

ESSEX

ARCHAEOLOGY & HISTORY



VOLUME 5

1973

THE ESSEX ARCHAEOLOGICAL SOCIETY

The Essex Archaeological Society was founded in 1852.

Its objects are:

- (1) To promote the study of the archaeology and history of the County of Essex.
- (2) To collect and publish the results of such studies in annual issues of *Transactions* and other publications.
- (3) To make researches, undertake excavations and field surveys, and assist in the preservation and recording of ancient monuments, earth works, historic buildings, documents, and objects of archaeological interest and importance.
- (4) To provide library facilities for members and approved students.

Publications

The articles in its *Transactions* range over the whole field of local history. Back numbers and offprints are available; list and prices on application to the librarian. Libraries requiring complete runs can often be assisted.

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A regular programme of excavations is maintained, on which help is usually welcome (depending on the size of the site). Details of current projects are given in the Newsletter.

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Articles for Publication are welcome and should be set out to conform with the Notes for Contributors, of which offprints are available. They should be sent to the Hon. Editor.

A list of officers, with addresses, will be found on the inside back cover.

Cover by Barbara Scorer.

ESSEX
ARCHAEOLOGY AND HISTORY

THE TRANSACTIONS OF
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TRANSACTIONS OF THE ESSEX ARCHAEOLOGICAL SOCIETY

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The Society acknowledges with gratitude the receipt of grants from the Department of the Environment, the Friends of Historic Essex, and the Waltham Holy Cross Urban District Council towards the expenses of this volume.

Editorial

THE tradition of county publications in Britain is of long standing. Our annually honoured Philip Morant had his counterparts throughout the land, and in the succeeding century the membership of the flourishing County Archaeological and Historical Societies was equally firmly based in the church and the professional classes. The county periodicals which they began are substantially still with us, this publication included.

The needs, as we said in our last issue, are self-evident and have not changed. The approach however has changed radically. To some extent this is a matter of technology. More detailed plans and more sophisticated photography require a larger medium than the narrow leather-bound volumes of the First Series, and the welcome afforded to our 1972 revisions is a gratifying indication that we are now achieving the best contemporary standards in this respect.

The problem however is more than technical, it is also social. Our predecessors were free to travel considerable distances to attend lectures or excursions. An excavation aimed at the recovery of objects for the Chippendale cabinet or perhaps stone foundations around which, with the help of the classical authors, a happy web of speculation and moralizing could be woven. The loss of their prose style may be deplored, and they cannot be blamed for not knowing what was not then known.

Today, however, those who are interested in archaeology and history are more numerous and though materially more comfortable, have less real leisure. To them history offers a break from routine, and a refreshing glimpse of other times and manners, an assurance of belonging to a great and continuing inheritance. They cannot travel far of an evening and hence have developed the 60 or so societies which now cover this county. They will attend lectures near at hand, and it is surprising that the television authorities have so far only dimly realized the potential audiences they might have in this discipline. Nor are they a pure passive community; many work extremely hard at weekends on fieldwork and excavations of varying degrees and quality. They care deeply for the environment in which they live, and defend, frequently with success, the historic buildings and sites which surround them.

Parallel with this increasing and enthusiastic public has grown up a small group of fortunate, if ill-remunerated, individuals who earn their living by archaeological and historical study, and are thence known as professionals, though perhaps we should take a leaf out of the Kentish book and call them full-time workers. Their standards also vary, but it is natural that in a technological age these standards should develop rapidly and anticipate those of workers in a part-time capacity.

It should be the task of a society such as ours, backed by over a century of experience and resources, to relate these two forms of activity through the subject which they both have in common, and there is no way in which this can be more

lastingly done than by the circulation of the printed word. This communication needs to be of two kinds, the current news items of topical interest, and the more long term consolidation of research material for ready reference in the future.

Such communication is, however, costly and there are already circulating in the area a galaxy of duplicated, typewritten and photo-lithoed documents which claim to be archaeological and historical publications. However suitable these may be for the announcement of immediate events, it seems to be the time to pose the question as to whether this is really good enough, and whether those who care about this county's history should not be considering whether a consolidation of resources would not achieve greater results.

At the present time the need for extensive publication is especially critical in the sphere of archaeology. Not only is the list of unpublished or badly published excavations extremely large, (and it is poor consolation to reflect that this is a problem not confined to Essex), but also the increased pace of building development is, for the foreseeable future, going to demand a major programme of excavation which will be useless unless it is properly recorded. So great and urgent is this crisis that proposals have been made for a national network of excavation units, all fully self-contained. While accepting that a major effort is required, we are entitled to an assurance that the object of the exercise will not be forgotten—we study archaeology to increase our knowledge of our unwritten history, and to share that knowledge with everyone interested.

What then is to be done? Is it not time that all those who care for the history of this county should be considering together the best means of achieving the objectives which are mutually acceptable? If this be read as a plea for the extended circulation of this journal, let it be so, and thought given as to how its organization should be adapted to meet the needs of to-day. Meantime it is proper to point out that those who appreciate and use its contents should not rely upon libraries and similar bodies but be prepared to subscribe to it themselves. Support for historical studies needs to be justified by proof and that proof is a very nominal annual cheque.

John George Samuel Brinson F.S.A., F.A.M.S.

BORN APRIL 23, 1911, DIED NOVEMBER 29, 1973
PRESIDENT OF THE SOCIETY 1960-1963 AND 1971-1973

IN classical times Africa, meaning the northern coastline, was a synonym for prosperity. Then under the tide of total war it was submerged, leaving great cities desolate in a wilderness of sterile sand. Few who have visited these shores can have failed to have reflected on the waste of life and skill which their crumbling ruins represent, and the lesson was emphasized again when the Allied armies fought their way along these historic coasts and then crossed to Sicily and Italy. Tent flaps were secured with Imperial inscriptions, lorries were parked in churches where shot-riddled masterpieces still adorned the walls, and hastily constructed trenches threw up the exported pottery of Periclean Athens.

All this made a deep impression on John Brinson, an officer in the Royal Engineers, as he followed his duties in this campaign. Before the war working in the Land Agents Office of the Essex County Council, he had already an interest in archaeology, more especially Egyptology. He had joined the Territorials, in which he was an N.C.O. and hence was mobilized on the first day of war and sent to France. Reported missing at Dunkirk, he was amongst the last to escape and was then posted to Aldershot where he was commissioned in 1941 and sent to North Africa. In Italy, when the advance slowed down, he was able to persuade the authorities to form a British Mobile Archaeological Unit to carry out such rescue excavations as might be practicable. Their greatest success was at the Italian Copper Age Cemetery of Gaudio, near Paestum, of which the finds are now in the Naples Museum.

Demobilized in 1945 he returned to his job in Essex and to a country where thoughts were turned to reconstruction. Much excavation had been done at Colchester, but elsewhere in the county there had been very little, and less still which could compare with the meticulous standard set before and during the war by that group of excavators, recently and so felicitously termed the 'St. Johns Wood or Inner Circle of British Archaeology'.

Our own society had not yet come to accept a concern for excavations, and hence Brinson formed the Roman Essex Society with the encouragement of Rex Hull, Curator of Colchester Museum, John Anstee, the late Douglas Kitchener ('Kitch'), David Trump and his father E. H. Trump, Lt. Col. R. J. Appleby, Ernest Fulcher and others made up this small, but very active group, which immediately embarked on a series of limited but significant excavations. These were: Little Laver, 1946, Bradwell 1947, Moulsham 1947-9, Great Chesterford 1948-9, Rivenhall 1948 and 1950-52, Little Waltham 1948.

Of these Ernest Fulcher wrote: 'It soon became clear that what John Brinson had in mind was no less than the creation of an archaeological flying squad, on the lines that van Giffen was then trying out in Holland. This was 20 years before Brian Philps' CIBA in Kent. I can remember his driving round and round the site at Great Chesterford at night, with dipped headlights, hoping to reveal unevennesses in the ground which might indicate the line of the Roman wall.

'It was his idea that we should hire the dragline excavator for a weekend and mechanically strip the topsoil. At Rivenhall he organized a light railway with tipping trucks for clearing spoil.

'I remember the fieldwork which we did at Great Chesterford. First we were given a summary of the records of Neville and Stukeley, and then, after a study of the air-photograph, we made a tour of the site, noting the depression in the Borough Field where Stukeley had recorded the current destruction of the wall. Finally we made a close inspection of the 'cliff' face left by the gravel digging. We saw evidence of pits, but no clear sign of the wall foundation trench. We also saw in section a V-shaped military ditch outside the presumed line of the wall—an unsuspected feature. Our fieldwork did not stop here, however, for we studied all the old walls of the district, and part of the base of a column was removed from one of them into the boot of John's car at dead of night. (The wall was already ruinous). We also made an expedition to Cambridge to study Neville's finds in the reserve collection of the Museum of Archaeology and Ethnology. I mention all this as an illustration of the thoroughness with which John prepared an excavation'.

This varied programme proved too much for one man to sustain, and Brinson therefore negotiated the fusion of the Roman Essex Society with the county body, hoping thereby to invigorate it. The finds were deposited in Chelmsford Museum. Unfortunately the original members lost contact as they came to be employed elsewhere, and the excavations were never published other than in summary in the Victoria County History Volume III.

In the next decade the archaeological crisis subsided somewhat, but in 1963, it became evident that Colchester was threatened by extensive redevelopment, and with his encouragement the Colchester Excavation Committee was reconstituted and he was elected its honorary secretary. For the first time in Essex, a salaried Director of excavations was appointed and a comprehensive programme was initiated. Similar needs later became evident in Chelmsford and in 1968 he established the Chelmsford Excavation Committee.

He had become President of the Essex Archaeological Society in 1960 and was at last able to exercise his personal influence on its functions. Convinced that the Society's image would best be restored by a vigorous programme of excavations, he concentrated on this activity, though not neglecting the other aspects of the Society's work. Excavations were organized in various towns and villages, in some cases for the first time and Maldon, Harwich, and Saffron Walden, to mention but three, had their history enriched as the result of his enterprise.

The new M11 motorway between London and Cambridge also posed a threat to the Great Chesterford area with which he was already familiar and he

energetically instigated the field work which evolved into the creation of the central section of the MII Committee.

By now however his health was beginning to deteriorate, and caused him acute pain, but with a determination appropriate to one born on St. George's day he worked on till his retirement from the County Council's service, to which he had so looked forward so that he could devote his full time to his archaeological interest. He attended meetings until a few weeks before his death, though it was evident that it was his resolution alone which brought him to them.

In all his work he was sustained by his wife Sybil, whom he married in 1937 and all those who visited their friendly and characterful home at Barnston will have their own memories of her generous hospitality. Her courage and support during his illness must defy description or praise.

The Society will remember him as one who was wholeheartedly committed to advance its interests, and if this forthright attitude seemed at times to be at variance with interests outside the Society there can be no doubt as to his personal determination to encourage, and extend, archaeological enquiry throughout the county.

The archaeology of Essex will undoubtedly continue to change and advance in the future; many of these changes will stem from the work, advice and foresight of John Brinson.

An Ancient Landscape Palimpsest at Mucking

By M. U. JONES

IT is appropriate that a type site for landscape rescue should be in Essex, since the principal river entry into Britain from the continent forms the county's southern boundary. Moreover much of this Thames side is now concealed or destroyed by urban spread.

Yet the excavation of the crop-mark sites at Mucking began by chance: chance that its hill-fort ditches resembled a henge, chance that the sites' discoverer (Prof. J. K. St. Joseph of Cambridge University) should have published in the first of his notes on 'Air Reconnaissance'¹ his now classic air photograph at a time when quarrying was about to overwhelm the sites, and good fortune that Mr. D. G. McLeod through Mr. D. A. Wickham (of Southend and Thurrock Museums) set in motion the machinery of state rescue. This began after harvest in 1965 in a decade when financial support for rescue archaeology was increasing steadily.

For more than a century gravel pits have been a major source of archaeological discovery. Now air photography of crop-marks, which develop most clearly on thin gravel soils, together with their large scale quarrying to feed new roads and building, are providing unprecedented opportunities for equally expanding knowledge. Far more is involved, however, than armchair exercises with air photographs and maps, and work at Mucking is helping to dispel the illusion of easily won data. Crop-marks do not provide more than partial glimpses of ancient settlements: they rarely reflect minor features, nor (except for orthodox military sites, roads etc.) are they capable of reliable interpretation without excavation. There is much to be said for a programme of sustained investigation of settlement areas in the major regions of Britain, comparable to that for its historic towns.

The Mucking crop-mark sites cover a continuous zone 1 Km. wide by 350 m. long above the 100 foot contour on Thames terrace gravel. Quarrying is slicing off this deposit (up to 8 m. thick) at a point where the river changes direction at what was almost certainly the lowest crossing point of the estuary, Fig. 1. Fig. 2 shows most of the area so far investigated, to which should be added the features rescued earlier in the adjacent Linford quarry without the help of crop-marks.²

It is a provisional and incomplete plan, since the speed of destruction forced the decision whether to regard rescue as top priority, or save only as much as could conveniently be studied and reported, in what are still quite inadequate provisions for rescue archaeology. There was never any doubt, on considering the

¹ 'Air Reconnaissance: Recent Results', J. K. St. Joseph, *Antiquity*, vol. XXXVIII, 1964, Pl. XXXVII (b).

² 'Settlements of the Iron Age and pagan Saxon periods at Linford (Quarry), Essex', *Trans. Essex Arch. Soc.* 3rd series, i, 1962.

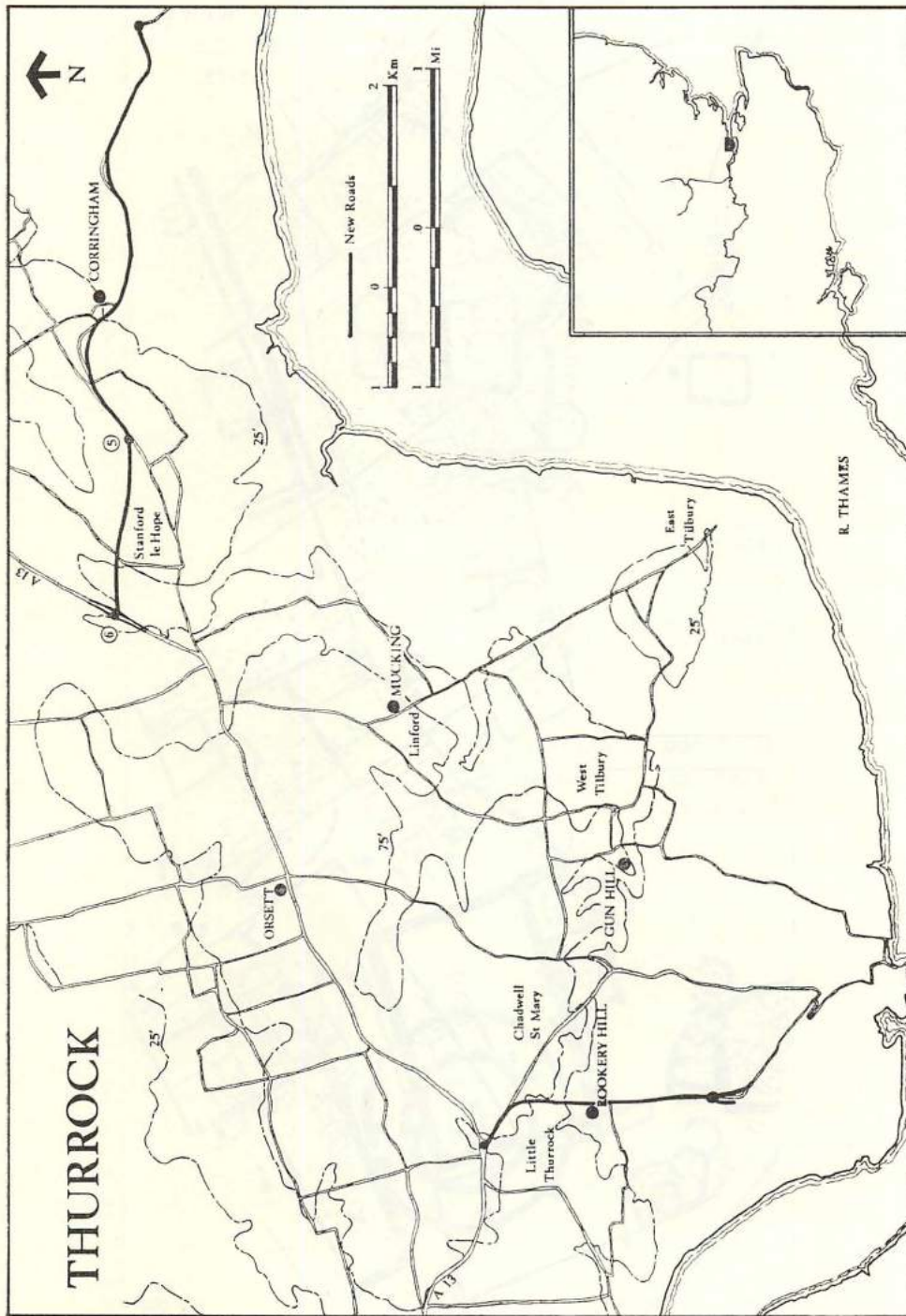


FIG. 1
The Thurrock area showing archaeological sites.

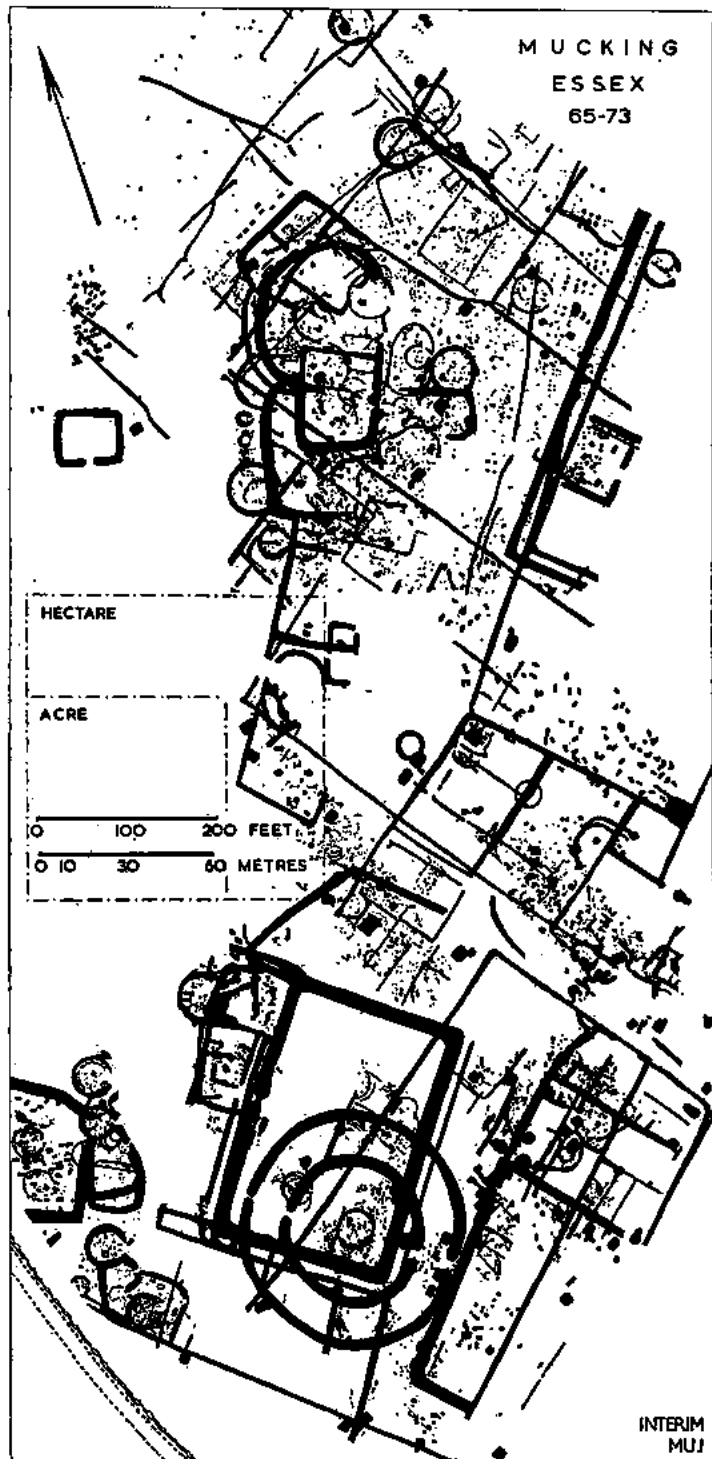


FIG. 2

Interim plan of the first c. 9 hectares of the Mucking crop-mark sites investigated 1965-73, showing soil-marks of archaeological features ranging from Beaker to modern, but predominantly Iron Age, Romano-British and Saxon.

average fragmentary settlement plans, and the ill founded speculations they have inspired in the archaeological literature, that complete rescue was the right target. Indeed, with sights set lower than this, the second Saxon cemetery, the second Romano-British cemetery, the first post-built Saxon 'hall'—to mention only a few—would never have been known.

Of the many crop-mark complexes which have come to light since the war, there is no doubt this Essex one, strategically sited in an area of primary Iron Age and primary Saxon settlement deserved as full treatment as possible. Thanks are therefore due to the Ancient Monuments Directorate of the now Department of the Environment (through Miss S. A. Butcher, who instigated the rescue, followed by Mr. J. G. Hurst), Thurrock U.D.C., the British Museum, Essex C.C., as well as local bodies, firms and individuals, especially members of Mucking Excavation Committee, for continued support. The co-operation of the landowner (Surridge Estate Trustees), tenant (Mr. Thomas Lindsay of Waltons Hall), and developer (Messrs. Hoveringham Gravels Ltd.) has eased many problems. An educational and international by-product of the excavation is the participation of students from many countries, with Czechoslovakia, Netherlands, Poland and the U.S.A. most strongly represented. Some finds are on display in the new Thurrock Museum.

A conservative count of archaeological features rescued is:

ditches		7 Kms. in length. Mostly Romano-British.
sub-enclosures		(where ditches define, but do not enclose, an area). 7, Belgic.
enclosures		1, Iron Age 'mini-hillfort'. 1, rectangular earthwork, on top of hillfort, 1st. C.A.D. 16, field enclosures, Belgic to R-B.
structures		pottery kilns, 6 R-B, c. 20 Belgo-Roman (see page 13). wells, 4 R-B. corn-driers, 3 R-B.
building traces—	penannular	gullies (round houses), 30 complete, 70 incomplete, Iron Age to R-B.
	rectangular	wall-slots, 5, ?Belgic.
	rectangular	post-built, 4 plus, ?R-B to Saxon
	rectangular	post-settings, 14 plus 4xpost, 2 6xpost, 1 9xpost, Iron Age.
	sunken huts,	110 Saxon
pits ('storage', hearth, smithing,	clay storage, water-pot, sheep-burial).	1,150, Beaker to modern, mostly Iron Age.
post-holes (inc. post-pits)		5,300, Beaker to modern. Final interpretation should yield more building plans.
burials		960, Beaker to Saxon.

- 2 R-B cemeteries: I incomplete, mixed, with
80 burials.
II complete, mixed, with 30 burials.
- 2 Saxon cemeteries: 1, incomplete, with 66 inhumations.
2, under excavation, 600 cremations, 250
inhumations

Regarded simply as discovery, some of these features (and many of the finds) are exceptional; many might be described as 'bread and butter' archaeology. An assessment of the material in human terms relies on relationships both in space and in time which reflect the changing role this patch of Essex has played in the emergence of Britain.

The provisional picture is of a landscape at first largely ignored, except by Mesolithic to late Neolithic people, presumably migrant groups, whose traces are mostly confined to flints, and an exceptional flat Beaker grave with all over combed Beaker and 11 barbed and tanged arrowheads. After slight evidence for Bronze Age agriculture, the gravel terrace came into prominence as the site of a circular bi-vallate earthwork—'mini-hillfort' quite well expresses its 80 m. overall diameter. Its pottery with varied finger-tip impressions, and a few linear combed designs, its few bronzes and entire absence of iron, assign this earthwork, (with its wide visual command and siting beside the probable river crossing indicated by the modern East Tilbury-Horndon on the Hill road), to the late Bronze-Early Iron Age transition. Since related features (mostly hearth-pits) are few and scattered, this must have been a time when defence was vital to a people whose economy seems to have been pastoral.

As the Iron Age developed, the need for defence disappeared. Except for two round house complexes with attached compounds, settlement traces are first of free standing houses (penannular gullies) and associated pits and postholes. With the Belgic phase, a rectangular house type seems to have been introduced, though round houses continued.

Without its complete excavation, a Belgic complex, dated by wheelthrown pottery, brooches and potin coins, and covering an area 230 m. × 100 m., could not have been understood. A succession of rectangular and curved ditches defining sub-enclosures (?sheepfolds), as well as complete enclosures—with related pits, post-holes, rectangular and round houses—can reasonably be construed as a pastoral settlement. It is unfortunate that, due to soil acidity, virtually no bone survives, but triangular clay loomweights (archaeological proof of sheep) support the idea of ditches as quarries for sheepfold banks forming protection against weather, marauders, and predators. Fringing this Belgic settlement, is a 100 m. long zone of rectangular posthole settings, usually regarded as granaries, though now the subject of growing speculation.

With the Roman conquest, land utilization of the gravel terrace becomes more intense, and now begin to appear some of the larger rectangular ditched enclosures (others are modern) seen in Fig. 2. Three equidistant earthworks, each enclosing

more than an acre ($\frac{1}{2}$ hectare), are apparently incorporated in a field system which extends over the whole length of the crop-mark area. There is no doubt this relates to a Roman villa from the buildings of which have come tile, window glass and patterned wall daub.

The most southerly earthwork (overlying the hillfort), rectangular, partly double-ditched, and with single entrance facing inland, seems to date from mid 1st. C. A.D., and a 1st. C. A.D. legionary's 'sporrán' pendant was found in its interior. The central enclosure is now being excavated. The northern enclosure has so far been only trial trenched, producing exceptional early Saxon pottery in its late fill.

The transition from, as well as into, the Romano-British landscape, is not yet clearly seen. Apart from the growing significance of the central enclosure, which forms a NE boundary to Saxon cemetery 2, and seems to mark a break in the Saxon hut distribution, there is no discernible pattern in Saxon settlement. While in spite of the fact that occupation continued to the end of the Roman period, and that more early Saxon domestic pottery has come from Mucking than any other settlement site in Britain, clear evidence for overlap is so far lacking. Where Saxon finds have appeared in non-Saxon contexts (mostly Roman ditches and well 4) they are confined to the late fills. Roman finds do occur in Saxon huts (which now total 110) though noticeably in those huts which lie within the Roman fields. They could have found their way into the hut fills because they lay about on the ground, and need not be evidence for native Romano-Britons and Saxon immigrants living together.

The four cemeteries so far discovered are quite separate. Of the two R-B cemeteries, II (within the enclosed fields) seems to be entirely of the 2nd. C.A.D. Cemetery I seems to span the Roman period, but has few and poor grave goods. The hundreds of finds from the two Saxon cemeteries are, with rare exceptions, distinctively Saxon, and reflect widespread contacts round the North Sea littoral. From womens' graves have come brooches, beads, purse mounts, pins, finger rings, and four glass vessels, including two outstanding Rhenish claw beakers and a Kempston type cone beaker. From mens' graves have come spears, franciscas, swords, shield bosses, buckles and buckets.

Even ignoring the complexities of dating hut and grave finds within the 5th to 7th C.A.D. bracket, the actual character of the Saxon landscape is not easy to assess. Certainly the idea of a hierarchical agricultural settlement reflected archaeologically in huts and smaller ground level buildings grouped around halls, with related enclosures, seems irrelevant. Not only are Saxon settlement traces almost entirely of huts, invariably of the simpler gable post type, accompanied by occasional pits and slight ditches; but the one certain post-built hall is 40 m. distant from the nearest hut—at any rate on its north-west side. Moreover, the frequency of loomweights among the domestic refuse of pottery and bone in hut fills implies open grassland, like the pre-Roman landscape must have been. Are the huts—like the Roman fields and their contained features (wells, corn driers, pottery kilns, granary, barn, cemetery)—then to be regarded as peripheral to more substantial settlement down the terrace slope below the spring line, where land is not threatened by quarrying?

Myres³ has suggested that at any rate the beginning of Saxon settlement might be explained in military terms—the posting of mercenary soldiers to guard the sea approaches to London. Their presence is archaeologically attested by the notable late Roman bronze and silver belt set from Saxon cemetery 1, now in the British Museum,⁴ and comparable pieces found in huts.

Perhaps the Nissen huts of the last war—low cost, easily erected shelters, for use as needed by soldiers, prisoners, refugees and immigrants—provide the most telling comparison we can find for this *grubenhäuser* strewn hillside overlooking the Thames. This was the final ‘archaeological’ landscape in the palimpsest of soil-marks shown in Fig. 2. The medieval church lies 2 Km. to the east, beside Mucking creek, and little besides field ditches, sheep burials and gin trap pits remain to witness the subsequent thirteen centuries.

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- (Offprints and postcards can be obtained from Thurrock Museum, Grays, Essex).

³ ‘The Anglo-Saxon pottery from Mucking’, J. N. L. Myres, *Antiq. J.*, XLVIII, part II, 1968, p. 226.

⁴ ‘Quoit brooch style buckles’, V. I. Eivson, *Antiq. J.*, XLVIII, part II, 1968, p. 231.

The Romano-British Pottery Kilns at Mucking

By M. U. JONES

with an interim report on Two Kiln Groups

By W. J. RODWELL

SUMMARY

ROMANO-BRITISH pottery making at Mucking is seen in its context, both in the Roman landscape of villa fields, and as part of a long tradition of pottery making from Early Iron Age to Saxon.

Determination of its products will help to establish the typology and dating of coarse pottery along the north Thames bank.

POTTERY making probably accompanied settlement at Mucking throughout the 1½ millennia from the late Bronze Age to the end of the Migration period.¹ Direct proof in the form of kilns is however known only for the Roman and immediately preceding periods. Six kilns of orthodox Romano-British type have so far been discovered during the first seven years' work.² Firebar fragments and 'blown' sherds suggest there may be two more. The remains of about twenty smaller versions may be regarded as Belgio-Roman prototypes.³

Domestic hearths may have served to fire prehistoric (especially earlier Iron Age) wares with their mixed oxidized/reduced colouring of red and black. Their considerable variety of finger impressed rims also implies that potting was a household chore carried out by many individuals. The more consistently reduced Saxon wares⁴ suggest that above ground clamp kilns, of which no trace would be expected, may have been used.⁵

The Mucking kilns are of interest on several counts: as *structures*; in their *products*; and in their settlement *context*.

Considered in their *context* these kilns are notable, since five of the six kilns are sited in or beside field boundary ditches of a Roman villa. The sixth lies outside its outfield boundary. (Fig. 1). (Although no romanized domestic buildings have yet been found, evidence for such a villa comes from pre-fabricated building tiles

¹ 'Crop-mark sites at Mucking, Essex', M. U. Jones, V. I. Evison & J. N. L. Myres, *Antiq. J.* vol. XLVIII, part II, 1968 and page 9 of this issue.

² 'The Mucking, Essex, crop-mark sites', M. U. Jones, *Essex J.*, vol. 7, no. 3, 1972.

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⁵ 'Early Saxon pottery kilns at Purwell Farm, Cassington, Oxfordshire', B. V. Arthur & E. M. Jope, *Med. Arch.*, vol. VI-VII, 1962-3.

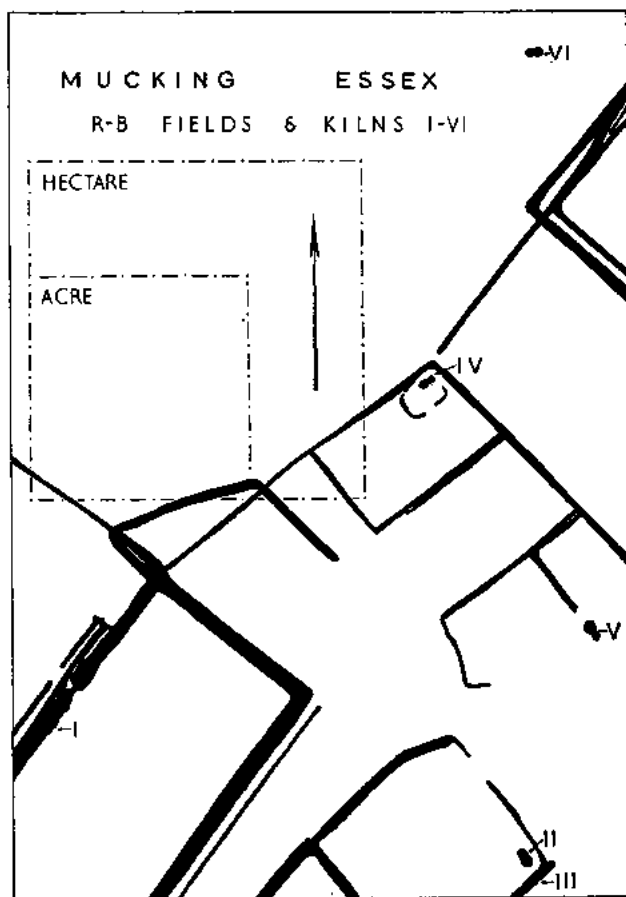


FIG. 1
Romano-British field boundaries and siting of kilns I-VI.

(tegulae, imbrices, tubuli), window glass, patterned daub, wells and corndriers). Six, or even eight, kilns are however too few to argue for an industrial pottery, as in the Nene Valley, with over seventy kilns;⁶ or at Cantley, Doncaster, with over thirty;⁷ or at Mancetter-Hartshill, Warwickshire, with fifty-nine kilns;⁸ or to suggest that this might be an enterprise serving a town, as at Colchester or Lincoln. Moreover, no Roman town sufficiently close to Mucking is known, in either Essex or Kent.

At the same time, pottery making on the scale implied by the size of these kilns⁹ puts it beyond a regular household task, and presupposes a craftsman. It

⁶ 'Notes on the Roman pottery industry in the Nene valley', B. R. Hartley, *Peterborough Museum Society*, 1960.

⁷ 'The Romano-British pottery kilns at Cantley estate, Doncaster', S. M. Cregeen, *Yorks. Arch. J. part 154, vol. XXXIX, 1957*.

⁸ 'The kilns at Mancetter and Hartshill, Warwickshire', K. F. Hartley, *C.B.A. Research Report 10, 1973*.

⁹ See B. R. Hartley, 1960, p. 16.

is suggested then that itinerant potters, set to work on six different occasions on the edges of fields to supply the villa kitchens, with perhaps any surplus to neighbours, might fit the evidence. Mapping of the distinctive products of these kilns should indicate their trading area.¹⁰

Although, as Corder stressed,¹¹ kiln groups make an important contribution to the value of coarse pottery as a means of archaeological dating, the *actual* dating of kilns, when they are discovered in isolation, is problematical. At Mucking however it will be possible to check the dating of its own kiln products from site stratigraphy and from the pots' frequent associations with other material, found in other settlement features as illustrated below and in graves.

Simple experiments which it is hoped to develop into technical study¹² have been made with the brickearth (or head) which in places overlies the Thames terrace gravel where the Mucking crop-mark sites lie. These have established its suitability as a potting clay. Except perhaps for added sand, no grog or other filler seems to have been used for the products of the Romano-British kilns. (Shell, dissolved to produce a vesicular fabric¹³ is typically Belgo-Roman and is associated with the prototype kilns. Its most common form is a globular jar with rebated rim which often carries a potter's graffito; very large vessels with upright perforated lugs also occur in this ware). Flint grit (the gravel is of flint pebbles) is characteristic of Iron A pottery, while 'grass'—tempered and sandy wares form Saxon pottery criteria.¹⁴ Brickearth would also provide a convenient source for the large amounts of clay needed to build and repair the kilns themselves (in the absence of suitable building stone), while wood fuel would have been easily got from the natural vegetation of the brickearth areas, with their heavier than gravel soils.

As *structures* all six kilns fall into Corder's Class I. They are single flued updraught kilns comprising three elements: a circular furnace connected by a tunnel-like flue to a stokepit, all being sunk into the ground.

All except kiln I and the destroyed IIA have survived to a height of at least 60 cms., so that, apart from the ambiguity of an open or roofed furnace, the structures are basically intact. Even allowing for the imprecise nature of clay construction, the kilns show individual variations (Fig. 2). However, all have a central solid single or twin pedestal rising from the furnace floor. None has a suspended floor, except for small 'bridges' spanning the twin pedestals of kilns II and III. Two of the six (kilns I and VI) contained clay firebar fragments, though without evidence for their function. Four kilns (kilns II, III, IV and VI) had an apparent 'ledge' round the inside of the furnace wall, which was distinctly higher than the top of the pedestal; though only in kiln VI did it continue all the way round.

The building of the kilns evidently began with the excavation of a circular pit,

¹⁰ 'Changing patterns of pottery trade to the Trobriand Islands', P. K. Lauer, *World Arch.*, vol. 3, no. 2, 1971.

¹¹ 'The structure of Romano-British pottery kilns', P. Corder, *Arch. J.*, vol. 114, 1957.

¹² As part of the 'Scientific aspects of archaeology' course at the N.E. London Polytechnic under T. J. Turbin.

¹³ 'Potter's graffiti at Mucking, Essex', M. U. Jones, *Antiq. J.*, vol. LII, part II, 1972.

¹⁴ See Note (4) *op. cit.*, p. 147.

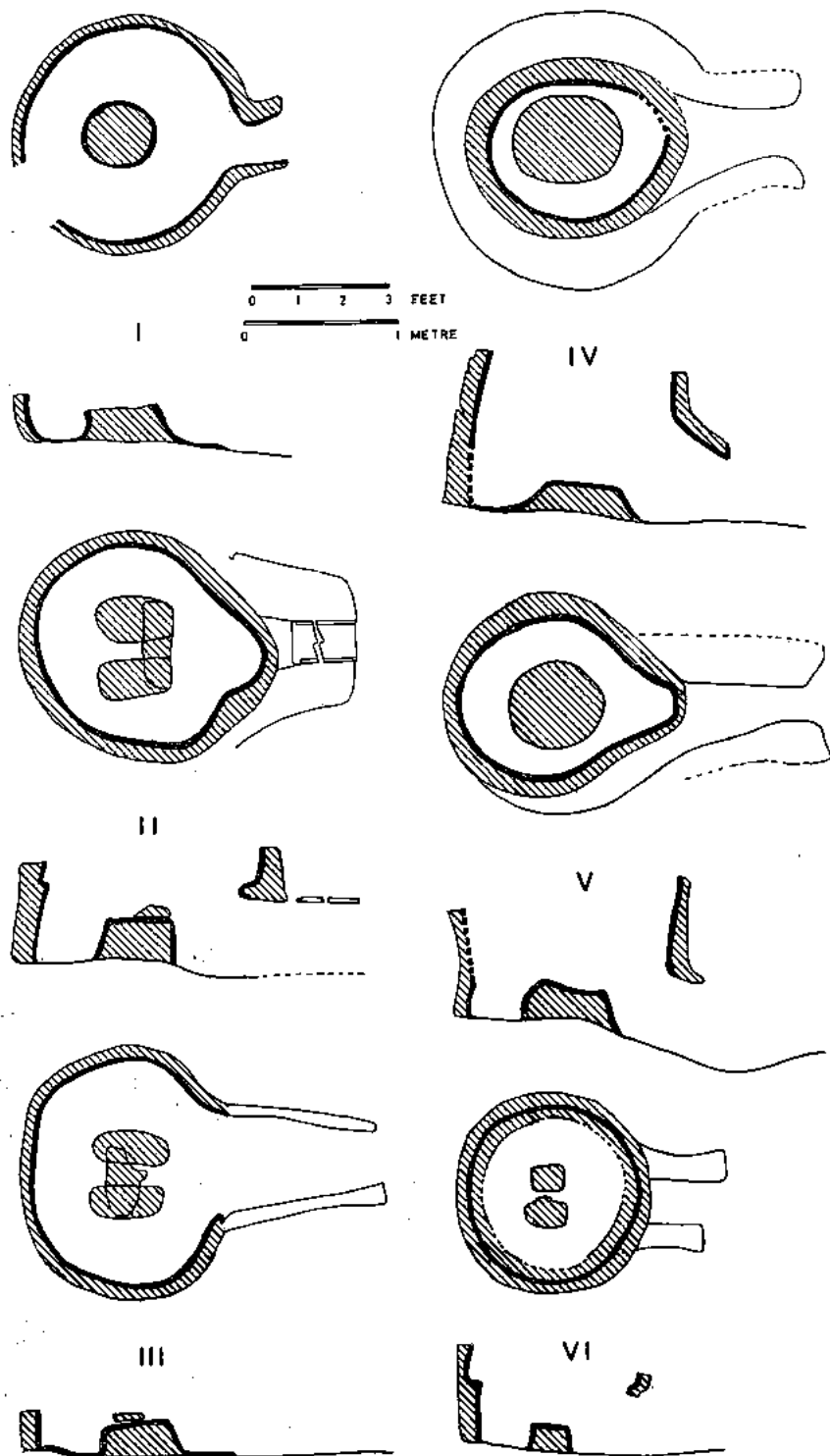


FIG. 2
Furnace plans, kilns I—VI, Mucking, Essex.

in which was erected the free-standing furnace wall. In kiln II irregular vertical channels (seen also in kilns III and IV) suggested a stiffening of the raw clay with branches (like the rods in reinforced concrete). A similar technique is seen in the Lincoln museum display of Swanpool kiln I. In kiln V, the gravel beneath the pedestal showed considerable heat-reddening, which might have resulted from flames penetrating a faulty first pedestal, or perhaps indicates a pre-firing to harden the rising walls.

Although the flue walls were, like the furnace, heat-hardened, the flue roof (or lintel) seems to have been rebuilt for each firing. In II¹⁵ an apparently movable *tegula* covered the flue; in VI the lintel was formed of raw clay lumps. The floor of furnace and flue was probably originally smeared with clay. Direct evidence for an open or domed furnace roof is lacking, though a distinct corbelling is apparent in the better surviving kilns, with a shape recalling a chimney hood rising from above the flue, (see section of kiln IV). Fragments of collapsed furnace wall occasionally have finished, rim-like, edges.

Experimental kilns, usefully summarized by Bryant¹⁶ have demonstrated that permanent domes are both unnecessary and unlikely. However, to ensure reduced (grey-black) wares, evidently the intention of the Mucking potters, the flue must have been sealed. Clear evidence of this survived in the form of kiln debris and raw clay blocking the flue.

Wood seems to have provided the sole source of fuel. Preliminary charcoal identifications include *Quercus sp.*, *Populus sp.*, *Ulmus sp.*, *Acer campestri* and *Corylus avellana*.¹⁷

One must then imagine the green pots being loaded through the open roof. Lacking suspended floors (and proof of firebar function) one can suppose that larger pots stood, perhaps propped on broken sherds, directly on the furnace floor, with the rest of the load stacked in layers around and above the central pedestal(s), the purpose of which may have been to provide stability. Bryant suggests that the green pots were first covered with a layer of waste sherds or tiles—a practice which might explain the abraded sherds among kiln debris. The next step would be to begin the fire on the flue floor; then, having reached the required temperature ('650 C. to about 900 C.'), the roof seal would be completed, using 'e.g. turves, clay, sand', and the flue itself made airtight after the fire had been stoked with a final fuel supply to use up any oxygen remaining in the furnace.

The approximate capacity of such kilns has been mentioned. The amount of use can only be guessed at; the volume of wasters is of course a measure of failure rather than of actual output, though the structures of kilns II and V imply more prolonged use than the other four kilns. Kiln V showed considerable wear, borne out by the deeply raked out flue floor, and the partly replaced walls (seen also in kiln IV). In kiln II a replacement furnace was built in the stoke pit of the first kiln. This seems clear proof that the orientation of kilns is not critical; presumably

¹⁵ A facsimile incorporating parts of the original structure of Mucking kiln IIB is on display in the new Thurrock Museum, Grays.

¹⁶ 'Experimental Romano-British kiln firings', G. F. Bryant, *C.B.A. Research Report 10*, 1973.

¹⁷ The help of G. C. Morgan in identifying charcoals from Mucking is acknowledged.

the depth of the flue in the ground effectively protected it from unwanted wind.

The firebars remain enigmatic. No complete examples survived, nor any fragment apparently *in situ*. The longest fragment measures about 25 cms., and in section they are about 5 cms. in diameter, and both rounded and squarish. Where ends survive they show tapering. (Where comparable firebars in other kilns have survived *in situ* they have been arranged radially to form a suspended furnace floor, with one end resting on a central pedestal and the other on a ledge (at Cantley kiln 20 on a 'shallow depression'¹⁸ (or a movable pilaster propped against the furnace wall).

Firebars are found also in the prototype kilns, which consequently merit consideration here. Not only are they much smaller than the developed Romano-British structures, but rarely more than a few cms. survives in depth. They have been found freestanding, in ditches within a Belgic settlement area, and also in the villa fields. There was doubt, when they were first found, whether their function was for cooking food or firing pottery, since they resembled circular clay floored and walled ovens already found, as well as a structure interpreted as an oven from a nearby site.¹⁹ Moreover, they contained very few sherds. (Other furnace type features found at Mucking are smithing hearths and corndriers).

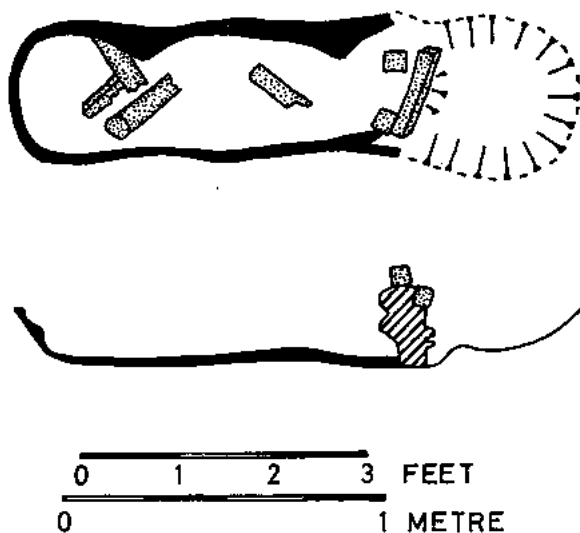


FIG. 3
Belgo-Roman kiln (site ref: 1155 × 195).

However, the example illustrated in Fig. 3 has established, by its clear division into furnace, tiny flue and stokepit, all containing mis-fired sherds, that some at any rate were pottery kilns.

¹⁸ 'The Roman excavations at Cantley, Doncaster, Kilns 16-21', E. F. Gilmour, *Yorks. Arch. J.*, part 152, vol. XXXVIII, 1955.

¹⁹ 'Excavation of a Romano-British site at South Ockendon', R. E. Chaplin & R. T. Brooks, *Trans. Essex Arch. Soc.*, vol. II, part I, 1966.

The function of *their* firebars is even more enigmatic, since complete firebars seem likely to be little shorter than the furnace width, and there seems no reason for tapering. A suggested explanation of the firebars found in both types of kiln is that they provided fireproof rods to help span the open roofs of furnaces and/or flues, and act as support to the material used for sealing them. The use of three firebar fragments to help seal the flue in Fig. 3 may be significant.

However, reconstruction of other, rare, Belgic pottery kilns,²⁰ based more on surviving kiln furniture than on structure, anticipates their orthodox Roman function as components of a suspended floor.

Acknowledgements. This account has been based on field records made by: M. D. Card, P. J. Drury, W. T. Jones, K. A. Rodwell, W. J. Rodwell, W. van Tent and the writer. Photographs by W. T. Jones.

THE PRODUCTS OF KILNS II AND III

by W. J. RODWELL

To date, only the pottery from the furnaces, flues and stokepits of kilns II and III has been catalogued, but it seems representative of the range of forms so far known to have been produced at Mucking. This material is therefore being published as an interim report, since so few Romano-British kiln groups are known from the area.

Kiln II was free-standing in the corner of a villa field, had a second furnace built in its stokepit and has yielded the largest amount ($\frac{1}{2}$ ton of sherds) of any of the first six kilns. Kiln III was built in the boundary ditch of the same field, only 5 m. distant, which had been recut after kiln III had been abandoned. Consequently, the wasters associated with this kiln undoubtedly include sherds from the earlier kiln II, at least. Kilns IV, V and VI also yielded substantial quantities of sherds, whilst kiln I had very little associated pottery. Three of the four wells so far discovered are near enough to kilns II and III to suggest that they were used by the potters, and what seem to be kiln products were found in two of them. Therefore, where better examples of some forms are known from these, and other features, they have been selected for illustration.

In general, the Mucking potters seem to have aimed at hard-fired black or grey wares: the jars are in a rough sandy fabric, and dishes, bowls and beakers in a more finely-prepared paste (lacking the larger sand particles), which is extensively burnished. Decoration is quite rare but includes line-combing, comb-stabbing, scored patterns and the uncommon diamond rouletting.²¹ To judge from the quantity of wasters, misfirings were common; whilst very few sherds are over-fired, cracked or significantly distorted, the majority are under-fired or have flaked badly. Instances of the body becoming detached from the base are numerous, as too are 'pot-lid' flakes.

Unfortunately, much of the pottery is in small sherds, which in itself might

²⁰ As at Rushden, Northants., *Britannia III*, 1972, p. 326, and Hanborough, Oxon., 'The Iron Age in the upper Thames basin', D. W. Harding, 1972, p. 119.

²¹ No local examples are known to the writer.

be an argument for the long life of the kilns, so that complete profiles are rare, and it was impracticable to assess the actual number of waster pots. Large, joining sherds were found only on the furnace floors, and even then were not numerous. Most basal sherds were quite undistinguished and simply displayed string marks, where the pot had been cut away from the wheel-head. However, the bases of pie-dishes were usually burnished, as too were some of the finer bowls and jars. The only really distinctive bases were those of pedestalled jars (Type N), flasks (Type O) and beakers (Type R).

The pottery has been divided according to form into twenty-one Types, lettered A to V. Examples of each type are described and illustrated. Assuming the wasters to be representative of the output of each kiln (and there is no reason to think that any types had a differential failure rate) these forms are then quantitatively analysed and further classified according to fabric. Finally a tentative chronology is suggested for all six kilns.

TYPE A: straight-sided pie dish

FIG. 4; NOS. 1-7

The majority are shallow in relation to their diameter, which varies between 18 and 26 cm. They are normally burnished all over, including the base, but details of finish vary considerably within any one deposit so that there can be no chronological significance here in the presence of an external rim-groove or basal bevel. No. 1 shows the dish in its simplest form; the interior of the base was sometimes elaborated by burnishing concentric bands only, as in No. 2, or, more rarely, by burnishing a wavy line in a reserved zone; No. 3. This vessel also exhibits a marked outward curvature to the wall, as does No. 4, which has the addition of a rim-groove. Basal bevels occur on about half the dishes from kiln II and bear no direct relation to rim-grooves (No. 5). An example of the less common deep dish is shown as No. 6 and a single example of the bifid rim as No. 7 (probably derived from kiln II).

The form is a very common one (*cf. Cam. f.40*)²² and has a long life; it begins to appear at Verulamium in the mid-second century (*Ver. 736-8*).²³ At Mucking it was produced in kilns II, III, IV and V.

TYPE B: beaded-rim pie dish

FIG. 4; NOS. 8-14

The commonest version of this type (kiln II) is broad and shallow, 20-25 cm. in diameter, with a well rounded bead. Occasionally the interior of the base is decorated with burnished concentric lines, as in No. 8, and there may be a basal bevel (No. 9) or there may not (No. 10). The deeper bowls usually have gently curving walls and may have the addition of an occasional groove (No. 11), and a few vessels belong to an altogether larger category (Nos. 12 and 13) and tend to be

²² C. F. G. Hawkes and M. R. Hull, *Camulodunum* (1947) and M. R. Hull, *Roman Colchester* (1958) describe the type-series. For further refinement see M. R. Hull, *The Roman Pottery Kilns of Colchester* (1963), hereafter abbreviated to *RPK*.

²³ S. S. Frere, *Verulamium Excavations*, i (1972).

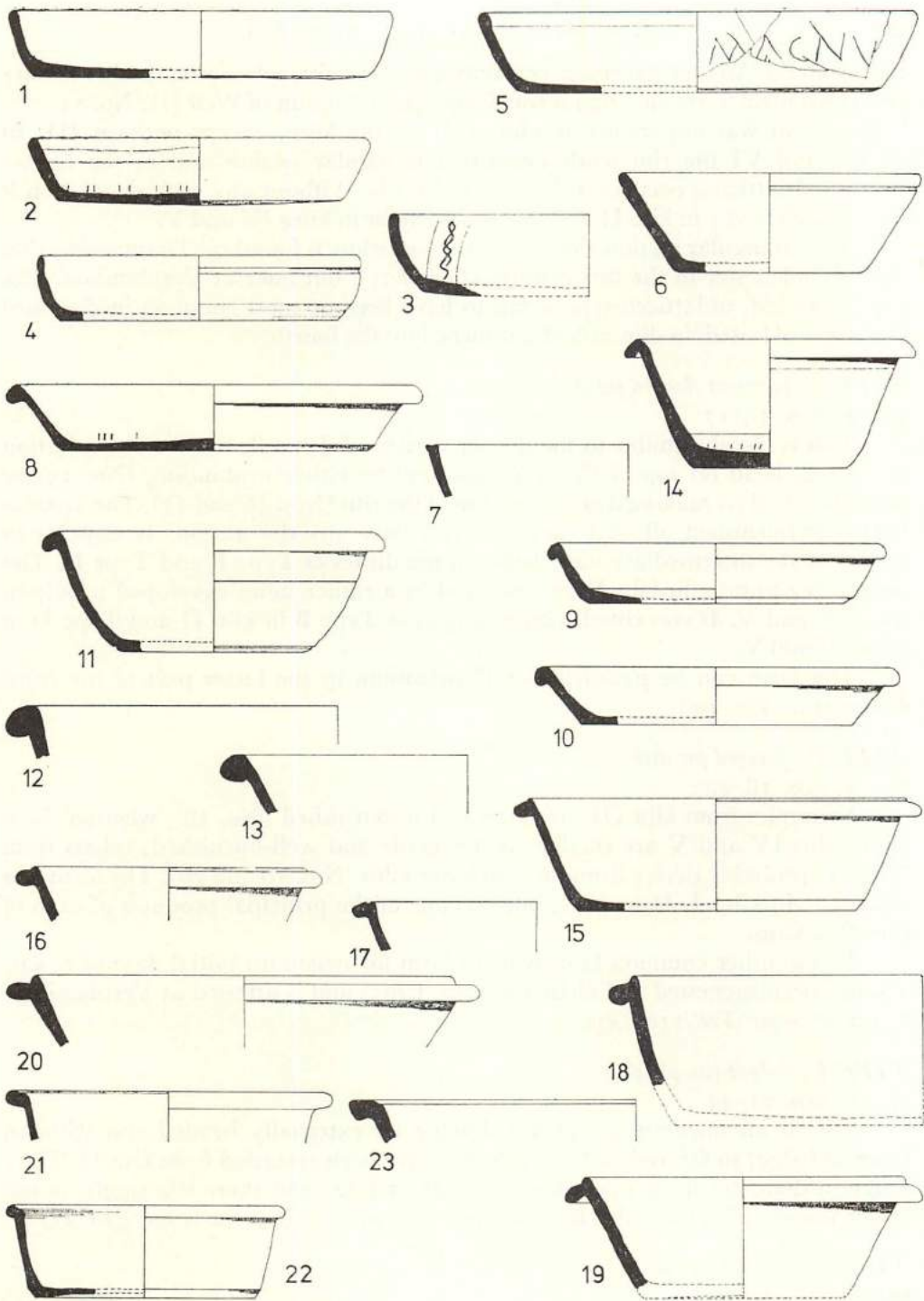


FIG. 4
 Pottery of Type A 1-7; Type B 8-14; Type C 15-17; Type D 18-20. Type E 21-23. Scale $\frac{1}{4}$

unburnished. An unusual vessel, certainly a waster, with a drooping rim, thick base and concentric burnished bands was found in the bottom of Well (1), No. 14.

The form was apparently produced in all the kilns, except perhaps III: in kilns I and VI the rim tends towards a triangular section and in the former burnished laticing occurs on the external walls. Without any such decoration it occurs prolifically in kiln II and to a lesser extent in kilns IV and V.

The triangular section rim with laticing below is found on Thames-side sites and at Colchester in the first century (*Cam. f.37*), but later at Verulamium. The round-beaded, unlatticed type seems to have become most common in the third century and lasted, in diminished numbers, into the fourth.

TYPE C: incipient flanged pie dish

FIG. 4; NOS. 15-17

This is closely similar to the deeper variety of Type B, but has the addition of a small bead on top of the rim; this may be either upstanding (No. 15) or simply formed by making a groove on top of the rim (Nos. 16 and 17). The vessel is normally burnished all over and does not bear any decoration. It appears to represent the intermediate stage between pie dishes of Type B and Type D. The form was common in kiln II and occurred in a rather more developed profile in kilns IV and V. It co-existed with examples of Type B in kiln II and Type D in kilns IV and V.

The form can be paralleled at Verulamium in the latter part of the third century: *cf. Ver. 1084*.

TYPE D: flanged pie dish

FIG. 4; NOS. 18-20

Examples from kiln III are large and unburnished (No. 18), whereas those from kilns IV and V are smaller, better made and well-burnished; others from Well (1) probably derive from the two latter kilns (Nos. 19 and 20). The form was not made in kilns I, II and VI, but was one of the principal products of each of the other kilns.

It is another common later-Roman form for which an initial date of *c. A.D. 250* has been suggested at Colchester (*Cam. f.305*) and is attested at Verulamium, *c. A.D. 270-90* (*Ver. 1101, etc.*).

TYPE E: ledged-rim pie dish

FIG. 4; NOS. 21-23

This is an uncommon pie dish having an externally beaded rim with an internal ledge; so far, only a few examples have been recorded from kiln II. They range in diameter from 15-19 cm. (Nos. 21 and 22) and there is a single, much larger vessel which has a flat-topped, grooved-rim as well as the ledge (No. 23).

TYPE F: ledged-rim jar

FIG. 5; NOS. 24-30

This simple storage jar with an internally-ledged rim occurs in large numbers on the site and was made in kilns I, II and VI. Fragments of these vessels in heavily

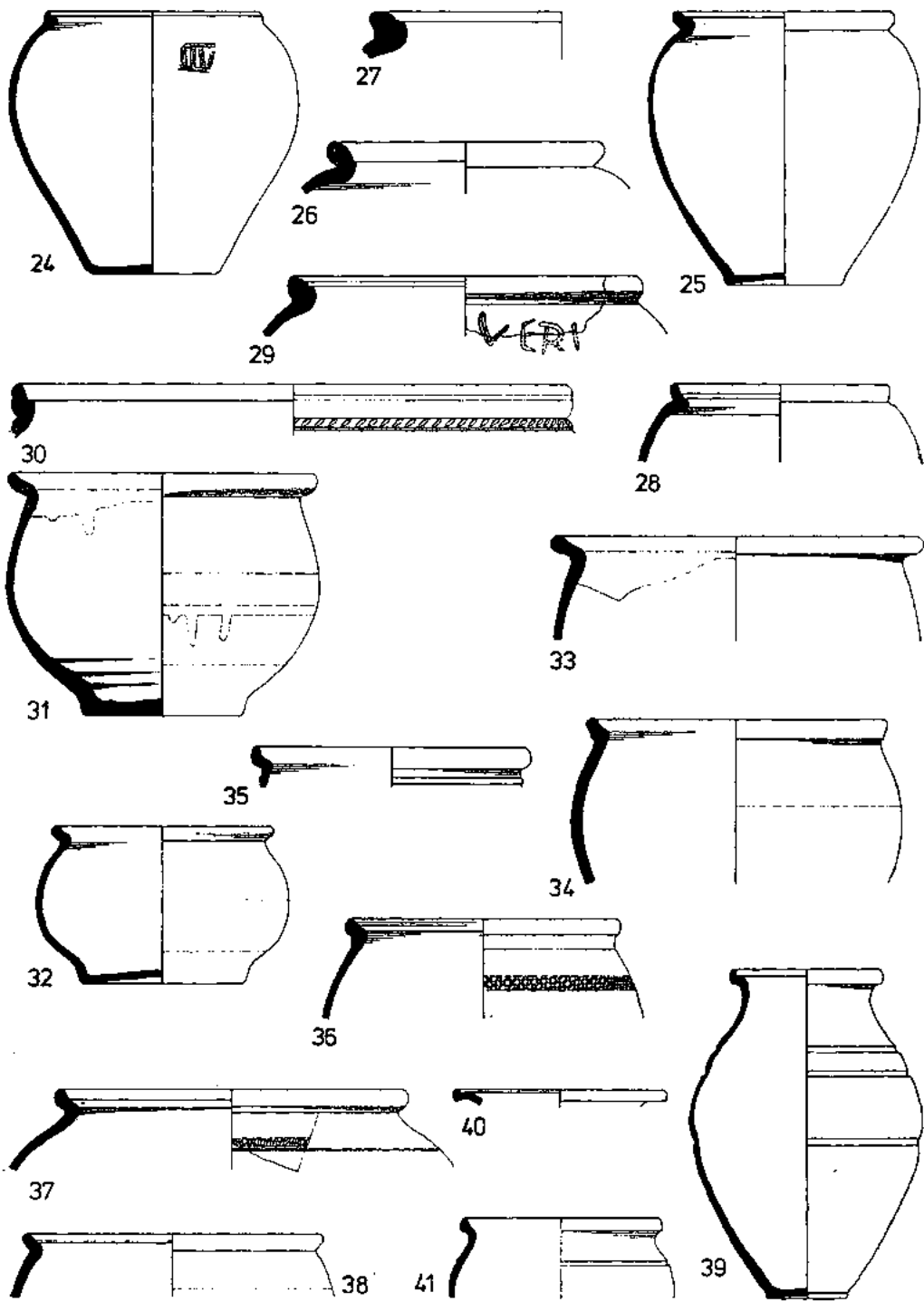


FIG. 5
 Pottery of Type F 24-30; Type G 31-38; Type H 39-41. Scale $\frac{1}{4}$

shell-tempered fabric, and often bearing one or more pre-firing graffiti on the shoulder, occur commonly in the Belgo-Roman kilns, where they were certainly made.²⁴ No. 24 shows a complete example with the graffito IIII. Kiln I produced these jars, without graffiti and in a fabric which is much less heavily shell-tempered; in kiln VI the fabric is far more sandy and contains only the occasional fragment of crushed shell.

Rim sections vary considerably within one deposit and Nos. 25-28 illustrate the range, whilst No. 29 is a particularly interesting and important piece as it bears a competently incised pre-firing graffito—presumably the potter's name—VERUS. The name, which is in the genitive, attests literacy amongst the Mucking potters. The diameter range for vessels of this type is 13-21 cm. and in unburnished grey sandy fabric they constitute the second highest proportion of any form in the kiln II assemblage. One very large vessel which probably belongs to this group is No. 30: it has a diameter of 33 cm. and is decorated with a stabbed cordon on the neck.

The origin of this form, which is particularly common in southern Essex, is well attested in the mid first century;²⁵ in Roman grey ware it continues throughout the second. Unfortunately, the form has not been dated at Colchester, due to its conflation with *Cam.* f.268 and is not reliably paralleled at Verulamium. It was probably still in existence in the early years of the third century. At Mucking, the internal evidence suggests that the early rim profiles are less thick and more delicately moulded than the later ones; often the rebate is represented by no more than a line.

Whilst matching lids are known for ledged-rim jars in first century contexts, they are very rare in later periods and there is nothing to suggest that kilns I, II or VI made lids for their jars; the Belgo-Roman kilns apparently did.

TYPE G: cupped-rim bowl

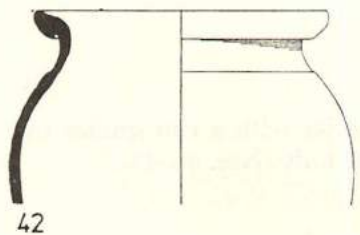
FIG. 5; NOS. 31-38

This is a wide-mouthed bowl with an internally cupped rim and is normally slipped and burnished over most of the exterior and inside the lip. The diameter range is 13-22 cm. Rim sections vary considerably and some are more cupped than others (Nos. 31-34) and sometimes there is the addition of a cordon on the neck (No. 35). Diamond rouletting in the form of a single band on the shoulder (Nos. 36-37) is recorded from all four relevant kilns, but is rare in III and is likely to be residual material derived from II. In a few instances the rim has a virtually flat internal face, instead of being cupped (No. 38). Burnishing, however, is one of the criteria which always distinguishes these vessels from those of Type F. Kilns II, III, IV and V have yielded examples of the form.

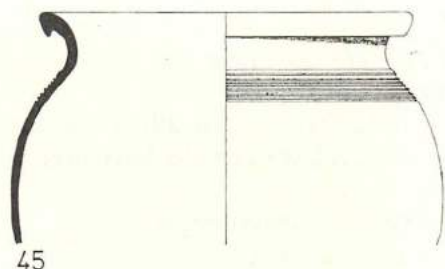
This is probably to be equated with *Cam.* f.307, which has been given a starting date of c. A.D. 200.

²⁴ Jones, 1972, *op. cit.*

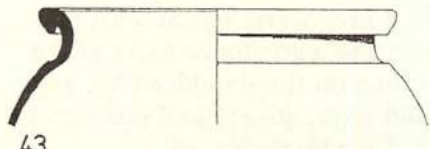
²⁵ Especially on Canvey Island, where many unpublished examples are known to the writer.



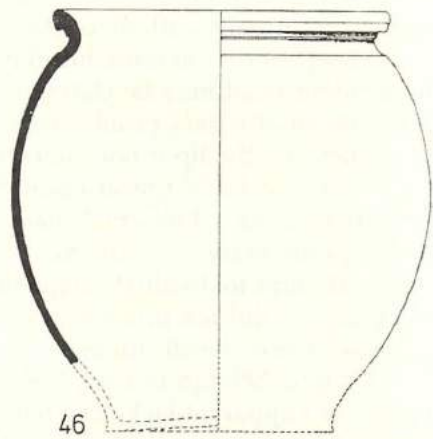
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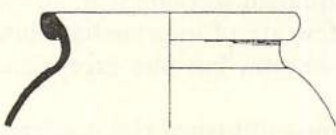
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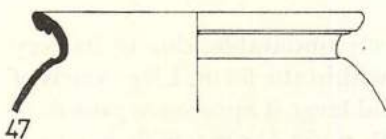
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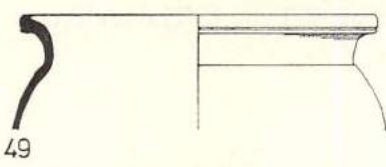
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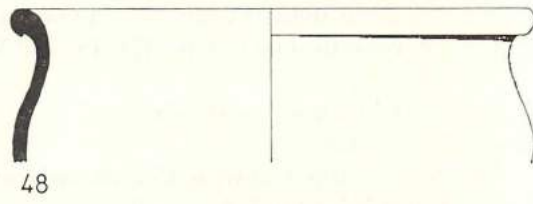
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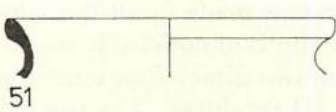
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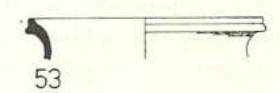
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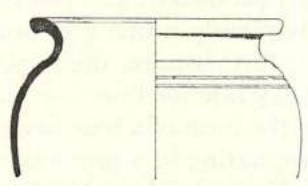
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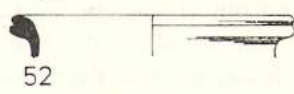
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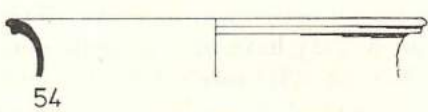
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50



52



54



55

FIG. 6
Pottery of Type J; Nos. 42-55. Scale $\frac{1}{4}$

TYPE H: cupped-rim jar

FIG. 5; NOS. 39-41

The form is basically a tall, ovoid, narrow-necked jar with a rim similar to Type G. A few examples have been recorded from kiln II only (Nos. 39-41).

TYPE J: undercut-rim jar

FIG. 6; NOS. 42-55

This vessel, which is always in an unburnished grey ware, has an outward-curving rim, usually with an oval-section lip undercut to a greater or lesser extent (Nos. 42-44) and sometimes has the addition of rilling on the shoulder (No. 45). The pendent bead may be elaborated or made bifid (Nos. 46-47) and one vessel has a wide mouth, slack profile and is better regarded as a bowl (No. 48).

Sometimes the lip is not undercut at all but of squarish section (Nos. 49-50) or it may be oval and upward pointing (No. 51); a few are of intermediate bifid form (Nos. 52-54). The usual diameter range is 13-22 cm., but one exceptional vessel is 40 cm. across the rim (No. 55).

An attempt to divide this type into three sub-forms—upturned rim, undercut and squarish—did not prove very successful on account of the many vessels which fell between two classifications.

This type belongs to *Cam.* f.268 and is effectively undatable, due to its very long life and apparent lack of systematic evolution within the form. Like vessels of Type F, this is a very common jar at Mucking. By and large it appears to post-date the ledged-rim jar and it is only in kiln II that both types occur together, where there are twice as many examples of Type J as there are of Type F. The undercut-rim jar occurs on its own in kilns III, IV and V.

TYPE K: wide-mouthed cavetto-rim bowl

FIG. 7; NOS. 56-62

A wide-mouthed bowl with outward curving rim was made in all the kilns. In kilns I and VI it tended towards simplicity and the rim is of noticeably smaller diameter than the girth, whilst in the other kilns these two dimensions tended to be more equal (this was particularly apparent in kiln III products). The rim diameter varies from 16-23 cm. and the fabric is most frequently a fine grey ware slipped and burnished on the rim, neck and shoulder; furthermore, the neck is decorated, almost without exception, by a burnished wavy line (or lines), set in a reserved zone between two grooves. The rim may be in the form of a true cavetto (No. 56) or may have only a gentle outward curve, terminating in a pronounced bead (Nos. 57-58); rarely is it of truly undercut form (No. 59). The middle and lower portions of the body may be decorated with subsidiary grooves or zones of burnishing (No. 60) and occasionally the wavy line itself may be replaced by a band of diamond rouletting (No. 61). In kiln VI a narrow band of acute angled latticing was used in place of the wavy line (No. 62). Some large, unburnished examples were produced in kiln IV.

The form is surprisingly rare at Colchester and hence unclassified, but a good parallel for our No. 56 was found in kiln 24 there (*RPK*, fig. 86.23) and was dated

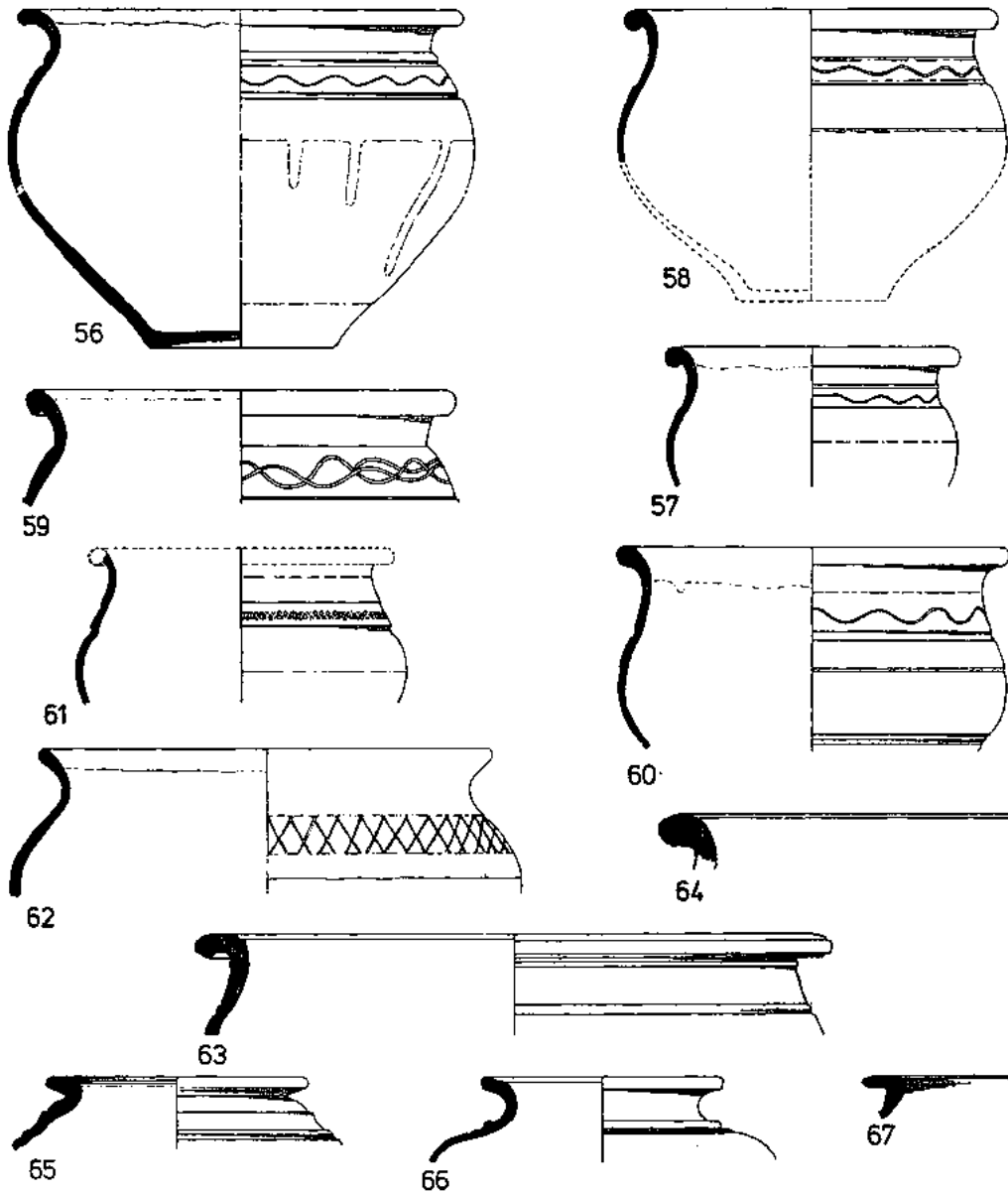


FIG. 7
Pottery of Type K 56-62; Type L 63-64; Type M 65-67. Scale $\frac{1}{2}$

to the early third century. The form had a very long life, from the late first or early second century²⁶ to about the middle of the fourth century, or possibly later; an evolution can be plausibly argued.

²⁶ Again, the type is common on Canvey Island: cf. W. J. Rodwell, 'The Excavation of a Red Hill on Canvey Island', *Trans. Essex Archaeol. Soc.*, ii (ser. 3) (1966), fig. 8, Nos. 28-29.

TYPE L: wide-mouthed flat-rim bowl

FIG. 7; NOS. 63-64

This is a rare form of which the majority of the profile is unknown. It is characterised by a flattened everted rim, embellished with grooves and cordons and is burnished (Nos. 63-64).

TYPE M: necked jar with flattened rim

FIG. 7; NOS. 65-67

Another rare form with an everted and more-or-less flattened rim, decorated with cordons and grooves on the shoulder. The rim diameter is *c.* 12-16 cm. It is just possible that these rims belong to elaborate vessels of Type N (Nos. 65-67).

TYPE N: large narrow-necked jar

FIG. 8; NOS. 68-74 and FIG. 9; NOS. 75-87

This group comprises medium and large sized ovoid jars which are always in a fairly fine grey fabric, often visibly slipped. The rim and neck are always burnished, and the body also may be largely burnished (No. 68), or only in bands, with intervening reserved zones decorated with burnished wavy lines (No. 69), or it may only be burnished down to the shoulder (No. 70). The base is usually simple, slightly domed and burnished underneath. There is, however in addition, a pedestalled form and several distinctly different rim types. They have all been included under this one group out of necessity, since in only three instances do we have a complete profile from rim to base (Nos. 69, 70 and 73), so that it is impossible to demonstrate adequately the relationship between the various rim and base forms.

The commonest rim is of simple outward-curving type with an undercut lip (Nos. 69, 71 and 72) and has a diameter of 7-14 cm. An alternative and less frequent rim is the flanged type which, in the case of No. 73, accompanies a more elaborately decorated body. No. 74 is exceptionally large with a diameter of 19 cm.

Type N includes the most elaborate pottery produced in the Mucking kilns, amongst which is the remarkable pot, No. 75, which has a frilled pedestal base and a body decorated with cordons, grooves, burnishing, combing and stabbing. Its base is closely paralleled by a pedestal from kiln IV, from which this vessel most probably emanated. Kiln V also produced elaborate vessels. The pedestals from kiln II are not frilled (Nos. 77-78), nor are there any of the scroll-decorated sherds like those found in the other two kilns. No suitable frilled rims have been found to match the frilled pedestals, so it must be assumed that they were plain, as for example No. 79. Large jars from kilns IV and V and some from kiln II were decorated with bands of rouletting. A distinctive wide-spaced rouletting attested in kiln V also appears on a jar from Well (1), No. 68. Diamond rouletting is not uncommon (Nos. 80-82) and, rarely, an attempt at true roller-stamping was made (No. 83). Pottery from kilns IV and V was often decorated with intricate running-scroll patterns executed with a fine burnishing tool (Nos. 84-85); some of these are very reminiscent of first-century sigillata decoration. Burnished intersecting

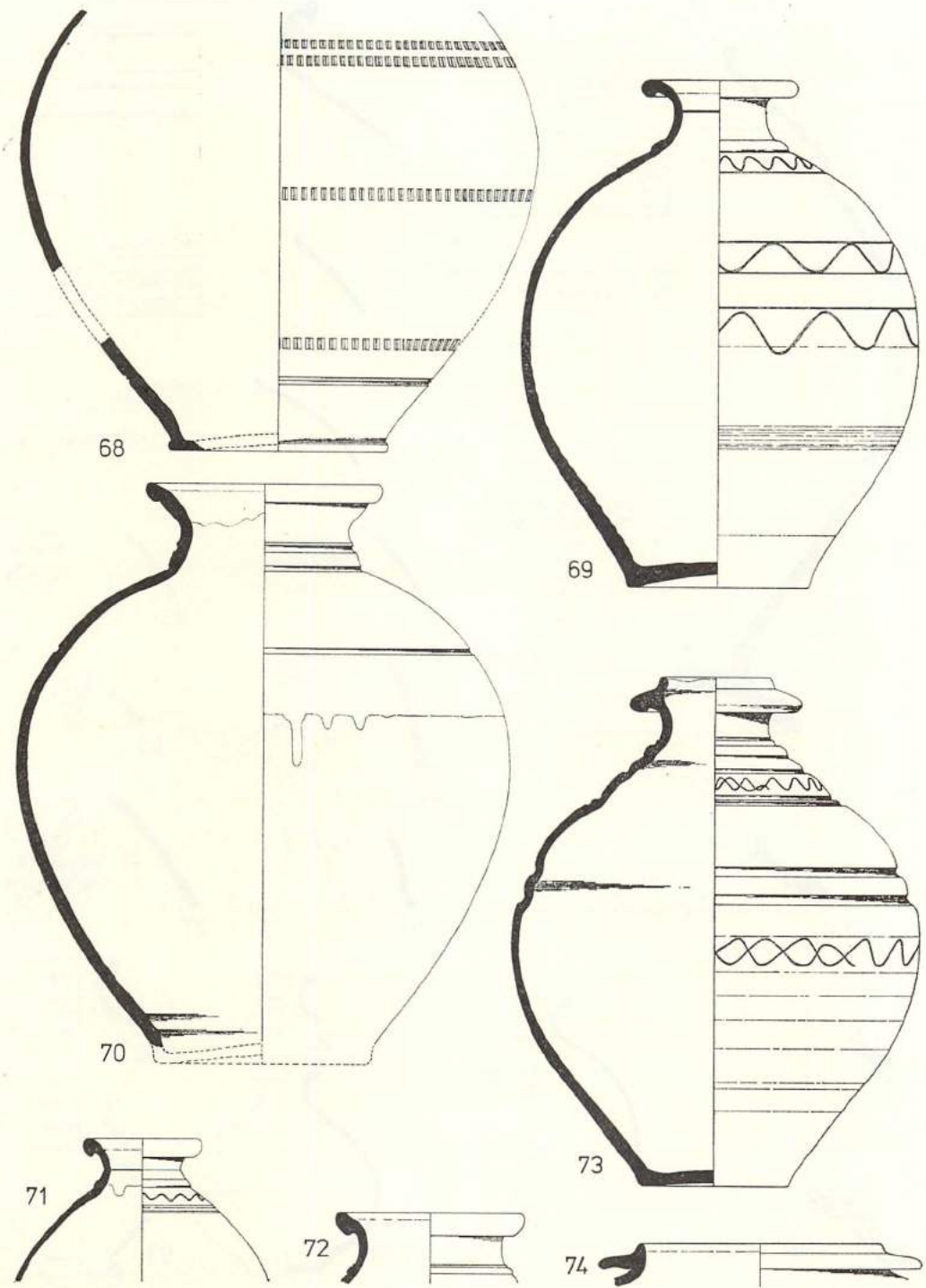


FIG. 8
Pottery of Type N; Nos. 68-74. Scale $\frac{1}{4}$

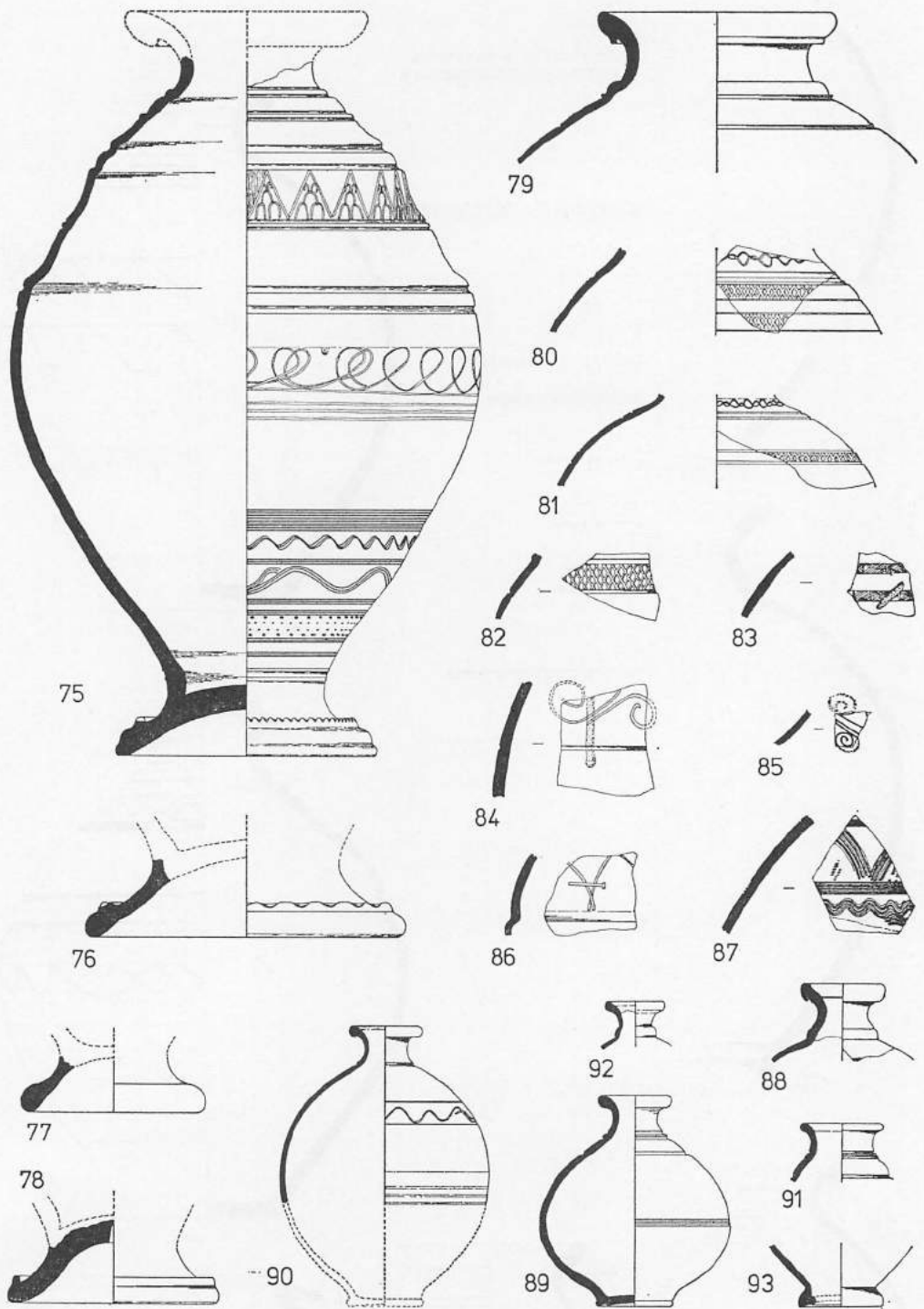


FIG. 9
Pottery of Type N; 75-87 and Type O; 88-93. Scale $\frac{1}{4}$

arcades are represented on No. 86, and on No. 87 a comb was used to decorate the vessel with straight and wavy lines, arcades and stabbing (see also No. 75). Comb decoration was also employed on kiln II products.

This Mucking speciality is best dated on internal evidence, particularly Well (1), although the flanged neck suggests a date not before the later third century anyway (*cf. Ver.* 1154). Vessels found in Well (4) at Wickford are so similar in form, fabric, decoration and surface finish to the Mucking pottery that a direct connection seems almost inevitable. At Wickford they cannot be dated before the end of the third century and may well be a little later. Mucking Well (1) evidence would accord with this. It may be worthy of note that there are many similarities between pottery of Type N and pottery from the Colchester 'Mithraeum', which has been dated to the mid fourth century.²⁷

TYPE O: narrow-necked flask

FIG. 9; NOS. 88-93

This is essentially a much smaller version of the non-pedestalled variety of Type N. It is always in a fine grey ware, well slipped and burnished. The neck is outward-curving, the rim diameter is 3.5-5.0 cm. and the lip is sometimes undercut, as in No. 88. The body is usually decorated with grooves and cordons (No. 89) and often with a burnished wavy line (No. 90). Details of the neck vary (e.g. Nos. 91-92) and the base is one of the few recognisable forms. It is not a common vessel in the kilns but was certainly made in small numbers in II and probably in IV and V as well.

Dating evidence for flasks in general is very poor: they occur commonly in Antonine cremation burials in Essex and are just as frequent in third-century, or later, inhumation burials. No typology seems to have been attempted. The Chadwell St. Mary flask, decorated with three scored figures (probably *genii cucullati*),²⁸ closely resembles the Mucking material and could well have emanated from kiln IV or V.

TYPE P: everted-rim jar

FIG. 10; NOS. 94-95

This is characterized by a tall, ovoid body with a sharply everted rim showing slight external hollowing. It is always in a fairly fine fabric, slipped and burnished down to the shoulder. The body may be left plain, as in No. 94, or, more commonly, decorated with groups of burnished lines (No. 95). The rim diameter is c. 12-17 cm.

This type, which has been found in kilns I, II and VI, is well-known at Colchester, where it is reported as prolific c. A.D. 100-120 (*Cam.* f.278). This agrees well with the evidence from Thames-side sites and may be crucial to the study of BB2 wares and their dating.²⁹

²⁷ *Roman Colchester*, fig. 68.

²⁸ *Antiq. J.*, li (1971), 327 f.

²⁹ R. A. H. Farrar in *C.B.A. Research Report 10* (1973), 100.

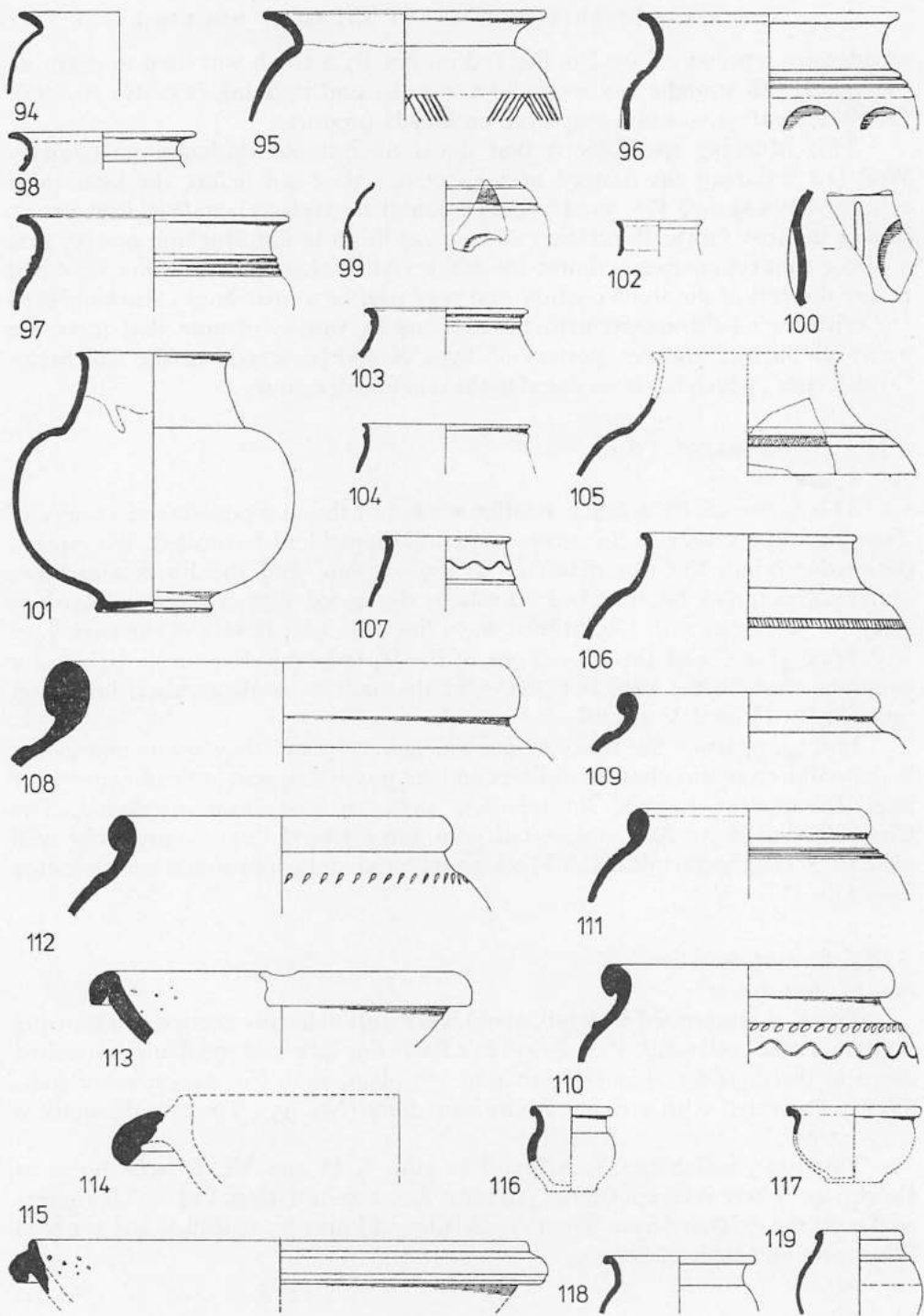


FIG. 10
 Pottery of Type P 94-95; Type Q 96-100; Type R 101-107; Type S 108-112; Type T 113-115;
 Type U 116-119, Scale $\frac{1}{4}$

TYPE Q: folded beaker

FIG. 10; NOS. 96-100

At Mucking the rim is usually outward-curving and ranges in diameter from 11-16 cm.; the neck normally bears a series of grooves or narrow cordons (Nos. 96-98) and one example is decorated with a band of roller-stamping on the shoulder (No. 99 and *cf.* No. 83). No complete profile has yet been obtained and both circular and oval folds are known. No. 100 has circular folds separated by vertical impressed stripes.

