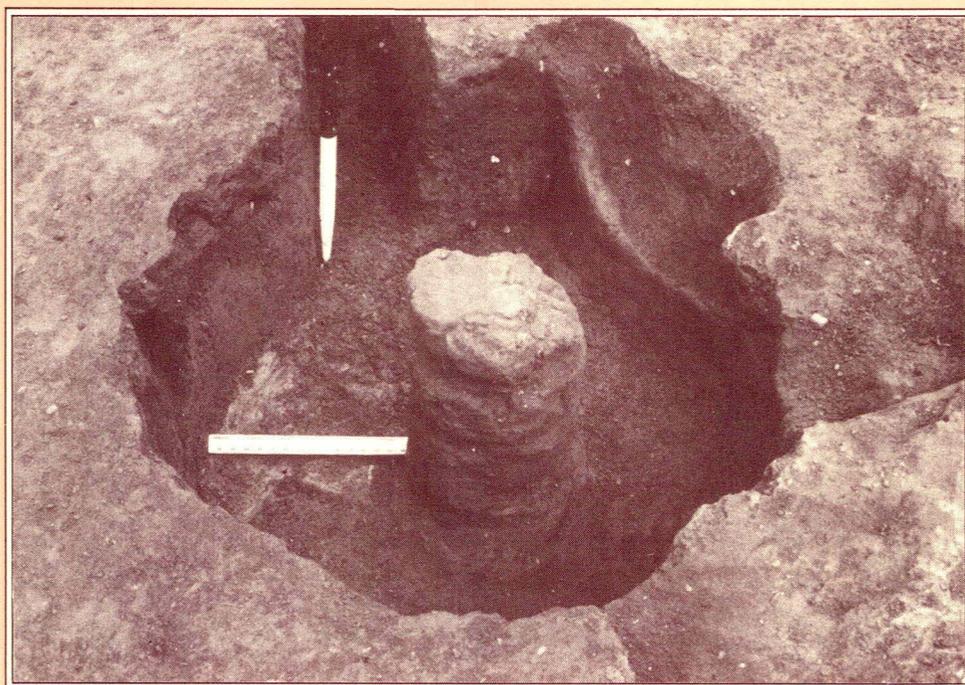


LONGTHORPE II

THE MILITARY WORKS-DEPOT: AN EPISODE IN
LANDSCAPE HISTORY

G.B. DANNELL and J.P. WILD



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BY

G.B. Dannell and J.P. Wild

with contributions by A. Challands, J.H. Cleland, K.F. Hartley, M.E. Henig, J.M. King,
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J.A. Todd, G.A. Webster, Calvin Wells[†], F.C. Wild.

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ABBREVIATIONS AND BIBLIOGRAPHY

1. ABBREVIATED JOURNAL TITLES

<i>Antiq. Journ.</i>	<i>Antiquaries Journal</i>
<i>Arch. Ael.</i>	<i>Archaeologia Aeliana</i>
<i>Arch. Camb.</i>	<i>Archaeologia Cambrensis</i>
<i>Arch. Journ.</i>	<i>Archaeological Journal</i>
B.A.R.	British Archaeological Reports
JRS	<i>Journal of Roman Studies</i>
<i>Journ. Brit. Arch. Assoc.</i>	<i>Journal of the British Archaeological Association</i>
P.P.S.	<i>Proceedings of the Prehistoric Society</i>
<i>Proc. Dorset Arch. Soc.</i>	<i>Proceedings of the Dorset Natural History and Archaeological Society.</i>

2. ABBREVIATIONS BY SITE OR VOLUME TITLE

<i>Aislingen</i>	G. Ulbert, <i>Die römischen Donau-Kastelle Aislingen und Burghöfe. Limesforschungen 1</i> (Berlin, 1959)
<i>Brampton</i>	W.H. Manning, 'A Hoard of Romano-British Ironwork from Brampton, Cumberland', <i>Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society</i> lxxvi (1966), 1-36.
<i>Camulodunum</i>	C.F.C. Hawkes, M.R. Hull, <i>Camulodunum, Research Report of the Society of Antiquaries XIV</i> (Oxford, 1947)
<i>Chichester III</i>	A. Down, <i>Chichester Excavations III</i> (Chichester, 1978)
<i>Cirencester I</i>	J.S. Wachter, A.D. McWhirr, <i>Cirencester Excavations I</i> (Cirencester, 1982)
<i>Cranborne Chase I</i>	A. Pitt-Rivers, <i>Excavations in Cranborne Chase I</i> (1887)
<i>Cranborne Chase II</i>	A. Pitt-Rivers, <i>Excavations in Cranborne Chase II</i> (1888)
<i>Eccles</i>	A.P. Detsicas, 'First-Century Pottery Manufacture at Eccles, Kent' in J. Dore, K.T. Greene (eds.), <i>Roman Pottery Studies in Britain and Beyond. British Archaeological Reports S30</i> (Oxford, 1977), 19-45
<i>Fengate I</i>	F.M.M. Pryor, <i>Excavation at Fengate, Peterborough, England: the First Report. Royal Ontario Museum Archaeology Monograph 3</i> (Toronto, 1974)
<i>Fengate II</i>	F.M.M. Pryor, <i>Excavation at Fengate, Peterborough, England: the Second Report. Royal Ontario Museum Archaeology Monograph 5</i> (Toronto, 1978)
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INTRODUCTION