These vessels are unlikely to be earlier than the middle of the third century and although the folded beaker is a common vessel throughout a large part of the Roman period, it is a rare form at Mucking and has only been found in kilns II, IV and V.

TYPE R: conical-necked beaker

FIG. 10; NOS. 101-107

This globular beaker with a short neck is always in a fine grey fabric, slipped and burnished externally (No. 101). The rim diameter range is 5.0-12.5 cm. and detail of the lip moulding varies (Nos. 102-104). In a few instances the shoulder is decorated with diamond rouletting (No. 105) or simple rouletting (No. 106), whilst No. 107 is exceptional in that it carries a wavy line on the neck. The form was certainly made in kilns II, IV and V and probably in III also.

Beakers of this general form had a long life in the third and fourth centuries (*cf. Cam. f.408*).

TYPE S: large storage jar

FIG. 10; NOS. 108-112

Storage jars in a variety of sizes and finishes seem to have been made in kilns II, III, IV and V. The largest has a diameter of 28 cm. (No. 108) and is in a very coarse fabric. Smaller examples, which may have a rim diameter as little as 14 cm., are in a finer grey fabric which may be burnished externally. The rim may be oval or round in section and usually tilts inwards. Some are undecorated (No. 109) whilst others have combed lines or stabbing on the shoulder (Nos. 110-112).

TYPE T: mortarium

FIG. 10; NOS. 113-115

A few waster sherds of mortaria in coarse fabrics have been found in kilns II, IV and V; their manufacture in III seems improbable. Three different forms have been noted, all in a coarse grey fabric, using quartz and flint as trituration grit. No. 113 shows a simple type with drooping flange: its spout was formed by merely impressing a finger in the top of the rim and pulling outwards slightly. In two instances, from kiln V, there are pre-firing graffiti in the form of two vertical strokes on the rim beside the spout. These must represent a very rudimentary potter's mark. No. 114 shows a fragment of mortarium with a rolled and beaded rim and No. 115 a sharply hooked rim. In the case of Nos. 114-115 the Mucking potters were clearly copying standard forms of mortaria, as produced by the

major factories: No. 114 is a *Cam. f.508* (see *RPK*, fig. 89.18); No. 115 is a *Cam. f.504* (see *RPK*, fig. 87.12). Both types occur in the third century.

TYPE U: miniature pottery

FIG. 10: NOS. 116-119

Several sherds of competently made pots of recognizable forms have been found, which are far smaller in dimension than the norm. Thus No. 116 is apparently a vessel of Type J; No. 117 probably belongs to Type G, No. 118 to Type K and No. 119 to Type S. They are perfect down to the slip coating and burnishing, and are certainly not to be regarded as pots made by children; nor does it seem likely that they were made simply to contain small quantities of goods,

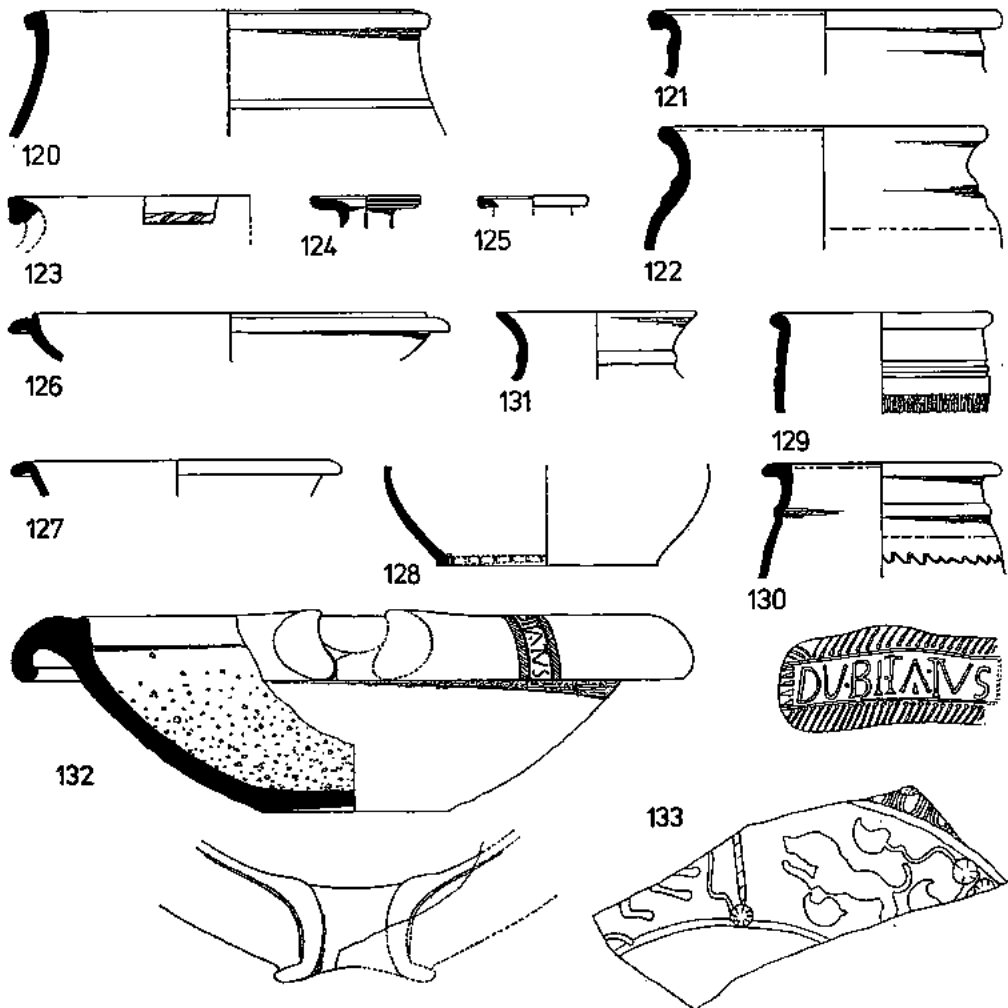


FIG. 11

Pottery of Type V; Nos. 120-133. Scale $\frac{1}{2}$, except mortarium stamp and decorated sigillata, $\frac{1}{4}$

as there would be no need to copy the larger vessels so closely (what is the use of No. 119 as a 'large' storage jar, or No. 116 as a cooking pot?); but whether they were produced as toys for children or as travellers' samples we cannot be certain. If pottery was being traded from Mucking to surrounding settlements, as seems highly likely, sets of samples would obviously be useful to send out to prospective buyers.

Miniature pots have been recorded on other kiln sites, for example: Swanpool.³⁰ and numerous examples of these 'unguent jars' were found in the 'Triangular Temple' at Verulamium,³¹ suggesting a votive use on that site at least. The Colchester 'Mithraeum' has yielded a similar vessel,³² and so have other, non-religious sites such as Richborough³³ and Verulamium.³⁴ In all these examples of miniature pottery there is, however, a tendency towards a consistent form of vessel, with a rolled rim. They are not obvious copies of well-known larger vessel types.

TYPE V: miscellaneous and unclassified

FIG. 11; NOS. 120-131

In addition to the definable forms which occur repeatedly within one or more kilns, there is a small number of fragments of vessels which are certainly of local manufacture but which occur too infrequently to warrant separate grouping. A selection is shown and described in detail in the Appendix (p. 46). Flagons ranked amongst the products of kiln II, at least: two rims are shown (Nos. 124-125; cf. No. 124 and *RPK*, FIG. 94.26). Fragments of handles and a trefoil mouth were also found.

No. 128 is one of the several colander fragments from kilns II and III; and No. 129 is an obvious copy of sigillata f.30R. The 'poppy-head' beaker, No. 131, is a solitary find from kiln II and does not match the other fabrics from that group; it is nevertheless a poorly fired vessel which probably derives from an earlier kiln in the area.

Quantitative analysis by form: Kiln II

Over 3,000 rims were found in the kiln II deposit and have been sorted according to form. These divide as follows:

Type A — 8.7%	Type M — 0.2%
B — 9.0	N — 1.7
C — 1.2	O — 0.2
D — 0.0	P — 3.0
E — 0.2	Q — 2.0
F — 20.7	R — 2.3
G — 2.0	S — 1.8
H — 0.2	T — 0.1
J — 40.7	U — 0.1
K — 5.2	V — 0.5
L — 0.2	

³⁰ *Antiq. J.*, xxvii (1947), 65, No. C97.

³¹ R. E. M. and T. V. Wheeler, *Verulamium* (1936), 118, 191, pl. LIX.

³² *Roman Colchester*, fig. 67, 96.

³³ J. P. Bushe-Fox, *Excavations at Richborough*, iii (1932), pl. XL, No. 323.

³⁴ Frere, 1972, *op. cit.*, Nos. 636, 822, etc.

Quantitative analysis by fabric: Kiln II

By grouping vessels of similar classes and fabrics, the figures in the first table can be simplified thus:

Simple jars (J)	40%	unburnished
Ledged-rim jars (P)	20%	
<hr/>		
Pie dishes (A, B, C, E)	20%	mainly burnished
Bowls and jars (G, H, K, L, M, P) ..	11%	
Beakers (Q, R)	4%	
Narrow necked jars/flasks (N, O) ..	2%	
Storage jars (S)	2%	
Miscellaneous (T, U, V)	1%	

Hence, some 60 per cent of the kiln's wastage (i.e. also presumed output) comprised coarse, unburnished and generally undecorated jars. The majority of the remaining 40 per cent comprised finer wares, upon which more care was lavished in the form of extensive burnishing, although a few of the larger vessels of Types L and S were exceptional in that they are of coarse unburnished fabric. Evidence for slip-dipping is frequently seen in the form of 'runs' down both the inner and outer surfaces and it seems likely that most burnished vessels were first dipped in a liquid suspension of clay of similar type to that used for the body of the pot, so that both the slip and body normally fired to the same colour. The purpose of the slip was apparently to provide a smooth surface for burnishing, as the area slipped seldom exceeds that which was actually burnished. Thus in instances where it was intended to burnish the rim and shoulder only, the vessel was inverted and the uppermost third dipped into the slip (for example, vessels of Type K).

These techniques apply equally to the products of kilns III, IV, V and VI, as well as kiln II.

Quantitative analysis by form: Kiln III

Only a few hundred sherds can be stratigraphically tied to kiln III, and even these are obviously contaminated by strays. The following analysis cannot be as statistically sound as that for kiln II as it uses only 175 rims.

Type A — 10.0%	Type K — 13.0%
B — 7.5	R — 3.0
D — 4.5	S — 3.5
G — 6.5	Types
J — 44.5	C, F, L,
	M, N, T,
	V — 7.5
	E, O, P,
	Q, U — 0.0

The reason for combining Types C, F, L, M, N, T and V is that not more than

four rims of any one type were found; it thus uncertain whether these were actually produced in the kiln under consideration—some are clearly strays from kiln II.

Quantitative analysis by fabric: Kiln III

Once again, if the material is regrouped according to class of vessel and fabric we find:

Simple jars (J)	44.5%	unburnished
Pie dishes (A, B, D)	22.0%	mainly burnished
Bowls (G, K)	19.5%	burnished
Beakers (R)	3.0%	burnished
Storage jars (S)	3.5%	some burnished
Strays and miscellaneous	7.5%	

As in kiln II, simple unburnished jars are again dominant, but the next most common type in II, the ledged-rim jar, is absent. The everted-rim jar (P) has also disappeared, as too has the folded beaker (Q). They are compensated for by a rise in the proportion of burnished bowls (G, K). Pie-dishes continue in similar quantities, but Types C and E of kiln II have been replaced by the flanged dish (D) in kiln III. Conical necked beakers and storage jars (R, S) may continue in the same proportion.

There is little evidence from kiln III for the production of elaborate vessels, particularly Type N, and in general it can be seen that there is a reduction in the number of forms and the quality of the products, whilst at the same time there is a tendency towards larger pots.

The occurrence of the twenty individual forms in the six kilns may be provisionally summarized in the following table:

Kiln	Type																			
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U
I		x				x				x					x					
VI		x				x				x					x					
II	x	x	x		x	x	x	x	x	x	x	x	x	x	(x)	x	x	x	x	x
IV	x	(x)	x	x			x		x	x		?	x	x		x	x	x	x	?
V	x	(x)	x	x			x		x	x		?	x	x		x	x	x	x	?
III	x	?		x			x		x	x		?	?			?	x	x	?	

(x) = rare

CHRONOLOGY

The dating of the Mucking kilns and their products can be approached from three aspects:

- (a) Finds of non-local pottery in the kilns (there are no coins or significant metal objects in association).
- (b) The association of Mucking pottery in datable contexts, both on the site and elsewhere.³⁵
- (c) General trends in the typology of pottery, within the region.

The provisional chronology proposed here takes all three into account, although work on (c) will continue for many years and it is unreasonable to suppose that pottery will be tied down to within less than half a century, by the means currently at our disposal.

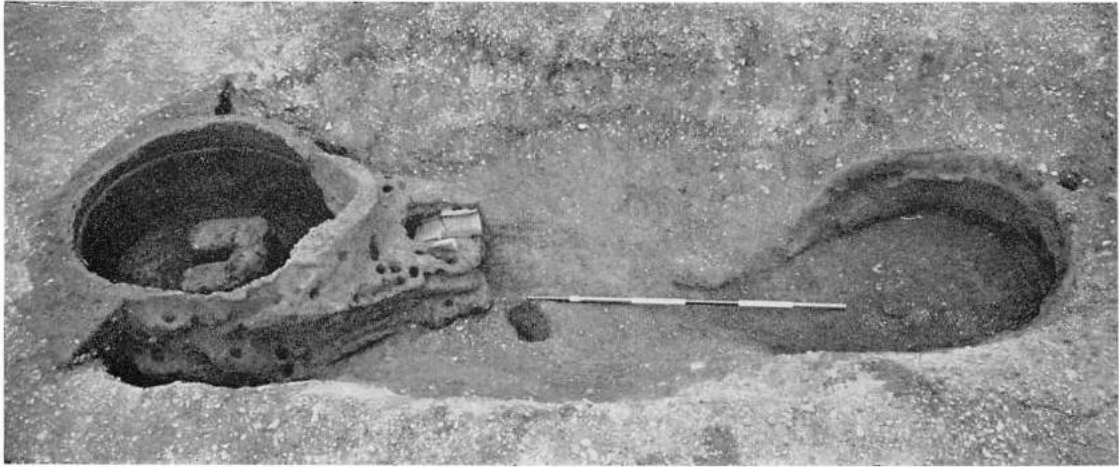
(a) Externally datable finds from the kilns are rare and are only really relevant in the case of kiln II: this has yielded two recognizable sherds of terra sigillata—one is a burnt f.31R of late Antonine date and the other is a portion of an East Gaulish decorated bowl, f.37 (FIG. 11, No. 133), of similar date. The latter showed signs of internal wear, by use, and was generally abraded by exposure. It can hardly have found its way into the stokepit much before A.D. 200, at earliest. In the upper fill of the same stokepit was a sherd of Nene Valley colour-coated beaker, probably of the first half of the third century, and a fragment of a burnt mortarium containing ironstone trituration grits. It is likely to be of *Cam.* f.305 and of third-century, Nene Valley origin. The mortarium No. 132 (FIG. 11) was found in the bottom of the ditch through which kiln III was dug; it also lay below the level at which kiln II pottery was found and may thus be additional evidence for the late second-century *terminus post quem* for that kiln.

(b) The possible relevance of the wells has been mentioned already: Well (1) yielded a small but useful collection of pottery from its lowest level—it is all consistent with the products of kilns IV and V. Nothing externally datable was found in direct association but a *terminus post quem* (which is probably much too early) for the construction of the well is given by a sherd of Antonine sigillata, f.31, found in its construction pit. Amongst the small amount of pottery in the filling of the well-shaft was a sherd of North African amphora,³⁶ probably of fourth-fifth century date and fragments of a fourth-century Nene Valley pie dish. There is every reason to believe that Well (1) was contemporary with kilns IV and V. Well (2) was almost devoid of finds, except for the large jar, No. 70 (FIG. 8), which is likely to be fourth century and most closely resembles the products of kiln III. Well (3) contained a small group of sherds consistent with the products of kiln II, but no independent dating evidence (Types B, F, K, J and O of kiln II pottery

³⁵ The quoting of extensive parallels from outside the immediate region is quite valueless and references have only been given where a very close correspondence can be seen. The only large, well dated and published groups upon which we can draw are those from Verulamium and Colchester, and even these are too distant to be really satisfactory. The pottery from Mucking and other sites in southern Essex (e.g. Wickford and Canvey Island) now includes a sufficient number of large groups to enable the contemplation of a broad chronology and typology of Romano-British coarse pottery on the north Thames bank.

³⁶ Kindly examined by Dr. D. P. S. Peacock.

PLATE I



A

Kiln II, Mucking, Essex. Kiln IIB (left) is built in the stokepit of the disused kiln IIA (right).

Photograph by W. T. Jones. Block loaned by Society for Promotion of Roman Studies (J.R.S. vol. LIX (1969) Pl. XIII (1).



B

Kiln IV, Mucking, Essex, showing half of the furnace wall cut away.

Photograph by W. T. Jones

were represented). Wickford Well (4) provides some external evidence which has already been noted (p. 31).

(c) On the evidence of typology of pottery, kiln I is clearly the earliest and the fabric of some of its products is little better than that of the Belgo-Roman pottery. It produced latticed pie dishes with triangular-section rims and latticed jars, for which a late first or early second century date is suggested. Kiln VI must have followed not long after, with its unlatticed pie dishes. The fabric still shows slight signs of shell-tempering and a second century date seems fairly certain.

Then came kiln II, with its two phases (IIA and IIB): as with the previous kilns it produced ledged-rim jars in quantity, but very few latticed jars. New types like the conical-necked beaker, folded beaker, cupped-rim bowl and incipient flanged pie dish all seem to demand a third century date. The same is true for the few mortaria it made. A date in the early or middle part of the third century is thus proposed.

Kilns IV and V can be seen to belong to a further stage in the development of Mucking pottery: the latticed and ledged-rim jars have disappeared and the fully flanged pie dish has come in. The pedestalled jars first seen in kiln II appear in their full splendour; a date in the second half of the third, or possibly early in the fourth century is suggested.

Last of all came kiln III which, as already mentioned, produced a more limited range of vessels with less attention being paid to decoration and finish than hitherto. There can be little doubt of its being fourth century.

This tentative chronology can be summarized in the following table.

	A.D.	0	100	200	300	400
Belgo-Roman kilns		_____				
Kiln I			_____			
Kiln VI				_____		
Kiln II					_____	
Well (3)					_____	
Kiln IV						_____
Kiln V						_____
Well (1)						_____
Kiln III						_____
Well (2)						_____ ? _____

APPENDIX CATALOGUE OF THE ILLUSTRATED POTTERY

FIG. 4

Type A: straight-sided pie-dish

1. M.3221a.³⁷ Hard, medium-grey fabric; poorly made, with grits projecting through surfaces. Totally burnished externally and partly internally. Kiln II.

³⁷ Numbers preceded by the letter M. refer to Mucking site catalogues in Thurrock Museum.

2. M.5048. Dark grey-brown fabric; surfaces dark grey-black. Exterior wall burnished and part way under base (sagging); interior wall crudely burnished with an irregular band near the rim omitted; four concentric narrow burnished bands in the base. Well (1), bottom.
3. M.3274a. Brown-grey fabric, medium-brown burnished surfaces inside and out. A reserved zone inside the base is decorated with two burnished, tangled wavy lines. Kiln IIA.
4. M.3119a. Hard, fine medium-grey fabric, with an attempt at burnishing the internal wall. Kiln II.
5. M.5042. Light brown-grey paste, well-fired and fairly hard; dipped in a light grey slip; interior burnished to base-angle of wall and exterior to bevel. A post-firing graffito on the wall reads MAGNV[S.³⁸ Well (2)].
6. M.3244a. Medium brown fabric, grey surfaces, lightly burnished all over. Kiln II.
7. M.3347a. Medium brown fabric with dark grey burnished surfaces. Kiln III ditch (upper fill).

Type B: beaded-rim pie-dish

8. M.5029. Softish, medium-brown 'sandwich' fabric; dark grey surfaces. Totally burnished exterior and inside, down to the base angle; centre of base also burnished and three concentric lines in the reserved zone. A poorly-made vessel, probably a 'seconds'.
9. M.3222a. Hard brown fabric, exterior well burnished all over; interior wall burnished down to base-angle and concentric burnished line inside base. Kiln II.
10. M.3002a. Fine, dark-brown fabric with burnished surfaces. Kiln II.
11. M.3185a, 3250a. Slightly sandy grey fabric, underfired; medium-brown finely burnished surfaces. Note the groove in place of the basal bevel. Kiln II.
12. M.3239a. Reddish-brown sandy fabric with dark brown surfaces. Kiln II.
13. M.3355. Medium brown-grey sandy fabric. Kiln II.
14. M.5049. Soft, medium-brown sandy fabric with dark grey surfaces. The base is disproportionately thick and clumsy. The walls are burnished internally and externally, but very poorly; and inside the base are three concentric burnished rings. Apparently a waster. Well (1).

Type C: incipient flanged pie-dish

15. M.3186a. Hard grey fabric with grey-brown surfaces; well-burnished exterior and interior down to base angle. Kiln II.
16. M.5050d. Medium brown sandy fabric with a large flint incorporated. Surfaces dark grey and possibly burnished, but now abraded; the flange shows traces of a thick black coating. Well (1).
17. M.3274b. Hard medium grey fabric with the surfaces well burnished dark grey-black. There is no upstanding bead, but simply a groove on top of the rim. Kiln IIA.

Type D: flanged pie-dish

18. M.3297c. Hard, sandy medium-grey fabric, unburnished. Kiln III.
19. M.5050a. Medium grey 'sandwich' fabric, slightly sandy; slip coated and totally burnished, dark grey. Well (1).
20. M.5050b. Medium brown sandy fabric with dark grey, burnished surfaces. Well (1).

³⁸ *J. Rom. Stud.*, lix (1969), 245, No. 70.

Type E: ledged-rim pie-dish

21. M.3183a. Medium brown, slightly sandy fabric, underfired; dark grey surfaces. Kiln II.
22. M.3245a. Hard grey-brown fabric with darker surfaces; burnished all over except the interior of the base, but the burnishing on the interior of the wall is poorly executed. Kiln II.
23. M.3352b. Fine sandy medium-grey fabric, with the exterior and top of rim slipped and burnished. Kiln II.

FIG. 5

Type F: ledged-rim jar

24. M.5014. Dark brown shell-tempered fabric, now vesiculated; pre-firing graffito IIII cut on the shoulder. RE. I ditch.
25. M.5012. Hard, medium-grey sandy ware. Pit.
26. M.3003a. Medium grey sandy fabric. Kiln II.
27. M.3208a. A very thick rim in medium grey fabric. Kiln II.
28. M.3101a. Grey-brown sandy ware with a double ledge. Kiln II.
29. M.5033. Hard, medium-grey sandy fabric, with a deeply incised pre-firing graffito on the shoulder, reading VERI, probably the genitive of VERUS.³⁹ The letter V is cut with double incisions. Kiln III ditch.
30. M.3248a. Brown sandy fabric with dark grey exterior, decorated with a band of stabbing on the neck. Kiln II.

Type G: cupped-rim bowl

31. M.5054. Hard sandy grey fabric coated with slightly darker slip which has run down both the interior and exterior; shoulder, rim and cup burnished. There is a narrow burnished band on the girth and a wide band running upwards from the base. The vessel is distorted and clearly a waster. Well (1).
32. M.3091d. Hard grey ware, burnished externally, except for a band around the girth. A waster left inside Kiln IIB.
33. M.5050e. Medium brown sandy fabric with dark grey surfaces, dipped in a dark grey slip; burnished externally and inside the cup of the rim. Well (1).
34. M.3033a. Hard medium grey fabric with dark grey surfaces. Shoulder, rim and cup roughly burnished. Kiln II.
35. M.3075a. Grey sandy fabric. Kiln II.
36. M.3022a. Hard dark grey ware, slipped and burnished externally; decorated with a narrow band of diamond rouletting. Kiln II.
37. M.3305b. Fine, medium grey fabric, slipped and burnished externally and inside cup. Decorated with a groove and a band of diamond rouletting on the shoulder. Kiln III.
38. M.3058b. Medium grey fabric with brown burnished exterior and inside lip. Kiln II.

Type H: cupped-rim jar

39. M.5011. Fine, medium grey fabric with lightly burnished exterior. Pit.
40. M.3217a. Fine, hard medium-grey fabric, burnished. Kiln II.

³⁹ *Britannia* ii (1971), 296, No. 43.

41. M.3033b. Fine, medium-grey fabric; slipped and burnished externally and inside lip. Kiln II.

FIG. 6

Type J: undercut-rim jar

42. M.3349a. Fairly fine, hard grey fabric. Kiln II.
 43. M.3060a. Brown sandy fabric with dark grey surfaces. The rim has a slightly flattened top. Kiln II.
 44. M.3211a. Hard, medium-grey ware, slightly sandy. Kiln II.
 45. M.5073a. Hard, dark grey fabric containing some fine sand; soot encrusted externally. Decorated with a band of deep rilling on the shoulder. Well (3).
 46. M.3298a. Hard medium-grey ware, with brown-grey exterior. Kiln III.
 47. M.3006b. Hard, medium-grey sandy fabric. Kiln II.
 48. M.3033d. Slightly sandy, medium-brown fabric, with rough surfaces. Kiln II.
 49. M.3191a. Hard, medium-grey ware, showing firing cracks under lip. Kiln II.
 50. M.3304. Hard, medium-grey fabric containing the occasional lacunae, resulting from grass in the clay. The rim is distorted. Kiln III.
 51. M.3005a. Medium-brown sandy fabric. Kiln II.
 52. M.3190c. Bifid rim; hard, dark-grey sandy fabric. Kiln II.
 53. M.3014a. Bifid rim in hard dark-grey fabric. Kiln II.
 54. M.3149a. Bifid rim in fine dark brown-grey fabric, smooth but not burnished. Kiln II.
 55. M.3271b. Medium-brown sandy fabric. Kiln II.

FIG. 7

Type K: wide-mouthed, cavetto-rim bowl

56. M.3293a. Fine, hard medium-grey fabric, slipped on rim and shoulder. There was burnishing on the slipped area, the base, and for a short distance up the wall. The reserved cordon on the shoulder is decorated with a burnished wavy line. This vessel is cracked and distorted and contains steam-pockets in the fabric. Ditch east of Kiln II.
 57. M.3299a. Medium grey fabric with rim and shoulder slipped externally and poorly burnished. Decorated with a wavy line on a reserved zone on the neck. Kiln III.
 58. M.3305a. Fine hard grey fabric, undoubtedly originally slipped, but this is not now evident; very well burnished, down to a line on the girth. Decorated with a burnished wavy line on a reserved band on the shoulder. Kiln III.
 59. M.3175a. Hard, medium-brown fabric, slightly sandy. The rim and neck is burnished grey, except for the cordon which carries three tangled burnished wavy lines. Kiln II.
 60. M.3299b. Medium grey fabric, slipped externally; burnished on the rim and shoulder, but not on the lower part of the body; the reserved zone on the neck carries a burnished wavy line. Kiln III.
 61. M.3244c. Hard, fine grey fabric with the exterior black burnished for a short distance above and below the cordon, which is itself unburnished and carries a band of diamond rouletting. Kiln II.
 62. Uncatalogued. Hard, dark-grey sandy fabric; rim and shoulder slip-coated and burnished. A reserved zone carries a narrow band of acute-angled, latticed burnishing. In part, the burnished area has oxidized and become orange. Kiln VI.

Type L: wide-mouthed, flat-rim bowl

63. M.3177a. Medium-brown sandy fabric, well made. Kiln II.
 64. M.5058c. Coarse, sandy, medium-grey fabric; dark grey surfaces. Well (1).

Type M: necked jar with flattened rim

65. M.3291. Hard, fine grey ware, slipped externally and well burnished to a light grey. A fine piece of work. Kiln II.
 66. M.3297a. Fine light grey ware, probably slipped; burnished externally and inside lip. Kiln III.
 67. M.3343a. Grey-brown fabric, burnished on the top of the rim. Kiln III.

FIG. 8

Type N: large narrow-necked jar

68. M.5056. Hard, medium-grey fabric, fairly fine; surfaces black. Decorated with four bands of unusually broad-pitched rouletting. The exterior is very well burnished, down to the lowest band of rouletting; no evidence of a slip-coating. Well (1).
 69. M.5045. Medium brown sandy fabric with dark grey surfaces. The upper half of the pot has been slip-dipped (to the bottom of the lowest wavy line). The wavy and horizontal lines are burnished, as is the rim and bands between the wavy lines. On the lower part of the body is a group of five very poorly burnished lines; the lowest part of the wall and underside of the base are also burnished. Well (1).
 70. M.5069. Hard, very sandy, brown fabric, with dark grey exterior. The upper part of the pot has been dipped in a dark grey slip which has run down the body; the rim and shoulder were apparently burnished. Well (2).
 71. M.5057. Medium brown sandy fabric dipped in a grey slip; burnished dark grey externally, with a burnished wavy line on a reserved band. Well (1).
 72. M.3231a. Hard, brown fabric, burnished. Kiln II.
 73. M.5046. Brown-grey sandy fabric; the upper half of the vessel has been dipped in a medium-grey slip and burnished, except for two reserved zones which contain burnished tangled wavy lines. Below the lower of these wavy lines the burnishing is in the form of alternate and reserved bands, finishing in a wide band which continues under the base. Well (1).
 74. M.3287. Hard, medium brown-grey fabric. The top of the flange is burnished in the form of four concentric circles. Kiln II.

FIG. 9

75. M.5044. Medium brown-grey fabric with grey-black surfaces; the paste contains fine sand, which protrudes through the surfaces where unburnished. The upper half of the vessel is slip-dipped and burnished black, down to the tangled scroll which is burnished on a reserved zone on the girth. A reversed zone on the shoulder is decorated with a continuous series of burnished triangle outlines. Each triangle contains five inverted U-shaped burnished lines. The inverted, blank intervening triangles are left unburnished, with one exception, where it has been filled with a series of hand-burnished vertical lines. The lower part of the body is decorated entirely with combing, in the form of straight, wavy and stabbed lines; and the pedestal is frilled. This is a most unusual, large and carefully-made vessel. Well (1).
 76. M.5038. Dark grey-brown sandy fabric with finger impressions on the pedestal. Kiln IV.

77. M.3274c. Fine, hard medium grey fabric. Kiln IIA.
78. M.3070a. Hard, medium-grey fabric, with lighter core. There is a curious tapered hole, 1 cm. deep, pierced into the centre of the base before firing; it did not go right through the vessel. Kiln II.
79. M.3316a. Hard, medium grey sandy fabric. Kiln III.
80. M.3182a. Dark grey fabric, decorated with burnished tangled wavy lines and two bands of diamond rouletting; the plain zones between are burnished. Kiln II.
81. M.3134a. Medium grey fabric, burnished. Tangled wavy lines burnished on a reserved zone on neck; a narrow band of diamond rouletting below. Kiln II.
82. M.5074a. Very fine grey fabric, externally slipped and probably burnished. Decorated on the shoulder with a band of lightly tooled acute-angle latticing. Well (3).
83. M.3052b. Medium grey fabric, slightly sandy; decorated with two bands of roller-stamping. The pattern on the roller was a crude cross-hatching. *Cf. RPK*, fig. 71, 6. This is partly masked by a kiln scar on the lower band. Kiln II.
84. M.5081. Sherd of a large-diameter vessel (*c.* 32 cm.) of hard grey-brown fabric containing fine sand; shows a good example of a slip 'run'. Decorated with a lightly burnished scroll pattern, applied after the slip. Kiln IV.
85. Uncatalogued. Medium grey fabric; decorated with a finely-executed and complicated scroll pattern. Kiln IV.
86. M.3164a. Hard, dark-grey fabric with black burnished exterior; decorated with tooled intersecting arcs. Kiln II.
87. M.5036. Fine, hard, grey fabric; decorated with combing in the form of straight and wavy lines, arcs and stabbing. RE.I ditch.

Type O: narrow-necked flask

88. M.5073b. Brown fabric containing a little sand; dark grey exterior which has been slip-dipped and has fired silver-grey on the shoulder. Burnished externally and inside lip, down to a shallow groove. There is a trace of rouletting on the shoulder. Well (3).
89. M.5005. Hard, medium-grey fabric; light grey burnishing on the upper half of the body. Grave 24, R.B. Cemetery 1.
90. M.5047. Brown fabric containing fine sand; medium grey exterior, slip coated. The upper half of the body is well burnished, except for a reserved zone which contains a tangled wavy line decoration. On the girth there are three or more individual burnished lines. Well (1).
91. M.3149b. Fine medium-grey fabric, slip-dipped. This has oxidized and fired off-white. Kiln II.
92. M.3068a. Fine, hard medium-grey fabric, slipped and burnished externally, and just inside the lip. Where unburnished, the slip has fired cream. Kiln II.
93. M.3269a. Medium grey fabric, slightly sandy. A waster—flaked. Kiln II.

FIG. 10

Type P: everted-rim jar

94. M.3347b. Hard, medium-grey ware, thin-walled. Kiln III ditch, probably residual from Kiln II.
95. M.3028a. Medium grey fabric; dark grey exterior, slipped and burnished down to the shoulder; below this the body of the vessel is decorated with groups of acute-angled burnished lines. Kiln II.

Type Q: folded beaker

96. M.3244b. Fine hard brown fabric, burnished inside the lip and down to the top of the folds; two neat grooves on the shoulders. Kiln II.
97. M.3251a. Hard, medium grey fabric; dark grey exterior, burnished. Kiln II.
98. M.3268e. Fine, hard medium-grey fabric, slipped externally and lightly burnished. Kiln II.
99. M.3134b. Fine, medium-grey fabric, burnished externally down to the top of the folds. Decorated with a band of crude roller-stamping. Cf. No. 83. Kiln II.
100. M.3130a. Medium grey fabric, burnished all over the exterior. Between each fold is a single impressed stripe. Kiln II.

Type R: conical-necked beaker

101. M.3300a, 3333a. Fairly fine, hard, medium-brown fabric, slipped and roughly burnished externally. Kiln III.
102. M.3274e. Fine medium-grey fabric, slipped and burnished externally. Kiln IIA.
103. M3268b. Hard, medium-grey fabric, slipped and burnished black externally. Kiln II.
104. M.3264. Fine, hard, medium-grey fabric, externally slipped and and probably burnished (now abraded). Kiln II.
105. M.3289. Fine, hard light-grey fabric with medium grey surfaces; exterior slipped and well burnished. Decorated with a single band of diamond rouletting, contained within a pair of horizontal lines. The sherd has broken at a line, which could be the top of another band of rouletting. Kiln II.
106. M.3179a. Medium brown fabric; finely burnished exterior; decorated with a band of lightly impressed rouletting, delimited by shallow grooves above and below. Kiln II.
107. M.3148a. Medium grey fabric, slightly sandy; decorated with a tooled wavy line. Kiln II.

Type S: large storage jar

108. M.3250b. Very sandy fabric, now heavily burnt and oxidized reddish-brown; it may have been used for a secondary purpose (e.g. supporting) in the kiln and is possibly not a product of this kiln. Kiln II.
109. M.3111b. Medium grey fabric; rim and exterior burnished. Kiln II.
110. M.3305c. Dark grey fabric, very hard and well fired; decorated with stabbing on the shoulder and an incised wavy line below. Kiln III.
111. M.3290a. Hard, medium-grey fabric; externally slipped and burnished to a lighter grey, mottled surface; two grooves on the shoulder. Kiln II.
112. M.3180a. Medium brown sandy fabric; decorated with stabbing, possibly done with a finger-nail. Kiln II.

Type T: mortarium

113. M.3335a. Reddish-brown sandy fabric with grey-brown surfaces: trituration grits of quartz. A very simple and insignificant spout was formed by pressing a finger on top of the rim whilst the pot was still in a plastic state. Kiln III ditch.
114. M.3366a. Medium brown sandy fabric (underfired); dark grey surfaces with small sand grains protruding. Kiln II.

115. M.3150. Medium-grey sandy fabric, badly flaked; quartz trituration grits. Kiln II.

Type U: miniature pottery

116. M.5058b. Hard, light grey fabric, quite sandy. Well (1).
 117. M.3268c. Medium grey fabric, apparently slipped, but now abraded. Kiln II.
 118. M.3212a. Fine dark-grey fabric. Kiln II.
 119. M.3237c. Medium brown fabric with light grey exterior, burnished from lip to girth. Kiln II.

FIG. 11

Type V: unclassified and miscellaneous

120. M.3352a. Possibly a biconical bowl. Hard dark-grey fabric containing much fine sand; slight evidence to suggest a surface slip. There is a groove on top of the rim and two more on the shoulder. Kiln II.
 121. M.3096a. Fine, hard, medium-grey fabric; black burnished externally and just inside the lip. Kiln II.
 122. M.3232a. Hard medium-grey fabric with poor burnishing on the neck and shoulder. Certainly a waster. Kiln II.
 123. M.3347c. Jar rim of medium grey fabric (*cf.* Nos. 52-4); decorated with deep fingernail impressions. No other rim is decorated thus and the diameter precludes its being a pedestal base. Kiln III ditch.
 124. M.3247a. Flagon neck in hard, dark-grey fabric; three incised grooves on the exterior. Another sherd of a similar vessel has an oxidized cream slip. Kiln IIB.
 125. M.3274d. Rim fragment of flagon or tall jar (*cf.* Group H). Fine hard medium-grey fabric, burnished externally and inside lip. Kiln IIA.
 126. M.3273a. Rim of shallow, hemispherical, flanged bowl. Very fine, hard medium-grey fabric; surfaces well burnished, except under flange. Kiln IIA.
 127. M.3237b. Pie-dish with unusually flat rim, well made in brown fabric with brown-grey surfaces, lightly burnished. Kiln II.
 128. M.3297b. Bowl or jar with perforated base (colander). Fine, hard, dark-grey fabric with a finely black burnished exterior. Basal holes pierced before firing. Kiln III.
 129. M.3033c. Beaded-rim bowl of fine, hard medium grey fabric; slipped and externally burnished to a light grey. The body is rouletted, below a pair of grooves. Almost certainly a deliberate copy of sigillata form 30R. Kiln II.
 130. M.3313. Unusual bowl or possibly an elongated neck to a Group N vessel. Dark grey fabric, probably slipped and burnished externally to just below cordon; irregular burnished wavy line below. Kiln III.
 131. M.3366b. Rim of a poppy-head beaker in light brown fabric with medium grey surfaces. Perhaps not a Kiln II product, but poorly fired and certainly local. Kiln II.

NON-LOCAL PRODUCTS

Mortarium

132. M.5024. Pinkish-buff fabric containing a small amount of fine sand, with cream-buff surfaces. The trituration grits are a mixture of quartz and flint fragments. The rims bears the potter's stamp DUBITATUS. Mrs. K. F. Hartley has examined the vessel and kindly reports that it is a product of the Colchester kilns, *c.* A.D. 150-200. It is from the same die as the Prittlewell stamp, the only other recorded example of Dubitatus' work from southern Essex. Found in the bottom of the Kiln III ditch.

Terra sigillata

133. M.3116. Decorated sherd, Dragendorff form 37, in orange-buff fabric, with an orange-red gloss, badly excoriated. The vessel had been used for some abrasive purpose which wore the gloss off the interior of the base. The decoration is very poorly preserved and the ovolo virtually illegible. The vessel is East Gaulish and probably a product of the kilns at Lavoye. Cf. the products of Germanus, who was particularly fond of the cordate leaf, F. Oswald, 'Decorated Ware from Lavoye', *J. Rom. Stud.*, xxxv, (1945), 49 f. Antonine. Found at a low level in kiln II stoke pit.

Excavations at Gun Hill, West Tilbury

P. J. DRURY and W. J. RODWELL

SUMMARY

EXCAVATION and observation in advance of gravel extraction is reported on a site occupied principally during the Iron Age, Roman, and Early Saxon periods. Domestic occupation in the early Iron Age was followed by an enclosure connected to a 'droveway' leading to the north. The major feature examined was a sub-rectangular defensive enclosure of mid-first-century date; after a short life, pottery kilns were established in the partially filled ditch. Saxon occupation was represented by a single Grubenhäus. The finds are described fully, three groups of particular significance—briquetage, curvilinear pottery, and pre-conquest amphorae—being discussed in more detail.

GUN HILL¹ is a sharply defined gravel spur on the 75 ft. (22·5 m.) contour of the Thames terrace, lying just to the west of West Tilbury village (at N.G.R. TQ 655778). In antiquity, the spur was most easily approached from the north, whilst to the south the land falls steeply to Tilbury marshes. In spite of the obvious potential of this spur as one upon which ancient settlement is likely to have taken place, no finds had previously been recorded within half a mile, the nearest known site being at Chadwell St. Mary, to the north-west. This was an extensive prehistoric and Romano-British settlement whose significance in the latter period at least is suggested by the finding of a tessellated floor and well-furnished burials.² Unfortunately, it has been almost totally destroyed by gravel digging over many years, with only the investigation of a very small area in 1959.³ (For a basic location map see p. 7).

Since the late 1950s the extensive application of aerial photography in Thurrock, mainly by Dr. J. K. S. St. Joseph, has shown that the Thames gravels in this area were intensively occupied throughout antiquity. Chadwell St. Mary can now be seen as one of the foci in a major settlement network covering many square miles. Amongst the discoveries made by St. Joseph was the group of features on Gun Hill which are described in this report. A series of photographs taken between 1959 and 1968⁴ showed the crest of the hill (c. 25 m. OD) to be dominated by a sub-rectangular enclosure with a single east-facing entrance (PL. I and FIG. 1, Enclosure A). Another, of slighter proportions (Enclosure B), adjoined this to the east and was approached from the north by a double-ditched 'droveway' (D) which could be traced as far northwards as Muckingford Road, a distance of some

¹ Gun Hill seems strictly to apply to the rise in Turnpike Lane south of Cranes House, the site being called 'Hot Hill' on the OS 6" to 1 mile map, 2nd Edn. 1897. However the name appears to have been transferred to the spur locally, and is used in that sense throughout this report.

² V.C.H. Essex, iii (1963), 62 f.

³ W. H. Manning, 'Excavation of an Iron Age and Roman site at Chadwell St. Mary', *Trans. Essex Archaeol. Soc.*, (ser. 3), i (1962), 127 f.

⁴ Cambridge University Committee for Aerial Photography: Nos. AOI 64, 65, 66, 69, AFK 22; YG 68, 69, 70.

GUN HILL WEST TILBURY ESSEX

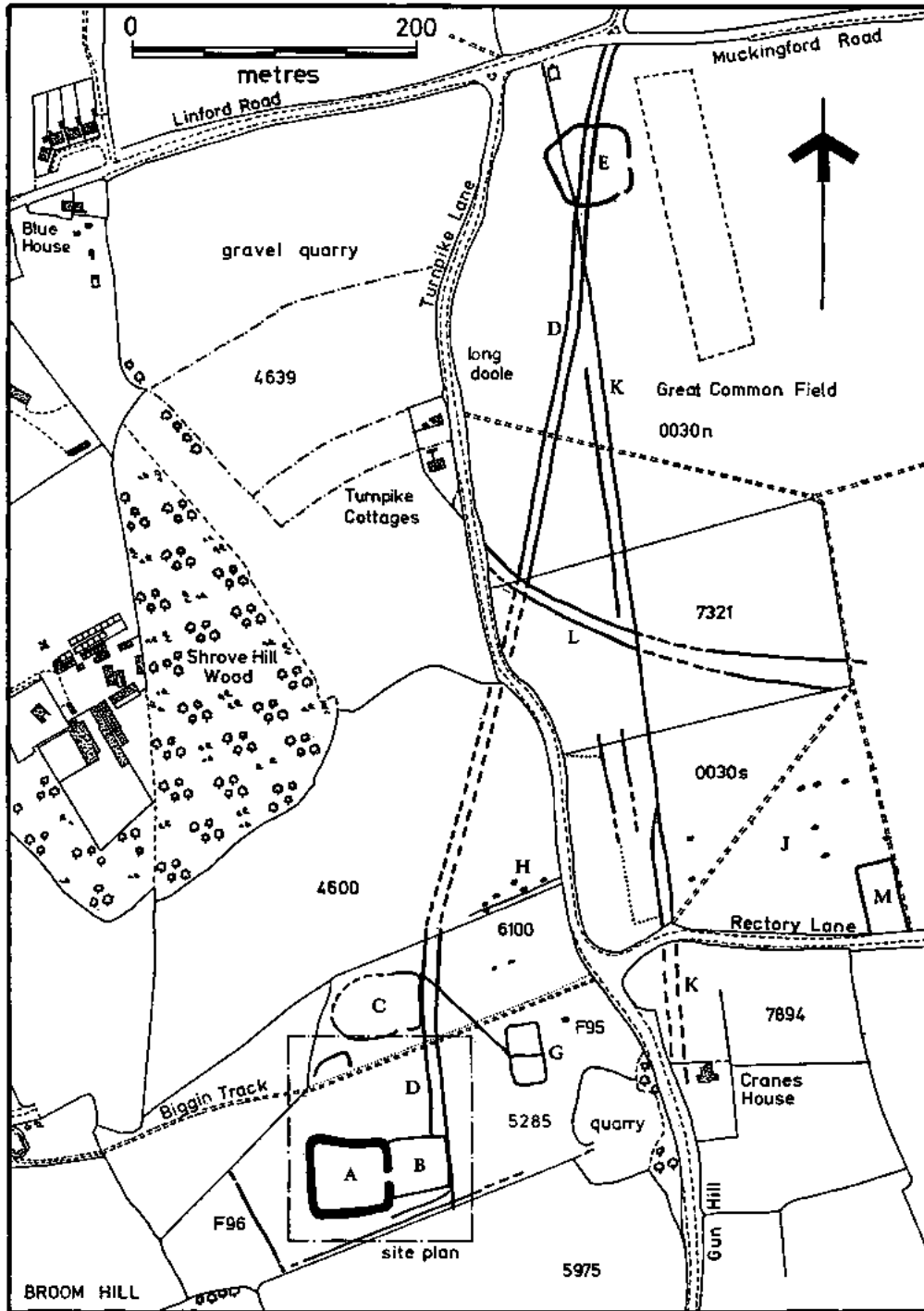


FIG. 1

Map of Gun Hill and adjacent areas, showing principal cropmark features, lettered A to L. Based on the 1:2500 OS Plan. Crown Copyright reserved.

750 m., after which it is still perpetuated by a lane.⁵ On the evidence of aerial photography these features appeared to be 'associated' and hence might be considered as broadly contemporary. A third, irregular enclosure (C) could be seen attached to the western side of the droveway, a little to the north of A and B, whilst a fourth enclosure (E), which lies just south of Muckingford Road, was clearly not contemporary as the droveway appeared to cut through it. (PL. II and FIG. 1). Traces of other enclosures and numerous pit-like cropmarks also appear on the air photographs.

Gravel quarrying has long been in progress alongside Turnpike Lane, the present-day northern approach to Gun Hill, and the whole of the 8 ha (20 acres) field in the south-west angle between Linford Road and Turnpike Lane (OS 4639) was worked without archaeological observation. By 1967 the draglines had begun to encroach on Gun Hill itself, commencing with the 1.25 ha field (OS 6100) to the north of the footpath from Rectory Lane to Broom Hill (which is also the parish boundary between Chadwell St. Mary to the north, and West Tilbury, to the south). Here, a section of the droveway, the whole of Enclosure C and sundry other cropmark features were destroyed without record. In the following year quarrying began in the 4 ha field to the south (OS 5285), commencing at the western end of the spur. Recognizing the potential importance of the site, Mr. Randal Bingley, then Assistant Curator of Thurrock Local History Museum, began an archaeological investigation; he cleared and excavated a prominent sub-rectangular cropmark feature (F95 on FIG. 1) which had the appearance of, and proved to be, an Anglo-Saxon *Grubenhaus*.⁶ At the same time Mr. A. G. Trusler cut a section across the droveway, immediately to the south of the Broom Hill footpath. He also examined possible earthworks on the north-western slope of the spur, which he proved to be of natural origin and caused only by soil-creep.⁷

With the quarry advancing apace, time and local resources were seen to be insufficient to tackle the remainder of the site. Hence, in order that the principal features might at least be sampled and, hopefully, dated, a nine-day rescue excavation was undertaken by the writers on behalf of the Inspectorate of Ancient Monuments of the then Ministry of Public Building and Works, in co-operation with Thurrock Museum and Mucking Excavation Committee, in June 1969. In addition, with the aid of several local volunteers, a close watch was kept on the progress of the quarry over many months and in March 1970 it was again possible to undertake a few more days excavation before the last of the major cropmarks was destroyed.⁸

⁵ High House Lane; just to the east of this is another extensive cropmark complex, close to Mill House, see *Panorama, The Journal of Thurrock Local History Society*, xiv (1971), 40.

⁶ *Panorama*, xvi (1972-3), 39 f.

⁷ *Panorama*, xii (1968), 67.

⁸ Our thanks are due to C. H. Cole and Sons and Essex Aggregates, successive quarry owners, for permission to excavate. We are very much indebted to Messrs. R. Bingley and A. G. Trusler for much willing assistance and for making available finds and information which they had previously collected. Mr. Bingley also gave his permission for the inclusion of a summary of his excavations in this report, together with his drawings of the *Grubenhaus*. We are grateful to his successor at Thurrock Museum, Mr. A. Babbidge, for continued co-operation; all the finds from the excavation have been deposited in that museum (Accession No. 1229). To Mrs. M. U. Jones, Mr. W. T. Jones and Mucking Excavation Committee we are greatly indebted for help and advice and for the loan of equipment. We are also grateful to all those who gave



PLATE I

Cropmarks on Gun Hill, West Tilbury, from the south-east (p. 49).
(Photo: J. K. St. Joseph, Cambridge University Collection: Copyright Reserved)

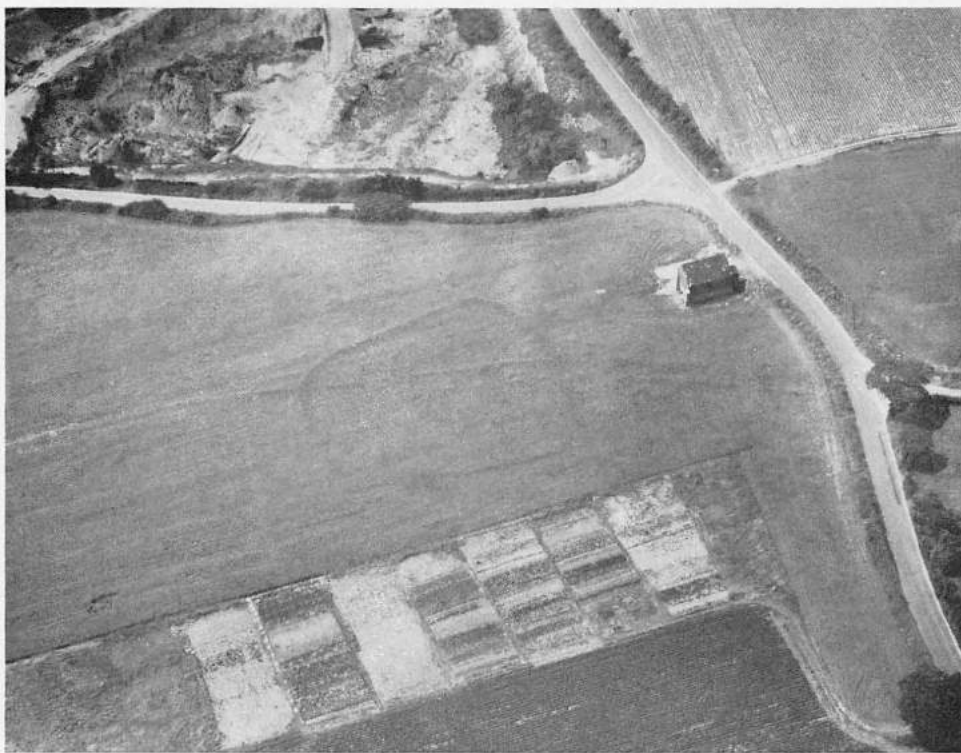


PLATE II

Cropmarks of Enclosure E and Droeway D, just north of Gun Hill, looking west.
(Photo: J. K. St. Joseph, Cambridge University Collection: Copyright Reserved)

1969-70 EXCAVATION

Numerous ditch sections of the main enclosure A were examined during the course of quarrying, whilst others were cut, partly by machine and partly by hand; only those selected for publication are marked on the site plan, FIG. 2. Machine sections were also cut across the droveway and boundary ditches on the southern edge of the site. The plotting of soilmarks, shown black on FIG. 2, was undertaken as topsoil clearing proceeded in advance of quarrying. The plan was completed using cropmark evidence, shown stippled.

Five sample areas were cleared and examined in detail, (FIG. 2 areas A to E)⁹ and other features sampled where possible.

A long, but apparently discontinuous sequence of occupation was established which has been divided into seven periods, the detailed chronology and interpretation of which will be discussed later (p. 95). In the following description, depths and widths of features are those pertaining after clearance of topsoil unless otherwise stated. Appendix A tabulates details of the features, and Appendix B provides details of the sections.

PERIOD 1—*Neolithic-Bronze Age*

No features of the earlier part of this period were encountered during excavation, although finds of worked flints (FIG. 20, 1-6), residual in later features, attest activity on the site. Erosion by post Roman ploughing has been considerable, so that shallow features on the summit of the hill would not have survived.

The earliest datable excavated feature was ditch 59 (FIGS. 2-4), probably a field boundary of the latter part of the Bronze Age. Some 25 m. of its length were examined, yielding no flints, but a scatter of Bronze Age potsherds at one point.

There can be no doubt that several posthole structures of this period existed but, unfortunately, circumstances did not allow a careful search, even of the areas stripped. Some of those found were cut by Period 2 ditches and must be attributable to an early phase, for example: postholes 50, 74 and 88 (Area B, FIG. 4) none of which yielded finds. Other isolated postholes, however, contained pottery of this period, for example: 60, with which were probably associated 61 and 73 (FIG. 2).

PERIOD 2—*Early-to-Middle pre-Roman Iron Age*

The principal features of Period 2 were the ditches 23 and 25, and their eastern continuations running along the crest of the hill (FIG. 2). Ditch 23 was the earlier and had a length of 32 m.; after a gap of 5 m. it probably continued eastwards in the form of ditch 22, observed mainly as a cropmark. The later ditch, 25, which also cut pit 53, was 23 m. long and after a 3 m. gap its alignment was continued by ditch 21. In the eastward direction they both appear to aim for, but do not join the north-south ditch 7. This was apparently a basic land division

practical assistance on the excavation, and in particular Mrs. K. A. Rodwell who processed the finds and who has given much help in their drawing and in the preparation of this report.

⁹ Due to the conditions in which the work was undertaken we cannot be certain that all minor features within these areas were discovered.

GUN HILL Site Plan

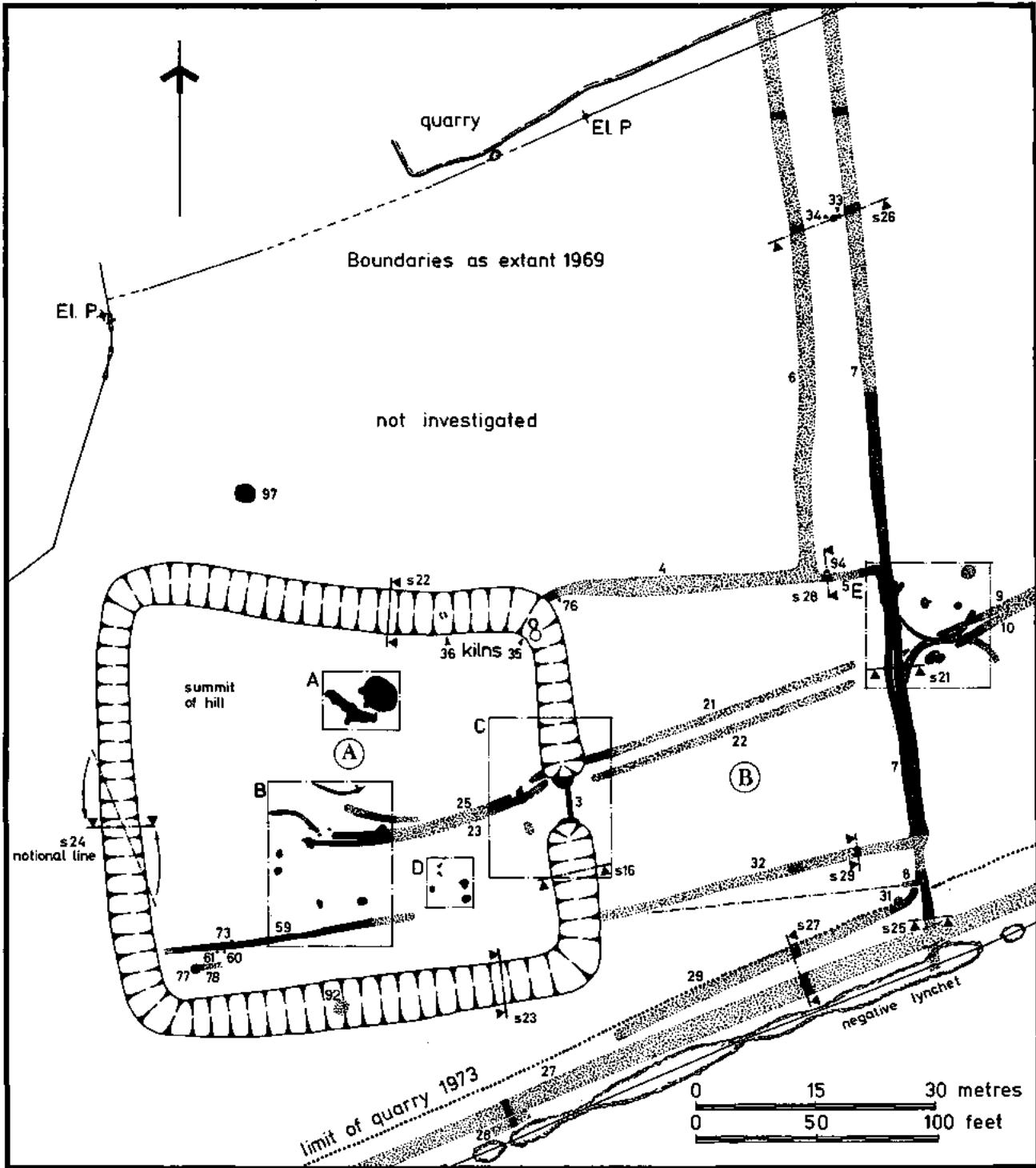


FIG. 2

Site plan of the main area investigated, showing the positions of main sections (S16 and S21-29) and the areas examined in detail (Areas A-E; see separate plans). Features plotted from crop marks are stippled.

across the hill, maintained and recut over many centuries; the relationship of the east-west ditches to it affording evidence of its early origin. On the evidence of plan, ditches 9 and 10, which continue the alignment of 21 and 22, should have an equally early origin, but in their final form they certainly belong to later periods. That ditch 7 predates, in origin, enclosure B, is shown by its relationship to ditch 8 (FIG. 2); section 25, south of the junction, shows clearly that it was a much recut feature prior to the construction of that enclosure in period 3.

Pottery, apparently of the EPRIA, was prolific in areas A and B but virtually absent from areas C and E, suggesting that initially occupation was confined to the western part of the hill. In this connection, the fragmentary shallow, curving gullies 46 and 49 (Area B) could be interpreted as parts of domestic enclosures. A few of the pits in areas A and B yielded no finds and could also belong to the EPRIA, but the majority certainly belong to the MPRIA. Pit 77 produced pottery early within that period; the gulley 78 is stratigraphically earlier than the pit. (FIG. 2).

In the latter part of the period, distinguished by the introduction of new pottery types, in particular the footring bowl (FIG. 14), clear evidence for structures emerges, principally in the form of the semi-circular slots 12 and 13 (Area E-FIG. 6). Slot 13 is the earlier, and had two phases, a and b. Although it was damaged by later features and was not fully examined, it is quite certain that it never formed more than a semi-circle in plan. An entrance gap to the north-east was observed in the second phase; the internal diameter was *c.* 11.5 m. Slot 12, which was stratigraphically later than 13, was in a better state of preservation and formed a semi-circle with an internal diameter of 9.25 m.

From the excavated sections it is clear that these slots were not drainage gullies but wall trenches, presumably for a contiguous setting of upright timbers

GUN HILL

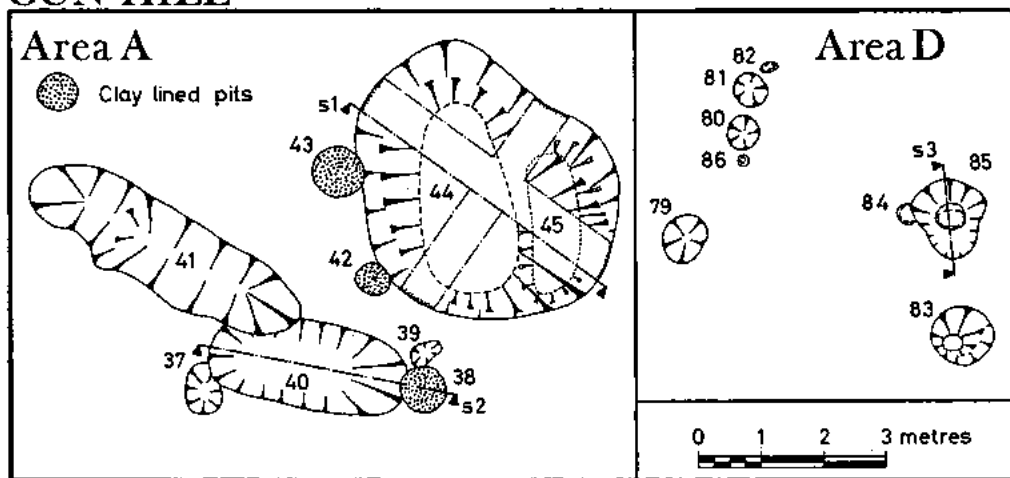


FIG. 3
Detail plan of Areas A and D.

(FIG. 8, section 17 and FIG. 9, section 21). The timbers were not more than 0.35 m. wide in the case of 12, and perhaps not more than 0.15 m. wide in the case of 13b; 13a was probably of similar size, though the profile at section 21 was not sufficiently sharp for an accurate assessment to be made. A careful search was made for any structural evidence to 'close' the semi-circles across their diameters, but the only feature of possible relevance was the large post-pit 16, lying on the diameter of slot 12. A clear 'ghost' survived, showing the post to have been *c.* 0.70 m. in diameter, approximately twice that of the wall timbers. The gap between the post and the north-east butt of the slot was 1.50 m., measured to the presumed face of the wall.

The area enclosed by each slot contained a single pit; thus pit 14 lay within slot 12 and pit 17 within slot 13. Significantly, pit 17 was recut, almost on the same spot, as pit 18. On excavation, 18 was found to be a hearth pit, (FIG. 8 section 20) which yielded lumps of fired clay, slag, pottery, two pieces of iron (FIG. 20. 7, 8) and much ash. Pit 90 was of the same period, as probably was posthole 15, adjacent to pit 14. Other features, apparently belonging in the latter part of period 2, were the short section of curving gully, 58, and five pits—56, 62, 64, 66, 69—scattered over area A. Of these, pit 62 had originally been for the storage of raw clay and was later backfilled with hearth refuse, whilst another, 69, had been a shallow hearth pit.

In Area A a complex of large pits was examined (FIG. 3). An exceptionally large pair of pits 44/45, filled with cleanish sand and gravel, contained only a few sherds of pottery, but in a humic layer (5) in the bottom of pit 44 were some badly decayed bovine teeth. Pit 45 was earlier, deeper, and oval in plan; it had originally been cut with near-vertical sides (see FIG. 8, Section 1), to a depth of at least 1.75 m. below ground level. It was superseded by the larger, but still oval pit 44 and the arrangement of the filling in the latter suggests that it was a massive post-pit from which a group of timbers had been deliberately extracted. On Section 1, layer (3) corresponds with the post position and layer (4) was the packing of large pebbles around it; when the timbers were removed this packing collapsed and filled the bottom of the post cavity. The area occupied by the posts in pit 44 would originally have been *c.* 3 m. by 1 m., which might correspond to three juxtaposed timbers, each not more than a metre in diameter. It is not unreasonable to suppose that pit 45 had previously held a similar but smaller post-setting; however, much of its filling had collapsed into pit 44, removing all possibility of detecting a 'ghost'.

It is fairly certain that pit 44/45 was an isolated structure: it was positioned virtually on the summit of the hill and showed very clearly on aerial photographs—there was no sign of other pits of comparable magnitude in the vicinity,¹⁰ nor was there any evidence from the air or on the ground for associated features, so that there is no reason to regard this post-setting as part of a building. In view of the considerable depth to which the two successive post-pits were dug and the obvious care taken in the selection of the packing material for 44, it seems best to regard these structures as free-standing and comprising (probably) three con-

¹⁰ Other than 97, clearly later on the evidence of its contents.

GUN HILL Area B

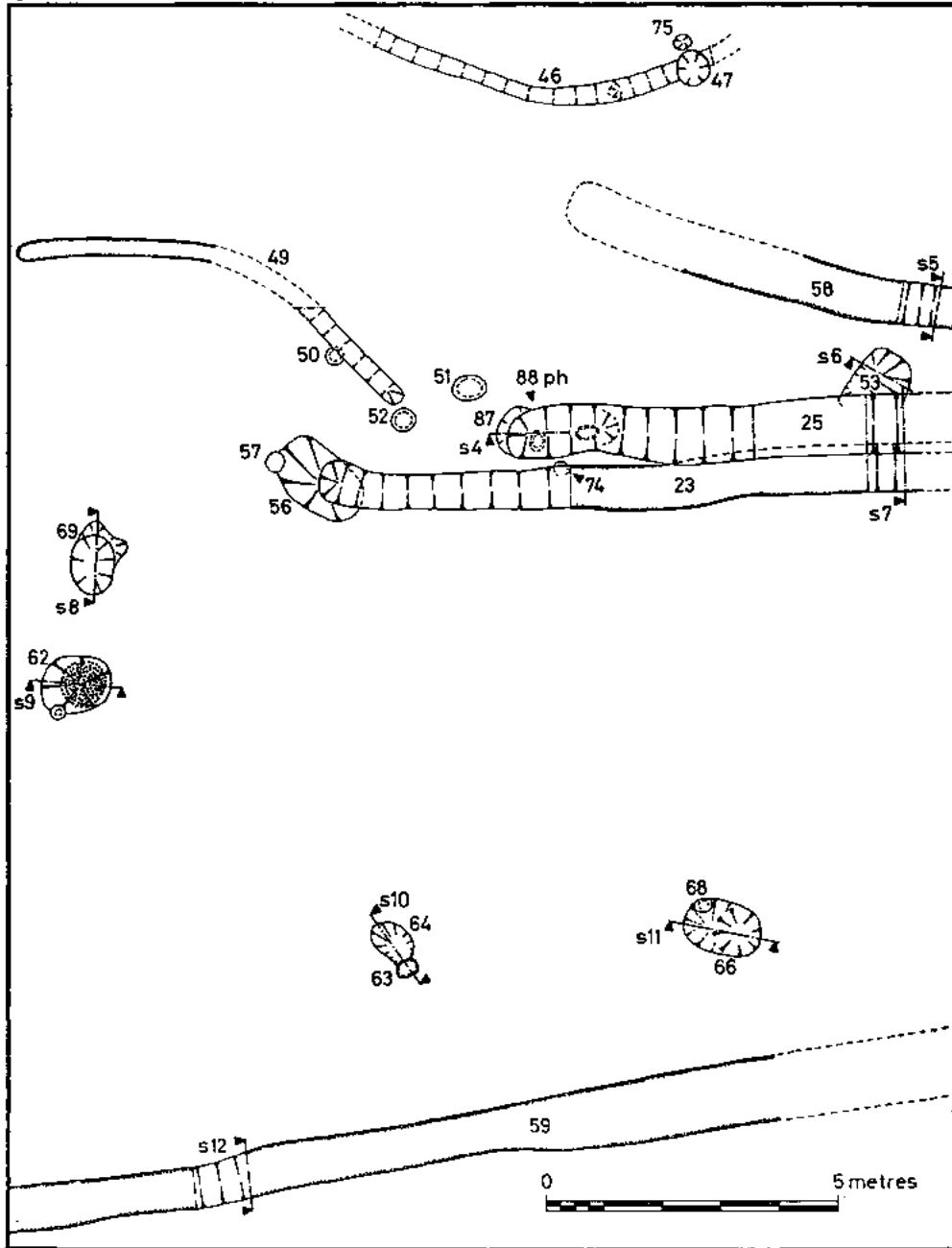


FIG. 4
Detail plan of Area B.

tiguous posts. The successive shallow oval pits 40 and 41 both contained much domestic refuse; a possible post 'ghost' appears in the upper filling (1) of pit 40 but this may be intrusive. (Section 2, FIG. 8).

Of slightly later date, but still within the same phase, are the three small pits containing raw grey clay. This is apparently an estuarine silt, which could easily be obtained from the Thames marshes, and which was stored in pits pending use. Similar pits have been noted at Mucking.¹¹ Three pits were observed in Area A: pit 38 was stratigraphically later than pit 40 (FIG. 8, Section 2) and contained the greater part of a black burnished footring bowl (FIG. 14.34). Pits 42 and 43 were both cut partly into the filling of the post-pit 44. In Area B a single clay-pit, 62, was noted (see p. 54 above and FIG. 8, Section 9).

Two further pits are worthy of mention—83 and 85 in Area D—as they are clearly a matched pair of post-pits. The posts, apparently roughly squared to c. 25 × 30 cms. had, particularly in 84, been well packed with stones which tumbled into the voids when the timbers were removed (FIG. 8, section 3). Unfortunately, they remain undated, but are perhaps most likely to belong to this phase of occupation. The distance between their centres was 2 m. and in the absence of any certainly associated features in the vicinity they may perhaps be interpreted as a two-post structure on a due north-south alignment. Postholes 79 and 82 may possibly form a similar, if less substantial structure. Similar pairs of posts, which are a well-known feature on Iron Age settlements in southern Britain, have recently been noted at Little Waltham.

PERIOD 3—*Middle pre-Roman Iron Age*

This period marks a basic change in the use of the hilltop: domestic occupation would appear to have ceased and no structural remains or pits, and very little domestic debris can be attributed to it. It is characterized by the introduction and development of the 'droveway' and its associated enclosure.

Phase A

The basic north-south land division (ditch 7) remained in evidence and a second ditch was cut approximately parallel to it at an average distance of 6 m. to the west (ditch 6, see FIGS. 1 and 2) forming what is known for the sake of convenience as the 'droveway'. How far north (and south) ditch 7 originally extended is uncertain, but its northern limit may have been just beyond the Broom Hill footpath where the first change of alignment can be observed. As previously noted, the droveway can be traced as far north as Muckingford Road on aerial photographs, whence it would appear to continue, as the present road, for at least another 225 m. before there is a change in the direction of High House Lane. If the droveway alignment is projected north-eastwards from this point (across OS field 8400) it picks up again on aerial photographs close to a significant angle in Hoford Road, having passed just to the west of the cropmark complex at Mill House. Hoford Road itself continues the line north-eastwards, dips slightly

¹¹ M. U. Jones 'Cropmark Sites at Mucking, Essex', *Antiq. J.* xlviii (1968), 214.

to cross the head of Muckingsford Creek and then climbs steeply on to Rainbow Shaw, where another prehistoric site has been destroyed by quarrying.¹² Although the northern end of the droveway can only be conjectured, its southern end is clearly visible on the crest of Gun Hill, terminating in the rectangular enclosure B, (FIGS. 1 and 2).

The initial phase of enclosure B was represented by ditch 8 at the south-east corner and its presumed extension westwards, ditch 3 on the west surviving in the entrance through the period 5A enclosure ditch, and the lines of the more substantial ditches 4 on the north and 7A on the east. Ditches 3 and 8 were of modest size, and 6A, the initial cut of the western ditch of the droveway, was similar. The enclosure measured c. 37 m. × 40 m. internally, defining an area of 0.15 ha, the droveway simply opening into the north-east corner. Here posthole 94 is probably significant (FIG. 2 and FIG. 9, s28) as it may have been one of a pair, or group, connected with a gateway to the enclosure.

It is to this period that the outlying field ditches delimiting the south and west sides of the plateau belong. Ditch 29 follows the contour of the southern slope of Gun Hill (FIG. 9 s27); the curving butt at its eastern end demonstrates that it is an addition to the pre-existing enclosure B in its primary phase. (FIG. 2). Although not traced, Ditch 29 probably continued westwards as far as ditch 96, which cut off the western nose of the hill (FIG. 1). Ditch 10 presumably continued in use.

Phase B

After a lapse of time during which these enclosure ditches had silted substantially, enclosure B was reconstructed. The south ditch was recut on a different alignment (ditch 32), diverging northwards from ditch 8, presumably to allow passage from east to west between the enclosure and ditch 29. Ditch 32 was, at 0.6 m. deep, more substantial than its predecessor; reconstruction on this larger scale was apparent along the eastern side of the enclosure (7A in section 21 FIG. 9) and continued northwards along the droveway where the maximum depth of about 0.8 m. was reached. Presumably at the same time the western ditch of the droveway¹³ was recut as ditch 6B, a little deeper than its predecessor 6A (FIG. 9, section 29). A new entrance in the west side was provided just to the south of its centre, where two isolated fragments of ditch-butts survived, protruding beyond the butt-ends of the ditch forming enclosure A. (FIG. 2 and FIG. 5, Area C, where the residual butt-ends are labelled 2A and 2B). These are deeper and wider in comparison with the remaining ditches, even in this recut phase, but it is not unusual for ditch proportions to increase adjoining the entrances of prehistoric enclosures.

The slightly assymmetrical fill of the ditches and the fact that recuts tended to move inwards fractionally, indicates that the banks of both enclosure B and the droveway were external to the ditches. The only possible entrance to enclosure B other than from the droveway which can be postulated on the evidence available

¹² *ibid.*, 214.

¹³ The spread of sand, layer (2), over the western ditch appears to be derived from small-scale medieval, or later gravel digging in the area, presumably for making-up the Biggin footpath.

GUN HILL Area C.

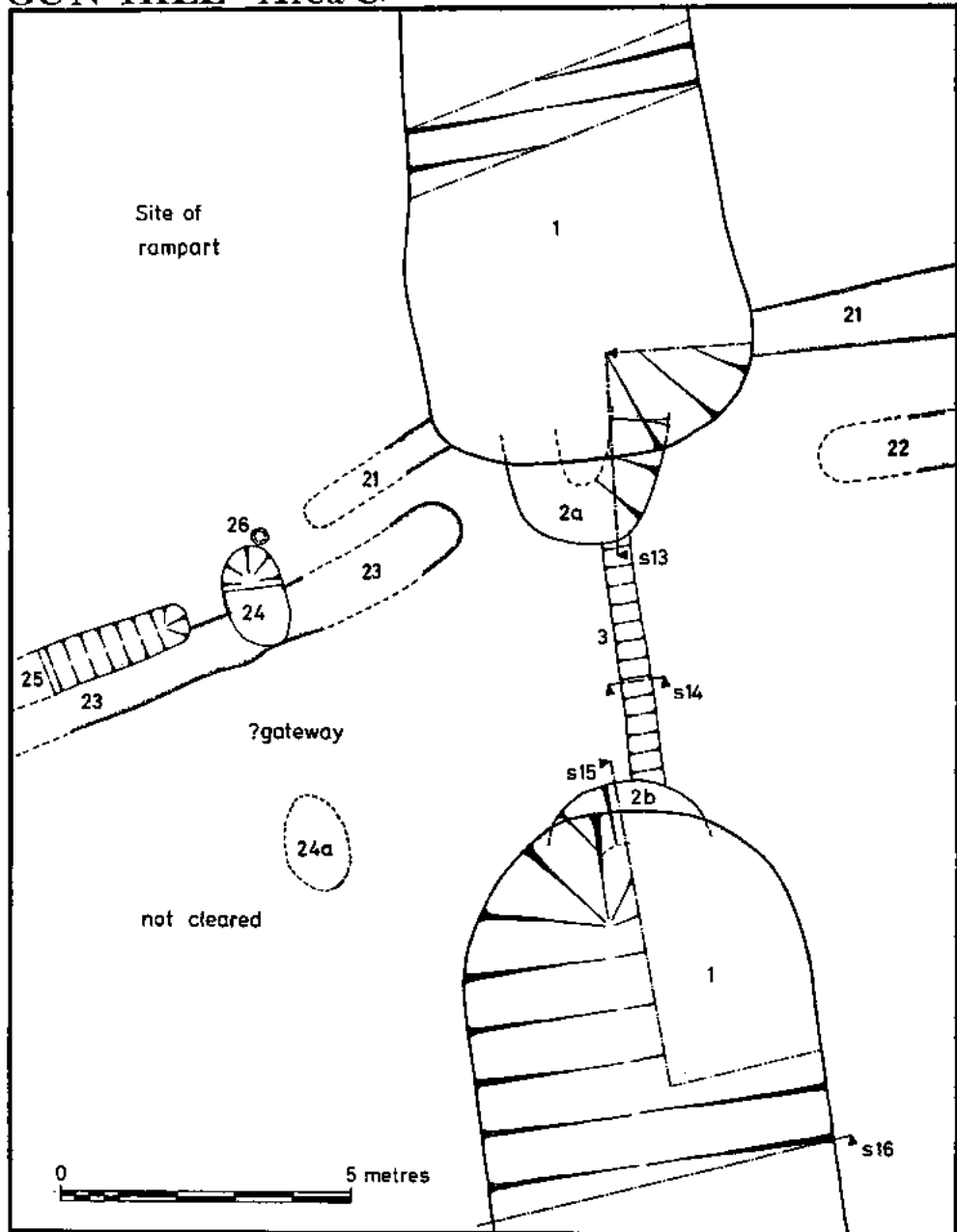


FIG. 5
Detail plan of Area C.

lay at the northern end of the eastern side. A bulge with distinct limits in a north-south direction might represent a short ditch dug to block an entrance; unfortunately, it was not possible to excavate this area. No internal features associated with the enclosure were found.

PERIOD 4—*Later pre-Roman Iron Age*

In this period the droveway appears to have become disused, though enclosure B was maintained. Its western ditch was recut on a smaller scale as 7B (FIG. 9, section 21), which curved westwards at the north-east corner to close the former entrance to the droveway as ditch 5. The remaining ditches—2, 4 and 32—were presumably maintained. It seems likely on the evidence of further recutting, suggested for ditch 6 by section 29, that it continued in use longer than ditch 7, to link enclosure B with enclosure C to the north (FIG. 1). The presence of pit 31, which contained pottery of periods 3 and 4, cutting partly through ditch 29, might suggest that the latter went out of use in this period. However, since the ditch also contained Romano-British pottery, it seems more probable that it survived. The apparent lack of more than two recuts is perhaps due to the inevitable build up of a lynchet (still extant) and the use of a hedge surmounting it as a boundary. The continuation of the line of ditch 10 can also be safely assumed.

The irregular enclosure C, on the north-west slope of Gun Hill is certainly secondary to the droveway on the evidence of the plan. It must have been constructed whilst ditch 6 was still visible, as its eastern side directly abuts that ditch, but whether before or after the droveway went out of use is not clear. The area enclosed was about 0.2 ha; a wide and slightly inturned entrance can be seen facing south and the proportions of the ditches, as revealed by cropmarks, cannot be very different from those of enclosure B. Strong cropmark definition once again suggests a widening and deepening of the ditches near the entrance.

Enclosure G was a rectangular cropmark, some 25 m. by 40 m. (FIG. 1) divided into two roughly square parcels, joined by a ditch from its centre to the north-east corner of enclosure C. It clearly postdates the droveway, across which the linking ditch cuts, but it must have been constructed while enclosure C was still visible, and presumably functional. A section across the linking ditch showed it to be V-shaped, *c.* 1 m. deep and of a single cut, backfilled with cleanish gravel. Enclosure G itself was observed in quarrying; its ditch was of very slight proportions, U-shaped and also backfilled with sterile gravel. It is more reasonably interpreted as a palisade trench than as an open ditch.

Finds of the LPRIA, and in particular Belgic pottery, are so rare on Gun Hill that it can be confidently asserted that there was no significant domestic activity on the site in that period.

PERIOD 5—PHASE A—*Mid-first century A.D.*

To this period belongs the massive sub-rectangular enclosure which formed the dominant cropmark on the summit of the hill (FIG. 2 enclosure A). Its external measurements were 62 m. east-west by 50 m. north-south on the east and 60 m. north-south on the west. The corners were all rounded and in three instances a

GUN HILL Area E

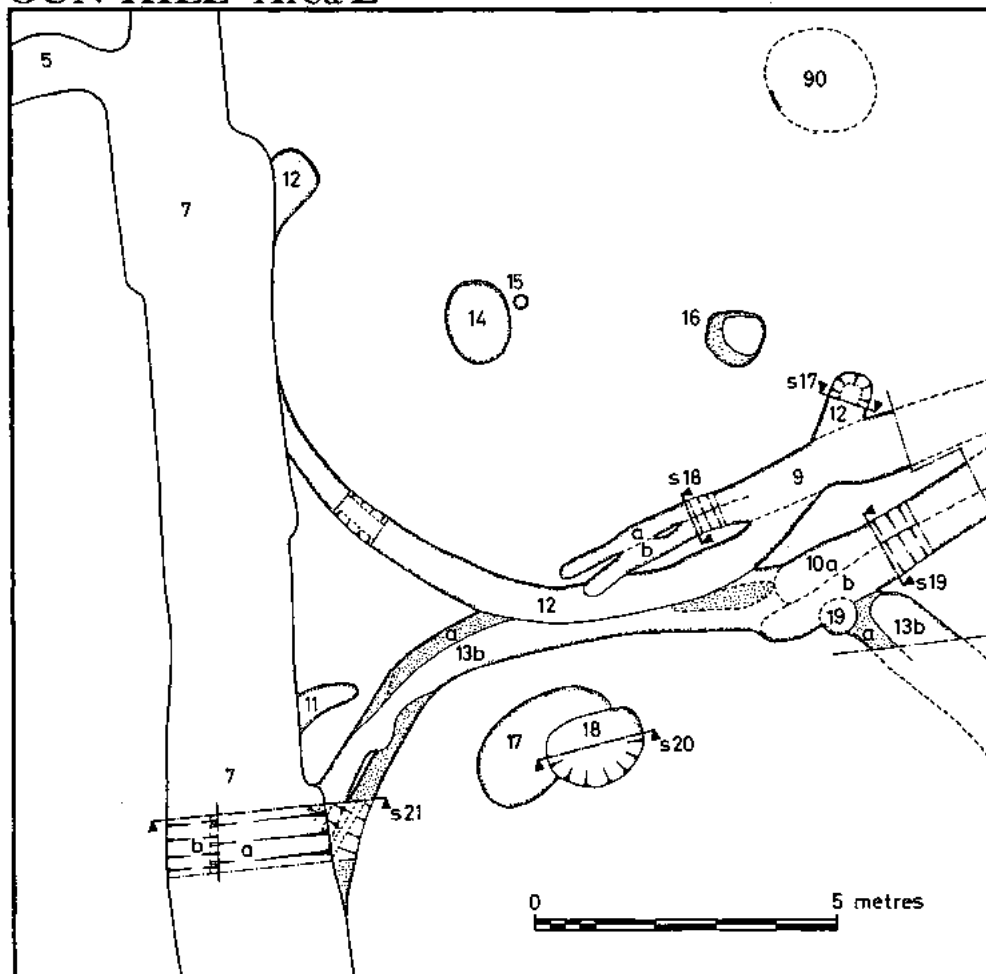


FIG. 6
Detail plan of Area E.

right-angle was formed between adjacent sides, the north-west corner being the odd one. As the north-east corner formed a reasonable right-angle it was necessary for the north ditch to have a distinct bend in its course. The enclosure had a single entrance in the middle of the east side, approximately coinciding with the much earlier west entrance to enclosure B.

The interval of time between the construction of the two enclosures must have been considerable as the butt-ends of B had almost completely silted up (and incidentally yielded no finds) before A was dug. (FIG. 10, sections 13 and 15). It can hardly have been coincidence, however, that the two enclosures overlapped so

neatly and fortuitously, so that enclosure B could not have been totally obliterated. Presumably its ditches showed as slight hollows and perhaps a pathway still passed through its entrance, which, being the only firm and undisturbed piece of ground, would logically be used as the causeway into the new enclosure.

One section across each ditch of enclosure A is given here (FIG. 10, sections 16, 22, 23 and 24); they are representative of the many observed. The width of the ditch at cleared-level was 5 m. to 5.5 m. and at ground level would have been *c.* 6 m. Its depth below cleared-level averaged 2.2 m. and below ground level *c.* 2.75 m. These measurements take no account of soil erosion caused by post-Roman ploughing; there has certainly been considerable denudation on the summit of the hill and this is undoubtedly the reason both for the apparent narrowness of the enclosure ditch near the north-west corner (although it had steeper sides here anyway) and also the apparent absence of prehistoric features in that area (observed during topsoil stripping in advance of quarrying). In section the enclosure ditch was V-shaped, with the scarp-slope generally a little steeper than the counterscarp. In all observed sections the filling was asymmetrical and derived from the interior, a clear indication of an internal bank. The primary silt was generally of cleanish sand and only *c.* 20 cm. in depth; in the south butt-end there was a small deposit of ash and charcoal.

The deliberate throwing-in of much of the bank was apparently the second stage in the filling of the ditch, which had the effect of approximately halving its former depth. The backfill was a sterile deposit of cleanish sand and gravel and was only a little darker in colour than the banded natural from which it must originally have been derived. Where the backfill comprised coarse gravel no internal differentiation was visible, but where it was of sand (particularly in the west ditch) many discontinuous turf lines were visible in section. This phenomenon was observed along the whole of the west side of the enclosure and a typical quarry-face section has been reproduced on FIG. 10 (Section 24, corrected from the oblique to a right-angle line). This section demonstrates that the turf was not in the form of growth lines, but occurred as randomly-tipped material and the considerable quantity observed implies that it had been used extensively in the construction of the bank, presumably as a revetment. This would have been very necessary in order to maintain any stability in an earthwork as substantial as this. The south butt-end (section 15) shows similar turf tip-lines.

A period of stagnation must have followed this rapid backfill, when the tipped material settled and consolidated and a natural turf-line grew across the ditch from side to side (*cf.* Section 16, or the uppermost turf-line in Section 15). In places, this was in turn covered by a smaller deposit of gravel and capped by another turf-line (Section 22).

No features which are likely to have been contemporary were observed either inside or outside enclosure A, with one minor exception—posthole 24 in Area C. It cut ditch 23 and produced sherds of LPR1A pottery; in plan it was oval and could have held a post some 75 cm. in diameter, but no actual 'ghost' was visible and it would appear that the timber had been deliberately removed. Its depth below

cleared level was 0·5 m. and below ground level 1·25 m. or more.¹⁴ Little significance would have been attached to this posthole were it not for the fact that it is later than all other datable postholes on the site and its position just inside the north butt of enclosure A, on what must have been the approximate centre-line of the bank, is suggestive of a gate-post. Both it and its apparent twin, inside the south butt, appear clearly on one of the aerial photographs.¹⁵ The gap between the posts would have been about 3 m. and as there is no evidence for other posts behind this pair, a simple, but substantial gateway is the most probable explanation. At modern ground level the distance between the ditch butts would have been 5 m. or a little less.

Although no trace of the internal bank survived due to later agricultural activity, it cannot have been less than 5–6 m. broad at the base and at least a narrow berm would have been required to prevent the collapse of the ditch scarp-lip (which evidently did not happen); thus the internal area of the enclosure would have been reduced to something in the order of 28 m. by 38 m., or *c.* 0·1 ha.

PHASE 5B—*Later first century A.D.*

This marks a completely new use of the site—mainly, if not entirely industrial. The ditches of enclosure A had become about two-thirds backfilled when they were used as convenient hollows in which to site Romano-British pottery kilns. Three kilns are known for certain but, to judge from the debris tipped into the quarry bottom by the dragline when it was clearing out the north ditch preparatory to gravel extraction, several others were destroyed without record. In fact the upper layers of the north ditch, along the whole of its length, were full of waste pottery and kiln debris and a well-defined layer of charcoal and ash, averaging 0·25 m. in thickness, was observed in many sections (*cf.* Section 22, layer (7) and Section 24 layer (3)).¹⁶ Although most concentrated in the north ditch it was also clearly visible down the whole of the west ditch and down the east ditch nearly as far as the north butt-end. There were also odd patches in the south ditch, but not a continuous layer.

Contemporary with the kilns was a series of shallow pits containing charcoal, ash and kiln debris. Many of these had been dug into the fill of the enclosure ditch and some can be detected on the air photographs (see Section 16 layer (29)); one was found beneath Kiln 1 (FIG. 7, pit 35a). Ditch 7 was still a visible feature of the landscape as it too had several pits dug along its length, although no kilns were detected in it. These pits are visible on the photographs and are confined to the southernmost 50 m. of the ditch.

Kiln 1 (Feature 35) lay in the north-east corner of the enclosure ditch A (see FIG. 2 for location and FIG. 7 for details) and was partly damaged by the dragline at the time of its discovery.¹⁷ It was of updraught type with a circular furnace

¹⁴ This area was cleared to a greater depth than usual.

¹⁵ The cropmark position of the southern posthole is shown on fig. 5—it was under a spoilheap at the time of excavation!

¹⁶ Hereafter called the 'charcoal layer'.

¹⁷ The dragline driver simply dug a hole with his machine 'to see if he could find anything'. This dictated the unfortunate position of Section 30.

chamber (1.25 m. internal diameter) with a very short flue which faced south. No discernible pit had been dug either for the construction of the chamber or for a stokehole—it had simply been set a few centimetres into a layer of charcoal and debris left by earlier activity (FIG. 7 Section 30 layer (5)). The stoking area

GUN HILL Pottery kiln f35

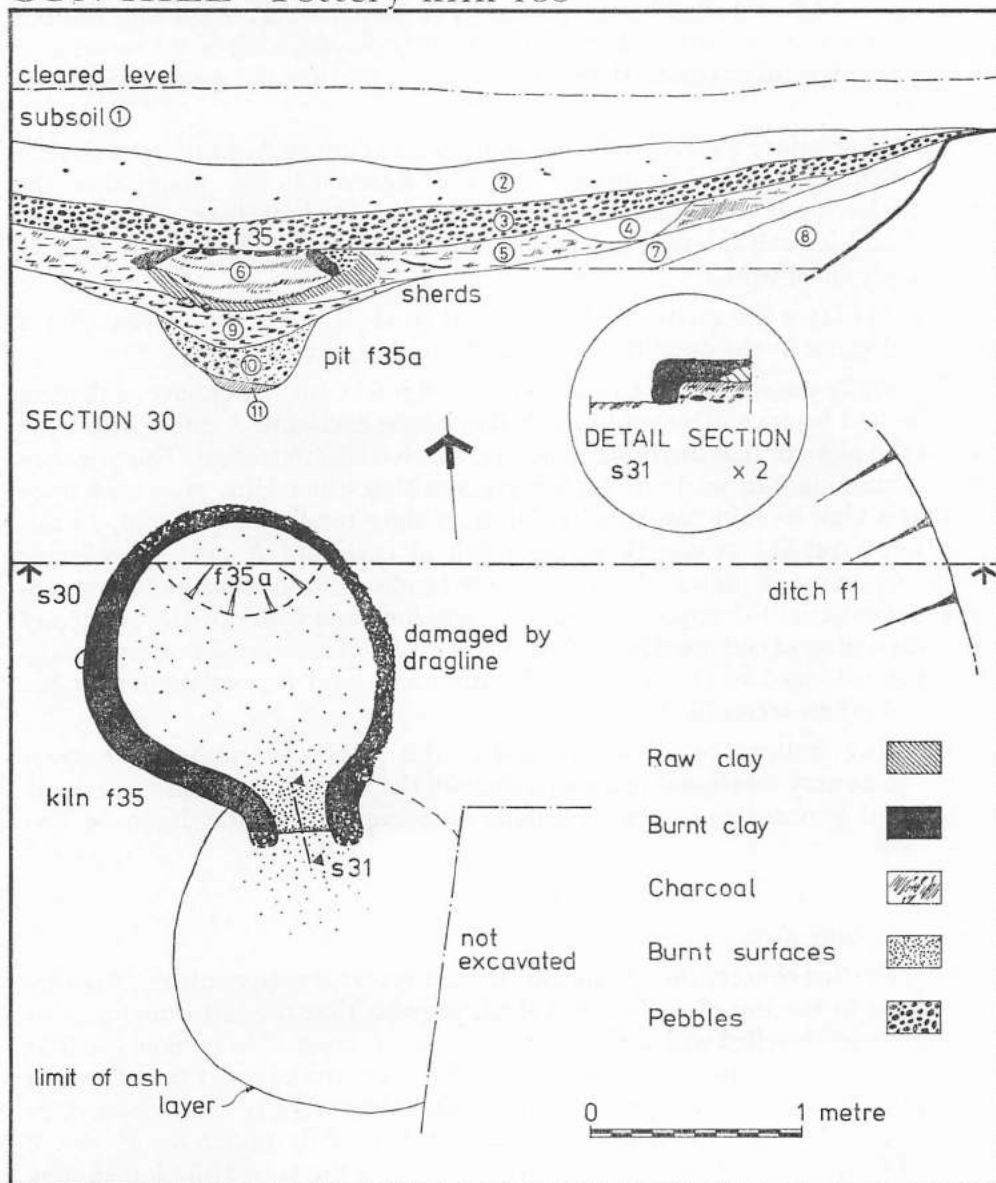


FIG. 7

Plan and sections of pottery Kiln I (F35). For key to section see p. 109.

appeared in plan as a roughly circular patch of ash and the floor of the kiln comprised a spread of raw clay showing a partly heat-reddened upper surface. The base of the furnace wall survived to a height of only 20 cm. and had collapsed inwards, as shown in Section 30. No trace of a suspended furnace floor survived *in situ* but fragments of a fired clay flooring, pierced with large holes, were found in the debris. In all probability there would have been some form of central pedestal but all evidence for this had been removed by the dragline. That the kiln was not the first on the site is shown by the fact that it partly overlies a pit (F35a mentioned above) and a spread of charcoal and debris (FIG. 7 Section 30 layers 5 and 9 and section 31).

Kiln II (Feature 36) lay in the north ditch of enclosure A, 12 m. west of Kiln I; part of the east side of its furnace wall was observed in the quarry face, the remainder having been already destroyed. It appeared to have been of similar size to Kiln I and its wall survived to a comparable height. In all probability the flue and stokepit faced west.

Kiln III lay a few metres to the west of Kiln II; it was observed just after it had been dug out by the dragline and thrown into the quarry bottom.

Essentially these kilns were surface-built and it was only by chance of the fact that some had been constructed in the hollow of the enclosure A ditch, below the reach of the plough, that anything structural survived for detection. The presence of pits containing kiln waste in ditch 7 suggests that other kilns may have once existed at a high level in that vicinity, but have since totally disappeared. In this connection a pit-like cropmark to the north of enclosure A may be relevant (Feature 97 on FIG. 2); it was cleared and very briefly examined before its destruction, and was found to comprise a shallow depression lined with raw clay, on top of which was a mass of collapsed fired clay. A few sherds of associated pottery indicated that it belonged to the period under discussion and its explanation as the remnant of a kiln seems likely.

No other features could be assigned to this phase and although a great quantity of pottery was found in association with the kilns, the majority was waste material and provides no evidence for domestic occupation on the site in the first century A.D.

PERIOD 5C—*Later Roman*

After the first century the site appears to have reverted to agriculture. Another tip of gravel in the top of enclosure A ditch suggests that the last remains of its bank were being levelled with a view to ploughing (*cf.* layer 18 in section 15). The ploughsoil which lay immediately over this gravel tip contained a few sherds of second-third century pottery and some quern fragments. Ditch 7 still retained its significance and ditch 9 contained Roman pottery in its upper layer (FIG. 6 Area E). Ditch 29 which delimits the southern edge of the Gun Hill plateau may also have been recut in this period and ditch 28 may have been yet another cut, on a slightly different axis.

GUN HILL Sections 1-12, 17-20

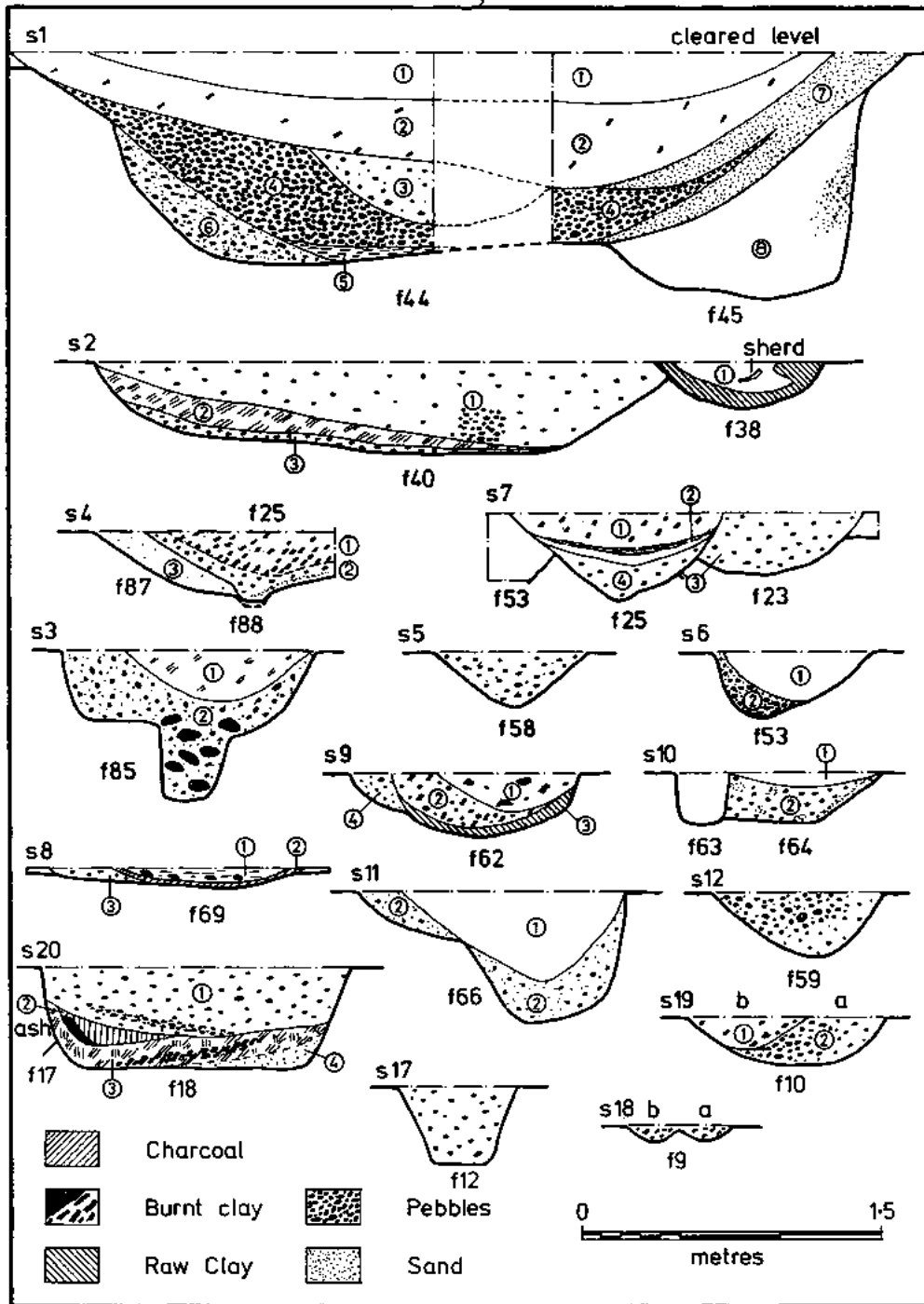


FIG. 8
Sections of pits and ditches: s1-12 and s17-20. For key see p. 109.

GUN HILL Sections 21,25-9

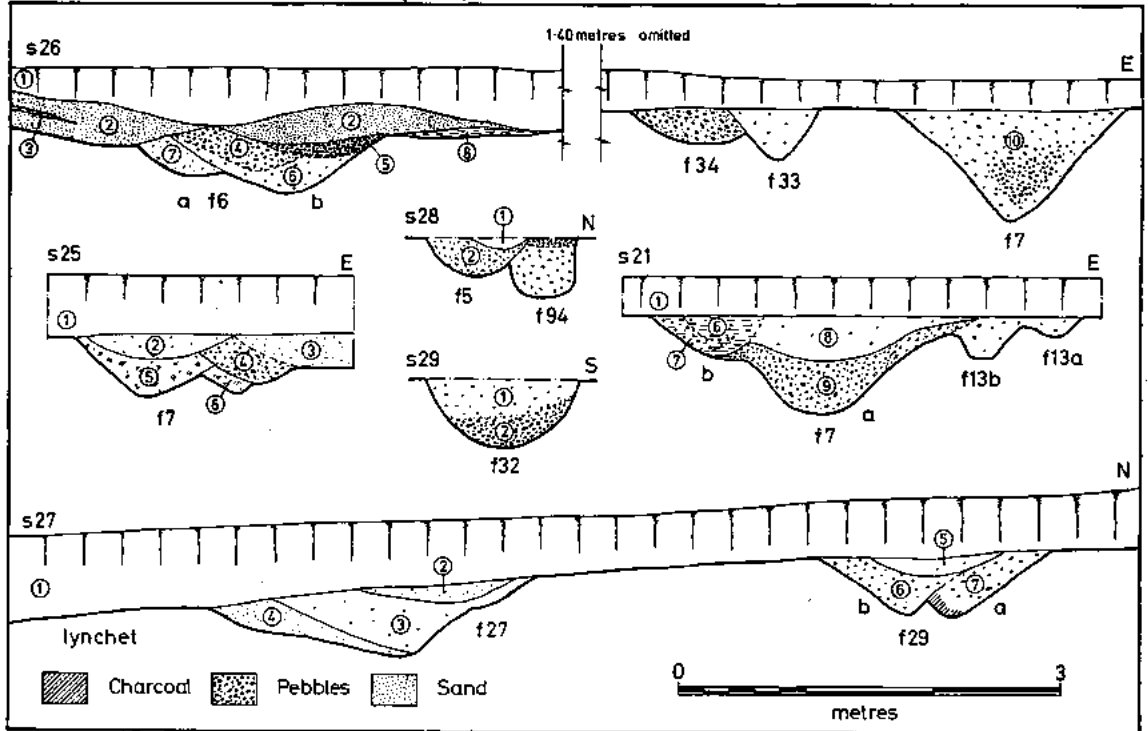


FIG. 9
Sections of ditches; s21 and s25-29. For key see p. 110.

PERIOD 6—*Early Anglo-Saxon*

The only excavated feature attributable to this period is the sunken hut, or *Grubenhäuser*, examined by Mr. Bingley. This lay to the north-east of the main area of excavation (Feature 95 on FIG. 1), and appeared as a distinct sub-rectangular cropmark on the air photographs. There is no reason to suggest the presence of any other *Grubenhäuser* in OS field 5285. One sherd of Anglo-Saxon pottery was found in the uppermost filling of ditch 7, showing that it survived as a boundary through the Roman period. The following summary account of the *Grubenhäuser* is based on Mr. Bingley's report,¹⁸ with his permission; his plan and sections are reproduced on FIG. 12.

The topsoil was stripped by hand, enabling the first hut plan to be obtained at subsoil level, some 15 cm. above the clean gravel surface. The feature was then quartered. A line of flint nodules was observed around the rim of the hut-pit at subsoil level; other nodules were later found in the filling of the north-west quadrant and it has been suggested that these were part of a low wall or kerb, forming the base of the hut at ground level. The long axis of the hut was orientated east-

¹⁸ Published in *Panorama*, xvi (1972-3). The field drawings are in Thurrock Museum.

GUN HILL Enclosure A

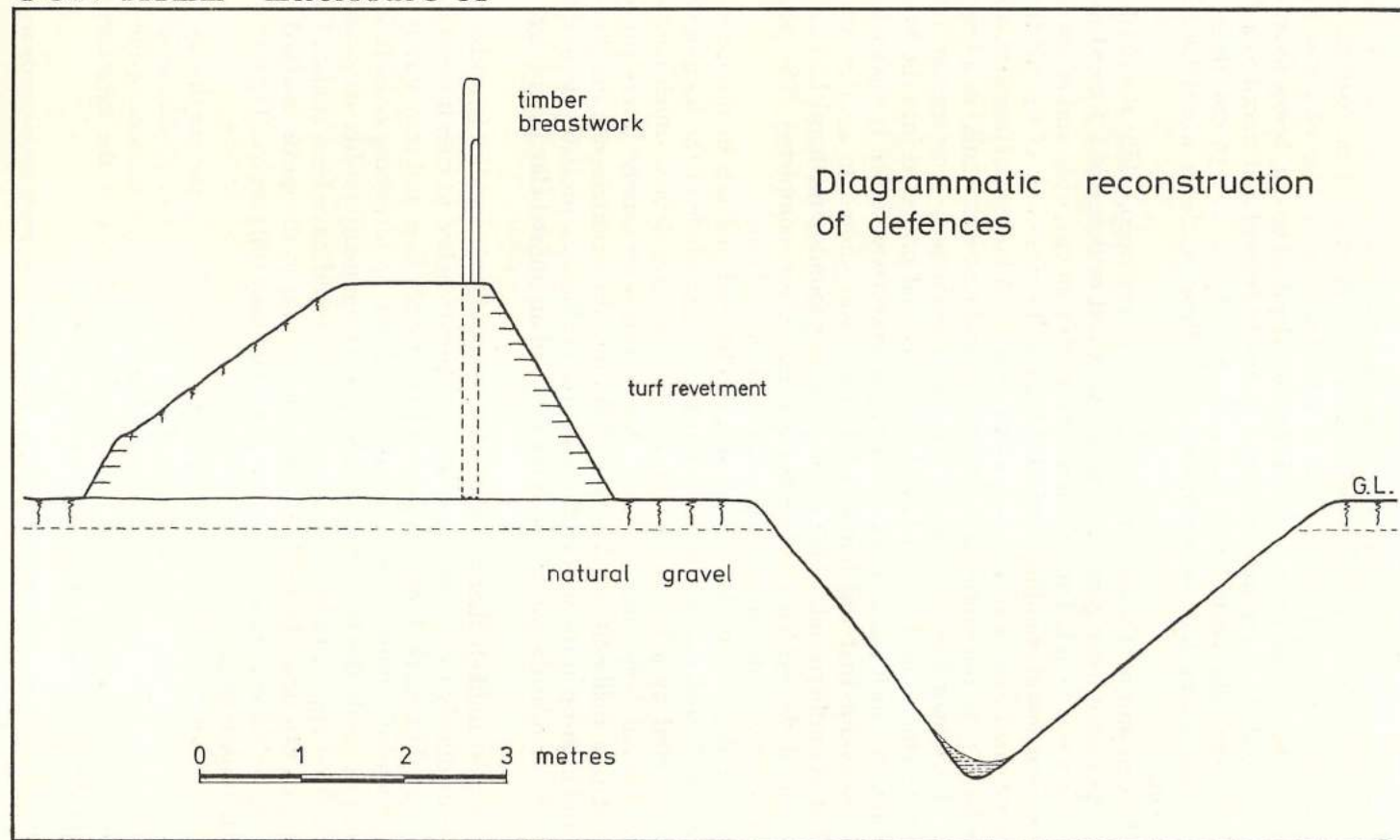


FIG. 11
A possible reconstruction of the defences of Enclosure A (see p. 99).

west and measured 3.9 m., whilst the north-south axis was 3.3 m., at subsoil level. The depth of the hut floor below ground level was 1.1 m. (0.7 m. below subsoil). Three internal postholes were recorded: one at the east end sloped towards the interior of the hut and was cut to a depth of 60 cm. below floor level; whilst the posthole at the west end was apparently vertical and traced to a depth of only 30 cm. The central post was also upright and was 55 cm. deep. The probable maximum diameter of timber which these postholes would have held was 20 cm.

The east and west walls of the hut pit were very steep, whilst the north and south slopes were more gentle and at the west end evidence of a framed timber construction was found. The silhouette of a timber 20 cm. wide and of uncertain thickness was found standing vertically against the west wall of the pit (in the north-west quadrant, near the main west posthole). A horizontal member, apparently jointed to it, ran southwards (into the central east-west baulk) at a height of 25 cm. above floor level and was seen to be of rectangular cross-section, 10 cm. deep by 13 cm. wide. It could have been wider and projected into the hut but only that part which was set back into the clean gravel was visible. It was suggested by the excavator that this horizontal member was jointed to another vertical timber at its southern end, which would have been found in the baulk had vandals not destroyed the evidence before the excavation was completed. The possible significance of this interesting feature will be discussed later.

On the floor of the hut-pit an area of charcoal and ash in the north-east quadrant indicated the position of a hearth and the whole of the bottom of the pit was covered by a 15–20 cm. spread of occupation debris, which contained pottery, animal bone and charcoal. Above this were sandy layers probably representing a deliberate back-filling of the pit; they contained some domestic refuse and high-up at the west end was an area of charcoal, probably derived from a hearth in or near the pit, whilst at the east end an unfired clay loomweight was found.

It is most unlikely that this *Grubenhäus* was isolated; another irregular crop-mark immediately to its north-west was machine-trenched in case it concealed a sunken hut. The mark, however, proved to be totally false and may simply have been the site of a manure heap, which would not be surprising considering its position just inside the field entrance. Several of the many pit-like cropmarks in OS field 6100 appear to be sub-rectangular and could have been sunken huts, a point which can never be resolved. Other marks just to the north (marked H on FIG. 1) are on the edge of a brick-earth patch and may still survive. These strongly resemble sunken huts.

Aerial photographs¹⁹ of OS field 00305, which lies in the north-east angle between Rectory Lane and Turnpike Lane show a rash of pit-like cropmarks which, if they are *Grubenhäuser*, must surely constitute the nucleus of the early Anglo-Saxon settlement (marked J on FIG. 1). In which case the excavated hut would be, as Bingley suggests, a south-western outlier.

¹⁹ Cambridge University Nos. AFK, 21, 22. Only a few of the more prominent cropmarks are shown on fig. 1.

GUN HILL Grubenhaus f95

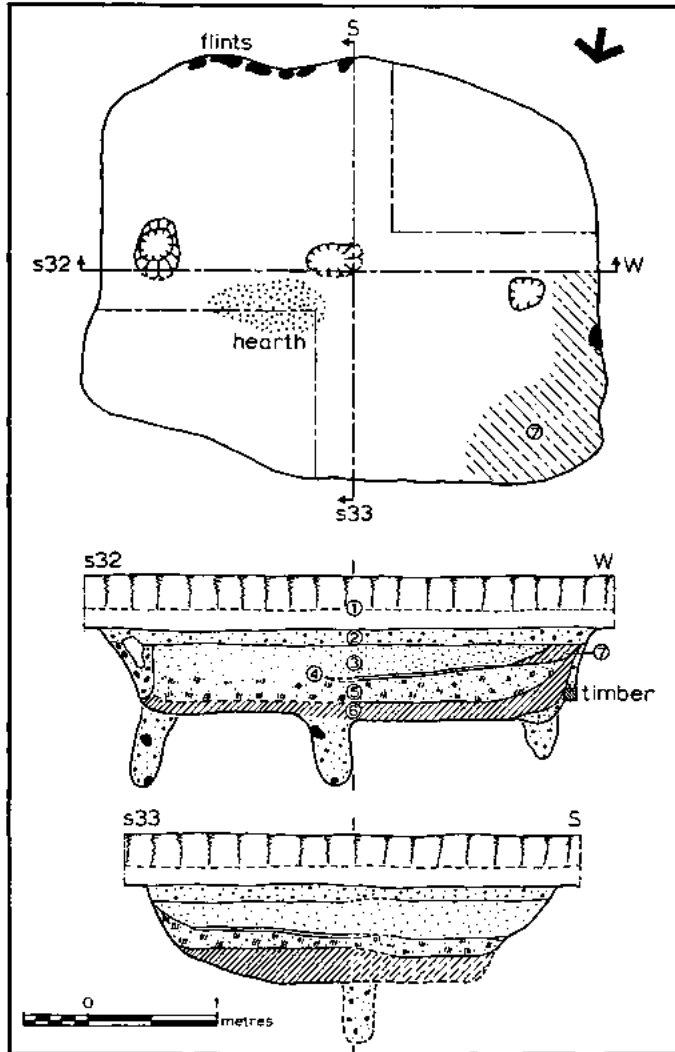


FIG. 12

Plan and sections of the *Grubenhaus*, F95. For key to sections see p. 112.

PERIOD 7—*Medieval and later*

In the excavated area the only medieval feature encountered was ditch 27, a replacement of the Iron Age and Roman field ditch delimiting the southern edge of the Gun Hill plateau (FIG. 2 and FIG. 9, Section 27). It had been recut several times and lay 2 m. to the north of the present hedgerow boundary, to the south of which is a 1 m. negative lynchet of unknown date.

Turnpike Lane, Rectory Lane, and its westward continuation, the footpath

to Broom Hill, are certainly of medieval or earlier origin and formerly linked West Tilbury village with Biggin hamlet (the footpath is known as the Biggin track). It may be no coincidence that the possible *Grubenhäuser* noted above lie alongside this track, apparently to the north and south of it, and that Biggin was formerly known as *Begging*.²⁰

West Tilbury village seems to have extended, until fairly recent times, along Rectory Lane to its junction with Turnpike Lane. In 1584, the 'tenement of Jones' occupied the north-east corner of the junction;²¹ this had gone by 1848, when the tithe map²² showed the opposite corner occupied by the Rectory (demolished earlier this century) with Cranes Farm to the south, and Glebe Farm in the enclosure M plotted from the aerial photograph.²³ These two latter were both demolished between 1862 and 1897, Cranes House apparently replacing the former.²⁴

The small scale quarrying undertaken in the south-east corner of field 5285, and on the site of the former Rectory belongs to the earlier part of the present century. Gravel extraction on a larger scale was in progress south of Blue House by 1897.²⁵

UNDATED FEATURES

Apart from the various unexcavated features for which a period has already been suggested on the grounds of horizontal stratigraphy, there are several cropmarks which are undatable but are nevertheless worthy of mention (see FIG. 1). Part of a small enclosure lies just to the north of the Biggin Track, between A and C; very faint cropmarks of other ditches in this area and to the north-east have been observed on the aerial photographs—these are too elusive to plot and undoubtedly belong to one of the earlier prehistoric periods of activity on the site.

Until some time after 1897,²⁶ a long straight boundary, K, separated a narrow field alongside Turnpike Lane, called Long Doole in 1584,²⁷ from the Great Common to the east. This shows clearly on the aerial photograph, PLATE III, together with sections of another ditch parallel to it, some 10 m. to the west. The features have the appearance of a road enclosure; its early disuse is attested by the fact that a map of 1584 shows the course of Turnpike Lane, Rectory Lane, and the boundary K virtually as they existed in 1897. A Roman origin for the road therefore seems likely. The name 'Turnpike Lane', superficially suggesting a relatively recent origin could merely suggest that the lane was once obstructed by a centrally pivoted gate.²⁸

²⁰ Shown as such on Chapman and André's map of Essex 1777.

²¹ Noted in a survey of the manor of West Tilbury by Walker, 1584, in the Essex Record Office (D/Du 23/198), but not illustrated on the accompanying plan since it did not form part of the manor.

²² E.R.O. D/CT 360B.

²³ Features L and M show most clearly on an aerial photograph taken by Jonathan Catton for Mucking Excavation Committee in 1970. MEC/JC/13.

²⁴ By comparison of the 1st Edn. 6" OS Map, Essex LXXXIV.9, surveyed 1862-65, with the 2nd Edn. 25" OS map, 1897. Both Cranes Farm and Glebe Farm are shown on the tithe map.

^{25, 26} 2nd Edn. OS map, 1897.

²⁷ This had become Long Doles by 1848—Tithe Award E.R.O. D/CT 360A.

²⁸ We are grateful to Dr. F. G. Emmison for this suggestion.

Enclosure E is polygonal with rounded corners, and there are signs of possible entrances to the east and south-east; the area enclosed is *c.* 0.2 ha. The probable Roman road and the driveway D pass over it but its relationship to either is unknown. On the evidence of its plan a prehistoric date seems most likely.

Finally, a pair of ditches, L, can be seen running from north-west to south-east across field 7321; they are not parallel in their eastern section and there is a definite change of angle in the centre of the field, obscured on the photograph by an area of brickearth. The north-eastern ditch can be traced as far as Turnpike Lane, its alignment seemingly continued to the west by the property boundary of Turnpike Cottages. This boundary and the southern pair of cottages are modern, however, the line of the former apparently being drawn between an indentation in the highway boundary and the south-west corner of the plot of the northern cottage, in existence by 1848.²⁹ If there is any survival of the early ditch line it can only be in the indentation.

THE FINDS

A considerable quantity of pottery and a few artifacts of other materials were found during the excavations. A great deal of pottery was also recovered, regrettably unstratified, in quarry rescue. Most of the illustrable material has been included in this report. At present there is very little Iron Age, Roman or Saxon pottery published from Essex (excluding Colchester) and virtually none has come from datable contexts. Large-scale excavations undertaken within the last decade have yielded vast quantities of pottery which will, when fully processed, provide the long-needed type series for the various periods. Hence, the temptation to quote extensive, but dubiously relevant parallels for the Gun Hill pottery has been resisted. In general, only local material has been quoted. Most of the finds from Gun Hill can be paralleled at Mucking which will undoubtedly provide a detailed chronology for Thameside finds in due course.³⁰ The dating suggested in a subsequent section of this report can, in the present circumstances, only be tentative. At the end of the section on finds three of the most significant items from the site are discussed in more detail.

POTTERY

PERIODS 1-3

FIG. 13

1. Two sherds of the base angle of a large vessel in very coarse grey fabric containing a large quantity of crushed calcined flint as temper.³¹ Bronze Age. From ditch F58. Body sherds of similar fabric were found in adjacent features and in ditch F59.
2. Base sherd in red flint-gritted fabric. LBA-EPRIA. Residual in pit F41.
3. Rim-sherd of flat-topped jar with an applied cordon decorated with finger-nail impressions (apparently in groups). Reddish-brown flint-gritted, sandy fabric. It is more common to find the cordon decorated with finger-tip impressions: cf. Mucking.³² LBA-EPRIA. Residual in ditch F1 (north).

²⁹ From the tithe map. The field boundaries as existing in 1848 in the area to the north-west of Turnpike Cottages are shown in broken line on fig. 1.

³⁰ We are very much indebted to Mrs. M. U. Jones for the opportunity to study and quote material from Mucking, prior to her full publication of the site.

³¹ Hereafter referred to as 'flint-gritted'.

³² M. U. Jones in R. L. S. Bruce-Mitford (ed.) *Recent Archaeological Excavations in Europe* (1973 forthcoming), fig. 48.1.

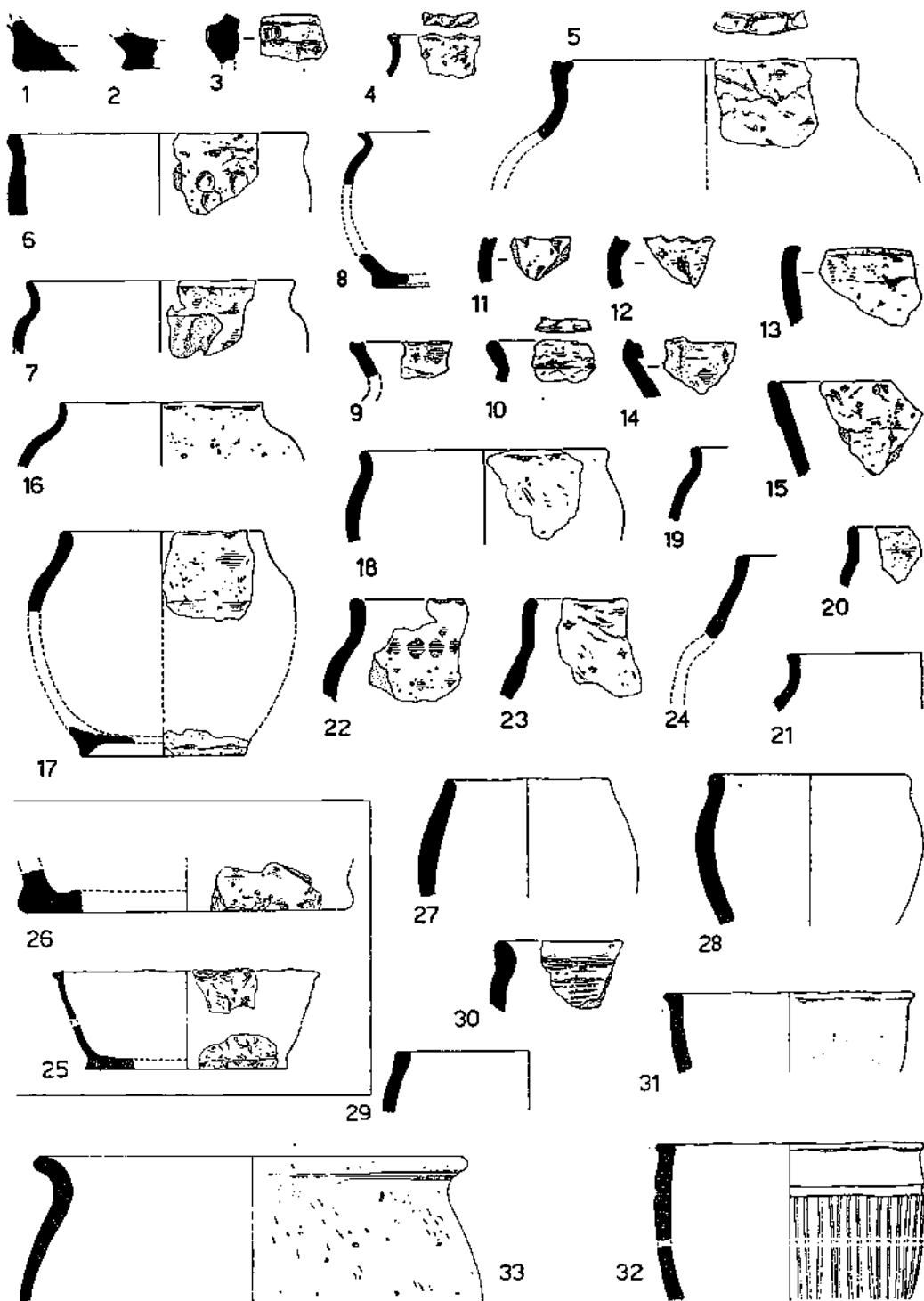


FIG. 13
 Iron Age pottery: Nos. 1-24, Periods 1-3; Nos. 25-26, Briquetage, Period 2; Nos. 27-33, Period 3. (Scale $\frac{1}{2}$)

4. Rim of shouldered jar in hard black fabric, showing lacunae (probably from dissolved shell-temper); surface fired brown; finger-tip impressions on top of the rim. The type is well-known locally in EPRIA contexts, e.g. Chadwell St. Mary,³³ where the fabric is also non-flint-gritted, Billericay³⁴ and Langdon Hills;³⁵ could be MPRIA as at Little Waltham.³⁶ From ditch F25 (Area B).
5. Rim of situlate jar of crudely-made black fabric containing a small amount of flint-grit; surfaces reddish-brown; the top of the rim is irregular and shows very slight finger impressions, cf. Chadwell St. Mary (Manning, 1962, FIG. 4.7). From ditch F25 (Area B).
6. Rim of coarse, irregularly-made bowl in black fabric, sand and flint-gritted; surfaces red to brown; decorated with at least two rows of finger-impressed dimples on the shoulder. cf. Linford.³⁷ From pit F41.
7. Flared rim of a globular bowl in soft red fabric containing a small amount of flint-grit. The exterior was apparently burnished, but is now flaked, perhaps as a result of misfiring; there are occasional vegetable marks on the surface. For profile cf. Danbury (*Antiq. J.*, xiv (1934), 186, FIG. 1.3). From pit F41.
8. Several sherds of a globular bowl with flared rim and slight footring. The vessel is misfired and distorted and the unusually thin rim seems to have been caused by part flaking away during firing; the surface is also partly flaked. The fabric is pinkish-red with greenish-grey surfaces; diameter uncertain. From pit F41.
9. Everted rim of angular-shouldered situla in fine grey fabric, slightly sandy; surfaces medium brown. cf. Linford (Barton, 1962, FIG. 1.1., 1.3). From pit F41.
10. Everted rim, crudely made, in reddish-brown fabric with a few vegetable lacunae. Traces of finger-tip impressions on the top of the rim. From ditch F25 (Area B).
11. Slightly inturned rim of a very crude bowl of uncertain diameter, in grey fabric with reddish-brown surfaces; possibly there was an attempt to pie-crust the rim. Closely paralleled in what is probably a conical bowl from Chadwell St. Mary (Manning, 1962, FIG. 4.4). From pit F41.
12. Rim similar to No. 11, but with a clearly wavy lip. There are some vegetable lacunae in the fabric, not as many as in salting briquetage, but the poor quality of manufacture is comparable. From pit F41.
13. Rim of a very large and irregular bowl or pan in reddish-brown fabric containing a little flint-grit. From ditch F25 (Area B).
14. Inturned rim of a crude vessel similar to No. 12. The fabric is black, with a medium brown internal surface. From pit F41.
15. Externally thickened rim of a bowl or pan of very large diameter, similar to No. 13. From ditch F25 (Area B).
16. Rim of globular bowl of black fabric tempered with finely-crushed flint-grit; the exterior is fired brown, the interior black, and both surfaces are burnished. Some flaking has taken place on the interior. From ditch F25 (Area B).
17. Globular bowl with footstand, of grey fabric containing finely-crushed flint-grit; surfaces reddish-brown. Also, not illustrated, fragments of a similar footstand with an external red burnished surface, but with the grits showing through. From ditch F25 (Area B).
18. Externally burnished rim of black fabric containing flint-grit; this is prominent on the interior but not the exterior. From ditch F25 (Area B).
19. Rim of grey fabric with lacunae (dissolved shell); reddish-brown exterior and dark-grey interior. From ditch F25 (Area B).

³³ Manning, 1962, fig. 4.2, 4.3.

³⁴ D. Kimball, 'Norsey Wood Camp', *J. Brit. Archaeol. Assoc.*, (ser. 3), iii (1938), pl. XVIII.4, 5.

³⁵ Unpublished. The site is probably that of a hillfort, *Panorama*, xv (1971), 57.

³⁶ Excavations 1970-71—Interim report in *Current Archaeology*, 36.

³⁷ K. J. Barton, 'Settlements of the Iron Age and Pagan Saxon Periods at Linford', *Trans. Essex Archaeol. Soc.* (ser. 3), i (1962), fig. 2.1.

20. Rim of red fabric with some fine flint-grit. From pit F41.
21. Flat-topped rim in black fabric with brown surfaces showing some vegetable lacunae; also tempered with a small amount of flint-grit. From ditch F25 (Area B).
22. Jar rim in coarse dark-grey paste, flint-gritted, with dark brown surfaces. The exterior is very irregular and has shallow finger impressions around the neck. From ditch F25 (Area B).
23. Rim of large jar, crudely made, in grey fabric with reddish-brown surfaces. cf. No. 22. From ditch F25 (Area B).
24. Crudely-made rim of large jar in hard grey fabric containing a little flint-grit; reddish-brown surfaces, very irregular (similar to Nos. 22 and 23). From ditch F25 (Area B).

Briquetage Vessels

25. Many sherds of small circular briquetage pans were found in the butt-end of ditch F25 (Area B). They were very friable and had been badly crushed by the quarry machinery so that it is impossible to effect joins or assess the total number of vessels present. Two representative sherds are shown. The fabric is fine, very porous due to numerous vegetable lacunae and, typically, fired to a variety of colours in section, but with a fairly uniform light reddish-brown exterior. The interior faces of some sherds show the typical purplish 'tide lines', confirming the use of these vessels for brine evaporation. They are irregularly made, the bases often have a frilled appearance (probably unintentional) and the rims tend to have flattish tops—the whole appearance is suggestive of knife-trimming. The walls are exceptionally thin (*c.* 2.5 to 4.5 mm.) so that the pans must have been quite shallow and the height of 6 cm., as illustrated, is the likely maximum for such frail vessels. Some confirmation of this can be obtained from the fact that hardly any pure body sherds were found—nearly all exhibited rims or base angles. The rim diameter averages 16 cm. and the volume would be *c.* 650 cc.
26. Base angle of a circular briquetage pan of soft red fabric with numerous vegetable lacunae; diameter *c.* 20 cm. The surfaces have a yellowish-green coating, as often found on salt-evaporating equipment. The walls of this vessel are much thicker than No. 25 (*c.* 12 mm.). From ditch F23 (Area B).

Coarseware jars and bowls

27. Small bowl of coarse grey granular fabric, tempered with a little finely-crushed shell; brown exterior surface. Residual in ditch F1 (west), above charcoal layer.
28. Externally thickened rim of small bowl of coarse brown fabric with large lacunae resulting from dissolved shell-tempering.³⁸ The vessel is thick-walled, crudely made and shows traces of vertical finger-wiping on the exterior, which is also soot-encrusted. Associated with No. 47; dug out of a feature exposed in the south quarry face by schoolboys in 1970; this was probably ditch F29. (Thurrock Museum No. 1227).
29. Simple flat-topped rim in coarse, hard black fabric containing some flint-grit; brown surfaces. From ditch F7.
30. Rim of a large jar of uncertain diameter; black fabric tempered with grog and a small amount of calcined flint; reddish-brown surfaces with crude, light rilling on the exterior, cf. Billericay (Kimball, 1938, pl. XVIII, 1). From ditch F8.
31. Irregularly-made, flat-topped rim of cooking pot of hard black fabric tempered with coarse sand; medium brown interior and soot-encrusted exterior. From pit F44.

³⁸ Much of the pottery of Periods 3, 4 and 5A was heavily shell-tempered, when made, but due to soil acidity this has generally completely dissolved, leaving the sherd full of lacunae—hereafter described as 'vesiculated'.

32. Rim and body sherds of a bowl in black sandy fabric, somewhat irregularly made. The exterior is fired light-brown to black and decorated with vertical combing; the rim is flat-topped, similar to No. 31. From ditch F7.
33. Flared rim of large jar in black fabric, tempered with a small amount of flint-grit; surfaces reddish-brown to black. From ditches F7 and F10.

FIG. 14

Fine black burnished wares.

34. Footring bowl with everted rim, half complete. The fabric is hard, black and contains fine sand. The exterior is finely burnished to give a good shiny surface. Originally, the interior was also totally burnished but abrasion has removed the shine, leaving only the impressions of the burnishing tool. A large cross was scored on the base, before firing. The type is well-known south of the Thames, which appeared as its northern limit on Ward Perkins' distribution map.³⁹ Mucking,⁴⁰ Chadwell St. Mary (Manning, 1962, FIG. 4, nos. 13-17) and other local sites have now yielded numerous examples; the form appears further north, at Little Waltham. From pit F38.
35. Rim of hard, dark-grey fabric with black burnished exterior. Same class of ware as No. 34, but from a vessel of smaller diameter and hence possibly a jar. From pit F44.
36. Similar rim, but thicker. From pit F66.
37. Bowl rim similar to No. 34 but of slacker profile. cf. Chadwell St. Mary (Manning, 1962, FIG. 4.14). From slot F12.
38. Bowl rim similar to No. 34, with which it was associated.
39. Everted bowl rim in fine brown fabric tempered with a small amount of finely-crushed flint-grit (? originally burnished). From ditch F1 (South), residual in charcoal layer.
40. Base of jar in fine hard grey fabric; exterior fired black and well burnished. Similar to No. 36, to which it could even belong. cf. Chadwell St. Mary (Manning, 1962, FIG. 4.16). From ditch F58.
41. Footring base in a very hard-fired, slightly sandy fabric, now red, probably as a result of post-firing burning; burnished externally, including under the base. It belongs to the same class of vessel as No. 34. From ditch F7.
42. Basal fragment of a footring bowl. Similar to No. 34, but now burnt reddish-brown. From pit F44.

Pottery with curvilinear decoration

43. A single sherd from the shoulder of an omphalos-bowl was recovered in quarry rescue work, unstratified from the south ditch of F1. It is of hard, dense black fabric tempered with a small amount of fine flint-grit. The sherd has been badly burnt so that the interior face has mostly flaked and the exterior is now a patchy brown colour. It was originally well burnished and presumably black. The decoration on the shoulder comprises incised intersecting semi-circles with the outside edge of each reinforced by two rows of triangular stab-marks; these continue in horizontal rows at the top and bottom of the zone of decoration.

This sherd belongs to a more elaborately decorated class of vessel than has hitherto been published from the South East.⁴¹ (For further discussion see p. 93). The following three sherds, Nos. 44-46, are published here for comparison; they all come from Thorney Bay, Canvey Island.

³⁹ J. B. Ward Perkins, 'Excavation on the Iron Age Hillfort of Oldbury near Ightham, Kent'. *Archaeologia*, xc (1944), fig. 6; see also figs. 5 and 12 for examples of footring bowls.

⁴⁰ Jones, 1968, 214; and Jones, 1973, forthcoming, fig. 48.9, 48.12.

⁴¹ J. B. Ward Perkins, 'An Early Iron Age Site at Crayford, Kent'. *Proc. Prehist. Soc.*, iv (1938), figs. 9-11; but see Jones 1973 forthcoming fig. 48.10, 11.

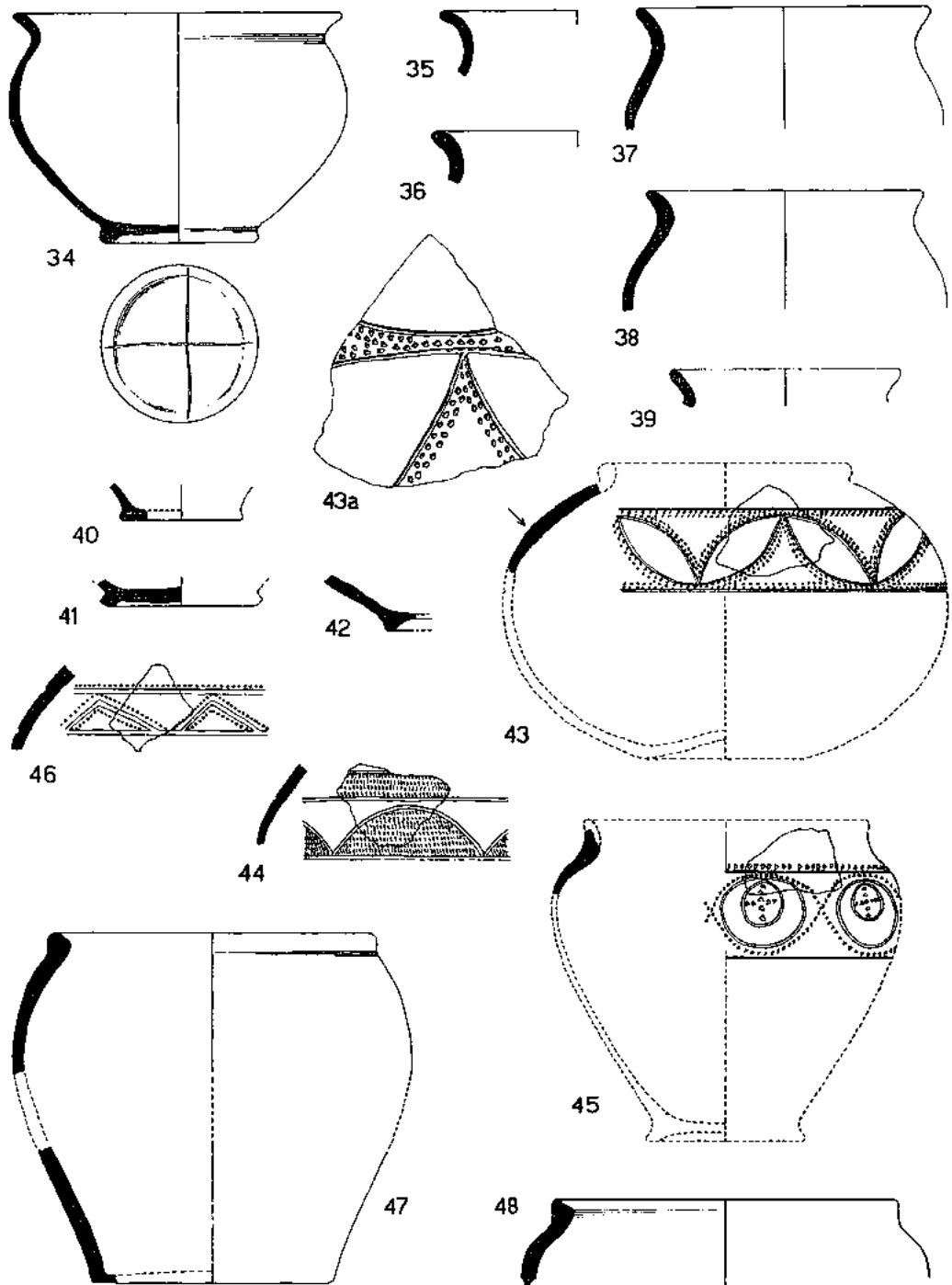


FIG. 14
Iron Age pottery; Nos. 34-48, Period 3. (Scale $\frac{1}{2}$, except No. 43a, $\frac{1}{3}$).

44. Sherd of an omphalos bowl in a fine sand-tempered fabric, abraded and now burnt brown. Decorated with a band containing four rows of fine comb-stabbing, beneath which is a series of incised semicircles, each filled with comb-stabbing. The intervening triangles were left blank but were presumably burnished. (Southend Museum, Rodwell Coll., TB/341).
45. Sherd from the shoulder of a wide-mouthed bowl, probably with a pedestal foot; hard black fabric, tempered with very fine flint-grit; the exterior is burnished. The decoration, which is more complicated than in the preceding examples, is composed of deep triangular stab-marks and incised lines. The scheme is based upon a pair of intersecting running scrolls; each scroll contains an incised circle, inside which is a smaller, eccentrically placed circle containing a St. Andrew's cross. The circles were obviously drawn freehand and are rather shaky. (Southend Museum, Rodwell Coll., TB/1071).
46. Sherd from the shoulder of a bowl, perhaps of omphalos type, in hard, dark-grey, flint-tempered fabric. Here, the true 'curvilinear' element is absent from the decoration, which comprises a horizontal band of comb-stabbed triangles and broad shallowly-tooled grooves. (Southend Museum, Rodwell Coll., TB/927).

Coarseware jars

47. Many sherds of a large jar with internally thickened rim in a very coarse shell-tempered (vesiculated) fabric. Period 3-4. Associated with No. 28 (Thurrock Museum No. 1227).
48. Cooking pot rim, internally thickened and flattened. Dark-grey fabric containing some grog and much shell (vesiculated). This is probably an intermediate form between the internally thickened rim (No. 47) and the true ledged rim (No. 98 etc.). Period 3-4. From pit F40.

PERIOD 4

FIG. 15

'Belgic' wares

49. Belgic bowl rim of hard granular grey fabric, tempered with sand and a little crushed shell. The surfaces are black and the exterior is well burnished, except for a reserved zone on the shoulder which is decorated with a series of burnished lines in groups of three or four, in chevron pattern. cf. *Cam. f. 218Ca*⁴² and Grubs Barn (*Herts. Archaeol.*, ii (1970), 33, FIG. 2.5.) Unstratified from ditch F1 (south).
50. Belgic bowl in grey grog-tempered fabric with black burnished exterior and also burnished well down inside the neck. The lip is thickened and there is a well-defined cordon on the shoulder. cf. Grubs Barn (*loc. cit.*, 33, FIG. 2.9). Unstratified from ditch F1 (south-east corner). (Thurrock Museum No. 1315).
51. Belgic bowl with two slack cordons on the neck; fabric similar to No. 50. cf. *Cam. f. 229B* and *Verulamium* 1936, FIG. 9.3.⁴³ The jar version of this form has been found at Billericay, *Cam. f. 229A*. From ditch F1 (east), north butt-end (FIG. 10, Section 13, layer 34).
52. Belgic bowl rim of uncommon form, with a small everted lip and a conical neck surmounted by a cordon. The fabric is slightly sandy and was undoubtedly originally black burnished, but is now burnt red. Unstratified from ditch F1 (north).
53. Rim and shoulder of jar in brown shelly fabric (vesiculated), formerly coated with a bright orange-red slip, of which traces remain. The neck is grooved and the shoulder decorated with a row of deep slashes. The form clearly imitates a Belgic jar. Unstratified from ditch F1 (north) and also from the charcoal layer in the same ditch.

⁴² C. F. C. Hawkes & M. R. Hull, *Camulodunum* (1947) and M. R. Hull, *Roman Colchester* (1958).

⁴³ R. E. M. & T. V. Wheeler, *Verulamium, A Belgic and Two Roman Cities* (1936).

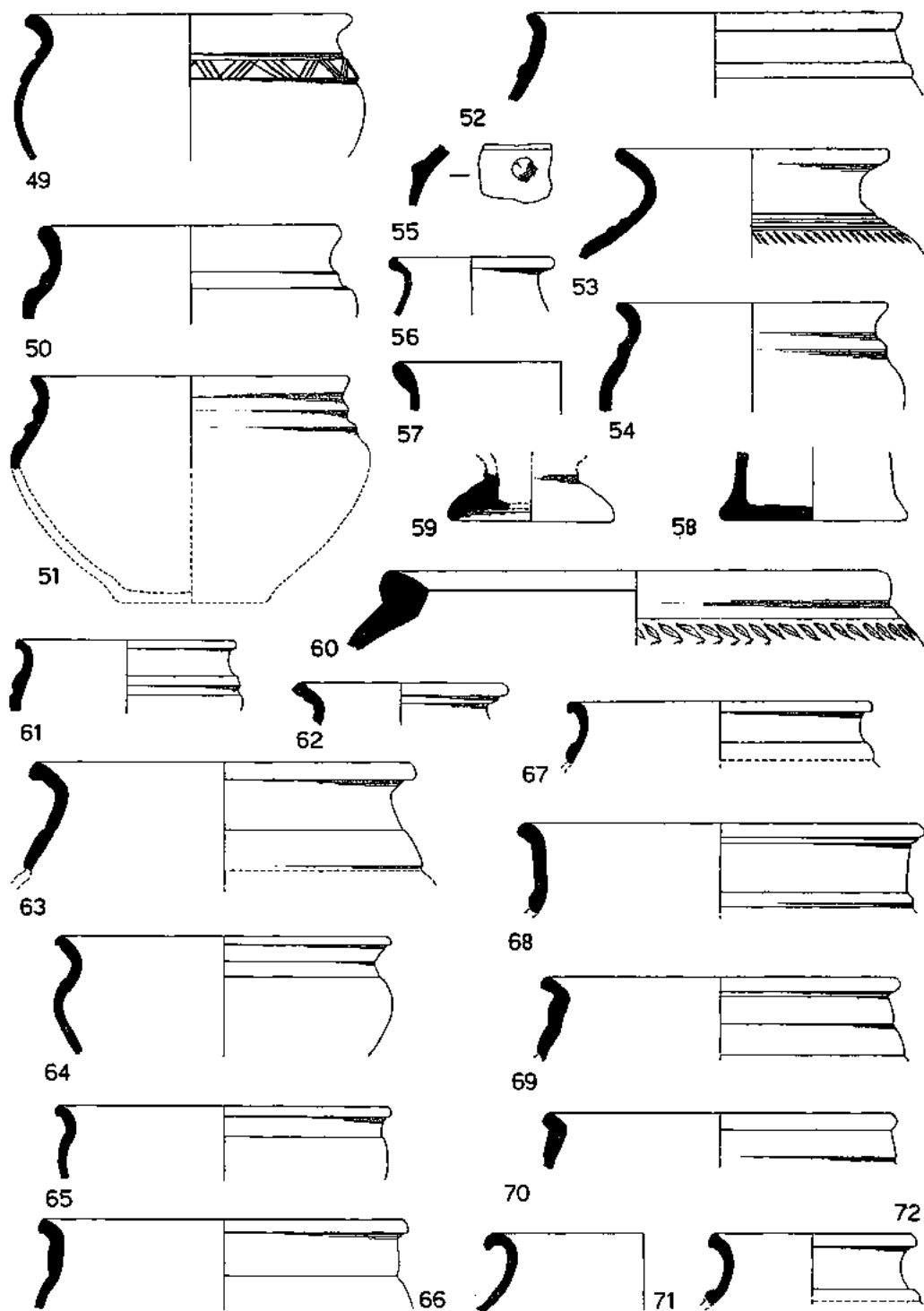


FIG. 15
 Iron Age and Romano-British pottery: Nos. 49-60, Period 4; Nos. 61-72, Period 5. (Scale $\frac{1}{4}$).

54. Simple cordoned Belgic bowl or jar rim in black fabric, formerly burnished, but subsequently damaged by burning. cf. No. 51. From ditch F7.
55. Abraded shoulder sherd of jar in medium brown fabric containing some sand and shell tempering. The shoulder carries an applied boss, an uncommon feature in LPRIA pottery. Local examples include Mucking, West Tilbury⁴⁴ and East Tilbury.⁴⁵ From ditch F1 (north), charcoal layer, near Kiln I (FIG. 7, Section 30, layer 5).
56. Belgic butt beaker rim in fine soft brown fabric containing fine grog-temper. It is a reasonable copy of terra rubra and a trace of the red coating survives on the exterior. cf. *Cam. f. 119*, which covers a wide range of forms (see especially *Cam. f. 119C*). Same location as No. 55.
57. Oval section late Belgic bowl rim in grey grog-tempered fabric with black surfaces and burnished exterior. From ditch F1 (east), south butt-end, primary fill (FIG. 7, Section 23, Layer 23).
58. Belgic pedestal in brown grog-tempered fabric with brown-grey surfaces. Uncommon form. Cf. *Verulamium*, 1936, FIG. 16.47. From ditch F1 (south), charcoal layer.
59. Pedestal in Fabric C (see below, p. 79). The exterior was formerly slip-coated and shows traces of a bright red finish. The form is a common one: cf. *Cam. f. 202* and *Verulamium*, 1936, FIG. 16.49a. Unstratified from ditch F1 (east), south butt-end.
60. Rim of a large storage jar in hard grey fabric, grog tempered. The exterior is black with traces of 'pitch' coating; the interior is reddish-brown. The shoulder is decorated with deep thumb-nail incisions, done with the right-hand thumb, working clockwise around the pot. 'Pitch' coating has been noted on other large storage jars in the area, e.g. Canvey Island,⁴⁶ and was presumably a deliberate measure to make these large, coarse vessels less permeable, although it has been generally assumed that they were for dry storage only. From ditch F1 (north), below charcoal layer (FIG. 7, Section 22, layer 8).

PERIOD 5

Pottery associated with Kiln I (feature 35)

The locally-made pottery found in and around Kiln I could be divided into four fabrics on visual inspection, the tempering materials providing the criteria for classification.

- FABRIC A Reddish-brown paste, heavily shell-tempered, now vesiculated.
- FABRIC B Orange-brown fabric, well tempered with sand.
- FABRIC C Fairly fine brown fabric tempered with fine grog and a very small quantity of crushed shell, now vesiculated.
- FABRIC D Brown fabric tempered with sand and a small quantity of crushed shell, now vesiculated.

Bowls and jars

61. Small cordoned bowl in Fabric B. From Kiln I chamber.
62. Rim of a small bowl or, more probably, a necked jar, in Fabric A. From Kiln I chamber.
63. Bowl rim with pendant lip and a broad, undecorated cordon on the shoulder. There is slight evidence to suggest the exterior was fired black in imitation of a Belgic bowl. Fabric A. From Kiln I chamber.
64. Wide-mouthed bowl in Fabric B, again showing a trace of a black external surface, mostly excoriated. Unstratified from Kiln I.

⁴⁴ London Museum Cat. No. 3, *London in Roman Times* (1930), fig. 56.7.

⁴⁵ T. May, *Catalogue of the Roman Pottery in the Colchester and Essex Museum* (1930), pl. VII.

⁴⁶ W. J. Rodwell, 'The Excavation of a 'Red Hill' on Canvey Island', *Trans. Essex Archaeol. Soc.* (ser. 3), ii, (1966), fig. 7.1.

65. Wide-mouthed bowl in Fabric B. From Kiln I chamber.
66. Bowl rim with broad cordon (cf. No. 63) and a trace of burnishing on the neck. Fabric A. From Kiln I chamber.
67. Cordoned bowl rim in Fabric C. From Kiln I stokepit.
68. Cordoned bowl with tall neck, Fabric A. From ditch F₁ (north), charcoal layer.
69. Bowl with double, broad cordon in Fabric B. From ditch F₁ (north), charcoal layer at north-east corner.
70. Bowl, similar to No. 69, in Fabric A. From the stokepit of Kiln I.
71. Bowl with undercut lip in a coarse Fabric C. From ditch F₁, charcoal layer at north-east corner.
72. Cordoned jar rim in Fabric C. cf. No. 62 Found with No. 71.
73. Conical necked bowl in Fabric B; 22 cm. diameter. From ditch F₁ (north) charcoal layer.

FIG. 16

74. Cooking pot with internally thickened rim and soot encrusted exterior. Fabric A, but black all through. This is a very common type of cooking pot on LPRIA sites in southern Essex: e.g. Corbets Tey (*Essex Natur.*, xxxi (1963), 126, FIG. 4). From ditch F₁ (south) charcoal layer.
75. Jar with clubbed rim with external groove, in Fabric A, black all through. From ditch F₁ (west) charcoal layer.
76. Jar with a somewhat flattened rim and small oval cordon below. The shoulder is decorated with pairs of incised lines in zig-zag formation. Fabric A. Cf. West Tilbury (*London in Roman Times*, *op. cit.*, FIG. 56.6). From ditch F₁ (north-east corner), charcoal layer around Kiln I.
77. Very large clubbed-rim jar with external groove and slight ledge on top. Fabric A. From Kiln I chamber.
78. Large clubbed rim jar with ledge on top. Fabric A. From Kiln I chamber.
79. Triangular section rim of pottery bucket in Fabric A. See No. 80. From Kiln I chamber.
80. Similar rim, of uncertain diameter, but probably larger than No. 79. The rim would probably have been surmounted by a pair of opposed, upstanding lugs, of which only a fragment of one survives on this sherd. The lugs were perforated for the attachment of a rope or similar handle. The reconstruction is based on similar lugs found at Mucking.⁴⁷ Lugged buckets are known in the Late Bronze Age and EPRIA, e.g. at Ardleigh 'Ring III'⁴⁸ but are very uncommon in the first century A.D. A sherd of a LPRIA bucket from Heybridge has a hand-moulded lug on top of the rim and a band of applied bosses below it.⁴⁹ From ditch F₁ (north), charcoal layer outside Kiln I.

Large storage jars

81. Everted rim of a large storage jar, diameter uncertain, in Fabric A. From ditch F₁ (north), charcoal layer.
82. Similar (diameter c. 38 cm.). From Kiln I stokepit.
83. Shoulder of a similar vessel decorated in a chevron pattern by deep slashing. Fabric A. From ditch F₁, charcoal layer at north-east corner.
84. Similar to No. 83, but decorated with a band of incised crosses. Fabric A. From ditch F₁ (north), charcoal layer. Storage jars in shell-tempered fabrics, decorated

⁴⁷ By courtesy of Mrs. M. U. Jones.

⁴⁸ Where one forms part of a late Bronze Age burial group. *Colchester Archaeol. Group Bull.* xiii (1970), 25, fig. 16C.

⁴⁹ May, 1930, *op. cit.*, pl. LIIIA. Romano-British examples are also rare, but not unknown: e.g. Runciton Holme, *Proc. Prehist. Soc. E. Anglia* vii (1932), 249, fig. 36.

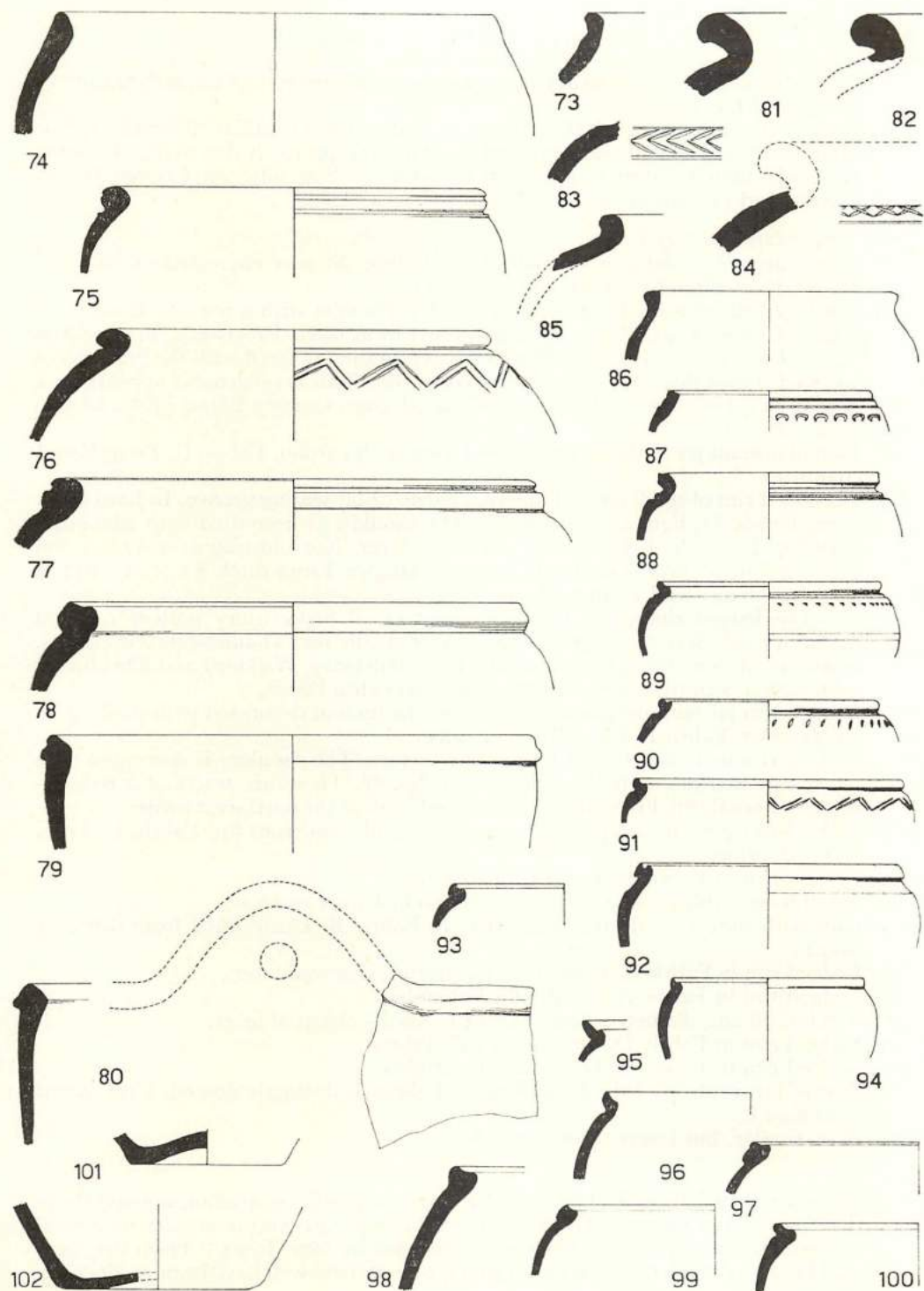


FIG. 16
 Iron Age and Romano-British pottery: Nos. 73-102, Period 5. (Scale $\frac{1}{2}$).

in the style of Nos. 83 and 84 are very common on Thames-side sites, such as Canvey Island and the Tilburys.

85. Storage jar with simple clubbed rim in vesiculated ware similar to Fabric A. The exterior was slip-coated and is now cream, but this is probably due to later burning. It closely matches storage jars from first-century 'red hills' on Canvey Island. Unstratified (Thurrock Museum No. 1477).

Small jars, mainly with ledged rims

86. Externally thickened rim of small jar in Fabric A; soot encrusted exterior. cf. No. 48. From ditch F1 (south), charcoal layer.
87. Cordoned rim of a small jar decorated on the shoulder with a row of semi-circular stamped impressions. Fabric B. Unstratified from ditch F1 (west). cf. *London in Roman Times, op. cit.*, FIG. 56.7. Not illustrated: a similar sherd with the impressions inverted. From ditch F1 (north), charcoal layer. This arrangement appears on a similar rim, but which is ledged to take a lid, from Canvey Island (J. C. Martin Coll., LB/2987).
88. Rim of a small jar with top groove and a squarish cordon. Fabric C. From Kiln I chamber.
89. Cordoned rim of small jar with internal ledge, or lid-seating groove. In hard black ware, Fabric D; light brown exterior. The shoulder is decorated with triangular stabbing. From ditch F1 (north), charcoal layer. Not illustrated: a similar rim decorated with vertical slashes instead of triangles. From ditch F1 (east), trench across north butt-end, charcoal layer.

The ledged rim jar is the commonest of all first-century pottery types in southern Essex: it occurs in profusion on the 'red hills' and Thames-side settlements, as well as at more inland sites like Mucking, Billericay, Wickford and Chelmsford (although it becomes noticeably rarer towards central Essex).

90. Ledged rim jar with deep recess just below the lip and decorated with slashing on the shoulder. Fabric D. From Kiln I chamber.
91. Ledged rim in Fabric C, but with a fine texture. The shoulder is decorated with pairs of incised slashes in zig-zag form, cf. No. 76. There are traces of a reddish-brown external slip. From ditch F1, charcoal layer at the north-east corner.
92. Ledged-rim jar with deep top groove and slightly undercut lip. Fabric D. From Kiln I chamber.
93. Ledged rim in Fabric C. From Kiln I chamber.
94. Small ledged-rim jar in a fine Fabric D. From Kiln I stokepit.
95. Rim with unusually deep-seated ledge, in Fabric B. Unstratified from ditch F1 (south).
96. Ledged rim in Fabric C. From ditch F1 (north), charcoal layer.
97. Ledged rim in Fabric A. From Kiln I chamber.
98. Similar, 28 cm. diameter. From ditch F1 (north) charcoal layer.
99. Ledged rim in Fabric D. From Kiln I chamber.
100. Ledged rim in Fabric A. From Kiln I chamber.
101. Base of jar, probably ledged-rim type, in Fabric A, distinctly domed. Unstratified from Kiln I.
102. Base, similar, but larger. From ditch F7.

FIG. 17

103. Ledged rim in Fabric A. The shoulder carries a pre-firing graffito, apparently in the form of the numeral III. Graffiti of this type are very common in central southern Essex and have recently been discussed by Mrs. Jones.⁵⁰ From the charcoal layer in ditch F1, near Kiln I. Graffiti pottery may well have been produced in

⁵⁰ M. U. Jones, 'Potters' Graffiti from Mucking, Essex', *Antiq. J.* lii (1972), 335 f. Canvey Island, which has produced two graffiti, should be added to the distribution map.

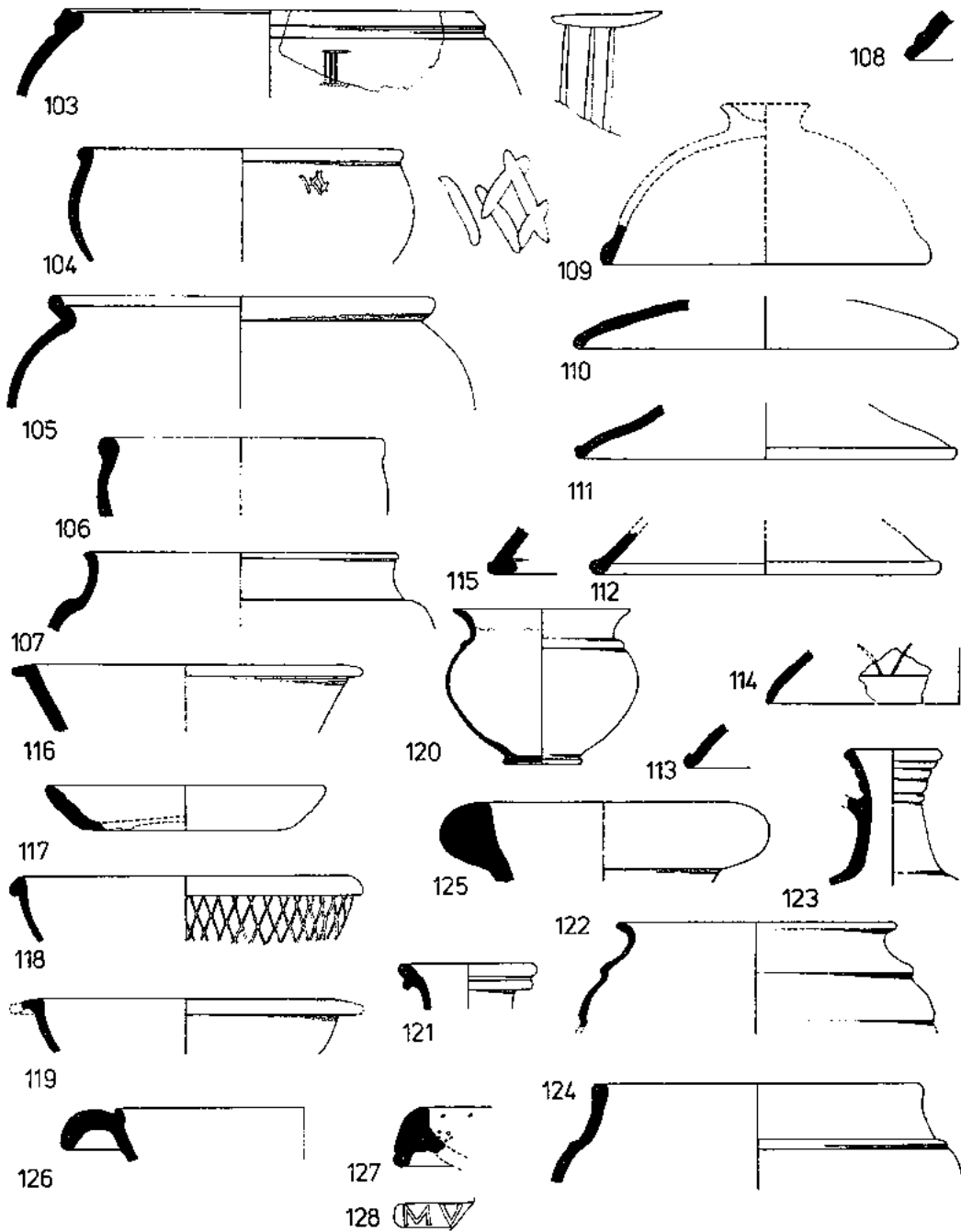


FIG. 17

Iron Age and Romano-British pottery: Nos. 103-128, Period 5. (Scale $\frac{1}{4}$, except graffiti on Nos. 103-104 and sigillata name-stamp No. 128, full size).

the Gun Hill kilns but it is impossible to be certain as the fabric of these vessels is always so similar.

104. Ledged rim in Fabric A with pre-firing graffito in the form of an adjacent stroke and diamond. This is an unusual arrangement, as the stroke normally bisects the diamond. From the charcoal layer in ditch F1 (north).
105. Ledged rim in Romano-British grey sandy fabric. 2nd-3rd century. cf. Mucking kiln products, Type F (p. 22). Unstratified from ditch F1 (south).
106. Clubbed rim in Fabric A, but black all through. Unstratified from ditch F1 (south).
107. Belgic bowl in grey grog-tempered fabric, burnished externally and inside the lip. This belongs to the basic form *Cam.* 221A. Unstratified from ditch F1 (south).

Lids

108. Rim of Belgic lid decorated with cordons, in grey grog-tempered fabric, lightly burnished externally. 21 cm. diameter. Unstratified from ditch F1 (south).
109. Rim of highly-domed Belgic lid in grey grog-tempered fabric. cf. *Cam.* f. 253. Unstratified from ditch F1 (south).
- 110, 111. Lids in Fabric D. From ditch F1 (north), charcoal layer.
112. Lid in Fabric A. From charcoal layer outside Kiln II (F36).
113. Lid in Fabric A, 22 cm. diameter. Found with Nos. 110 and 111.
114. Lid fragment in soft black fabric containing a little shell-temper (vesiculated). Decorated with tooled semi-circles and a horizontal line. Originally, both the interior and exterior were probably burnished. From Kiln I chamber, but almost certainly residual.
115. Lid fragment with flattish clubbed rim in Fabric D. Diameter uncertain. From ditch F1 (north), charcoal layer.

Platters and Dishes

116. Flat-topped dish or bowl in soft red fabric. First century, Native. Unstratified from ditch F1 (north).
117. Platter rim in very fine brown sandy ware. The surfaces were apparently slipped and poorly burnished. Now burnt to a brownish-grey. It is a very degenerate version of the Gallo-Belgic platter *Cam.* f. 13. From ditch F1 charcoal layer at north-east corner.
118. Pie dish with triangular beaded rim in grey sandy fabric, now burnt. The rim and interior were fully burnished and the exterior is decorated with a burnished lattice pattern. From a pit within ditch F7. A few sherds of the same or an identical dish, also burnt, were found in the charcoal layer in ditch F1, around Kiln I.

The form is *Cam.* 37, where it is said to be common c. A.D. 60-170, but it is interesting to note the absence of the latticed pie dish at Verulamium in levels prior to c. A.D. 130.⁵¹ On Thames-side sites the form is certainly common in the latter part of the first century, where it abounds on 'red hills' and may be a clue to the local beginnings of the BB2 industry.⁵²

119. Plain-flanged hemispherical bowl probably originally in fine grey ware, but now burnt red. cf. *Cam.* f. 246B and *Verulamium*, 1972, No. 334 (where it is dated c. A.D. 80-105). From ditch F1, charcoal layer at north-east corner.

Romano-British—miscellaneous

120. Small bowl, half complete, thin-walled and of very fine grey fabric. The exterior and the inside of the lip are well burnished (where slip 'runs' can be seen). The form is common in the later first century. Unstratified from ditch F1 (south).

⁵¹ Except for a solitary example: S. S. Frere, *Verulamium Excavations*, i (1972), fig. 114, 531.

⁵² For discussion of this point see R. A. H. Farrar, 'The Techniques and Sources of Romano-British Black-burnished Ware' in A. Detsicas (ed.), *Current Research in Romano-British Coarse Pottery* (1973), 100.

121. Flagon neck, badly burnt and abraded and now buff in colour, originally cream. The type is common in the second half of the first century, e.g. at Richborough⁵³ and at Chichester in a grave dated *c.* A.D. 80–100.⁵⁴ From ditch F7.
122. Thin walled beaker with corrugations on the shoulder, in fine grey Roman fabric with the exterior formerly burnished. Beakers of this form belong to the first century and are often mica-coated. cf. *Verulamium* 1972, FIG. 103.125 (dated *c.* A.D. 60–75). From ditch F1 (north), charcoal layer.
123. Ring-neck flagon in coarse cream sandy fabric. Probably late first century. cf. *Cam. f.* 155B. Unstratified from the south-east corner of ditch F1 (Thurrock Museum No. 1315).
124. Bowl or large beaker in softish red fabric tempered with grog. The exterior is burnished and coated with a cream slip. The neck is nearly upright and the shoulder cordoned, apparently a development from a Belgic form (cf. No. 50). For a similar form cf. *Verulamium*, 1972, FIG. 104.169 (dated A.D. 60–75) and a later version, which is slip coated, *Verulamium*, 1972, FIG. 116.600 (dated A.D. 140–150). The Gun Hill example is certainly first century and probably of local manufacture. From ditch F1 (north), charcoal layer. Sherds of other cream-slipped vessels occurred in the same deposit, and included the well-moulded footing of a flagon, probably *Cam. f.* 165.⁵⁵ A body sherd from yet another flagon in thin, fine hard fabric, with a fine white slip, is an altogether superior piece the quality of which is unparalleled locally. The tradition of cream-slipped wares certainly begins at Colchester in the pre-Roman period, but their subsequent history has not been studied in detail. It is, however, a long one, as sherds appear in first-century contexts on Canvey Island, flagons are fairly common in second-century burials, and a kiln excavated at Little Thurrock in 1970 was found to be producing elegant flagons and pedestalled jars in the closing years of the second century.⁵⁶

Amphorae

125. Rim in pinkish-buff sandy fabric with cream surface. This is a South Spanish globular amphora, Dressel form 20. First century. From ditch F1 (north), charcoal layer.

Many small sherds, mostly burnt, of several different amphorae of this form were found scattered along ditch F1 (in the charcoal layer) and inside Kiln I. The stub of a handle was also found.

Not illustrated

Body sherd of a cylindrical amphora, *c.* 30 cm. diameter, with a wall thickness of 2.2 cm. The fabric is hard, pinkish-buff in colour and is coated with an off-white slip. The sherd strongly resembles a Dressel form 1 and was hence submitted to Dr. D. P. S. Peacock who very kindly thin-sectioned it. He reports that it is a Dressel form 1, in his *Fabric* 1.⁵⁷ It is thus likely to date to the second half of the first century B.C. Unstratified, from ditch F1 (south).

Mortaria

126. Rim of quadrant section in pinkish-cream fabric with cream-slipped surface. No trituration grits survive. There is a trace of the very edge of a potter's stamp. From ditch F1 (north-east corner) in vicinity of Kiln I; recovered in quarry rescue and not securely stratified but probably from the Period 5B filling over Kiln I. The

⁵³ J. P. Bushe-Fox, *Excavations at Richborough*, i (1926), ff. 67–69; ii (1928), f. 143; iii (1932) f. 197.

⁵⁴ A. Down & M. Rule, *Chichester Excavations*, i (1971), fig. 5.21, grave 60C.

⁵⁵ For discussion of early cream slipped flagons see *Camulodunum*, p. 248.

⁵⁶ *Panorama*, xiv (1971), 45 f. Full report forthcoming.

⁵⁷ D. P. S. Peacock, 'Roman Amphorae in Pre-Roman Britain' in M. Jesson and D. Hill (eds.) *The Iron Age and its Hillforts* (1971), 164.

sherd was submitted to Mrs. K. F. Hartley, who kindly reports that the vessel was made in the Verulamium region in the period *c.* A.D. 110-145. It has not been possible to identify the stamp from the surviving fragment.

127. Mortarium rim, 28 cm. in diameter, in soft buff fabric with flint trituration grits. It is probably a product of the Colchester kilns. cf. *Cam.* f. 499, which is dated to the third century. From ditch Fg.

Terra Sigillata

128. Half the base of a dish, Drag. f. 18/31, bearing the first two letters of the potter's stamp MV[. Unstratified from Ditch F1 (south).

Not illustrated

Small body sherd of Drag. f. 35 or 36; South Gaulish, first century A.D. From the charcoal layer in ditch F1 (north).

Half the base of a Drag. f. 18/31; Central Gaulish, probably Hadrianic. Unstratified from the south butt-end of ditch F1 (east).

Body sherd of platter f. 79 or Tg; East Gaulish, Late Antonine.

From ditch F1 (north); upper fill, above charcoal layer.

Rim of cup Drag. f. 33; East Gaulish, Antonine. Unstratified from ditch F1 (west).

PERIOD 6

FIG. 18

Anglo-Saxon pottery from the Grubenhaus (F95)

All layers in the *Grubenhaus* produced grass-tempered pottery, mostly in the form of small, undistinguished sherds; none was decorated. The fabric was mainly hard, grey-to-black in colour and laminated as a result of vegetable inclusions.

129. Jar with sharply everted rim, slightly cupped. NW. quadrant, layer (5).
 130. Everted rim, softer fabric. NE quadrant, layer (3).
 131. Everted rim. SW. quadrant layer (2).

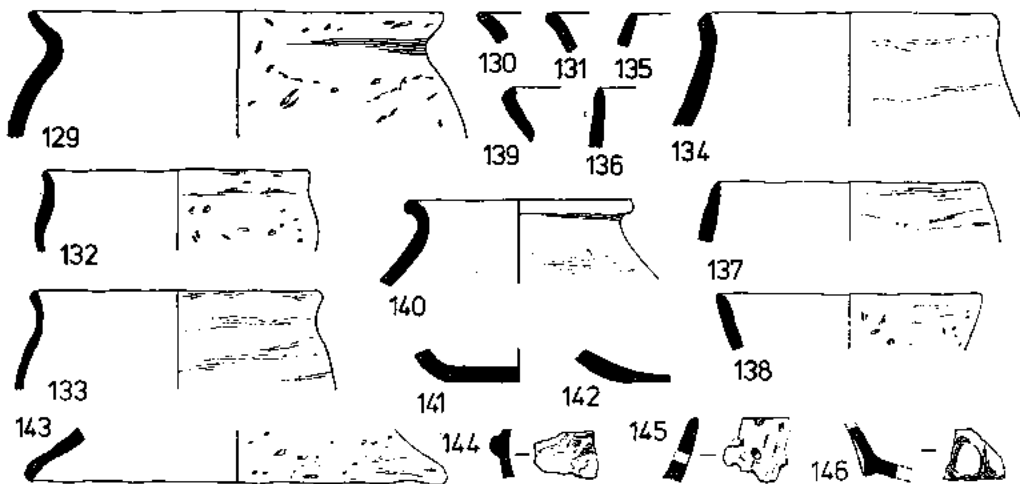


FIG. 18

Anglo-Saxon pottery: Nos. 128-145, Period 6. Medieval pottery: No. 146, Period 7. (Scale $\frac{1}{4}$)

132. Globular bowl, slack profile. cf. Mucking⁵⁸ (Jones, 1969, FIG. 4.416c) NW. quadrant, layer (5).
133. Jar, black and externally burnished. cf. Mucking (Jones, 1969, FIG. 5.417c). SE. quadrant layer (3).
134. Similar, but thicker-walled. cf. Mucking (Jones, 1969, FIG. 5.418b SE. quadrant layer (3).
- 135-7. Simple jar or bowl rims. 137 is externally burnished. NW. quadrant, layer (5); NW. (2); SE. (2), respectively.
138. Conical bowl rim. NW. quadrant, layer (5).
139. Rim of (?) conical bowl, with internally thickened lip. NW. quadrant layer (5).
140. Cavetto rim in very hard fabric, with black exterior and grey-buff interior. NW. quadrant layer (5).
- 141-2. Examples of simple bases. NW. quadrant, layer (3) and SE. quadrant layer (3).
143. Rim, apparently of a lid; the angle seems too low in relation to the diameter for the likelihood of this being a bowl. NW. quadrant layer (5).
144. Body sherd with a simple applied boss, perhaps intended as a blind lug. SE. quadrant, layer (3).
145. Simple rim in a soft fabric, pierced with numerous small holes before firing. SW. quadrant, layer (3). Other small sherds, not illustrated, came from SE. quadrant, layer (3) and NW. quadrant layer (2). The type is well known as a colander. cf. Sutton Courtney⁵⁹ and Mucking (Jones, 1973, forthcoming FIG. 54.6).

PERIOD 7

146. Fragment of a large pitcher with sagging base, in fine, hard brown fabric; decorated at the wall/base angle with 'pinching'. 14th century. Unstratified from ditch 27.

OBJECTS OF FIRED CLAY

FIG. 19

Clay weights

1. Fragment of a triangular loomweight with sides of c. 16 cm.; roughly made in brown clay, with a few vegetable lacunae. It is pierced through the angles with holes of c. 12 mm. diameter. Unstratified.
2. Fragment of a similar weight in soft black fabric, fired red on the exterior; contains the occasional trace of vegetable material used as temper. Ditch F9.
3. The greater part of a much larger triangular weight with sides of c. 19 cm. Black fabric, heavily vegetable-tempered; medium-brown surfaces with many lacunae. Neither of the two extant corners is pierced, but presumably the third one was. Unstratified, in scraping west of enclosure A.

Not illustrated

Various small fragments of pierced triangular weights, mainly from ditches F1 and F7.

Triangular weights are well known on Iron Age sites in the area.⁶⁰ It has recently been suggested that the larger size might be thatch weights rather than loomweights.⁶¹

4. Annular weight, 10 cm. diameter, with a 1.8 cm. hole; black grass-tempered fabric. From the *Grubenhau* SW. quadrant layer (2).

⁵⁸ M. U. Jones, 'Saxon Pottery from a Hut at Mucking, Essex', *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* (1969), 145 f.

⁵⁹ *Archaeologia*, lxxvi (1927), 73, fig. 10.

⁶⁰ e.g. Mucking (Jones, 1973, forthcoming, fig. 48.20)—Linford, (Barton, 1962, fig. 1.11).

⁶¹ *Panorama*, xvi (1972-3), 33.

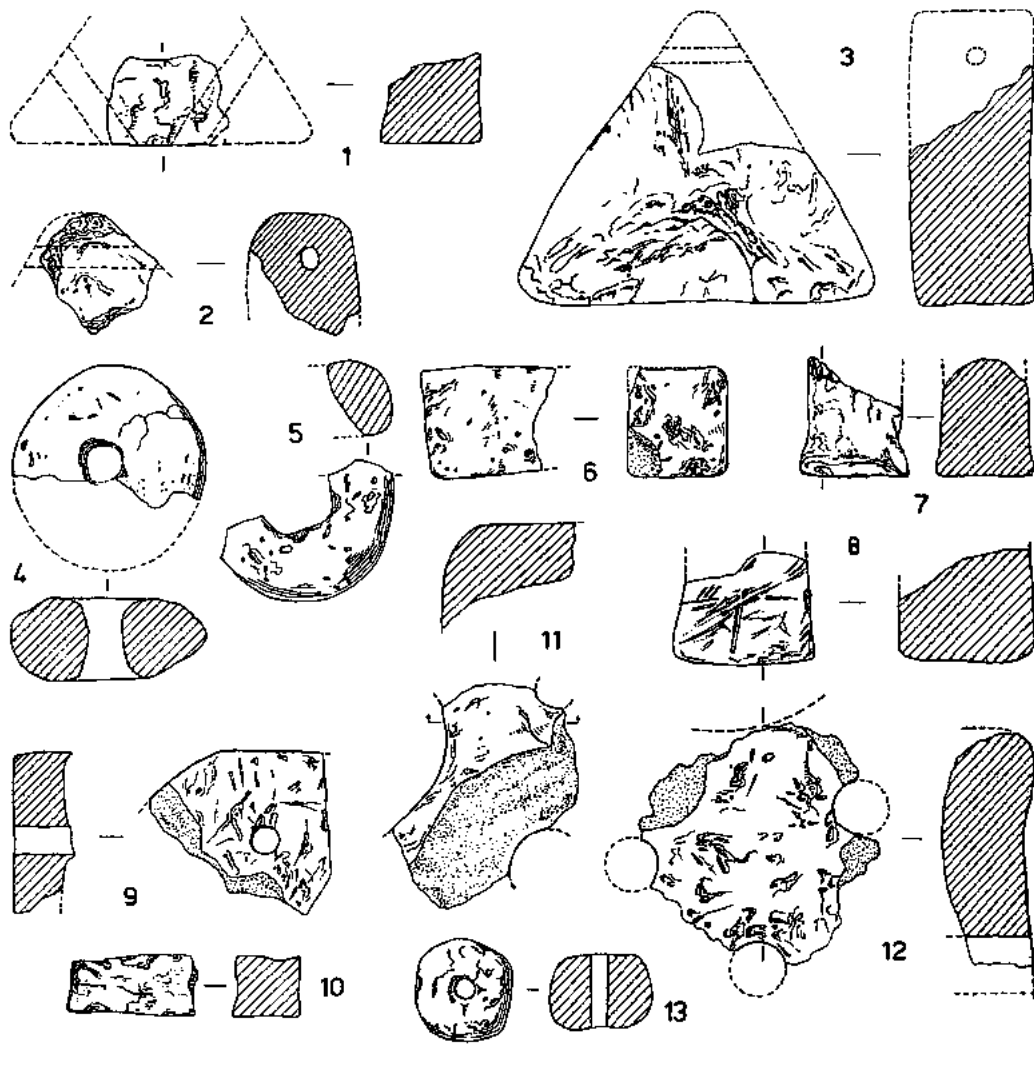


FIG. 19
 Objects of fired clay: Nos. 1-13. Objects of stone: Nos. 14-15 (Scale $\frac{1}{2}$)

5. Part of an annular loomweight, 10 cm. in diameter with a sub-circular hole *c.* 3.5 cm. across. Red fabric tempered with vegetable material and sand. From the *Grubenhäus*, SW. quadrant layer (3).

Not illustrated

Other fragments of loomweights were found in the uppermost layers of the *Grubenhäus*. Annular weights with both large and small holes are attested from Saxon huts, e.g. Linford (Barton, 1962, FIG. 7, 16, 17).

Oven and kiln furniture

6. End of a parallel-sided firebar, *c.* 5.5 cm. square in section. Reddish-brown sandy fabric with a few vegetable lacunae on the surface. cf. complete examples from Orsett (see note 101) and Mucking (Jones, 1973, forthcoming, FIG. 48.18). Unstratified from ditch F1 (west).
7. End of a firebar, 5 cm. square in section, with a slightly expanded and flattened end, clearly made with the intention of standing vertically, as a pedestal. Reddish-brown fabric with no deliberate tempering material. From the semi-circular slot F12.
8. Similar to No. 7 but *c.* 7 cm. square and only expanded in one direction. Very hard-fired brownish-red fabric with a few vegetable marks on the surface; tempered with a little sand. From ditch F1 (west).
9. Fragment of a pierced clay plate in red fabric, well tempered with vegetable material. Parts of two edges survive, meeting at an oblique angle. The plate is *c.* 2.7 cm. thick and is pierced with a 14 mm. hole. From the charcoal layer in ditch F1 (north). cf. *Verulamium*, 1936, pl. LVIB.
10. End of a slender firebar, tapering in one plane only. Very hard-fired reddish-brown fabric, with a few vegetable marks on the surface. From pit F93, in the quarry face, where it was found in association with undatable Romano-British pottery sherds. Nos. 6–10 are basically of unknown use; in the past such items, which are very different in appearance and probably in use, have been forced into the omnibus classification of 'Belgic bricks'. On some sites they have been found inside fired-clay structures believed to be ovens, but there is no clear evidence as to how these diverse pieces could be used in ovens. It seems by no means impossible that they might be the removable furniture employed in Iron Age surface-built pottery kilns.
11. Fragments of fired clay of some crudely-made structure, almost certainly the suspended floor in the furnace of a pottery kiln. It is of coarse red fabric, containing a little vegetable material as tempering. The fragment has a concavely-curved edge and is pierced in the vertical plane by two holes. From ditch F1 (west), charcoal layer.
12. Similar fragment, in reddish-brown fabric with greyish-white tinges on the upper surface. The piece survives to a thickness of 4.5 cm. but there is no sign of the lower surface; heavily tempered throughout with vegetable material. Parts of three circular holes through the 'floor' can be seen (*c.* 2.7 cm. diameter). There is a rounding-off towards one edge of the fragment (as shown in section) suggesting a similar concavity to that in No. 11. From the chamber of Kiln I.