1. THE SITES AND THEIR IMPORTANCE

The group of sites under review in this report lies not far to the east and south-east of the Roman vexillation fortress of Longthorpe, about 3km WSW of the centre of Peterborough, Cambridgeshire.¹ The fortress itself was explored during the summers of 1967–1971 and 1973 by Professor J.K.S. St Joseph and Professor S.S.Frere and the results published in full in *Britannia* v (1974), 1–129, hereafter cited as *Longthorpe I*. Our campaigns (1970–1974) overlapped theirs, not as a deliberate extension to their research programme, but in response to the threat posed (in the expansion of Peterborough) to the Longthorpe Scheduled Monument 84 by the construction of the Western Primary Road Stage II (Soke Parkway), and later by the landscaping of a new golf course which now covers the fortress and adjacent sites north of the Nene. Professor St Joseph's aerial view taken in 1973 (*Longthorpe i*, pl.III) indicates the scale of that disturbance.

The reader may reasonably expect to be told at the outset the purpose of our excavations and what we consider to be their most important results.

Our initial objectives in 1970 were modest: to examine on the ground the ditched enclosures of a presumed Iron Age farm identified from the air at the eastern end of the Longthorpe ridge, and to establish the farm's relationship, if any, with the Roman fortress. It was not until 1971 that the presence of a Roman military works-depot on the same site was discovered. Recognition of the later Roman farm on the Haul Road followed in 1972.

In presenting the results of our work in this report we have adopted a chronological approach. This may sound unexciting: but our primary aim has been to present the picture which we have uncovered of a landscape developing through time. Landscape archaeology is currently much in vogue, and with good reason: the difficulties of defining what constitutes a 'site' are nowhere more acute than at Longthorpe, and to regard the area we investigated as a potential continuum in space and time alleviates the problem. Moreover, recent excavations across the Nene at Lynch Farm (Ferry Meadows) south-west of Longthorpe and at Orton Meadows to the south-east have enabled us to appreciate the wider geographical setting of Longthorpe's development in each successive phase.

It is undeniable that the most important episode in the changing landscape at Longthorpe was intrusive: the creation, operation and abandonment of a Roman military works-depot between c.A.D.48 and 62. It was linked to the vexillation fortress and its main function was to supply high-quality pottery to the garrison. The kilns and their products shed an interesting side-light on the problems of provisioning the Roman army. While ceramic and tile manufacture is well known in connection with permanent military bases (the long development on the Rhine frontier is typical), the vexillation fortresses of Britain – a class of site still not fully understood – might be thought less likely to have had either time or resources for such industrial activity.

We discovered a comparatively large number of kilns and a large body of pottery; and a few

¹ As a point of reference, the Iron Age farm (FIG. 2) has its centre at TL 164975. The topographical aspects of the sites are discussed below.

points of wider significance about both need to be raised. First, the kilns and pottery suggest that there was a lasting demand on the spot for a considerable volume of good-quality pottery – a demand which local suppliers or indeed the army's own far-flung supply network could not satisfy. Secondly, the technology of pottery manufacture was well understood and ably managed at Longthorpe. A number of familial traits in the vessel-series indicate the army's hand in firm control and point to the inspiration for some of the pottery forms being found in the Rhineland provinces and still further afield. Finally, the assemblage as a whole reflects activity which is parallel to legionary work elsewhere, and it is worth speculating that it was legionary demand that was the driving force in the enterprise at Longthorpe.

The kilns are now known (thanks to the work of Mr P.J. Woods and Mrs V.G. Swan) to follow a local La Tène tradition for which there is good evidence from sites in the neighbourhood. Potters may have been recruited locally: they were certainly available in the south-east of the province.

Certain vessel-types bring together the culinary tastes and requirements of the garrison and the products of local agriculture. The cheese-presses for instance by their number and range of forms show cheese (probably sheep's cheese) to have been an essential element in the soldiers' diet. The Fenland economy of the Middle Ages, based on transhuming flocks, is brought by these finds into close focus; there was almost certainly a strong pastoral component in the economy of the Iron-Age sites of the Nene and Welland Valleys, as Dr F.M.M. Pryor has shown, and the Romans made good use of it.

Leaving the military dimension aside, our investigations at Longthorpe revealed a peaceful agricultural landscape evolving over a span of 3000 years and more. Only in the later Roman period is the local farming community likely to have lived at a level much above that of mere subsistence.

The three ring-ditches noted or examined at Longthorpe later proved to be part of a larger barrow field which extended south of the present course of the Nene. On a new lake and golf course complex there (known as Orton Meadows) recent excavation has revealed two unusually well-preserved barrows and a number of other possible examples. In the late Neolithic and Early Bronze Age there was evidently a flourishing community here, and it is one that can be readily paralleled, for instance, in the Welland Valley and on the Fen edge.