Not illustrated

Many other small sherds of similar type, showing either concave edges or small circular holes. They are principally associated with the kilns and the charcoal layer in ditch F1. There can be no real doubt that they formed part of the kilns and the most likely explanation is that they are derived from broken-up suspended floors, of unknown thickness. Presumably the floor was luted to the chamber wall and may have had the additional support of a clay pedestal in the centre. The

concave edges shown on some sherds may indicate the presence of very large holes through the floor, as well as the small ones, or that there were lunette-shaped openings at intervals around the edge of the floor. The latter is more likely from the point of view of the efficiency of gas circulation in the chamber. cf. Shoebury.⁶²

Spindle whorl

13. Complete spindle whorl, c. 5.25 cm. diameter, in soft pinkish-buff fabric tempered with crushed flint, grog and vegetable material. Iron Age. Possibly from ditch F29; see reference for FIG. 13.28. (Thurrock Museum No. 1227).

OBJECTS OF STONE

FIG. 19

Hone

14. Block of laminated quartzite sandstone, flat in one plane, ovate in the other (maximum length 6.5 cm.).⁶³ Probably derived from the local gravel and used as a sharpening stone; all edges show evidence of abrasion, although the upper surface (as drawn) less so than the others. From the *Grubenhäus*, layer (2).

Quern

15. Fragment of the upper stone of a quern of Rhenish lava.⁶⁴ It has been worn thin by use and has subsequently been heavily eroded by soil action, so that tooling is only faintly visible on the under surface. There is a trace of a possible horizontal hole in the edge, for the insertion of a handle. Romano-British. From the upper fill, above the charcoal layer, of the north butt-end in ditch F1.

Not illustrated

A few other small fragments of lava quern were found elsewhere in the upper layers of ditch F1. Fragments of two or three querns of Puddingstone were also found, unstratified, from the same ditch.⁶⁵

FIG. 20

Flint

1. Unfinished leaf-shaped arrowhead with the point missing. It was made from a primary flake of black flint; pressure flaking had removed most of the bulb of percussion and about two-thirds of the cortex. Unlocated.
2. Snapped-off blade of grey-black mottled flint, showing bulb of percussion on one face and several flake scars on the other, slightly retouched. From the surface of ditch F7 (southern end of site).
3. Blade of mottled grey flint, snapped off at both ends; three longitudinal flake scars on one face. From ditch F8 (corner).
4. Blade of poor black-and-white veined flint with bulb and striking platform at one end and trace of cortex at the other; retouched for use as a scraper. From pit F77.
5. Large primary flake of poor black-and-white veined flint, retaining much of the cortex and striking platform. Roughly trimmed and retouched to form a steep-sided, hollow scraper. From pit F77.
6. Blade of brown and grey mottled flint with bulb and platform surviving; retouched along the right-hand edge for use as a (?) knife. Unlocated. (Thurrock Museum No. 1527).

⁶² *Proc. Soc. Antiq.*, (ser. 2), xvi (1895), 40.

⁶³ There is a fuller geological description in *Panorama*, xvi (1972-73), 50.

⁶⁴ For the general type see E. C. Curwen, 'Querns', *Antiquity*, xi (1937), 149, fig. 40.

⁶⁵ E. A. Rudge, 'Interim Report of the Distribution of Puddingstone Querns', *Trans. Essex Archaeol. Soc.*, (ser. 3), i, (1965), 247.

OBJECTS OF IRON

7. Two thin pieces of iron joined together with three iron rivets; The object is heavily corroded but shows slight curvature and the top edge, as drawn, may be a true one. The surface preserves wood-grain impressions, running in many different directions. The object could be interpreted as the junction between a horizontal band and a

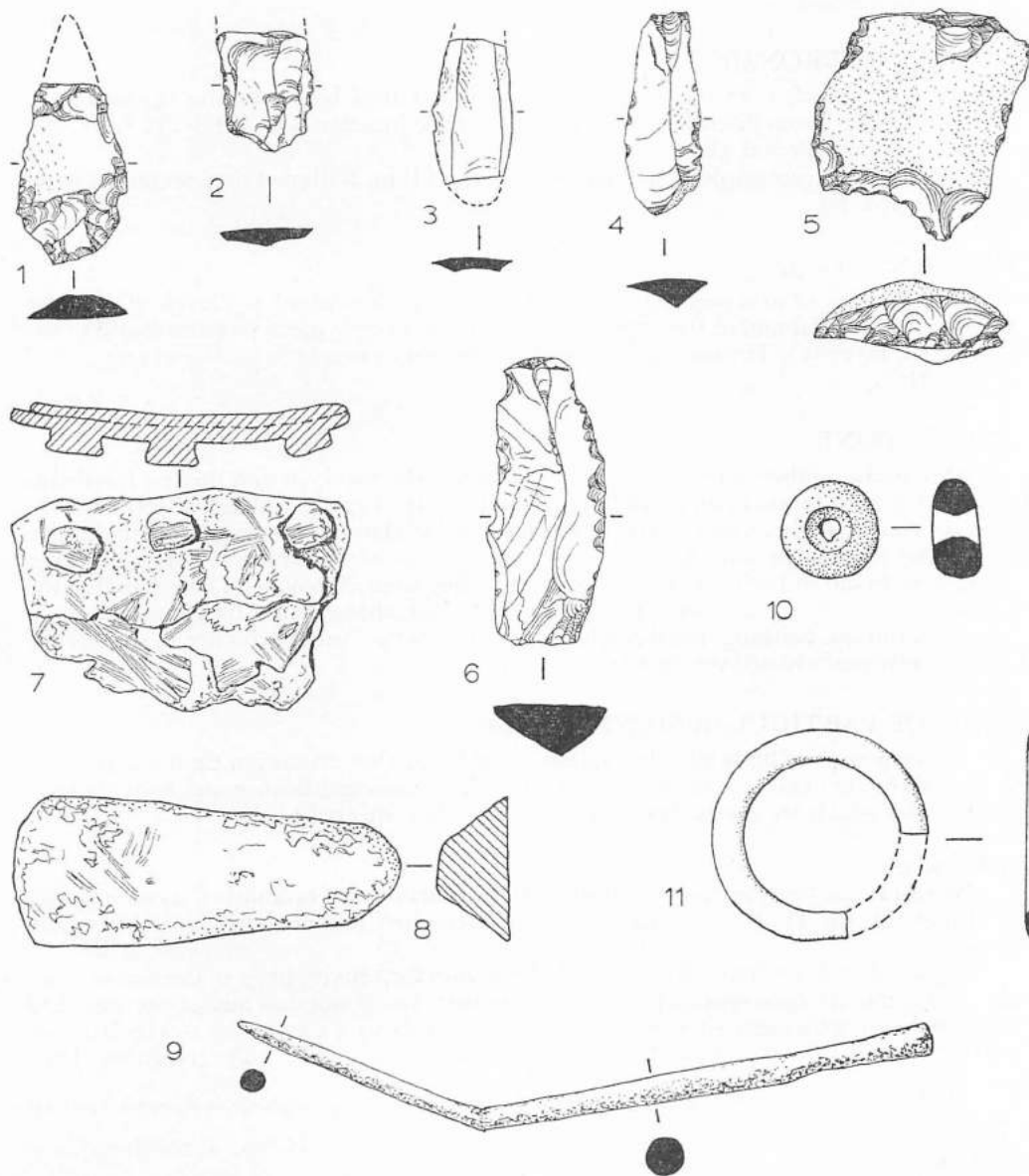


FIG. 20

Flints: Nos. 1-5. Iron objects: Nos. 7-9. Bronze objects: Nos. 10-11. (Scale $\frac{1}{2}$)

vertical strip on a metal-bound wooden bucket, but too little survives to be certain. From the Period 3A hearth pit, F18.

8. Iron lump 5 cm. long, parallel in one plane and tapering slightly in the other; the ends are rounded and the cross-section is trapezoidal. Use uncertain. Found with No. 7.
9. Iron instrument 9.5 cm. long, of circular cross-section tapering towards a point. Possibly a bodkin with the 'eye' broken off; bent in antiquity. From the west end of the *Grubenhäus*.

OBJECTS OF BRONZE

10. Circular bead, 1.25 cm. in diameter, with a central hole tapering inwards from both sides. From ditch F7, an early cut near the junction with ditch F8. Iron Age, earlier than Period 3B.
11. Bronze ring (incomplete) 2.8 cm. diameter, of thin, flattened oval section. Found with No. 10.

METAL SLAG

Small lumps of iron slag were found in pit F18, in the Period 4-5 levels of ditch F7 and one lump was found in the upper fill of ditch F1. A single piece was also found in the *Grubenhäus*, layer (2). The quantity is quite insufficient to suggest smelting at any period of Gun Hill.

ANIMAL BONE

Due to the acidity of the soil bone has not generally survived and the few fragments which have been found in an identifiable condition are of cattle and have been found in Period 5 contexts. Pit 93, seen in the quarry face, yielded horse bones and teeth, undatable within the Roman period. A few teeth, which have a higher survival capability than bone, were found in Period 3, 4 and 5 contexts. They were all bovine. Those found in the bottom of the post-pit, 44, were in a formation which showed that they had been in a jaw when buried. Nothing useful can be deduced from the faunal evidence in view of the rare and obviously biased survival rate.

FINDS OF PARTICULAR SIGNIFICANCE

Three groups of finds have been singled out for further discussion than was possible in the preceding catalogue as they are of more than local significance and contribute to wider topics which are currently under study by various specialists.

1. *Briquetage*

Whilst it has long been assumed that salt production was established as an industry in Britain by the Hallstatt period,⁶⁶ the evidence cited has not always been soundly based.⁶⁷

None of the Essex 'red hills' has yielded evidence for activity prior to the first century B.C. and some are demonstrably of the first century A.D.,⁶⁸ nor has any of the stratified briquetage on settlement sites been hitherto assignable to a date prior to the late first century B.C.⁶⁹ Elsewhere in Britain the situation has, until quite recently, been

⁶⁶ S. Piggott, *Prehistoric Europe* (1965), fig. 94 and J. Nenquin, *Salt, A Study in Economic Prehistory (Dissertationes Archaeologicae Gandenses, vi)*, 1961, 130 f.

⁶⁷ cf. Nenquin's 'five localities . . . where we have irrefutable proof' for Hallstatt salt-boiling—four of these can be immediately dismissed.

⁶⁸ Rodwell, 1966, *op. cit.*

⁶⁹ e.g. at Camulodunum, Hawkes and Hull, 1947, *op. cit.*, 48, 346-7; Wickford; Chelmsford; Rivenhall and Kelvedon (*Britannia*, ii, 1971, 273).

similarly uncertain: Mrs. Hallam's reconsideration of the alleged Hallstatt industry in Lincolnshire has shown that there is no real evidence in support of it.⁷⁰ At Runcton Holme, Norfolk and Brampton Hall Farm, Suffolk, the briquetage which Nenquin used to demonstrate a Hallstatt industry is totally unassociated; like Essex, the Kentish sites have produced consistent evidence for a late La Tène and Roman activity; so that it is only in the south and south-west that acceptable evidence for Hallstatt brine-boiling has been found, notably at Gaulter Gap, near Kimmeridge. R. A. H. Farrar has drawn attention to a late La Tène industry at Wyke Regis,⁷¹ Dorset, and recent work in the areas of Portsmouth and Chichester harbours has shown the presence of salt evaporating sites dating back to at least the MPRIA.⁷² It is still unfortunately true that very little briquetage has been detected by excavators on inland settlement sites, but this is gradually being remedied, for example, by recent finds in Iron Age pits at Danebury hillfort, Hampshire.⁷³

It therefore seems likely that salt production in the EPRIA and MPRIA was commonly undertaken on a modest local scale and for this, or other reasons concerned with the technical aspect of its production, failed to result in the creation of the prominent mounds of debris which characterize LPRIA and Romano-British salterns. Hence the study of prehistoric salt production in its earlier phases may have to be approached from the finds of briquetage in datable contexts on settlement sites. At Gun Hill fragments of briquetage have been found scattered through features of Periods 2 to 5A, but only in the butt-end of ditch 25 was there a concentration. Its occurrence in later features may only be fortuitous. Close dating is, of course, impossible but it is likely to fall within the period 4th-3rd century B.C. and is thus by far the earliest recorded material from the county. Unfortunately, there is no evidence for significant typological change in the form of evaporating pans: here, as on Canvey Island in the first century A.D., there are both thin and thick-walled pans⁷⁴ and in general appearance the material from the two sites is indistinguishable. (WJR).

2. Curvilinear Pottery

The decorated curvilinear pottery is of considerable interest as it, together with the newly-published Mucking sherds⁷⁵ and Canvey sherds⁷⁶ adds significantly to our knowledge of such pottery in south-east Britain. Previously, the only published examples from Essex were the well-known Langenhoe and Canewdon vessels;⁷⁷ their decoration comprises simple interlocking arcs and roundels, without any trace of the hatching which is a notable feature of so much of the other British curvilinear pottery. This led Professor Grimes to dismiss the group summarily.⁷⁸ However, finds and excavations in the last few years (as yet unpublished) have added considerably to the bulk of the material from the county and have shown that the South-Eastern curvilinear pottery sequence is far more complicated and varied than hitherto thought. No less than five main elements of decoration can now be seen, sometimes singly and sometimes with several elements in association.

1. Simple incised lines and roundels in the Canewdon/Langenhoe style. Further exam-

⁷⁰ S. J. Hallam in C. W. Phillips (ed.), *The Fenland in Roman Times* (1970), 68 and especially footnote 131.

⁷¹ R. A. H. Farrar, 'A Note on the Prehistoric and Roman Salt Industry in relation to the Wyke Regis site', *Proc. Dorset Nat. Hist. & Archaeol. Soc.*, lxxxiv (1962), 137 f.

⁷² We are indebted to Mr. R. J. Bradley for this information.

⁷³ Information from Professor B. W. Cunliffe.

⁷⁴ Rodwell, 1966, 23.

⁷⁵ Jones, 1973 forthcoming, fig. 48.10.

⁷⁶ This paper, fig. 14.44-46.

⁷⁷ Ward-Perkins, 1938, fig. 10.1, 2, 4 and W. Pollitt, *Southend Before the Norman Conquest* (1953), pl. XX.

⁷⁸ W. F. Grimes, 'The La Tène Art Style in British Early Iron Age Pottery', *Proc. Prehist. Soc.*, xviii (1952), 170 f.

- ples include an omphalos bowl with intersecting arcs from Canvey (Southend Museum) and sherds from Mucking and Wickford (recent excavations).
2. Stabbed decoration in the Gun Hill style; this accompanies incised arc decoration. There is an identical sherd from Wickford, which confirms the reconstruction of the decoration shown in FIG. 14.43. The general scheme of this decoration can be paralleled at Hengistbury⁷⁹ and Meare⁸⁰ and in closer detail at Dragonby, where a bowl superficially appears to have identical decoration to the Gun Hill and Wickford sherds, but in place of two rows of stabbing it has two rows of notched rouletting, giving very much the same appearance.⁸¹ The three illustrated Canvey sherds all belong to this group and are decorated with stabbing in various ways. The arrangement in FIG. 14.45 is particularly interesting and can be paralleled at Meare;⁸² and in FIG. 14.46 comb-stabbing has been used to produce a series of triangles. cf. Meare⁸³ and Hengistbury.⁸⁴ The precedence of stabbing over line decoration is also seen at Warham, Norfolk.⁸⁵
 3. Decorative schemes involving the use of notched rouletting; this occurs in conjunction with incised lines. Examples have been found at Mucking⁸⁶ and Wickford.
 4. The use of shallowly impressed dimples is illustrated on a sherd from Mucking.⁸⁷ Here the dimples are very small and have been arranged to form a 'catherine wheel'.
 5. Simple hatching and cross-hatching, used in conjunction with line decoration. This is perhaps the least common form of decoration in the area: Wickford has yielded an example of the former and Heybridge and Little Waltham examples of the latter (recent excavations).

Dr. Peacock's important study of Glastonbury ware has shown that curvilinear pottery was not always made and used locally, as was formerly thought, but that it was produced at a limited number of centres, from which it was traded all over south-western Britain.⁸⁸ Similarly, trading patterns may well be detectable amongst the various curvilinear pottery groups in south-east Britain, so that in due course it may be possible to tie these down petrologically to specific areas of manufacture. Until petrological study has at least been attempted it is pointless to speculate upon the origin of the material found in Essex. Certainly it seems unlikely that the widely differing types of curvilinear pottery listed above are all of local origin. It is perhaps significant that the majority of this pottery comes from sites on or near the coast.⁸⁹ On general considerations pottery decorated by the first method is the most likely material to be indigenous to Essex, whilst that decorated by the fifth method is perhaps the least likely. (W.J.R.).

3. *Amphorae*

The amphora sherds from Gun Hill are valuable for the light they shed on the prosperity and romanized tastes of the community living in the area in the first century B.C. and first century A.D. The single sherd of a Dressel form 1 amphora had obviously found its way to Gun Hill as rubbish from a nearby settlement (?Chadwell St. Mary) and been thrown in the ditch of Enclosure A. The person who could afford to import

⁷⁹ J. P. Bushe-Fox, *Excavations at Hengistbury Head* (1915), pl. XX, Class D.4.

⁸⁰ A. Bulleid and H. St. G. Gray, *The Meare Lake Village* (1948), ii, pl. II, P25.

⁸¹ *Antiq. J.*, 1 (1970), 237, fig. 7.7.

⁸² Bulleid and Gray, 1948, pl. II, P143.

⁸³ *Ibid.*, pl. II, P15.

⁸⁴ Bushe-Fox, 1915, pl. XXI, Class F6-8.

⁸⁵ *Antiq. J.*, xiii, (1933), 411, fig. 5.

⁸⁶ *Panorama*, xv (1971-2), 23.

⁸⁷ Jones, 1973 forthcoming, fig. 48.10.

⁸⁸ D. P. S. Peacock, 'A Contribution to the Study of Glastonbury Ware'. *Antiq. J.*, xlix (1969), 41 f.

⁸⁹ Although long-distance, cross-country trade may be in question if the Brickwall Hill (Herts.) pottery proves to be petrologically related to Hengistbury Class E Ware; see *Herts. Archaeol.*, ii (1970), fig. 3, especially No. 1.

fine Italian wine in the first century B.C. was certainly not living on Gun Hill itself. Dr. Peacock's recent study of these amphorae⁹⁰ has shed much new light on the affluence and romanized attitude of the Trinovantes in the period between Caesar and Claudius.⁹¹ The sherds of several South Spanish amphorae, Dressel form 20, which were found in Period 5B levels in ditch F1 are of the first century A.D., but whether they were imported before or after the Conquest it is impossible to tell. Originally they would have contained olive oil or fish sauces, but when found they were mostly severely burnt and had been used for some secondary purpose in the kilns. Amphora sherds have been found in pottery kilns elsewhere (e.g. Mucking) and it seems likely that they were used as conveniently-curved 'dome-plates'. (W.J.R.).

DISCUSSION, INTERPRETATION AND DATING

The earliest finds from Gun Hill are four Acheulian handaxes and some possible Palaeolithic flint flakes; they derive from the Thames gravel and the abraded condition of some shows them not to be from a primary context. They are obviously unrelated to the history of the site.⁹² Of the later flints, little can also be said, as they are too few in number, disparate in date and fragmentary in condition to enable any conclusions to be drawn regarding possible industries in the area. The blades may be Mesolithic, whilst the leaf-shaped arrowhead and the scrapers belong to the Neolithic/Bronze Age.

Erosion may well have eradicated shallow Bronze Age features and the only possible candidate for this period is ditch 59. Exactly when ditch 7 was first cut is unknown, but as the Period 2 ditches along the ridge clearly have a relationship to it, it must be of contemporary or earlier origin (FIG. 21). Its topographical siting suggests that it may have initially been a spur-ditch, cutting off a promontory of grazing land.

Longitudinal division of the hill, by the Late Bronze Age or Early Pre-Roman Iron Age, suggests agricultural activity and the creation of a field system. Alongside this, domestic occupation, covering no great area, is attested by traces of posthole structures and finds of pottery in the ditches towards the centre of the hilltop (the approximate area of occupation is stippled on FIG. 21). The chronological range in the pottery and the recutting of ditches shows that occupation, continuous or intermittent, extended over a long period of time, in fact well into the Middle Pre-Roman Iron Age.

In the latter part of Period 2 a large quantity of refuse was deposited in the western butt of ditch 25, including distorted and underfired pottery, providing positive evidence for its manufacture on the site. The same deposit also contained many small sherds of briquetage vessels which are of considerable interest for their early date (see p. 74).

Settlement continued with some expansion eastwards, and at this stage the first structures could be defined: there is at least one two-post structure in Area D,

⁹⁰ Peacock, 1971.

⁹¹ Since the publication of his paper the known distribution of Dressel form 1 amphorae has been extended into southern Essex. The following sites can be added to his map: White Colne (area); Kelvedon; Osea Road, Heybridge; Mucking; South Benfleet and Gun Hill. Sherds from other sites are still under study and will probably expand the map yet further.

⁹² Mr. R. Bingley kindly sent details: two of the axes are with him, one is in Thurrock Museum and the fourth is in private possession.

GUN HILL The Evolution of the Landscape

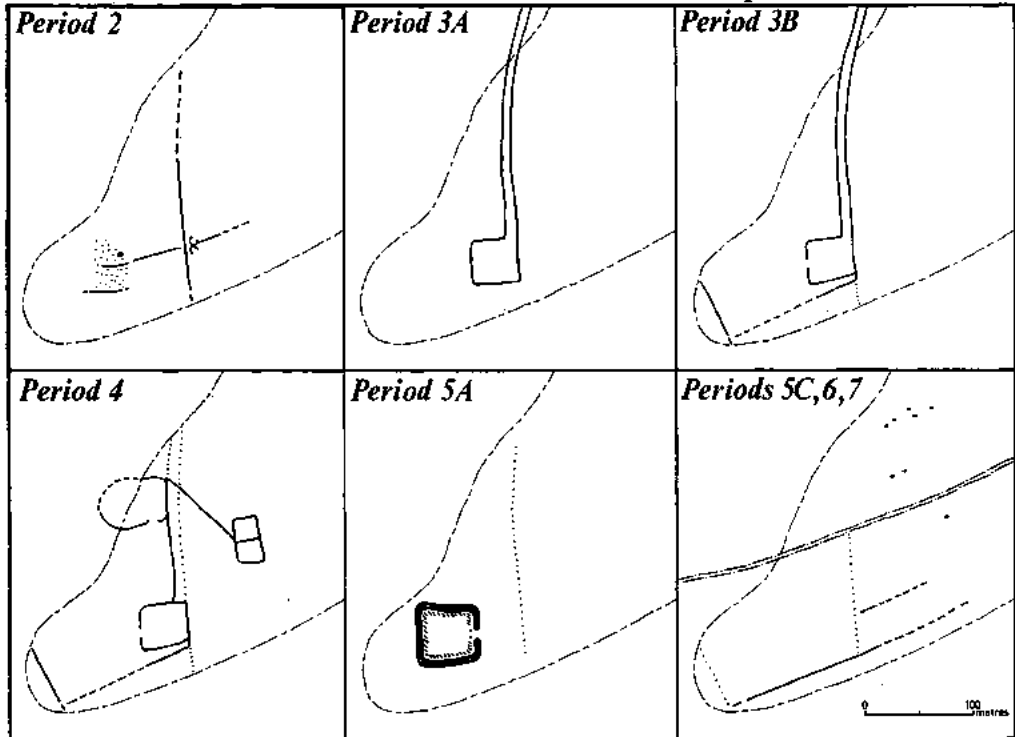


FIG. 21

The evolution of the landscape of Gun Hill, showing the principal features of each main period, in relation to the 75 ft. (22.5 m.) contour. Residual features, still visible in later periods, are shown in dotted outline.

of a type which Bersu originally called a corn-drying rack.⁹³ More interesting are the two successive semi-circular structures in Area E. One explanation for these is that they were stock pens, the open side of which could be closed by a hurdle fence. This would be attractive were it not for their small size and the pits located within, one certainly a hearth-pit. In fact the fired-clay, slag and iron objects from pit 18, and the pottery from the pits and slots themselves point more to a domestic, or perhaps industrial use. It is therefore more reasonable to envisage these structures as semi-circular, or D-shaped roofed buildings. Admittedly, precedents for such a building are not easy to establish, but this need cause no serious hindrance as our knowledge of Iron Age buildings in south-east Britain is minimal, and almost entirely limited to the circular-hut. At Gun Hill it would be an abuse of the evidence to force a circular-hut interpretation on these structures. Furthermore, semi-circular structures do form a definable class of features on Iron Age sites but have been generally presented in reports without any convincing explanation.⁹⁴

⁹³ But see *Proc. Prehist. Soc.*, xxxvii, (1971), 183, for a reconsideration of such structures.

⁹⁴ For example, cf. Rainsborough, *Proc. Prehist. Soc.*, xxxiii (1967), 222, where gully D1 is patently not a drip gully, but a construction trench. Interestingly, a hearth lies on the diametrical line of this structure.

Quite often, as at Gun Hill, it can be shown that only a half-circle was ever intended and that these are not simply round huts which have been partly eroded away. Similarly, some are so clearly wall trenches that the 'drip gully' theory will not stand (in any case, where was the water channelled to?): nor does the 'windbreak' theory, as they can face in any direction: at Gun Hill 13a and 13b faced south, whilst 12 faced north-east.

Slot 12 is the more complete, for which the following reconstruction might be suggested: the main wall was in the form of a semi-circle of contiguous logs set vertically in a foundation trench and presumably tied together at the top; the two open ends would be tied by a diametrical beam, perhaps broken and jointed at a door-post, (F16). The filling of the open side was presumably of some light-weight material for which a deep foundation trench was not required, which in itself may suggest that the wall was not intended to be a permanent fixture. Indeed, if these buildings were workshops a large area of removable panelling or hurdling would be very desirable to allow maximum illumination and ventilation of the interior. Here one immediately recalls the traditional smithy with one open or 'removable' side (in the form of shutters and doors), so that the smith can work with maximum light and air round him, but still be inside a building. Archaeologically, a recent smithy would appear as an open-sided building. Here pit 18 must surely be relevant, as whatever operation was being undertaken it involved a great heat which was responsible for the fragmentary hard-fired clay lining. The associated iron slag has already been noted.

The roofing of a D-shaped building need be no structural problem; a pair of principal rafters and some studwork could be erected on the diametrical beam, in effect forming a gable-end and from this common rafters could be taken down to the top of the wall and tied at both ends. Thus a perfectly stable building could be constructed without the need for any complicated joinery or excessively long timbers.

The only other MPRIA structure is the massive post-setting in Area A; the unlikelihood of its being part of a building has already been discussed, so that one is forced to give consideration to the possibility of its being a free-standing 'monument', although one is always reluctant to resort to a ritual explanation without positive evidence, which is usually elusive. However, the following may be said in its favour: it is free-standing in a very prominent position on the summit of Gun Hill, where it could be seen from several miles around;⁹⁵ it apparently comprised three contiguous posts, the number itself being very significant in Celtic society;⁹⁶ and finally the finding of a row of bovine teeth in the bottom of the pit shows that a skull or part of one had been placed there prior to the erection of the posts. This Celtic practice of burying skulls and complete animals in the bottom of significant post pits is well attested on many sites.⁹⁷ In Essex, the only

⁹⁵ Gun Hill protrudes slightly beyond the general line of the terrace and is therefore visible from the whole of the Grays and Tilbury marshes, as well as a considerable area inland.

⁹⁶ A. Ross, *Pagan Celtic Britain*, (1967), 34, 41.

⁹⁷ cf. Danebury, Hants, where dog burials were found in the bottom of pits dug to contain free-standing posts: *Antiq. J.*, li (1971), 241-3; and at Rams Hill, Berks., animal burials were noted under the principal posts of a gate structure: *Current Archaeol.*, iv (1973), 9.

other evidence for a free-standing post is at Chelmsford, where a single post set in a gravel-paved *temenos* preceded the construction of the Romano-Celtic temple.⁹⁸ The context is somewhat later, but the tradition the same.

At Gun Hill it is not certain that the domestic occupation in Area A is contemporary with the post-structure; certainly two of the pits containing raw clay are later in date than the post pit itself.

The complete change in the layout of the hilltop in Period 3 indicates that not only did settlement move away but that the agriculture suggested by the field ditches ceased too. Everything was apparently replaced by the externally embanked enclosure B, approached from some distant place to the north by the 'droveway' (also with external banks). The evidence for a possible gate at the entrance to the enclosure has been noted. The most plausible explanation is that the re-organization of the hilltop accompanied a change in farming practice and that the earthwork under consideration was a small stock enclosure (presumably for sheep rather than cattle, on account of its size). This being so, the inverted commas might justifiably be removed from 'droveway'. Where the stock was being driven from, is uncertain, as the distance from Rainbow Shaw seems impracticably great, especially when one considers the effort involved in digging the droveway ditches, compared with that of the actual enclosure.⁹⁹ However, we do not know whether there were other points of entry into the droveway; it may have been part of a system of inter-connecting droveways. One aerial photograph shows a second droveway, coming from the north-west, which may join it in the field between High House Lane and Hoford Road.

Period 4 can be seen as a continuation and intensification of pastoralism, with accompanying modifications to the stock enclosures. The disuse of the southern part of the droveway suggests an alteration in land grazing patterns, perhaps making more use of the marshland. It has been argued that Enclosure C must have been added at this stage; it has a south-facing entrance which is slightly inturned and which would support the suggestion of its being a stock enclosure. The west ditch of the droveway was maintained and would have formed a continuous barrier linking enclosures B and C, so that stock being driven uphill from the low-lying pasture to the west would be prevented from straying beyond the desired limit; the flanking ditch added along the southern edge of the hill plateau would serve the same purpose.

Possibly stock of a different kind was kept on the land to the east of the old droveway, for which Enclosure G may have been built. This, it has been noted, was surrounded not by a ditch, but by a substantial fence. A suggestion might be that it was a pig-pen, which would explain the deep-set fence—to prevent the animals from burrowing their way out of the enclosure. There would be ample rough foraging ground on the southern slope of Gun Hill, which was almost certainly too steep to cultivate.

The sparse amount of domestic refuse which can be attributed to Periods 3 and 4 makes any attempt at dating very difficult, but in general terms they prob-

⁹⁸ *Essex Archaeol. and Hist.*, iv (1972), 3.

⁹⁹ There were c. 4 km. of droveway ditch as opposed to only 150 m. of enclosure ditch.

ably span the second and first centuries B.C. The structures associated with the latter part of Period 2 may also belong within the second century.

It seems likely that Enclosure B went out of use before Period 5 began, in view of the fact that its western ditch had silted up completely, or nearly so. Period 5A saw another complete change in the landscape of Gun Hill, with the construction of the well-defended but quite small Enclosure A.

At first sight the enclosure appears to be very irregular in outline (PL. 1), but when plotted during excavation it became clear that the irregularity was caused only by the anomalous siting of the north-west corner (FIG. 2). The other three corners each form an acceptable right-angle, which strongly suggests that the original intention was to set out a truly rectangular enclosure, but due to an error in the measurement of the west side, or an obstacle on the summit of the hill, the north-west corner was placed too far north; hence the course of the north ditch had to incorporate the distinctive twist, which brought it into alignment with the north-east corner, presumably already laid out as a true right-angle.

There can be no real doubt about the enclosure's defensive role: it lay on the spur of Gun Hill, with the ground falling away on three sides (FIG. 21); it is one of the most easily defensible positions in Thurrock and, as noted, commands a fine view.¹⁰⁰ A simple reconstruction of the defences is shown on FIG. 11, which can be taken to indicate at least the order of magnitude of the works, if not the detail.

Who built the Gun Hill enclosure, for what purpose and precisely when are, unfortunately, unanswerable questions at the moment. It certainly belongs to the first century A.D., as the few sherds of late Belgic pottery in its lower filling attest; whilst at the same time it must pre-date the Flavian kilns built into its partly backfilled ditch. In all, a date in the middle years of the first century seems fairly certain. There is no tradition of heavily defended late Belgic farmsteads in the area and there is no evidence whatever in support of a domestic occupation on Gun Hill at any time in the first century. Furthermore, one would be hard-pressed to make out a convincing case for its being a stock enclosure, especially as it had an internal, turf-revetted rampart, so that in view of both the positive and negative evidence it seems more likely that the enclosure served as a military defence, in the broadest sense of the term.

Whether it was built just before, at, or soon after the Roman conquest the evidence does not tell us.¹⁰¹ Whatever its purpose, it was certainly short-lived: there was no sign of the ditch having been recut and very little primary silt had accumulated in the bottom before the rampart was thrown back and the site abandoned for some years, during which time a substantial turf-line formed across the sunken fill of the ditch. That the rampart had only a short life is shown by the tumbled turves in the ditch—they had not been in the revetment long enough to have decayed into an unrecognizable mass.

¹⁰⁰ To appreciate the distance over which the site commands a good view it is necessary to be elevated a few metres, in order to see above the surrounding vegetation; when photographing from the dragline jib one could not help being impressed by the command of the position.

¹⁰¹ This enclosure is only one of several apparently similar defences in Thurrock: e.g. Orsett; see *Trans. Essex Archaeol. Soc.* vi (1974), (forthcoming); and Mucking; Jones, 1968, 215. They will probably be more easily understood when studied as a group.

In the latter part of the first century (Period 5B) industrial activity began on the site and a series of kilns was established in the hollow of the ditch, and probably elsewhere at ground level. The pottery they produced basically copied late Belgic bowl and jar forms, but in inferior fabrics. There is some indication that a smooth black finish was intended and that possibly some slip-coated wares were also being attempted. Amongst the industrial waste which spread out all round the ditch of Enclosure A was a very small amount of Roman pottery, sufficient to establish a Flavian, rather than an earlier date, for the activity.

Subsequently (Period 5C), the site came under agriculture and only a few stray sherds of Roman pottery were found. In Period 6 Anglo-Saxon settlement began, but on the evidence of one excavated *Grubenhäus* it is not possible to tie this down to a firm date; there is nothing distinctive about the pottery—a date sometime in the fifth or sixth century is probable.

The structural details obtained from the excavated *Grubenhäus* are a welcome addition to our knowledge, especially the three-post arrangement, although a pyramidal roof rather than a longitudinally-ridged one is not necessarily indicated by the fact that the eastern posthole is angled inwards, towards the centre of the hut.¹⁰² It could just as easily have been dug thus to accommodate a slightly bent timber. The evidence for a wooden structure at the west end of the hut is most tantalizing; Mr. Bingley has suggested that it was an H-frame which formed the anchorage for a ladder or arrangement of steps, for access to the hut. Certainly, some such provision would have been required as the step down from the exterior ground surface to the hut floor would have been at least a metre. Alternatively, the framing could be interpreted as the last-surviving remains of a timber casement which lined the hut-pit, as at West Stow.¹⁰³ This would surely have been necessary in any hut-pit dug deeply into loose sand or gravel. One point which does seem clear is that the Gun Hill *Grubenhäus* did not have a raised floor over a 'cellar',¹⁰⁴ as a hearth was found directly overlying the gravel in the bottom of the pit. The floor of the pit was also covered with a thick layer of occupation debris, which must have accumulated whilst the hut was in use. When abandoned, it was largely backfilled with sand and gravel, capped by a layer of domestic refuse, probably discarded from another, nearby hut.¹⁰⁵

Gun Hill thus makes a welcome addition to the very short list of Pagan Saxon settlements known in Essex, and like most of the other known examples is, perhaps significantly, close to the coast. It is also perhaps sufficiently close to Biggin, an *-ingas* placename, for a direct association to be postulated. The present location of Biggin may well represent a later Saxon movement to lower ground. Subsequently Gun Hill and the adjacent high ground reverted to agriculture, in

¹⁰² As suggested by the excavator in *Panorama*, xvi, 42.

¹⁰³ S. E. West, 'The Anglo-Saxon Village at West Stow', *Med. Archaeol.*, xiii (1969), 1 f. cf. Hut 12.

¹⁰⁴ *Ibid.*, 8.

¹⁰⁵ It will be seen that our interpretation of the later history of the hut differs slightly from that of the excavator. The hut could not have been completely dismantled and left open to the weather, otherwise the timber framing and steep end-walls of the pit would not have survived in the condition they did; furthermore, open postholes would rapidly have lost their shape. Another piece of evidence which favours a timber casement being left to decay *in situ* in the base of the hut is the vertical line between two distinct fillings, which appears at the east end of Section 32 (fig. 12).

which state it has remained until recent years, when large-scale gravel quarrying began the systematic destruction of the landscape.

CONCLUSIONS

Although only a modest excavation, Gun Hill has served to demonstrate or reinforce several basic points. First, one is reminded of the difficulties inherent in the interpretation of complex aerial photographs and how widely the anticipated and actual results of excavation differed. Nevertheless, it was found possible for the evolution of a sizeable area of ancient landscape to be disentangled in general terms, if not in minute detail, by a careful analysis of the photographs and an economy of excavation. It has been shown that a remarkable number of changes in land usage took place in this small area of Thurrock in $2\frac{1}{2}$ millenia of human activity: pastoral, agricultural, industrial, defence and settlement, all took their turn, before the ultimate industry, quarrying, took its. Perhaps the most interesting result which emerges, in spite of all these changes, is the fact that archaeological features of great antiquity can and do determine present-day topography; this is perhaps more surprising in Essex than in many other parts of Britain, since intense agriculture, Roman, Medieval and modern, has levelled most of our archaeological sites, vastly diminishing the possibilities of productive field survey. It would, however, appear that medieval and modern land boundaries preserve an enormous number of ancient features; thus at Gun Hill several valuable confirmations of this point have been established. For example: High House Lane and Hoford Road, both 'typical' medieval lanes, are in fact partly middle Iron Age droveways; the survival of a field boundary marking one side of a Roman Road until the early part of the present century, and, perhaps more interesting still, another field and parish boundary running almost parallel to it, through Shrove Hill Wood, 350 m. to the west.

Studies in the evolution of the landscape, which are rapidly proving their worth in some parts of Britain, could be undertaken to great advantage in several areas of Essex, but this is not the place to pursue them.

APPENDIX A
LIST OF FEATURES AND ASSOCIATED FINDS

All depth measurements are given below the machine-cleared level, approximately 40–50 cm. below ground level. The fillings of the principal features are listed in Appendix B; unless otherwise described, the fill of the remaining features was brown pebbly loam.

NO.	FEATURE DESCRIPTION	FIG.	FINDS	FIG.	PERIOD
1	Ditch of Enclosure A: sub-rectangular in plan; internal revetted bank; single entrance; V-section ditch 5.5 m. wide by 2.2 m. deep.	2; 5; 10.S13, S15, S16, S22, S23, S24	A few small LPRIA sherds and other residual pottery from lower fills; and a great quantity of LPRIA and RB pottery from upper layers, especially the charcoal layer; also a little animal bone and various objects of fired clay.	13.3, 27; 14.39, 43; 15.49-53, 55-60, 68-9, 71-3; 16.74- 6, 80-1, 83-4, 86-7, 89, 91, 95-6, 98; 17.103- 11, 113, 115- 7, 119-20, 122-6, 128; 19.6, 8, 9, 11, 15.	5A
2A & B	Ditch butts of Enclosure B, c. 2.5 m. wide by 1.1 m. deep. Largely destroyed by F1	2; 5; 10.S13, S15	—	—	4
3	West ditch of Enclosure B; only a trace surviving	2; 5; 10.S14	—	—	3
4	North ditch of Enclosure B	2	—	—	3, 4
5	Droeway blocking ditch, continuation of F4. c. 0.8 m. wide by 0.35 m. deep	2; 9.S28	—	—	4
6	West ditch of droeway, recut at least twice	2; 9.S26	—	—	3, 4

7	Boundary ditch; later east ditch of driveway; later east ditch of Enclosure B	2; 6; 9.s26; s25, s21	Flint flakes, pottery of Periods 2-6; briquetage; loomweights; bronze ring and bead	13.29, 32-3; 14.41; 15.24; 16.102; 17.118, 121; 20.2, 10, 11.	2-5 (+?6)
8	South ditch of Enclosure B, c. 1 m. wide by 0.5 m. deep	2	Flint blade; bovine teeth; E, M & LPRIA pottery	13.30; 20.3	3A
9	Field ditch, recut	2; 6; 8.s18	Flint blade; bovine teeth; loomweight; EPRIA, MPRIA & RB pottery	17.127; 19.2	(?2-4) 5
10	Field ditch, recut	2; 6; 8.s19	E, M, LPRIA pottery; iron slag; teeth	13.33	(?2-3), 4
11	Gully, unexcavated	6	—	—	?
12	Semi-circular wall trench, c. 1.2 m. wide by 0.9 m. deep	2; 6; 8.s17	MPRIA pottery; fired clay pedestal	14.37; 19.7	2
13	Semi-circular wall trench, recut	2; 6; 9.s21	—	—	2
14	Pit inside F12, unexcavated	6	—	—	prob. 2
15	Posthole, 23 cm. diameter, unexcavated	6	—	—	?
16	Post-pit with ghost, 70 cm. diameter unexcavated	6	—	—	prob. 2
17	Oval pit inside F13, unexcavated	6	—	—	prob. 2
18	Hearth pit, cutting F17	6; 8.s20	MPRIA pottery; iron; vitrified clay; ash	20.7, 8	2

NO.	FEATURE DESCRIPTION	FIG.	FINDS	FIG.	PERIOD
19	Posthole, 30 cm. diameter, unexcavated	6	—	—	3 or later
21	Field ditch, unexcavated	2; 5	—	—	2
22	ditto	2; 5	—	—	2
23	Field ditch, <i>c.</i> 1.8 m. wide by 0.6 m. deep	2; 4; 5; 8.s7	Flint flake; LBA, EPRIA pottery; briquetage; fired clay	13.26	2
24	Posthole (gatepost to Enclosure A), <i>c.</i> 1.2 m. by 1.8 m. by 40 cm. deep. Its twin plotted from air photos	2; 5	LPRIA sherds	—	prob. 5A
25	Field ditch (replacement of F23), <i>c.</i> 2.2 m. wide by 0.9 m. deep	2; 4; 5; 8.s4, s7	Flint flakes; EPRIA pottery; fired clay; briquetage; bovine teeth	13.4, 5, 10, 13, 15-19, 21-25	2
26	Posthole, 25 cm. diameter by 8 cm. deep	5	—	—	?
27	Field ditch, recut	2; 9.s27	Medieval sherd	18.146	7
28	Field ditch	2	LPRIA sherd; iron slag	—	4-5
29	Field ditch, recut	2; 9.s27	MPRIA and RB sherds	probably 13.28; 14.47; 19.13	4 (+?5)
31	Pit <i>c.</i> 1.3 m. diameter, by 30 cm. deep; charcoal-rich fill	2	M-LPRIA pottery. Charcoal-rich fill	—	4
32	South ditch of Enclosure B, <i>c.</i> 1.2 m. wide by 0.6 m. deep	2; 9.s29	—	—	3B

33	Small pit seen in section	2; 9.s26	—	—	?
34	ditto	2; 9.s26	—	—	?
35	Kiln I, lying in ditch of Enclosure A	2; 7	Much Belgo-Roman and some RB pottery	15.61-7, 70; 16.77-9, 82, 88, 90, 92-4, 97, 99-101; 17.114; 19.12	5A
36	Kiln II, ditto, found in quarry face	2	Belgo-Roman pottery	17.112	5A
37	Small pit, c. 50 cm. diameter, by 32 cm. deep	3	Fired clay lump	—	1-2
38	Clay storage pit	3; 8.s2	MPRIA pottery	14.34, 38	2
39	Posthole, 10 cm. deep	3	Fired clay lump	—	1-2
40	Large oval pit	3; 8.s2	E, MPRIA pottery; briquetage, firebar	14.48	2
41	Large oval pit, cutting F40, c. 4.6 m. by 1.3 m. by 30 cm. deep	3	Flint flakes; E, MPRIA pottery; fired clay lumps; briquetage	13.2, 6-9, 11-12, 14, 20	2
42	Clay storage pit	3	—	—	2
43	ditto	3	—	—	2
44	Massive post pit, probably a recut of F45; possibly held three contiguous posts	2; 3; 8.s1	Flint flakes; E, MPRIA pottery; fired clay; bovine teeth	14.35, 42; 13.31	2

NO.	FEATURE DESCRIPTION	FIG.	FINDS	FIG.	PERIOD
45	Large pit which may have held a post	2; 3; 8.s1	—	—	2
46	Gully	4	E, MPRIA pottery	—	2
47	Hearth pit cut into F46	4	E, M, LPRIA pottery; animal bone	—	4
49	Curved gully	4	EPRIA sherds	—	2 or later
50	Posthole	4	—	—	1-2
51	ditto, c. 50 cm. diameter, 12 cm. deep	4	—	—	?
52	ditto, c. 38 cm. diameter, 18 cm. deep	4	—	—	?
53	Pit; cut by F25	4; 8.s6	—	—	1-2
56	Pit; cut into F23	4	BA, EPRIA, MPRIA pottery	—	prob. 2
57	Posthole, c. 30 cm. diameter, 15 cm. deep	4	—	—	?
58	Ditch	2; 4; 8.s5	BA, EPRIA, LPRIA pottery	13.1; 14.40	3
59	Field ditch, c. 1 m. wide by 0.5 m. deep	2; 4	BA pottery	—	1
60	Posthole, c. 30 cm. diameter, 18 cm. deep	2	EPRIA pottery	—	2
61	Posthole, c. 23 cm. diameter, 15 cm. deep. Pairs with F60.	2	—	—	2

62	Clay storage pit	4; 8.s9	—	—	2
63	Posthole; cuts F64	4; 8.s10	—	—	2 or later
64	Pit	4; 8.s10	E, MPRIA sherds	—	2
66	Pit (light brown sandy loam fill)	4; 8.s11	Flint flake; MPRIA pottery	14.35	2
68	Posthole	4	—	—	2 or later
69	Hearth-pit	4; 8.s8	—	—	2
73	Posthole, 18 cm. diameter, 20 cm. deep; ? associated with F60, 61	2	—	—	?2
74	Posthole; cut by F23	4	—	—	1-2
75	Posthole, 23 cm. diameter, 15 cm. deep	4	—	—	?
76	Posthole (seen in section)	2	—	—	?
77	Pit, c. 1.25 m. diameter, 30 cm. deep	2	Flints; EPRIA pottery	20.4, 5	2
78	Ditch (unexcavated); cut by F77	2	—	—	1-2
79	Posthole, c. 80 cm. diameter	3	—	—	? 1-2
80	Posthole, c. 48 cm. diameter, 15 cm. deep	3	MPRIA sherd	—	2
81	Posthole, c. 48 cm. diameter, 17 cm. deep. Pairs with F80	3	—	—	2
82	Stakehole	3	—	—	?

NO.	FEATURE DESCRIPTION	FIG.	FINDS	FIG.	PERIOD
83	Post-pit, <i>c.</i> 1 m. diameter, 60 cm. deep	3	—	—	prob. 2
84	Posthole	3	—	—	prob. 2
85	Post-pit <i>c.</i> 1 m. by 1.1 m., 80 cm. deep. Pairs with No. 83	3; 8.s3	—	—	?2
86	Stakehole	3	—	—	?
87	Pit (cut away by ditch F25)	4; 8.s4	—	—	1-2
88	Posthole (cut away by ditch F25)	4	—	—	1-2
90	Pit, <i>c.</i> 1.8 m. diameter (unexcavated)	6	MPRIA sherds from the surface	—	2
92	Pit in south ditch of F1 (unexcavated)	2	—	—	5 or later
93	Pit in Quarry face	—	RB pottery; firebar	19.10	5
94	Posthole (possibly a gatepost), cut by F5; <i>c.</i> 50 cm. diameter, 50 cm. deep	2; 9.s28	—	—	?3A
95	<i>Grubenhau</i> , 3.9 m. by 3.3 m. by 70 cm. deep, orientated east-west	1; 12	Much Anglo-Saxon pottery	18.129-45; 19.4-5, 14; 20.9	6
96	Field ditch across tip of spur (observed in quarrying)	1	—	—	prob. 3B
97	Pit containing raw and fired clay (possibly a kiln—destroyed without full excavation)	2	Belgo-Roman sherds	—	5A

APPENDIX B

KEY TO PUBLISHED SECTIONS

FIG. 7

Section 30

- Layer (2) —fine medium brown loam with few pebbles.
 (3) —loose fill of large pebbles.
 (4) —fine medium brown loam (? pit).
 (5) —fine grey ash and charcoal.
 (6) —alternating layers of fine brown silty loam and charcoal, sealed by collapsed kiln structure.
 (7) —dark brown loam containing loose pebbles.
 (8) —dirty sand and gravel.
 (9) —dark grey loam, loose and pebbly.
 (10) —light brown, loose sand/pebbles. Pit F35a.
 (11) —charcoal.

FIG. 8

Section 1

- Layer (1) —medium brown pebbly loam.
 (2) —fine dark brown loam with few pebbles and some fired clay fragments.
 (3) —dark brown pebbly loam.
 (4) —loose, large pebbles (collapsed post packing).
 (5) —dark loam.
 (6) —dirty sand and gravel.
 (7) —cleanish sand.
 (8) —dark brown pebbly loam with sand lenses.

Section 2

- Layer (1) —pebbly brown loam.
 (2) —charcoal-rich loam.
 (3) —pebbly brown loam.

Section 3

- Layer (1) —dark brown pebbly loam with charcoal flecks.
 (2) —light brown sandy loam containing pebbles and packing stones.

Section 4

- Layer (1) —medium brown loam containing fragments of fired clay.
 (2) —medium brown pebbly loam.
 (3) —light brown sandy loam.

Section 5

—medium brown pebbly loam, loosely packed.

Section 6

- Layer (1) —brown loam.
 (2) —orange sand and pebbles.

Section 7

- Layer (1) —dark brown loam with a few pebbles.
 (2) —fine greyish loam.
 (3) —medium brown pebbly loam.
 (4) —as for (1).

Section 8

- Layer (1) —dark brown loam.
 (2) —charcoal-rich loam containing calcined flints.
 (3) —pebbly brown loam.

Section 9

- Layer (1) —fine grey loam containing a few pebbles and some flints.
 (2) —dark brown pebbly loam.
 (3) —raw clay (grey).
 (4) —dirty gravel.

Section 10

- Layer (1) —dark brown loam.
 (2) —brown pebbly loam with sand patches.

Section 11

- Layer (1) —medium brown sandy loam.
 (2) —light brown sandy loam.

Section 12

—dark brown pebbly loam with some large flints.

Section 17

—medium brown pebbly loam.

Section 18

—medium brown loam with fired clay particles.

Section 19

- Layer (1) —medium brown loam with a few pebbles and flecks of fired clay.
 (2) —medium brown pebbly loam.

Section 20

- Layer (1) —medium brown pebbly loam.
 (2) —sandy white ash and fired clay, apparently *in situ*.
 (3) —charcoal and ash, containing loose fired clay fragments.
 (4) —dirty sand.

FIG. 9

Section 21

- Layer (1) —topsoil and subsoil.
 (6) —fine dark loam.
 (7) —black pebbly loam.
 (8) —fine black charcoal-rich loam.
 (9) —very pebbly dark brown loam.

Section 25

- Layer (1) —topsoil and subsoil.
 (2) —fine medium brown loam with few pebbles.
 (3) —ginger sand.
 (4) —loose ginger sand and gravel.
 (5) —charcoal-rich loam.
 (6) —similar.

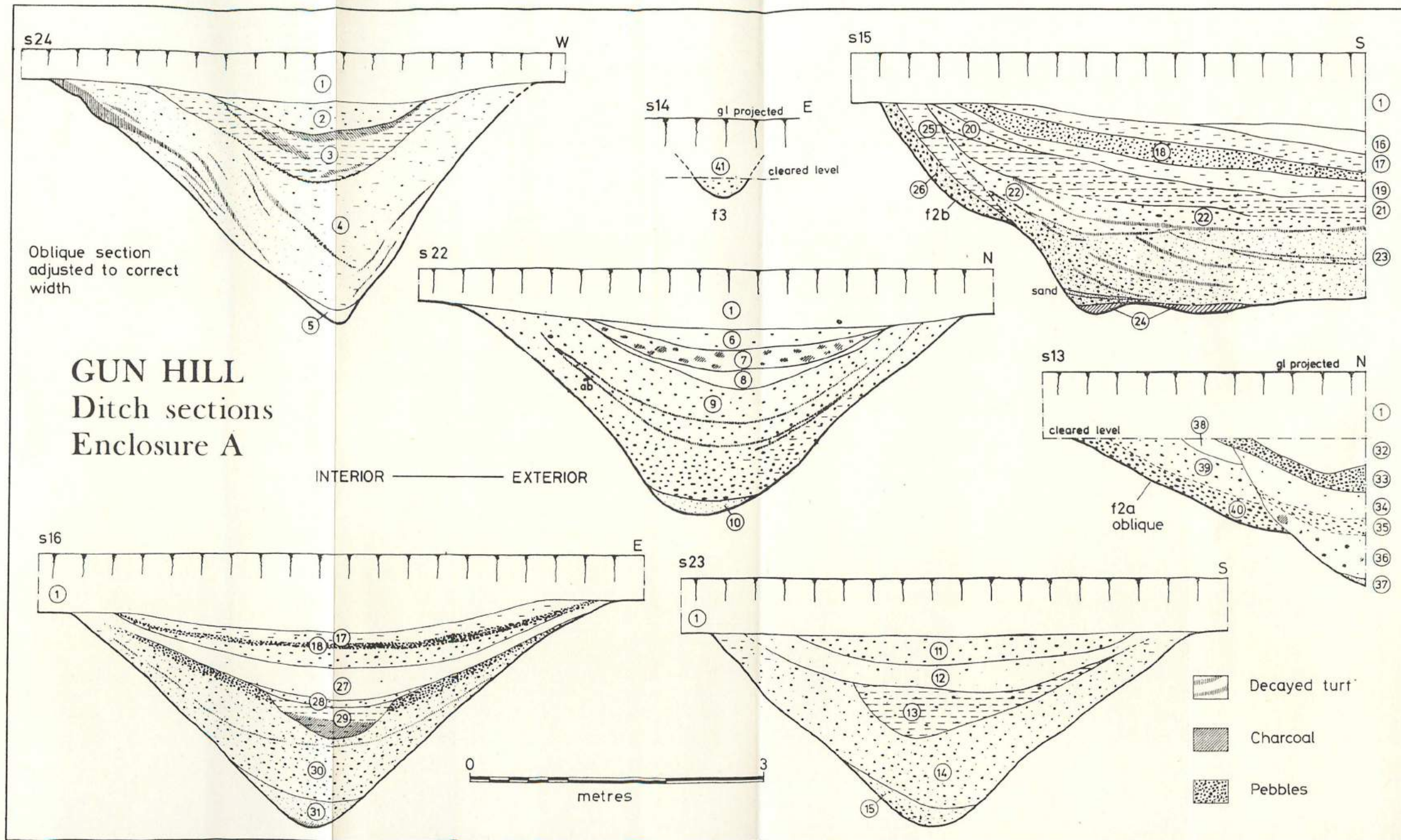


FIG. 10
Sections of the ditch of Enclosure A: s13-16 and s22-24. For key see p. 111.

Section 26

- Layer (1) —topsoil and subsoil.
 (2) —cleanish sand.
 (3) —dark loam streak.
 (4) —loose pebbly loam.
 (5) —loose pebbles.
 (6) —dark brown pebbly loam.
 (7) —ginger pebbly loam.
 (8) —dark loam.
 (10) —medium brown loose pebbly loam.

Section 27

- Layer (1) —topsoil and subsoil.
 (2) —fine sandy loam.
 (3) —dark brown loam with a few pebbles.
 (4) —dirty sand.
 (5) —medium brown loam with a few pebbles.
 (6) —pebbly brown loam.
 (7) —medium brown pebbly loam containing charcoal.

Section 28

- Layer (1) —fine brown loam.
 (2) —brown sandy loam.

Section 29

- Layer (1) —medium brown loam, few pebbles.
 (2) —loose pebbly loam.

FIG. 10

Section 24

- Layer (1) —topsoil and subsoil (and in following sections).
 (2) —medium brown pebbly loam.
 (3) —fine grey loam containing a few pebbles and some large flints; also patches of charcoal.
 (4) —fairly clean sandy fill containing clear turf lines (tips).
 (5) —fine brown sandy loam.

Section 22

- Layer (6) —medium brown loam with some pebbles.
 (7) —charcoal rich loam.
 (8) —fine brown loam with a few pebbles.
 (9) —loose dark brown pebbly loam.
 (10) —dirty sand with a few pebbles.

Section 23

- Layer (11) —dark brown pebbly loam.
 (12) —medium brown sandy loam.
 (13) —fine dark grey loam and pebbles.
 (14) —loose dirty sand and pebbles.
 (15) —dirty sand and gravel.

Section 15

- Layer (16) —fine medium brown loam.
 (17) —similar with some pebbles.

- (18) —similar, very pebbly.
- (19) —fine brown silty loam with few pebbles.
- (20) —medium brown pebbly loam.
- (21) —grey silty loam, fairly pebbly.
- (22) —medium brown pebbly loam.
- (23) —sandy loam containing many pebbles and turf lines.
- (24) —charcoal-rich loam.
- (25) —fine grey silty loam with few pebbles.
- (26) —dirty sand and gravel.

Section 16

- Layer (27) —fine medium brown silt with many pebbles.
- (28) —medium brown pebbly loam.
- (29) —fine grey, charcoal-rich loam (pit).
- (30) —dirty sand and gravel with turf line.
- (31) —cleanish sand with some pebbles and charcoal in the bottom.

Section 13

- Layer (32) —fine medium brown loam.
- (33) —loose pebbly loam.
- (34) —brown loam with a few pebbles.
- (35) —dark brown pebbly loam.
- (36) —fine brown loam with some pebbles and charcoal patches.
- (37) —dirty sand.
- (38) —fine brown loam, few pebbles.
- (39) —dark brown pebbly loam.

Section 14

- Layer (41) —medium brown pebbly loam.

FIG. 12

Sections 32 and 33

- Layer (1) —topsoil and subsoil.
- (2) —ginger brown loam with some pebbles.
- (3) —cleanish yellow sand.
- (4) —streak of lighter sand.
- (5) —sandy loam with charcoal flecks.
- (6) —brown loam containing much charcoal.
- (7) —charcoal tip.

Observation of Roadworks in Thurrock 1969-70

By P. J. DRURY

SUMMARY

SITES observed during the construction of the Tilbury Docks Approach Road and the Stanford le Hope Bypass are noted, including medieval occupation at Little Thurrock and Corringham, and a Romano-British pottery kiln at Chadwell St. Mary.

A. THE TILBURY DOCKS APPROACH ROAD

THE construction of phase III of the Tilbury Docks Approach Road, linking the improved dock entrance with the A13, proceeded during 1969 and 1970. The early stages of the work were not observed, the route passing mainly over marshland¹ or former gravel quarries. In February 1970, however, observation of the cutting into the south-eastern side of Rookery Hill, to accommodate the diverted Marshfoot Road, indicated medieval occupation of the area. Limited excavation was subsequently undertaken, prior to the enlargement of the cutting to produce a safe angle of repose, in May 1970.² (FIG. 1).

Works at the junction of the new road with Chadwell Road necessitated the re-routing of the foul sewer from Grays Palmers Grammar School for Girls. A new sewer was laid across the playing field, from the north-west corner of the swimming pool, to join the main sewer at the junction of Chadwell Road and Wood View. Observation of contractor's excavations for the sewer located a number of features, including a Romano-British pottery kiln and two cremation burials without grave goods. The kiln was subsequently excavated by Mr. W. J. Rodwell. All finds have been deposited in Thurrock Museum.

I. ROOKERY HILL

Rookery Hill, FIG. 2, is the southern end of a narrow spur of the 50' Thames Terrace; its appearance as an isolated hill is due to gravel quarrying. The western slope is steep, the southern less so; a platform below the now wooded summit seems to be associated with second world war defences. Other small disturbances, probably due to gravel digging, are apparent on the south side.

Limited excavation was undertaken in an area where medieval pottery had been disturbed by contractor's excavations. Trimming back the weathered face of the original cutting indicated that beneath the humus was a layer of greyish brown

¹ Without prior excavation. Observation of the subsequent excavation of drainage channels alongside the road was negative.

² Thanks are due to the County Surveyor, Essex County Council, and the contractors, for their co-operation, and to Mr. J. Webb for his observation of contractor's works.

TILBURY DOCKS APPROACH ROAD

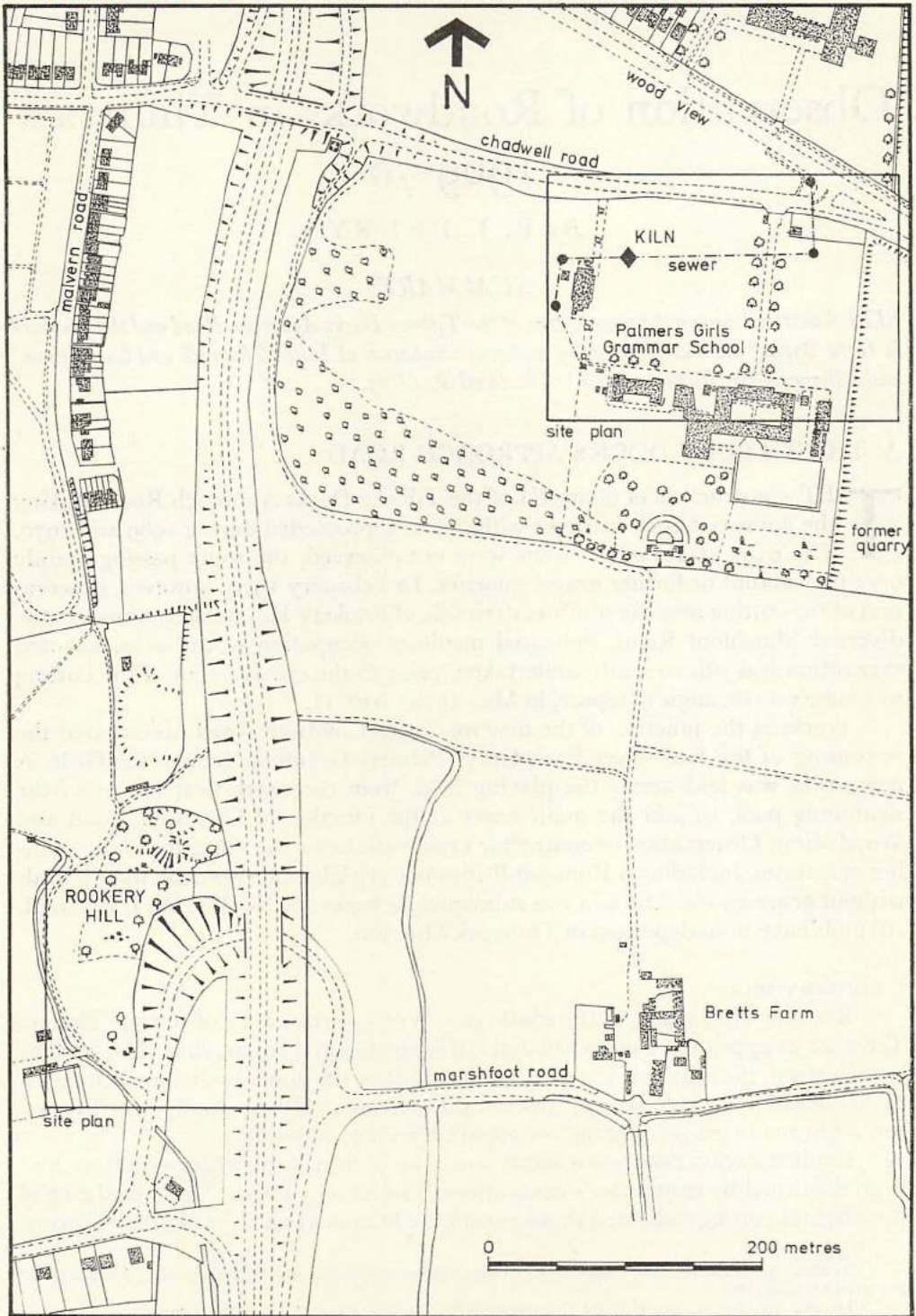


FIG. 1

Based upon the Ordnance Survey plan. Crown Copyright Reserved.

pebbly loam with chalk nodules, L1, containing mostly fourteenth century pottery. This overlay a pit, f2, not fully sectioned. The upper filling, L3, was grey-brown pebbly loam containing much shell and some pottery, and the lower a light brown gravelly loam, L4. Despite the shape of the pit the filling tends to suggest that only one feature was present. A patch of loamy sand, L5, may be upcast from this feature.

To the south, f3, with a mixed filling of chalky boulder clay and orange gravel, L2, seems to be a posthole; the gravel in and around it had been reddened by fire, but the extent of the burning and the absence of ash or charcoal mitigates against its having been a hearth pit. Burnt chalky boulder clay and charcoal patches also occurred above f2, at the base of L1. To the north of these features, L1 tailed out, humus directly overlying the gravel towards the summit. The only other feature encountered was the ditch, f1; it was *c.* 0.7 m. deep with a rounded profile and brown loam filling. The lack of features towards the summit is perhaps more likely due to the effects of erosion and tree roots on gravel than to an original lack of occupation. A few fragments of recent pottery in contractor's excavations were not sufficient to imply post-medieval occupation.

A substantial scatter of flints was present generally, with a concentration on the upper part of the southern slope of the hill. They suggest flint working on the site, in or after the Neolithic period.

THE FINDS (TM 1558)

a. FLINT³

Seventy-one worked flints were found, including one rough core and two core rejuvenating flakes; there were no implements. The remainder consisted largely of fairly broad medium sized flakes, of which about twenty show small irregular areas of apparent steep retouch, though in some cases this may be due to recent damage. Some waste flakes and preliminary trimmings were present. About two-thirds of the assemblage was honey coloured (probably pebble) flint, the remainder being grey blotchy nodular flint probably imported to the site. In the absence of implements the group is not closely dateable, though it cannot be earlier than the Neolithic period.

b. MATERIAL FROM THE MEDIEVAL FEATURES

- F1 Few fragments of brown shell tempered pottery, vesiculated, including one with an applied strip similar to FIG. 3 No. 5. Much corroded iron nail, 30 mm. long.
- F2 Rim in hard grey fabric with fine sand and shell tempering (FIG. 3 No. 1). Several sherds in a similar fabric, brown/grey, vesiculated. Sherd in fine hard reddish brown fabric with mottled external green glaze. Small abraded sherd, coarse black fabric with grog and probably vegetable tempering; possibly a Belgic stray.

³ This section is based on a report by Mr. C. J. Dunn, to whom my thanks are due. It has been deposited with the finds in Thurrock Museum.

ROOKERY HILL Little Thurrock

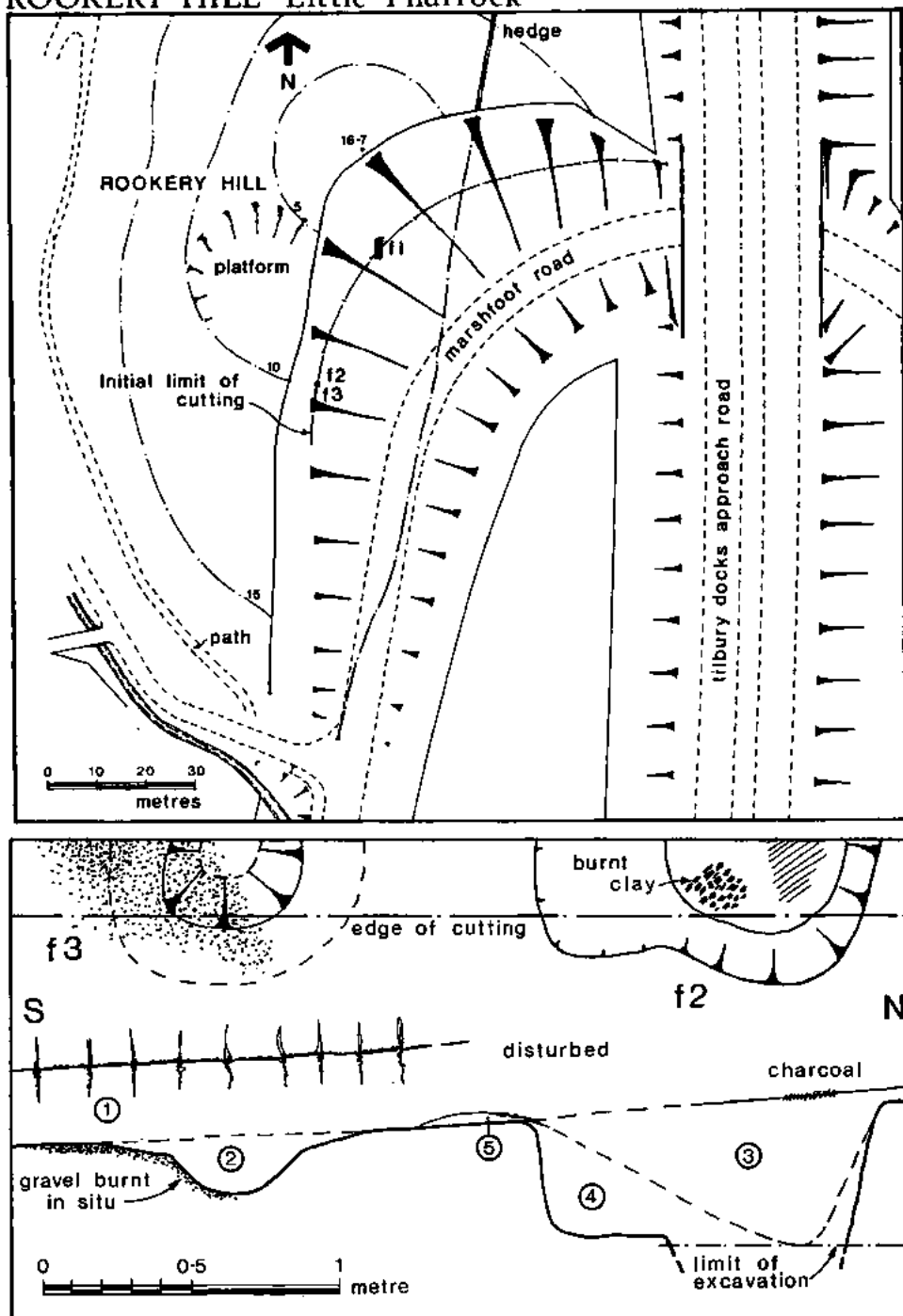


FIG. 2
Rookery Hill excavations.

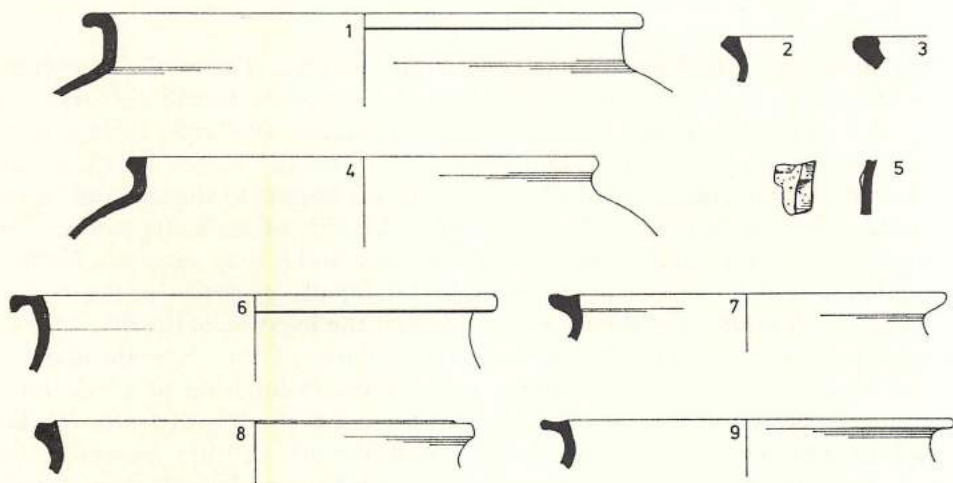


FIG. 3
Rookery Hill: Medieval pottery. Scale $\frac{1}{4}$

Many oyster shells, together with indeterminate long bone and rib fragments and a fowl bone.

F3 No finds.

Layer 1, area of features 2 and 3:

Rims, mostly of large diameter vessels, FIG. 3 Nos:

2 Reddish brown fabric, grey core, shell tempered.

3 Reddish brown fabric, coarse gritty tempering.

4 Reddish brown fabric, grey core, shell tempered.

5 Dark grey fabric, shell tempered, decorated with applied strip.

6 Reddish brown fabric, grey core, shell tempered and vesiculated.

7 Dark grey, hard sandy fabric.

8 Red fabric, light brown core; fairly soft, slightly micaceous.

Not illustrated; sherds of brown vesiculated and grey sandy fabrics, shell tempered sherd 10 mm. thick seriously eroded and vesiculated.

Oyster shells and a few indeterminate long bone fragments.

Unstratified from Contractor's excavations:

Rim in hard grey fabric with brownish red surfaces, FIG. 3 No. 9.

Few sherds of recent pottery not illustrated.

Dating: The only significant vessel from the features, No. 1, is paralleled at Writtle, period 1A,⁴ and seems securely to belong to the thirteenth century; other material from features 1 and 2 would not be at variance with such a date. From LI Nos. 2, 3 and 5, also seem to belong to the thirteenth century, 2 being paralleled at Waltham Abbey⁵ in a context dated *c.* 1150-1250. The remaining vessels, 6-9, probably belong to the fourteenth century.

⁴ Rahtz, P. A., *Excavations at King John's Hunting Lodge, Writtle, Essex, 1955-7*, 1969, fig. 52, No. 11.

⁵ P. J. Huggins, 'Monastic Grange and outer close excavations, Waltham Abbey, 1970-2' in *Essex Archaeology and History*, Vol. 4, 1972, fig. 19, No. 6.

COMMENT

The presence of the flints is to be expected in the area. The medieval pottery indicates that occupation began in, perhaps early in, the thirteenth century, and continued into the fourteenth century. On the evidence available, little can be said of the nature of the occupation, though substantial timber buildings are suggested by the presence of chalky boulder clay, an import to the site and much used in Essex as an impermeable bedding for the cills of such structures. The amount of pottery and shell in the area of features 2 and 3 may suggest a kitchen area, which would provide a context for the pit f2; the evidence of fire is also pertinent. The dominance of shell over bone reflects the location of the site.

The spur gives a commanding view, particularly of the riverside marshes which it abuts; this perhaps was the reason for the occupation of a relatively inhospitable spot. There is some evidence that the use of the Thames marshes for seasonal grazing developed from twelfth or thirteenth century onwards, for example, from the pottery found on the red hills on Canvey Island, these apparently being used as refuges at high tide.⁶ This could perhaps provide a context for the origin of the site; whilst a shift 350 m. to the east, to Bretts Farm, may provide a possible explanation of its abandonment.

II. GRAYS PALMERS GRAMMAR SCHOOL FOR GIRLS

The kiln located in the sewer trench was excavated in the summer of 1970; it was found to have a circular chamber 1.5 m. in diameter and a short flue to the south west. It produced lid seated jars in coarse grey fabric and pedestal urns and flagons in a fine fabric, coated with a cream slip. Waste from other presumed kilns in the area included mortaria stamped with a herringbone mark of a previously unrecorded type. The kiln was active in the later second century. A full report is forthcoming in *Essex Archaeology and History*.⁷

B. THE STANFORD LE HOPE BYPASS

Observation was undertaken⁸ during the construction of the Stanford le Hope Bypass, commenced early in 1970. Much of the western section of the route passed through former gravel workings, principally the Dobson and Ellis pit (TQ 687 838) which had produced material of Romano-British and Saxon date;⁹ many other areas were seriously disturbed. To the east of the Sorrells roundabout (5 on map) the road followed closely the pre-existing Thames Haven Road, diverting from it at Corringham to join Manor Way at the edge of the marshes. The improvement of this road was included in the contract; new sections were,

⁶ W. J. Rodwell, 'The Excavation of a Red Hill on Canvey Island', *Trans. Essex Arch. Soc.*, Vol. 2 (Third Series), 1966, p. 14.

⁷ This note was supplied by the excavator, Mr. W. J. Rodwell, who also supplied the illustration, fig. 5, 3.

⁸ By the writer, and Messrs. C. B. R. Barnard, R. Bingley, W. T. Jones and J. Webb, who have supplied the information summarized here. Thanks are due to the Engineer and Surveyor, Thurrock Urban District Council, and the contractors, Messrs. Higgs and Hill, for their co-operation, and the Department of the Environment for a small grant which covered the expenses of the work.

⁹ *Victoria County History of Essex*, vol. iii, 1963, p. 181.

however, built directly on the ground surface and observation of ancillary drainage works revealed neither finds nor features. The locations of the sites described below are shown on FIG. 4 (1-4) and the location map, p. 7, (5-6); the finds have been deposited in Thurrock Museum, accession numbers being given where available.

Site 2: TQ 7095 8315

Scraping for the slip road to Rookery Hill produced the following, in what appeared to be silt and soil accumulated in a small natural valley;

Flint

Lower Paleolithic flake, FIG. 5, F1. Mr. J. Wymer¹⁰ writes: 'It is a primary flake, rolled and stained with bifacial secondary working. The shape is fortuitously pointed and although I would hesitate to claim that this is a specialized tool type, it clearly resembles a small hand axe and I believe was intended for the same purposes.' The edges have suffered recent damage. TM 1554(1).

Scraper in dark grey flint, finely pressure flaked on the end; FIG. 5, F2, TM 1159.

Three flakes, one showing possible secondary working (?or damage) on both edges. Probably of Neolithic or Bronze Age date. TM 1554 (2-4).

STANFORD LE HOPE BYPASS A1014

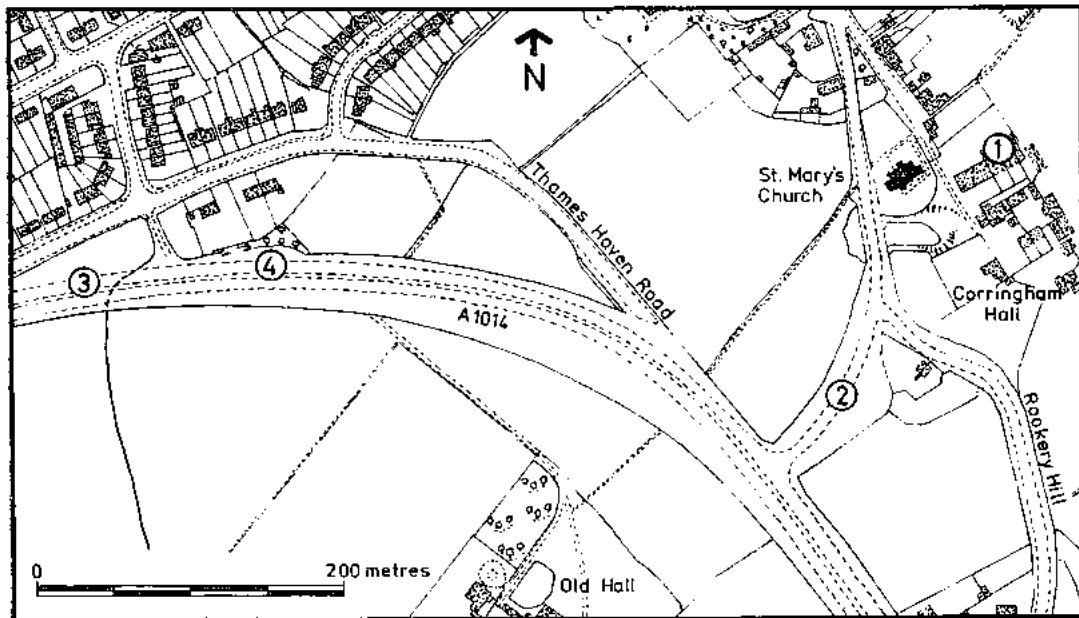


FIG. 4
Based upon the Ordnance Survey plan. Crown Copyright Reserved.

¹⁰ In a letter to Mrs. M. U. Jones, 14.8.70.

Pottery

Scatter of mostly small, abraded sherds of twelfth to nineteenth century date; TM 1138.

Site 3: TQ 7046 8323

Scraping across the line of an old watercourse, surviving in a much diminished form as a field boundary, produced a scatter of pottery fragments; more were found in the upcast from a surface water drainage trench south of the west-bound carriageway. The section was unfortunately not observed.

The material (TM 1555) was as follows:

FIG. 5, 1

Jar in hard grey fabric with buff surfaces, heavily tempered with fine sharp flint grit. The base is soot encrusted. From the drain upcast; thirteenth/fourteenth century.

FIG. 5, 2

Rim in black, vesiculated, soapy fabric. From the drain trench; probably 12th century.

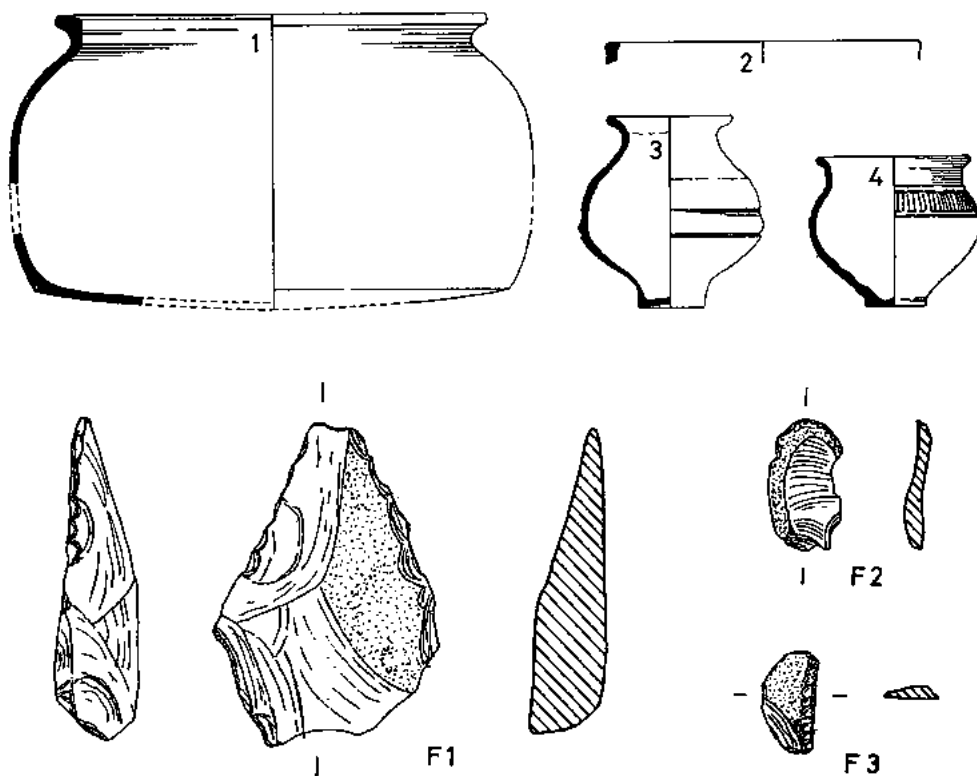


FIG. 5
Stanford le Hope Bypass: Pottery, Scale $\frac{1}{2}$, and Flints, Scale $\frac{1}{2}$

Not illustrated

Rim sherds of two vessels, similar form to 5, 1, in hard grey-brown fabric; one with good green glaze externally below rim.

Many small medieval and post medieval sherds dating from the twelfth century onwards, the post medieval being in the minority.

Romano-British grey everted rim sherd, oxidized externally.

Much abraded sherd of Central Gaulish terra sigillata, form indeterminate, Antonine period.

Fragment of a Rhenish lava quern, probably Romano-British.

Site 4: TQ 7057 8324

In the make up of the former track to Corringham Old Hall, three grey/red sand tempered body sherds of Medieval date were found, together with a fragment of a Romano-British bonding tile 30 mm. thick, burnt after breakage (TM 1556).

Sites 1-4: Comment

The existence of a Roman site to the north of the road line here seems probable in view of the material in the watercourse. The area is fully developed, however, and the only chance find recorded was made in 1959 during the construction of a Dutch barn at Corringham Hall Farm.¹¹ This was a small jar of fine medium grey fabric (FIG. 5, 3, TM 464), deposited complete but broken at the time of finding. The wall is very thin near the base and there is a slight corrugation on the girth of the body. The vessel was lip-dipped externally (which ran just inside the lip), and was probably burnished all over, but the lower part of the body is now severely abraded. A second century date seems likely; it probably accompanied a burial.

Whilst the scatter of medieval pottery on site 2 is probably derived from the Corringham Hall area, the quantity and size of the material from the watercourse, especially No. 5, 1, suggests that it was derived from a site in the immediate vicinity, in existence from the twelfth century onwards but perhaps not surviving the medieval period.

Site 5: TQ 6998 8298

A fragmentary implement in brownish-grey translucent flint was found near the Sorrells roundabout. The British Museum¹² describe it as 'a fragment with fine pressure retouch suggesting Beaker or Bronze Age technique. The shape of the original tool is uncertain, possibly a small knife'. (FIG. 5, F3; TM 1156.) Nothing of pre-eighteenth century date was found further west, near the site of Abbott's Hall.

Site 6: TQ 6798 8288

Observation of the preliminary scraping in the area of the intersection with the A13 revealed only a much abraded Romano-British mortarium fragment

¹¹ *Essex, ibid.*, iii, p. 123.

¹² In a letter to Thurrock Museum.

(TM 1557) at TQ 681 831. It is a flange rim type, the flange probably once reeded, dating from the second century. However, during the progress of the work the contractors uncovered a quantity of timber, thought to be the remains of a well in alluvium on the eastern side of Horndon Brook, at about 1.5 m. below ground level under the north-west verge of the original A13 carriageway. The material was tentatively dated to the Roman period by a small complete jar²³ found by the contractors apparently in association with the timber. The vessel was in grey ware, with a much eroded surface; it perhaps belongs to the second century (FIG. 5, 4).

Mr. W. T. Jones examined and recorded the timber *in situ*; his report will be published in due course.

²³ The illustration is after an original drawing by Mr. J. Webb.

Prehistoric, Roman and Saxon Finds from Stanford le Hope

By K. A. and W. J. RODWELL

IN NOVEMBER 1968 Thurrock Museum acquired the J. G. Coates Collection of antiquities obtained from workmen engaged in gravel quarrying at Stanford le Hope, probably during the 1930s.¹ The exact provenance of the material cannot be ascertained with certainty and whilst it may well have come from the Dobson and Ellis pit, which is known to have been yielding much archaeological material about that time (TQ 687828)² Mr. Bingley has established that three other quarries were operating in the area and which cannot be ruled out. The collection comprises nine flint implements, five Romano-British pottery vessels and one Anglo-Saxon pot.

The Flint Implements

FIG. 1

On first sight this would appear to be an acceptable collection of quarry finds of Neolithic/Bronze Age date; there are traces of orange sand in the crevices. On closer inspection, however, certain problems are encountered, as some of the flints display unorthodox features which are difficult to explain. No. 1 could be seen as either an Upper Palaeolithic handaxe, or as a large Neolithic "Thames pick". Dr. J. d'A. Waechter has kindly examined it and is of the opinion that it is not a genuine handaxe, but could be an attempted forgery of one. Viewed as a Neolithic pick it is also difficult to accept, on the grounds that it is exceptionally large, unusually angular in section and steep-butted.³ No. 2 is a smaller pick of more acceptable proportions, but is nevertheless crudely flaked and retains its cortex in places. Nos. 3-7 are barbed-and-tanged arrowheads of incredibly poor manufacture; and in the case of No. 3, at least, it is clearly made from a flake, the bulb of percussion of which is still visible on one of the barbs. Finally, Nos. 8 and 9 are a pair of knives displaying somewhat better workmanship.⁴

There are thus three possible explanations to be considered for the origin of these implements: first, they could all be recent forgeries, but probably made by different people. Here it should be noted that there is no record of forgeries being made or circulated in the locality; indeed it is hard to envisage a worthwhile market for antiquities in the area. Secondly, they could all be genuine and rep-

¹ The finds were brought to the writers' attention by Mr. R. Bingley, then Assistant Curator at Thurrock Museum, to whom thanks are due for much help in the study of these objects and their background.

² *V.C.H., Essex*, iii (1963), 181.

³ Dr. A. Rosenfeld and Dr. I. H. Longworth have also examined this and expressed uneasiness about its being genuine.

⁴ Dr. D. L. Clarke examined Nos. 2-6 and, whilst expressing some reservations about all, he considered the arrowheads particularly suspect.

resent an uncommonly primitive industry; this is difficult to accept, as the implements are not likely to be of contemporary date and similar implements showing far superior workmanship are well-known in Thurrock. Thirdly, they may be a mixture of genuine and fake artifacts: the arrowheads are the most suspect, followed by the large pick; the others are debatable.

It would be wrong to denounce the whole group as forgeries without much

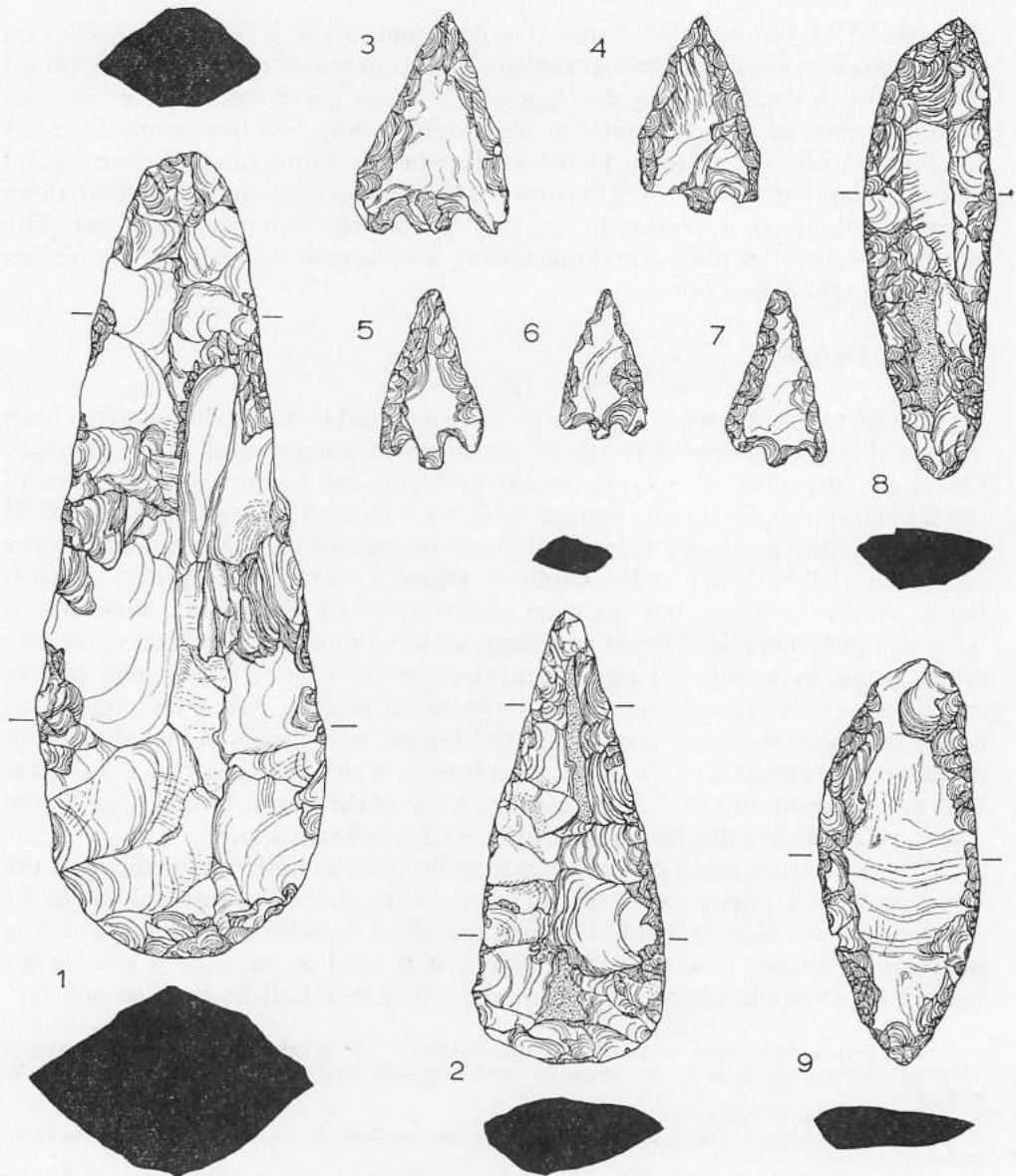


FIG. 1
Flint implements from Stanford le Hope. Scale $\frac{1}{2}$

further evidence. Whether genuine or not, they merit careful consideration, as it will only be a detailed study of similar flints in museum collections in Essex and their comparison with newly-found material that we will be able to discover whether there was active forgery in the county in the 1930s, or simply crude flint-knapping in the Neolithic/Bronze Age.

Romano-British Pottery

FIG. 2

Five complete and undamaged pots were found, which strongly suggests that they were derived from graves. Burials were reported from the Dobson and Ellis pit and from the Stanford Wharf pit (TQ 690811).

1. One-handed flagon in fine buff fabric with chocolate-brown colour-coated exterior, burnished. Probably a Nene Valley product of the fourth century.

2. Jar of reddish-brown sandy fabric with dark brown surfaces; tempered with a small amount of very finely-crushed shell, which has partially dissolved leaving a slightly pitted surface. First century. cf. *Camulodunum* f. 264.

3. Small Romano-Saxon pot in fine, hard red fabric with orange slipped and burnished exterior (the burnishing lines are very pronounced); decorated on the girth with four shallowly pressed-out bosses, each outlined by a surrounding groove. Between each pair of bosses is a group of three dimples in triangular formation.⁵ This vessel was almost certainly made in the area of Much Hadham, Herts., where a substantial late Roman pottery industry has now been identified.⁶

4. Folded beaker in hard, dark grey fabric, with pronounced burnishing lines all over the exterior, including inside the six 'folds'. The body leans slightly in

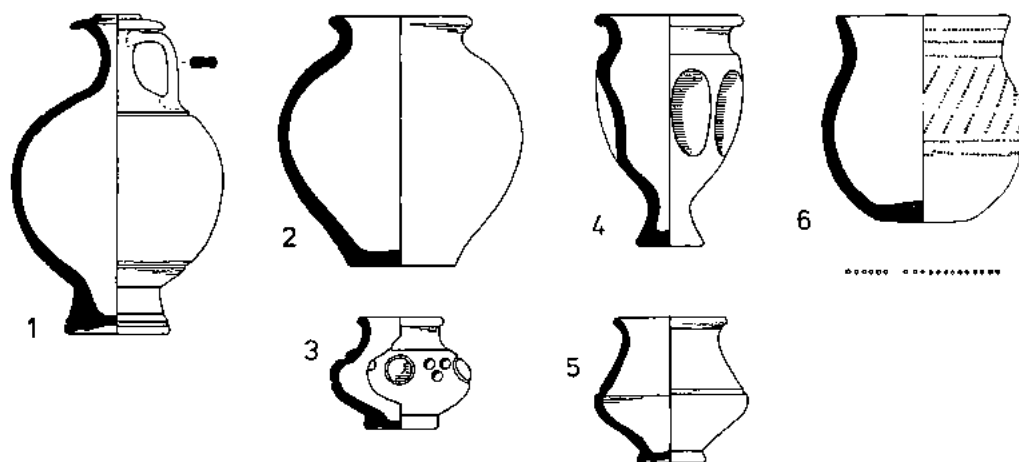


FIG. 2

Pottery from Stanford le Hope. Nos. 1-5, Romano-British; No. 6, Anglo-Saxon. Scale $\frac{1}{4}$ (except comb impression, $\frac{1}{2}$)

⁵ See *Antiq. J.*, 1 (1970), 266 and FIG. 4a.

⁶ We are indebted to Mr. B. Barr for the opportunity to examine material from here.

relation to the base and may be generally described as a rather crude vessel. Probably fourth century.

5. Small carinated cup of fine, hard medium grey fabric, well burnished all over the exterior; the base is also neatly finished. A second-century date seems most likely. cf. *Verulamium*, No. 581.⁷

These vessels clearly range over a long period and, if derived from burials, imply a long-used cemetery.

Anglo-Saxon Pottery

FIG. 2.6

A complete Anglo-Saxon globular beaker was found, again suggesting the likelihood of a grave. It is of black grass-tempered fabric with a slightly 'soapy' medium brown surface. The body has been decorated with horizontal and oblique rows of comb-stabbing. The comb used was 4.1 cm. long and apparently had twenty teeth originally. One, however, was missing, so that the impression on the pot consists of thirteen stabs, a space, and then six more stabs. This decoration can be precisely paralleled on a vessel of similar form, but larger size, from Rainham, where the same broken comb is in evidence.⁸ Instances where the products of one Anglo-Saxon potter can be identified on different sites are rare (apart from the notable decorated works of the Illington/Lackford potter, etc.) and this example shows that even simple pottery was not necessarily a home-product, but could be made with a local market in view. The Rainham and Stanford pots were found some eight miles apart.

Dr. J. N. L. Myres has kindly examined this vessel and considers it to be of early-seventh-century date.

⁷ S. Frere, *Verulamium Excavations*, i (1972).

⁸ *Archaeologia*, xcvi (1955), 170, FIG. 7.3 and PL. LXIIe.

Excavation of Monastic Forge and Saxo-Norman Enclosure, Waltham Abbey, Essex, 1972-73

By P. J. and R. M. HUGGINS

Rescue excavations in the Grange Yard of the monastic home farm of the Augustinian Abbey revealed an early monastic flint-and-stone walled 3-bay aisled forge. There was evidence of iron smelting and lead and bronze working. A well was lined with oak casks.

Underlying occupation of the 10th, 11th and 12th centuries was evidenced by gullies, pits, postholes and a double palisade fence. It is interpreted as part of the outer manorial enclosure.

Finds included iron ore, much bloomery and smithing waste, bar material, blanks, tools and other iron objects. There was a large group of 12th-century pottery mainly shell-tempered, with some glazed imports.

THE town and adjacent Abbey of Augustinian Canons, lay on a gravel terrace to the east of the river Lea (or Lee) in the parish of Waltham Holy Cross, 14 miles due north of Greenwich, London. Waltham Grange, the monastic home farm, lay to the north-east of the Abbey precinct; eight medieval buildings in the Grange Yard have recently been reported¹.

The forge, building XX on FIG. 1, was discovered in the south-west of Grange Yard when the NE. corner was cut by the ditch of an access road. Rescue excavation by the Waltham Abbey Historical Society followed. Stratified under the medieval forge was the boundary of a Saxo-Norman enclosure.

The name *forge* is applied to a blacksmith's shop where general iron working is undertaken and horses may be shod. The site here described is a *bloomery forge* because, besides blacksmithing, iron was being smelted from the ore, blooms of iron being the result of this operation.

DOCUMENTARY by K. N. Bascombe

The site of the excavation evidently lies at the eastern edge of an 11th/12th century enclosure—essentially domestic rather than defensive, since there is no evidence of a ditch outside the palisade. The canons of earl Harold's secular college, established² in *c.* 1060, to replace Tovi's church of the Holy Cross founded in Cnut's reign, are stated³ to have lived in houses adjacent to others in the town, rather than in community, and in fact there is no definite evidence that the college itself possessed any communal buildings other than the church. It is therefore

¹ Huggins, 1972.

² *V.C.H. Essex*, II, 166.

³ Stubbs, 1861, 42.

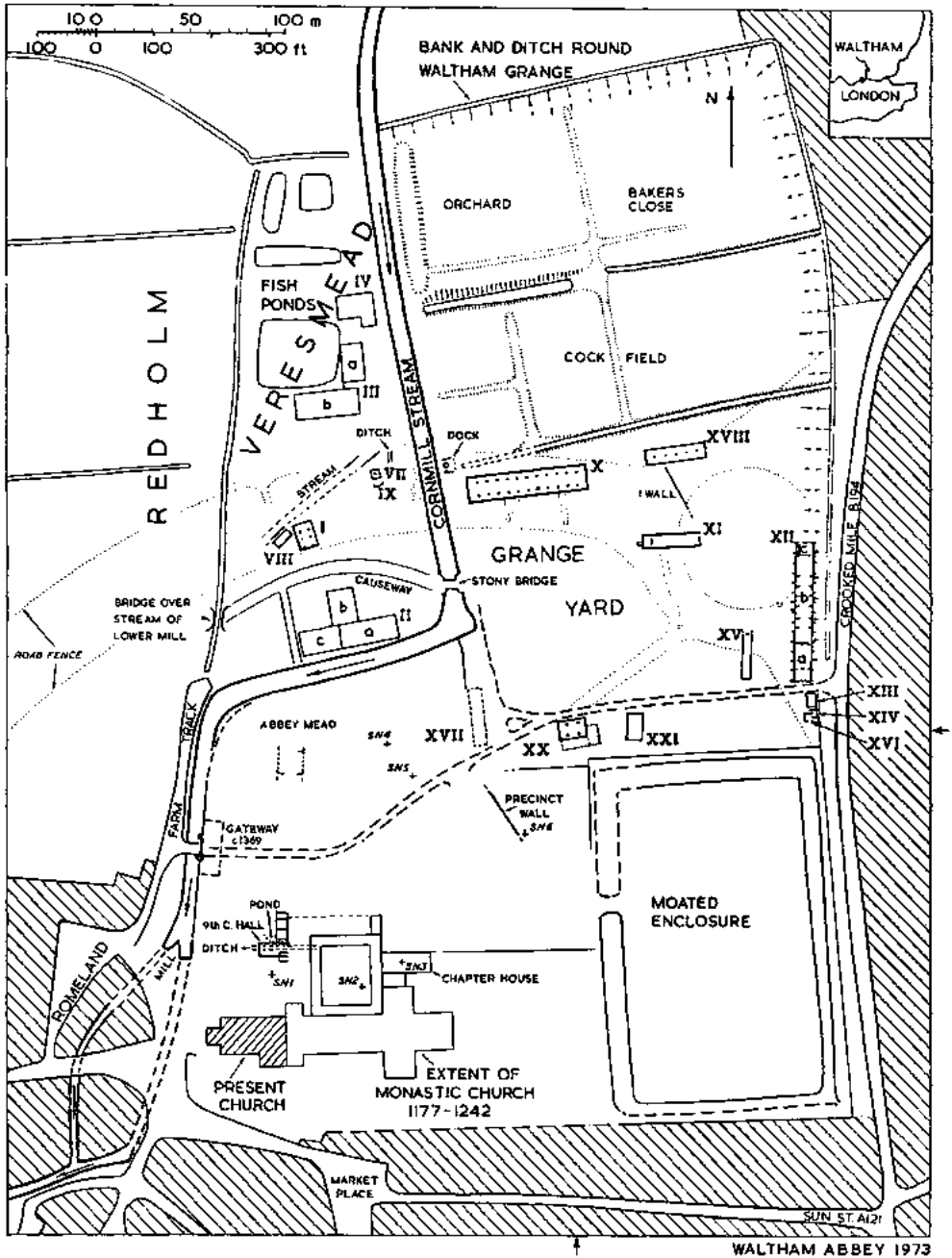


FIG. I
WALTHAM ABBEY, ESSEX
 Site map: the bloomery forge is Building XX in Grange Yard (arrowed).

suggested that the enclosure is manorial rather than ecclesiastical or urban, and comparable with that recorded⁴ in 1265 at the adjacent parish of Chingford. This view is strengthened by the discovery⁵ in 1970 of a large hall (admittedly of earlier date) north of the present church; the first church may have originated as an appanage of such a hall.⁶

The area would then presumably have been included in Tovi's gift⁷ to his church of *villam praesentem scilicet Waltham*. This grant was not fully effective, since the estate was forfeited to the Crown by Tovi's son, Athelstan. Although granted to earl Harold by Edward the Confessor, it was not (with the exception of one area called *Northlande*) given to the secular college. Its subsequent history is discussed⁸ by Fisher. In 1806 Domesday records that it was held by the Bishop of Durham, providing him with a house near London, while from 1163 to 1189 it was leased out by the Crown. In 1177, however, Harold's college was re-founded by Henry II as an Augustinian priory which, becoming an abbey in 1184, obtained, in 1189, a grant of the manor of Waltham from the Crown. At about the same time, in 1190-1, the Abbot obtained⁹ a licence to alter the course of the river at Waltham in order to improve the navigation. This suggests that the Abbot was actively involved with extensive works in the last decade of the 12th century.

The forge itself is first mentioned¹⁰ in an inventory, taken at the Dissolution of the abbey in 1540:

The Smythes Forge 2 anvils the one the *stele* worn out and other *trashe* for a smith

(A longer extract from this document has been printed elsewhere).¹¹ This entry, which appears only because the items mentioned were of monetary value, precedes a section describing *The Graunge*. When, however, in 1541, Waltham Grange was leased¹² to (later Sir) Anthony Denny, who was granted¹³ the reversion in 1544, 'those houses and buildings called *le Forge* and a certain stable assigned to *les charet horses* of the king' were specifically excepted. Royal stables at Waltham had first been mentioned¹⁴ in 1294. The Crown was still interested in the Waltham site in 1552-3, when extensive repairs were carried out¹⁵ to the king's stables and barn at Waltham: large quantities of planks, and of *heletrees* . . . with *quarters* to lay under the same planks were provided for the *great stable* and the *stable where the horses of the close car stand in*. These entries suggest the installation (or replacement) of

⁴ *V.C.H. Essex*, v, 104; this is the manorial enclosure of Chingford St. Pauls, held by the church of St. Pauls in London, it is some 8 km. (5 miles) south of Waltham. The hall, with pantry and buttery, a chapel, a kitchen, a grinding house, a granary, a dairy and a room for the clergy with a privy 'were within the inner gate. Outside the gate lay servants' quarters, granaries, a stable and a kiln, enclosed with ditches, walls and fences. Beyond the middle gate were two byres, and beyond the outer gate was a pigsty.'

⁵ Note in *Medieval Archaeol.*, 15 (1971), 125; fuller report forthcoming.

⁶ As the tract 'de Inventione' printed by Stubbs, 1861, in fact implies.

⁷ Stubbs, 1861, 11.

⁸ *V.C.H. Essex*, v, 155-7.

⁹ British Museum Harleian (hereinafter B.M.Harl.) MS. 391, f. 103.

¹⁰ Public Record Office (hereinafter P.R.O.) E117/11/24, f. 16.

¹¹ Huggins, 1972, 32-3.

¹² Northamptonshire Record Office (hereinafter N.R.O.), W.C. 163.

¹³ N.R.O., W.C. 164.

¹⁴ B.M.Harl.MS. 391, f. 64.

¹⁵ P.R.O., E101/490/9.

lofts; the stables and *great barne* were also tiled (or re-tiled). No mention, however, is made of a forge. Using the numerology previously adopted,¹⁶ the *great barne* must be building X. The reservation of the forge and stable was repeated¹⁷ in a further grant in 1553 to Sir Anthony's widow, Joan. Royal carriage stables at Waltham were still in use¹⁸ in 1587 and would therefore probably appear¹⁹ on the Hatfield House map of c. 1600; principal candidates for these would appear to be building XII (interpreted as a stable) and building XVII (so far unexcavated). These stables could reasonably still have had an associated forge, and in 1608 'all that building called the Forge' and one stable was granted²⁰ to Sir Edward Denny, Sir Anthony's grandson. The site of the present excavation is nearer building XVII than building XII. The building XX is not apparently shown on the Hatfield House map, however it is small in comparison with others which are shown and may have been regarded as insignificant. It therefore seems unnecessary at present to postulate a second forge in the Grange area, as previously suggested.²¹ Certainty is however impossible without excavation of building XVII and the undisturbed area of the Grange Yard.

There is no subsequent mention of the forge, and the later history of the site is that of the Abbey Farm, and has been outlined elsewhere.²²

Relevant references to metal-working are (not unexpectedly in the absence of all the cellarer's disbursement records for Waltham) scattered. The Pipe Rolls between 1179 and 1184 record²³ payments for no less than 290 cart-loads of lead from Yorkshire and the Peak District, *ad operationem ecclesie de Waltham*. This enormous quantity (according to Salzman²⁴ the cart-load varied between 19 cwt and 1 ton) is certainly too large, and the dates on the present interpretation are too early, for the small lead furnace in the forge (another lead furnace, north of the church is also known).²⁵ When a water conduit was constructed²⁶ from Wormley to Waltham in 1220-2 the lead pipes laid were apparently made some at Waltham and some at Stratford, 10 miles south of Waltham. A mid-14th-century reference to Robert de Elinton (abbot 1289-1302) states²⁷ that while the whole church was originally (*primitus*) tiled, it then stood all well covered with lead. No mention has been found of the transport of iron ore to Waltham, but in 1543, in connection with the building of a new lodge for the king, 11s. 3d. was paid²⁸ to John Hallywell, smith, for *makyng* 270 lb of iron; 80 lb of this was worked into hooks and hinges.

¹⁶ Huggins, 1972, 35-6.

¹⁷ N.R.O., W.C. 169.

¹⁸ B. M. Lansdowne MS. 51, f. 71.

¹⁹ Hatfield House, Maps and charts II, f. 23; part reproduced as in Huggins, 1972, Pl. IA.

²⁰ N.R.O., W.C. 194.

²¹ Huggins, 1972, 89.

²² Huggins, 1972, 34-5.

²³ Pipe Roll Soc., 29 (1908), 75 and 137; 31 (1910), 47; 32 (1911), 57.

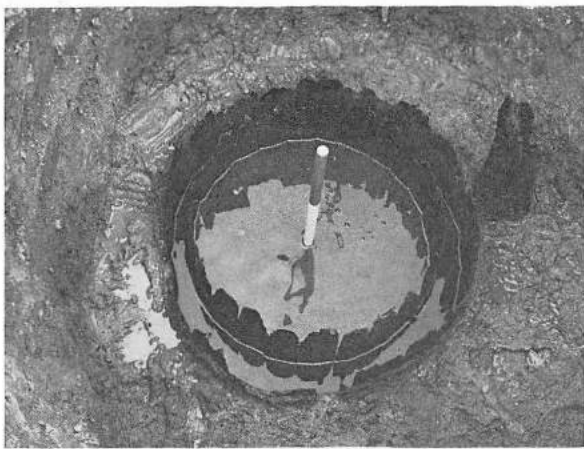
²⁴ Salzman, 1967, 263.

²⁵ In the area of the excavation summarized in *Medieval Archaeol.*, 15 (1971), 125.

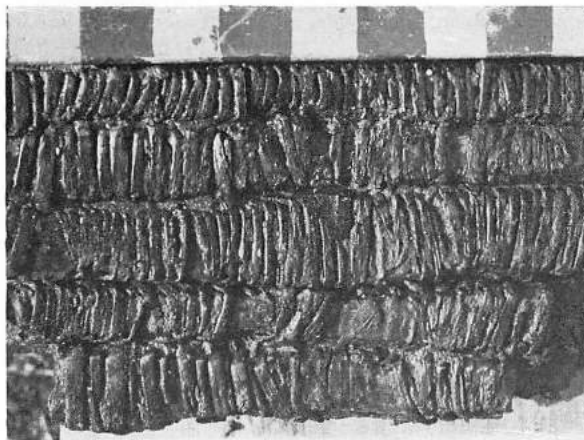
²⁶ B. M. Harl. MS. 391, ff. 1-5.

²⁷ B. M. Harl. MS. 3776, f. 38. This is not entirely clear but may refer to leading of the roof of the early-12th-century nave and aisles; to judge from the quantity of lead mentioned in the Pipe Rolls the late 12th-century extensions must have been so covered when built.

²⁸ P.R.O., E101/545/29, 80.



A



B



C



D

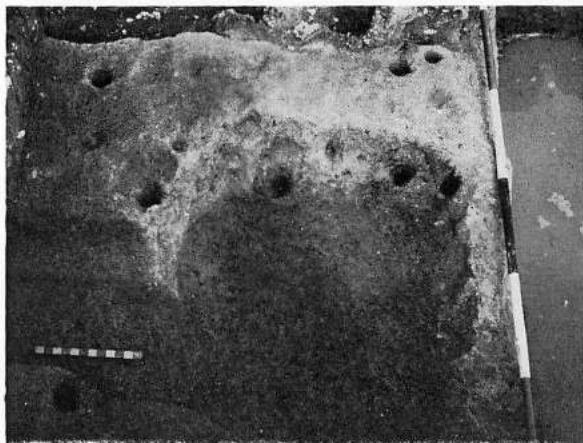
Photos A-D: P. J. Huggins

A and B. BLOOMERY FORGE, WALTHAM ABBEY

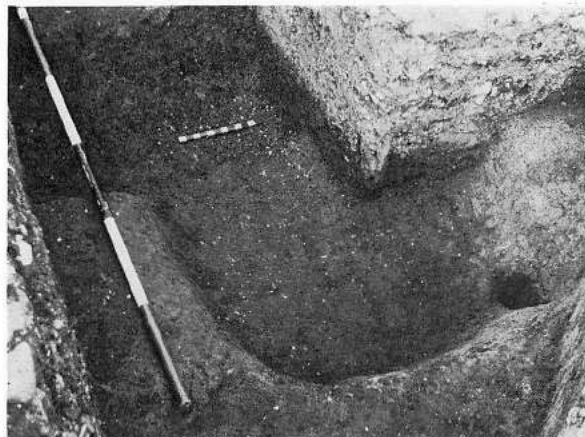
A: Concentric barrels of well. B: Barrel bands bound with withies. Scale in inches.

C and D. SAXO-NORMAN ENCLOSURE, WALTHAM ABBEY

C: View from south-east showing stakeholes of palisade fences (in foreground), pits F185/8, F189/95, F196/9 and ditch F171 (in middle picture). Also seen is medieval lead furnace F25 (right foreground) and edge of smith's hearth F12 (under plastic on right). Scales in feet. D: Pit F209 and 'ditch' F176 showing how foundations of forge wall were carried down to the bottom of earlier features. Scales in feet and inches.



A



B



C



D

Photos A-D: P. J. Huggins

A and B. SAXO-NORMAN ENCLOSURE, WALTHAM ABBEY

A. Pit F212 with surrounding stakeholes, re-cut gully F178 (on left) and 'ditch' F175 (full of water on right, after a storm). Scale in feet and inches. B: Pit F200 with single stakehole and intersecting ditch F171 (at top left). Unexcavated corner is under the forge stylobate. Scale in feet and inches.

C and D. CONSERVATION OF BLOOMERY FORGE, WALTHAM ABBEY

C: View to north west showing repaired smith's hearth F12 (in foreground), partially re-formed robbed stylobate foundations (in centre and at top), highest barrel of the re-made well (at top). D: View from east showing conserved and unconserved parts of north wall of forge, well (at top left).

THE EXCAVATIONS

Part of the forge site was originally to be covered by a car park entrance but, as discovery progressed, the plans were changed and total excavation and conservation of the remains was possible.

The excavation took place intermittently at weekends from February 1972 to April 1973, as other work allowed, and in a two-week period in July 1972. Re-building of the well and conservation of other forge features began during this period and was completed in August 1973.

THE BLOOMERY FORGE; THE BUILDING (FIG. 2)

The forge is a 3-bay aisled building measuring 15.7 m. (51½ ft.) long by 10.1 m. (33 ft.) wide externally, with a lean-to at the south and east. The walls F1 were of mortared flint and stone with some chalk on the inside; ashlar Reigate stone blocks remained at the NE. corner.

It is not clear if the roof would have been supported by timber principal posts or by flint and stone piers.²⁹ In buildings elsewhere³⁰ at Waltham, but timber framed, similar chalk stylobate foundations have supported brick stylobates for timber posts, but no such evidence remained in this case. After a time the stylobates F5 went out of use, as shown by: the SW. foundation being cut away for the clay lining to a pit; the robbing of the NW. foundation; the covering of the NE. foundation by mortared tiles F61 and by the curb F62 of a hearth.

Internal partition ground walls of mortared roof-tile, brick and stone remained. The earliest, F28, possibly followed by F28A, divided the central nave into almost equal parts but left the aisles as passage ways. At the S. end of F28 two Reigate stone blocks were set to hold the post for a door F29 across the aisle. A similar sized opening remained across the N. aisle but seemingly there was no door there.

Further interior walls were added to F28. One such wall, F31, partially laid over the SE. stylobate, defined a passage or compartment in the S. aisle. Later, F34 closed the W. end of the compartment in an awkward manner.

The foundations of the main walls were continuous round the whole building so that entrances are not obvious. At the NE. corner on the E. side the chalk foundations were widened on the inside, and the ground outside was stabilized with large blocks of chalk, so that a small entrance F3 is postulated here; a slab of sandstone (S) remaining in the wall may be part of a doorstep.

No other original entrance was detected but on the S. side a wide doorway F7 is suggested. The chalk and flint foundation had been chopped away over this length and the wall re-made at half width on the outside, perhaps to take a door sill. This postulated entrance some 2 m. (over 6 ft.) wide leads into the small compartment which is about the right size for a horse.

The lean-to was not extensively investigated. On the E. side it was 5.8 m. (19 ft.) wide as defined by a roof-tile ground wall 10 m. (33 ft.) long with end and central buttress. Two clay foundations, presumably for supporting posts, see FIG. 1,

²⁹ Such as in the aisled barn at Cholsey, Berks.; Horn, 1963.

³⁰ Buildings I and X; Huggins, 1972, fig. 1.

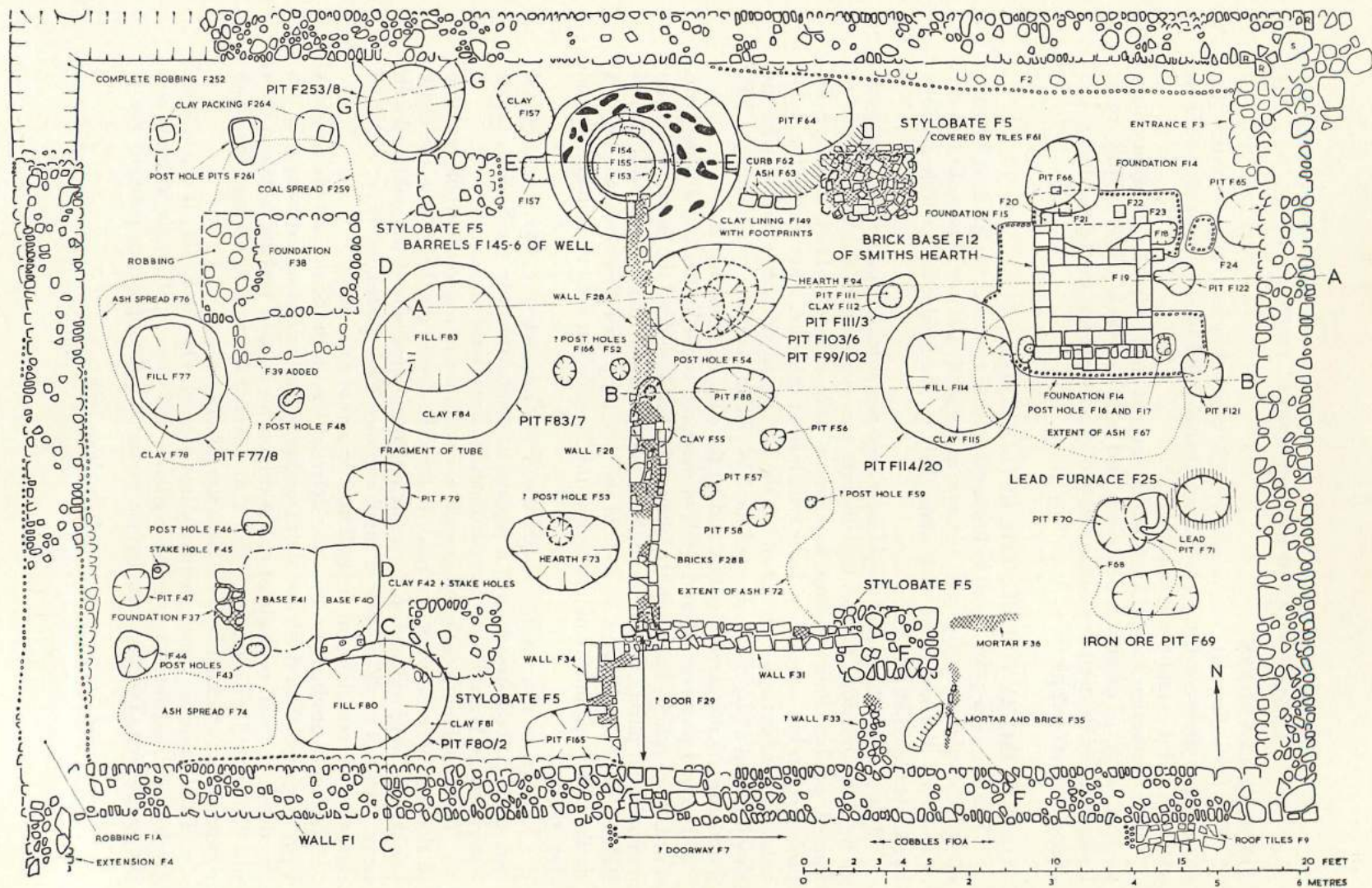


FIG. 2
 WALTHAM ABBEY, BLOOMERY FORGE
 Plan of excavations (p. 131).

indicate that the S. lean-to was c. 4.9 m. (16 ft. wide). The S. lean-to is under grass and a path, the E. lean-to was destroyed during car park construction.

THE BLOOMERY FORGE: FEATURE LIST

The excavated features have been given feature numbers, e.g. F72, under which the feature is described and the significant finds listed. The numbers F1-F168 and F250-F266 apply to the forge period, but only a selected number are listed here.

- F2 Wall foundations of loose gravel and chalk blocks (Pl. ID). Late 12th/early 13th century. *Pottery*: 5D, 7G, 1J1 (Stamford); nos. 135, 138, 139.
- F10 Layer of small cobbles, c. 10 cm. thick, forming ground surface to W. of building. Late 12th/early 13th century. *Slate*: FIG. 15/14. *Iron*: FIG. 12/36. *Pottery*: 24D, 21G, 1H, 12J; nos. 45, 157, 160, 161.
- F10A Layer of small cobbles, c. 10 cm. thick, under lean-to by doorway F7. *Iron*: 130 horseshoe nails in and on this surface.
- F12 Base of smith's hearth, 1.42 × 1.67 m., great bricks (Appendix 5b), 5 courses remained, 4 courses measure 27 cm. (10.5 in.).
- F63 Ash and debris of hearth overlying F61, curb of stones F62. *Stone*: Appendix 5B. *Pottery*: 3D, 3G, 1J, no. 165.
- F66 Pit, 41 cm. deep, filled with coal and chalky gravel under, hard surface of possible hearth remained at east, posthole driven through deposits: *Iron*: FIG. 12/39. *Pottery*: 3M; 16th century.
- F68 Spread of iron ore on clay floor and over F69, 16th century. *Bronze*: FIG. 14/5. *Bone*: Appendix 9 no. 18. *Pottery*: derived, 1M.
- F72 Pile of clinker and ash over F56-59 and F88. Butted up to walls F28 and F31 but was under the added line of bricks F28B. *Iron*: FIG. 11/28.
- F73 Hearth, 20 cm. deep; hard black surface, posthole F53 dug through it. *Iron*: FIG. 11/26. *Pottery*: derived.
- F76 Spread of ash and hammer scale over F77 around smith's hearth F38. *Bronze*: FIG. 14/6. *Pottery*: 8M; 16th century.
- F77 Fill of clay-lined pit with bloomery products, and flints and stones at bottom, c. 25 cm. deep. *Pottery*: 4D, 4G, 3J.
- F80 Fill of second of four large clay-lined (partially) pits with mixed forge products. *Iron*: FIG. 11/7. *Pottery*: derived 12/13th, 1M; 16th century.
- F83 Fill of third of four large clay lined pits, filled with bloomery products. *Pottery*: 1J.
- F85 Fragments of ore + dust and piece of (?) bellows tube. *Iron*: FIG. 11/17. *Pottery*: Derived 12/13th century.
- F94 Hard surface of hearth by well, with clay F95 above.
- F96 Ash and debris over F94 and F95. *Iron*: FIG. 11/5, 32-4. *Bone*: Appendix 9 no. 16. *Pottery*: 1D, 10J, 63M, 2 Raeren stoneware; 16th century.
- F98 Loam with roof tile fragments, particularly dense, over F96. *Iron*: FIG. 12/42.
- F108- Clay and ash of indeterminate feature (section AA). *Iron*: FIG. 11/15, 18. *Pottery*: 110 derived + 2M; 16th century.
- F114 Clay + ash, top of pit F112/20. *Grindstone*: Appendix 9 no. 18.
- F117 Forge debris filling of pit F114/20. *Pottery*: 41D2, 1H; 12th/13th century, either derived or from an early phase of the pit.
- F120 Forge debris with hammer scale filling above F117. *Pottery*: 15D2, 2E, 7G, 1H, 1J1, 1J2, 3M; no. 153; 12th/13th and 16th century.
- F121 Small unlined pit at SE. of smith's hearth, forge debris filling. *Sharpener*: Appendix 9 no. 18. *Pottery*: 2H, 1J, 3M. 16th century.
- F125 Topsoil, c. 25 cm. thick, mostly removed by machine. *Iron*: FIG. 12/41. *Pottery*: 6D2, 15G, 2M, 2 buff, 3N, 2 Delft, 1 combed slipware.

- F126 Destruction debris inside building under F125, some removed by machine. *Iron*: FIG. 11/1, 8, 10, 22-3, 27. *Bronze*: FIG. 14/8, 9. *Pottery*: 1D2, 5G, 3H, 1J, 12M, 2N; 16/17th century + derived.
- F126A Loam with roof tile outside building at east, could cover period of building to destruction. *Pottery*: 1D2, 2G, 1H, 5J, 4K.
- F127 Upper occupation debris of ash, stones, slag, cinders on clay floor F128. *Iron*: FIG. 11/12, 21, 30; FIG. 12/37, 48. *Pottery*: 1D1, 10D2, 16G, 8J, 16M; no. 153, 158, 159; 12/13th century and 16th century.
- F128 Clay floor inside building, in places dug through by pits and postholes. Where possible separated into A and B. *Iron*: FIG. 11/20, 24; FIG. 12/44. *Bronze*: FIG. 14/10-12. *Hone*: Appendix 9 no. 18. *Pottery*: 70D2, 4E2, 97G, 26H, 9J1, 1 Pingsdorf, 1 Raeren; nos. 12, 43-44, 51, 146-8, 150A & B, 152, 154, 155, 157.
- F128A Upper clay floor, separated from F128B by debris or soil. *Iron*: FIG. 11/29. *Bronze*: FIG. 14/15. *Pottery*: 23D2, 23G, 13H, 2J1, 11J2, 62M; 13th-16th century.
- F128B Lower clay floor. *Iron*: FIG. 11/14; FIG. 12/43. *Pottery*: 1A, 1D1, 14D2, 20G, 5J1; nos. 22, 140-5, 149, 151, 156; 12th/13th century.
- F129 Miscellaneous occupation deposits of ash, mortar, charcoal, debris under clay floor. Possibly deposited during building or before. *Iron*: FIG. 11/11. *Pottery*: 4D, 2G, 15H; nos. 38, 127-134; 12th/13th century.
- F130 Loam outside building under F126A to the east. *Iron*: FIG. 12/40. *Pottery*: 1G, 5J2, 9M; 13th and 16th century.
- F132 Loam of buried soil re-deposited between F15 and F111. *Bronze*: FIG. 14/13. *Pottery*: 7D2, 12G; nos. 136-7; 12th/13th century.
- F134 Clay + loam + ash, deposited over F111, F129 and F133 to level of floor after F15 went out of use. *Iron*: FIG. 11/2, 25; FIG. 12, 38. *Pottery*: 1G, 1J1, 1M; 13th and 16th century.
- F136 Loam + ash under track, seen at NE. corner of building only, possibly track foundation. *Pottery*: 1E2, 1J2, nos. 162, 163. Late 13th century.
- F140 Rubble fill to top of well. *Iron*: FIG. 11/6. *Pottery*: 1D, 1G, 1H, 5J; 15/15th century. *Bones*: Appendix 10.
- F141 Dirty clay round top of well above F142. *Pottery*: 2D, 1G, 3J, 1 buff, 1H; nos. 167-8; c. 1300.
- F142 Coal dust round top of well. *Pottery*: 4D, 1H, 2J, 3G, 7H; c. 1300.
- F144 Wet clay fill above barrels in well, not easy to distinguish from lining F149. *Iron*: FIG. 11/4; FIG. 12/45. *Sharpener*: Appendix 9 no. 18. *Pottery*: 5J, 1K, 2M; 15/16th century.
- F147 Grey silt between barrels. *Iron*: FIG. 12/46.
- F148 Grey silt within inner barrel. *Iron*: FIG. 11/31; FIG. 12/47. *Pottery*: 2G, 2H, 3J2; no. 168; c. 1300.
- F149 Dirty clay well lining, footprints where top puddled in. *Bronze*: FIG. 14/14. *Pottery*: 1G, 12J; no. 168; c. 1300.
- F151 Silt below level of inner barrel after it had been removed, hence contained some of F147. *Iron*: FIG. 11/35.
- F152 Lowest silt when both barrels removed including that which fell in from the sides. *Iron*: FIG. 11/16, 19. *Leather*: FIG. 15/15.
- F153 Three blocks of Reigate stone on which inner barrel was set (see Appendix 5B).
- F154 Post at north side of barrels.
- F157 Clay filled hole at top of well, possibly a stepdown to the well. *Pottery*: 1H; no. 166; 13th century.
- F168 Hard black loam under track which crossed NW. corner of building. *Pipe A & O*. 25, 1710-70.3^a

^{3a} Atkinson and Oswald, 1969, fig. 2.

- F252 At NW. corner, complete robbing of walls and foundations, under F168, hence contains 18th-century or derived material.
- F261 Three large postholes, c. 30 cm. deep in NW. corner, in line with N. wall. Possibly posts to support a bench. *Pottery*: 8D, 4G, 3H; no. 22. *Iron*: FIG. 11/9.
- F264 Clay packing to pits for postholes F261, spread around pits. *Pottery*: 11D, 15J, 1H; late 13th/early 14th century.
- F264A Spread of F264 around the pits. *Iron*: FIG. 11/13. *Pottery*: 18D, 4G, 20J.

THE BLOOMERY FORGE: THE WORKING FEATURES (PLAN FIG. 2; SECTIONS FIG. 3)

The dominant feature of a forge is the smith's hearth. This is likely to be a square structure supporting a firebed at waist height. A hood or canopy would take away the fumes and a bellows would produce a forced air supply through a *tuyère*; the bellows might be quite large and require a timber structure to support them. Near to the hearth, so the smith could strike while the iron was hot, would stand the anvil which would fit, possibly by means of a spike, into a timber anvil block. The anvil would be positioned so that the smith could, by means of a part turn, move iron in his left hand from the fire to the anvil. Against or near to the hearth would stand the *bosh*, a water tank used for quenching. An iron rail along one or more sides of the hearth might be provided for the smith to hang his tools upon. A bunker or store for fuel is likely nearby.

Other features in a forge, of which archaeological evidence might remain, are benches, likely to be represented by postholes probably parallel to a wall. Another likely feature is a grindstone supported on a timber structure, again postholes might survive.

There are two features, at least, which are likely to represent smith's hearths, the brick base F12 (PL. 2C), on chalky gravel foundations F14, and the flint and chalk foundation F38; these stand in comparable positions in the northern corners of the building. Each has a separate foundation F15, of chalky gravel, and F39, of mortared flint, which could have supported the bosh. The brick hearth has associated postholes F18 to F23 to the north, which could have supported the canopy and two to the south F16 and F17 which could have supported a tool rail; also a separate foundation F24 was of similar material to the main foundation and may have been used to support the bellows. The foundation F38 did not have such postholes but the base itself could have supported the canopy, bellows and rail. Coal was found to the north of each hearth, in a pit F66 by the brick hearth, and as a spread F259 near the other hearth.

Hammer scale had accumulated close to the two hearths above. It was also found in the SW. corner around the features F37, F40 and F41. Two of these are described as bases on the plan (FIG. 2) and one as a foundation since it remained to a greater height with mortared flint and stone. These remains may possibly represent a third smith's hearth. Little can be said of the purpose of the nearby postholes; they need not be associated.

Perhaps the most significant features in the building were the five clay-lined pits F77/8, F80/2, F83/7, F111/3 and F114/20. They are seen in plan, FIG. 2, and some are in the sections, FIG. 3; their contents are discussed in Appendix 2. The

pits would have been suitable for smelting³¹ iron ore and for subsequent bloom re-heating. The sections show that the pits were dug through the old ground surface F170 and into the natural clay; they were lined, used, partially filled, sometimes re-cut, used again and finally backfilled. An alternative suggestion is that the pits were quenching tanks; one pit, F77/8, contained a silty deposit at the bottom. See discussion on p. 141.

Other pits were not clay lined but were similarly filled with waste smelting and smithing products. One of these, F253/8, contained 60 kg. of waste material,

³¹ This primitive method of smelting in bowl furnaces is known at High Bishopley in Weardale in the 12th or 13th century and elsewhere; Tylecote, 1962. Its survival into the later medieval period seems exceptional.

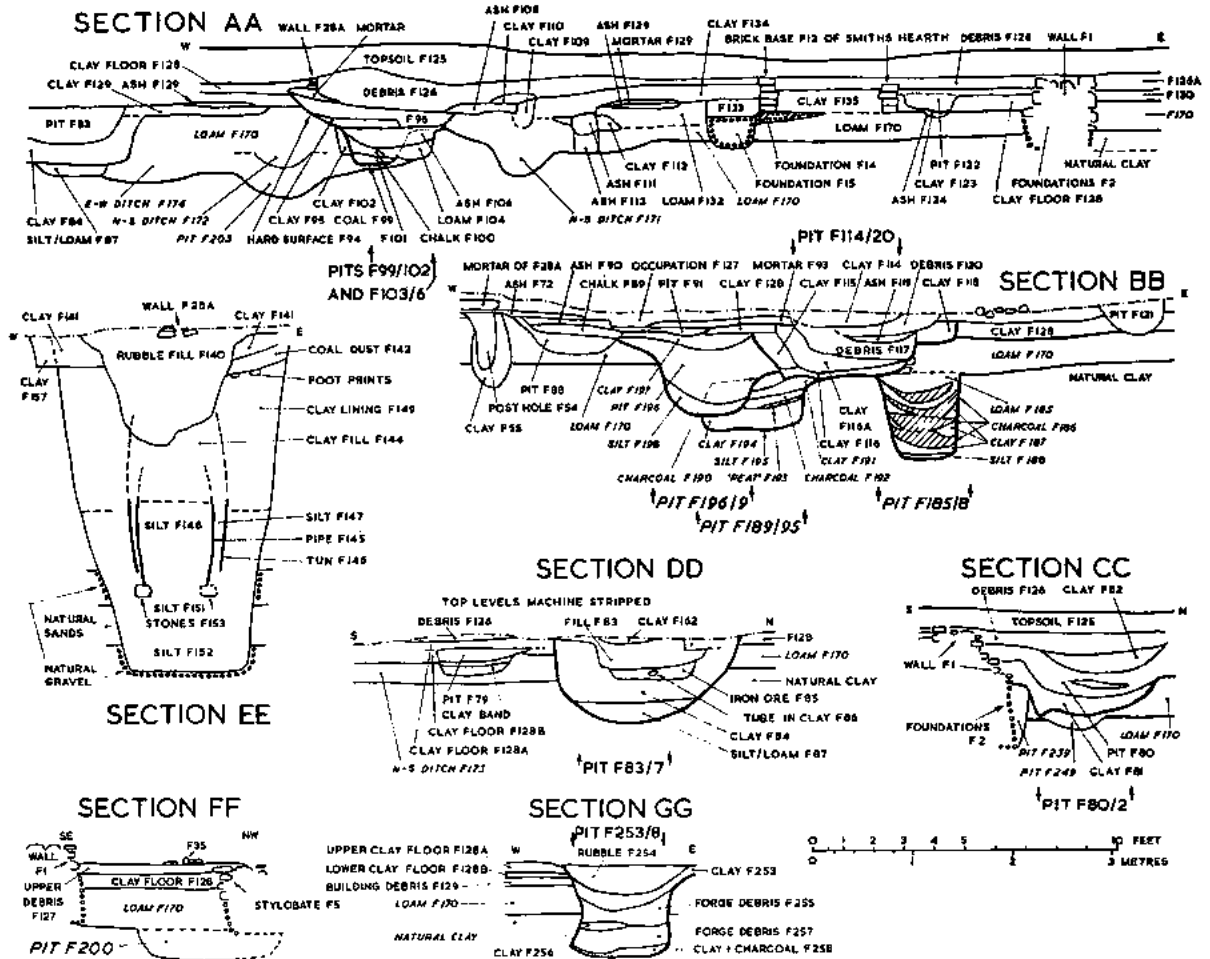


FIG. 3

WALTHAM ABBEY, BLOOMERY FORGE AND SAXO-NORMAN ENCLOSURE

Sections AA–GG, for location see figs. 2 and 4. (Forge and enclosure features are in upright and sloping fount respectively).

the others were small. One pit stood out from the rest, F99/102, in that it was lined with coal dust, FIG. 3/AA; this was the only pit in which evidence of heating remained, the surroundings being ochre in colour and friable; this pit did not contain smelting or smithing waste.

A clay floor, F128, was laid on the old ground surface; in places it was much disturbed. The original clay floor could have resulted from the digging of the foundation trenches for the walls and stylobates; this would have resulted in a floor thickness of c. 7 cm. Further clay could have been spread as the deep pits, including the well, were dug. In some places the floor was separated into layers F128A and F128B by the presence of occupation debris between.

Set into the floor were two hearths with a hard surface, F73 and F94, and there was also a fire area with a curb of stones F62 and ash F63. Horseshoe nails were found in the deposit F96 of the hearth F94 (Appendix 6) and may indicate that small objects were heated in the ground hearths rather than in the raised smith's hearths.

Lead was melted in a simple hole in the ground F25 (PL. 1C and Appendix 8). There was evidence that the lead was tapped into a nearby pit F71 by piercing through the side of the furnace. The lead was melted with charcoal, that for use could have been ladled out.

A small amount of solidified spillage showed that bronze was melted. This would have been accomplished in a crucible. Crucibles could have been heated in some of the small pits but there was no direct evidence of this, neither were any crucible fragments recognized.

A wall bench is probably represented by the three post-pits F261 at the NW. corner of the forge. Other postholes may represent benches or the position where the grindstone stood, but no definite conclusions can be drawn.

A water supply was achieved by digging an internal well 3.4 m. (11 ft.) down to the water bearing gravels. The hole dug tapered from nearly 2 m. (6 ft.) diameter at the top to 1.2 m. (4 ft.) diameter at the bottom. It may have been in use for a considerable time as a water hole since silt filled the full diameter for about half the depth of the well (FIG. 3/EE). Two barrels (PL. 1A and B and Appendix II) were inserted into this primary silt as a well lining; one would presume that the smaller *pipe* was inserted when the *tun* had become ineffective. The space between the barrels and the edge of the pit was filled with a clay lining F149 which was puddled in at the top as evidenced by the footprints which remained (FIGS. 2 and 3/EE.) Coal dust F142 filled the footprints and a further layer of clay F141 was deposited over it. It is not clear what the well was like above the level to which the barrels would have extended; remains of a third barrel were found in the silt. For instance, a second *pipe* on top of the lower one would have brought the top close to that of the floor inside the forge. When the well went out of use it was filled with clay F144 and rubble F140. The water level, judging from the rotting of the barrels, was about 1.7 m. (5½ ft.) from the coal dust surface so that the water did not have to be raised far. Since, presumably, only men were involved in raising the water, a windlass might appear unnecessary, but the remains of a timber post F154 to the north of the barrels and two large nails (Appendix 6,

Timber nails type 9) in the clay lining F149, may represent the remains of a superstructure. For raising water a small distance, a simple lever might be used, in this respect the posthole F54 set in clay packing F55 to the south may be significant; both the well and this posthole went out of use when the wall F28A was built. An iron bucket strap (FIG. 12/45) was found in F144 just at the top of the remaining barrels. Pottery jugs, the predominant ceramic form, were probably filled from buckets at the well side.

THE BLOOMERY FORGE: DATING

Pottery in miscellaneous deposits F129 on top of the old ground surface F170 but under the clay floor F128, and a few sherds found in the foundations F2 are consistent with a late-12th/early-13th-century date. Construction would be expected any time after 1189 when the Abbot became lord of the manor. A date of c. 1200 is thus suggested for the construction of the forge.

The clay floor is likely to have been deposited from the digging of the foundation trenches, but, as pits were dug through it, further clay was deposited. Sherds of the late 12th/early 13th century were found in the lower floor F128B. The floor must have been kept clean since there was only a scatter of pottery, mainly pitchers and jugs, from the first 300 years of use. It is not until the 16th century that sherds were left around on the clay floor.

Outside the building to the west was a cobble layer F10. Some 50 sherds were obtained in a small area and suggest the surface was established in the 13th century. At the NE. corner was a cobbled layer F11, possibly a track along the N. side of the building, under this in foundation F136 was late-13th-century pottery, this possibly representing metalling of the track postulated to be on the same line before the forge was built.

The dating of the smith's hearths cannot be given very exactly. The foundation F38, at the NW. corner, is of similar construction to that of the walls and may be an original feature. Some 15th-century sherds were found in the coal spread to the north of it. The bricks of F12, at the NE. corner are comparable to bricks seen elsewhere in the 14th century (Appendix 5B). At the SW. corner the base F41 contained a few sherds of the late 12th/13th century, but possibly derived. A few late sherds in the coal pit F66, and in the ash spreads F74 and F76 around each of the smith's hearths suggests that each may have survived into the 16th century.

A small amount of pottery was found in the clay-lined pits of uncertain use. In the fill F77 were a few early medieval sherds. The lining F84, to the pit F83/7, contained twelve 12th-century sherds and two in the fill F85 may show that this is the first such pit unless the material is derived. The filling F80 to the pit by the S. wall contained some 15th/16th-century sherds. In the Phase 1 lining F115 to the pit numbered F114/20 was a rim of the late 13th/14th century, whereas the top filling F120 contained some sherds of the middle 16th century. The lining F112 to the small pit F111/3 contained early medieval sherds. There was clearly derived material in some of the features above so that dating is difficult, however some of the pits could be early in the forge period. From pottery in the filling it is likely that some of the pits were in use quite late.

The well may have been in use as a waterhole before the clay lining F149 was deposited round the barrels. Sherds of the jug (reconstructed in FIG. 10, no. 168) were found in the lining F149, in silt F148 and in the top clay layer F141, and are dated to the late 13th/early 14th century; other sherds in these deposits and in the coal dust F142 are consistent with this date for the lining and presumably also for the setting of the outer barrel F146. Sherds in the fill F140 and F144 of the well indicate a late-15th/early-16th-century date for the closing of the well. The key (FIG. 11/31) in silt F148 and the sole (FIG. 15/15) in silt F152 are both 15th century in style.

The interior dividing walls are late features, F28A overlay both the filled well and a nearby hearth with fill F96 with sherds of *c.* 1540, this part of the NS. interior wall is therefore of middle-16th-century date. The wall F28 had a gravel foundation F30 with a sherd of the late 15th century or later. Bricks of the added line F28B have previously been found (Appendix 5C) in a post-1540 context. In the wall F34 were bricks previously dated to the last quarter of the 15th century. Underlying the bricks F28B were early-16th-century sherds in ash F72. Taken together therefore we see a late-15th-century wall added to in the early and perhaps middle or late 16th century.

The documentary evidence shows that iron was being made at Waltham in 1543 for the king and a *forge* is mentioned as late as 1608. A few sherds in the destruction debris F126 may suggest the building stood into the mid 17th century. At the NW. corner the wall and foundation was completely robbed and a track deposit, with a pipe of 1710-70, was laid over it.

By the 14th century it is thought that roofs could be spanned without recourse to aisle posts. The SW. stylobate was cut by pit F80 but the pottery therein is not helpful. The NE. stylobate was overlaid by the ash F63 with sherds of 13/14th-century date so that the stylobates were out of use by about 1350.

Other features in the forge include a large unlined pit F253/8 with 15th-century pottery in the fill. The small pit F121, by the brick hearth, is of the 16th century and the nearby pit F122 with a pipe stem is probably late 16th century. The postholes F261 for a bench at the NW. corner may be dated to the late 13th/early 14th century by sherds in the clay packing F264.

In summary the forge was built *c.* 1200, i.e. after 1189 when the Abbot became lord of the manor, and seems to have survived the dissolution, by which time it was divided into two by interior walls. It may have survived, but not have been used, into the early or middle 17th century. The lean-to wall foundations are taken to be integral with the main walls so that the lean-to is part of the original design.

ARCHAEOLOGICAL EVIDENCE OF IRON-WORKING

Production of iron objects from the ore involves three distinct processes, smelting to form the raw bloom, then conversion into slag-free iron, and finally forging into finished products.

In the smelting process the ore is reduced or separated from its oxygen content, at the same time unwanted minerals are melted out as slag. Smelting can

be carried out at temperatures of the order of 1150°C., well below the melting point of iron. The technique is discussed by Tylecote.³² The requirements of smelting, of which archaeological evidence may remain, are:

The ore: natural oxides or carbonate of iron

Fuel: most frequently charcoal

An air supply: from hand or foot operated *bellows* or achieved by the use of water power. The air would be directed into the furnace through a tube or *tuyère*, usually ceramic.

A furnace: in the most primitive form this is a bowl-shaped hole in the ground, sometimes lined with clay, the slag would run to the bottom of such a furnace and remain there. A development was to allow slag to run out of a hole at the bottom.

The products of smelting, evidence of which may remain, are:

The raw bloom: a single lump of iron per firing, in sponge like form with entrapped slag and attached cinders. From the name of this product the smelting site is called a bloomery.

Cinders: a porous mass of unsmelted ore and fragments of charcoal, probably from the side of a furnace where conditions were unfavourable for reduction to the metal.

Slag: a dark, dense, solidified, fluid waste resulting from the fluxing, with iron oxide, of unwanted minerals in the ore.

Furnace bottom: a large lump of cinders/slag from which the bloom has been detached. Sometimes the *bottom of the bloom*, a slag-iron mixture, remains attached to the furnace bottom after the bloom has been broken off.

Tap-slag: this is slag which has been run off from the bottom of a furnace, it retains a characteristic rivulet-like surface irregularity.

The second distinct part in the production of iron from the ore is a smithing process carried out on the raw blooms. After removal of loose debris, the blooms are reheated, then hammered, cut and hammered again to dislodge particles of slag. The requirements of this smithing operation are:

A smithing or 'stryng' hearth: this may be a hole in the ground like a primitive smelting furnace or be a more exposed hearth.

Fuel: coal would be suitable for this process since the sulphur content would not be absorbed into the iron, an oxidizing atmosphere would be beneficial in this respect whereas for smelting a reducing atmosphere was essential.

Air supply and *tuyère* as for smelting.

Products of the smithing process which may be particularly difficult to single out as diagnostic of this operation are:

Smithing slag: further slag would be melted out in this operation. It might be tapped or remain as a *furnace lining* or *bottom*.

Hammer scale: slag which has been hammered out of the bloom during the smithing operation.

The slag-free bloom is unlikely to be found.

³² Tylecote, 1962, Chapters 6 to 9.

The final forging into usable objects would be made easier by the provision of a waist-high smith's hearth or forge. The products which might indicate that this final operation was being carried out are:

Semi-finished products such as bar stock

Blanks or moods suitable for making objects such as a horse shoe, a key or a nail.

Partially finished objects

Fuel: if coal was used, *clinker* as well as *ash* may result.

Hammer scale: coming mainly off flat surfaces this scale would be of laminar form.

DISCUSSION OF THE EVIDENCE FOR IRON WORKING AT WALTHAM

Taken singly the pits and hearths and the presence of iron ore, fuels and slags would be unlikely to give a certain indication of what operations were being performed. The ore, for instance, could have been used as a colourant. However if the whole evidence is taken together it is considered sufficient to show that smelting and the subsequent smithing and final forging were likely to have been carried out at Waltham. The evidence is summarized below: the details are recorded in Appendix 2.

Dr. R. F. Tylecote has identified samples and, by comparison with these, bloomery cinders and slag to the extent of 170 kg. were detected. Amongst this bloomery material were at least three furnace bottoms and two pieces which, on sectioning, were seen to be slag-iron mixtures identified as the 'bottom of the bloom'.³³ The total of iron ore found inside the forge weighed only 9 kg. The presence of this assemblage of material, however, shows that smelting was being carried out at Waltham.

Four of the largest pits F77/8, F80/2, F83/7 and F114/20 were clay lined and would have been suitable as smelting pits; there was no evidence as to whether they had been covered. A smaller pit F111/3 was also clay lined and would have been suitable for a small smelt. There were other pits, not with remaining clay linings, such as F253/8 which could have been used for smelting. No bloomery or other products were judged to be *in situ* in these pits but two of them contained back-filled bloomery debris only (Appendix 2, Table 1). It must be stated that none of the above pits had heat-affected reddened sides but with the reducing atmosphere required for smelting none should be expected. These pits were of the most primitive bowl-shaped form, in none was there a hole from which slag could be tapped and no tap slag was recognized. The suggestion that the pits might be quenching tanks (by Ian Goodall, based on an interpretation of such a pit at a smithy at Goltho, Lincs., excavated by Guy Beresford) may be an explanation, at least in some cases, or at some stage in their life, with the smelting being carried out outside but nearby.

Since smelting is thought to have been carried out, it is very likely that the

³³ Dr. Tylecote writes that a similar piece was left behind at the 17th-century bloomery at Muncaster Head: Tylecote and Cherry, 1970.

subsequent operation of bloom preparation would be undertaken too. Coal, suitable for this operation (and the final forging), was found in 52 of the excavated features (Appendix 3B). A waste product, described as 'clinker' (Appendix 2) is thought to be derived from smithing work employing coal. Any of the pits would appear suitable for re-heating the blooms, in particular pit F99/102 is lined with coal dust and may have been so used.

Another waste product has been classified as furnace lining; this is probably a smithing furnace lining (Appendix 2). It was found associated with both bloomery products and clinker.

Hammer scale was present in recognizable quantity in eight features (Appendix 2). In particular it was concentrated round the two smith's hearths F12, F38 and round the group of features F37/40/41.

A length of tapered tube is taken to be the end of a bellows (Appendix 9, no. 19). Without bellows the forge could not have functioned.

Bar iron, blanks and semi-finished products represent states in the forging of the final product. Examples of this material are illustrated in FIGS. 11-13 and discussed in Appendix 6.

THE SAXO-NORMAN ENCLOSURE (PLAN, FIG. 4; SECTIONS, FIG. 3; PLS. 1C, D, 11A, B)

The whole of the interior of the medieval forge was excavated to natural clay to reveal mainly loam-filled features of the Saxo-Norman period. The area involved is 14.3 × 8.7 m. (47 × 28½ ft.) with a slight extension to the west. The site was possibly occupied right up to the construction of the forge c. 1200.

THE SAXO-NORMAN FEATURE LIST

All the excavated Saxo-Norman features are described and the associated finds are listed. On the plan and sections the Saxo-Norman features are labelled in sloping fount. Where possible the features have been separated into phases I to V (see below).

- F170** Loam forming ground surface during pre-forge period. Dug before some features apparent, hence includes sherds belonging to these features. Some 85 per cent of the sherds were in the E. half of the area excavated, but inside the confines of the outer fence F181. Phases I-V. *Lead*: FIG. 15/7. *Loom weight and spindle whorls*: FIG. 14/4-6; *Pottery*: 6A, 16B, 1C, 22D1, 542D2, 4E1, 5E2, 417G, 103H, 44J1; nos. 1, 4, 10, 11, 14, 16, 19, 20-25, 27, 32, 33, 36, 37, 39, 41, 47-50, 66, 84-121, 153.
- F171** Loam filled N-S ditch, bottom 55 cm. below top of F170. Phase II. *Pottery*: 3 (worn) C, 8D1 (worn), 11D2 (worn), 5G (small); no. 46.
- F172** Loam filled N-S ditch, bottom 42 cm. below top of F170. Phase V. *Lava*: Appendix 9 no. 12. *Bones*: Appendix 10. *Pottery*: 1A, 36D1, 3D2 + pot no. 77; nos. 7, 8, 17, 34, 76, 77.
- F173** Loam filled N-S ditch, bottom 23 cm. below top of F170. Phase V. *Pottery*: 3D1 (worn), 6D2, 3G; nos. 3, 35.
- F174** Short, loam filled, E-W ditch, bottom 46 cm. below top of F170. Later than pit F203, earlier than ditch F172. Phase IV. *Lava*: Appendix 9, no. 12. *Bones*: Appendix 10. *Pottery*: 1A, 2D1, 20D2, 2E1, 2E2, 20G, 3J1; nos. 69-75.

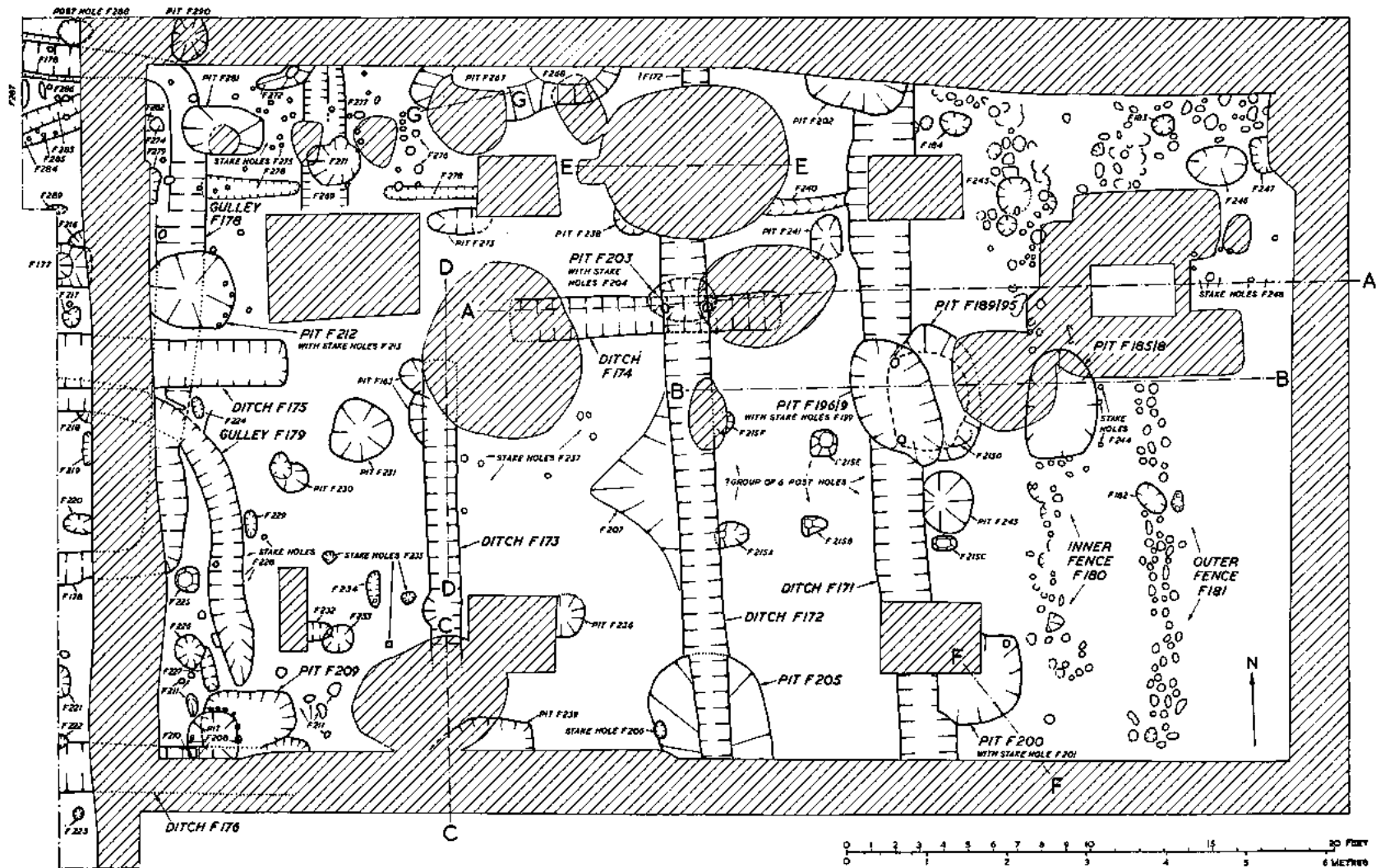


FIG. 4
 WALTHAM ABBEY, SAXO-NORMAN ENCLOSURE
 Plan of excavation (hatching indicates later disturbances) (p. 142).

- F175 Dirty clay filled E-W. ditch, grey-black silt at bottom, bottom 57 cm. below top of F170. Phase V. *Bronze*: FIG. 14/1. *Pottery*: 1A, 2D1, 3D2, 4E1, 5E2, 6G; nos. 5, 13, 78.
- F176 Clay + loam filled E-W. ditch, bottom 42 cm. below top of F170. Phase II. *Pottery*: 1G.
- F177 Dirty clay filled E-W. ditch, bottom 68 cm. below top of F170. Phase V. *Pottery*: 1D2, 2E1, 2G, 1J; no. 80.
- F178 Shallow gully at west, filled with loam + stones, charcoal at N. end, bottom 25 cm. below top of F170. Possibly to collect eaves drip from rectangular building. Some evidence of re-cutting. Earlier than F179, F175 and F212. Phase II. *Pottery*: 1B, 2D1, 2D2, 3G, 3H, 1J1 (Pingsdorf); nos. 15, 79.
- F179 Curving shallow gully or ring ditch filled with loam + charcoal and daub fragments, bottom 21 cm. below top of F170. Possibly to collect eaves drip from circular building. Phase III. *Pottery*: 1C, 1D1, 22D2, 1E1, 5E2, 5J1; nos. 31, 40.
- F180 E-W. row of stake and postholes forming inner palisade fence. Holes only seen in natural clay, round bottomed suggesting stakes had burnt ends, remained up to 10 cm. deep. Phases III-V. *Pottery*: 2C, 6D2, 2E1, 3E2, 12G, 1H; no. 122.
- F181 E-W. row of stake and post holes forming outer palisade fence. Most holes round bottomed up to 10 cm. deep in natural clay, few were pointed up to 20 cm. deep, possibly representing repair. Phases III-V. *Pottery*: 1A, 1C, 20D, 3E1, 16G, 4J1; nos. 123, 124.
- F182 Hole for stout post in fence F181, 18 cm. deep, round bottom.
- F183 Hole for stout post, 13 cm. deep, round bottom. Possibly forms the corner of an out-turned entrance to the enclosure.
- F184 Hole for stout post, 16 cm. deep, round bottom. Possibly forms the corner of an inturned entrance to the enclosure.
- Pit F185/8* (Section FIG. 3/BB). Phase II.
- F185 Loam fill at top of pit. *Pottery*: 3C, 1D1, 16D2, 5G.
- F186 Layers of charcoal. *Daub*: Appendix 5A. *Pottery*: 1C.
- F187 Clay pushed in from edge between F186.
- F188 Grey silt at bottom.
- Pit F189/95* (Section FIG. 3/BB). Phase III.
- F189 Remaining outline of pit, dirty clay fill at top not seen in section. *Pottery*: 1 Roman?, 1A; no. 26.
- F190 Layer of charcoal under F189. *Daub*: Appendix 5A. *Pottery*: 1D2.
- F191 Layer of dirty clay under F190. *Pottery*: 1D2.
- F192 Layer of charcoal under F191. *Bronze*: FIG. 14/2.
- F193 Thin spread of vegetable matter under F192.
- F194 Dirty clay under F193, fragments of daub, timber. *Bones*: Appendix 10. *Pottery*: 1A, 1B, 1C, 1D1.
- F195 Grey silt at bottom of pit F189, timber fragments. *Bones*: Appendix 10.
- Pit F196/9* (Section FIG. 3/BB). Phase IV.
- F196 Pit, seen in section to be dug from old ground surface, 25 cm. above natural, upper fill clayey loam with charcoal specks. *Pottery*: 107 D2, 36G, 10H; nos. 21, 52-68. *Shells and Bones*: Appendix 10.
- F197 Clay + loam filling depression in F196. *Pottery*: 5D2, 3E1, 3E2, 3G.
- F198 Grey silt at bottom of pit.
- F199 Two silt-filled stakeholes, 96 cm. apart at bottom of pit, 25 cm. deep, pointed.
- F200 Pit (Section FIG. 3/FF), flat bottomed, 30 cm. deep into natural, loam filled, no visible stratigraphy, cut by ditch F171. *Bone*: Appendix 9 no. 8. *Pottery*: 2B, 5D1, 23D2, 7E1, 4E2, 3G, nos. 21, 81-3. *Bones and shells*: Appendix 10
- F201 Single silt-filled stake hole, 20 cm. deep, positioned in sloping side of pit F200.

- F202 Pit, loam filled, 68 cm. deep; pit cut ditch F171 as grey silt at bottom overlay ditch fill. Phase IV. *Bones*: Appendix 10. *Pottery*: 4C, 4D1, 8D2, 3E1, 11G, 2H, 1J1, nos. 29-30, 42, 125, 126.
- F203 Pit, loam filled, cut by ditches F172 and F174. Phase I, see F204.
- F204 Two silt-filled stakeholes, 53 cm. apart, at bottom of pit F203, 60 cm. deep. W. post vertical, E. post splayed out 20°.
- F205 Pit, loam filled, 23 cm. deep into natural, thought to be earlier than ditch F173. Phase I, see F206. *Pottery*: 1A; no. 28.
- F206 Single stakehole, 30 cm. deep, at edge of pit F205.
- F207 Lead-in to ditch F172, loam filled. *Pottery*: 3D1, 1D2, 1E1, 1G.
- F208 Pit, shallow, loam fill, surrounded by small flints and chalk with charcoal under. Phase IV. *Lava*: Appendix 9 no. 12. *Pottery*: 2D1, 1E1; nos. 17, 18.
- F209 Pit, under F208, loam filled, 48 cm. deep. Phase III, *Pottery*: 1D2, 1G.
- F210 Stakehole, 25 cm. deep, clay + stones packing around it. May be associated with Pit 209, certainly later than ditch F176. *Lava*: Appendix 9 no. 12.
- F211 Group of 8 possible stakeholes, 2 to 10 cm. deep, around pit F209.
- F212 Pit, shallow, stony loam + charcoal, 25 cm. deep into natural. Phase IV. See F213. *Bronze*: FIG. 14/3, 4. *Lava*: Appendix 10 no. 11. *Bones and shells*: Appendix 10. *Pottery*: 1D1, 10D2, 1E1.
- F213 Group of 8 stakeholes around F212, 4 were in sloping sides of pit, up to 10 cm. deep.
- F214 Clay, 8 cm. thick, filling depression in top of pit F212.
- F215 Group of 6 postholes, A to E, in natural. F cut by medieval feature, D vaguely seen in F189, B had square pointed hole 20 cm. deep, E was 13 cm. deep, others round bottomed up to 7 cm. deep, dirty clay packing remained in pits. May represent small building. Phase III.
- F216 Remains of 15 cm. deep hole, loam fill possibly for a post.
- F217 Depression, 2 cm. deep, loam fill, possibly for a post, with 16 cm. deep stakehole nearby.
- F218 Remains of 15 cm. deep hole, loam fill, possibly for a post. *Lava*: Appendix 9 no. 12.
- F219 Remains of 8 cm. deep slot, loam fill.
- F220 Remains of round bottomed hole, 15 cm. deep, dirty clay fill.
- F221 Part of 10 cm. deep hole, clay + loam + daub fill; 8 cm. deep stakehole nearby.
- F222 Stakehole, 30 cm. deep, loam fill, in edge of ditch F176. *Pottery*: 3D2.
- F223 Stakehole, 8 cm. deep, loam fill.
- F224 Hole, 8 cm. deep, loam fill.
- F225 Hole, 25 cm. deep, loam fill, possibly for a post.
- F226 Hole, 19 cm. deep, loam fill, round bottom. *Pottery*: 1G.
- F227 Slot, 8 cm. deep, loam fill. *Pottery*: 1D1.
- F228 Four stake holes, 5 to 12 cm. deep, loam fill.
- F229 Slot, 23 cm. deep, loam fill. *Pottery*: 1D2, 1G.
- F230 Pit, 8 cm. deep, loam fill. *Pottery*: 1C, 1J1.
- F231 Pit, 14 cm. deep, loam fill. *Pottery*: 5D1, 2D2, 2J1.
- F232 Hole, 8 cm. deep, loam fill. *Pottery*: 1D1.
- F233 Hole, 8 cm. deep, clay + loam fill.
- F234 Slot, 5 cm. deep, loam fill, stakehole 10 cm. deep at one end. *Pottery*: 4G.
- F235 Three stakeholes, 10 to 13 cm. deep, loam fill.
- F236 Shallow depression, loam fill. Phase I. *Pottery*: 1C.
- F237 Seven possible stake holes, 5 to 10 cm. deep.
- F238 Remains of pit, 15 cm. deep, loam fill. *Pottery*: 1D1, 1G; no. 21.
- F239 Pit, seen from old ground surface, 60 cm. deep, clay + loam fill. *Pottery*: 3C, 9D1, 5D2, 3G; nos. 2, 6.
- F240 Minor gully, 12 cm. deep, dirty clay fill, feeding into ditch F171. Phase II.

- F241 Pit, 15 cm. deep, dirty clay fill.
 F242 Number not used.
 F243 Pit, 15 cm. deep, loam fill. *Pottery*: 1E1, 1J1.
 F244 Three stake holes on E. side of pit F185/8, possibly representing a screen.
 F245 Pit, 10 cm. deep, loam fill, earlier than inner palisade fence F180.
 F246 Pit, 20 cm. deep, loam fill.
 F247 Number not used.
 F248 Seven pointed stake holes, 5 to 15 cm. deep, loam filled.
 F249 Remains of pit, loam fill, under medieval pit F80/2.
 F267 Pit, 75 cm. deep, loam fill + charcoal. Phase IV. *Pottery*: 1C, 14D2, 4G.
 F268 Pit, 77 cm. deep, grey loam fill with clay patches. *Pottery*: 1E1.
 F269 Shallow gully, 8 cm. deep, in disturbed natural.
 F270 Number not used.
 F271 Pit, 50 cm. deep, backfilled with slightly dirty clay. *Pottery*: 3C, 2D1.
 F272 Depression round stakehole, 10 cm. deep. *Pottery*: 1D1.
 F273 Shallow depression, 10 cm. deep, loam fill. Phase I. *Pottery*: 4C.
 F274 Posthole, 25 cm. deep, clay/loam fill.
 F275 Nineteen stakeholes, possibly surrounding pit F281.
 F276 Twelve stakeholes, showing some linearity.
 F277 Nine stakeholes.
 F278 Shallow depression, loam fill, 3 cm. deep, possibly beam slots.
 F279 Depression, 10 cm. deep, loam fill.
 F280 Number not used.
 F281 Pit, 25 cm. deep, disturbed by medieval post pit, loam filled. Surrounded by stakeholes F275.
 F282 Gully, 10 cm. deep, clay/loam fill, direction uncertain, turned into hole F274. *Pottery*: 1D1, 1D2.
 F283 Gully or beam slot, 11 cm. deep, loam fill. *Pottery*: 1D, 1G.
 F284 Sloping lip to S. side of F283.
 F285 Group of 5 stakeholes in F284.
 F286 Three stakeholes and one 25 cm. deep hole for a segment of timber, loam fill.
 F287 Depression, loam filled, depth not established.
 F288 Hole, 23 cm. deep, stony fill, probably for squared timber.
 F289 Hole, 18 cm. deep, loam fill.
 F290 Remains of pit under robbed forge wall, filled with chalk blocks of wall foundation.

DISCUSSION OF THE SAXO-NORMAN FEATURES (PHASES, FIG. 5)

The Saxo-Norman occupation is evidenced by ditches, gullies, pits and post and stakeholes; features with loam fill were generally only seen where they disturbed the natural clay. The ditches were set in N.-S. or E.-W. directions, an orientation noted previously in Saxo-Norman features found in the Cloister site excavations 170 metres to the south-west. Many features intersected and an attempt has been made to divide them into phases. Dating of these phases must be very tentative, some features may have been open for only a year or so and others may have been used for a considerable time.

Phase I. Pits with very little rubbish. In the lowest levels of the loam F170 were a few mesolithic flints, prehistoric sherds and occasional Roman sherds but there were no identifiable features of this very long period; it is probable that the area was open grassland for this time. The same conclusion was reached in the Cloister site

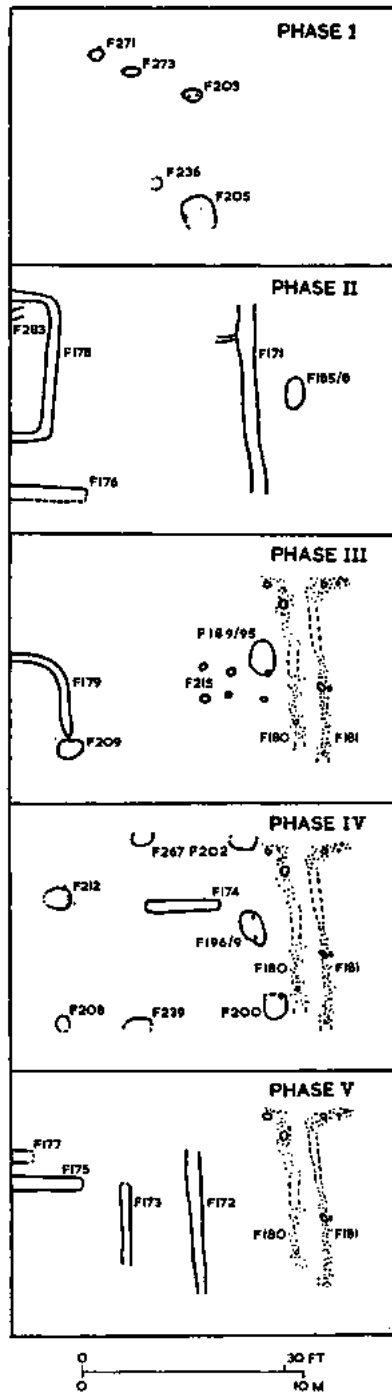


FIG. 5
 WALTHAM ABBEY, SAXO-NORMAN ENCLOSURE
 Phases of development (p. 146).

excavation where mesolithic, neolithic, occasional Roman, and Saxo-Norman material was found in a shallow loam layer under the cloister garth.

In this open ground were five pits considered to be Saxon and possibly associated with the 9th-century hall to the west (FIG. 1) which had similar pottery. These pits may not be contemporary but they do not intersect and contain only a few sherds; they are grouped together here.

The largest pit F205 was shallow and had a single associated stakehole which may represent some slight superstructure. Pit 203 was smaller but twice as deep and had two stakeholes. Both pits were cut by ditch F171 and were loam filled, the only sherd from these two was the rim no. 28 from F205 which is probably the earliest Saxon rim found on the site.

Two smaller pits F273 and F236 were filled with loam and occasional Saxon hand-made sandy sherds; the third small pit F271 had a dirty clay fill with 3 sherds and a rim of this sandy ware with 2 shelly sherds, so it may be the latest of the five pits.

Only a small amount of Saxon pottery was found either stratified or derived in the site generally, and this is consistent with the area being an outlying part of the occupied area in this phase.

A parallel first phase, with pits only, is Period 1B at Northolt,³⁴ Middlesex. Northolt like Waltham was held by Tovi in Cnut's reign.

Phase II. Rectangular gully. The first evidence of a building is suggested by the rectangular gully F178 which is taken to be an eaves drip gully round a building; the stake and postholes and the slot F283 which lie within it may be part of this building, but the evidence is insufficient and much destroyed by the medieval wall foundation. The gully had remains of charcoal in the northern arm.

The ditch F171 would seem to cut across the trackway postulated for the Phase III palisade period, and may have formed a first boundary; it contained a little daub and other occupational debris and appears to have been open until the 12th century on the evidence of the few worn sherds of pottery in it. It is too small to be defensive but could have acted as a demarcation of area, and served as a drainage ditch.

The E.-W. ditch F176, which is cut by later features, may also belong to this phase; in common with all the E.-W. ditches it was deeply cut and may have been a latrine trench.

The pit F185/8, which cannot be contemporary with the palisade, is also ascribed to this period. The section (FIG. 3/BB) shows that above the bottom silt F188 of this pit were alternate layers of clay F187 and charcoal F186, with loam F185 at the top. The fill contained over 100 pieces of daub with 12th-century sherds, which, with the charcoal, suggest the remains of a burnt-down wattle and daub structure. As both this feature, the ditch F171 and the gully F178 contained evidence of burning, it is possible that the phase ended with fire, and it is tempting

³⁴ Hurst, 1961, 230 and fig. 59.

to suggest a date of 1144 when a fire is reported³⁵ to have burnt down many buildings at Waltham.

Phase III. Ring ditch and palisade fence. The ring ditch F179 which may enclose a building, cuts the rectangular gully F178 and thus supersedes it. The ditch F171 seems to have been replaced by the palisade fence F180 and F181 (PL. 1C); this may always have been double as the two opposed posts F183 and F184 and the east and west out-turns would suggest, or it may have had two phases. The out-turn suggests a gateway with an E.-W. track and this would necessitate a re-siting of any building on the line of the track, such as that inside the rectangular gully above. The pit F189/95 had two layers of charcoal with daub and in this respect compares with pit F185/8 in Phase II except for being shallower. It may supersede the ditch F171 and is considered a Phase III feature. Both pits F185/8 and F189/95, however, may have been open for no longer than one season and could occur together as an intermediate phase.

Subsequent to the filling of pit F189/95 a small hut is postulated from the six postholes F215A-F, one of which is positioned in the fill of the pit. This hut might serve as a shelter for a keeper of the palisade gate.

Phase III may have lasted only a short time from the mid 12th century to c. 1177 when the monastic building period began.

Phase IV. Mainly rubbish pits. Features considered to be phase IV are several pits, F196/9, F200 (PL. IIB), F202, F212 (PL. IIA), F239 and F267, and the short E.-W. ditch F174, all of which included pottery mainly of coarse shelly Group D2 ware. Pit F208 is included as it is later than F209 in spite of having a few early sherds. The surrounding loam F170 also contained much pottery of this period, several sherds fitting those in pits.

The pit F196/9 contained the largest quantity of pottery (over 150 sherds, encrusted and burnt), the two stakeholes may suggest a superstructure or have supported a horizontal latrine bar; there was no evidence of a screen around the pit, but one could have existed of stakes not driven deep enough to penetrate the natural clay. Pit F200 had a single stake hole at the NE. corner in the sloping side; this pit measured 1.2 m. (4 ft.) square at the top and was flat-bottomed. There was no stratification in the fill of F200 but F196/9 had silt at the bottom and a clay fill at the top (Section, FIG. 3/BB). A bone tool from F200 is described in Appendix 9, no. 8.

Pit F208 had a ring of stones around it. Pit F212 had a clear line of stakeholes in the E. side; it contained a considerable amount of domestic rubbish like F196/9.

It is suggested that the pits and possibly the ditch were being used for some domestic purpose, probably either culinary or perhaps latrine purposes, and they were filled by a large quantity of rubbish which also formed a considerable part of the loam build-up F170. This rubbish dumping is perhaps due to a change of use

³⁵ Houses, including those of the canons, suffered when Geoffrey de Mandeville burnt the town of Waltham: *V.C.H., Essex*, v, 156.

in the area caused by extensive alteration within the manorial enclosure when the 1177 conventual buildings were being erected. The rubbish did not extend beyond the palisade and the pits are sited within it, so the palisade is taken to last to the end of this period; it would become redundant when the Grange boundaries were established, probably soon after 1189.

Phase V. 'Ditches'. This phase includes the shallow ditch F172, which was later than F174, the deeper, steep-sided 'ditch' F175, which was later than the buildings of Phases II and III, and possibly the steep-sided 'ditch' F177 and the shallow ditch F173. It was noticeable that N.-S. ditches were all shallow, while E.-W. 'ditches' were deeper and steep sided. The Phase V ditches were not filled with rubbish, containing only a few sherds which could be derived from the earlier periods. None of these ditches seems to have been re-cut and they may not all have been open together. They are within the palisade area and this may still have been standing.

At North Elmham³⁶ two deep parallel slots (with 4 postholes) are taken to define a rectangular building 'H'; there was no trace of end walls. At Waltham the two steep-sided 'ditches' F175 and F176 are parallel, but they have different fills and it is not clear if they are the same length, they also differ slightly in depth. F176 is tentatively assigned to Phase II; further excavation might clarify the relationship.

General discussion. The Saxo-Norman features are as bewildering as those at other sites of the period occupied over any length of time. Northolt and North Elmham have already been mentioned. At Thetford,³⁷ Norfolk, a similarly confused ground plan showed 'evidence of deliberate zoning of pits and buildings together with some overall control of domestic activities'; this could be said of Waltham. At Little Paxton,³⁸ Area B, Cambridgeshire, the finds were 'domestic in character, and suggest the close proximity of an occupied settlement'; this is true of Waltham with the settlement very close.

At Waltham, being on the leeward side of the manorial enclosure, only the pigs might be expected further east of the present site. At Chingford³⁹ the picture is of three fenced areas, that of the lord himself, that for the servants, horses and storage, and finally that for farm animals. The amount of domestic rubbish found on the site suggests that we are seeing the servants' quarters rather than the farm buildings or animal byres.

However do we see a site which, through much of its life, was used as a latrine area? Were the pits and trenches filled up with whatever was available when they became offensive? The two-stakehole pits could be interpreted as latrine pits, the small Phase I pit F203 and the large Phase IV pit F196/9 might in later contexts be called a one-holer and a two-holer respectively. Certainly pit F203 was too small

³⁶ Wade-Martins, 1969, 371.

³⁷ Note in *Medieval Archaeol.*, 10, (1965), 172 (excavated by B. K. Davison).

³⁸ Addyman, 1969, 75.

³⁹ See note 4.

for a being, other than a chicken, to get inside. The steep-sided 'ditches' F175, F176 and F177 could be similarly interpreted. The successive filling of pits F185/8 and F189/95 would not preclude their use for latrine purposes.

The two single-stakehole pits F200 and F205 are relatively shallow and would seem to require a different interpretation. Again they are too small for habitation but could be simple working shelters.

No features were seen with successive layers of ash which might be interpreted as hearths. The Bayeux Tapestry shows⁴⁰ cooking being done in the open air in a (?) charcoal brazier with a pot suspended from two forked poles. It may be that this method was fairly widespread. The shallow pit F212 with its surrounding windshelter F213 contained an amount of charcoal and may be a brazier location. Another shallow pit F208, with stones around, is likely to be a cooking hole.

When excavated to natural clay, i.e. admittedly with all the absorbent top-soil removed, excavated features were full of water in a very short time and remained so for some time (PL. 1A). This reminds us that storm water ditches and sumps would be very necessary and several of the features could be so interpreted.

CONCLUDING REMARKS

Manorial enclosure: The excavation has focussed attention on the 11th and 12th century manorial enclosure and it seems worth summarizing what is known of this manor.

Occupation of this date has been seen before at positions SN1 to SN6 (FIG. 1); it overlapped the life of the secular college (1060-1177). The dean of the college was not lord of the manor. After Harold's death in 1066, William I held the manor and in c. 1075 granted it to the Bishop of Durham as a home near London (Documentary). Later the manor reverted to the Crown. The manor house would have been intermittently used, but a steward and servants would presumably have been retained.

The manor was leased out during the latter part of the collegiate period. This is apparently first recorded in 1163 and continued until 1189. The re-foundation took place in 1177 and the Abbot became lord of the manor on his election in 1189. This would have presented the opportunity for the establishment of Waltham Grange as the home farm of the monastery. Pottery under the Crooked Mile boundary bank is consistent with a late-12th-century date and Phase I of the Great Barn X could date from this time.

The setting out of the conventual buildings for the new priory, later Abbey, to the north of the church would have meant a complete change of use of the area. The old manorial enclosure would have come to an end. The farm buildings would have become redundant as Waltham Grange was established to replace them. The bloomery forge was soon erected on the eastern boundary of the former manorial enclosure.

Tovi and Harold were both lords of the manor of Waltham. Both built churches which were presumably close to their manor houses and within a manor-

⁴⁰ Denny and Fulmer-Sankey, 1966, pl. 26 (unnumbered).

ial enclosure. The vill of the men is likely to be to the south where the town of Waltham Abbey has grown up. The 9th-century turf-walled, stately hall found⁴¹ to the north of the present church may be an early representative in a sequence of manor houses. This hall had a large pond along its northern side which remained open until the late 12th/early 13th century. The hall overlay a deep linear storm-water ditch. The discovery of the hall established occupation over 200 years earlier than the first recorded church built by Tovi c. 1030.

The Bloomery forge. The reader will have realized that because of the presence of ore and bloomery products, the site, if not the building, is interpreted as a bloomery forge. There remains a slight possibility that poorly sorted usable and waste bloomery products may have been transported to the site from ore sources in Waltham forest which the Canons owned; this could account for such waste being found in the building. If this turns out to be the case the word *forge* should replace *bloomery forge* wherever it occurs.

Records⁴² suggest that smelting and working was done in separate forges. Engravings⁴² of blacksmith's hearths are known from the 12th and 16th century.

The aisled construction of the 3-bay building is that commonly used⁴³ for halls and barns of the 12th and 13th centuries.

Conservation. The excavating team has conserved the foundations for public viewing (PLS. II, D), this was completed in August 1973; the cost of materials was met by the Lee Valley Regional Park Authority. All original structural features have been made good to the same height and covered with Thames estuary cobbles; sections of wall and stylobates extensively robbed have been re-formed. The well has been rebuilt with 2 chestnut *pipes* and a 50-gallon *hogshead*, one on top of the other; it has filled with nearly 2 m. of water and has supplied all constructional needs; the surround to the well is completely conjectural. The masonry and brick smith's hearths have been conserved, but at a lower level than the constructional features. Interior dividing walls have not been retained.

The finds. The finds are at present in the custody of the Waltham Abbey Historical Society, but they, and the records, will eventually be lodged with the museum, soon to be built by the Lee Valley Regional Park Authority. The finds are available for study and the authors will be interested to hear from those who can contribute further to their understanding.

APPENDIX I: IRON ORE

Lumps of iron ore were found in 10 medieval features. The most significant were in the deposit F68/9 (1.9 kg.) and in the pit F64 (6 kg.). Lesser quantities of c. 1 kg. were found in the clay floor F128 and in the upper occupation debris F127.

⁴¹ Not yet fully reported but position shown on fig. 1. This was a divided structure with massive gable end posts and with an end door framed by posts. The structure gives the impression of having been built in the Scandinavian tradition. The dating material, including Ipswich ware and relief-band amphorae was in the turf walls and the fill of an underlying ditch.