The Iron Age farmyard ditches offer the earliest unequivocal evidence for agricultural settlement at the eastern end of the Longthorpe ridge. Disappointingly, no traces of contemporary structures were found, although they were presumably once present within the two farmyards. The Catswater sub-sites at Fengate and Monument 97 in Orton Longueville parish are better examples of the same class of site. The Longthorpe farm ditches were mere hollows in the ground when the Roman army arrived.

After the departure of the army, there are few signs of an early resumption of farming on what may well have been an industrial wasteland. Within the area which we examined in detail, however, we found ample archaeological evidence for moderate agricultural prosperity in the later second and early third centuries. The furnace and corndrier on the Haul Road and the substantial stone buildings nearby may have been at the centre of a small estate, bounded on the south by the Nene and by a stream at the foot of the ridge to the east. By the fourth century the main focus of activity had moved away, and the land may have been administered from one of the larger villa-estates further upstream.

2. METHODS OF EXCAVATION

Our methods of excavation and recording changed over the five years of work, and those of the earlier seasons now have a disconcertingly antiquarian aura. The principal reason for this is that the land continued to be farmed as arable until shortly before the roadworks began, and in 1970–1971 satisfactory reinstatement of the topsoil was a paramount consideration. Open area excavation, although still on a limited scale, was possible from Easter 1972. Consequently, a considerable area of the Iron Age farm remains intact and probably safe from modern intrusion;

little is likely to be left, on the other hand, of the Roman kilns and farming installations beneath the line of the Haul Road.

The exploration began in 1970 with a three-week summer excavation which concentrated on the eastern sector of the Iron Age farm enclosures. The western sector was under beet at the time, but was investigated in the following season. In 1970 we used a Thwaites Dumper-Digger to cut trial trenches to establish the positions of the ring- and enclosure-ditches revealed by Professor St Joseph's aerial photographs (FIGS. 3,4). We then opened by hand some limited areas which we thought could prove important. More extensive trenching was undertaken in 1971 with a JCB IIC fitted with a toothless ditching-bucket. The weather was exceptionally dry in both years, making it difficult to spot gravel-filled ditches cut into gravel. The three-week interval between the barley harvest and autumn ploughing was too short for natural weathering to bring out the contrasts.

The third season (Easter 1972) had a different basis. A line was surveyed by the Peterborough Development Corporation for a haul road to carry contractors' traffic from a temporary river-bridge south of the fortress to the site of an embanked intersection north of the Iron Age farm. The topsoil was removed from this strip, 10 metres wide, by a John Deere self-elevating box-scraper under our direct supervision. After the archaeological features had been located, surfaces were cleaned first by a JCB IIC and then by hand-digging. In the summer of 1972 an area of topsoil was cleared by JCB IIC along the NW ditch of Yard II of the Iron Age farm (FIG. 4) and dug by hand. In the final season (Easter 1974) the NW corner of Yard I was examined by hand after initial clearance of the topsoil by bulldozer.

There was a limited programme of environmental sampling. A column of samples was taken from the organic deposits in Pit 8 (FIG. 18) for study by Dr D.G. Wilson of the Botany School, Cambridge University. Some of her results are embodied in the review of the military food supply at Longthorpe (p.66) but the supporting data, gathered in her doctoral dissertation, will be published in due course elsewhere.

3. ACKNOWLEDGEMENTS

The excavations were conducted for the Nene Valley Research Committee, chaired by Professor W.F. Grimes. A great burden of administration was carried on our behalf by the Hon. Secretary, Mr Eric Standen, and the Hon. Treasurer, Mr George Dixon, in whose debt we shall long remain.

The principal costs of the excavation were borne by the Department of the Environment (1970, £2000; 1971, £1684; LHR72, £520; 1972, £500; 1974, £1500), but in 1972 and in 1974 we received much help in kind from the Peterborough Development Corporation. We are grateful to both organisations, our main supporters.

The sites were all on land owned and farmed by the Horrell family of Longthorpe, and we would like to record our debt to the late Mr Hugh Horrell and to Mr John Horrell and Mr Robert Horrell for kind permission to excavate. We remember Mr Hugh Horrell's kindness to us with particular warmth. Ownership of the land was transferred in 1971 to the Peterborough Development Corporation who very kindly granted us continued access and support.

In the course of the five campaigns over 50 volunteers contributed to the progress of the excavation, many of them in successive seasons. We thank them here collectively; we were proud of them and of their competence. Supervisors on site were: Dr and Mrs D.G. Bird, Miss C. Dallas, Mr J.A. Hadman, Mr R. Thomas, Mr A. Main and Dr and Mrs F.M.M. Pryor. A valued figure was Mr Bill Cardew, driver in 1971 of the JCB IIC.

The excavation team was accommodated in the Stibbington Outdoor Centre by courtesy of the Cambridgeshire Education Committee and the founder and Warden of the Centre, Mr R.H. Forster. They were fed at the Cross Keys, Wansford, by Mr Jim and Mrs Eileen Morris, who provided a series of memorable occasions.