⁴² Salzman, 1923, Ch. 2.

⁴³ Wood, 1965, Ch. 3.

The ore has been examined by B. C. Worssam of the Institute of Geological Sciences. He describes it as a fine-grained ferruginous (limonitic) sandstone and considers it suitable for smelting. Some fragments show fine laminations which are likely to be an original feature.

The sandstone is possibly a Lower London Tertiary deposit either from the Woolwich, Claygate or Bagshot Beds. Mr. Worssam points out that in South Weald Park (some 20 km. east-south-east of Waltham and, in fact, owned by the Canons of Waltham since 1060) ferruginous material from sand of the Bagshot Beds had been re-deposited as ochre in the soil surrounding a small opening at the junction of the sand with the Claygate Beds.^{43a} Similar pockets might occur in Epping Forest around the fringes of the Bagshot Beds. Ferruginous concretions or box stones also occur in the Claygate Beds and these might have been exposed in stream sections in Epping Forest. Epping Forest, previously the Royal forest of Waltham, was owned by the monastery and ore extraction would have been permitted so long as it did not disturb the king's beasts.

APPENDIX 2: BLOOMERY AND SMITHING WASTE PRODUCTS

Waste products were found in 41 of the medieval features. Nearly 300 kg. of material was sorted by comparison with samples identified by Dr. Tylecote. Significant quantities are listed in Table I.

TABLE I. ASSOCIATION OF MATERIALS

DESCRIPTION OF FEATURE	BLOOMERY PRODUCTS (kg.)	CLINKER (kg.)	FURNACE LINING (kg.)	HAMMER SCALE PRESENT (p.)	COAL PRESENT (p.)	IRON LUMPS (kg.)
Clay-lined pit fill F77	20	—	—	—	—	—
Clay-lined pit fill F80	3	12	$\frac{1}{2}$	p	p	7
Clay-lined pit fill F83 and 85	77	—	—	—	—	2
Clay-lined pit F114/20	10	—	3	—	p	20
Unlined pit F255/7	29	23	8	—	p	—
Small unlined pit F79	4	5	1	p	p	—
Small unlined pit F121	—	1	—	p	p	—
Small unlined pit F122	—	5	—	—	p	—
Upper occupation debris F127	11	5	—	—	p	—
Coal dust F142 round well	—	3	—	—	p	—
File of ash and debris F72	—	46	1	—	p	1

There was 170 kg. of bloomery products from 29 features, 104 kg. of clinker from 21 features and 14 kg. of furnace lining from 13 features. The amounts given in Table I account for above 90 per cent of the identifiable material.

'Bloomery products' include *cinders*, *slag*, *bottom of the bloom* and *furnace bottoms*, these items have been defined in the text. *Clinker* is a fused ash from operations using coal, either from bloom re-heating furnaces or from the smith's hearth; in appearance it has a smooth contorted surface, fractured surfaces are glassy bright with voids. Wherever clinker was found coal fragments were present too. *Furnace lining* is probably from bloom re-heating furnaces, the pieces are about 2 to 3 cm. thick, one side has a smooth undulating surface, the other side is of entrapped soil as the material solidified against the side of the pit; the attached soil was reddened to suggest the lining was from bloom re-heating furnaces where an oxidizing atmosphere would be expected.

The *hammer scale*, described in the text, had accumulated in 9 features. Besides those shown in Table I, it was found in the scale and ash spreads F67, F74 and F76, in the fill F111, F114, F120 and F121 of small pits and in deposits F129 to be covered by partial relaying of the clay floor. These find spots occur substantially in three corners of the building and first suggested that three smith's hearths, each in a similar corner position,

^{43a} This was noted by Dines, H. G. and Edmunds, F. H., "The Geology of the country around Romford", *Mem. Geol. Surv.*, 1925.

might have existed. Each would have had an associated anvil from which the scale would have fallen. A sample from F120, of steel-blue laminar appearance, was described by Dr. Tylecote: 'this hammer scale looks like a cross between that from Huckhoe which is largely F_2O_3 and the scale from Ashwicken.⁴⁴ There is a fair amount of porosity connected with the hematite but the magnetite has the same inter-granular slag film between the magnetic grains.'

Amongst the bloomery products were three *furnace bottoms* identified because they had taken on the shape of a pit in which they had originally formed; they weighed $1\frac{1}{2}$, $1\frac{3}{4}$ and 4 kg. Two pieces are thought to be *bottoms of the bloom*, weighing $2\frac{1}{4}$ and 1 kg. Dr. Tylecote has examined a piece of the latter and suggests it was from the bottom of the bloom having become detached during the removal of the bloom from the furnace bottom; he writes: 'The metal is very like that from Muncaster Head.⁴⁵ It has equally variable carbon content. There are some signs of fusion in the high carbon areas but in no case do these exceed 0.8 per cent, which suggests that the temperature must have been a lot higher than 1200 °C., the normal free running temperature of the slag. The slag has not got a well-developed structure and has therefore cooled very rapidly.'

APPENDIX 3: COAL AND CHARCOAL

(a) *Saxo-Norman*. Charcoal was found in 14 Saxo-Norman features. In the pits F208 and F212 and in the northern arm of the gully F179 charcoal may indicate brazier positions. Charcoal in the pit deposits F186 and F193, with daub, may be from a burnt down wattle and daub structure. No coal was found in the Saxo-Norman features.

(b) *Medieval*. Charcoal was found in 34 medieval features. It was embedded in cinders (Appendix 2) showing that it was used for smelting the iron. It was also used to heat the lead in the furnace F25.

A few fragments of coal were trodden in to the old ground surface F170 suggesting that coal was available at Waltham by c. 1200. Coal was found in 50 medieval features. The most significant deposits were in: the (?) coal hole F66 to the north of the smith's hearth F12 (6.1 kg.); F142, a layer of dust 18 cm. thick around the top of the well; F259, a deposit of dust around the north side of the base F38 which may have been the original smith's hearth; a deposit 12 to 30 cm. thick with much dust in the filling F255 to the pit F253/8; a thin lining of small fragments F99 to the pit F99/102. The total of lumps weighed c. 15 kg.

Samples of coal were submitted to the National Coal Board. Mr. A. V. H. Smith describes^{45a} the samples as below:

F,149 clay of well lining, c. 1300. Banded bituminous coal. Thin layer of inferior coal associated with one lump.

F96, top of fire pit, 16th century. Pieces of micaceous siltstone with coaly streaks, one with thin covering of carbonaceous shale.

F72, pile of ash and debris, 16th century. Pieces of carbonaceous shale.

Mr. Smith undertook reflectivity measurements and spore analyses of the coal which indicate an origin in a seam of the Middle Coal Measures, between the Harvey and High Main marine bands of Durham or their equivalents in other coal fields. The seam outcrops in Durham and South Wales. The seaborne trade in coals from Newcastle was well established by the 14th century and coal was imported by sea into London by the early 13th century.^{45b} Mr. Smith considers it likely that the Waltham coal came from Durham. The River Lea was certainly navigable up to Waltham in the Middle Ages.

⁴⁴ Tylecote, 1962, Pl. 26; these are 2nd-century Roman sites in Northumberland and Norfolk respectively.

⁴⁵ Brown, 1971, 29-32.

^{45a} National Coal Board, Yorkshire Regional Laboratory report YRL.3046, 'Coal from Medieval Forge at Waltham Abbey', by A. H. V. Smith.

^{45b} Salzmann, 1923, Chapter 1.

APPENDIX 4: POTTERY by Rhona M. Huggins

Pottery from features connected with the forge itself was scarce. Sixteenth- and early-17th-century pottery was found in destruction levels. Parallels for this can be found in debris of other buildings destroyed at or soon after the Dissolution at Waltham.⁴⁶ A small quantity of 14th-century pottery was associated with the lining of the well, possibly when the barrels were inserted. There was, however, a large group of pottery from pre-17th-century levels when the area seems to have been the outer perimeter of the 11/12th-century manorial enclosure. A few Roman and some Saxon sherds were found in the lowest levels, when the area seems to have been open ground, but the greatest quantity is 11th and 12th century in date and for the first time it has been possible to separate the shelly wares into groups. A wide range of imported pitchers, both glazed and unglazed, of 12th/early-13th-century date and a few early 13th-century jugs were also found.

Some re-assessment of groups previously distinguished at Waltham⁴⁷ has been made and the pottery is discussed below under these group headings:

- A Before 850. Grass-tempered, hand-made, black pots with upright or slightly everted rims, the outer surface sometimes being burnished. This was common in the foundations of the 9th-century hall⁴⁸ found to the north of the church in 1969/71 but only 10 sherds were found in the present excavation and all had sand temper added to the grass or chaff. It is suggested therefore that sand-tempered hand-made ware superseded that with grass/chaff temper. Dating is still uncertain however.
- B Hand-made gritted ware, black or brown. No rims were found, some sherds have heavy grits and are thought to be prehistoric being always very worn; a few have finer grit giving a rough surface and these may be a coarser version of C. This is always rare in Saxon groups so far discovered at Waltham.
- C 850-1060. Fine-sand temper, hand made, thick small pots with brownish or black surfaces. The slight marking of sherd no. 35 is the only sign of decoration. Rims are all simple except no. 36 which has an outward roll, but this is a softer fabric black with a smooth surface. The surface is normally slightly rough. Most of the group was found in early levels or in features which had disturbed these levels. It is smaller in quantity than Group D₁, but probably did not continue after 1060.
- D₁ 850-1200. 'St. Neots' ware,⁴⁹ tempered with fine shell particles, well levigated and wheel made, pink, brown or black surfaces. Nos. 1-5 are the only rims likely to be earlier than 1060. No. 16 is 12th century in form, larger in diameter and more coarsely tempered, but still better quality than contemporary Group D₂ ware. Individual sherds are, however, difficult to distinguish from the later wheel-made D₂ sherds. The canons of Waltham Holy Cross were given an estate at Arlesey in Bedfordshire, 15 miles from St. Neots, by Harold in 1060.⁵⁰
- D₂ 850-1300. Coarse-shell tempered ware, at first hand-made, poorly levigated, with grey surfaces and found with late Saxon wares. Diameters are always larger than D₁ except for a group of small late pots which may have replaced the earlier St. Neots type. The late 12th century, when the Phase IV pits and ditch F174 were filled, seems to be the peak of production when D₁ has disappeared and the grey sandy Group G pots are beginning to appear. Nos. 84-96 show the range of rim forms found in F170 ranging from slightly out-turned with rounded edge, which may be 10/11th century, to the pots with sharply angled broad rims, which are probably only finished on the wheel; these can then be seen to develop a more gentle curve with wheel-made squared rims or slightly rolled rims. The pit

⁴⁶ R. M. Huggins in Huggins, 1972, 97-110 and in Musty, 1972, 25-37.

⁴⁷ R. M. Huggins in Huggins, 1969, 68-85.

⁴⁸ See note 41.

⁴⁹ Hurst, 1955 and Addyman, 1969.

⁵⁰ Stubbs, 1861.

- group F196 (FIG. 7) shows several contemporary forms. In the early period cooking pots only seem to be made, other needs being filled by D1 pots, but in the 12th century bowls and small pots are made as well as cooking pots, probably replacing the D1 types. The only evidence of shelly-ware jugs or pitchers is the handle no. 52 from pit F196 and a similar one from the top of F170, both 12th century and probably of developed 'St. Neots' type rather than D2.
- E1** 1060-1200. (FIG. 6 nos. 37-46). This is a new division difficult to distinguish from D2 except when seen in quantity. It is wheel made, tempered mainly with sand giving a hard rough surface but has coarse shell fragments, possibly for decoration, surfaces are usually red with a black core. Rim forms are simple with occasionally an outer roll or thumbing on top or inside the rim, very neatly executed. No. 44 shows a thumbed band applied in this fabric and no. 45 has a diamond pattern impressed with a smaller four-pronged tool to that used on no. 46. The group is small compared to D2 and occurs with D2 and G. The only base found was slightly sagging.
- E2** 1150-1250. Sandy ware, brown or grey surfaces, sometimes blackened, with complex rim forms, clearly made on the wheel. Nos. 47 and 50 have the triangular section which begins to appear in the 13th century. The sand is more even than Group G and gives a rough feel. Nos. 162 and 164 are late examples of the group.
- F & G** 1150-1250. Coarse-sand tempered wares. The main difference between F and G previously noted was colour, but variation in different parts of the same pot makes this a doubtful distinction, and the two groups are now counted together as G. There is, however, considerable variation in the coarseness and type of sand used and they are probably imported from other areas. At Northolt, Middlesex⁵¹ and South Mimms, Hertfordshire (excavated by Dr. J. P. C. Kent) it was a common group and called 'early medieval' or 'developed early medieval'. Some of the rim forms can be paralleled in group D2, with which it is contemporary in the 12th century. Incised decoration is quite common and pitcher spouts, thumbed rims and applied thumbed bands also occur. (FIG. 8, nos. 106-126).
- H** 1200-1500. Red sandy ware. By the time the forge was built shell temper was declining and sand temper replaced it with improvement in firing technique to give an oxidized ware. Later it became the dominant group, but in the early forge levels it had not yet become established.
- J1** Imported jugs and pitchers. A wide variety of different fabrics and glazes was found. From Saxo-Norman levels were: 18 sherds of yellow glazed Stamford ware (nos. 97-99); two sherds with deeper orange glaze on a whitish or pink fabric, probably Andenne ware;⁵² three sherds of a darker buff ware with orange and yellow glaze decoration (nos. 100-101); 5 sherds of Pingsdorf-type red-painted ware probably from Brunssum⁵³ (nos. 102 a-c); the strap handle no. 105 in a buff ware with traces of glaze, it is finer in quality than nos. 158-159 which occur in early forge levels; sherds of this buff sandy or grey sandy ware with greenish glaze outside occur in both pre-forge and early forge levels equally. The only green-glazed Stamford ware⁵⁴ sherd was in two pieces one in the foundation trench of the forge and the other below the clay floor some distance away. From the forge levels were more highly decorated jugs and the true jug appears, nos. 153-5 are examples of these, possibly from London based on French types.
- J2** c. 1250 onwards. Local jugs. Redware with a thin green glaze on white slip overall outside, or white painted linear decoration with a brownish-green glaze.

⁵¹ Hurst, 1961, 254-76.

⁵² Identified by J. G. Hurst.

⁵³ J. G. Hurst in Dunning *et al.*, 1959.

⁵⁴ Hurst, 1958, 37-65.

The earliest jug which can be said to be local is no. 163 which has an inward bevel typical of other early jugs from Waltham. The similarity of rim form with the associated cooking pots is striking between nos. 162 and 163 and between nos. 167 and 168. The fabric is sandy red or occasionally grey.

- K 1450-1600. Pinkish-buff well fired ware with green mottled glaze on one side only.
- L 1450-1540. Rough, sandy, hard grey ware.
- M 1500-1640. Fine red ware, brown glaze used sparingly. Jugs, pipkins, skillets and storage vessels, cooking pots.
- N 1640-1700. Fine red ware, glaze like M but more thickly applied often on both sides. Unglazed vessels become rare.

FIG. 6. POTTERY FROM SAXO-NORMAN ENCLOSURE

Fine-shell tempered St. Neots ware (D1)

1. Small out-turned rim, very fine shell, pink surfaces. F170.
- 2-14. Out-turned rims, pink, black or brown surfaces. F239, F173, F170, F175, F239, F172, F172, F231, F170, F170, F128, F175, F170 respectively.
15. Slightly inturned bowl rim with external bevel, pinkish grey fabric with some leaching of shell. F178.
16. Large hollow flanged rim with thumbing on rim. F170.
- 17-18. Out-turned rims with flattening of outside edge, brown inside, black outside. F208 sherd of no. 17 fits F172; no. 18 from F208.
19. Thick sherd with narrow applied band pressed in at intervals. Pink outer surface, black inside. F170.
20. Small inturned bowl rim, black surfaces. F170.
- 21-23. Inturned bowl rims; fragments with expanded rims like no. 21 occurred in F170, F200, F196 and F238; rims like no. 22 were in F128B, F261 and F170, no. 23 was in F170.
24. Large sherd of base with strong wheel marks inside, black inside, pink outside, black under base. F170.

Roman

25. Rim with orange-red surfaces, light grey core, fine with some burnishing outside under rim. Similar to fabric of a ring base found under the Waltham Chapter House. Probably Much Hadham ware, 4th century A.D. (information from W. Rodwell). Lowest level of F170.
26. Worn sandy rim, buff, wheel made, possibly Roman. F189.
27. Fine grey rim, wheel made, worn, possibly Roman. Lowest level of F170.

Saxon handmade, group A

28. Black, sand temper with grass or chaff impressions. F205.

Saxon sandy hand-made, group C

- 29-34. Black, hand-made simple rims with fine-sand temper and often reddish brown surfaces. From F202, F202, F179, F170B, F170, F172 respectively. Some 20 sherds were up to 12 mm. thick.
35. Sherd of black ware as above with outer surface brown, impressed by comb in two directions. The impressions are shallow and difficult to see. The teeth of a comb found on the 9th-century hall site at Waltham fit the impressions perfectly. F173.
36. Rim of hand-made black ware, softer fabric with smooth surface, slight trace of shell in temper. F170.

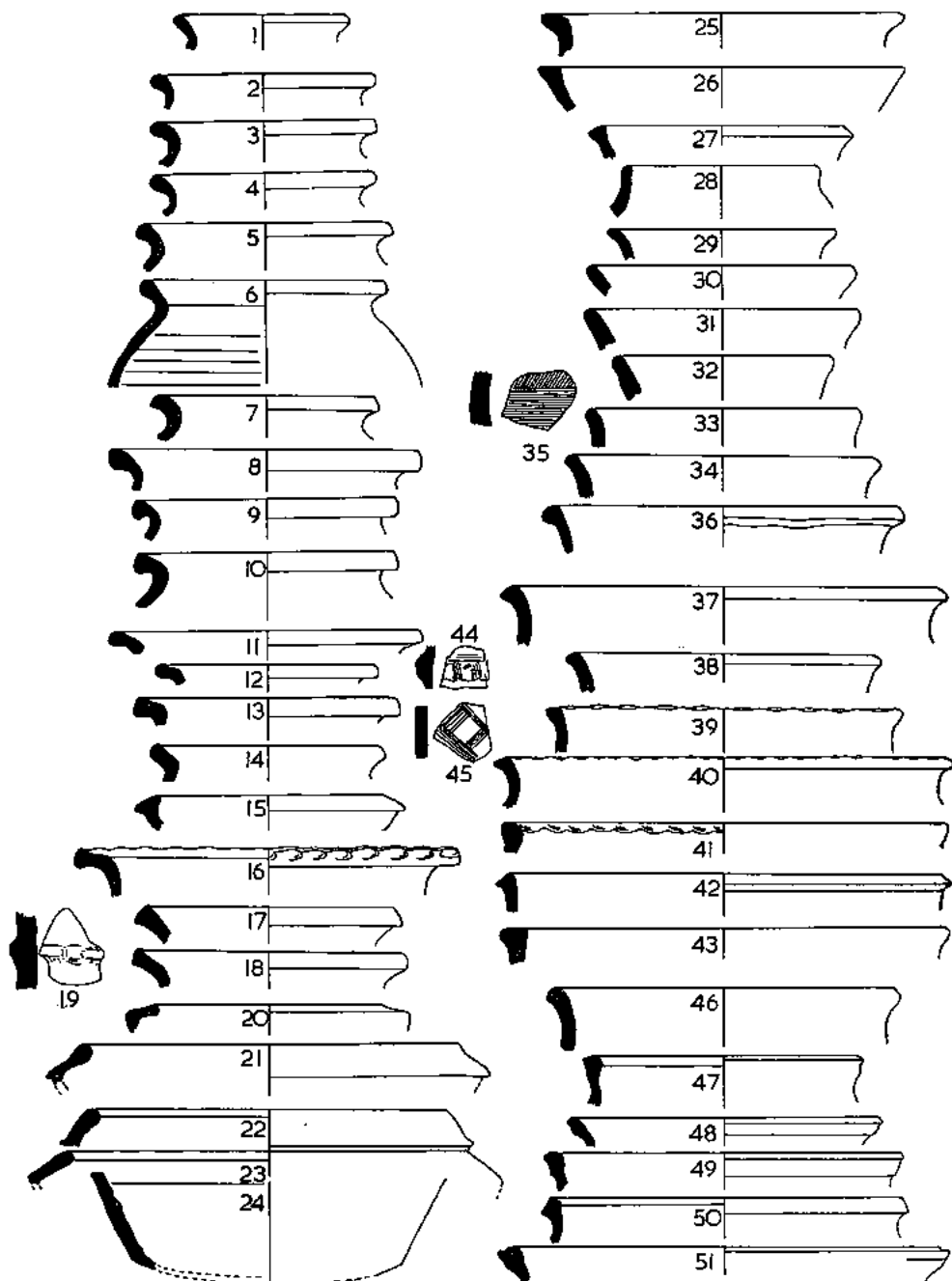


FIG. 6

WALTHAM ABBEY, SAXO-NORMAN ENCLOSURE

Pottery. 10th-12th century: nos. 1-24 Group D1; no. 28 Group A; nos. 29-36 Group C; nos. 37-46 Group E1; nos. 47-51 Group E2. Roman: nos. 25-27 (p. 157). Scale $\frac{1}{2}$

Sand and shell, rough surface, group E1

- 37-38. Plain rims, dark red surfaces, dark grey core, tempered with fine sand and traces of shell, hard with rough surface, wheel made. F170 and F129.
 39. Rim of similar fabric with thumbing on top of rim. F170.
 40. Rim of similar fabric with small impressions on top of rim probably made with forefinger. F179.
 41. Rim similar to above with thumbing inside rim. F170.
 42-43. Plain rims similar to above. No. 42 from F202 and F77, no. 43 from F128.
 44. Sherd with thumb band decoration. Similar fabric to above. Impression of 4-pronged tool in each thumb mark. F128.
 45. Sherd with incised pattern made with similar 4-pronged tool as no. 44. Fabric as above, black outside. F10.
 46. Rim of similar fabric to above but less shell and grey/black surfaces. F171.

Fine-sandy ware, group E2

- 47-51. Rims of fine sandy ware, more uneven than E1 with light brown or blackened surfaces, grey core. F170, F170, F170, F170, F128 respectively.

FIG. 7. 12TH-CENTURY POTTERY FROM SAXO-NORMAN FEATURES F196, F174, F172, F177, F178 AND F200

52. Pitcher or jug rim and rod handle, red sandy ware with some fine shell, black surfaces, only slight grey core. F196. A similar handle and rim with black core and less blackened surface was found in F170 upper level. (D).
 53. Part of pitcher spout, grey sandy ware with black surfaces, trace of incised pattern below spout. F196 (G).
 54. Rim of sandy red ware like no. 39 with thumbing inside. F196 (E1).
 55. Rim of pot like no. 46, with outer ridge, brown surfaces. F196 (E1).
 56. Rim of large pot, wheel made, uneven sand and grit temper with some leaching, blackened through and encrusted as if burnt in fire. F196 (G).
 57. Large rim of pot, shell and sand temper, grey core with light red surfaces, slight groove on top of rim. F196 (D2).
 58. Rim of pot, wheel-thrown rim, body probably hand-made, shell and sand temper, slightly leached, grey core with light red surfaces, smoke blackened outside. F196 (D2).
 59. Rim of pot, coarse shell temper, clear wheel marks on rim only. F196 (D2).
 60. Similar rim to no. 58 with sharper angle at body join. F196 (D2).
 61. Rim of similar ware to no. 58, smoke blackened outside, internal ridge roughly pressed down. F196 (D2).
 62. Out-turned rim with slight internal bead, coarse shell and sand temper, dark red/brown surfaces, grey core. F196 (D2).
 63. Rim similar to 62, coarse shell without sand temper, wheel thrown, red surfaces. F196 (D2).
 64. Rim of thin pot, coarse shell, wheel thrown, slight internal bead. F196 (D2).
 65. Rim of coarse shelly pot, light brown inner surface, outside blackened, grey core, leached. F196 (D2).
 66. Rim of large bowl, sand and shell temper, the rim heavily rolled outward. From top of F196 and half from F170 (D2).
 67. Rim of thin pot with rim rolled outward, some coarse shell and fine sand, red surface, blackened outside. F196 (D2).
 68. Rim of bowl with outward roll, flattened inside rim, red, coarse shelly ware. F196 (D2).
 69. Rim of pot, wheel made, coarse shelly ware, grey and brown surfaces. F174 (D2).
 70. Rim of pot like no. 46 fabric with outward roll. F174 (E1).

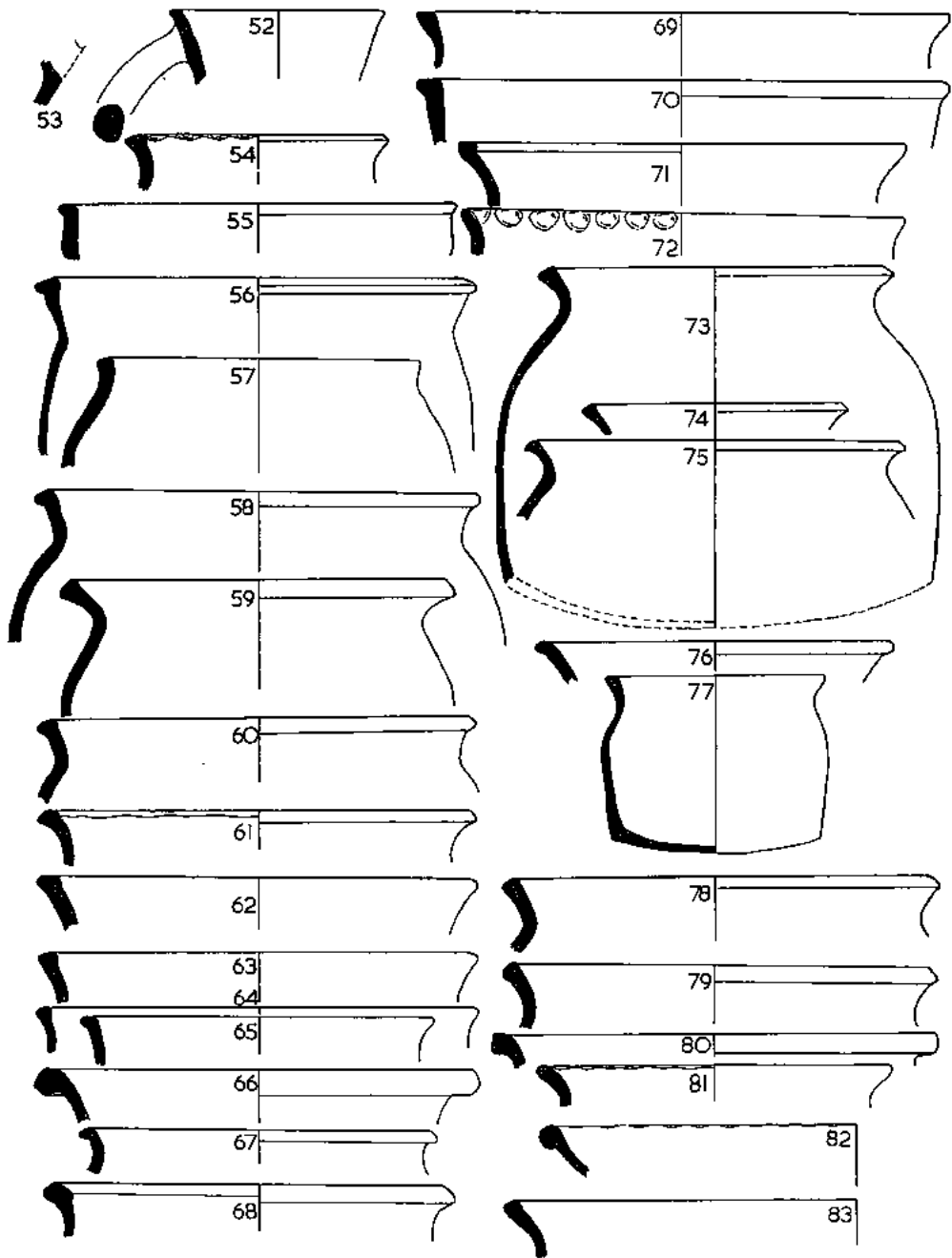


FIG. 7

WALTHAM ABBEY, SAXO-NORMAN ENCLOSURE

Pottery, 12th century, from features F196, F174, F172, F175, F178, F177 and F200 (p. 159). Scale $\frac{1}{4}$

71. Rim of pot, grey hard fabric with coarse sand temper, grey surfaces, slight red margin inside, pronounced internal roll. F174 (G).
72. Rim of red, rough, sand and shell ware, slightly rougher than nos. 37-43, internal thumbing of rim. F174 (E1).
73. Large portion of wheel-made, red ovoid pot with out-turned rim, sand temper with some small shell fragments, grey core, poorly fired and crumbly fabric, smoke blackened outside lower half. F174 (D2).
74. Rim of small grey pot with coarse shell temper, slight internal bead. F174 (D2).
75. Rim of pot, coarse shell, red surfaces, grey core. F174 (D2).
76. Rim of rough grey pot, wheel marks, coarse shell. F172 (D2).
77. Small pot found intact with one large piece missing. Leached shelly, poorly fired friable fabric, red surfaces outside rim and inside lower half, blackened on bottom and inside upper half. F172 (D2).
78. Out-turned rim, coarse shell temper. F175. (D2).
79. Out-turned rim with outward roll, shell and coarse sand, surfaces darkened by heat, grey core. F178 (D2).
80. Grey moulded rim, hard, tempered with sand giving rough surface like sandpaper F177 (G).
81. Rim of pot, rough coarse shell temper, wheel-made, brown surfaces, blackened outside, slight thumbing on rim. F200 (D2).
82. Rim of large bowl, red shell temper, slight thumbing on rim. F200 (D2).
83. Rim of large grey bowl, wheel made, tempered with coarse shell. F200 (D2).

FIG. 8. 12TH-CENTURY POTTERY FROM SAXO-NORMAN ENCLOSURE F170, F180, F181, F202

Coarse-shelly ware from F170 (D2)

- 84-87. Rims of early type with rounded edge, thumbing on outside edge of rim as in no. 87 is also an early feature.
- 88, a-j. Rims of out-turned type with flattened edge, h has a groove on top of the rim. The angle between rim and body can be seen to disappear. Diameters 20-25 cm. See no. 73 for whole pot.
- 89-91. Rims of smaller pots, impressions on outside of rim of no. 89 probably made with small rounded tool.
92. Bowl rim with thumbled outer edge. b and c are similar diameter unthumbled rims. Probably from bowl like no. 93.
93. Rim of bowl, reconstruction based on bowl found by A. E. Musty excavating west of the forge 1972.
- 94, a-i. Rims of thin-walled pots with simple rims. Diameters 20-25 cm.
- 95, a-m. Rims of thicker pots with tendency to outward roll and rounded edge. Diameters 20-25 cm.
- 96, a-i. Rims of heavy, and early flanged, pots. Diameters 20-24 cm.

Various imported pitchers (J1)

- 97-99. Rim and sherds of at least two pitchers. 98 has flat thumbled applied band, 99 has incised lines. A sherd of 'Andenne' ware more pink in colour had darker yellow glaze and thumbled band like 98. F170.
- 100-101. Shoulder sherds of fine pink/buff fabric, raised applied band on no. 100, no. 101 has vertical applied band, upper half of both sherds glazed yellow, lower half light brown. The applied band of no. 101 is yellow. Glaze is slightly pitted. F170.
102. Rim of Pingsdorf-type pitcher. Hard light grey fabric with buff surfaces, unglazed, trace of spout. Sherds a-c are of similar fabric with red painted patterns typical of the ware. All considered by J. G. Hurst to be from Brunssum, 12th century. F170.
103. Rim of hard grey sand-tempered ware, probably a pitcher, thick red outer margin with dark surface, inside surface grey/buff. F180.

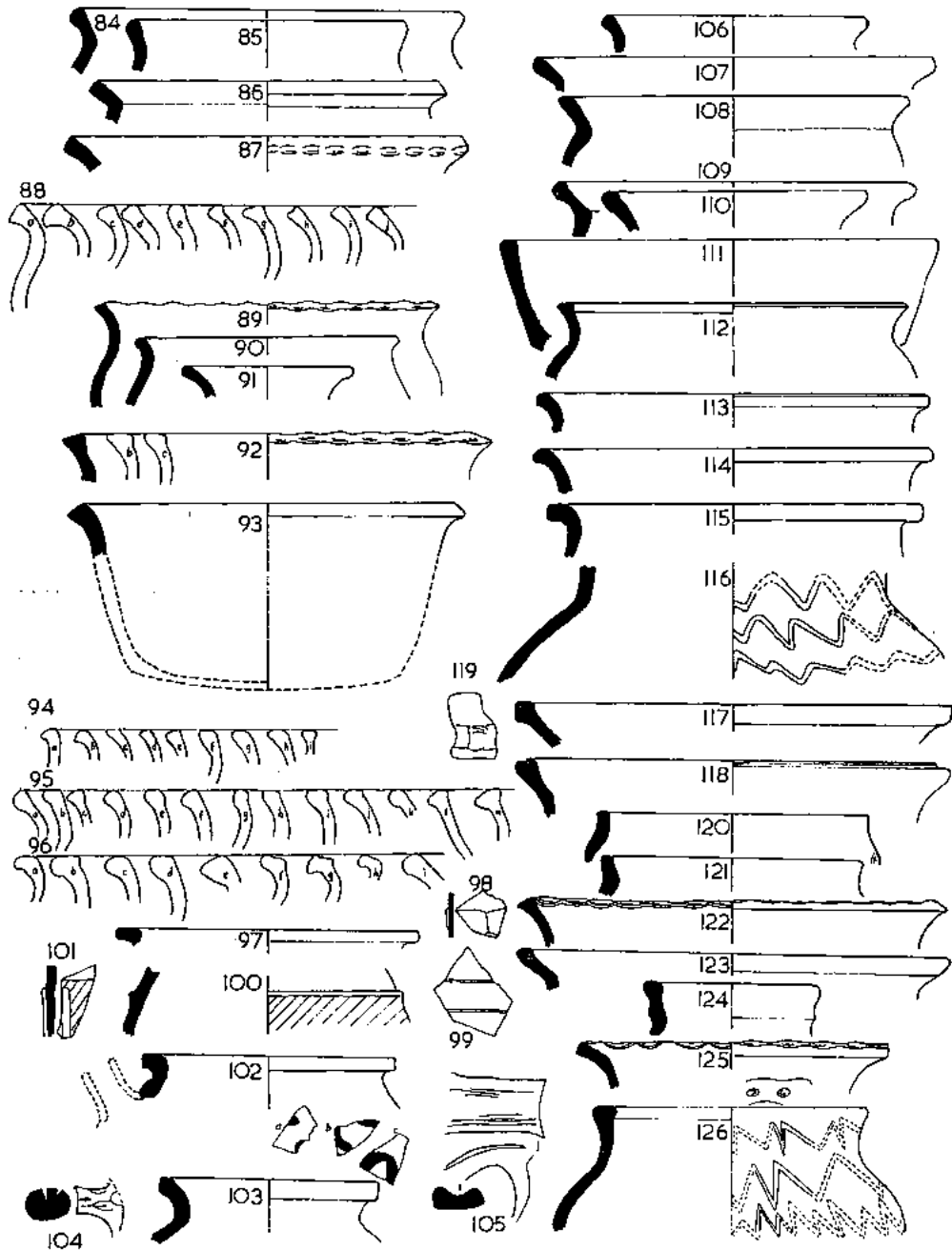


FIG. 8

WALTHAM ABBEY, SAXO-NORMAN ENCLOSURE

Pottery, 12th century, from features F170, F180, F181 and F202 (p. 161). Scale $\frac{1}{4}$

104. Handle with thumb impressions and knife stabbing, red, coarse sandy ware. F170.
 105. Handle of sandy, buff ware, glaze on back of handle and on part of body has deteriorated to dull grey.

Sandy wares (Groups G and H) from F170

106. Rim of small, red, sand-tempered pot. (H).
 107. Rim of fine sandy, grey pot, rough surface. (G).
 108. Large sherd of out-turned rim, grey fine sandy ware like 107. (G).
 109. Rim with internal hollow moulding, black inside, red outside, slight trace of shell, sand tempered. (G).
 110. Two sherds of rim of grey sandy pot, internal bead. (G).
 111. Shallow bowl with plain rim, coarse grey ware with sand and red inclusions, probably grog, some white specks. (G). A similar bowl of same ware was found in F75.
 112. Rim of sandy ware, red surface below rim turn, upper and outside surface blackened, grey core. (G).
 113. Rim of grey pot, coarse sand temper, moulded rim. (G).
 114. Rim with outward roll, fabric like no. 113. (G).
 115. Out-turned rim of light grey ware, black surfaces, coarse sand temper. (G).
 116. Neck and shoulder of vessel, perhaps a pitcher, grey ware with dark grey outer surface, black inside, coarse sand temper and tiny white inclusions. Incised decoration of this type was seen on several sherds in pre-forge levels. (G).
 117. Rim of cooking pot, grey with coarse sand temper, moulded rim, slight blackening outside. (G).
 118. Rim of pot or bowl, coarse sand temper, the sherd is pale grey but this appears to be the result of intense heat causing a colour change. Marked groove on top of rim could have been made with similar tool to that used for 89, 116 and 126. (G).
 119. Sherd of grey sandy ware with applied thumb band, several other examples were found. (G).
 120. Rim of small pot, fine sandy ware, grey core, red surfaces, trace of thumb impression on shoulder. (H).
 121. Rim of similar shape and fabric as 120, but dark grey surfaces. Both rims are of unusual shape. (G).

Pottery from features F180, F181, F202

122. Rim of rough red sandy ware, red surfaces, grey core, thumb band. F180 (H).
 123. Rim with hollow moulding, grey ware with black surfaces, coarse sand temper with round red inclusions. F181 (G).
 124. Rim of jug in light grey, hard, ware, raised ridge on neck. F181 (G).
 125. Similar rim to 122 with more out-turn and smaller diameter. F202 (H).
 126. Rim of vessel, perhaps pitcher, red ware, sand temper, grey core, grey surface on top of rim, incised decoration made with same tool as small circular impressions on top of rim. See nos. 89, 116 and 118 for use of similar tool. F202 (H).

FIG. 9. POTTERY OF BLOOMERY FORGE PERIOD, 12/13TH CENTURY

Feature F129, building period

127. Cooking pot rim, red coarse sand temper (H).
 128. Rim with thumb band of large cooking pot, coarse sand temper, grey ware. (G).
 129. Rim with trace of lip, probably pitcher, coarse sand temper, grey ware. (G).
 130. Out-turned rim of coarse shelly ware, wheel made, red surface inside, black outside; 26 cm. diameter, one of the largest of group D2.
 131. Cooking pot rim with internal bevel, red sandy ware, grey inside rim. (H).
 132. Rim of grey pot with outer surface worn showing red under black, coarse sand and grog temper. (G).

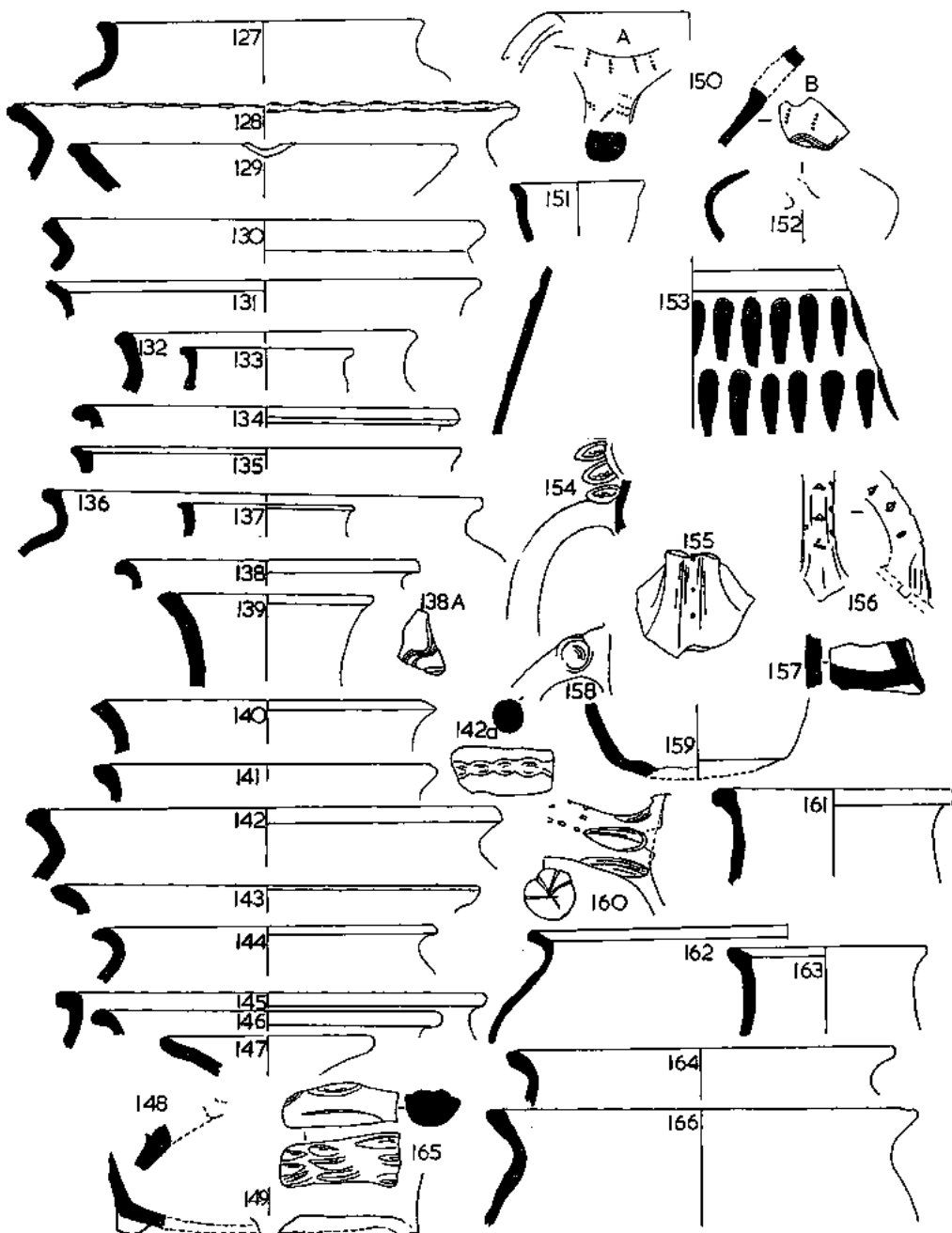


FIG. 9
 WALTHAM ABBEY, BLOOMERY FORGE
 Pottery, 14th-13th century (p. 163). Scale $\frac{1}{4}$

133. Rim of small pot with out-turned edge, coarse shelly. (D2).
 134. Grey ware pot with slightly moulded rim, coarse sand temper. (G).

From wall foundations F2, and from loam F132 over foundation F15 to smith's hearth F12

135. Rim with hollow moulding, sandy ware, black throughout, possibly burnt. F2 (G or H).
 136. Large rim of grey sandy ware, very well made. F132 (G).
 137. Rim of small pot, coarse shell temper, burnt black throughout. F132 (D2).
 138. Rim of grey sandy ware. F2. (G).
 138A. Sherd incised with four-pronged tool (G).
 139. Jug rim of thick sandy ware, grey with smooth red outer surface, light brown rough inner surface. F2 (H or J2).

From clay floor features F128, F128B, F128A

140. Cooking pot rim, coarse shell temper, grey. (F128B) (D2).
 141. Cooking pot rim, wheel made, leached shell cavities, blackened and encrusted. F128B (D2).
 142. Rim of large pot, sandy, red with black surfaces, wheel made. F128B (G).
 142a. Sherd of similar fabric with thumbled band. F128B (G).
 143. Rim of grey sandy ware, moulding at edge. F128B (G). Like no. 134.
 144. Rim of pot with coarse sand temper, greyish brown slightly blackened surfaces. F128B (G).
 145. Rim of coarse shelly ware. F128B (D2).
 146. Rim of grey sandy ware, like no. 134 and 143. F128 (G).
 147. Rim of small bowl (or possibly pedestal upside down), coarse shelly ware, inner surface blackened. F128 (D2).
 148. Lower part of pitcher spout, grey sandy ware with black over red surface, like no. 142 fabric. F128 (G).
 149. Base with shallow foot of tripod pitcher, fine red ware, lighter core, pale orange surface inside, splashes of orange glaze outside. F128B (J1).
 150A. Handle of dark buff vessel, possibly pitcher, grey core, fine sand temper, unglazed, pattern pricked with four-pronged tool giving triangular impressions, no depth to pricking. F128 (J1).
 150B. Sherd of similar fabric, slightly darker reddish surface, incised lines probably made with same four-pronged tool as the pricking, trace of spout opening. F128 (J1).
 151. Rim of buff sandy ware, unglazed. F128B (J1).
 152. Large sherd of fine red ware vessel with oblique handle, thin dark grey core, orange/greenish glaze, pitted, over most of outside and handle. F128 (J1).
 153. Large body sherd of decorated jug. Grey fine ware with dark buff inner surface, red clay scales applied by pulling downwards, pitted yellowish green glaze overall, the scales appearing as dark brown. Fitting sherds were found scattered in F127, F120, and F170.
 154. Fine red ware jug rod handle with two applied ears at body junction, green glaze on back of handle and ears. F128 (J1).
 155. Base of jug strap handle, pinkish red inner surface, rough finish, light grey core, mottled green glaze outside overall, central groove on back with pricking 0.8 cm. deep. F128 (J1).
 156. Lower half of rod handle, coarse sand temper, dark grey with red surfaces, back stabbed perhaps by knife point. F128B (J1).
 157. Sherd of jug, coarse sandy ware, dark grey core with orange surfaces, dark brown linear design roughly applied outside with patchy greenish glaze both sides showing orange where glaze is thin. Eight sherds of similar fabric, glaze and pattern were found, but all had glaze outside only, some inner surfaces were grey. One sherd

- from F128 fitted a sherd from outside building in F10, other sherds were in the clay floor F128 or features cutting through it. (J1).
158. Rod handle of jug, buff sandy ware, deep thumb marks at join, patchy light green glaze, grey core. F127 (J1).
159. Base of similar jug to no. 158, glaze on body outside. F127 (J1). (16 sherds of similar fabric with a wide range of internal surfaces from dark grey to light grey-buff were found in F170 and F128. One neck sherd has a brown horizontal stripe.)

From cobbles outside building F10

160. Heavy rod handle of jug or pitcher, coarse sandy grey ware, the rim was too small to obtain a diameter. Six deeply thumb impressions at junction, with thumbnail impressions at bottom. Stab marks, possibly with iron nail of square section, on top, reaching to centre as shown in section. Deep tooled impression on inside to fix handle to body. (G).
161. Rim of jug, similar fabric to no. 160 with some red on surface, unglazed. (G).

From loam F136 under track at NE. corner of building

162. Rim of large pot with wide internal bevel, sand temper giving a rough surface, brownish grey surfaces. E1).
163. Jug rim with internal bevel, grey fine sandy with red margins, white slip both sides ending at bottom of sherd inside, green glaze traces outside. (J2).

From upper debris F127

164. Rim of rough red sandy ware pot, tool marks outside rim. (E2).

From hearth ash F63

165. Handle with shallow thumbing on back, red sandy unglazed ware, end doubled under and joined to strengthen handle. (J1).

From clay by top of well, F157

166. Rim of red cooking pot, coarse sand temper. (H).

FIG. 10. POTTERY, c. 1300, FROM WELL LINING FEATURES

167. Rim of cooking pot, red sandy ware, internal bevel. F141 (H).
168. Jug of grey, hard, sandy ware with white painted decoration on shoulder, white band under rim typical of local jugs. Base slightly thumbed outside. Reconstructed from sherds from clay F141 and F149 and silt F148. (J2).

APPENDIX 5: BUILDING MATERIALS

A. DAUB (*Saxo-Norman*)

Daub, presumably accidentally fired so that it survived, was found mainly in two adjacent pits F185/8 and F189/95; some 100 pieces came from the filling F186 and half as much was in the filling F190 of the two pits respectively. Associated charcoal suggests the remains may be of a burnt wattle and daub building. Some pieces had clear evidence of wattle impressions, others showed straw or grass impressions on the outer face. A curving profile on some pieces was quite pronounced.

B. STONE

(a) *Saxo-Norman*

No stone was used in a constructional sense in the Saxo-Norman levels. A few fragments found may have been derived from Roman debris common in such strata at Waltham. See Appendix 10 for description of sharpening stones and lava fragments.

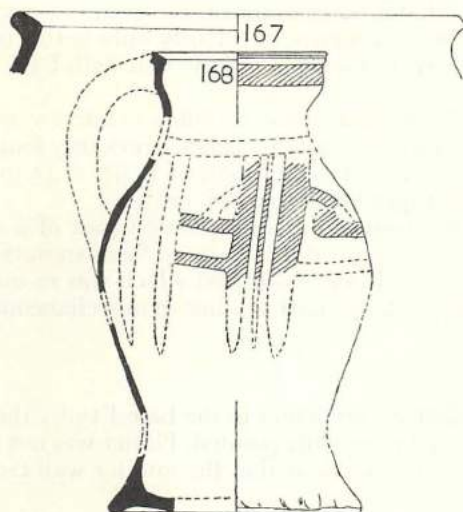


FIG. 10
WALTHAM ABBEY, BLOOMERY FORGE
Pottery, c. 1300, from well lining (p. 166). Scale $\frac{1}{4}$

(b) *Medieval*

The walls F1 of the medieval forge were mainly of mortared flint and chalk, the latter being used in the core and for the internal face to some extent. Chalk lumps in gravel formed the foundations F2 to the walls. Earlier pits and gulleys along the lines of the walls had been dug out and an extra depth of chalk laid therein (Pl. ID). The stylobate foundations F5 were of mortared chalk in loose gravel and flints. A few pieces of Reigate stone were used in the walls, in particular to form the only quoin detected, at the NE. corner. Some rough pieces of Kentish ragstone were also used, particularly in the external face of the E. wall. One 8 cm.-thick slab of sandstone (S. on FIG. 2) may have served as part of a step to the postulated doorway F3 at the NE. corner. A few pieces of brick and roof tile were seen in the walls especially at the position of the postulated doorway F7 in the S. side.

The interior walls were mainly of roof-tile and brick. Two pieces of Reigate stone, one rebated, formed a slot for a doorpost in the S. end of wall F28. A block of Caen stone formed the corner of wall F34.

Pieces of derived ashlar and moulded Abbey stone are common in excavated features at Waltham. The hearth curb F62 included two 33 cm.-long rough-hewn Purbeck marble engaged shafts c. 11 cm. diameter. A fragment of Purbeck marble capital c. 30 cm. diameter was found in pit fill F80. Three pieces of Reigate stone F153 were used to support the bottom of the inner barrel of the well; one was a moulded jambstone with a pointed roll,⁵⁵ therefore probably of early 13th-century origin.

c. BRICKS (*Medieval and post medieval*)

Bricks from Waltham have previously been classified⁵⁶ Great (G) and Flemish size or Statute (f). The bricks of the smith's hearth F12 lay within the range $12\frac{3}{4}$ to $13\frac{1}{2}$ × $6\frac{1}{4}$ to $6\frac{3}{4}$ × 2 to $2\frac{1}{4}$ inches (7 measured); these are nearest to the type G178 which have

⁵⁵ A form of moulding at its zenith in 1200-1220. Forrester, 1972, 10.

⁵⁶ Huggins, 1972, 111-4.

previously been found in what is taken to be a 14th-century context. Also in F12 was one specimen G162, $11\frac{1}{2} \times 7\frac{1}{2} \times 2$ inches, previously only found re-used in 16th-century contexts. Fragments of Great bricks occurred in walls F28, F31, F34, well fill F140 and well silt F152.

Flemish-size bricks have been found as follows: interior wall F28B, 4 specimens nearest to F84, 9 to $9\frac{1}{2} \times 4\frac{1}{2}$ to $4\frac{1}{2} \times 2$ to $2\frac{1}{2}$ inches, previously found in a post-Dissolution context: wall F34, 4 specimens of F100 (or F95), $9\frac{1}{2}$ to $9\frac{3}{4} \times 4\frac{1}{2}$ to $4\frac{1}{2} \times 2\frac{1}{2}$ to $2\frac{1}{2}$ inches, previously dated to the last quarter of the 15th century.

The SE. corner of the hearth F12 incorporated part of a segmental brick $5\frac{1}{2}$ in. (14.6 cm.) wide \times $2\frac{1}{2}$ in. (5.4 cm.) thick, it would form an outside radius of c. 2 ft. (61 cm.). It thus compares with a brick coded SB8 which was re-used in a first half of the 15th-century context, this brick was part of a line of miscellaneous material added to the original hearth.

D. PLASTER (*Medieval*)

Fragments of wall plaster were found in the base F15 by the smith's hearth and in the ash F96, the latter piece being white painted. Plaster was not found in the remaining destruction debris F126, so it is unlikely that the interior wall faces were plastered.

E. MORTAR (*Medieval*)

Differences in mortar colour at position F7 of the postulated doorway in the S. wall of the forge, show that the wall had been re-formed there at half width, possibly as a ground wall to a timber door sill.

F. ROOFING MATERIALS

(a) *Saxo-Norman*

Fragments of tegula (and flue tile) represent Roman debris in 9th-century levels elsewhere at Waltham. Similar material was found in 13 of the excavated Saxo-Norman features and in 6 forge-period levels. The source of the material has not yet been found.

Besides the Roman material, 8 fragments of flat roof tile were recorded in the Saxo-Norman levels.

(b) *Medieval*

Material in the destruction debris F126 shows that the forge was roofed with flat, red, ceramic tiles. Five fragments of ridge tile were discovered in forge-period features; only one piece remained in destruction debris, but this was mainly machine-dug. One fragment of hip tile was found in the upper clay floor F128A. With bays of equal length a hipped roof would not be expected, but, when the stylobates went out of use, the building may have been re-roofed with hipped ends, or it may have come from the lean-to.

Fragments of roof tile were incorporated in the internal walls F28, F28A, F31 and F34 and in the mortared base F61. Some pieces were incorporated in the S. wall where the doorway F7 is postulated.

One fragment only of slate was found, in the foundation F15 by the smith's hearth F12.

APPENDIX 6: IRON OBJECTS by Ian H. Goodall, SPURS by Blanche Ellis (FIG. 11 to 13)

(a) *Saxo-Norman*

There was very little iron in the Saxo-Norman levels, indicating that there was no iron working on this part of the site until the forge was built. Seven nails, one with a figure-eight head, and a 7 cm. length of wire were found in F170; a length of bent rod was found in F172.

(b) *Medieval and Post-Medieval*

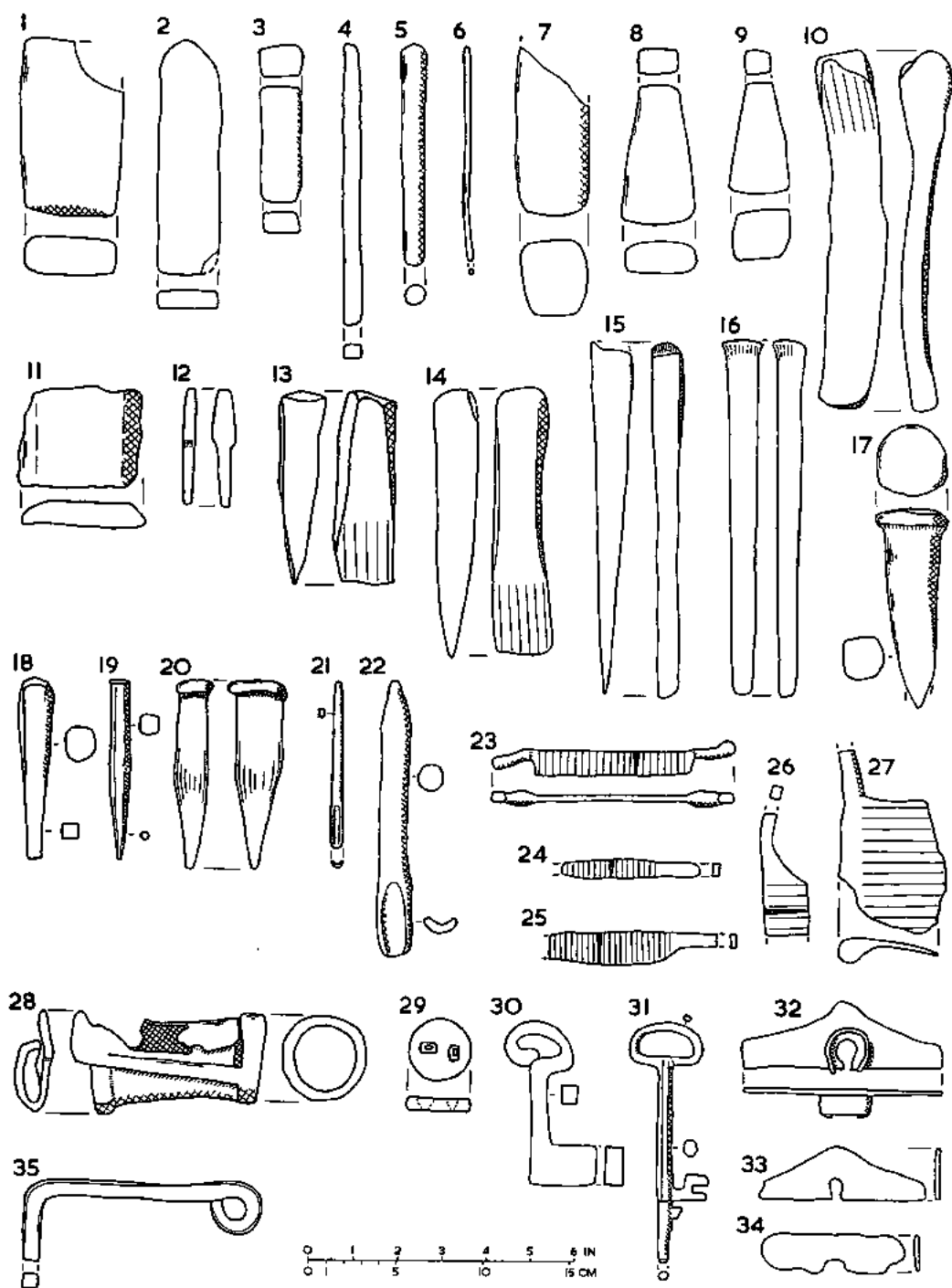


FIG. 11
WALTHAM ABBEY, BLOOMERY FORGE

Iron objects 1: Bar iron and incomplete forgings (nos. 1-12), Tools (nos. 13-27), Locks and keys (nos. 28-35) (p. 170)

Bar iron and incomplete forgings (FIG. 11)

1-6. Over one hundred pieces of bar iron of square, rectangular, round and sheet section, from which the blacksmith forged his objects, were found in forge-period features. Nos. 1-6 form a representative selection. The wire, no. 6, 3 mm. in diameter, may have been for fish-hooks: seven pieces 60 cm. in total length came from F140. Nos. 1-6 came from F126, 134, 128B, 144, 96, 140 respectively.

A few fragments of bar iron, generally from one to three pieces, but up to six, came from the following features: F66, 68, 72, 73, 76, 84, 85, 96, 106, 110, 111, 120, 129, 130, 131, 134, 141, 142, 144, 150, 259, 261. Ten or eleven each came from F114, 125, 126 and 127, and nineteen were found in F128, including two specifically in 128A and three in 128B.

7-12. A number of shaped pieces of iron and moods, i.e. rough blanks or forgings for objects, were found. No. 7, of octagonal section, may be part of a sledge hammer. No. 12 is one of six identical objects which are moods for auger bits: cf. a small bit from Basing House, Hampshire.⁵⁷ Other forgings are nos. 29, 30, 32, 33 and 34 below. Nos. 7-12 are from F80, 126, 261, 126, 129, 127 respectively.

Tools

13, 14. Chisels or sets for cutting cold iron. Hammered heads, stout octagonal stems becoming rectangular and tapering to the blade. F264A, F128B.

15. Chisel or set for cutting hot iron. Long slender rectangular stem tapering to the blade. F110.

16-20. Punches. The punch, used on hot metal, could be round, square or any other required section, as this collection indicates. F152, 85, 110, 152, 128 respectively.

21. Spoon bit, circular section stem becoming rectangular at the terminal. F127.

22. Spoon bit, heavily corroded and probably incomplete. F126.

23. Shave, blade damaged, expanded terminals with knobbed ends. F126.

24. Knife, pointed tang, blade incomplete. F128.

25. Knife, tang broken across rivet hole, blade incomplete. F134.

26. Shears blade fragment, stem broadening in side view. F73.

27. Top of blade with stout back-rib continuing as the tang. Probably from a large pair of shears rather than a scythe. F126.

Locks and Keys

28. Distorted and incomplete padlock case from a barrel padlock with shackle. Green corrosion indicates that it was assembled by brazing with copper alloy (?spelter). The case is of sheet iron strengthened by straps around each end and by three down the case. The key was inserted from the lower left in the drawing and the shackle hinged on a frame, now largely lost, above it. The expanded and pierced plate at the end of the shackle passed through a slot, now partially closed, at the upper right end of the case, and the bolt was passed through it from the right to secure the whole padlock. A similar padlock case is known from House 1 at Kettleby Thorpe, Lincolnshire, in a context from probably the second quarter of the fourteenth century to the mid fifteenth century.⁵⁸ F72.

29. Head of padlock bolt with two rectangular countersunk holes to take the spines to which the springs were attached. Compare with a complete, but more complex, example from The Mount, Princes Risborough, Bucks.⁵⁹ F128A.

30. Key, partly forged from rectangular section bar iron. The bit has not been completed, but the bar has been drawn down and roughly forged into a bow by butting one end against the stem. This junction has yet to be welded. Another

⁵⁷ Moorhouse, 1971, fig. 20/70.

⁵⁸ Excavated by R. and E. Russel.

⁵⁹ Pavry and Knocker, 1953-60, fig. 13/5.

key, complete but for cutting the wards in the bit, was found in a croft at Goltho, Lincs., which in the late fourteenth, early fifteenth centuries contained a smithy.⁶⁰ F127.

31. Key, D-shaped bow, octagonal stem becoming rounded below the stop, knobbed end. Bit incomplete. LMMC Type VIIA.⁶¹ F148.
- 32-34. Wards from locks, no. 32 additionally with a collar. Fixed locks, such as plate-locks and stock-locks,⁶² included in their mechanism one or more wards, with or without collars, which the bit of the key had to pass before it could eventually throw the bolt. The vertical ward cuts in the key passed the wards in the lock, horizontal cuts passed collars such as that on no. 32. The same principle was used on post-medieval fixed locks.⁶³ All F96.
35. Looped door latch. F151.

Horse furniture (FIG. 12)

36. Horseshoe, three nailholes in each arm, calkin to complete arm. Nail with large rectangular head. F10.
37. Horseshoe, no calkin, broken across a nailhole. F127. Fragments of two further horseshoes, each with a thickened tip, were found in F127 and F128.
38. Oxshoe, incomplete, of characteristically thin section iron with small nailholes placed near to the edge which consequently bulges out around them. F134. A smaller oxshoe fragment was found in F128A. These examples may be compared with others from Waltham Abbey and from Hangleton, Sussex.⁶⁴ Horseshoe and oxshoe nails are discussed separately below.
39. Three-armed curry-comb handle, incomplete. The tang fitted into a wooden handle and the three arms ended in expanded terminals—part of the central one survives—which were rivetted to the back of the semi-cylindrical comb. A similar handle was found in a sixteenth-century context at West Hartburn, Durham,⁶⁵ but other curry-combs with two and three armed handles are known from medieval and later contexts. F66.

Spurs

40. Slender iron rowel spur from F130 with its undamaged side bent at right angles under the ankle of the wearer. Short straight neck projecting downwards towards the rowel. The spur is badly damaged by rust and only the top of one side remains. The entire spur has been crushed and twisted. The complete side has a small single-ring terminal with two attachments for the spur leather. Although badly corroded, each still has the remains of one rivet. A similar spur in better condition from London, which has its attachments rivetted to some of the original leather, is illustrated in LMMC (FIG. 30, no. 6).

The points of the rowel have rusted away to stumps and it is difficult to ascertain the number of points it originally had; it seems likely that there were six.

The deep bend under the ankle, the slender proportions of the spur and its rivet attachments are all typical features of the earliest rowel spurs and this example dates from the first half of the fourteenth century. On a stained glass window at the east end of Tewkesbury Abbey, similar spurs are illustrated on the figures in armour of Hugh Despenser and Gilbert de Clare. The window dates 1340-44.^{65a}

⁶⁰ Excavated by Guy Beresford.

⁶¹ LMMC, 1967, 141-2.

⁶² Salzman, 1967, 302-3.

⁶³ Hume, 1969, 243-9.

⁶⁴ Huggins, 1972, fig. 32/15, 16 and Holden, 1963, fig. 38/7-9.

⁶⁵ Excavated by L. Still and A. Pallister.

^{65a} 'The glass in the choir clerestry of Tewkesbury Abbey', *Trans. Bristol and Gloucestershire Archaeol. Soc.*, 46 (1924). Pages 320-21 are especially relevant to the date of the windows.

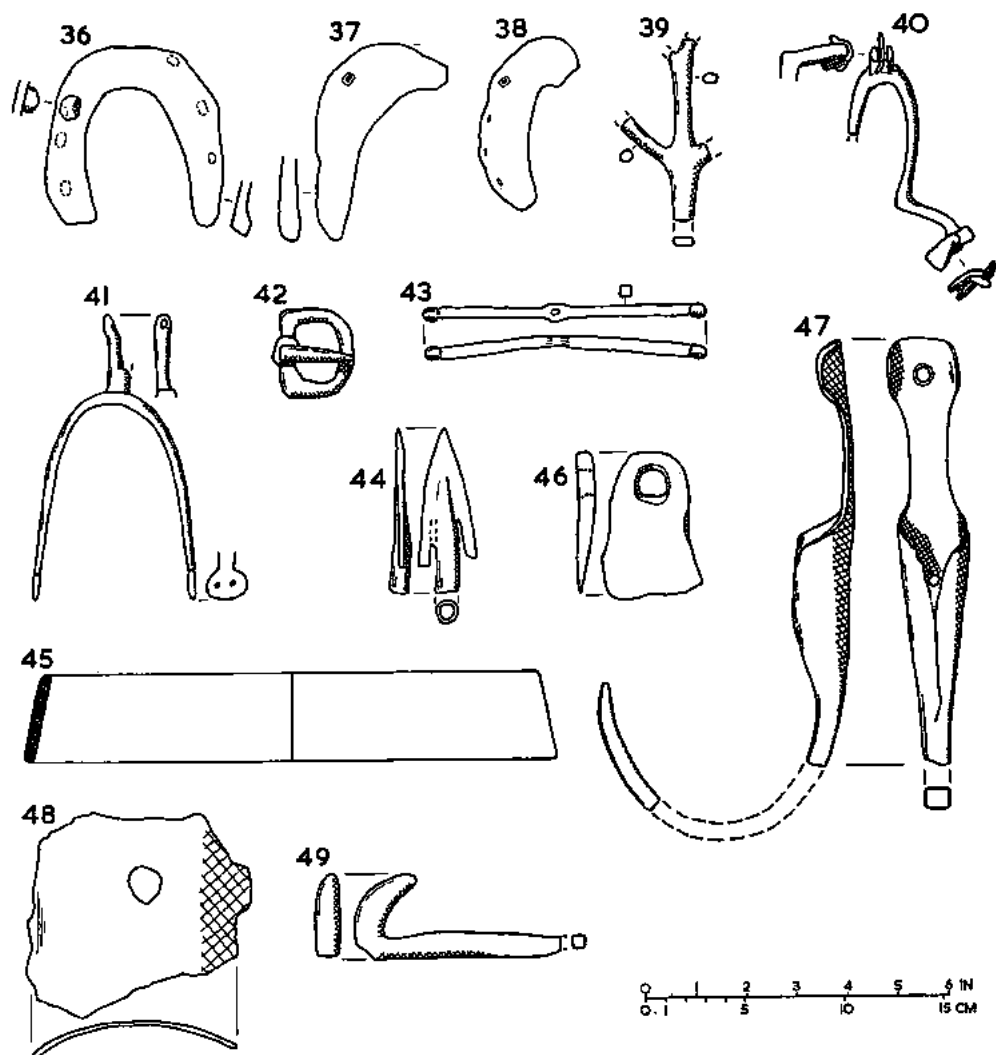


FIG. 12
WALTHAM ABBEY, BLOOMERY FORGE

Iron objects 2: Horse furniture (nos. 36-41), Personal fittings (nos. 42-3), Arrowhead (no. 44), Bucket fittings and hook from well (nos. 45-7), Structural fittings (nos. 48-9) (p. 171)

Due to its damaged conditions the only useful measurements of this spur are the length of the neck 3 cm. and the total length of the complete side approximately 9.5 cm.

41. Iron spur with straight sides and short straight neck from topsoil F125. Oval terminals each pierced with two small holes one above the other. The buckle and attachments for the leathers are missing. One side of the neck is complete and the remains of an iron rowel pin appears to be present on the inner side, but the other side of the rowel box and neck has rusted away completely. The rowel is missing. The spur is badly rusted and no traces of tinning can be seen.

It is of a type worn in England in the seventeenth century. This spur is approximately contemporary with the straight-sided bronze spur from the Sheepen Farm site of a Parliamentary earthwork connected with the Siege of Colchester in 1648, now in the Colchester and Essex Museum.

It may be compared with the tinned iron spur from Sewardstone Street, Waltham Abbey,⁶⁶ which is a later seventeenth-century development of the same type, being smaller with tapered sides and a waisted neck.

Both the Colchester and the Sewardstone Street spurs retain stud attachments. The spur under discussion might also have had stud attachments to go into slits in the spur leathers, alternatively simple hook attachments were also in common use during the seventeenth century.

Personal fittings

42. Buckle with pin. F98.
 43. Purse bar with terminal knobs and central, perforated expansion for the swivel. The pendent frames which hung from the grooves immediately within the terminals have been lost, as have any attachment plates elsewhere on the bar. It is of interest to compare this purse bar with one from Montgomery Castle, a castle founded in 1223 and demolished in 1649, but for the general type see LMMC Types A3-A5.⁶⁷ F128B.

Arrowhead

44. Socketed and barbed arrowhead. F128.

Bucket fittings and hook from Well

45. Bucket strap of canted rectangular section with mean internal diameters of 26 cm. and 24.5 cm. top and bottom. There is no indication of nailing, but vertical wood graining from the staves is preserved on the inner side. F144.
 46. Bucket escutcheon, incomplete. Compare with an example from Basing House, Hants.⁶⁸ F147.
 47. Hook, incomplete, with closed nailed socket and strengthening bar with expanded nailed terminal. The hook is of octagonal section. The hook may have been used to lower or to retrieve lost jugs and buckets from the well. F148.

Structural fittings

48. Broad, perforated sheet iron strap or sheath. F127.
 49. Tanged wallhook. F91.

Horseshoe nails (FIG. 13)

All have square or rectangular section shanks.

Type A: Fiddle-key type, the generally semi-circular head only as thick in cross-section as the shank. In contrast to the succeeding types of nail, which were used with plain outline horseshoes with rectangular nailholes, this type was used with horseshoes which had large countersunk nailholes and a consequent wavy edge. This type has been thought not to date after the thirteenth century,⁶⁹ but a number of examples are known from fourteenth-century contexts including Bramber Castle, Sussex and Seacourt, Berkshire.⁷⁰ The single example from F127 has an incomplete length of 3.2 cm. and a shank section 6 × 4 mm.

⁶⁶ Huggins, 1969, fig. 33, no. 4.

⁶⁷ Lewis, 1968, fig. 8/25 and L.M.M.C., 1967, 162-6.

⁶⁸ Moorhouse, 1971, fig. 20/64.

⁶⁹ L.M.M.C., 1967, 112-5.

⁷⁰ Bramber Castle quoted in Holden, 1967, 124; Biddle, 1961-2, 176.

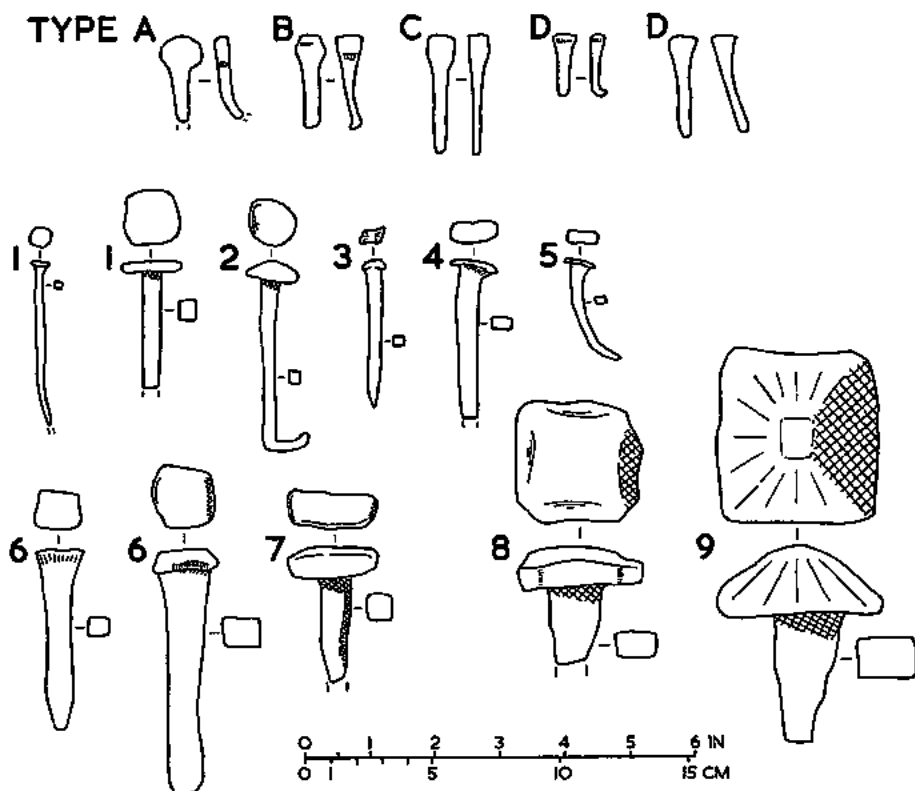


FIG. 13
WALTHAM ABBEY, BLOOMERY FORGE

Iron objects 3: Horseshoe nails (types A-D), Timber nails (types 1-9) (p. 173)

Type B: Trapezoidal head, often with well-defined ears, with a marked expansion in side view. Examples include those from a late-twelfth to late-thirteenth-century context at Ellington, Hunts., thirteenth- and probably early-fourteenth-century contexts at Clough Castle, Co. Down, a late-thirteenth-century context at Weoley Castle, Warwickshire, and a fourteenth-century context at Seacourt, Berkshire.⁷¹ Of six examples from the present excavation, the longest incomplete one is 4.1 cm. in length, and the shank sections range from 4 × 3 to 6 × 4 mm.

Type C: Shouldered head with near-vertical sides; in side view the head expands at the shoulders and may thicken slightly above them. There is an example in a horseshoe from Cambokeels, Durham, a site which has pottery with a range from the last quarter of the fourteenth century into the fifteenth, and a little of the early sixteenth century.⁷² Of 78 examples from the present excavation, five complete nails are from 4.7 to 5.7 cm. long, and shank sections are from 5 × 3 to 6 × 3 mm.

Type D: The shank expands from all sides up to the flat top of the head. Nails of this type vary considerably in size, but in general the smaller examples are best suited for oxshoes and the larger for horseshoes. A horseshoe from Cambokeels,

⁷¹ I. H. Goodall in Tebbutt, Rudd and Moorhouse, 1971, fig. 12/7; Waterman, 1954, fig. 12/10-12; Oswald, 1962-3, fig. 51/30; Biddle, 1961-2, 176-7.

⁷² Hildyard and Charlton, 1947, fig. 3/1.

Durham, has one of these nails.⁷³ Of 130 examples from the present excavation, five complete nails have lengths from 2.9 to 4.5 cm. and a shank section from 5 × 2 to 6 × 4 mm.

TABLE 2. HORSESHOE NAILS

TYPE	F128	F127	F96	F72	F126	F98	F10A	TOTAL
A	—	1	—	—	—	—	—	1
B	—	3	1	—	—	—	2	6
C	6	8	21	3	3	1	36	78
D	14	10	11	—	3	—	92	130
Total	20	22	33	3	6	1	130	

Timber nails

All have square or rectangular shanks centrally placed except in types 4 and 7.

Type 1: Flat head, square, rectangular or rounded in shape. Of 31 examples all but two have heads under 2 cm. maximum width and shank sections from 3 × 3 to 6 × 3 mm. The two have 2.2 cm. square heads and a shank section of 6 × 9 mm.

Type 2: Single example with domed head of rounded rectangular shape. The tip is clenched and wood graining is visible across the shank.

Type 3: Raised faceted head, rectangular in shape. Complete nails are from 4 to 6.4 cm. long, the shank section from 8 × 7 to 10 × 10 mm.

Type 4: Flat head, long rectangle in shape. The five nails have lengths from 3.4 to 10.4 cm., heads from 12 × 6 to 18 × 9 mm. and shank sections from 3 × 3 to 8 × 6 mm.

Type 5: Flat head of figure-eight shape. The two nails are over 4.5 cm. long, with heads 9 × 6 and 12 × 5 mm. and shanks 4 × 3 mm.

Type 6: Flat rectangular head formed by a flaring, wedge-shaped shank.

Type 7: Stud with long, flat rectangular head.

Type 8: Stud with rectangular, or occasionally rounded, domed head. F73 and F127 have a marked edge-chamfer. A complete stud is 6.8 cm. long, an incomplete one 8 cm. The heads are from 29 × 25 to 50 × 37 mm., the shanks from 10 × 8 to 15 × 10 mm.

Type 9: Stud with rectangular pyramidal head. The complete stud is 10.8 cm. long, the incomplete one 7.7 cm.

TABLE 3. TIMBER NAILS

TYPE	F148	F144	F134	F128	F96	F72	F126	F98	F10A	F68	F127	F149	F73	F252	TOTAL
1	1	—	—	12	13	—	3	2	—	—	—	—	—	—	31
2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1
3	—	—	—	7	—	—	—	—	1	—	—	—	—	—	8
4	—	—	1	2	2	—	—	—	—	—	—	—	—	—	5
5	—	—	—	—	—	1	1	—	—	—	—	—	—	—	2
6	—	—	—	2	—	—	—	—	—	—	—	—	—	—	2
7	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1
8	—	—	—	—	—	—	1	—	1	1	—	1	1	—	5
9	—	—	—	—	—	—	—	—	—	—	—	2	—	—	2
Total	1	1	1	23	15	1	5	2	1	1	2	2	1	1	

The illustrated nails are from the following features: A: F127; B: F10A; C: F96; D: both F10A; 1: F128, F10A; 2: F144; 3: F128; 4: F128; 5: F126; 6: both F128; 7: F127; 8: F127; 9: F149.

APPENDIX 7: BRONZE OBJECTS (FIG. 14)

(a) *Saxo-Norman*

1. Strap end with 3 holes; ditch F175, 11th/12th century.

⁷³ Hildyard and Charlton, 1947, fig. 3/2.

2. D-shaped ring probably of a strap-end buckle; pit fill F192.
3. Part of ingot, probably cast in groove in stone or sand; pit F212, 12th century.
4. Length of decorated strip, broken at fixing holes at each end; pit 212, 12th century.

The presence of the ingot, no. 3 suggests that bronze working was, by the 12th century, being undertaken somewhere within the Saxo-Norman enclosure. There was no clear suggestion that this was done within the area excavated.

(b) *Medieval and Post Medieval*

5. Object of 1 mm. thick sheet; iron ore spread F68.
6. Object with two iron rivets, possibly half a belt hanger; spread of ash F76, 16th/early 17th century.

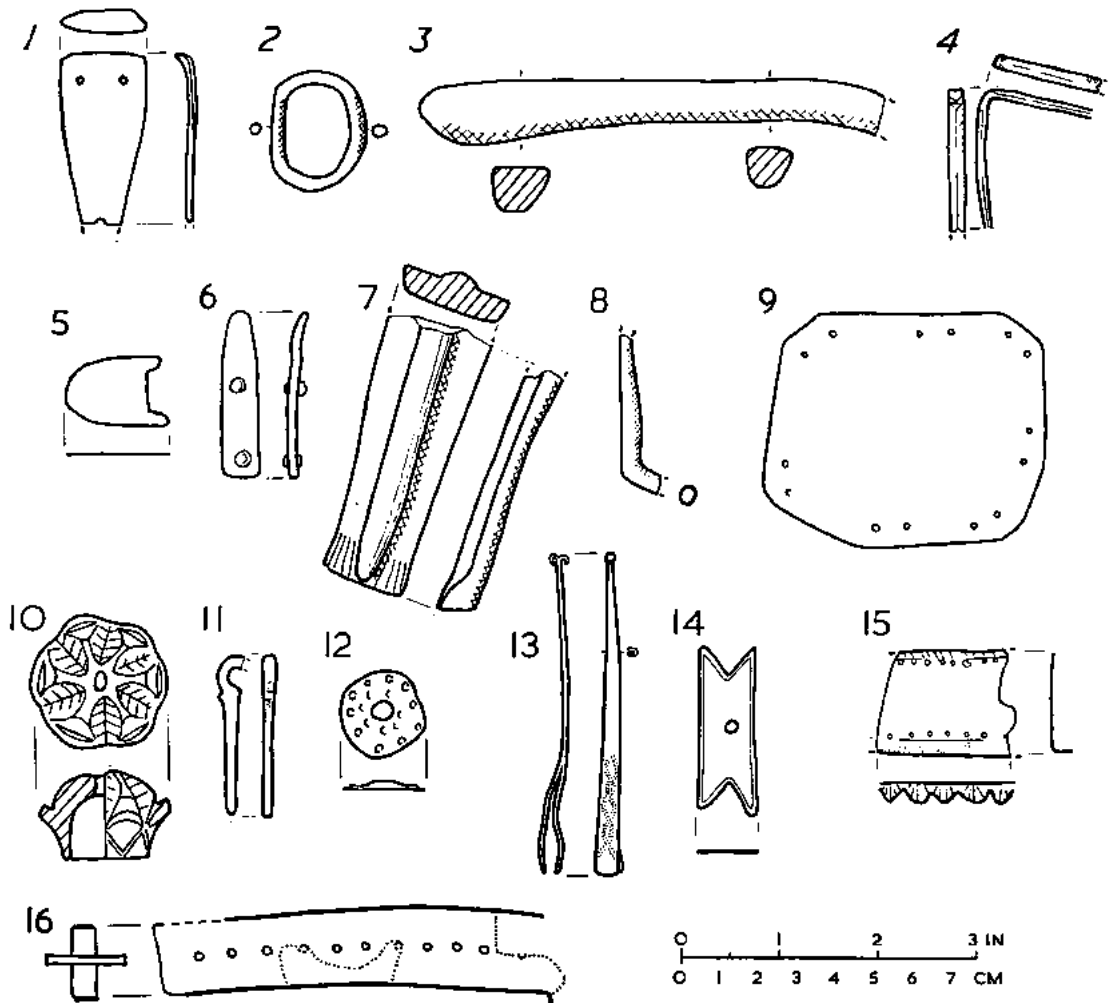


FIG. 14
WALTHAM ABBEY, BLOOMERY FORGE AND SAXO-NORMAN ENCLOSURE
Bronze objects: nos. 1-4 Saxo-Norman; nos. 5-15 Medieval (p. 175)

7. Broken foot of bronze vessel; destruction debris F126. Numerous 14/15th-century examples are shown in LMMC, p. 199-207.
8. Fragment with filed surfaces, possibly part of buckle; destruction debris F126.
9. Sheet patch or cover, 0.6 mm. thick, 14 fixing holes; destruction debris F126.
10. Cast pommel, 35 mm. diameter, to fit haft of 20 mm. diameter, 6-lobed design with incised lines on the re-entrant flat faces; clay floor F128.
11. Pin, 41 mm. long, for circular brooch as used for fastening clothing; clay floor F128. Compares with LMMC, PL. LXXVII, no. 2; typical of 13/14th-century plain brooches.
12. Dimpled roundel, 0.6 mm. thick sheet; clay floor F128.
13. Tweezers, 82 mm. long, made from one piece of 0.6 mm. thick sheet, decoration by rouletting tool; re-deposited loam F132 with 13th century rim sherd.
14. Strip, 26 mm. wide, 0.4 mm. thick with 16 fixing holes, one edge bent over and scalloped, decoration by incised lines; well lining F149, late 13th/early 14th century.
15. Strip, 42 × 15 × 1 mm. thick, notched ends, fixing hole, all edges on one face slightly chamfered; wall robbing F252.
16. Iron tang of knife with at least 11 bronze wire rivets 2 mm. diameter × 20 mm. long, thin bronze strip 4.5 mm. wide applied to each side of tang; upper clay floor F128A.

Besides the above objects, there were: sheared offcuts of sheet in twelve medieval deposits; a 7 cm. length of 1 mm. diameter drawn wire, hearth ash F96; a 6 cm. length of 1.8 mm. square forged wire, clay floor F128; pieces of sheet material, upper clay floor F128A.

Evidence of the melting and casting of bronze objects was a small amount of solidified spillage discovered in the rubble fill to the lead furnace F25 and in the clay floor. The bronze was presumably melted in crucibles and cast into stone or sand moulds, but no direct evidence of this remained.

APPENDIX 8: LEAD

(a) *Saxo-Norman*

The only lead was an object illustrated and described as FIG. 15/7. There is a possibility that this object could have been trodden into the old ground surface at the time of the building of the forge.

(b) *Medieval*

The lead furnace F25 was a simple hole in the ground. As it has been boxed in for removal it is not known if the pit was clay lined. All that is visible is a skin of lead and lead compounds. The furnace was possibly tapped into the nearby pit F71, a lump therein weighed 36 kg. All around the furnace crevices had formed due to contraction of the soil and had filled with metal, this lead weighed 20 kg. Fragments in the furnace showed that charcoal had been used as the fuel. The metal for use could have been ladled out. Solidified spillage and/or waste sheet fragments were found in 10 medieval features.

APPENDIX 9: MISCELLANEOUS OBJECTS (FIG. 15)

(a) *Saxo-Norman*

BONE, STONE, CERAMIC, LEAD, GLASS

1. Rib bone of half thickness decorated with grooves and cut-out tri-forms and circles, evidence of two fixing holes and lightly scribed marking-out lines. Possibly part of the apex of a triangular comb although linear grooving suggests the angle is not a position of symmetry; found in two pieces in pit F267, a late 12th-century context.
- 2, 3. Rib bone with shallow cut ring-and-dot decoration, two fixing holes, remaining length 57 mm. × 15 mm. wide. Possibly part of the side plate to a comb;⁷⁴ found

⁷⁴ But a number of such pieces could be used to decorate a box lid, e.g. the ring-and-dot and criss-cross ornamented pieces from Ludgershall Castle, Wilts.: note in *Medieval Archaeol.*, 10, 1966, 192 and Pl. 15.

with no. 1 in pit F267, a late 12th-century context.

4. Piece of bun-shaped loom weight,⁷⁵ ceramic, coarse-sand temper, grey fabric reddened at surface only, *c.* 100 mm. (4 in.) diameter with 23 mm. diameter hole; found with another small fragment in old ground surface F170, with mostly 11th- and 12th-century pottery.
5. Spindle whorl, 35 mm. diameter with 10 mm. diameter hole, mass 27 grams, surface blackened but material probably Reigate stone; old ground surface F170, with mostly 11th- and 12th-century pottery.
6. Half of round object, ceramic, fine orange-red fabric with fine-sand temper, 31 mm.

⁷⁵ If the distinction between intermediate and bun-shaped loom weights is valid (Dunning, *et al.* 1959, 24) this weight by comparison with one from 1970 Abbey Close excavations at Waltham, could be called bun-shaped. Material in the old ground surface is mainly 11th or 12th century with some earlier pieces.

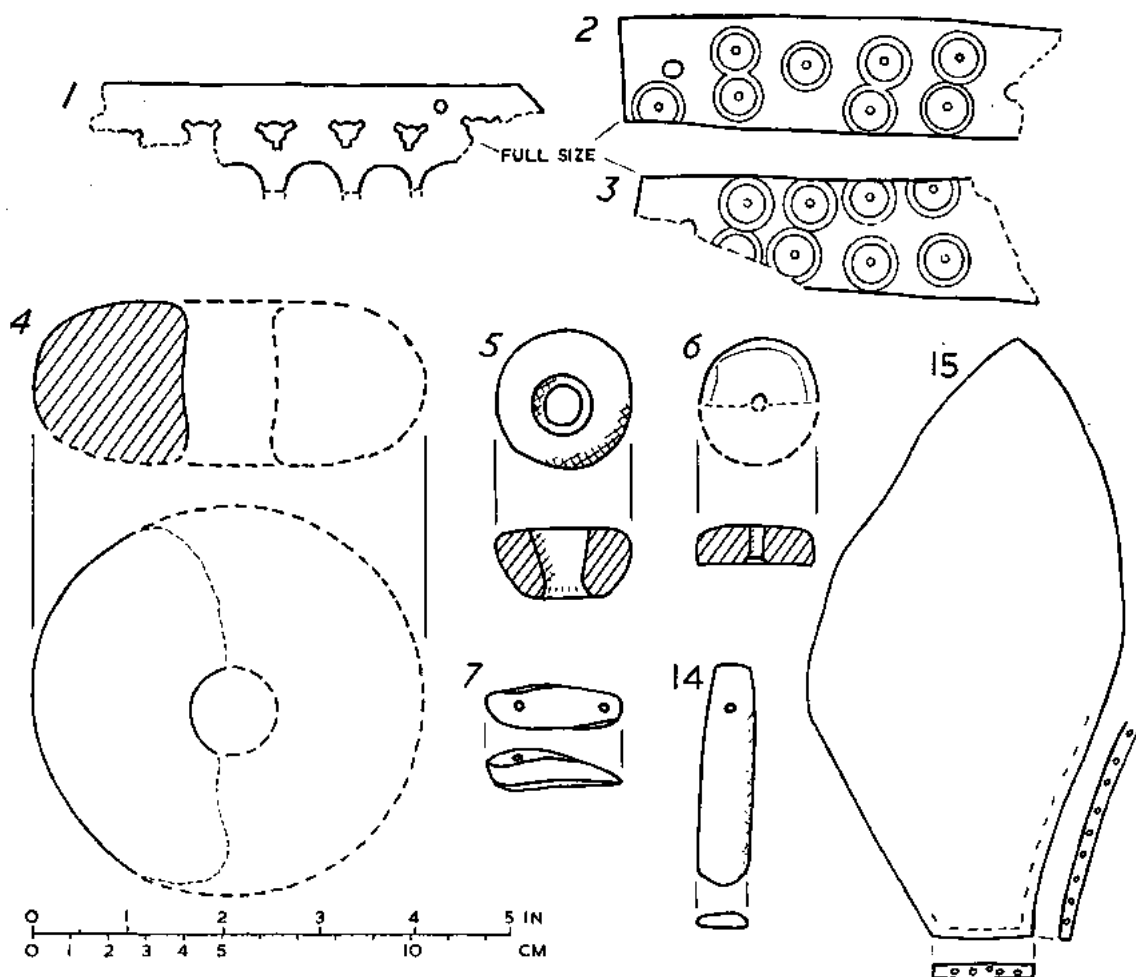


FIG. 15

WALTHAM ABBEY, BLOOMERY FORGE AND SAXO-NORMAN ENCLOSURE

Miscellaneous objects: nos. 1-7 Saxo-Norman; nos. 5-15 Medieval (p. 177).