The specialist reports which augment or are the basis for our main account of the results of the excavation have been contributed by many friends and colleagues, whose assistance was invaluable. In first place we should like to thank Miss Marion Wilson, who described, drew,

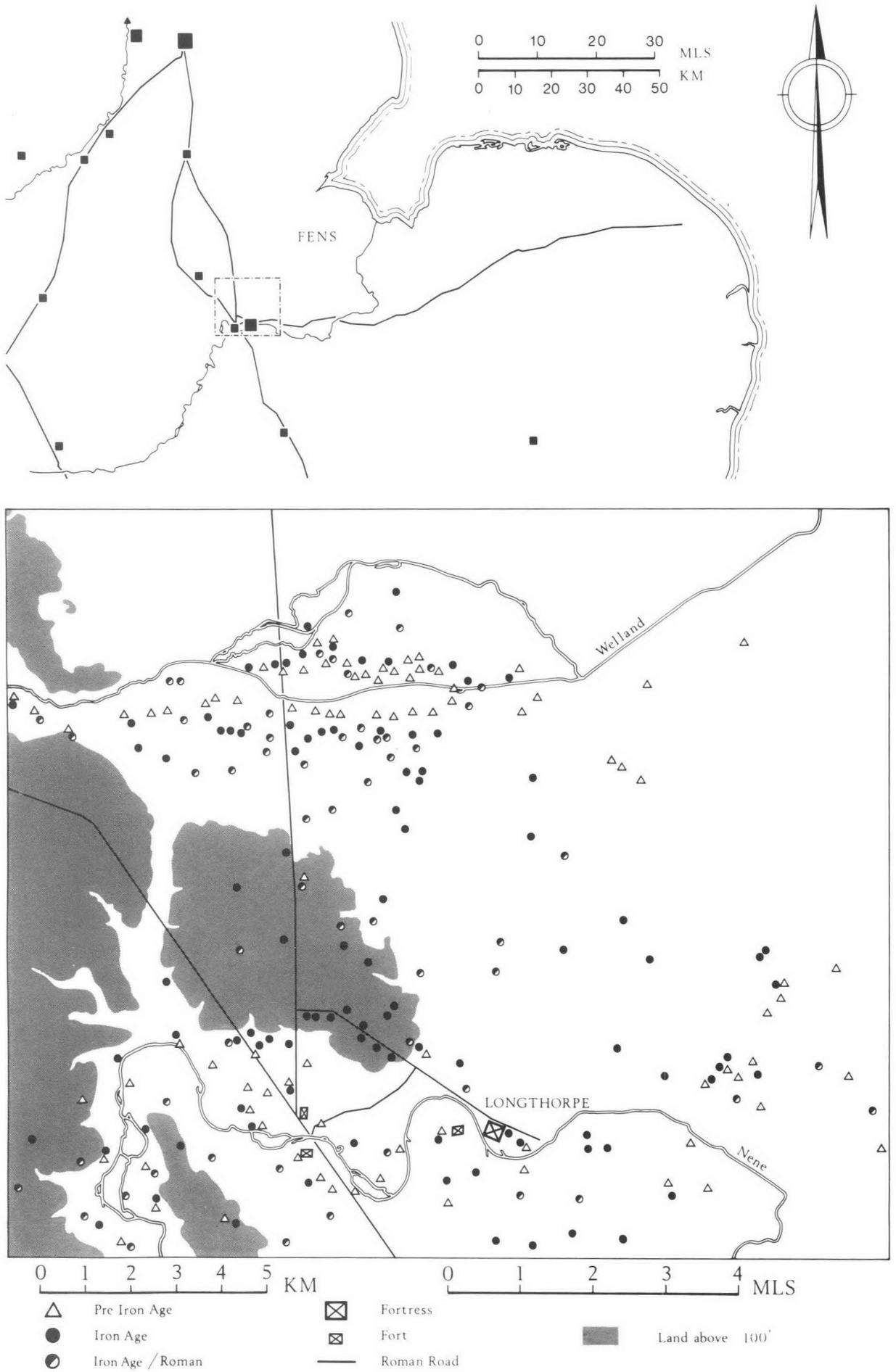


FIG. 1 Longthorpe in its prehistoric and Roman setting

classified and indexed all the coarse pottery selected for publication and whose painstaking work was the essential foundation of the coarse pottery report (p.133). We are immensely grateful to the following: Mr A. Challands for his description of the topography and geology of the site, the late Miss D. Charlesworth for reporting on the glass, Dr J.H. Cleland and Miss J.A. Todd (ironworking), Mrs K.F. Hartley (mortaria), Dr M.E. Henig (intaglio) Mrs J.M. King (animal bone), Dr D.P.S. Peacock (amphorae), Dr F.M.M. Pryor (flints), Dr R.M. Reece (coins), Miss V. Rigby (stamped wares), Mr. T.C. Rowbotham (dental material), Dr J.L. Scheuer (human remains), Dr G.A. Webster (small finds), the late Dr Calvin Wells (cremated remains) and Mrs F.C. Wild (samian ware).