- diameter with 3.5 diameter hole, probably made from a potsherd, material possibly of Roman origin, estimated mass of complete object 15 grams, central hole is so small object may not be a spindle whorl; old ground surface F170, with mostly 11th and 12th-century pottery.
7. Lead object, 36 mm. long with two holes; old ground surface F170.
 8. (Not illustrated). Fragment of horse cannon bone, flat surface cut on one side at distal end; a tool of indefinite function. Broken piece of rib bone, 92 mm. long, with cut edges suggesting objects like nos. 1 and 2 were made on site, both found in pit F200, late-12th-century context.
 9. (Not illustrated). Light blue glass 'tear', 5 mm. × 6 mm. bulb drawn out to length of 7.5 mm., possibly fixed to vessel at the thin end; old ground surface F170.
 10. (Not illustrated). Lump of Reigate stone with grinding facets and grooves; old ground surface F170 to west of forge site.
 11. (Not illustrated). Part of circular disc of Kentish ragstone, c. 10 cm. diameter, 17 mm. thick, one side and the periphery showed evidence of grinding; old ground surface F170.
 12. (Not illustrated). Twenty fragments of lava⁷⁶ were found as follows: old ground surface F170 (9 pieces), ditch F172 (2), F271 (3), 1 each in ditch F174, pit fill F196, pit F208, stake hole F210, pit F212, hole F218. Two pieces have one face well used as a grinding surface, one having peripheral depressions possibly purposely made to fit the fingers of the right hand.
 13. Calcined flints, possibly used as pot boilers, were found as follows: old ground surface F170 (13 pieces), gully F178 (3), pit fill F186 (11), pit fill F192 (6), pit fill F194 (2) pit F202 (2), and 1 each in ditch F172, ditch F174, pit fill F191, depression F272 and gully F283.

(b) *Medieval*

SLATE, LEATHER, BONE, GLASS, STONE

14. Slate hone, 58 mm. long, small hole drilled from each side, edges in particular were well utilized, suitable for hanging from belt; cobble layer F10 with early-13th-century pottery.
15. Left-foot leather sole, 15.7 cm. long, split-closing stitching, 8 stitches per 5 cm., possibly a repair sole since the stitching extended right round the edge, a small shoe possibly for a woman or child; well silt F152. Probably a 15th-century form in a contemporary deposit.
16. (Not illustrated). Complete horse metatarsal, 287 mm. long, proximal width 59 mm., distal width c. 52 mm., minimum shaft size 27 mm., flat surfaces cut on each side at distal end; a strong tool of indeterminate function; hearth ash F96, c. 1540.
17. (Not illustrated). Window glass fragments were found only in the topsoil F125 and, presumably trodden in, in the top of the old ground surface F170.
18. (Not illustrated). Stone sharpening or grinding objects were found as follows: hone of micaceous sandstone, c. 12 cm. long of biconical form, clay floor F128; fragment of micaceous sandstone grindstone, c. 90 cm. diameter and more than 3½ cm. thick, pit fill F114; lumps of micaceous sandstone in pit F121 and of Kentish ragstone in well fill F144 with evidence of use as sharpeners; fragment of mica schist, for a hone, in iron ore spread F68.
19. (Not illustrated). A length of tube was seen in the section (FIG. 3/DD) across pit F83/7 possibly purposely set in clay F86. Only a 3 cm. length remained in a fragmentary form; it was slightly tapered and measured c. 7 cm. × 5 cm. elliptical at the narrowest remaining position. The material was adjudged to be oak possibly up to 8 mm. thick with a rounded end; however the outer surface only remained around the complete circumference having been permeated by iron salts so that the

⁷⁶ Similar to material previously identified by F. G. Dimes as Neidermendig lava.

object looked like an iron tube c. 1½ mm. thick. The tube may be part of a bellows to which a metal end tube would have been attached.

APPENDIX 10: BONES AND SHELLS

(a) *Saxo-Norman*

Animal bones weighing 19 kg. were found in 33 of the Saxo-Norman features. Ox, pig and sheep were most common with horse in 3 features. The longbones were almost exclusively shattered. The most significant amounts of bone debris were as follows:

Pit silt F195 (0.6 kg., length of ox radius and ox horn core with attached skull, positioned (?) purposely side by side at the bottom of pit F189).

Pit F196/9 (1.5 kg. representing minimum of 1 ox, 1 pig, 1 sheep)

Pit F200 (0.5 kg., 1 ox, 1 pig, 1 sheep, 1 horse)

Pit F202 (1.6 kg., 1 ox, 1 pig, 1 sheep)

Pit F212 (1.1 kg., 1 ox, 1 pig, 2 sheep)

Ditch F172 (0.5 kg., 1 ox, 1 pig, 1 sheep)

Ditch F174 (1.5 kg., 1 ox, 2 pig, 1 sheep)

Old ground surface F170 (8.8 kg., 2 ox, 2 pig, 1 sheep, 1 horse).

Bird bones numbered 117 from 15 features: 44 (minimum 3 birds) in old ground surface F170; 21 (3 birds) in the pit F200; 17 (2 birds) in the pit fill F196/9 and 16 (2 birds) in the pit F202. Two fish vertebrae came from F170. These bones have not been identified.

Oysters numbered 134 from 19 features; 60 in F170; 18 in the pit F212; 17 in the pit F196 and 8 in the pit F200.

(b) *Medieval*

Animal bones weighing 9.5 kg. were found in 39 of the forge-period features. Ox, pig and sheep bones were most common with horse in 2 features. Most of the longbones were shattered. A tiny point cut from a deer antler was found in the well lining F149.

Nearly 4 kg. representing 1 ox, 1 horse, 1 pig and 1 sheep were found in the clay floor F128. Almost complete bones of ox, 1.3 kg., were found in the filling F140 of the well: right femur (more than 328 mm. long, minimum shaft dimension 32 mm.), right tibia (333 mm., 27 mm.), right metatarsal (264 mm., 22 mm.), left scapula (more than 245 mm., 72 mm.).

Bird bones numbered 18 from 9 features. There was one fish vertebra and one cockle. Oysters numbered 97 from 18 features: 37 in the floor F128, 10 in topsoil F125.

APPENDIX 11: THE BARRELS OF THE WELL (FIG. 16, PL. IA, B)

Two barrels or casks F145/6 were set concentrically to form a lining to the well, the lower halves only remained. The staves were of oak and were cleft radially⁷⁷ from the tree, they were convex on the inside⁷⁸ as well as on the outside.

The staves would have been held together with 34 bands or hoops, there being 17 on each side of a central band-free area where the bung hole and vent peg hole (FIG. 16) were bored. On the larger barrel the 17 bands were further divided into groups of 10 and 7. The bands were made by cleaving small branches into two across a diameter, as on the small barrel, or by splitting larger ones into three as shown in FIG. 16/C; the larger barrel had examples of each. The band joints were of considerable length; on both barrels pared ends of the bands were lapped over and bound with withies for about a quarter of the circumference of the band. Two strands of withy were used at a time (PL. IB) ends

⁷⁷ It was considered essential to do this presumably because the timber is more compressible in this direction and the fluid seal between staves is more easily obtained: Elkington, 1933, 276.

⁷⁸ The staves were thus thinner at the edges, presumably so that a greater pressure between the staves, for a given band tension, could be obtained.

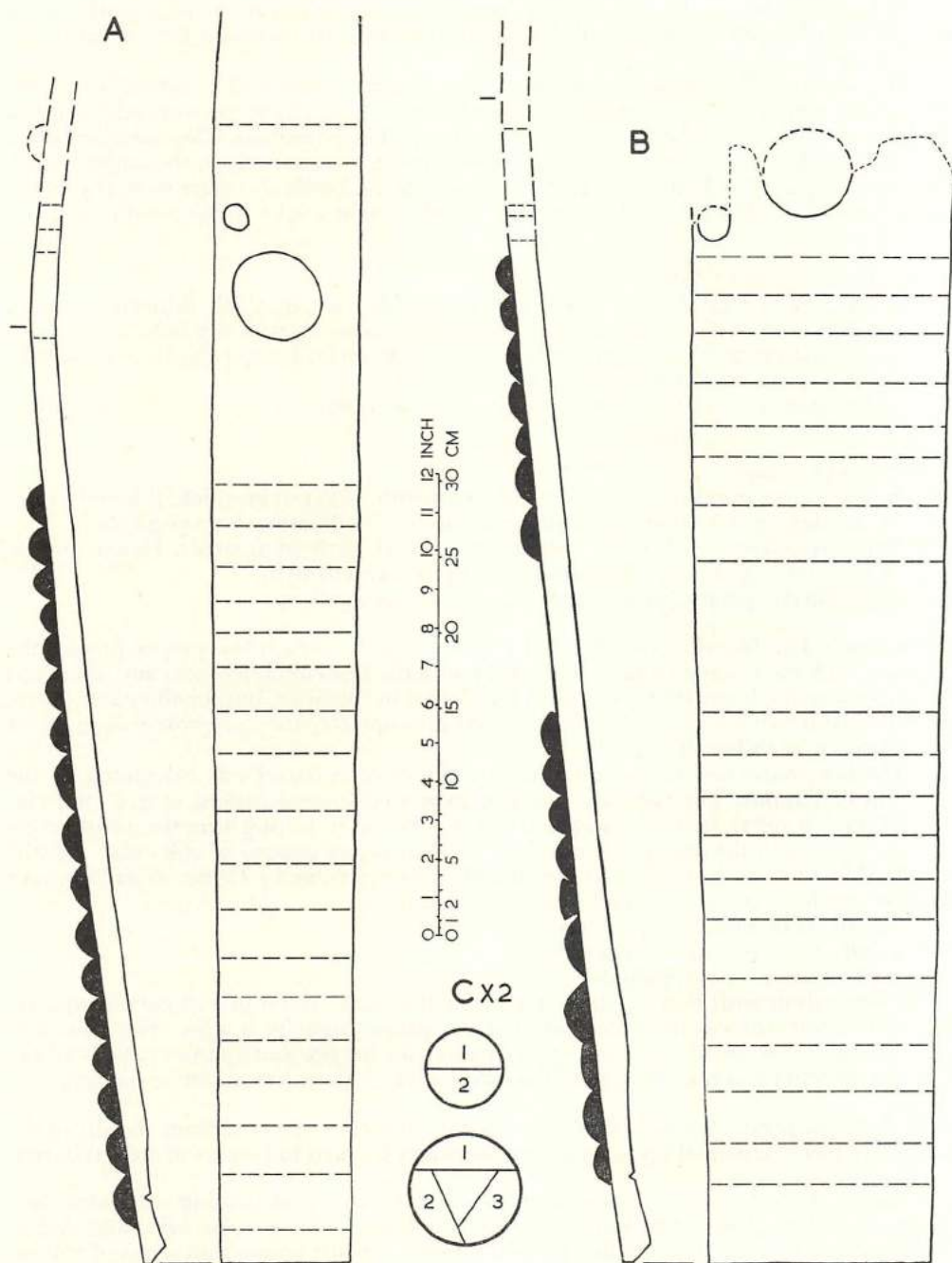


FIG. 16
WALTHAM ABBEY, BLOOMERY FORGE

Section and elevation of barrel stave of pipe (A) and tun (B) with enlarged view showing how bands were cut from small branches (C); horizontal dash lines on elevations indicate positions of bands (p. 180).

were threaded under. The joints in the bands were set one above the other rather than being randomly positioned around the barrels; the binding extended for several inches beyond the actual joints.

The ends of the staves were bevelled so that a special tool could be rotated to cut the groove into which the barrel ends or headpieces were fitted. The staves were adze thinned at the grooves to allow the headpieces to be snapped into position. The headpieces had been removed. Dowel holes between the groove and the stave and, on the larger barrel, show that a cross bar had been fitted to strengthen the head; the holes suggest this bar was at least 8 in. wide, it would have been fitted at right angles to the head timbers.

INNER BARREL (*pipe* or *butt*)

Staves: 25 in number, 3.1 to 4.6 in.⁷⁹ max. width, 0.7 in. thick, thinned to 0.5 in. at edges, 2.3 in. diameter bunghole with 0.7 in. diameter vent peg hole.

Barrel diameter: 25.6 in. at bottom, 30.7 in. at girth. Height: 49 in. (estimated), 29 in. in good condition, rotted remains to 36 in.

Calculated capacity: 27 200 cubic in., 118 *customary* gallons.

OUTER BARREL (*tun*)

Staves: 21 in number, 4.6 to 6.7 in. max. width, 0.8/1.0 in. thick, thinned to 0.7 in. at edges, 2.3 in. diameter bunghole with 0.7 in. diameter vent peg hole.

Barrel diameter: 33.6 in. at bottom, 39.2 in. at girth (estimated). Height: 61 in. (estimated), 25 in. in good condition, rotted remains to 38 in.

Calculated capacity: 56 100 cubic in., 243 *customary* gallons.

Calculations: The barrels were distorted when *in situ*. To obtain the proper profile, the width of each stave was measured at several positions. The circumferences and diameters followed. For the inner barrel the girth was found in this way, but for the outer barrel an 8 in. band-free length at the girth seemed appropriate; the bunghole was thus just off centre for each barrel.

Having established the profile, the capacity of each barrel was calculated by the theorem of Pappus. The capacity could be expressed in *wine* gallons of 216 cubic in. (established in 1267), in *customary* gallons of 231 cubic in. (resulting from the introduction of Troy weight in the early 15th century), in Winchester gallons of 268 cubic in. (the standard in 1497) or in modern Imperial gallons of 277 cubic in. *Customary* gallons have been chosen here, in 1707 this gallon was legalized when:

1 *hogshead* of wine = 63 gallons

1 *butt* or *pipe* of wine = 126 gallons

1 *tun* of wine = 252 gallons

Comparison with these figures shows that the inner barrel of 118 gallon capacity is a *pipe* or *butt* whereas the outer barrel of 243 gallon capacity is a *tun*. The estimated errors in these calculated values are up to 6 gallons for the *pipe* and up to 12 gallons for the *tun*. The effect of compression due to the external earth pressure cannot be gauged.

Other barrel fragments. Several other stave fragments were recovered from the silt of the well. One piece remained up to 45 in. in length and is taken to be part of a third barrel.

The timbers. The staves were of oak. Samples of the bands and binding were identified by D. F. Cutler. The bands were of Sweet Chestnut, *Castanea sativa* Mill, and Alder, *Alnus glutinosa* Gaertn. The binding in both samples was the young thin stems of willow, *Salix*.

⁷⁹ The barrels would have been made using *inch* dimensions and gallon capacities, these measurements are thus used: one inch = 2.54 cm., 1 *customary* gallon = 3.77 litres.

Parallels. Barrel-lined wells are known from Roman times and are still in use on allotment gardens in the London area. A Roman example⁸⁰ from Lime Street, London, consisted of concentric barrels with a square timber framing at the top. The method is, without doubt, the easiest way to line a well. During conservation, three barrels were set one above the other and the pit filled for the expenditure of about 25 man hours (3 men) and a material cost of £10.

APPENDIX 12: MESOLITHIC FLINTS

A total of 32 flints was found, mainly in the old ground surface and in the filling of Saxo-Norman features:

- A. Untouched primary flakes: 6
- B. Primary rising flakes showing signs of use and/or slight secondary trimming: 6
- D. Cores: 3
- G. Flake scraper: 1
- Spalls and flake fragments: 16

The raw material varies from honey-coloured opaque to grey-brown translucent and is similar to the Cloister-site Maglemosean mesolithic material.⁸¹ The latter material previously reported included 46 artefacts and 57 waste pieces; 15 artefacts and 10 waste pieces have recently been returned to Waltham by a previous excavator, and 5 artefacts have turned up locally, so that the total assemblage from Waltham is now 82 artefacts and 83 waste pieces including 4 microliths, 9 cores, 11 core dressings, 1 core scraper, 12 flake scrapers, 1 burin, 1 core axe and 1 hammerstone. The forge site is some 170 metres distant from the cloister site. No features clearly mesolithic were recognized.

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⁸⁰ Merryfield, 1965, Pl. III.

⁸¹ Huggins, 1970, 223-8.

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Essex Farming in 1801

By GLADYS A. WARD

I

IN the last years of the eighteenth century as the war with France dragged on, the government was increasingly preoccupied with the problem of food supply. Population was rising steadily during these years and the increase in the price of provisions, particularly of cereals, was viewed with concern. In the decade 1791-1801 there were five poor harvests, those of 1795 and 1799 being especially deficient. The price of a quarter of wheat averaged $51/3$ over the years 1790-4; in 1795 the average price was $81/6$ while in 1800 it was $127/-$, and during each year there were wide seasonal fluctuations.¹ Riots occurred and in the worst years there was real danger of famine.²

The new Corn Law of 1791 to regulate the export and import of grain in relation to the price of cereals was soon found to be unworkable,³ and in 1795 temporary measures were taken to economize in the use of wheat and to find substitutes for it. It was forbidden, for example, to use wheat for the making of starch, hair powder and blue (36 Geo. III c.6), nor could distilleries use cereals for the making of low wines and spirits (35 Geo. III c. 119). After the disastrous harvest of 1799 the temporary acts were extended for a further period.⁴

Following on a royal proclamation, members of both Houses of Parliament in December, 1795, pledged that they would either 'limit . . . the quantity of fine wheaten bread used by each individual in our families or we will consume therein only mixed bread of which not more than two-thirds shall be made of wheat . . .'.⁵ A similar resolution was taken by both Houses in the winter of 1799-1800.⁶ A committee set up in the Commons to consider the high price of provisions reported six times in November and December, 1800, and seven times between February and June, 1801; and there were two reports from a committee in the Lords.⁷ In parliamentary debates many schemes were suggested to limit the consumption of wheat at all levels of society, and by an act of 1800 'for making better provision for the maintenance of the poor', justices of the peace were to direct parish overseers to give part relief in wholesome and nutritious food other than wheaten bread.⁸

It is interesting to find evidence of such schemes in Essex. At a justices' meeting for the hundreds of Barstable and Chafford held at Brentwood in February,

¹ T. Tooke, *History of Prices* (1838) I *passim*; II, 389 (tables).

² D. G. Barnes, *A History of the English Corn Laws*, (1930) 72, 77.

³ *Ibid.*, 59, 71-2.

⁴ *Ibid.*, 77-8.

⁵ *Lords Journal*, XL, 567-8; *Commons Journal*, LI, 223-4.

⁶ *L.J.*, XLII, 378; *C.J.*, LV, 215.

⁷ H.C. 1800-1, II, *Reports* (1); cf. *Parl. Hist.* XXXV, col. 778-854, 1004-7.

⁸ 41 Geo. III, c. 12.

1801, it was decided to give to those entirely dependent on the parish one-third of their relief in food other than wheaten products.⁹ And the records of many parishes indicate that local vestries were coping with the same problem. At Leyton, for example, from January, 1796, only mixed bread (two-thirds wheaten flour and one-third barley flour) could be used in the workhouse; and signatures were required from the inhabitants that they intended to reduce the consumption of wheaten bread and flour in their homes.¹⁰ In 1800 the Leyton vestry for the first time bought rice for the workhouse and from 1801 potatoes were purchased at a price per ton which rose from 52/6 to 120/- in two years.¹¹ The vestry of East Ham was likewise providing rice at 3d. per lb. and potatoes at 5/- a cwt. for the workhouse in 1800.¹²

As a result of the bad harvest in 1799, stocks of grain had been practically consumed by the following August,¹³ and much depended therefore on the next harvest. It was found to be only moderate, the wheat crop generally one quarter below average, although supplies of barley and oats were more plentiful.¹⁴ In many cases farmers were forced to use their new stock of wheat for consumption as well as for seed; (the amount of seed required was estimated as the equivalent of six weeks' supply for consumption.)¹⁵ As it was reported in the House of Lords, 'The consumption of the new crop began as soon as it was fit for the flail. When there is an average crop little of the new crop, excepting for seed, is threshed till after Christmas; but of the present it is calculated that a quarter is already [December, 1800] gone to market.'¹⁶ At the same time the government was considering sources of supply of cereals in Europe and North America, and an increased import of rice, fish and other provisions was urged.¹⁷

By the summer of 1801 there was again acute interest in the harvest, and an enquiry was instituted whereby the parish clergy were to report on the acreages of crops. This method was not new,¹⁸ and it was typical of the contemporary interest in statistics, best exemplified in the bills for a census of population, the last of which became law in 1800. In 1795 Sir John Sinclair, President of the newly formed Board of Agriculture, had been involved in a scheme to obtain information about the last harvest from local magistrates and officials.¹⁹ Two years later Sinclair issued an 'Address to the Clergy of the Church of England on the nature and principles of statistical philosophy.'²⁰ Quoting a fairly successful census of Scottish parishes made by him in 1790, he now drew up a questionnaire on popu-

⁹ E.R.O. D/P 118/18.

¹⁰ Leyton Ref. Lib. L47, MS. Vestry Mins. 1781-1811.

¹¹ *Ibid.*

¹² E.R.O. D/P 156/8/3.

¹³ *Parl. Hist.* XXXV, col. 780.

¹⁴ *Ibid.*

¹⁵ *Ibid.* col. 781.

¹⁶ *L. J.* XLII, 688.

¹⁷ *Parl. Hist.* XXXV, col. 782.

¹⁸ For a full account of such investigations see W. E. Minchinton, 'Agricultural Returns and the Government during the Napoleonic Wars', *Agricultural Hist. Rev.* I (1953), 29-43, reprinted in *Essays in Agrarian History*, ed. W. E. Minchinton, 1968, II, 105-119.

¹⁹ *Reports from Committees of the House of Commons*, 1st. ser. IX, 1774-1802. First rep. on the high price of corn, 16 Nov. 1795, p. 45.

²⁰ *Communications to the Bd. of Agriculture*, I, 1797, xxxvi-xxxvii.

lation for English parishes which in detail went far beyond the censuses of 1801-41. Sinclair also proposed that if the inhabitants agreed, two full enquiries should be made on agriculture, one for stock, the other to show the annual produce of every cereal and grass crop, as also of gardens, orchards, woods, fisheries and mines.²¹

It was probably due to Sinclair's *Address* that when information was being collected on the harvest of 1800, reference was made to Receivers of the Land Tax and other officials as well as to parish clergy 'to whom circular letters for that purpose had been addressed by the bishops in each diocese.'²² A similar procedure was used at the beginning of September, 1801, when every bishop sent out printed forms to the parish clergy for a report on the acreage of the main crops grown for that harvest: wheat, barley, oats, potatoes, peas, beans, turnips, rape and rye, (not so complete a list as suggested by Sinclair). There was a space on each form for comment, but some clergy enclosed separate letters when returning the forms to Lord Pelham, the Home Secretary. The surviving returns are at the Public Record Office, arranged under dioceses.²³

In Essex returns exist for 213 of the 410 ancient parishes, about 52 per cent of the whole; and there were reports from two 'hamlets', Brentwood and Billericay. In a few cases the clergy sent only comment; and where an incumbent held two livings he did not always receive a form for each of them. The returns give a picture of a predominantly cereal producing county, and the letters from the clergy touch on many agricultural and social matters. Further, the returns can be set against contemporary writings on Essex agriculture. In 1794 the Griggs of Hill House near Kelvedon published a *General View of the Agriculture of . . . Essex* for the consideration of the newly formed Board of Agriculture. A more detailed report was produced in 1795 by Charles Vancouver in his *General View of the Agriculture of Essex with observations on the means of its improvement*, likewise drawn up for the Board. Vancouver divided the county into fourteen districts and in the first part gave an account of most of the parishes in each area with a detailed chart to show rent and present valuation of all types of land, with figures of annual production; in the second part he dealt with the main aspects of farming, adding an appendix giving the replies of individual farmers to a questionnaire drawn up by the Board.

The two volumes of a *General View of the Agriculture of Essex* published in 1807 by Arthur Young, Secretary of the Board of Agriculture, were very largely based on Vancouver's work. Young treated Essex in eight districts and used his predecessor's statistics but in more selective lists; in particular Young relied indiscriminately on information from farmers, landowners and their stewards.²⁴ Both writers found that there was such great variety of soil in each district as to make generalization difficult. They agreed that for the greater part of the county the soil

²¹ *Ibid.*, xli.

²² *Parl. Hist.*, XXXV, col. 779, 841.

²³ P.R.O. Home Office 67. The Essex returns are with those of the diocese of London, H.O. 67/16.

The 1801 returns have been examined for other counties: cf. W. E. Minchinton, *Trans. Bristol & Gloucs. Arch. Soc.*, LXVIII, 1949; W. G. Hoskins, *Trans. Leics. Arch. Soc.*, XXIV, 1948; R. A. Pelham, *Staffs. Rec. Soc.*, 1950/1, 1954; A. G. Parton, *Surrey Arch. Collns.*, LXIV, 1967; H. C. K. Henderson, *Sussex Arch. Collns.*, XC, 1952. cf.; H. C. K. Henderson, 'Agriculture in England & Wales in 1801', *Geog. J.*, 1952.

²⁴ cf. E. Kerridge, 'Arthur Young and William Marshall', *History Studies*, 1(2), Oct. 1968, 43-53, with strong criticism of Young.

ranged from 'temperate mixed' to heavy wet clays. The richest loams were in the coastal strips. The only considerable area of light, gravelly soil was in the north-east, 'good turnip land' as Young called it. In the chalk district of the north-west the soils were of varying depth and consistency.

II

In the letters from clergy there is some evidence of the methods adopted in the survey. At Ashdon the bishop's letter was brought by a churchwarden before the vestry, then read out on three successive Sundays; but few of the farmers attended at the parsonage on either of the days appointed and in the end the Rector chose two 'intelligent farmers' to make the return. In three instances the parson said that he had used an earlier survey of 1796. At Sible Hedingham the returns were attested by the rector, two churchwardens, an overseer and five inhabitants. Several incumbents wrote that they had made personal enquiry: the Vicar of Harlow had gone from house to house, and the Vicar of All Saints and St. Peter's, Maldon, had personally viewed all the farms. It is not surprising that the Vicar of Barking, (a parish of 12,307 acres),³⁵ complained of 'the exceeding great difficulty of collecting such agricultural accounts . . . in so extensive a parish.'

When the places for which returns exist are plotted on a map, it is seen that the county as a whole is well represented except for the Hundreds of Freshwell and Witham, east and west of a line between Helions Bumpstead and Witham. Possibly a batch of returns for this area was lost.

Before making an analysis it is important to decide how trustworthy were the returns. In eleven parishes the farmers refused to give any answer whatsoever, and in fifteen other parishes details were said to be largely inaccurate because of the reluctance of farmers to answer the enquiry. At Burnham they declined to help 'unless required by an Act of the Legislature'. The Vicar of Dovercourt reported that in the neighbouring village of Ramsey tenants declared that 'as wheat is now so cheap it [the enquiry] is not necessary, a subject', added the parson, 'which I must submit to your Lordship's better judgment.' The Vicar of Gestingthorpe advised that 'nothing short of compulsion will weigh with them.' The Vicar of Ashdon, already quoted, wrote that the farmers' reluctance 'proceeded in a considerable degree from the general aversion which persons in trade usually feel when they are called upon to disclose the sources from which the principal part of their profits arise, especially in cases where purposes are not stated by Authority towards which the enquiry is directed.' He added that a rumour had been circulating round his own village that the object of the scheme 'was to raise the emoluments of clergy nearer to their real value.'

Apart from such general charges many clergy stated outright that the main difficulty was that the farmers feared that their payments of tithe were involved. It is known from parish records that there was a good deal of controversy between

³⁵ The acreages of parishes are taken from *V.C.H. Essex*, II, 344-54; figures supplied by Ordnance Survey Department.

the parson and the farmers, sometimes involving legal action, as at Cranham in 1805.²⁶ Arthur Young ignored the general problems of tithe, only giving figures for certain parishes and quoting from Vancouver's tithe returns for 1794.²⁷ Young chose to ignore controversial writings, which must have included the Rev. John Howlett's *Enquiry concerning the influence of tithes upon Agriculture*, published in 1801. Indeed there seems to have been ill-feeling between some of the clergy and officials of the Board of Agriculture; the sub-title of Howlett's book refers to 'the animadversions of Mr. A. Young and his Correspondents . . . as well as those of the County Agricultural Surveyors . . .'

The acreage returns throw some light on the administration of payment of tithe. At Ashdon the Rector reported that the farmers feared an immediate rise in tithes, a justifiable fear, he added, as 'the tithes are let by me to the Parishioners only from year to year.' The Rector of Abbess Roding, complaining that 'suspicion is entertain'd that a snake lies lurking in the grass', said that he had been unable to correct his return since the practice of compounding with the farmer was very general in that part of the world and 'we are little acquainted with the sizes of the different fields which are annually sown.' At Great Wakering the great tithe was let by the Proprietor to a single farmer who paid tithe in kind, while the small tithe was compounded by the Vicar at about £1 an acre. The Rector of Pattiswick who had been in his benefice only one year said that he had examined the tithe position with the help of a reputable clergyman, and until a new composition could be agreed on 'every individual has an intent in keeping me in the dark.'

On the other hand we find that in a dozen parishes the clergy reported that while the farmers could be difficult, their returns were probably accurate; and in over twenty parishes the statements were said to be true, and indeed made 'very cheerfully' as at Harlow, and 'with great willingness', as at Rawreth. It is significant that in several villages the incumbent noted that an individual farmer had not sent in his return, which suggests accuracy. At Little Canfield the Rector gave details of the acreage of four farms, Langtons, Glebe, Green and Elms, all held by one Robert Clarke, who was in that case the only one to reply. Most of the returns, however, were sent in without comment as to their exactness; and in view of the fact that very few showed round figures, it seems reasonable to conclude that they give in the main a true account of the acreages.

Essex was an enclosed county, and at the end of the eighteenth century Vancouver estimated that only in about forty parishes was there any open field;²⁸ while the few enclosure acts then and in the early nineteenth century were of commons and wastes.²⁹ In the returns there are a few references to the open field, as at Arkesden in the chalk region, where about two-thirds of the parish was cropped. Many instances occur of land lying fallow, which method, according to Young, was still prevalent in the county. In the Roding district, for instance, where the soil was well suited to cereals, a crop of wheat or barley was normally

²⁶ E.R.O. D/P 118/3.

²⁷ Young, *op. cit.*, I, 77-86.

²⁸ Vancouver, *op. cit.*, 185.

²⁹ Young, *op. cit.*, I, 165-179.

followed by one year fallow.³⁰ Young found great variety over the county, with one year fallow in a four to six year sequence, or even in an eight year rotation.³¹ The Norfolk four-course system, (roots, barley, seeds and wheat), was suitable only for the lighter Essex soils.³² In the acreage return for Walthamstow, where the open field continued late, 100 acres of the arable were said to lie fallow in alternate years.

In parts of the county pasture predominated, including the marshlands of coast and river, and the production of general crops was comparatively small. In the return for Langenhoe, a parish of 2,091 acres, only 447 acres were sown for crops; the greater part of the parish was meadow and salt marsh, 1,000 acres of which had been lately surveyed and marked out for enclosing and draining by order of the Proprietor.³³ At Lawford (2,711 acres) 1,500 acres had been sown for cereals and roots, the rest being meadow, 'artificial grasses' and fallow. Similarly at Great Oakley (3,329 acres) less than half the area, 1,425 acres, came within the report; the rest was clover, tares, grass, wood and fallow. As would be expected the percentage of arable in the forest region was low; at Woodford only 339 acres had been planted in a parish of 2,146 acres; and Chigwell was described as two-third forest and one-third cultivated.

In the south-west of the county along the Roding valley the Theydon villages and Stapleford Abbots and Tawney were all said to have more grass than arable land. At Theydon Mount it was reported that 'the landowners pay more attention to their dairies, sheep, calves and fat stock.' Along the Thames the situation was similar. At Wennington the grassland near the river was more than double the acreage of arable; and reference was made to the rich pastures of West Ham. In the large parish of Barking the Vicar analysed the production of peas, potatoes and similar crops grown for the London market.

It is interesting to find that contemporary farming problems were mentioned in several of the clergy's letters. There were complaints about the increasing monopoly of farms, putting several estates under the control of one farmer, a system advocated by Young in the cause of efficiency.³⁴ According to the return for Hatfield Broad Oak (8,810 acres) this tendency had increased in the past twenty years: 'there are instances of 2, 3, 4 or five farms in a hand besides some of the persons alluded to holding 2, 3, and 4 maltings apiece'. At South Ockendon (2,936 acres) the Rector wrote in some detail about the changes since 1787, when there were 'only 378 acres of grass, the rest being nearly 2,600 in *good* cultivation for corn, by sixteen farmers; and at this time there is not more than 1,400 acres of arable land in the parish, owing as I conjecture to the monopoly of the farms, for the same parish is now *badly* cultivated by eight persons only.'

The Rector of Moreton blamed such a monopoly for the increased price of

³⁰ *Ibid.*, I, 211.

³¹ *Ibid.*, I, 206 seq.

³² *Ibid.*, I, 237-8.

³³ cf. D. W. Gramolt, 'The coastal marshlands of East Essex between the 17th and mid 19th century', M.A. (Lond.) thesis, p. 70 (copy of thesis in E.R.O.). He found that while only about three-quarters of this acreage was enclosed, it was probably the largest single reclamation made along the E. Essex coast.

³⁴ Young, *op. cit.*, I, 176.

provisions and the continued poverty of the labourers; he accused the millers at the weekly markets of fixing the price of flour higher than the price of wheat justified; and he added a practical note that he himself gave seed potatoes to all the cottagers to encourage the growth of this crop. At Hornchurch (6,783 acres) one farmer had twelve farms, and others 'as many as they can engross'; if there were no monopoly, the Vicar wrote, far more land would be under cultivation than the 2,870 acres reported.

Several incumbents were concerned with the rise in prices. The Curate of Little Wakering wrote that with the abundant harvest just brought in it was a lamentable pity that the common necessities of life should be 'so enormously dear'. He added, 'with great humility and submission': 'I have only this one curacy of forty pounds, casual benevolence excepted.' Other suggestions were made to reduce prices and thereby aid poor relief. The Minister of Great Parndon considered that farmers should be bound by their leases to raise a number of pigs and poultry every year while cottagers should be encouraged to keep breeding sows.

It is not surprising that some of the clergy's letters touched on irrelevant matters. To quote only one, the Vicar of Halstead argued that all dealers in corn and flour should be compelled to take out a licence, and all transactions should be from such licensed dealers and should be registered. He attacked the system whereby cattle and provisions passed through too many hands between the breeder or grower and the consumer. 'Nor will the nation ever prosper long unless some means are devised to prevent the importation and spread of irreligious and Jacobinical principles amongst us.'

III

Of the crops recorded, cereals were *circa* 77·7 per cent of the whole; of these wheat was 40·3 per cent, barley 16·5 per cent, oats 19·4 per cent and rye 1·5 per cent. It was generally agreed by the clergy that the harvest had been abundant, due, it was said, to the late sowing, and gathered in during good weather. Only in a few parishes was the crop said to be deficient, as in Tendring Hundred where the winter rain and a long dry spring had bound the clay soil. In several parishes it was specifically stated that owing to the high prices, more acreage had been sown with cereal; and in some cases, as at Rochford, more wheat had been sown at the expense of barley. This increase was in contrast to the two previous years when it was said that less wheat than normal had been sown because of the wet seasons.³⁵ In many instances the incumbent wrote that the yield of wheat was well above average, in some cases giving details of crops, that of wheat ranging from 18 bushels per acre at Sible Hedingham to about 32 bushels at Great Wakering.

The yield of barley surpassed that of wheat; it was often 40 bushels per acre, particularly in the north-east of the county, but not all was of the finest quality. Oats likewise were a heavy crop according to the returns, sometimes yielding 40

³⁵ *L.J.*, XLII, 688.

bushels an acre. Rye was far less grown in the south than in the north of England. In Essex, Dagenham had the largest acreage, 250 acres. This crop was normally used for early feed; at Grays Thurrock it was 'in general fed off, very little any year standing for a crop.' At Copford the yield was 24 bushels per acre.

Of the leguminous crops, peas comprised 6·8 per cent of the total acreage, beans 8·2 per cent. Arthur Young considered that beans should be grown much more extensively in the county. In cultivation beans normally followed barley, the stubble being ploughed once before winter and then the seed dibbled in immediately after the frosts.³⁶ Young quoted an interesting case from Ardeleigh of peas grown under contract for a London seedsman who provided the seed and agreed to take the crop at 90s. a quarter.³⁷ Where figures are given in the 1801 returns, the yield of peas varied from 18 bushels per acre at Sible Hedingham to 28 bushels at Copford, while beans were from 20 bushels per acre at Sible Hedingham to 34 bushels at Purleigh. The incumbent of Barking wrote that peas and beans were usually gathered green for the London market and had been exceedingly fine crops. Some clergy reported on the practice of sowing oats with peas or beans; Young considered that such an 'etch' crop (after spring ploughing of the stubble) was not to be recommended.³⁸ The few references to tares, mustard and a French wheat called 'brank' are noted in the parish totals below.

The yields given above for cereals, peas and beans can be usefully compared with those quoted by contemporary writers:

	<i>Average yield (bushels per acre)</i>		
	Vancouver		Young
Wheat	24 bu.	2 pecks	25
Barley	33	3	40
Oats	36	2	45
Rye	20		—
Peas	20	1	— ³⁹
Beans	27		(32) ⁴⁰

In most of the returns turnips and rape were treated together, their combined acreage being 5·6 per cent of the total. As pointed out by Young, only the drier, lighter soils were suitable for this crop,⁴¹ and the reports on its acreage are mainly from the north-east and south-west of the county. The Rector of Little Bentley said that there had been a very good plant, and the same was reported from Hornchurch, with 200 acres of turnips and rape, and from Barking with 330 acres of the same; here the roots 'are generally fed off except a small proportion sent to the London Markets.' The incumbents of Weeley and Great Bentley mentioned that these crops were still in the ground; this was doubtless general and an accurate report was likely.

³⁶ Young, *op. cit.*, I, 355-8.

³⁷ *Ibid.*, I, 365-6.

³⁸ *Ibid.*, I, 210.

³⁹ Young gave yield for only one parish (Ramsey), 24-32 bu. *Ibid.*, I, 366.

⁴⁰ Average yield estimated from Young's figures, *ibid.*, I, 361-2.

⁴¹ Young, *op. cit.*, I, 25-6, 368.

Of all the returns the least satisfactory are those for potatoes; their acreage was only 1.7 per cent of the total, yet Arthur Young considered that they were probably more extensively grown in Essex than in any other southern county.⁴² This crop was possibly included in the enquiry because of the hope that it could be to some extent a substitute for wheat. A scheme had been drawn up in parliament for premiums to be paid to farmers growing potatoes on land which had not been used for arable purposes in the seven preceding years.⁴³ Incumbents in the south-west of Essex spoke of considerable areas planted with potatoes: Chigwell had 158 acres, Hornchurch 150, Barking 1,014, and here the yield was said to be below average owing to the long dry spell in the summer. Referring to the Ilford district Young wrote, 'the favourite potatoe was formerly the rednosed kidney . . . The champion is now very generally preferred, which does not curl.'⁴⁴ He found that the potatoes grown elsewhere in the county were used mainly for fattening stock.⁴⁵ According to the returns, apart from the south-west area, potatoes were for the most part cultivated in cottage gardens and not for trade. From Stapleford Abbots the Rector wrote, 'almost all the housekeepers in this parish have in their gardens a sufficient quantity of that useful root for the consumption of their respective families.'

IV

Looking finally at the returns as a whole, they are obviously useful in providing a comparative study of the various crops, but it is impossible to generalize from them. It is noticeable that the fraction of the cultivated area to that of the whole parish is generally between one third and one half.⁴⁶ It has been said earlier that the 1801 returns are for about 52 per cent of all the Essex parishes. They give a total of 178,744 acres of land cultivated with the specified crops. This would suggest about 343,739 acres for the whole county under these crops, to which must be added the remaining arable under 'artificial grasses', vetches and similar crops not included in the enquiry. The rest of the county's 986,975 acres,⁴⁷ consisted of fallow, (estimated by Young as varying between one sixth and one half of the arable in a parish),⁴⁸ wood, marshlands, pasture, commons and waste.

There are no total figures in Vancouver's and Young's writings with which to compare the above figures. One instance gives some check on the wheat acreage; the Rev. Howlett, quoted by Young, considered that about one sixth of the county (whose area he over-estimated at nearly 1,200,000 acres) was sown with wheat,⁴⁹ which would be nearly 200,000 acres. In comparison, the total area sown with wheat for the 1801 harvest was reported as 72,069 acres for the 52 per cent of

⁴² *Ibid.*, I, 382.

⁴³ H.C. 1800-1, II, Reports (1), appendix to 2nd. rep. from committee on high prices of provisions, p. 203. Cf. *Parl. Hist.*, XXXV, col. 1004.

⁴⁴ Young, *op. cit.*, I, 382-3.

⁴⁵ *Ibid.*, I, 385 seq.

⁴⁶ See Tables below.

⁴⁷ *V.C.H. Essex*, II, 344.

⁴⁸ Young, *op. cit.*, I, 201.

⁴⁹ *Ibid.*, I, 320.

the parishes, which would make the total for the county about 138,594 acres: and this seems the nearest comparison which can be made for one particular crop. It is most likely that the 1801 returns for wheat and other crops were on the low side.

In view of the fact that a census of the population was taken every decade from 1801, it is surprising that there was no similar survey of agricultural statistics.⁵⁰ Indeed, it was not until 1866 that an annual return was made by farmers,⁵¹ at first voluntarily and after 1925 on a compulsory basis. A brief summary of the 1866 figures for Essex is given in an appendix below. There can be no close comparison between the 1801 and the 1866 tables: these last included more varieties of crops (notably the vetches, clovers and 'artificial grasses'), and they gave a survey of all types of land. But certain points can be usefully made. By 1866 potatoes were considerably grown, and there was a big increase in root crops, turnips, swedes and mangolds. Vegetable crops such as carrots and cabbage were not extensively cultivated; the market gardening area in the south-west was being developed for building and other towns in the county were not yet needing a big production of vegetables. In 1866 the cereals represented 58 per cent of all the cultivated area, (as compared with 77·7 per cent in 1801), with wheat still as the main crop, (53·6 per cent of the cereals), barley (32·5 per cent), and far less oats (13·4 per cent); rye was only a negligible crop, (0·5 per cent). The total acreage of vetches, clover and 'artificial grasses' (just over 100,000 acres) brought these crops second in yield to the cereals, though rather less than the yield of barley itself, and this is the most significant difference between the returns of 1801 and 1866.

APPENDIX: ESSEX. The acreage of land under crops, bare fallow and grass 1866.⁵²

Wheat	181,062	}	337,544
Barley	109,636		
Oats	45,504		
Rye	1,342		
Beans	43,778	}	68,662
Peas	24,884		
Potatoes			10,808
Turnips, Swedes	32,487	}	59,782
Mangolds	27,295		
Carrots			1,092
Cabbage, Kohl Rabi, Rape			4,540
Vetches, Lucerne etc.	28,278	}	100,021
Clover, other Artificial Grasses, under rotation	71,743		
Hops			137
Fallow			46,361
Pasture			160,694
			Total 789,641

⁵⁰ There were returns of acreages under Hops for individual parishes from 1821-1862. H.C. (1821) xvii to H.C. (1862) lv.

⁵¹ H.C. (1866) lx.

⁵² H.C. *Accounts and Papers* (22) 1866 vol. LX. The order has been slightly re-arranged.

Place	Area (acres)	Acreage under:								Total arable
		Wheat	Barley	Oats	Potatoes	Peas	Beans	Turnips/ Rape	Rye	
Abness Roding	1619 ¹	170	173½	43	1	29½	—	6T	2	425
Aldham	1847	358	197	156	2	66	50	49	—	878
Althorne	2242	318	87	162	—	12	163	10	—	752
Ardleigh	5062	913	555	505	34	224	63	479	13	2786
Arkesden	2367	255½	254½	282½	8	130	—	29½T	—	960½
Ashdon & Little Bartlow hamlet	5020	480	499	264	—	100	31	30	4	1408
Barking	12307	1381½	433½	618	1014	88	51½	330½	377½	4294½
Barnston	1472	230	190	82	—	49	17	14T	4	586
Basildon cum Laindon	4010	767	64	432	—	44½	300	—	—	1607½
Beaumont cum Moze	2890	430	158	263½	—	79½	185	88½	—	1204½
Belchamp Otton	1771	384	117	103	—	70	102	—	—	776
Belchamp Walter	2190	383	155	142	—	62½	46	8	—	796½
Berners Roding	1073	146	136	34	—	24	7	—	—	347
Billericay ²	1284	518	104	190	—	15	295	—	—	1122
	[1841]									
Blackmore	2588	260	74	203	½	24	4	20	—	585½
Bobbingworth	1642	291	63	114	—	14	25	4	—	536 ³
Bowers Gifford	2585	340	63	93	5	6	209	—	—	716
Bradfield	2153	495	121	153	—	76	60	176	—	1081
								(with rye)		
Brentwood ⁴	459	6	—	13	2	—	—	—	—	21
Brightlingsea	2867	429	211	116	1	124	99	224	8	1212
Bulmer	2801	496	340	151	2	72	52	84	1	1198
Bulphan	1713	298	45	126	—	46	75	25	—	615
Burnham	4517	—	—	—	(no figures)	—	—	—	—	—
Buttsbury	2113	288	37	173	15½	95	60	11	7	686½
Canewdon	5234	975	37	350	4	121	276	49	—	1812
Chignall St. James	913	237	140	65	—	23	22	6T 6R	—	499
Chignall Smealy	476	78½	62	20	2	20	—	—	—	182½
Chigwell	5009	300	33	164	158	50	55	16	—	776
Childerditch	1635	227½	54½	74½	2½	39½	73½	12	—	484
Chingford	2791	101	6	86	20	5	29	—	6	255 ⁵
Colchester All Saints	285	25	27	12	—	9	1½	3T	—	77½
Colchester St. Botolph	905	158	131	76	—	22	2½	72T	1	462½
Colchester St. James	238	16	11	10	6	—	—	—	—	43
Colchester St. Leonard	82	—	10	5	—	—	3	—	—	18
Colchester St. Mary at the Walls	487	80	32	25	36½	26	14½	46½T	—	260½
Colchester St. Mary Magdalene	65	2	—	—	—	—	—	—	—	2
Colchester St. Michael Mile End	2352	338	181	252	52½	100	77	212	8	1220½
Colchester St. Nicholas	14	—	—	—	(no figures)	—	—	—	—	—
Colchester St. Runwald	13	—	—	7	—	—	—	—	—	7
Cold Norton	1692	267	56	116	—	21	118	—	—	578

Place	Area (acres)	Acreage under:								Total arable
		Wheat	Barley	Oats	Potatoes	Peas	Beans	Turnips/ Rape	Rye	
Colne Engayne	2478	422½	245½	153	9	54½	65½	61	—	1011
Copford	2492	483	261	235	1	108	52	107	3	1250
Corringham	2744	461	74	105	4	52	112	92	—	900
Cranham	1879	322	119	132	2	68	73	—	—	716
Creeksea	866	159	35	74	—	21	36	—	—	325
Dagenham	6556	918	299	412	—	—	30	—	250	1909
Debden	4653	539½	531½	461½	2½	113	18½	43T	—	1709
Dedham	2568	320	174	167	6	64	30	80	4	845
Dovercourt	1422	304	96½	69½	3½	54½	76½	30	—	634½
Downham	2229	374	44	257	—	27	108	15	—	825
Dunton	2379	400	—	231	—	16	183	—	—	830
East Hanningfield	2504	525	30	325	1	65	137	28	—	1111
East Horndon	1530	186	15½	145½	½	24	23	1	—	395½
Feering	2254	600	700	100	2	70	200	30	—	1702
Felsted	6426	—	—	—	(no figures)	—	—	—	—	—
Fingringhoe	2890	397	230	156½	—	83	88½	156	1½	1112½
Fobbing	2588	429	92	307	11	42	109	69	—	1059
Foulness	6133	924	72	273	—	264	393	31	—	2132½
Foxearth	1683	260	210	112	—	48	25	10	—	665
Frinton & Little Holland	1117	280	104	81	—	92	47	92T	—	696
Fryerning	1395	185	33	120	2	13	4	7T	—	364
Fyfield	2451	361	232	89	6	54	43	2	—	787
Gestingthorpe	2708	—	—	—	(no figures)	—	—	—	—	—
Grays Thurrock	1382	208	131	25	5	60	—	113	26	568
Great Baddow	3911	559	105½	433½	22	46	31	125	23	1345
Great Bentley	3236	595	325	292½	½	152	76½	320½	—	1762
Great Birch & Little Birch	3105	595½	285	261½	16	103	149	80	16½	1509½
Great Bromley	2996	529	241	310	4	120	56	144	22	1426
Great Burstead	3709	594	67½	452	24	74	159½	65½	9	1445½
Great Chrisball	2542	216	343	295	—	99	—	34	25	1012
Great Clacton	4069	944	366	327	—	275	225	272T	—	2409
Great Coggeshall	2638	—	—	—	(no figures)	—	—	—	—	—
Great Easton	2559	420	283½	112½	5	121½	41	36T	—	1019½
Great Holland	2104	450	150	150	—	100	100	80	—	1030
Great Horkesley	3177	487	411	215	3½	83	8	—	7	1214½
Great Maplestead	1966	262½	206½	119½	12½	78½	42½	59½	3	784½
Great Oakley	3329	600	200	260	5	100	160	100T	—	1425
Great Parndon	2232	400	300	100	30	70	80	120	1100	2200
Great Totham	3263	473	156	255	3	135	128	111	2	1263
Great Wakering	2771	454	31	121	40	77	151	7	—	881
Great Warley	2891	489	106	167	6	64	143	54	—	1029
Great Wigborough	2527	418	80	186	—	15	244	—	—	943

Greensted by Colchester	1501	208½	88	190	27	49½	29½	33T	—	625½
Greensted by Ongar	683	99	2½	31	—	11	12½	—	—	156
Hadleigh	2337	181	17	85	—	53	56	28	14½	434½
Hadstock	1731	173½	210½	147½	½	52½	1½	25½	26½	645½
Halstead	5631	1150	900	400	30	200	250	200	—	3130
Harlow	4022	525½	444½	155½	3½	49	53	18	—	1249½
Hatfield Broad Oak	8810				(no figures)					
Hawkwell	1365	202	41	121	10	43	141	22	—	580
Hazeleigh	989	181	49	89	—	14½	46½	—	—	380
High Laver	1894	279	224	70	1	60	20	—	—	654
High Ongar	4519	512	346	243	10	24	7	12T	—	1154
High Roding	1815	241	289	65	—	55½	18	—	—	668½
Hornchurch	6783	1000	500	600	150	120	100	200	200	2870
Hutton	1699	273½	16	188	—	26½	25	—	—	529
Ingatestone	2738	310½	74	285½	½	61	22½	4	6	764
Ingrave & West Horndon	3219	321	34	292	—	30	35½	—	—	712½
Kelvedon Hatch	1684	125	39	112	1	34½	3	31	—	345½
Kirby le Soken	3859	617	201	209	—	209	187	—	—	1423
Laindon, <i>see</i> Basildon	2372									
Lambourne	2470	251	19	141	6	28	5	—	5	455
Langdon Hills	1801	301	11	248	1	36	96	26	—	719
Langenhoe	2091	210½	44	39	—	5	148½	—	—	447
Langford	1078	141	40	76	2	12	1	84	—	356
Langham	2977	407	316	225	1	73	17	312	21	1372
Latton	1618	96½	46	61½	14	17	10	31	—	276
Lawford	2711	487½	349½	276	4	80	—	313T	—	1518½
Layer Breton	962	189	32	87	—	6	93	—	—	407
Layer Marney	1995	363	84	170	—	38	113	8T	—	776
Leigh	1527	239	31	79	8	42½	51	28	—	478½
Lexden	2334	294	226½	171	4	56½	25	185½	10½	973
Liston	643	642	73	38	—	27	1½	—	—	781½
Little Baddow	2756	393	84	370	3	54	44	119	7	1074
Little Bromley	1844	337	276	289	1½	75	20	180T	—	1178½
Little Burstead	1839	280	11	127	—	28	89½	—	—	535½
Littlebury	3537	185	635	276½	3	218	1	—	31	1349½
Little Birch <i>see</i> Great Birch										
Little Canfield	1492	95½	51½	14½	3½	—	—	½T	—	105½ ¹⁰
Little Clacton	3009	522½	329	227½	—	114½	92½	98	—	1384½
Little Dunmow	1728	305	203	62	—	98	29	19	—	716
Little Easton	1602	127	82	64	2	38	11	15	2	343 ¹¹
Little Holland <i>see</i> Frinton										
Little Horkesley	1039	158	86	83	3	15½	6½	52½	—	404½
Little Laver	965	177	104	29	—	5	6	2T	—	323
Little Oakley	1224	192	90	70	—	65	100	—	—	517
Little Parndon	522	55	21	34	2	1	—	9T	—	122
Little Stambridge	606	134	18	39	2	31	40	34	—	298

Place	Area (acres)	Acreage under:								Total arable
		Wheat	Barley	Oats	Potatoes	Peas	Beans	Turnips/ Rape	Rye	
Little Thurrock	1348	204	53	78	11	58	49	60	33	546
Little Wakering	2410	346	64	104	14	98	152	63	—	841
Little Wigborough	1223	181	39	36	—	20	82	—	—	358
Magdalen Laver	1229	199	138	65	—	24	—	—	—	426
Maldon All Saints, St. Peter	1667	273	85	186	8	27	85	29	—	693
Maldon St. Mary	1368	120	—	104	2	2	62	—	—	290
Manuden	2531	371	331	216	2	119	5	—	—	1044
Margaretting	2284	327	29	257	2	47	9	31	2	704
Marks Tey	1225	250	140	58	—	26	81	11T 3R	—	569
Mashbury	822	176	127	30	—	29	9	—	—	371
Mayland	2067	366	105	257	—	17	215	11	—	971
Messing	2593	331	212	166	—	58	109	24	2	902
Mistley	2125	364	189	107	—	22	10	97	—	789
Moreton	1475	241½	188½	89	2	20	—	5½	5	551½
Mountnessing	4206	859	84	771	4	96	49	72	—	1935
Mundon	3091	584	14	213	1	22	328	18T	—	1180
Nevedon	993	175	7	76	—	10	110	4	—	382
North Benfleet	2418	391	43½	278	—	12	123	—	—	847½
North Fambridge	1249	282	37	90	—	12	159	12	—	592
North Ockendon	1709	400	200	150	2	50	30	150	20	1002
Ovington	716	114	63	61	—	27	16	6	—	287
Pattiswick	1320	188	118	48	—	17	85	10	—	466
Pebmarsh	2062	359	280	116	—	79	44	4	—	882
Pitsea	2014	343	55	190	—	18	216	—	—	822
Pleshey	732	168	118	38	—	18	37	—	—	379
Purleigh	5646	1100	135	660	10	100	355	120	—	2480
Quendon	657	51	46	41	—	14	—	12	—	164
Ramsden Belhouse	2699	509	27	271	20	29	129	40	—	1025
Rawreth	2372	426	95	169½	½	26	166	10½	10	903½
Rayleigh	2906	650	150	300	—	150	250	50	20	1570
Rayne	1707	341½	179½	121½	1	93½	20	5½T	6	768½
Rettondon	3890	713	135	453	9	63	284	22	—	1679
Rochford	1867	297	28	118	—	77	79	80	—	679
Roxwell <i>see</i> Writtle										
Roydon (part of)	3031	314	144	150	3	56	27	25	—	719
Runwell	2073				(no figures)					
St. Lawrence	2023	415	60	229	—	23	208	10	—	945
St. Osyth	8877	1132	507	439½	2	279½	258½	331	1	2950½
Salcott	274	31	10	27	—	—	45	—	—	113
Sandon	2318	320	33	260	—	79	50	72	—	814
Shellow Bowells	469	91	43½	25½	1	23	6	—	—	189½
Shopland	1055	165	10	27	40	35	40	—	—	317
Sible Hedingham	5407	862½	408½	316	9½	178½	121½	80½	4	1980½
South Benfleet	2893	300	50	190	21	50	195	14	10	830
South Fambridge	1192	215	39	92	—	47	84	—	—	477
Southminster	6316				(no figures)					

South Ockendon	2936	523	238½	177	2	229	74	54	34	1331½
South Weald	4630	415	90	468	23	79 (peas & beans)	57	20	1152	
Stambourne	1910	319	209½	94½	1½	33½	66	3½T	—	728½
Stanford Rivers	4414	533	73	321	7	51	30	20	12	1047
Stanway	3436	664	341	261	11	153	40	397	62	1929
Stapleford Abbots	2365	193	—	157½	6½	24	1	5	—	387
Stapleford Tawney	1657	136	49	98½	1	22	10	11½	—	328
Stifford	1597	272	149	128	10	109	35	70	54	827
Stondon Massey	1126	179	35	85	5	21	—	4T	—	365½
Stow Maries	2378	417	71½	306	—	54	142	12	—	1002½
Sutton	699	177	5	57	4	52	19	—	—	314
Tendring	2873	604	214½	307½	1	170½	113½	200T	—	1611
Thaxted	6251	—	—	—	—	(no figures)	—	—	—	—
Theydon Bois	2198	142	—	70	—	15	10	—	—	237
Theydon Garnon	3168	280	8	199	5	21	29	—	8	550
Theydon Mount	1564	100	4	92	11½	9½	6½	3	—	226½
Thundersley	2545	380	60	190	12	60	140	30	10	882
Tilbury ¹³	953	148½	132	48	—	27	—	2½	—	358
Toppesfield	3332	516	404	157	—	91	102	2	—	1272
Walthamstow St. Mary	4473	367	63	218	61	80	14	2	24	829
Weeley	2098	382	157½	224½	—	126	121	117½T	—	1128½
Wennington	1301	47	52	13	20	5	19	40	19	215
West Bergholt	2296	348½	221½	214	1½	85	47	100½	—	1018
West Ham	4667	272	—	67	575	—	—	87T	25	1026
White Colne	1466	223	152	91	6	45	36	24	—	577
White Roding	2540	515	382	165	6	145	86	7	4	1310
Wickford	1775	368	64	234	—	51	187	23	—	927
Wickham Bishops	1549	200	60	110	—	24	10	75	—	479
Widdington	2054	247	225	105	6	70	2	63	14	850¼
Widford	692	105	15	46	7	15	27	60T	—	275
Willingale Doe	1771	313	226	30	—	105	3	—	—	677
Willingale Spain	1216	213	147	55	4	43	1	6T	—	469
Wimbish	4920	567	557½	179½	½	79	38½	20½T	—	1609½
Wivenhoe	1549	267	122½	175	—	60	45½	87½T	—	757½
Woodford	2146	162	8	54	75	19	17	4	—	339
Woodham Ferrers	4482	741	34	448	4	75	232	26	—	1560
Woodham Mortimer	1986	200	100	110	3	50	90	50	12	615
Woodham Walter	2621	451	211	226	—	62	23½	4	13½	991
Wrabness	1108	175	123	154	16	44	21	156	—	689
Writtle with Roxwell	8786	1451	750	516	52	311	189	14	—	3283
	4782									
TOTALS		<i>wheat</i>	<i>barley</i>	<i>oats</i>	<i>potatoes</i>	<i>peas</i>	<i>beans</i>	<i>turnips/ rape</i>	<i>rye</i>	<i>total acreage</i>
		72069½	29558	34684½	2989½	12138½	14634½	9998	2671½	178744½

mixed crops 617½
full total of 179361½

- ¹ Parish acreages are taken from *V.C.H. Essex*, II, 344-54; figures supplied by Ordnance Survey Department.
- ² In parish of Gt. Burstead; 50 acres included in St. Lawrence parish by error.
- ³ Includes 19 acres peas & oats, 6 of tares.
- ⁴ In parish of South Weald.
- ⁵ Includes 2 acres tares.
- ⁶ Includes 175 acres mustard.
- ⁷ Includes 5½ acres peas and oats.
- ⁸ Includes 3 acres tares, 5 of French wheat called Brank.
- ⁹ The acreage figures do not accord with size of parish.
- ¹⁰ Acreage from four farms.
- ¹¹ Includes 2 acres tares.
- ¹² Includes 12 acres oats/peas, 24 oats/beans.
- ¹³ From the small acreage this was probably Tilbury *iuxta* Clare.
- ¹⁴ Includes 118 acres peas/oats.
- ¹⁵ Includes 166½ acres peas/oats.

I am indebted to my son, J. T. Ward, N.D.A., for advice on agricultural matters in this article.

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The Chancellor Collection of Architectural Drawings in the Essex Record Office, Chelmsford

Review and Appreciation by

K. DIXON BOX,

A. R. I. B. A.

(With comparative material drawn from faculty papers in E.R.O.)

Introductory note by K. G. NEWTON, County Archivist

THE deposit in the Essex Record Office of the faculty papers and plans for Essex churches, 1854-96, part of the records of the Diocese of Chelmsford, and of the huge collection of plans and papers assembled in the architectural practice of the Chancellors during more than one hundred years coincided with the retirement of Mr. K. D. Box as Assistant County Architect. Mr. Box kindly agreed to go through all these plans and it is good to have this resulting professional assessment of their worth.

A full catalogue of the faculty papers can be seen in the Essex Record Office (D/CF). A similar catalogue of the Chancellor material (D/F8) is in preparation and when this and the necessary repair to the older plans are complete the collection will become generally available. In the meantime the excellent listing carried out by Miss Olwen Hall has made a study like this one possible and will enable particular groups of plans to be produced when needed. In addition Mr. Box has deposited his detailed notes on a large number of the plans in both series.

SUCCESSIVE TITLES OF FIRM AND APPROPRIATE DATES

Beadle Son & Chancellor	1853-1860?
Frederic Chancellor J.P., F.R.I.B.A. 20 Finsbury Circus, London and 19 Duke St., Chelmsford	1860-1896
Fred Chancellor & Son	1896-1918
Wykeham Chancellor M.A., F.R.I.B.A. 19 Duke St., Chelmsford	1918-1945
Wykeham Chancellor, Simpson & Bragg (W. C. died 1945)	1945-1948

Wykeham Chancellor & Bragg

1948-1950

Geo. J. Bragg L.R.I.B.A.
19 Duke St., Chelmsford

1950-1965

1. *Frederic Chancellor, birth and background—Church repairs 19th century*

Born on 27 April 1825, for Frederic Chancellor, the victories of the Nile, Trafalgar and Waterloo must have been as fresh from the past as are Alamein and Normandy to the present younger generation. Nelson and the Duke of Wellington were for him household names, as Montgomery and Winston Churchill are for us today. His long life was to carry him through three-quarters of the nineteenth century and the best part of the first quarter of the twentieth century; from the historic past to modern times. It is against such a background that his life and work must be measured and judged.

By the middle of the nineteenth century a crisis had been reached with the maintenance of parish churches in Essex; a condition no doubt reflected throughout the country. The majority of churches were in need of urgent repair and in some the stability of the walls was threatened. Coupled with this, was the pressing need for larger churches to meet the requirements of expanding congregations, a situation brought about by the population explosion of that century. The long drawn out years of the Napoleonic wars, ending with the victory of Waterloo in 1815, had drained the finances of the nation and contributed to the rundown on church maintenance work during that period.

To this situation must be added the fact that many of the churches built between the twelfth and fifteenth centuries had, after five hundred years or more, reached a stage of structural decline. Further, in the last century, although confined to a small area around Colchester, the earthquake of 1884 was responsible for a considerable amount of damage to buildings. The rubble wall construction of flint and lime mortar, so common in Essex churches, was no match for earthquake disturbances. Apart from its vulnerability to this form of destruction, walls of this type required constant maintenance, otherwise frost and damp would penetrate behind flint facings. With dampness came wood decay, especially true of the timber flooring under the pews, and of roof timbers exposed to faulty gutters and tiling. Parish reports and architects' specifications for restorations during the second half of the nineteenth century are a grim revelation of the sad state of deterioration suffered by our churches at that time.

2. *Victorian Gothic—F. Chancellor, early years of practice*

As the outcome of these circumstances churches throughout the County, in the short space of fifty years, were to undergo a process of rehabilitation and expansion that would in many cases change, if not destroy, the basic qualities of their designs. This was the period of 'Victorian Gothic', a revival of Gothic architecture inspired by the drawings of Pugin and the writings of Ruskin. This was a period destined to change the character of many of our cities, a period which

posterity has judged to have been for the worse, but one which nevertheless captured the mind and inspired the best intellects of the day.

Out of this revival emerged the name of a young architect, Frederic Chancellor, who, together with his son Wykeham, was to have a profound influence on the future of Essex parish churches. As Diocesan Architects their influence extended throughout the County, and it is true to say that there are very few parish churches in Essex that do not, if only in some small detail, bear the stamp of their work. The purpose of this review then is to attempt a brief survey of their work, and that of their associates. Their practice extended over a hundred years, commencing with the partnership of Beadel Son and Chancellor, and terminating with the death of George J. Bragg 1965. It embraced every department of design; houses, schools, maltings and public buildings. Above all, however, they were renowned for their church work, and it is to this sphere of their practice that this survey is confined.

3. *Historical background of parish churches—problems of maintenance*

From time immemorial the parish church has been the dominant architectural feature of the English landscape, and the centre of village life. Within its walls are contained the records of its history, and in the beauty and creative quality of its fabric lies the genius of a great age of architecture, which, if allowed to decay, would disappear from the land for ever. In Europe this period represented a break-away from the classicism of Greece and Rome, and through a transitional Romanesque period, emerged the new era of Gothic design. The Normans brought the Romanesque style to Britain where it became known as Norman, and which for all practical purposes represents the beginning of living architecture in this country. In the succeeding Gothic styles the builders and craftsmen reached a level of artistic perfection and creativeness only equalled during the Classic age of Greece. In no other country do the parish churches possess greater charm, or are they so universally admired. They were in fact the mainspring of architectural thought in this country for many centuries.

The responsibility for their maintenance and extension is one that has weighed heavily on the architectural profession in the past. Their maintenance in experienced hands, was a comparatively straight forward matter, but any variation or addition presented a real challenge to the person undertaking it. There appeared to be a great temptation with architects of the Victorian period to experiment with Gothic detail, forgetting that Gothic architecture had long been finalized and could not be re-vitalized; one might as well try to improve the Parthenon with a second century Roman addition. The inspiration given to the original buildings had flowered, and died with the end of an epoch, which for Gothic architecture was to close with the fifteenth century.

4. *F. Chancellor, standard pattern of drawings—Rettendon church restorations (PL. I)*

Frederic Chancellor's drawings followed a standard pattern of presentation, varying little over a period of forty years. They were usually drawn in ink on an

Imperial size sheet of stiff white Whatman's paper to a scale of $\frac{1}{8}$ in. to 1 ft. Often a scheme comprised two sets of drawings, one of the church 'as at present', and the other a complete set of plans, elevations, and sections, of the whole church coloured to show old and new work. These were sometimes supplemented with $\frac{1}{2}$ in. and 1 in. details, to form a complete set of contract drawings containing the diocesan seal and the signature of the contractor. For purposes of record, these two sets of drawings, one before, and the other after the alterations, provide us with an invaluable link with the past, for the original appearance, which may have been obliterated by the alterations, is thus preserved in the drawings 'as at present'. Alternative methods of presentation were drawings in ink on yellow tracing paper, mounted on Whatman's or cartridge paper. This facilitated their duplication; a method more suited to working drawings than sketch plans.

The restorations and additions to All Saint's Church, Rettendon, although of a more recent date than many others (1894), may be taken as typical, and one of Frederic Chancellor's best schemes. The first set of drawings marked 'as at present' is in ink to $\frac{1}{8}$ in. scale on cartridge paper and comprises a plan, three sheets of elevations and two of sections. Well drawn they show a church with nave, chancel, north aisle and vestry. On the South front is an entrance porch, and at the West end of the nave the massive walls of the splendid 72 feet high stone tower. No church tower, from its hill-top, dominates the surrounding countryside more dramatically than this one. Over the vestry is a priest's room reached by an outside staircase. Referring now to the six $\frac{1}{8}$ in. scale drawings of the second set, we find that they comprise a plan, three sheets of elevations, and two of sections. They are in ink on Whatman's paper, fully coloured. Titles are elaborately presented in Gothic lettering and the drawings are signed 'Fred Chancellor, F.R.I.B.A., Architect, 20 Finsbury Circus, E.C., and Chelmsford, Essex, June 1894.' As contract drawings they are also signed by the builder J. A. H. Wray, 31 July 1895, and stamped by the Incorporated Church Building Society, 21 June 1895. Existing walls on plan are coloured grey, new or restored walls red, and new stone windows and quoins to buttresses blue. From these demarcations, we find that the whole of the south wall of the nave and chancel has been rebuilt with modified buttresses. Windows throughout have been redesigned and rebuilt, and there is a new oak porch with stone base and tile roof. The outside stair to the priest's room has been done away with, and an old inside circular stair reinstated. The flooring throughout has been renewed with red tiles, and there are new pews and choir stalls. It would appear that the high pitched timber roof has been redesigned, rebuilt and covered with tiles, completing a very extensive restoration of the whole church.

It is interesting to analyse the work on the basis of whether the original design has suffered a deterioration, or conversely whether there has been an improvement in the appearance of the church. The fifteenth-century Kentish rag tower with diagonal buttresses and large stair turrets has escaped any structural alterations. The south elevation of the nave and chancel has, however, been completely redesigned, five new Tudor windows replacing the original odd assortment, and a new porch, Victorian as it may be, is a considerable improvement on the

original weatherboarded one. Likewise, a reshuffle of the windows on the north elevation, and a new boiler flue must be judged as a simplification of that façade. Turning to the east elevation, we see the twin gables of the chancel and vestry-priest's room backed by the dominating mass of the west tower and stair turret. The old three light circular headed sash window with its strange segmental hood has been replaced by a large three light perpendicular traceried window, greatly improving the eastern aspect. Of special interest is the appearance of the roof timbers in these gables, reflecting the internal roof design, and finishing flush with the outside stone face of the wall. So often does this feature appear in Frederic Chancellor's restorations that it might well be regarded as the seal to work, so much so that whenever this feature appears in an Essex church the work may safely be attributed to him. Aesthetically its value is questionable, but structurally it has the advantage of tying in the gable wall to the roof construction and preventing masonry falling out. The proportions of the east elevation are certainly nicely balanced between small and large gables, and in a vertical sense, between the new boiler stack and the tower turret. Internally there is no demarcation between nave and chancel by the usual chancel arch. In the new roof Chancellor has endeavoured to overcome this deficiency by inserting a heavy arched timber truss at this point. Although these drawings are of a good standard they do not possess the fine delicacy of some of his earlier schemes such as Althorne and Good Easter.

5. *F. Chancellor, St. Mary's Church Maldon alterations and additions—Rev. Crawshay on Victorian restorations*

Proceeding now from restorations to the more contentious subject of alterations and additions, I propose to examine what I consider are two of the more successful of Frederic Chancellor's schemes. They are the fine, if ponderous, old church of St. Mary at Maldon, known locally as the fishermen's church, and then St. Mary's Broomfield, best known for its Norman round tower. One visualizes him in 1885 undertaking the former scheme with a deep sense of responsibility and enthusiasm, for here is a church steeped in legend and history. On this site, it is claimed, were two previous wooden Saxon churches dating from 660 and 995 A.D. Parts of the existing walls are Norman, and was not its massive brick tower used as a navigation beacon for many centuries to aid shipping coming up the Blackwater? The improvements were to include the addition of a south aisle and clerestory windows, a vestry and organ space, and the restoration of the roof. Included also were new flooring, seating, and under-floor heating. The new aisle was dealt with by opening up the south wall of the nave to receive an arcade of well proportioned arches, and bold round columns of Norman proportions, all in keeping with the large scale of an interior whose roof rises 40 feet above the nave floor. This work undoubtedly resulted in a great improvement to an interior otherwise austere and lacking breadth.

The Rev. R. V. E. de B. Crawshay in his history of the church observes, 'These two most important years (1886-7) represent the dates of the Restoration of this particular church and it is not going too far to say that if Fred Chancellor had not been given a free hand to carry out this work in accordance with his

unparalleled knowledge of Essex Norman and subsequent churches, St. Mary's would not have been with us today'. He further observes 'Work done on a church in Victoria's Reign comes in for much abuse which is so often repeated over a number of years, mostly by people who should remain silent on the matter, that it invariably gets regarded as a fact by the majority'. These are telling words containing more than a grain of truth, and should serve as a warning to all those who automatically condemn the work of the Victorian period.

6. *Restoration of Broomfield church (PL. II)*

The requirements for Broomfield church were similar to those for Maldon except that the additional aisle was on the north side. Otherwise the new work was almost identical, and might be regarded as the standard requirements for many churches at that time. The restorations at Broomfield are of special interest because of their early date. Frederic Chancellor was then 42 years old and supposedly in his prime. This is manifested in the high quality of his drawings. Once again they are in ink on Whatman's paper, dated 1867, and contain the Diocesan seal. Only those who have had experience in drawing on the rough texture of this paper can fully appreciate the skill of these delicately executed drawings. These qualities are seen later in the drawings of Althorne and Good Easter, which more than any others, convey to us subtleties of thought on architectural matters that have no place in a modern world. They reveal also a hidden truth, that the ancient beauty of these churches is not there by accident, but was created by men skilled in the use of the pen, and guided by good taste.

7. *F. Chancellor, personality*

Above all Frederic Chancellor was a great personality, prominent in his profession, and well known and respected in a society that placed much importance on integrity and respectability. He was the father figure in an age when a beard and formal clothes were the indispensable attire of the successful business man. Not many people alive today knew him in his prime. One who did describes him as an autocrat, and a person who was not easily approached. Inevitably clothed in a frock coat, top hat and red carnation, he was a stickler for etiquette, and his arrival at the office was accompanied by 'good morning sir', and the removal of his coat and hat by the junior assistant. He was a familiar figure around Chelmsford in his horse and trap with driver, and his expeditions into the country were as carefully planned manoeuvres. Moreover his arrival at the job was in the nature of a parade ground inspection with everyone literally standing to attention. No-one would dare approach him unless requested, and he spoke only with the foreman or the master builder himself, who was usually there to receive him. All the more baffling therefore is his choice of the modest Fred in place of Frederic, as the signature at the bottom of all his drawings.

8. *F. Chancellor, timber towers and belfries: Ulting, South Hanningfield, Stock, Good Easter, Blackmore, Margaretting, Shenfield and Laindon Churches*

There was one field of work in which Frederic Chancellor excelled above all

others, and that was in his handling of timber belfries; so characteristic a feature of the smaller Essex village. He seemed to have a special affinity for this work, and whether modifying an existing belfry, or designing a new one, the work was usually dealt with understandingly. Two excellent examples are the remodelling of the bell turret at the tiny Ulting church, and his design for a new belfry at South Hanningfield, which had the unusual feature of tapering sides to the bell chamber. Had this design been carried out it would have been one of the most graceful in the County. A strange thing about these belfries is that their eccentricities, as with people, often endear them to the public. Stock tower, for instance, with its elongated base and gabled off-shoot is a good example of this, as is the unusually tall belfry at Good Easter. Their architectural value however, goes beyond their outward appearance; they are, in fact, outstanding feats of engineering in timber, which in their day were the equivalent of our modern undertakings in steel and concrete. Only as one examines and re-examines the drawings, and meets their complex piles at close quarters, is their importance understood.

The fine sturdy little church of St. Nicholas, Laindon, has one of the best timber belfries in the County. It is one of the larger examples of its type in which the oak posts and beams supporting the bell chamber and steeple are carried down through the roof to the floor of the nave. The smaller belfries usually rest on the roof or are supported on side walls. The coloured set of restoration drawings by Frederic Chancellor (Jan. 1880) and signed by the builder, Walter E. Letch, illustrates the complicated construction and the new appearance of the Laindon belfry. We see the original ungainly structure reshaped into a simple but graceful louvred bell chamber and broach spire: a great improvement on its pre-restoration design.

However, not until we stumble across drawings of some of the larger and better known free standing towers, such as Blackmore, Margaretting and Shenfield, do we appreciate their full dramatic qualities. No one, we imagine, could have known these old timber towers and belfries better than Frederic Chancellor. He measured them, drew them out on paper, and restored and remodelled them; their secrets and shortcomings he knew intimately, for they appear on scores of his drawings. Although outwardly familiar to most people, their interiors remain a secret, except to the privileged few who have been admitted through their locked doors. For them the scene inside must be a little breath-taking when confronted by a massive array of oak posts, beams and braces, the combined strength of which must be formidable. That the Chancellors should have recorded details of many of these towers is of considerable value to us and to posterity.

9. *Blackmore, Shenfield and Margaretting church towers*

At Blackmore we have the largest and possibly the most impressive of these towers. The best drawings are those contained in two sheets of $\frac{1}{8}$ in. scale plans and sections of the church drawn by F.C. in ink on Whatman's paper, dated December 1896. Besides providing a valuable record of the church as it then existed, the structural members of the tower are clearly shown. Externally the

tower rises in three stages of tiled setbacks, but internally there are five vertical stages including the bell chamber. Four main posts forming the centre space, twelve feet square, rise 53 feet from the ground floor to the bottom plate of the broach spire. For the first two stages they are 22 in. \times 19 in. and 19 in. \times 19 in. Above this they reduce to about 12 in. \times 12 in. Surrounding this central space, and buttressing it, is an aisle five feet wide comprising 15 in. \times 15 in. and 12 in. \times 12 in. posts, giving a total floor space of about 26 ft. 6 in. by 27 ft. 6 in. In all there are twenty posts which combine with five levels of beams and braces to form a veritable forest of structural members. The three receding external wall faces are finished from the bottom upwards in plaster, vertical boarding, and horizontal weatherboarding, and the broach spire with shingles. Impressive as this structure is we are perhaps more over-awed by the age of these huge oak timbers, already five hundred years old, and likely to last as long again if preserved from the death-watch beetle and other forms of decay. There is another drawing to $\frac{1}{2}$ in. scale, dated September 1900, indicating the reconstruction of the spire above the bell chamber.

Viewing the drawings of Shenfield church tower by Wykeham Chancellor, one in pencil on cartridge paper, dated Sept. 1927, shows the structural timbers as then existing, and the other, a pencil tracing, Dec. 1927, indicates the proposed strengthening of the timbers at the second stage with steel sections. The records of the Margaretting tower are confined to one linen backed sheet of $\frac{1}{8}$ in., $\frac{1}{4}$ in. $\frac{1}{2}$ in. drawings in sepia ink, and undated. The construction is a modification of that at Blackmore, the overall internal dimensions being 24 ft. 6 in. by 24 ft. 6 in. and 40 ft. 9 in. to the underside of the spire plate, as against 53 ft. at Blackmore. There are three stages internally, including the bell chamber, and one set-back externally. The structural composition is similar except for two additional posts forming the jambs of an external doorway. Four of the six posts forming the central core rise to the full height of the tower, the fourteen outer ones, acting as buttresses, rise fifteen feet to support the rafters of the three sided lean-to roof over the ground floor aisle. Accompanying these are four pencil perspectives, dated June 1869, illustrating alternative designs for the junction of the tower and nave roof, any one of which would have been a happier solution than the present awkward arrangement.

10. *F. Chancellor, draughtsmanship and good design—East Hanningfield new church*

The several schemes mentioned in the previous pages represent the peak level of Frederic Chancellor's attainment. It would be misleading, however, for anyone to assume from these that his entire practice was maintained at this level. Likewise one must not confuse good draughtsmanship with good design. The prestige of an ancient design tends to enhance ones own efforts when brought together in one drawing. Only a few architects of outstanding talent survived the mistakes of the Gothic Revival, and Frederic Chancellor was not one of them. That role perhaps was left to his son Wykeham who was to grow up in a new school of thought. The father's excursions into the realms of creative design were no more

successful than the average architect of the day. The closer he kept to orthodox Gothic the less vulnerable his designs became.

His new church built at East Hanningfield about 1883 illustrates this point very clearly. At first glance there is little to betray the fact that it is not genuinely Early English with a few Decorated period windows added. Flint walls, stone dressings, weatherboarded belfry, and shingle broach spire, the full complement are there, as seen on hundreds of old parish churches. Two extraneous features however betray its secret; a stone base to the belfry, and a semi-circular staircase turret on its west face. Notwithstanding, it is a church of pleasant appearance, and one, no doubt, its village views with approval.

11. *F. Chancellor, Ford End new church*

The new brick church at Ford End near Great Waltham was probably one of Frederic Chancellor's most ambitious designs. Six different sketch plans were prepared for this scheme, and three pencil perspectives. The coloured plans, dated November and December 1869, are drawn in pencil, and have varying layouts, but generally include nave, aisle, chancel, vestry and south porch. Square, round, and splayed angles are submitted as alternatives for the termination of the east end of the chancel. Vestry walls usually serve as a base to the tower adjoining the chancel arch. The overall length of the church averages 85 feet with widths varying from 32 to 36 feet. The north and east elevations, in pencil, are not without merit, but over elaborated. The 72 feet high tower with conical spire, reminiscent of the Merchant Seamen's Hospital, Wanstead (G. C. Clarke, 1861) is a creative work, especially the introduction of carved stone angels on the four corners. The low swept roof over the nave and aisle is most impressive. These features are well illustrated by a highly commendable perspective viewed from the south-east, but two other perspectives are inferior in quality. Both inside and out the church is full of interest and a good example of its period.

12. *F. Chancellor, Saxon church, Greensted, restoration*

Some drawings are interesting by virtue of the quality of the draughtmanship or design, others more the historic importance of the building. The small roll of drawings of the ancient wooden Saxon church at Greensted is in the latter category. The roll includes four contract drawings in ink to $\frac{1}{4}$ in. scale, on Whatman's paper comprising plan, south elevation, long, and cross sections, and details of the dormer windows. They are dated August 1889, and signed by the builder, Walter Ed. Letch, 26 June 1891. Once again the drawings are vague about the extent of the restorations. It seems likely that, the whole of the nave roof and dormer windows were renewed, re-using some of the original timber and ornament. The pleasantly rendered elevation looks very much as we see the building today. What were Fred Chancellor's thoughts, one might wonder, as he measured those ageless logs and pondered their history? He was not to know that 70 years later dendromagnetic methods would determine that they were there in 845 A.D., some two hundred years earlier than once supposed. Of all the valuable drawings in the Chancellor collection these are possibly the most noteworthy.

13. *Survey sketches: Great Yeldham and Greensted churches*

In no other form of draughtmanship does an architect reveal himself so intimately as in his survey sketches. These hastily prepared records of existing buildings, often done in wet and cold conditions, or in cramped and dark positions, tax the skill and patience of the best. There are no artificial guides for straight lines and correct angles. It is all freehand and one must fall back on a steady hand, neatness, and a good sense of proportion. Two examples of this are the survey sketches prepared by Frederic Chancellor for Great Yeldham and Greensted churches. The latter are on nine small sheets of cartridge paper, dated 21 August 1889. They include the south elevation of the church, internal views of the nave walls, a cross section, and two plans. There are two survey sheets only for Great Yeldham; a complete plan of the church, and the south elevation, dated 24 January 1884. In this case both sketches have been aided with a straight edge, although the elevation is mainly freehand, and has a professional touch.

14. *F. Chancellor, interior perspectives: Fryerning and Little Waltham churches*

There are several water colour perspectives of interiors in the collection, notably those by Frederic Chancellor for Fryerning and Little Waltham churches. For the latter there is a view of the nave and chancel taken from the tower arch no doubt prepared for the purpose of illustrating the new north aisle. The pencil work lacks sharpness, and as with other Chancellor perspectives the shadows are unrelated to a common source of light. It is strange, also, that in the colouring, the only two elements to be treated with precision, are the floor tiles and the roof rafters, both of little consequence in the design. The identity of the two figures in the foreground is intriguing, especially that of the man holding a top-hat. Is it intended to be the great man himself? The large interior view of Fryerning church is probably the most ambitious of his perspectives, and deserves praise for its honest forthright presentation.

15. *F. Chancellor as archaeologist—Ancient Sepulchral Monuments of Essex—observations on church monuments*

No assessment of the value of Frederic Chancellor's association with Essex churches would be complete without considering his work as an archaeologist. In the eyes of his readers, at least, his reputation as an authority on the history of these churches, and the families connected with them, would outweigh his importance as an architect. One work alone, his *Ancient Sepulchral Monuments of Essex*, published in 1890 by Messrs. Edmund Durrant & Co. of Chelmsford, is a classic. This vast 580 page volume dedicated to the Right Rev. Thomas Legh Claughton, first Lord Bishop of St. Albans, contains superbly drawn plates of all the important church monuments, together with historic outlines of the leading Essex families and their family trees from Norman times onwards. John S. Corder, Frank Brown, Arthur Kent, and others, including Wykeham Chancellor, were responsible for the drawings. This great work, his articles on churches in the *Essex Review*, and as one of the founders of the Essex Archaeological Society, established him as the foremost

authority of the nineteenth century on Essex churches and their monuments. A study of his professional work, therefore cannot be dissociated from these extramural undertakings which inevitably increase his prestige as an architect. One is sometimes misled by the apparent simplicity and restfulness of an interior as seen on the drawings, a restfulness not always enjoyed on entering the church, when the walls are found to be cluttered with every possible shape, size, and design of memorial tablet (monuments and wall tablets are not usually shown on architectural drawings). What a curse these memorials can be to the enjoyment of an otherwise beautiful interior. Two or three well placed tablets are quite enough in any small church. Stock is an outstanding example of a beautiful interior unmarred by discordant designs on its walls, an example that many other parishes might well follow. It would be interesting to know Frederic Chancellor's views on this subject. For the historian, the monuments tend to be of the first importance, and the church a mere shell to house and protect them; for others they are an unwarranted intrusion into the spiritual sanctuary of the church.

16. *Faculties and parish meetings*

The work of an ecclesiastical architect in the nineteenth century was subject to certain controls and approvals. Usually his approach was through the vicar and churchwardens with whom he discussed the proposals. The resultant sketch plans and estimates were then submitted to a meeting of the Parishioners, from where if agreed, a petition for their implementation was sent to the Bishop of the Diocese. The subsequent approval, or license, was issued in the form of a *Faculty*, a carefully worded document reiterating the proposals and bearing the seal of the Diocese and the signature of the Registrar.

Many of these beautifully inscribed documents written in ink are of great interest both on account of their presentation and their historic associations. Their repetitive wording is almost prosaic to our modern way of thought, but behind the verbosity lies a shrewd legal mind. Very little is omitted, and one feels that it would be difficult to escape the general meaning of the instructions. These include the carrying out of the work in accordance with the architect's plans, specifications and estimates, and methods of financing the scheme are enumerated. Such items are sometimes revealing. For instance there is a letter from Caroline St. John Mildmay, of the 21 March 1867, offering to donate £100 towards the cost of removing the west gallery, and repositioning the organ in Chelmsford Cathedral, the total estimated cost being £225. The balance was to have been met by public subscription. It was not uncommon for a vicar to subscribe large sums for the improvement of his church or vicarage. The Rev. William Holland, in 1854, agreed to provide the whole of the £1442 required for demolishing the old church at Cold Norton, and building a new one—surely a very handsome bequest, and one which could be made only by a man of means. At Little Leighs in 1895 the Rev. H. E. Hulton of Great Waltham donated £1000 towards the restorations.

These nineteenth-century Faculties provide many familiar Essex family names in the signatures of witnesses and churchwardens, and the names of builders

on drawings are often those met with in practice today. From the faculty for Messing church, 10 April 1886, we learn that it was severely damaged by the 1884 earthquake, and that Frederic Chancellor's estimate for repairs was £925 of which £50 would be met from the earthquake relief fund, and £35 from the Diocesan Church Building Society. Of Chancellor's good relationship with the church dignitaries, and in particular the ever present vicar, there can be no doubt. Numerous letters from the latter reveal a close understanding between them based on a common interest. (For extract from Faculty for Boxted church see page 222).

17. *Restoration of porches—Little Waltham church*

As one might expect restorations include many porches, and one of the most interesting of these is that at Little Waltham. The drawing is in ink to $\frac{1}{2}$ " scale, on mounted yellow tracing paper, and signed Fred Chancellor, F.R.I.B.A., 1887. Scalloped bargeboards and traceried side panels enhance an oak framework which in turn is supported by a stone base. This is joinery at its Medieval best, and as far as one can see the restorations have adhered closely to the original. The porch shelters a Norman doorway and is flanked by a small round-headed window.

18. *Wykeham Chancellor in partnership with his father—W. Chancellor, drawing of the Saltonstall monument in South Ockendon church*

It is difficult to review Wykeham Chancellor's work and avoid the feeling that everything he did was overshadowed by his illustrious father. Viewed from the reaction of the general public, this is understandable for not only did his father head a well established practice, he enjoyed, as well, an international reputation for his treatise on church architecture and ancient monuments. Further, he was a prominent public figure in his home town, having been the first Mayor of Chelmsford, and re-elected to this office on five subsequent occasions. Surely this must be unique in the history of a profession where political ambitions are seldom encountered. Wykeham joined his father as a partner in 1896, at the age of thirty-one. The partnership lasted until the death of his father in 1918, at the age of ninety three. Chancellor senior was therefore over seventy when the partnership commenced, so it is reasonable to assume that by then his architectural work had been delegated to other members of the staff. By the beginning of this century, Wykeham must have taken over the major responsibility for the work, a point to be kept in mind when examining the drawings. It is important, also, to remember that he gained his early training in his father's office following his graduation as an M.A. at Oxford. The date of his entry into the office is uncertain, probably somewhere about the age of twenty five in 1890. While this is a matter of conjecture, it is interesting to find a pen and ink rendering of his, on Whatman's paper, of the Saltonstall monument, in South Ockenden church, a brilliant piece of work which establishes him as a draughtsman of the first calibre. So by 1890 he was his father's equal as a draughtsman, and would, as we now know, surpass him in this, and more particularly, in the field of design. Wykeham Chancellor was an artist in

the use of the pencil, a medium he used with great success for many of his most intricate drawings, whereas his father worked mainly in ink, the use of pencil being relegated to rough details.

19. *W. Chancellor, new church, Goodmayes (PL. III)*

By the end of the nineteenth century the restoration of Essex churches had been largely completed, and the Chancellors' domestic and commercial practice was rapidly expanding. In the next twenty years they were to carry out a large number of public and school buildings, all of which must have taken up much of their time. Wykeham was nevertheless responsible for one or two new churches foremost of which must have been St. Paul's Goodmayes. The contract drawings, dated May 1902, indicate a large church about 108 feet long, and 57 feet wide, comprising nave, north and south aisles, chancel, north and south porches, vestry, and a fine large tower 83 feet high. Constructed of bricks with stone facings, it is designed in a modern Gothic style, the key-note of which is a masculine simplicity. The drawings contain three signatures, those of J. W. Alban, Alfred Brown and Son, and Henry Everett and Son, the builders. Accompanying these drawings is a particularly fine ink perspective of the church and tower. Although incomplete it illustrates a design of outstanding merit, a design in which the frills have been omitted while the Gothic character has been retained.