At the NVRC Archaeological Field Centre Mr E.H. Curry prepared for publication our site plans and sections (FIGS. 1–20), with characteristic thoroughness. The figures already to hand to illustrate the small finds and pottery were mounted by Mrs L. Meadows. Credit for the individual drawings is as follows: Miss D. Bonakis: FIG. 21 No. 13; FIG. 22 Nos. 19,20,27; FIG. 23 Nos. 30,31,33,50; FIG. 24 Nos. 52–4,56,61; Mrs C. Barrett: FIGS. 26,47,48; Mrs J. Coombs: FIG. 21 Nos. 3,8; FIG. 23 Nos. 34,37–9; FIG. 24 Nos. 60,63,92; FIG. 25 No.102; FIG. 28 Nos. 126,127,130,131,135–7,139,140; FIG. 29 Nos. 142,143,147,149,150; FIG. 30 Nos. 164–8,170,173; Miss P. Mallett: FIG. 21 Nos. 1,2,4–7,9–12; FIG. 22 Nos.21–6; FIG. 23 Nos. 28,29,32,35,36; FIG. 24 Nos.51,55,57–9,62,93–5; FIG. 25 Nos. 96–101; FIG. 28 Nos. 122–5, 128,129,132–4,138; FIG. 29 Nos.144–6,148,151; Mrs L. Meadows: FIG. 30 No.172; FIG. 31 Nos.1–4,7–20; FIG. 32 Nos.21,24–44,45,46; FIG. 33 Nos.47–69; Miss R. Prentice drew the preliminary versions of FIG. 31 Nos.1–4,7–20; FIG. 32 Nos.21,24–44; FIG. 33 Nos.47–69; Dr F.M.M. Pryor: FIG. 27; Mrs F.C. Wild: FIG. 34; Miss M.G. Wilson: FIG. 30 No.171; FIG. 31 Nos.5,6; FIG. 32 Nos.22,23; FIG. 35; FIG. 36 No.5; FIGS. 37–46.

The authors are glad to acknowledge a great deal of practical assistance from the NVRC Archaeological Field Centre and its Director Mr D.F. Mackreth. Mrs Lindsay Rollo ably transferred the *disiecta membra* of our manuscript to disc on the NVRC word-processor. Finally, we would like to pay a special tribute to Professor S.S. Frere, excavator of Longthorpe and editor of the *Britannia* monographs, for help and encouragement over many, many years, and exceptional forbearance towards two old lags.

4. TOPOGRAPHICAL AND GEOLOGICAL INTRODUCTION.

By Adrian Challands

The excavated sites at Longthorpe all lie on a gentle slope forming the northern side of the valley of the River Nene, about 1 km south of Longthorpe village in a slight southerly meander of the river (FIGS.1–3). The succession of drift deposits is represented first by a flat area of alluvium, consisting of greyish-brown plastic clays and beds of organic silts and peat running from the river to the first gravel terrace. The first-terrace gravels then overlie the solid geology of the hillside to a level of approximately 7.5 m (24 ft.) OD where second-terrace gravels first occur. A fault line running north-south divides the Iron Age farm and military kiln sites from the later Roman farm buildings and cemetery, so that the solid geology varies across the area. Ring Ditch 3 is cut into first-terrace gravels whilst the rest of the features lie on the second terrace.

The underlying solid deposits at Ring Ditches 1–3 and the southern part of the Iron Age farm are the upper estuarine series and consist of green and grey silty clays. The northern section of the Iron age farm and the dug kilns 1–3 are on the Blisworth limestone. This is a blue shelly limestone; its rubble upper surface is weathered to a light brown colour. Under the corndrier and adjacent Roman farm buildings the solid deposit is Blisworth clay, which consists of grey-green and dark purple mudstones. The Roman farm is situated where the Blisworth clay outcrops from below the cornbrash, so presumably a ready water-supply would be available. The later Roman cemetery (FIG. 5) is cut through the first- or second-terrace gravels into limestone fragments in a matrix of blue clay. This represents a downwash of cornbrash and Blisworth clay, all overlying the solid deposit which is Blisworth limestone.²

2. For further information on the geology, see A. Horton *et al.*, *The Geology of Peterborough*. Institute of Geological Sciences 73/12 (HMSO, 1974).

5. NOTES ON THE TEXT AND CATALOGUES

Measurements were taken during excavation on the imperial standard. In the text the original measurement is put first, then in parentheses the metric value. The imperial measurements of the kilns in TABLE 1 have not been converted. In the catalogues of finds and their discussion, metric measurement has been preferred.

The resolution of the layer-codes used at Longthorpe is as follows: the code of the year (70 = summer 1970; 71 = summer 1971; LHR72 = Easter 1972; 72 = summer 1972; 74 = Easter 1974) is followed by the trench code (Roman numerals in 1970, Arabic thereafter) or feature code (Easter 1972) and lastly by the number of the layer proper. Except for LHR 72 (= Longthorpe Haul Road 1972) the year codes are preceded in the archive by the letters LTH (= Longthorpe); in this report these letters have been omitted for brevity. In summer 1972 a single continuous layer-number sequence was used without direct reference to separate trenches. In the catalogues the layer code is followed by the small find (SF) number of the object. Small finds from 1970 and 1971 have a single sequence of small find numbers; 72,74 and LHR72 have separate, individual, sequences. At the end of every entry in the catalogue of small finds the relevant layer-code and small find number is followed by a brief context description. The dating in parentheses after the context description is based on the position of the layer at the site and on its contents (principally pottery), and not on any independent dating of the particular small find itself. Dates independent of context are not offered for most small finds.

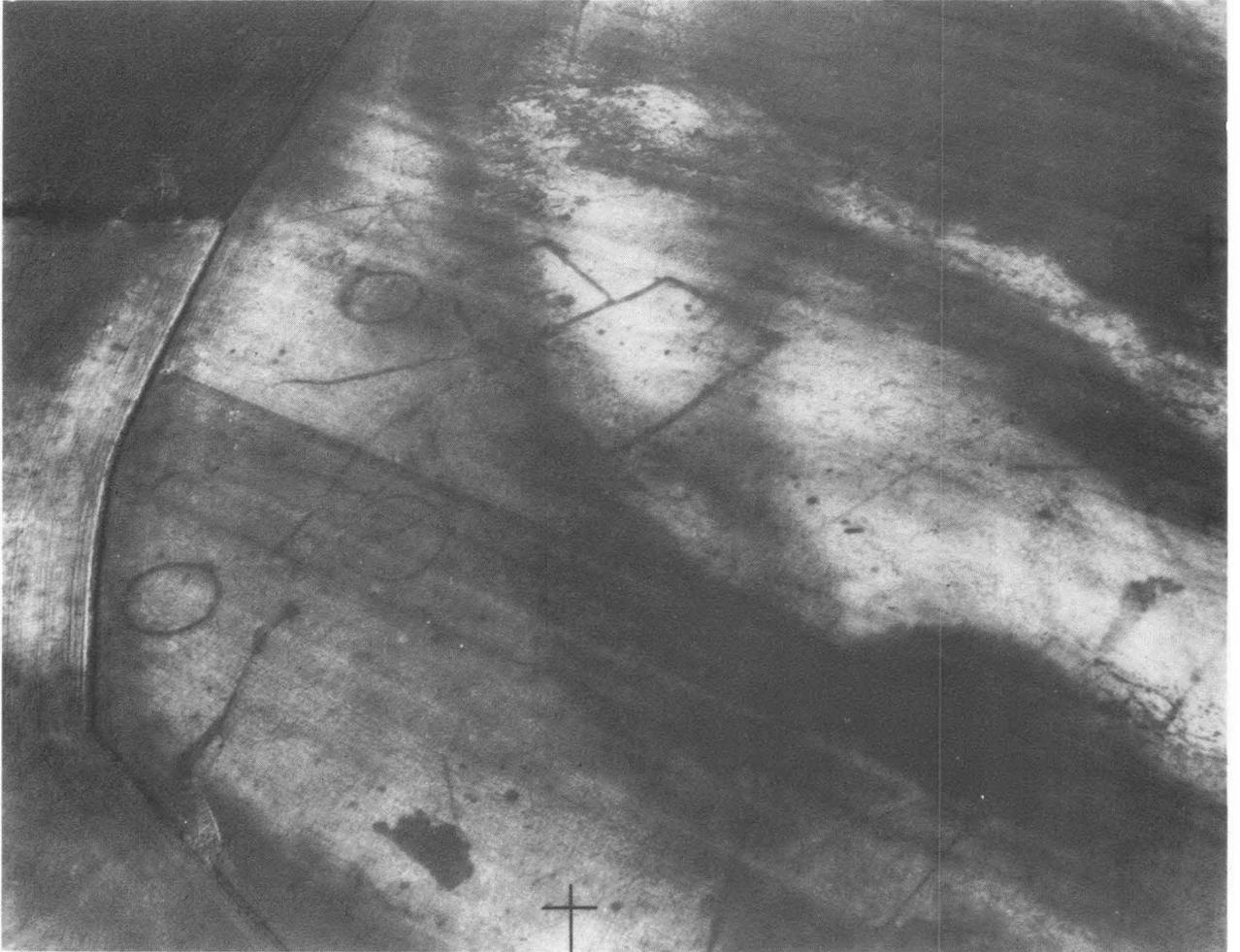
Colour designations given in the pottery and small-find catalogues correspond to those in the Study Group for Romano-British Coarse Pottery *Pottery Colour Chart*, so far as is feasible.

Metallurgical analysis of objects of copper alloy was not undertaken, and they have been described in this book as **bronze** objects, the word being understood in its traditional generalised sense of (unspecified) copper alloy.