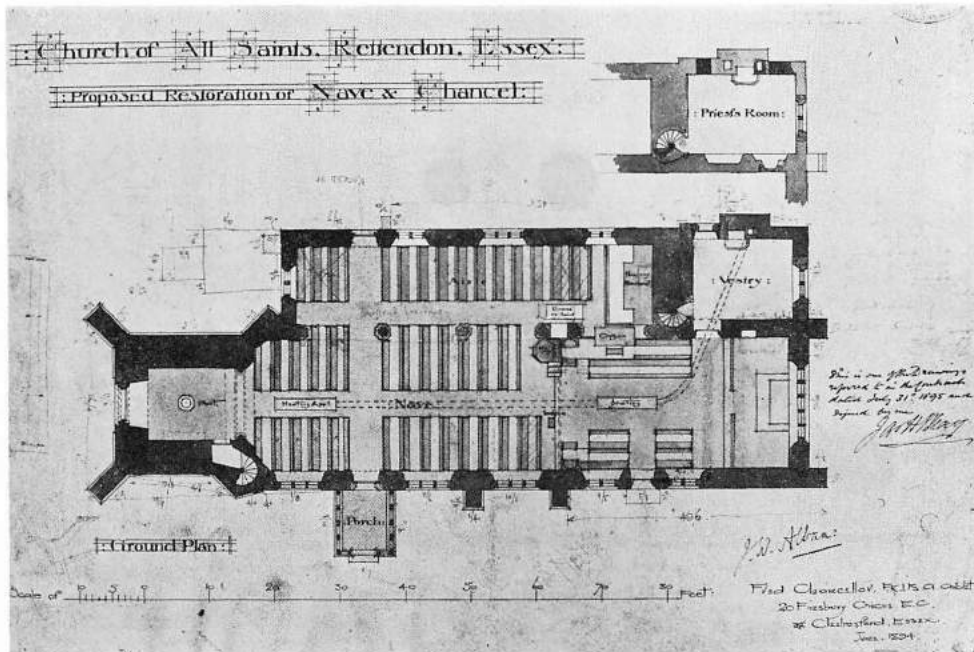
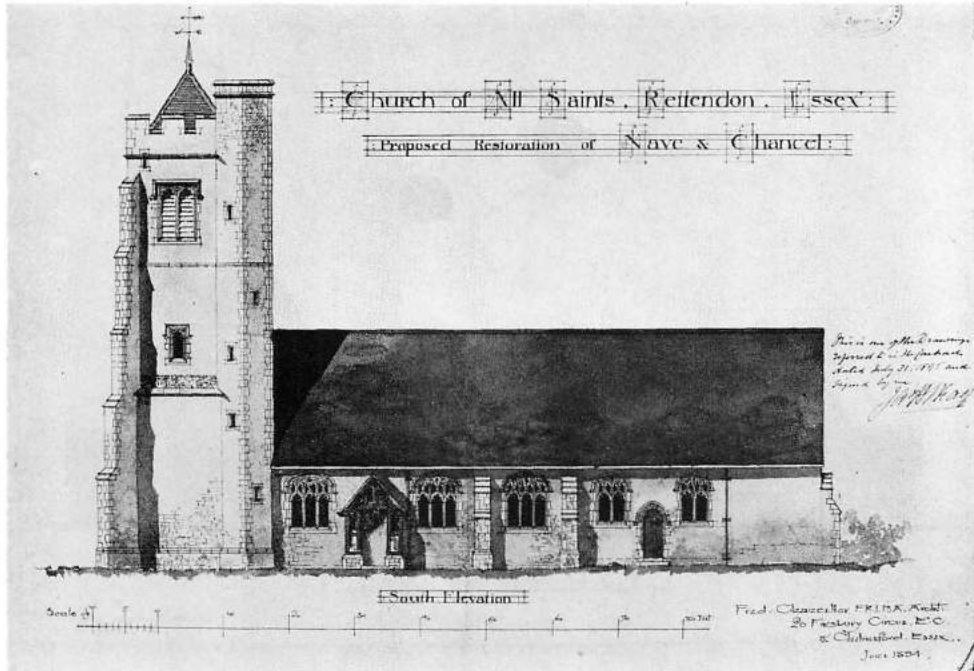
20. *Drawing Methods*

The choice of drawing materials had an important influence on draughtmanship and indirectly on design. Frederic Chancellor's preference for Whatman's paper has already been alluded to, so much so that the years 1860 to 1900 might almost be called the Whatman period. Nevertheless cartridge paper and yellow tracing paper were used to a lesser extent. On the hard surface of Whatman's, erasures could be made without much disfigurement of the surface, whereas the softer texture of cartridge paper would not stand up to the abrasions of a rubber or sharp knife without disfigurement. The disadvantage of both materials was their lack of transparency, for only by re-drawing could a duplicate of a drawing be made. This was frequently done by the method of pricking-through from the original to the copy, and so eliminating the need for a new setting-out of the drawing. With the introduction of tracing linen, and thin white tracing paper, and the process of obtaining prints from these, drawing-office methods were revolutionized. Roughly speaking this was the Wykeham Chancellor—Geo. Bragg period, 1900—1965. Both architects made great use of tracing paper, favouring pencil to that of ink.

21. *W. Chancellor as mender of churches—W. Chancellor, designer of oak screens and church furniture: Felsted and Margaretting*

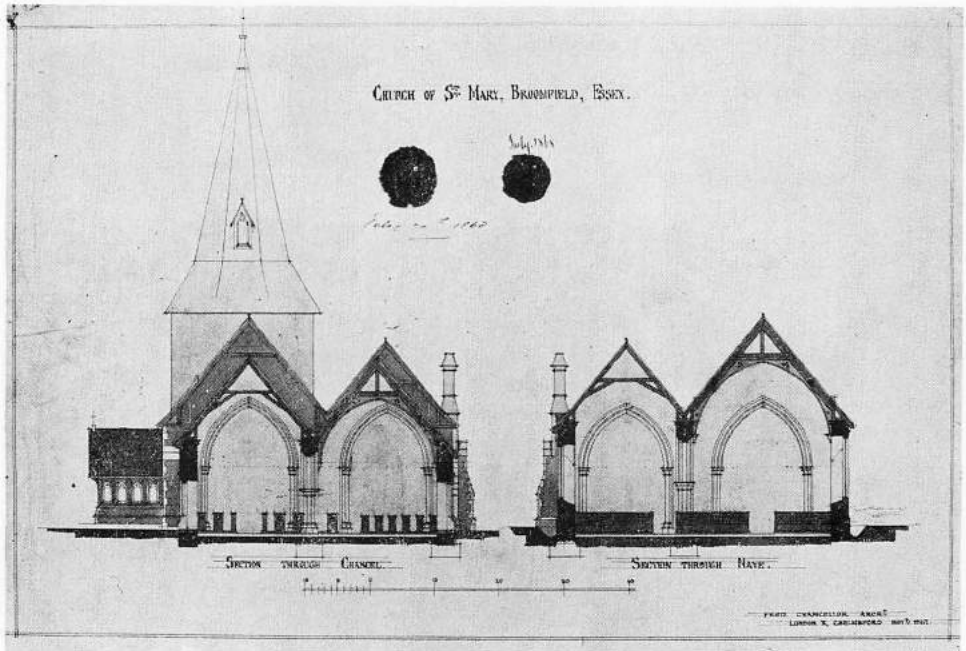
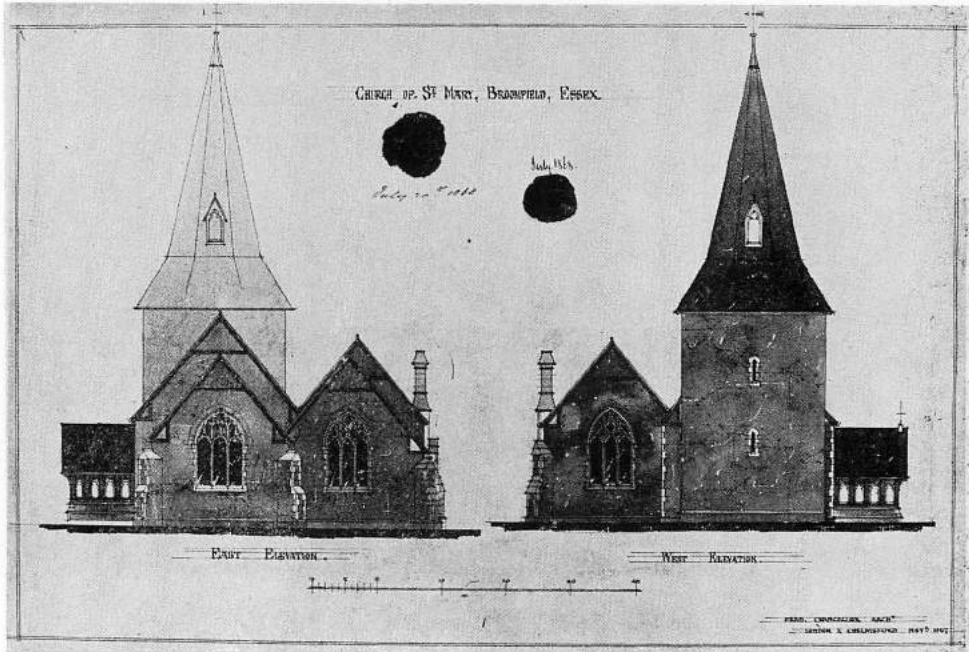
The late Mr. A. E. Wiseman said 'Wykeham Chancellor was steeped in Gothic tradition. He would, I think have been the last man to describe himself as a great architect in that he designed large and magnificent buildings, but thanks

PLATE I



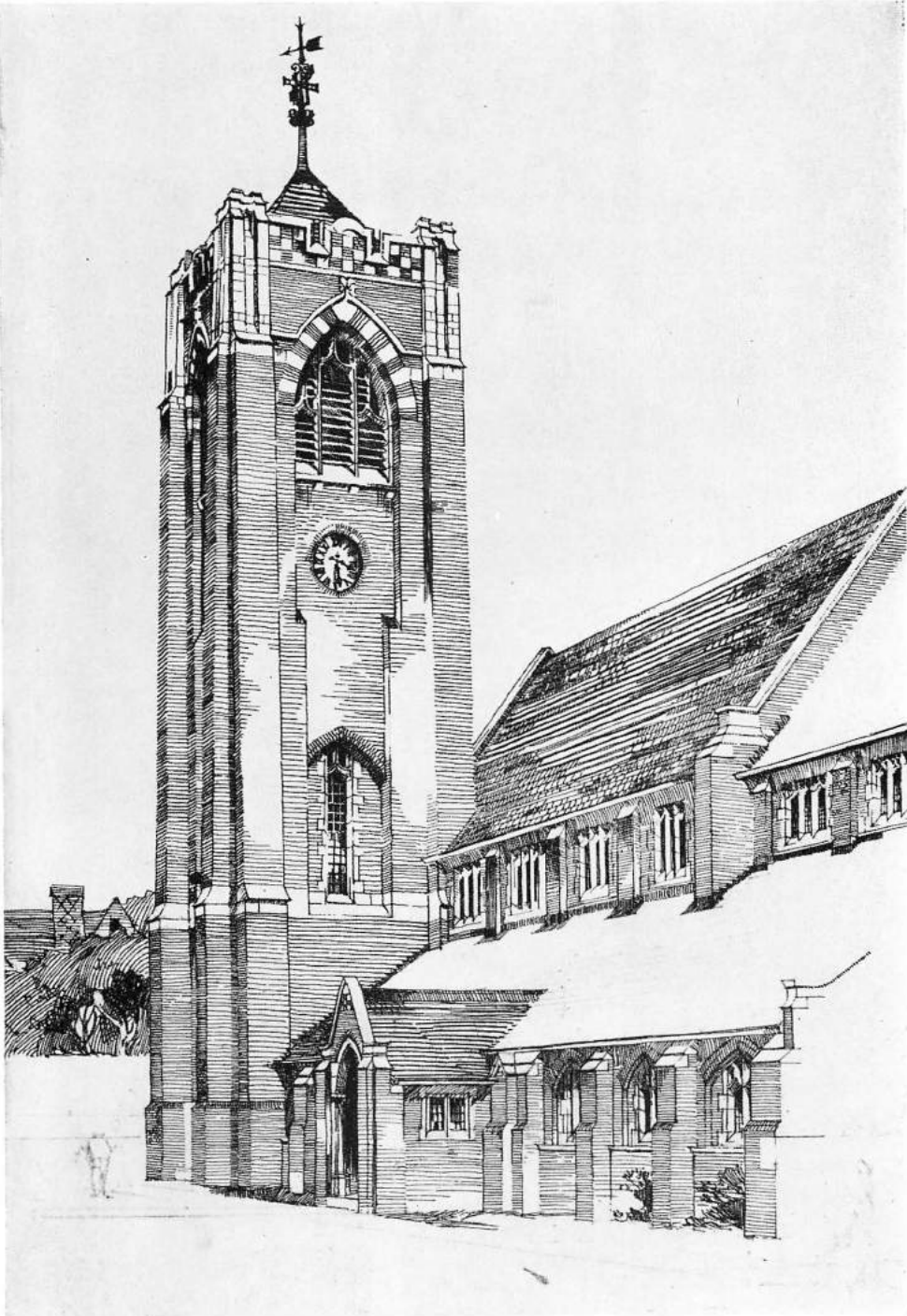
ALL SAINTS' CHURCH, RETTENDON, ESSEX

PLATE II



ST. MARY'S CHURCH, BROOMFIELD, ESSEX

PLATE III



DESIGN FOR ST. PAUL'S CHURCH, GOODMAYES, ESSEX

to his care and knowledge, posterity will enjoy the many lovely churches and buildings which he mended with such skill and loving care'. In this role of mending and improving, he excelled above all else in his designs for chancel and parclose screens, a skill he must have passed on to Geo. Bragg his successor. So identical are their designs it is sometimes difficult to establish the authorship, one way or the other.

Oak screens were prepared for a large number of churches. One of the finest is possibly that designed for the chancel arch at Felsted. There are three drawings of this, the original coloured sketch, dated March 1938, and a linen tracing and print dated August 1938. The screen is 10 ft. 6 in. wide, 7 ft. 9 in. high and divided into seven bays, the centre one wider than the others, and fitted with a wicket door. The oak tracery, both at dado and cornice levels is of great delicacy, as is the carved ornament along the cornice itself. Accompanying these drawings are full size details beautifully profiled and of high quality. Unfortunately this design, as with others, was not carried out. An earlier screen is that erected as a memorial to the fourteen inhabitants of Margaretting who fell in the Great War. It is drawn in sepia ink on tracing paper to one inch scale. While the new upper portion is the work of Wykeham, the lower portion is said to have been restored, and given by Frederic Chancellor in 1870. The drawing shows a broad central opening with a flat four centred arch, and on either side the oak screen is divided into four bays with moulded mullions and beautiful tracery heads, and above a frieze with carved oak leaves. The panelled dado is decorated in William Morris fashion with painted floral and human forms. The drawing is signed Fred Chancellor & Son October 1901. There is a smaller scale coloured drawing in pencil on cartridge paper of the same screen with three painted panels on either side instead of four.

22. *W. Chancellor and George Bragg, choir stalls Bocking church and high altar Great Dunmow*

The design of church furniture figures frequently amongst the Wykeham Chancellor drawings, or should one say the Chancellor-Bragg drawings. Tied up with a large roll of details is a pencil drawing headed 'St. Peter's Church, Bocking—Proposed Choir Stalls' and dated November 1928. There is nothing very special about this detail, other than that the design is a big improvement on earlier details of bench ends by Frederic Chancellor. Nevertheless there is a new quality about the choir stalls and a simple originality in the carving. Some of the best detailing is contained in a series of drawings for the John Campbell Dick memorial at St. Mary's, Great Dunmow, which takes the form of a High Altar. The earliest design, December, 1929, depicts a highly ornate oak altar table and wall panelling. One might feel that the design was over-elaborate, and this fault has been rectified in a revised design of November 1930 in which the ornament is more restrained.

23. *Hand bier, Blackmore church*

Architects are sometimes called upon to design things outside the normal scope of their work. Under the signature of Chancellor & Son, January 1908,

with the drawings of Blackmore church, is a neat one inch scale detail of a funeral hand bier. There is nothing architectural in its makeup. On the contrary it reminds one of an eighteenth century piece of machinery, sometimes seen in industrial museums. About six feet long, with four wooden rubber shod wheels, it has a roller top and brass rails. Why, one wonders, should an architect bother himself with so mundane a piece of equipment when, no doubt, there were plenty available on the market? On the drawing is a pencil note 'Tracing sent to the Rev. Petrie, Jan 21st. 1908'.

24. *W. Chancellor, Churchyard cross at Castle Hedingham*

There is no finer churchyard cross than that seen through the lychgate at Castle Hedingham. Erected as a 1914-18 war memorial from fragments of ancient stonework unearthed, so it is said, in a local basement, it stands recreated in its present form. About three quarters of the original Saxo-Norman ornamented shaft and the base have survived, and have been re-used in a new design. This includes a modern sub-base displaying the names of the fallen soldiers, terminated above by a new bronze Celtic cross. Two valuable drawings of this scheme are in the collection, but neither is as we now see it. The first, dated February 1920, is a one inch scale pencil detail of a tall slender cross about twenty feet high. The length of the original Saxo-Norman shaft has been doubled by adding a new section, and this is finalized with a stone cross. The original running pattern ornament continues through the new section of the shaft and into the cross. The original carved stone base is omitted and there is a new one two feet high to receive the carved names. The second drawing in pencil to half-inch scale and dated March 1920 utilizes the original shaft and base which sits on a new sub-base, and the shaft is terminated above by a rather clumsy stone cross. Both drawings are by Wykeham Chancellor. The first one has considerable merit but it is doubtful whether, with its great height and jointed shaft, it would be stable. The memorial cross as erected would seem to be more elegant and certainly the more logical. It is disappointing not to have a drawing of this scheme.

25. *Famous pillar piscina, Sandon church*

It may come as a surprise to the parishioners of Sandon church to learn that a detailed drawing exists of their famous pillar piscina which for many centuries lay hidden in one of the buttresses of the north aisle. The drawing, in ink on Whatman's paper, is dated September 1904. It shows a piscina having a three quarter circular shaft with beaded and flinted spiral decorations, supporting a cushion type capital containing Norman ornament. The top of the capital is hollowed—out to receive the Holy water. There is a new square base on which is inscribed—'This twelfth century piscina was found embedded in the N.W. buttress of the church during some restorations, August 1904 B. Wright, Rector'.

26. *W. Chancellor, Leez Priory restorations*

Leez Priory in its present role of private residence has a very distant claim for inclusion in this review, but in view of its original ecclesiastical association it might

with advantage be made the exception. For many years Wykeham Chancellor was intimately involved in the restoration and maintenance of the remnants of this ancient Priory. His most important scheme is the conversion of the old two storey stable wing, about 180 feet long, into living quarters. The first phase of this work appears to have been the conversion of the south front in 1911 and then in 1915 the preparation of sketch plans for the stable wing. The east and west elevations are of special interest both for their design and draughtmanship. Drawn on frail yellow tracing paper the elevations are rendered with a rose coloured wash representing Tudor brickwork. The horizontal emphasis of the brick mullioned windows, and the verticality of the tall Tudor chimneys give good scale to the long façade. A later scheme is the design for a water tower (January 1935) a pleasant design in brick with corner buttresses and tile roof, about 38 feet high and with storage for 2400 gallons of water.

27. *G. Bragg, his contribution as designer and draughtsman: Aldersbrook church*

There is no doubt that George Bragg's contribution to the reputation of the firm was substantial, but it was his lot to be overshadowed by the Chancellor image. Of the three, he was the most accomplished draughtsman in that his drawings were more fully lettered and better finished. For a masterly piece of penmanship there is nothing in the whole collection of drawings to equal the pen and ink rendering of the Saltonstall Monument by Wykeham Chancellor. However, with the general run of working drawings, G.B. was in a class of his own. Contained in the Aldersbrook drawings are several copies of a half inch detail of a new chancel screen and sanctuary panelling, designed as a war memorial and signed Geo. J. Bragg 1951. Supplementing these is a white line on black background perspective of the chancel illustrating the oak screen and panelling. The design of the screen in particular is noteworthy, for here is something that will compare with the best mediaeval work, and the drawing itself is first class.

28. *G. Bragg, designer of the Garden of Remembrance, Stock church*

It is fitting that George Bragg, the last partner of this esteemed firm of architects, should be remembered in a memorial of his own creation. This, of course, is the beautiful Garden of Remembrance at All Saint's church, Stock. It is in the form of an octagonal enclosure paved with headstones recovered from the churchyard after it had been devastated by a bomb in 1940. At its centre is a delicate traceried stone cross, supported on a slender shaft, and erected in 1953 to the memory of King George VI. Carved on the coping of the enclosure wall are the names of benefactors, and among them is that of George John Bragg. The sketch plan prepared in March 1948 is modest in its presentation, even to the extent of having a full size profile of the coping stone overlapping the plan of the garden. There is nothing controversial about this design. Traditional in conception, it is both tasteful and scholarly, and fits perfectly into its environment. Flowers and shrubs now soften the lines of the stonework, and sitting there one remembers that the Chancellors too had close associations with this church. It was they who added

the vestry and organ chamber in 1903, and prepared those excellent drawings of the church as it existed in 1902. It might well be said that at no other church can one come nearer to the memory of these three dedicated men than in this peaceful enclosure.

29. *The Chancellors in retrospect—the work of their contemporaries*

What then is their true image after a hundred years as Diocesan architects, and how does their work compare with that of other church architects? That the Chancellors enjoyed an honoured position in their profession is well established. They were, however, above all restorers and improvers of churches. Few new churches to test their skill and initiative as designers came their way. Of the 110 or more restoration and improvement schemes examined not more than half a dozen new designs appear. Numbered among these are the new churches of East Hanningfield, Ford End, St. John's Chelmsford, and Goodmayes of which the latter is perhaps the only one to merit special mention. In the new qualities of this design we see at last the abandonment of the old traditional Gothic detailing, and an advance into twentieth-century rationalism. This imaginative design is their most creative work. It is unfortunate, however, that the fine tower was never completed.

From twenty-nine architects listed on pages 18–19, whose drawings are contained in the faculty papers deposited in the Essex Record Office, three are selected for their restoration schemes, and one for a new church at Cold Norton. This small stone church, designed by G. E. Pritchett (1855) in traditional Gothic with a bell turret above its western gable, reminds one of the new church at East Hanningfield by Frederic Chancellor, built about thirty years later. The drawings although painstakingly executed look amateurish and lack information. At Shenfield (1867) Boxted (1870) and Prittlewell (1870) are three alterations by W. G. Bartlett, Arthur W. Blomfield and Ewan Christian respectively, all eminent architects in their day. There are five large well drawn uncoloured sheets of the fine old church at Prittlewell, their outstanding feature being the attractive script lettering, most unusual in an age of poor lettering. Sir Arthur Blomfield's two drawings of Boxted church are a real disappointment. Lacking professional finesse, they are casual to a degree of indifference, as might well have been the case. At Shenfield Bartlett gives a clear and well presented set of drawings on Whatman's but the lettering is poor, and the general appearance is undistinguished. These indifferent schemes by celebrated architects impel one to return to the Chancellors with renewed confidence, to the delicate touch of F.C.'s best drawings and those scholarly essays in design by Wykeham, and the brilliant draughtmanship of George Bragg. Frederic Chancellor as the founder of this family practice set the pattern of their work. Whether in the shape of schools, maltings, public buildings or churches the pattern was encompassed by the thought of the period, the Victorian period, in which one either concurred or was forced to drop out of the race. Had he been born into the eighteenth century, the era of Classic mansions and

Georgian houses, his undeniable talent might have followed another course, and we may then have found his name coupled with such personalities as James Paine, Sir Robert Taylor, and Capability Brown.

30. *Frederic Chancellor, obituary (From 'The Builder', 11 January 1918).*

The death occurred on the 3rd inst. at Bellefield, Chelmsford, of Mr. Frederic Chancellor, J.P., F.R.I.B.A., as the result of a serious illness. Deceased was born on 27 April 1825, and was the son of the late Mr. John Chancellor. He was educated at a private school at Kingston-on-Thames, and afterwards at the London University College, subsequently taking up the profession of architect and surveyor. In 1864 he was elected as Associate of the Royal Institute of British Architects, and in 1870 a Fellow. In 1854 he secured a seat on the Local Board of Health, the then governing body of Chelmsford, and was made chairman of that body in 1881, holding that position until 1888, when the Board ceased to exist, Chelmsford having obtained its charter of incorporation. He was made the first Mayor, and subsequently he held that office in 1894-5, 1895-6, 1896-7, 1901-2, 1905-6, and 1906-7, and it was not until November last that he retired from the municipality. The honorary freedom of the borough was conferred upon him, and a scheme is now on foot to further recognize his services by establishing scholarships, tenable either at the Chelmsford Grammar School or the County High School for Girls, Chelmsford, to be known as the Frederic Chancellor Scholarships. Besides serving on the Local Education Committee and as one of the governors of the two schools mentioned above, deceased had been a member of the Essex Education Committee, and he also served on the Essex County Council. He signed the roll of Chelmsford Volunteers in 1859 and retired in 1892 with the rank of Lieutenant-Colonel. Archaeology was a subject of great interest to him, and he was one of the founders of the Essex Archaeological Society in 1852, and was elected President in 1908. He was the author of numerous articles and papers on Essex churches and ancient buildings. From 1871 to 1892 he was the diocesan surveyor of St. Albans and honorary diocesan architect in 1859. In 1879 he was elected Master of the Coachmakers and Coach and Harness-Makers' Company of London.

31. *Wykeham Chancellor, R.I.B.A., biographical record*

Frederic Wykeham Chancellor was born in 1865 and died 21 December 1945 at the age of 80. He obtained a degree of Master of Arts at Pembroke College, Oxford, and his Architectural training was received in his father's office. In 1896 he went into partnership with his father under the title of Fred Chancellor & Son. This continued until the death of his father in 1918. Wykeham Chancellor served as Surveyor to the Chelmsford Diocese from 1902 to 1945, but was originally architect to the Coachmaker's Co. He was a member of the R.I.B.A. Council, President of the Essex, Cambridge and Hertfordshire Society of Architects 1929-30, and Chairman of the Chelmsford Chapter of Architects 1928-29. He contributed many articles to the Essex Archaeological Society's Review. Following his death in 1945, the practice adopted the title of Messrs. Chancellor, Simpson &

Bragg of 19 Duke Street, Chelmsford; R. M. Simpson, A.R.I.B.A.; George John Bragg, L.R.I.B.A.

32. *W. Chancellor, an appreciation by A. E. Wiseman, F.R.I.B.A., President of the Essex Cambridge and Hertfordshire Society of Architects. (From Essex Review, 1946)*

The County of Essex and its people have sustained an irreplaceable loss in the passing of Frederic Wykeham Chancellor, M.A., F.R.I.B.A. on 21 December 1945. His encyclopaedic knowledge of the history of Essex, its people and ancient buildings was unsurpassed, and as a lecturer he was known throughout the County—his gift was such that he could transport his listeners back to Roman days, in which the March of Legions could be heard. As First Chairman and Founder Member of the Chelmsford Chapter of Architects, he was a tower of strength, and his enthusiasm did much to ensure its foundations were well laid, and he was subsequently elected President of the Essex, Cambridge and Hertfordshire Society for the year 1929. Wykeham Chancellor was steeped in Gothic tradition. He would, I think, have been the last man to describe himself as a great architect in that he designed large and magnificent buildings but thanks to his care and knowledge, posterity will enjoy the many lovely churches and buildings which he mended with such skill and loving care; enduring monuments to a good man. In writing of Wykeham Chancellor, one remembers his charm of manner, his keen sense of humour, which so often would break into the Essex dialect, of which he was an expert, and indomitable strength of mind, which in latter years transcended pain and suffering resulting from an accident, and above all his uprightness of character and integrity in the profession which he loved and adorned. I for one am proud to have been a friend of Wykeham for 24 years, and with countless others mourn the loss of a man whom we remember with affection and esteem.

33. *Restorations and Alterations to Essex Churches by architects other than the Chancellors, 1854-1933" a selective list drawn from faculty papers (E.R.O., D/CF)*

Churches	Date of Work	Architect
Aldham	1854	Edward C. Hakewill
St. Margaret		Charing Cross
Althorne	1884	H. Hardwick
St. Andrew		
Aythorp Roding	1896	A. Blomfield Jackson (Inman & Jackson)
St. Mary		7 Bedford Row
Basildon	1888	Joseph Peacock
Holy Cross		15 Bloomsbury Square
Boxted	1870	A. W. Blomfield, M.A.
St. Peter		Cavendish Square, London

Bradwell	1919	H.M. Office of Work, London
St. Peter on the Wall		
Brentwood	1878	Ernest Lee
St. Thomas		15 Bedford Row
Colchester	1895	Knight & Lister
St. Peter		Plymouth
Colchester	1891	Ernest Geedock
St. Martin		
Cold Norton	1855	G. E. Pritchett
St. Stephen		
Colne Engaine	1872	A. Swansborough
St. Andrew		London
Great Chesterford	1891	Sir Arthur W. Blomfield, A.R.A. and Sons
St. Mary		
Great Totham	1878	Joseph Clarke, F.S.A. London
Great Wigborough	1889	J. W. S. Bowles
St. Stephen		16 Cambridge St., S.W.
Harlow	1872	H. Woodyer
St. Mary		
Harlow	1888	Ewan Christian
St. Mary Magdalene		Whitehall Place, London
High Easter (St. Mary)	1854	Charles Ainslie London
Langley	1884	Ewan Christian
St. John		Whitehall Place, London
Little Easton	1879	Joseph Clarke, F.S.A.
St. Mary		
Nazeing	1890	W. F. Lyon, F.R.I.B.A.
All Saints		Charing Cross
Prittlewell (Southend)	1870	Ewan Christian
Rainham	1896	Whitehall Place, London
St. Helen & St. Giles		Ernest Geldart
Shenfield	1867	W. G. Bartlett
St. Mary		Old Bond St., London
South Weald	1867	S. S. Teulon,
St. Peter		Westminster
Stanford le Hope	1877	H. M. Linklater, A.R.I.B.A.
St. Margaret		
Stanway	1878	Sir Giles Gilbert Scott, R.A.
St. Albright		
Thorpe Bay	1933	Henry W. Allardyce, F.R.I.B.A.
St. Augustine		

Tiptree	1858	Beadel Son & Chancellor London
New Church of St. Luke		
White Notley (Dedication unknown)	1885	Geo. Aldric Scott 31 Spring Gardens, London
Witham	1877	Joseph Clarke, F.S.A.
St. Nicholas		

34. *Parish Church of St. Peter, Boxted. Abridged extract from Faculty dated 18 May 1870 (E.R.O., D/CF 9/2)*

Thomas Legh, by Divine Permission Lord Bishop of Rochester, to all Clerks and Literate Persons in and throughout the whole Diocese of Rochester, Greeting. Whereas it hath been represented unto us by a Petition under the hands of the Vicar and Churchwardens of the Parish of Boxted in the County of Essex, and within the Diocese of Rochester, that the sittings and internal fittings generally of the parish church of Boxted, aforesaid, need repair and admit of much improvement in form and arrangement, and that the Fabric of the church requires repair, and may be much improved by careful renovation. That at the Meeting of the Parishioners and Inhabitants of the said Parish in Vestry, assembled on the seventh day of April One thousand eight hundred and seventy, pursuant to public notice given previously, according to Law and resolution, was agreed to assenting to the proposed alterations. That in carrying out the work aforesaid etc. . . .

That the estimated cost of the renovation of the Chancel is provided for by money in part, promised in part, deposited with Messieurs Mills Bawtree and Company, Bankers, Colchester. The consent of the Lay Impropiator, John Joselyn Esq., to the proposed alterations in the Chancel has been obtained. That it will be necessary to remove the Mural Tablets etc. . . .

And whereas the said Petitioners have humbly besought us to decree a License or Faculty authorizing them to reseat and refloor the said Chancel, to replace the said East Window by one of stained glass, to reseat the said nave, to extend the said North Aisle, to refloor and reseat the said Tower Basement, and to remove the Mural Tablets in manner aforesaid, Wherefore we do hereby require you to Cite, or cause to be Cited, all persons having or pretending to have any interest in the premises, by publicly affixing this original Notice on the principal outer door of the said Parish Church of Boxted, and by leaving thereon affixed, a true copy prior to Divine Service on the Sunday immediately following the receipt hereof, to appear personally or by a Proctor or Proctors duly constituted before the Worshipful John Elliot Pasley Robertson, Doctor in Civil Law, and Vicar General etc. . . .

Dated at Rochester this eighteenth day of May, one thousand eight hundred and seventy, and of our Consecration this third.

(signed)

Geo. H. G. KNIGHT
Registrar

There is an appendage on the back sheet certifying that the Decree was duly executed and signed by Charles K. Thompson. The punctuation is mine. None appears on the document.

35. *Three letters to F. Chancellor about a new screen at Writtle church*

Judging from the following correspondence attached to the drawings of the chancel screen, eight years elapsed before it was completed in 1909.

Pilleys,
Manston,
Grantham.

Nov. 2 1901

Dear Chancellor,

Your drawings are so delightful that they tempt me to give up everything else and go for the screen at once. But (fortunately perhaps) I can't do that so I must reluctantly put them away for a while and take them out again when my work allows me more leisure. But I shall not disappoint you, and altho' it may not be this year or next, some day we will have a great christening of the screen and many shall be the bottles of Phiz uncorked. Thanks very much for your trouble.

Yours sincerely,

EDW. T. USBORNE.

Two later letters concerning the Joinery, and written on the notepaper of the Thurgarton Golf Club Notts. read as follows.

Thurgarton Priory,
Notts.

Feb. 3 1909

Writtle Church Screen

Dear Chancellor,

This is to be finished by the month of April and I have given up all hope of getting my amateur carving friends to provide me with the work for the panels above the archway. Will you be good enough to provide me with designs for the other three? I have one of yours, a foliage pattern and the carver whom I've found to do the work wants to get on with them. Hoping to hear you are well and happy and that I may see you on my next visit to Writtle. Believe me.

Yours sincerely,

EDW. T. USBORNE

Thurgarton Priory,
Notts.

Feb. 6 1909

Dear Chancellor,

Very many thanks. I shall be making a journey round among my relations after easter when I shall be very pleased to dine some night with you. I am writing to my carver to send you the original drawing and if you will kindly return the others direct to him he will start on the work. I hope to have it all finished and ready for erection after Easter.

Yours sincerely,

EDW. T. USBORNE

P.S. The carver's name is J. Holroyd, Rope Walk, Nottingham.

John Belcher's Colchester Town Hall and the Edwardian Grand Manner

By ALASTAIR SERVICE

THE Colchester Town Hall was designed by John Belcher in 1897—more than a building, it was a symbol. 'Belchester', Sir Albert Richardson called it, a symbol of all that the young Arts and Crafts architects of the time were fighting against. But to most people, 'Belchester', in the neo-Baroque style, self-confident, joyful, inventive and above all Imperial, seemed to express precisely the spirit and ideas of the prosperous classes of Britain in that year of 1897 when Rudyard Kipling was starting to pour out his stream of stories of the British Raj, when Mrs. Humphry Ward's novels were recording the comfortable lives and high aspirations of the ruling classes and when the nation and Queen Victoria herself were celebrating her Diamond Jubilee. Amongst all this Imperial jubilation, who had time to notice that 1897 also saw the publication of Sidney and Beatrice Webb's monumental work 'Industrial Democracy' or that the 4-year-old Independent Labour Party was slowly but inevitably starting to gather support among the working class? No, the feeling of the time was that Britain was at the apogee of glorious Empire.

The plan for the new town hall was a symbol of all that Imperial feeling to the citizens of Colchester, and, more intimately, a symbol of the success and importance of *their* part of the British Empire. It would tell the world that in their way they were just as successful and important as Burnley, Sheffield, Battersea, Stafford, Birmingham, Glasgow and others, all of which had built vast new civic buildings in the previous decade. When the competition was announced, it was immediately known what general style of building was required and the winner of the competition was the chief originator of that style, John Belcher.

To understand the design we must have a look at Belcher's own background and development.

His father, John Belcher Senior had a prosperous if undistinguished practice in the 1850s and 60s as surveyor and architect of big early Victorian classical office buildings and banks in the City of London, with offices on the north side of London Bridge and a comfortable big house in Southwark. The house had to be big, for Mr. Belcher was an Irvingite or Catholic Apostolic. By his first wife he had 10 children, by his second wife several more.

John Belcher Junior, the Belcher of Colchester, was the eldest child of this vast family. He inherited talents for draftsmanship and for music from his parents and, after a private education, went into his father's office to learn his profession. He then spent a year studying in Paris and came back full of ideas and energy, to be given charge of the design of a now vanished City bank for his father's firm.

The style of that bank was French Renaissance, the first of an ever-changing series of styles with which Belcher fell in love. We will see later that his best work was always produced when he was under the influence of a new idea. The only idea that continued to play a big part in his work all his life was that the architect's job was to be the leader of a band of artists and craftsmen, weaving together the work of builders, sculptors and painters into one great work of art, *the building*. He always saw himself as an Artist with a capital 'A' (often to the despair of his businesslike partners) and had a weakness for holding forth about the architect being the equivalent of the conductor of a great orchestra.

Belcher's love of this analogy is not surprising when we learn that music was the second great passion of his life. He performed on various instruments, especially the cello, conducted amateur orchestras and composed a number of orchestral pieces. His first book was not about architecture at all, but was called 'The History of Ecclesiastical Music', published in 1872. But his most important musical talent was for singing—he had a fine bass voice and when he was young he often used to sing the solo parts in large public oratorio concerts—Mendelssohn's 'Elijah' was a particular favourite of his. There is a rather nice story about this. After a performance of Elijah he was leaving the concert with the audience and he overheard a conversation in front of him in the crowd.

'What's the name of the bass singer—the professional, I mean?' said one man.

'Oh, he's called Belcher, John Belcher. He's not a professional though, he's an architect.'

'Well', said the first man, 'He can't be much of an architect if he's got time to practice enough to sing like that!'

There was some truth in that comment and for a time it seemed that Belcher's career might lie in music. He married in 1865 to an Irish Roman Catholic lady, and as they were unable to have any children, music was their great common interest. But in the late 1860s a new architectural passion claimed Belcher, who although mild and charming in personality, was of a highly obsessive character.

He became fascinated by William Burges's marvellous but rejected competition design for the Law Courts in London and plunged into what he himself was to call 'a wild Gothic career'. Few of his Gothic buildings now survive, but one example can be seen in the grim but romantic Catholic-Apostolic church in Camberwell New Road, built in 1876. This phase distressed his father, with whom Belcher was now in practice as J. and J. Belcher, but the old man comforted himself by telling his son patronisingly 'You will come back to what I have taught you.' It must have been infuriating for a young architect and would-be all-round artist in his thirties, but Belcher Senior obviously knew his son's character well, even if he would have been astounded by the buildings produced when Belcher did finally return to a form of classical architecture.

His next passion was for the work of Norman Shaw, and it was Norman Shaw at his most tile-hung picturesque that attracted him. At Norwood there is a Cottage Hospital that Belcher designed and built in 1881, very free in form, with groups of gables and chimneys making a spectacular and charming outline against the sky. I rate this building pretty high from the point of view of looking friendly and

welcoming for patients—quite a contrast to the cold clinical appearance of so many modern hospitals.

In the 1880s two very important things happened to Belcher. He became friendly with the loosely organized group of architects who had worked under Norman Shaw and were determined to revolutionize English architecture. They were led by Lethaby, E. S. Prior, Ernest Newton and Mervyn Macartney, all later leaders of progressive architecture in Edwardian times. Belcher was now in his forties while the rest of them were all aged under thirty, bubbling over with ideas of getting away from revivals of historical styles and creating a modern architecture based on vernacular British buildings, rooted in ancient crafts, yet *modern* aesthetically and functionally. One of the theories that appealed to these young men was Belcher's pet notion that architecture was an orchestration of the Arts and Crafts. They grabbed hold of this concept and Lethaby put it in his own words in forming the aims of a new Guild, the Art Workers Guild, which the group founded in 1884. Lethaby's aims for the Guild read 'to reverse the drifting apart of the arts of architecture, painting and sculpture' and John Belcher took the chair at the inaugural meeting. The Art Workers Guild still exists today, having met regularly for nearly 90 years for informal discussions on topics involving the different forms of art.

The other important event for Belcher was that he became friendly with and then employed as chief assistant, a young man of vivid and powerful originality called Arthur Beresford Pite. Pite was aged only 24 when he joined Belcher's office, but the older man took him to his heart and they talked and travelled together for long periods. Pite's vitality and flow of ideas was just what Belcher needed and they doubtless hatched constant schemes for new buildings embodying the ideas they developed. One of Belcher's obituaries, written by someone who worked in the office at the time, says that Beresford Pite's 'magnetic personality influenced Mr. Belcher very strongly and left its impress on the character of the work turned out. This was markedly the case . . . in the remarkably successful building for the Institute of Chartered Accountants, off Moorgate, London, which may be said to have started a new phase in modern civic architecture, and to have produced numerous imitations.'

This building for the Chartered Accountants, designed in 1888, was the first large-scale chance that Belcher and Pite had to put their new ideas into practice, and they did so in a most unexpected way. Belcher had recently been travelling extensively in Bavaria and Northern Italy, and he suddenly came to the conclusion that the heavily decorated late Baroque buildings of Genoa were the key to his ideal of combining the arts of architecture, sculpture and painting. We see the results in this building. He did not copy (in fact Belcher hardly ever copied anything from another architect) but he took ideas from Genoese work and wove them into a building that could only date from about 1890.

The main façade is *almost* symmetrical, with strong horizontal lines and a comparatively plain middle floor relieves the heavily sculpted texture of the upper and lower storeys. Note the sculpted frieze of figures running the length of the frontage and wrapping around the corner.

It was this section around the corner in Great Swan Alley that shows the touch of Beresford Pite and really excited the progressive young architects when it was opened in 1893. For here we have the cupola turret emphasizing the break of levels between two parts of the building, which was a favourite motif of the radical free style young, here used with a generally classical style of decoration.

The long frieze continues, another entirely unprecedented use of an ancient classical feature, and the oriel window on the corner and the side doorway show a swirling use of foliage and sculpture which anticipates the Art Nouveau decoration of the rest of the 1890s.

It is ironic that the building pleased the Arts and Crafts architects so much, for it was to start the destruction of their cause. The Chartered Accountants building made Belcher famous and thrust freely Baroque architecture before the public and the architectural profession as the style of the moment for big buildings. But there was one thing wrong with it for the young idealists—the cry of the time was for a modern architecture that was *native* to the country, a vernacular architecture. And Belcher's next obsession was with the English equivalents of what he had liked so much in Genoa. English Baroque of course meant Wren, Hawksmoor, Vanbrugh and Gibbs. If the big civic buildings were to be modern Baroque (or late Renaissance, as it was known then) he felt he should study the originals.

The change is seen at once in Belcher's entry for the competition to complete the Victoria and Albert Museum (won by Sir Aston Webb in 1891), with its echoes of Greenwich. But after that the young Arts and Crafts architects realized that Belcher was developing in quite a different way from them. One of their few large buildings, the Mary Ward Settlement of 1896 by Smith and Brewer, showed how they were trying to simplify architecture.

Belcher spent most of his time for the next few years in travelling around England with Mervyn Macartney, preparing a huge full folio book in 2 volumes called 'Later Renaissance Architecture in England' which appeared in 1897. Vanbrugh's Seaton Delaval house of the 1720s was illustrated in the book. It seems clear that the powerful massing, giant columns and long vertical arched windows of this and other Vanbrugh houses were to influence Belcher's designs considerably in the next few years.

Again I must emphasize that he was influenced but did not copy. A design by him and Pite for a competition for a Liverpool Insurance building in 1896 was again unplaced, but brilliantly original. The masses are very strong and the



Council took professional advice in 1878 and again in 1887, and were horrified when they were recommended to knock down the old building, whose foundations were unstable, and rebuild on a large scale. So nothing was done and conditions got worse and worse. Finally, things got so bad that a committee was appointed in January, 1897, at the instigation of Councillor (later Alderman) Wilson Marriage and, after 5 independent architects had all recommended a completely new building, the Council accepted that it was necessary, and asked Norman Shaw to be assessor of an architectural competition.

The results of the competition were announced in August, 1897, and it is interesting to hear the reactions of architectural critics of the time. Some of these are very revealing.

The Builder magazine wrote 'Mr. R. Norman Shaw, R.A., has reported on the 8 entries received, as follows.

'In the case of the design placed first, the scheme was one of exceptional merit, exceptionally well fitted for its purpose and most original and striking as an architectural composition.'

The Builder's own critic added the comment 'Mr. Belcher shows a fine, stately looking plan (which) combines dignity with efficiency.'

The British Architect, the most progressive magazine of the period, wrote 'Though the result of the competition has been disappointing, especially if one were looking for heroics from some of the shining lights of the profession, yet it is impossible not to feel gratified that the award has fallen in favour of an architect who is an artist. Mr. J. Belcher's design is not only of good dignified character, but the plan has a distinguished merit as to simplicity, dignity and good architectural effect . . . We have in this design a strict adherence to many first essentials of good architecture . . . a good accentuation in the main storeys of the more distinguished parts of the building, with a reserved use of judicious enrichment: a picturesque angle treatment of the site by the long oriel (at the corner): a good general outline to the whole design, sufficiently broken up to be picturesque without loss of dignity'.

The Architectural Review wrote the following year 'We regard Mr. Belcher's Institute of Chartered Accountants, his dignified design for the South Kensington Museum, and that for Colchester Town Hall . . . as contributions towards the formation of a style for these days, when architects have been content, for the most part, to borrow from works of the past'.

The second prize in the competition was awarded to Messrs. Baker, May and Rickards, of London and Colchester. The magazines did not deign to reproduce this design, for it was obviously a case of the ploy (so often used in architectural competitions) of designing one's entry in the style of the competition assessor. The comments about it are rather amusing.

Norman Shaw, the assessor, was the dominating genius of English architecture at this time. But he was not always above being flattered by imitation. He commented, 'As far as general design and character go, I decidedly preferred the one to which I awarded the second premium, but (it) has serious defects in planning.'

The British Architect wrote 'The exterior of the second premiated design it is impossible not to be pleased with, for it reads like a clever study of much that Mr. Norman Shaw has (himself) done so well.' A gentle dig.

But *The Builder* was far more outspoken. '(Mr. Belcher's design) combined dignity with efficiency. It is impossible to say the same of the (second premium). The winners of this distinction owe it solely to a cleverly-handled perspective view, to which the rest of the drawings appear being as something perfunctory and comparatively unimportant. They have *just* done enough planning to justify the existence of their perspective, which is itself a medly from various well-known examples of Mr. Norman Shaw's own work.'

Before looking at the other entries, look again at the photograph of Belcher's own Institute of Chartered Accountants, completed 4 years before the Colchester competition. Notice the long frieze behind the half-columns, the heavy rustication around the windows, the turret at the angle and the oriel at the far corner. We will see more of these in a moment.

Shaw awarded third premium to Edward Mountford's entry for the Colchester competition. Mountford was one of the ablest men to take up Belcher's Baroque style and he was later to build the Old Bailey in London. Here we see a good if rather dull design, quite worthy of the third prize it got. The use of Belcher-type frieze and rustication is restrained, while the tower is a bit of a fruit salad of various steeples by Wren and Gibbs.

The British Architect commented 'Just what we should expect from Mr. Mountford, a little quieter and simpler perhaps.' While *The Builder* remarked 'Mr. Mountford submits much better work (than the second premium) and in many points comes quite on a level with Mr. Belcher, but he has not in this instance put forth his best skill in planning.'

Apart from the prize-winners, two other designs stood out. The first is the fascinating entry by H. T. Hare, architect of the romantic Oxford Town Hall. Again we see Belcher-like motifs in the frieze, rustication and oriel turret, as well as in the exuberant left-hand doorway. But there is very much more to it than that: the sheer overwhelming power of the tower, the strength and invention of both frontages, far freer in their use of Baroque than in any other entry. One regrets that it was not built, but perhaps one is grateful in the interests of Colchester that the town was not given such an aggressive, almost ferocious, building to live up to.

Again the critics of the time are interesting. *British Architect* wrote 'In the design by Mr. Hare the treatment of the façade to the High Street is particularly successful . . . giving an effect of much richness . . . The tower looks too heavy (but) . . . on the whole it is a design which runs the chosen one very close.'

The Builder went far further than that. 'An impartial critic can have no hesitation in saying that this is the one design which really fulfils every requirement of the competition . . . compared with the first-premiated design, it is every whit as dignified, considerably more graceful and refined in detail, has numberless practical points of the greatest importance and is much more appropriate to the situation.' Well, opinions differ.

The other unplaced design which attracted notice was that by Beresford

Pite, who had quite recently left Belcher's office. But his design is entirely different from Belcher's and is in many ways quite bewildering.

The British Architect remarked 'Mr. Pite's design is a really grandiose piece of architecture, but it at once strikes one as far too awe-inspiring and vast in its monumental character for modest little Colchester . . . (in short) the plan is charming, if impossible.'

The Builder also enjoyed the design. 'Mr. Pite is very noticeable and undoubtedly the most poetical composition. There is however an airy unsubstantiality about it: it is like a cloud castle and could hardly be expected to commend itself to any Town Council for actual adoption.'

That description might almost be applied to the charming Beresford Pite himself, whose wayward architectural genius went on to produce a succession of brilliant and usually utterly illogical buildings.

Now let us have a look at Belcher's original design and compare it with what was finally built. The general concept remained the same, with the large columns taking the eye grandly up the main façade, but there were many important differences of detail. The main doorway was visually strengthened and improved by adding a rusticated surround and the splendidly surging forward balcony above. The mezzanine floor vanished and so the Council Chamber level was brought lower.

The tower design was changed from a rather massive bell-stage with a heavy crown above, to the present far more subtle and slender affair, a composition of columns and concave swirling forms that Borromini might have been proud of. Belcher's models for the statues on the corners of the tower, made by Messrs. Watts of Colchester, still survive. The bronze statue of St. Helena is said to be Italian.

But most important of all, the whole frontage facing down the High Street was drastically altered. The original design shows a 3 storey oriel of a type Belcher loved at the corner, a very bold expression of the lower part of the tower, and beyond that the high windows of the Public Library.

All that went. The corner oriel became one of two 4 storey bay windows, giving a tidier and more impressive view from the east, though at the expense of a really satisfactory turn to the corner. The architectural problem of what to do with a corner was one which interested Belcher and Beresford Pite very much and they devised a form of long oriel window which provided an admirable solution. We have already seen the corner oriel on the Institute of Chartered Accountants and one cannot help regretting the loss of this one at Colchester.

But on the whole one feels that Belcher was right to sacrifice it for the sake of the strong composition of the facade and tower which now dominates the view from the High Street. And what a superb frontage and piece of townscape it is! Professor Pevsner says of it 'the way in which (Belcher) placed his exceedingly high tower (of 162 feet) in exactly the spot where the High Street narrows as one walks towards the West, is excellent according to any standard, and the scale is excellent too.'

During the years 1898-1902, while the Town Hall was being built, the archi-

tectural magazines published a number of the detailed designs for various parts of the building. These include a beautifully drawn elevation and section, drawn by Belcher himself in 1899, showing the altered arrangement of the floors as well as the giant two-storey aedicules, with great Corinthian columns and fractured pediments, reminiscent of Vanbrugh, yet actually without any historical precedent. This reminds us once again that the aim of Edwardian Baroque architects was to create a new, modern style, drawing on various traditional English styles for particular features, but using them in an entirely original way.

There is a drawing by J. J. Joass, later Belcher's partner, of the original design for the Council Chamber. You can see how the swirling painted decoration complemented and played happily with the swirling lines of the vaulting, thus realizing Belcher's ideal of architecture and painting harmonizing to form one work of art. Some of this effect has been lost in the recent restoration, though the result is perhaps nearer to the taste of our own time.

There is also Joass's drawing of 1900 of the design for the Moot Hall, the grandest of all the interiors and the most successful large room of its period that I know. It is singularly little changed in the succeeding 70 years, except the colouring. The coupled columns along the walls had been used by Belcher before, but the barrel-vaulted ceiling is a surprise. Those rectangular patterns look far more like Joass's taste than Belcher's, and it may be that this ceiling was the first design job that the older man put in the hands of his future partner.

Anyway, work on the building and decoration progressed steadily. Local contributions helped greatly with the embellishments and local craftsmen with the quality of the work. Finally, in May, 1902, the Earl of Rosebery performed the opening ceremony before a mighty gathering of citizens and the building was nationally acclaimed. The report in one magazine read:

British Architect, 23 May, 1902
The Colchester Town Hall

'That Mr. Norman Shaw's decision in favour of Mr. Belcher's design has had a successful result, no judge of matters architectural can doubt. The town was 'en fete' last week when Lord Rosebery performed the opening ceremony . . . and it is pleasant to be able to chronicle one more addition to the small list of artistic town hall buildings. A building with some stateliness and dignity of effect, not withstanding its small size . . . carried out in all its parts with much unity of effect and with interesting and refined detail—the Colchester Town Hall may be credited as one of the best examples of the revived Renaissance.'

'Whether the Municipality deserves credit for a real determination to have (an) . . . artistic building . . . we cannot say, but it may at least be congratulated on its good fortune.'

'The Victoria Tower, presented by Mr. James Paxman, is 162 feet high and cost over £3,000. The cost of the whole building has been some £55,000, over £12,000 of which was provided by townfolk.'

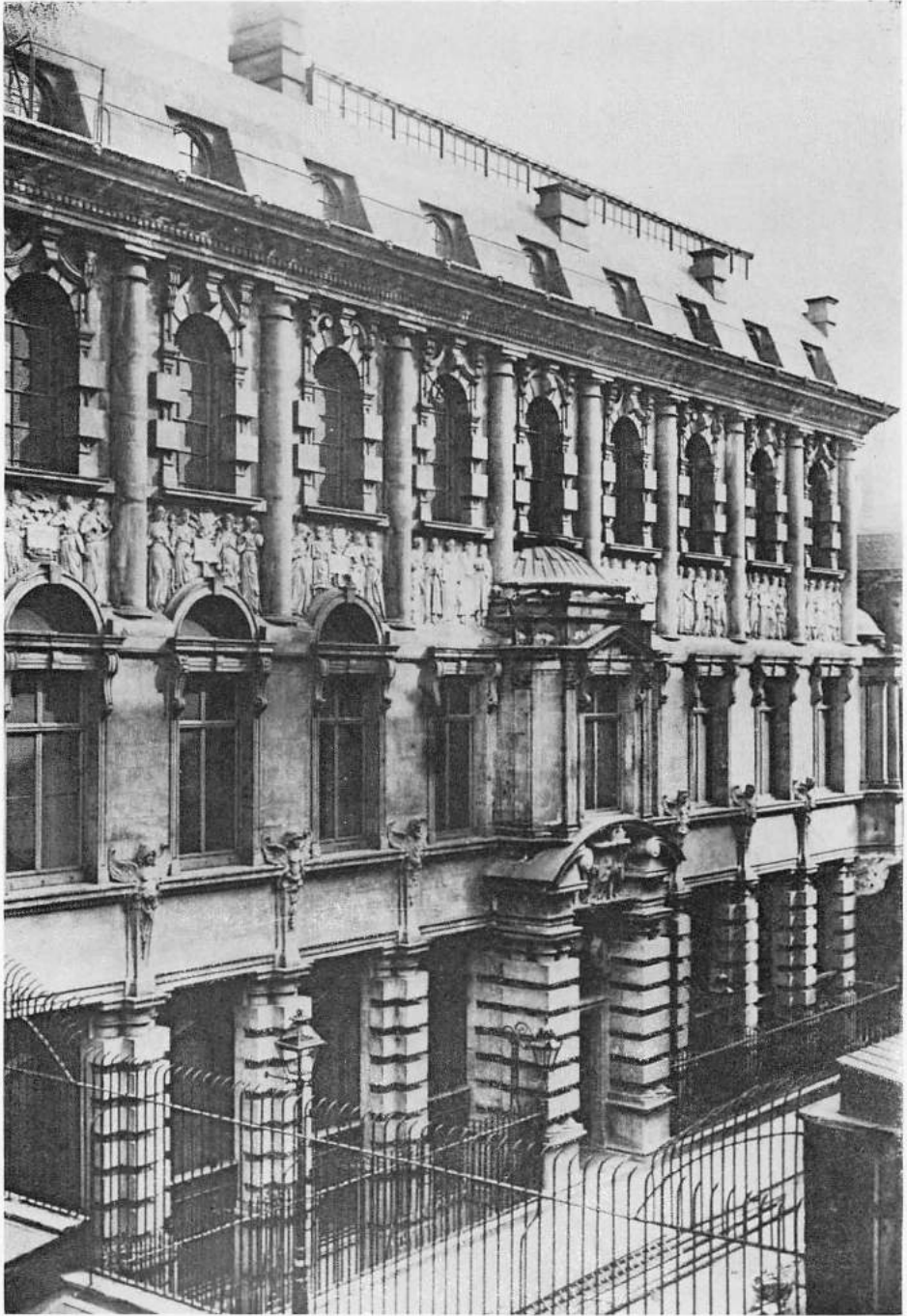
Finally, I should give a brief account of the Edwardian Grand Manner after the Colchester competition, for this was the first of a wide-ranging series of Imperial

PLATE I



John Belcher in 1900.

PLATE II



Institute of Chartered Accountants, Moorgate Place, City of London (designed 1888 by John Belcher with Beresford Pite, completed 1892).

PLATE III



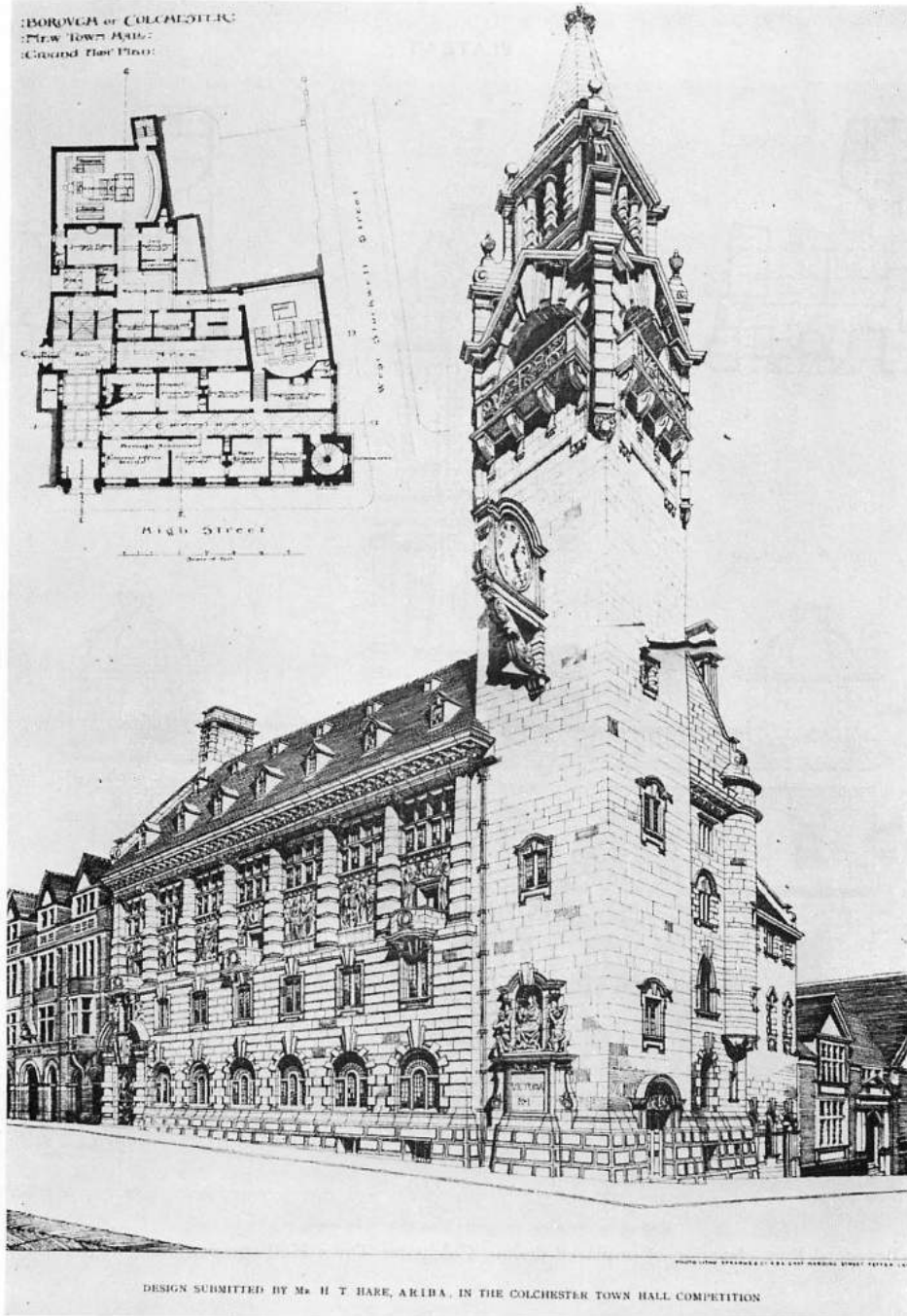
John Belcher, perspective drawing of First Premium design, Colchester Town Hall competition (August 1897).

PLATE IV



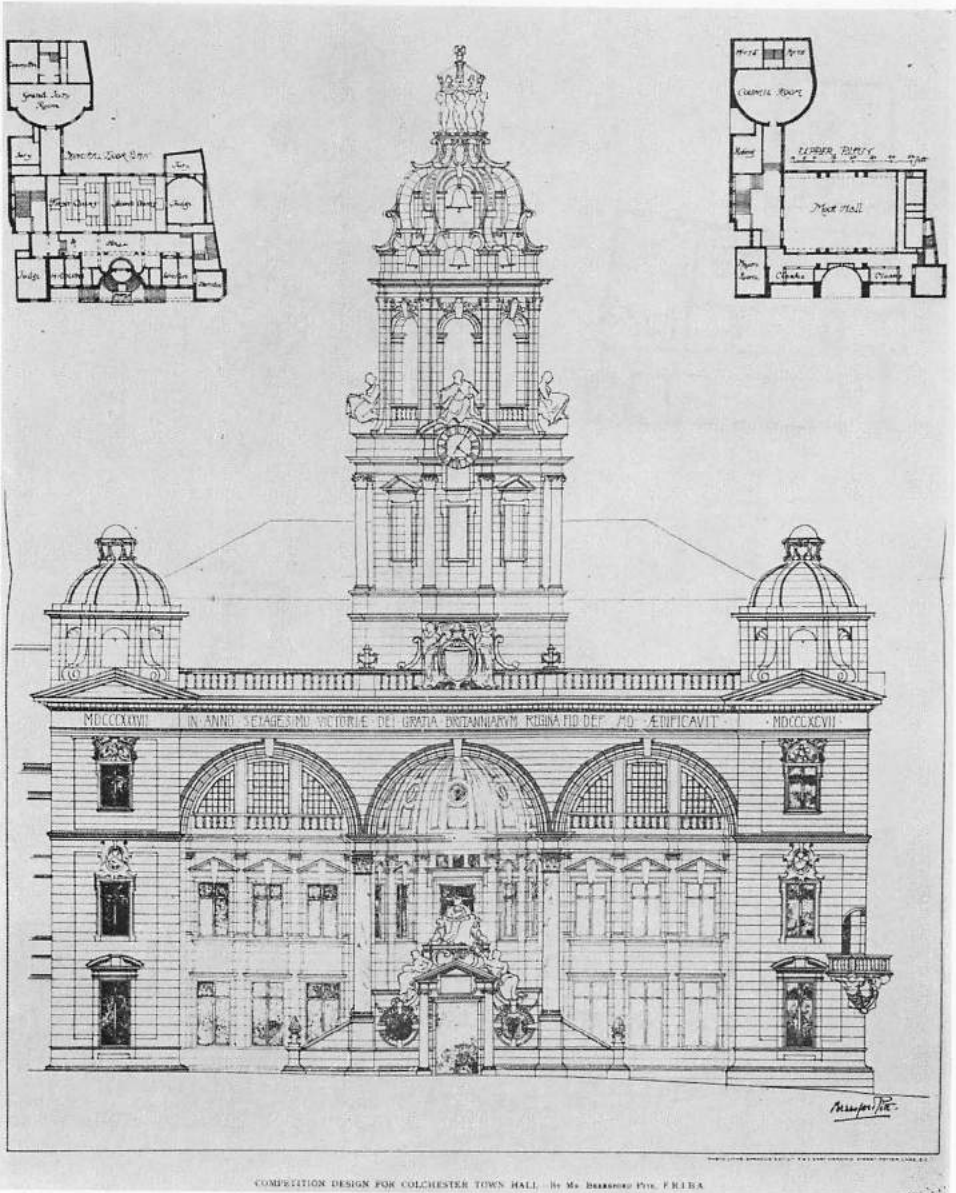
E. W. Mountford, perspective drawing of Third Premiated design, Colchester Town Hall competition (August 1897).

PLATE V



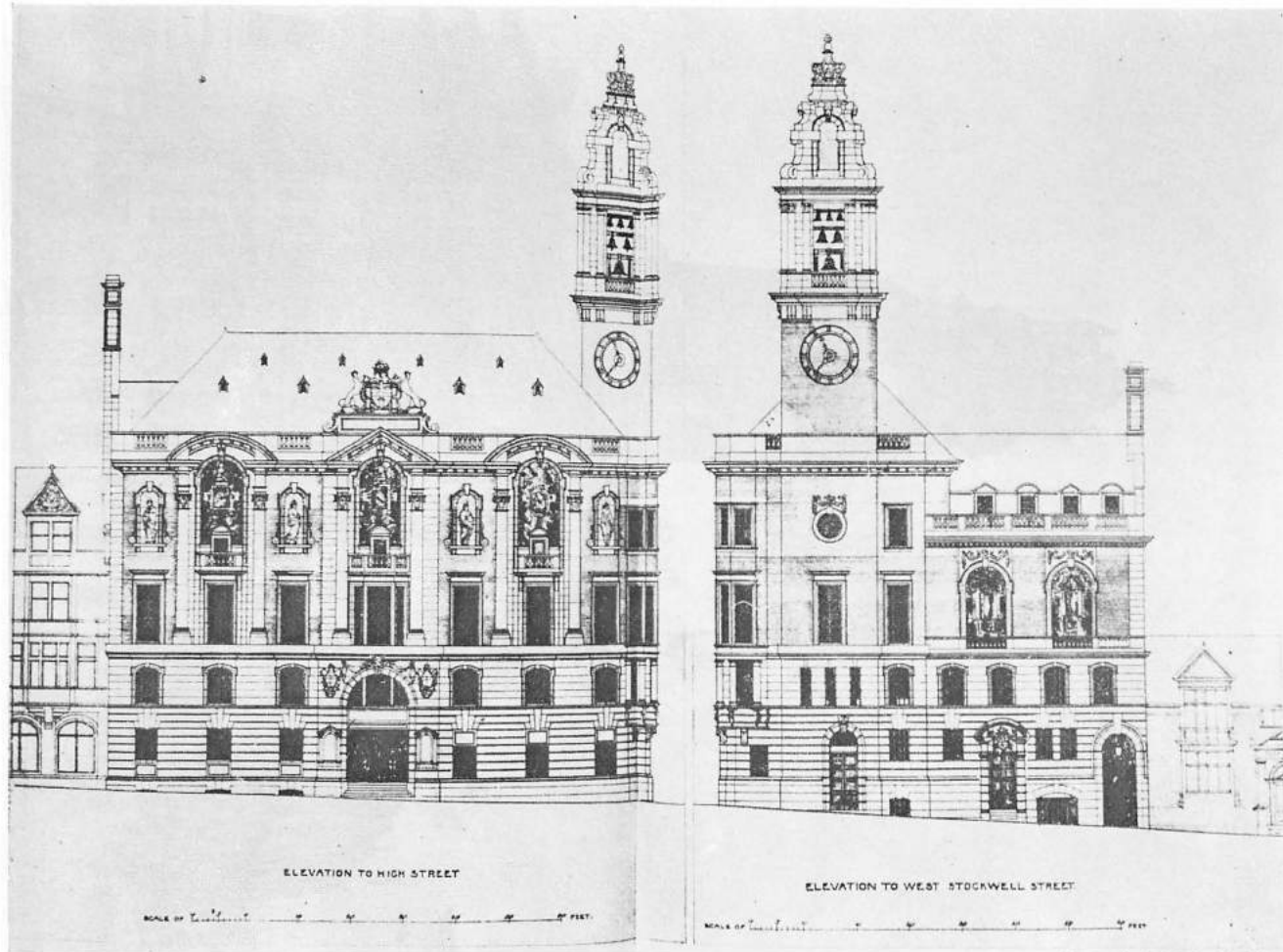
H. T. Hare, perspective drawing of unplaced design, Colchester Town Hall competition (August 1897).

PLATE VI



Beresford Pite, elevation of unplaced design, Colchester Town Hall competition (August 1897)

PLATE VII



John Belcher, elevations of First Premium design, Colchester Town Hall competition (August 1897). The elevation of West Stockwell Street was altered later.

PLATE VIII



John Belcher. Colchester Town Hall from the High Street, showing the alterations made to the 1897 design before completion in 1902.

PLATE IX



COLCHESTER TOWN HALL. INTERIOR OF COUNCIL CHAMBER, SHOWING SCHEME OF DECORATION.
MR JOHN BELCHER, F.R.S.A., ARCHITECT.

John Belcher, design for interior of Council Chamber, Colchester Town Hall (drawing by J. J. Cass, in *The Builder* 4 Nov. 1899).

PLATE X



John Belcher, design for interior of the Moot Hall, Colchester Town Hall (drawing by J. J. Joass, *The Builder* 16 June 1900).

PLATE XI



John Belcher, Colchester Town Hall (designed 1897, built 1898-1902).

PLATE XII



John Belcher, The Ashton Memorial, Lancaster (designed 1904, built 1907-1909).

Baroque Buildings, some of them excellent, others merely pompous and ridiculous. Only now are architectural historians starting to look at them seriously and to sort out the gold from the dross.

The Old Bailey, the London Criminal Law Courts, was started in 1900. It was designed by Edward Mountford, who came third in the Colchester competition, and the influence of Belcher's Colchester design is obvious. The building as a whole is very impressive, though a little overblown for my taste.

Nor was the style limited to London. There is a very charming free Baroque Westminster Bank in Leicester designed by a local firm, Perkins and Pick, in 1900. This English neo-Baroque was the mainstream of the Edwardian Grand Manner, though there were many variations, including Austrian Baroque (Central Hall, Westminster), French Beaux Arts (The Ritz Hotel) and Norman Shaw's own exuberant variety. But what of Belcher himself? His next building was Electra House in the City of London, designed in 1900. Not one of his best designs, too ponderous by half, but it was rated highly at the time by the directors of giant companies. It started off a series of prestige company headquarters which was to continue the Baroque style for many years.

The headquarters of the Royal London Insurance (1904) in Finsbury Square, London is rather better, but Belcher's final great work in this style shows him on his best form again. This is the Ashton Memorial in Lancaster of 1904, a family memorial for Lord Ashton to mark the donation of a large park near the centre of the City of Lancaster. Lord Ashton paid out over £30,000 for this little piece of self-indulgence. I am not competent to judge the use of so much money which might have been spent in a more productive way, but the Memorial is certainly a splendid composition of what one might call Abstract Baroque (for it has no function except sheer visual splendour).

The only weakness in the design is at the bottom corners, where the rather haphazard rusticated windows and recessed chamfering of the corners fail to provide a sufficiently powerful or vertically unified support for the gorgeous pavilions and cupolas above.

But the higher levels are a tremendous success with the pavilions, coupled columns and lofty aedicules of the drum sending the composition soaring up to the great dome and its crowning lantern. It is certainly one of the most sheerly *enjoyable* buildings I know.

At this time Belcher was in his sixties and was becoming more and more involved in the affairs of the Royal Institute of British Architects. He was President of the Institute in 1904 and presided over the International Congress of Architects in 1906. In 1907 he was awarded the Royal Gold Medal for architecture and he was asked to assess an increasing number of competitions. He still enjoyed working out the first general design of buildings with his partner J. J. Joass, but he left the finding of commissions and the designing of the detail more and more to the younger man. After a few years of semi-retirement, he died in his sleep in 1913. War broke out the following year, putting an end to the series of Baroque town halls which Colchester had started.

Archaeological Notes

Little Holland Church

By Kenneth Walker

THE site of the former Little Holland Parish Church (TM/209167) is located near the sea, about sixty yards south-east of Little Holland Hall, and immediately against a sharp bend on the road B1032 between Clacton and Frinton.

By permission of the late Mr Arthur Christiansen I examined this part of his grounds in 1960. The only visible remains were the bases of the east wall and two diagonal buttresses, one at each end. The north-east buttress, standing about five feet above the ground, was the highest feature. The south-east buttress was falling sway towards the road. The ground appeared to have dropped outside the wall, and the ruin was almost undermined. Septaria or puddle-stone from the beach was the material used, and it was partly encased and reinforced with brickwork.

These few remains were within a rather neglected plantation, but the site of the church extended into open and level ground. As far as I could ascertain from a few shallow trial holes the footings were intact just below the surface and appeared to enclose a rectangle approximately 65 feet by 22 feet. These dimensions are almost identical with those of the nave of Little Clacton Church, three miles distant, and both belonged to St. Osyth Abbey. They were probably built in the first half of the 12th century when this monastery was being enriched by various endowments, and the brickwork at Little Holland would indicate repairs carried out by the Abbey shortly before the Dissolution when they made extensive use of this material. The Tithe Survey Map of 1839 shows a rectangular outline with diagonal buttresses at the corners, and the building must have been more apparent then than it is today.

The coastal parish of Little Holland was small and isolated and suffered by inundations of the sea. In 1428 there were no more than ten households, and at the dissolution of St. Osyth Abbey in 1539 one of its sixteen priests was described as *curatus* of Little Holland. Thomas Evans, rector 1618 to 1633, was a poet who has a place in the D.N.B. In 1650 the Parochial Inquisition decreed that the parish should be united with Great Clacton, and so it has remained to this day. The visitation of 1683 recorded that the church had been down about 24 years, and its three bells were in the yard of the Hall.

Human remains have been unearthed (in 1935 and 1967) to the south-east of the church, both under and on the far side of Frinton Road B1032, indicating the extent of the old graveyard and implying that the ancient highway terminated at the church gate as shown on Norden's map of 1594. At a later date this road was continued northward, forming the sharp bend against the church, to link across Holland Brook with a winding lane from Great Holland. The two villages

of Great and Little Holland were once separated by the estuary of the Gunfleet, or Holland Brook, but the building of a sea-wall to withhold the tide from Tendring Level facilitated the construction of a bridge.

Editors Note. The foundations were exposed by a local group a few years ago, but it is not known if an accurate plan was made.

Monuments of Essex Interest in Kent and Sussex Churches

By Ronald F. Newman

Kentish churches

1. CHISLET

A complete inventory of the church and churchyard monuments, together with their inscriptions is given by the Rev. Francis Haslewood, F.S.A. in his *The Parish of Chislet, Kent* etc. (Ipswich, 1887). The following is abstracted from page 38 and concerns a gravestone in the churchyard, east of the church:

Sophia, d. 6.9.1848, aged 66, wife of Barrington Syer, vicar of Gestingthorpe, Essex, and Little Waldingfield, Suffolk, d. 31.10.1849, aged 69; also Alfred Stuart Barrington, d. 31.2.1846, aged 4 months, 27 days, s. of Alfred Westmacott, of Broomfield House, Herne [Kent], (4th s. of Henry Westmacott of Lauriston Cottage, Finchley, Middx [*quaere* if the sculptor of that name mentioned in Rupert Gunnis's *Dictionary of British Sculptors?*]), d.24.6. 1852, aged 33, by Mary Matilda ([Barrington?]), his wife.

Mr. L. Dow, F.S.A., of the Suffolk Institute of Archaeology informs me that a further reference to Barrington Syer occurs on page 119 of vol. IX of their *Proceedings*.

2. PLUCKLEY

The same author has recorded the inscriptions here in his *The Parish of Pluckley, Kent* etc. (Ipswich, 1899). The first extract is copied *verbatim* from page 8 of that work and concerns a monument on the east wall of the south chapel, while the second is an abstract from page 75, from a gravestone in the churchyard, south of the church.

- (1) Sacred to the memory of / SIR EDWARD DERING of Surrenden Dering / In Kent Bart. he was born in 1732. and died in 1798. / He married in 1755, SELINA, daughter and Coheiress / of Sir Robert Furnese Bart. who died in 1757, / Leaving a son Edward, (who married Anne daughter / of William Hale of King's Walden / In the county of Herts Esq. by whom he had issue /

Edward, Cholmeley, and Charlotte,) / And a daughter Selina, married to the / Rev. Dr. Dealtry of the Kingdom of Ireland. / Sir Edward Dering married secondly, / Deborah, only daughter of John Winchester / of Nethersole in Kent Esq. / By whom he had Elizabeth, (who married / Daniel Byam Mathew, of Felix Hall in Essex Esq. / And died in 1812, leaving issue Daniel and Elizabeth) / Cholmeley (who married in 1789, / Charlotte-Elizabeth, only daughter of / The Honble Mr. Justice Yates, / By whom he had issue a son, Cholmeley-Edward-John,) / Robert (who died on board the Iphigenia frigate / In the West Indies.) / Charlotte, (who married / The Revd. Philips Monypenny, of Hadlow in Kent.) George (who married Elizabeth, daughter of Charles Dering of Barham-Court, Esq. By whom he had issue, George, Robert, Charlotte, Harriott, and Caroline.) Harriott (who died at Paris in 1789.) And Henry, who died an infant. / Sir Edward Dering represented / The town and Port of New Romney / In five successive parliaments.

- (2) Sarah Ann Hardstone Cackett, d. 8.10.1859, aged 21 y. 8 m., 'To her lady she was a faithful servant . . .'; also to her father, Thomas Cackett, d. of consumption (as did his children) 26.8.1843, aged 35 y. 3 m., survived by his wife, Charlotte Sarah, their sons, Daniel, d. 4.6.1855, aged 23 y. 3 m., at Westham, Essex, and bur. at the new church (survived by his wife, Maria, and a dau. Harriet, who d. in 1858, aged 4), and Thomas-Edward, d. 2.4.1854, aged 18 y. and 8 m., and a dau., Sarah-Anne-Hardstone.

Sussex churches

1. RYE BAPTIST CHAPEL

The inscriptions on the gravestones contained in the yard surrounding this chapel were copied in 1861 by G. Slade Butler, and printed in *Sussex Archeol. Coll.*, XIII (1861), pp. 299-301. The following is abstracted from page 300a.

Thomas Holloway, late of Rumford [*sic*], Essex, draper, d. 19.8.1832, aged 37. 'Expiring he prayed, "Lord Jesus, receive my spirit".'

2. SEAFORD

A similar report on the inscriptions in this church and churchyard was made in 1860, by Henry Simmons, and published in *ibid.*, XII (1860) from which the following are taken:

Page 244

Abstracted from a gravestone in the church, near the porch: Elizabeth, dau. of Alexdr. Champion, of Walthamstow, Essex, d. 31.8.1784, aged 16.

Page 249

In the churchyard, south-east of the church: 'Mrs. Elizabeth Rolls, late of Chigwell Row, Essex, died January 20th, 1843, aged 75.'

Colchester Castle Well, an unusual excavation (Pl. I)

By Stuart R. Bacon

THE well is situated inside the Castle to the right as you enter, and enclosed by the wellhouse which was restored in the 18th century by Charles Gray, he also cleared out the well and strengthened it during the restorations. Earlier, in 1683 the whole Castle had been bought by John Wheelley for demolition and he removed the original stone lining of the well. However the task of breaking up the Castle walls proved to be too much and the ruins were left.

Looking down the well there is a drop of over 40 feet to the water. A wooden shaft could be seen protruding from the water. The top 8 feet of the shaft is bricked but the remainder is of hardened clay, except for the centre drainage point which is also brick. The main idea of excavating the bottom was to find out if there was a cistern underneath, and to discover any evidence of Roman work. Several books on the history of Colchester Castle state there is a false bottom and underneath a bell shaped cistern. In earlier years the well may have extended to the floor above.

A metal grid now covers the opening at the top allowing people to look down and, of course, drop objects down the well. However, for many years the opening had been covered with wood therefore it appeared there would be an accumulation of recent rubbish, including new coins, and then a halt in deposits when the opening was covered. It is probable that Charles Gray covered the opening after cleaning it and restoring brickwork, etc., in 1750. Previous to that and the demolition of 1683 there would probably have been a cover of some sort on the well opening. Feelings were, therefore, rather mixed as to what would be found at the bottom.

The project was announced at a meeting of the North East Essex Sub-Aqua club and was greeted with much enthusiasm. This was a relief to myself as at least eight men were required to operate the ropes and gear.

Scaffolding, lighting and all the necessary tackle were installed on the 24th March 1972 in preparation for the excavation the following day. Two of us could not resist going down the well, an experience I shall never forget. I asked to be lowered slowly in the bosun's chair in order that I could examine the sides of the well on the long descent to the water. The first few feet had been bricked at various periods and rested on blocks of concrete. However, apart from this structure which appeared completely insecure and held up by nothing, the walls of the well were of hardened clay down to the water level. At the half-way mark a very uneven band of bricks (that appeared to be Roman tiles when viewed from the top) had been installed. The reason for these was to reinforce this part of the well when the water drained in from the outside walls of the castle. In old books on the subject and referring to workmen working on the well state that a small passage was found leading south but not large enough for a man to crawl along. I feel this 'passage' was in actual fact a drain and holes in the ring of bricks at the drainage point confirm this.

Roman tiles are embedded in the clay walls in the bottom part of the well and other than these the walls are featureless. At the water level the original stone lining (most probably Reigate from the Norman quarry) can be seen and it would appear the water level has changed little since 1683, when John Wheeley attempted to demolish the castle, as it would have been difficult to remove the remaining stones underwater. To add to the general unpleasant surroundings at the bottom of the well, bubbles were constantly appearing on the top of the water therefore we tested for noxious gas.

On the 25th March 1972 we made a start. Some twenty divers from the North East Essex Sub-Aqua Club had volunteered to go down the well and operate all the ropes etc., at the top. At first the divers had the unpleasant task of removing recent rubbish that had been dropped through the grill at the top. A schoolgirl had recently dropped her glasses and we had been asked to look for these.¹ The water at the bottom turned black as the bottom was disturbed and the smell was appalling. At one time a valve on one of the lungs was dislodged by a safety rope and the foul air was quickly renewed by the compressed air.

We were using buckets to bring up the bottom and these were containing more and more of the newer decimal coins. The divers had been instructed to remove the bottom in layers, but one has to work in the restricted area of a well over 40 feet to appreciate the actual conditions. A team of volunteers had assembled outside the castle to examine and sieve the contents of the buckets.

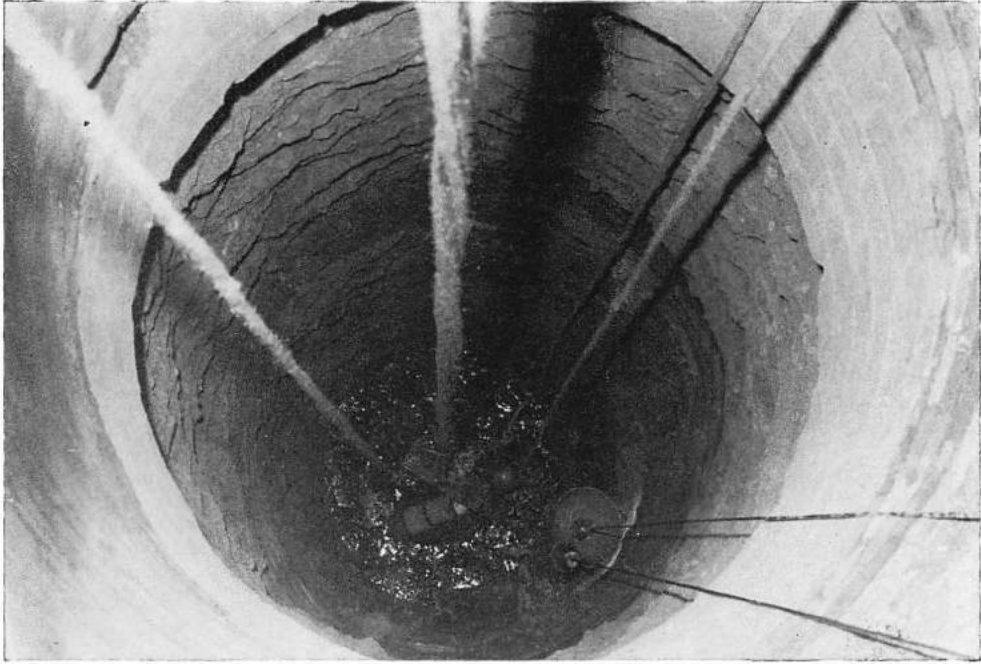
By midday less coins were being found and the removal of the bottom was becoming much more difficult, so much so that we decided to have two divers working at one time. In the early afternoon pieces of pottery were being found, old nails and part of a clay pipe. Very few decimal coins but a great number of older coins were coming up. By 4 p.m. we had dug down the stone lining and found a wooden collar which appeared to be the original former and below that an opening with a vertical iron bar twelve inches in length set into the stonework. A few pieces of Roman mosaic were the best items found before we finished our first day.

We made an early start on the 2nd April, 1972 with great hopes, especially as the area had been cleared of early rubbish and we now had the possibility of discovering the false bottom. At midday we found our oldest coin, a King George III penny dated 1806 and I feel this coin was dropped in the well at the completion of restoration initiated by Charles Gray. Shortly after this an old ladle was found. In the early afternoon the shaft in the centre of the bottom of the well had become free and was removed. It was extremely heavy and in excellent condition. It appeared the shaft was used in connection with pumping the water and it had a hole in the centre with holes in the sides at its base. Shortly after this our most important find was made, being a 15th-century hunting arrowhead, which was handed over to the Museum. (Pl. Ib). The second day ended without further finds and still no evidence of the possibility of a false bottom.

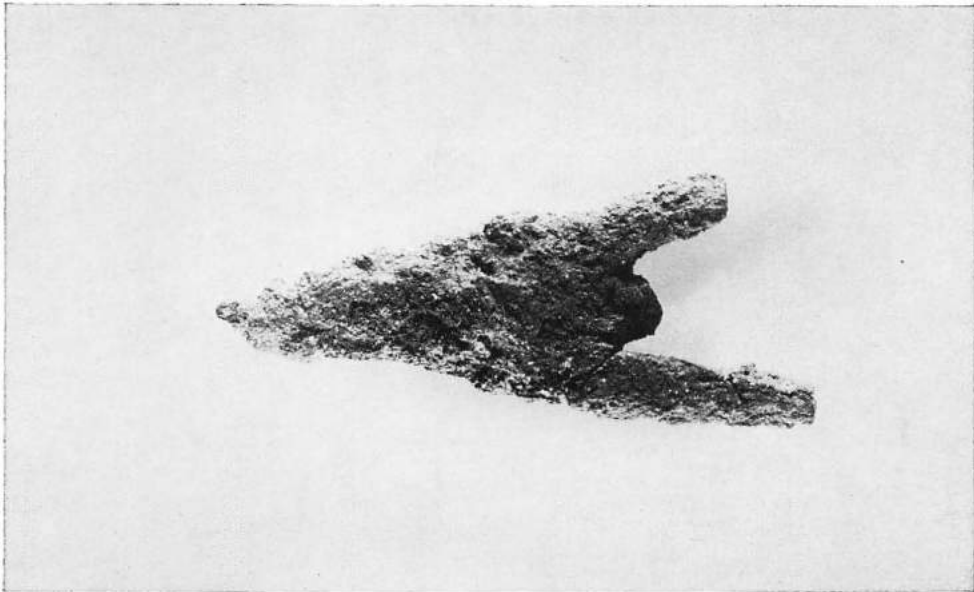
The next attempt was made on the 9th April, 1972 and we decided to lower pumps to reduce the water level and make the excavation easier and enable us to

¹ They were safely recovered, Ed.

PLATE I



(a). Colchester Castle Well: Excavation in progress.



(b). Colchester Castle Well: Iron arrowhead.

see what we were doing. The pumps reduced the water level by about 2 feet and it was possible to see the perfectly cut stone lining and wooden collar/former all in very good condition. The collar/former was carefully made with slots cut in the bottom part.

The excavating continued but all we were now removing was fine sand and I felt the shaft was being undermined. In order to prove the existence of a false bottom we drove a metal tube 3 feet into the silt at the bottom of the well. Whilst at times there seemed to be a hollow sound. I had to admit there was not a false bottom and the project was closed.

Acknowledgements

The members of the North East Essex Sub Aqua Club who worked so very hard deserve special thanks, especially Dink Balls and Brian Jay who supplied the necessary ropes, scaffolding and tackle.

Mr. D. T-D. Clarke, Curator of the museum gave me permission for the venture, my thanks to him, and finally the lady who sorts out my unreadable notes, Jean Carter.

Seal Found at Radwinter

By F. G. Emmison

Under this heading the Rev. G. Montagu Benton recorded (*Transactions*, XV, page 158) the digging up in 1917 of 'a brass or latten seal in a moated enclosure which forms part of the Rectory garden at Radwinter. This seal, which is in the possession of the rector, is a nearly flat, circular disc . . . It bears for a device S. George and the dragon . . . The legend is DIEV: ET: MON DROIT . . . Sir William St. John Hope, writes, "It seems to be an official seal, but who could want to use the device of the Order of the Garter in your neighbourhood".'

The seal was undoubtedly in the possession of our renowned social historian, William Harrison, rector of Radwinter and author of the *Description of England* (1577, new edition 1587), who was made a canon of St. George's Chapel at Windsor, 1586. Does any reader know if and where the seal exists? It is not in the custody of the present rector.

OUR CONTRIBUTORS

K. Dixon Box, A.R.I.B.A. Assistant County Architect, retired 1966, since when he has maintained a private practice and spent two years research on the Chancellor drawings. Author of *24 Essex Churches*.

P. J. Drury, A.R.I.C.S. Contributed a major article on Roman Chelmsford to our last volume. He has served as secretary to the Fieldwork and Research Committee of the Society, and is at present preparing reports on his excavations at Little Waltham, Dunmow and Heybridge for publication.

P. J. Huggins, B.Sc(Eng.), C. Eng., M.I. Mech. E., also contributed to the previous volume. He is actively concerned with both excavation and conservation in Waltham Abbey and Chairman of our Publication Sub-Committee.

Mrs. M. U. Jones, B.A. was first involved in field archaeology as an undergraduate reading geography before the war. Since 1956 she has been archaeological consultant to the now Department of the Environment and has directed rescue excavations in seven counties. These include work in gravel pits at Lechlade, Glos. near Newport Pagnell, Bucks., and since 1965 at Mucking, Essex.

W. J. Rodwell, B.A., D.L.C. is a member of Council of the Essex Archaeological Society and has been directing excavations for the Department of the Environment, the Society and other bodies since 1965; author of *Roman Essex* and various papers in journals; and currently writing a thesis on the Trinovantes at Worcester College, Oxford. His wife, Kirsty, studied at the Institute of Archaeology, and has directed excavations at Kelvedon. Alastair Service was born in 1933 and educated at Westminster School and the Queen's College, Oxford, where he read Modern History. He is now a partner in his family publishing firm. Mr. Service has written a number of studies of individual architects of the Edwardian period for the *Architectural Review* and his book *Edwardian Architecture and its Origins* will be published by the Architectural Press later in 1974. He is deeply involved in the Town and Country Planning Bill now before Parliament for the preservation of historic buildings.

Gladys A. Ward, B.A., Ph.D., F.S.A., F.R.Hist.S. Lecturer in History, Westfield College, University of London 1928-37. Married 1936 to Dr. J. G. S. Ward; two children. Author of *A History of Clare, Suffolk*, 1928 and *Essex Local History*, a guide to books and manuscripts, 1950; edited with E. C. Lodge *English Constitutional Documents, 1307-1485*, 1935. Lecturer in Extra-Mural Dept. University of London, 1951-70. Secretary of Brentwood and District Historical Society since 1943.

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