6. KEY TO PUBLISHED SECTION DRAWINGS

- | | | |
|----------|---|---|
| FIG. 5a. | NE of Yard I (70.XIV NW face) | 3 charcoal patch within (1) |
| | 2 brown soil and small stones (Roman ploughsoil) | 4 brown sand with slipped gravel lenses |
| | 3 grey-brown soil and stones | 6 dark loam and stones in gully |
| | 1 greeny-grey soil | 13 brown sand silt |
| | 4 light brown gravelly soil | |
| | 5 soft brown stony soil (silting layer) | FIG. 5e. |
| | 6 grey-brown sand (silted or slipped layer) | NW ditch of Yard II (72.4/8 SW face) |
| | 7 brown gravel (silted or slipped layer) | 1 greeny-grey soil |
| | 8 dark brown gravel | 2 slipped gravel layers |
| FIG. 5b | Yard I/II ditch (70.XIX NW face) | FIG. 5f. |
| | 1 brown ploughsoil | NW ditch of Yard II (72.1 SW face) |
| | 3 greeny-grey soil | 1 light brown sandy earth with scattered gravel |
| | 5 browner soft greeny-grey soil | 8 greeny-grey silt with scattered gravel |
| | 4 hard packed brown gravelly soil | FIG. 5g. |
| | 9 soft brown soil, few stones | SE ditch of Yard II (70.XXII SW face) |
| | 10 soft grey-brown soil | 1a ploughsoil |
| | 8 light grey silty clay and organic matter, shell fragments | 7 dark grey soil and small stones |
| FIG. 5c. | Yard I/II ditch (72.4 E face) | 2 dark loam (occupation layer) |
| | 14 greeny-grey soil | 1 dark sandy loam |
| | 15 brown gravelly soil (slipped layer) | 3 greeny-grey loam |
| FIG. 5d. | N.W. ditch of Yard I (74.B1 NE face) | 5 dark brown silt |
| | 2 hard packed loam with white gravel | FIG. 9. |
| | 1 dark silty loam | Section A-B through Kiln 1 and stokehole |
| | 7 dark silty loam | 1 brown earth |
| | | 2 brown earth with burnt clay and damaged kiln lining |
| | | 3 dirty trampled dark brown earth |
| | | 4 black ash and charcoal debris |
| | | 7 yellow sand |

- 13 dirty grey-brown sand with charcoal and burnt clay flecks
 9b black ash, kiln rakings
 15 yellow clay and sand with pottery
- FIG. 12 Section of Pit 1 (71.53 E face)
- 1 dark brown ploughsoil
 39 light grey soil in gully
 4 compacted greeny-grey material
 9 fine greeny-grey (more clayey towards bottom)
 7 slipped gravel
 14 brown gravelly earth
 19 compacted brown earth
 31 sandy silt
 25 silty brown gravel
 16 gully with greeny-grey filling
 10 brown stony earth with silt bands
 30 charcoal and greenish-brown soil (?post-hole)
 37 charcoal and red burnt earth (?post-pit)
 13 burnt clay, gravel and wood lenses
 18 dark brown sand
 38 brown sandy silt
- FIG. 14a. Section of Pit 4 (71.62 N face)
- 1 compact brown earth
 2 greeny-grey loam
 3 light brown sand
 4 grey brown sand
 5 sand and gravel, bones and pottery
 6 sand and gravel, charcoal and burnt limestone fragments
 7 sandy brown clay
- FIG. 14b. N-S section of Pit 5 (71.56.38)
- 38 dark stony earth and charcoal
 42 greeny-grey soil
 56 yellowish-brown sandy silt
- FIG. 14c E-W section of Pit 6 (71.56.35)
- 35 earth and small stones
 41 greeny-grey soil
 59 brown sandy silt and gravel
 44 charcoal patch
- FIG. 15. Section A-B across lower deposits of E side of working terrace (Pit 7) (71.56)
- 1 Roman ploughsoil
 5 hard packed earth and pebble
 7A soft yellow-brown sand
 50 patch of burnt sand
 10 brown sand and pebbles
 9 greeny-grey soil, pebbles and charcoal flecks
 22 greeny-grey soil filling gully
 33 mixed reddened gravel and silt
 25 dark greeny-brown silt
 36 clean gravel lenses
 37 dark sandy silt
- FIG. 17a Section NE-SW through charcoal-filled hollow (70.XXIV.8)
- 1 hard brown ploughsoil
 2 light brown loam
 3 grey loam, shell, small stones
 4 sandy grey loam
 5 patch of greeny-grey soil
 6 charcoal and furnace rakings
 7 burnt natural gravel
 11 greeny-grey soil in NE ditch of Yard I
- FIG. 18. Section E-W across Pit 8 (71.59)
- 1 ploughsoil
 2 compact stony filling
 3 dark loam
 4 stones
 5 dark clayey filling
 6 iron pan
 7 black organic material



PL. I Aerial photograph of the three ring-ditches and the Iron Age farm enclosure ditches at Longthorpe, seen from the east

(by courtesy of the Cambridge University Committee for Aerial Photography: Crown copyright reserved)

PART I: THE EXCAVATIONS

CHAPTER 1 EARLY PREHISTORIC

The small group of worked flints discussed by Francis Pryor (p.99) is the earliest evidence for human activity at the eastern end of the Longthorpe ridge. The leaf-shaped arrowhead (FIG. 27 No.121) and the broken blade (p.99 No.117) are probably Neolithic while the other flints are likely to be of the Bronze Age. Most are damaged; and their find-spots around the periphery of the Iron Age farm suggest that they were scraped up and moved during the later Roman farming activities. There was no sign of domestic occupation associated with these artefacts.

Three ring ditches were photographed from the air at Longthorpe by Professor J.K.S. St Joseph and Mr S.G. Upex. They were visible both as crop-marks and as shadows-sites (PL. I and FIGS.2,3).

A. *Ring Ditch 1*

The westernmost ring ditch may be judged from the aerial photographs to lie about 350 ft. (106.68 m) WSW of Ring Ditch 2 (measured centre to centre) and about 70 ft. (21.37 m) SE of the south corner of the Iron Age Yard II (FIG. 3). It lay just below the 25 ft. contour. Trial trenches (70.I, XXVI) were cut by hand at the beginning of the 1970 season E-W and N-S across the presumed site of the ring ditch (FIG. 4), and a further trench was cut mechanically at the end of the season. No trace was found of the ditch in the dark natural sand of the river terrace. The unexpected absence of recognisable features was put down to the dry spring and summer weather; but in 1971 a further trench cut mechanically with a toothless ditching bucket also proved negative. Aerial photographs taken in spring 1971 by Mr S.G. Upex confirmed, however, the reality of the ring ditch.

The overall diameter of Ring Ditch 1 was not more than 80 ft. (24.38 m).³ Its wide and probably shallow ditch may have been *c.* 12 ft. (3.66 m) across.

B. *Ring Ditch 2*

Ring Ditch 2 lies just above the 25 ft. contour about 200 ft. (60.96 m) NNW of Ring Ditch 3 (FIG. 3). Trenches cut in 1970 sectioned the ditch at two points on its western perimeter. The north-west section, cut obliquely, revealed a ditch about 12 ft. (3.66 m) wide (in reality presumably much narrower) with fairly steep sides and a rounded bottom at *c.* 3 ft. (0.91 m) below the present ground surface. It was filled uniformly with mixed sand and gravel, distinguishable from the undisturbed gravel subsoil. On the west the ditch was only 4 ft. (1.22 m) wide and 2 ft. (0.61 m) deep, filled with cleaner sand and cut into iron-stained natural gravel. It had a flattened U-shaped profile.

3. Mr C.C. Taylor (1969, 9) estimates the diameter of Ring Ditch 1 as 55 ft. (16.76 m), Ring Ditch 2 as 75 ft. (22.86 m) and Ring Ditch 3 as 80 ft. (24.88 m).

C. Ring Ditch 3

The third ring ditch lies at about 23 ft. OD and its position was located in trial-trenches in 1970. The ditch, sectioned in four places (FIG. 3) measures 8–10 ft. (2.44–3.05 m) wide; it was round-bottomed and contained a mixed dirty sand filling distinct from the gravel subsoil. Only the lower 2–2½ ft. (0.61–0.76 m) of the profile was untouched by the plough. The overall diameter of the ring ditch is c. 98 ft. (29.87 m).

LONGTHORPE IN EARLY PREHISTORY: DISCUSSION

The worked flints described above suggest occupation at Longthorpe in the Neolithic and Bronze Ages. No settlement remains were noted in the 1970–74 excavations; but they may have lain further west along the Longthorpe ridge above the 40 ft. contour. The ring ditches, despite their lack of dating evidence, may perhaps be attributed to this phase of the site's history. It may be argued that they belong to the same group of barrows as those recently excavated by Mr F. O'Neill and Mr D.F. Mackreth in the Orton Meadows across the modern course of the Nene.

The interpretation of simple ring ditches is still debatable.⁴ At Fengate, for example, a late Neolithic settlement enclosure became in the Early Bronze Age a funerary monument with central mound.⁵ At Longthorpe there was no hint of occupation-material and Mr P.J. Woodward has argued that ring ditches were deliberately set apart from contemporary settlement foci.⁶ At Longthorpe low central mounds might have been flattened by the seasonal floodwater of the Nene.⁷ Whatever their form and purpose, they are representative of a class of field monument widely distributed on the gravel terraces of the main river systems of central and southern Britain.⁸

4. H. Case, 'Notes on the Finds and on Ring-Ditches in the Oxford Region', *Oxoniensia* xxviii (1963), 35 ff., 41–47 (table).
5. F.M.M. Pryor, *Fengate* ii, 59 ff.
6. P.J. Woodward, 'Flint Distribution, Ring Ditches and Bronze Age Settlement Patterns in the Great Ouse Valley', *Arch. Journ.* 135 (1978), 32 ff.
7. A gully visible on the aerial photographs traverses the site of Ring Ditch 2 from the north west; but it is undated and so contributes nothing to the understanding of the putative mound.
8. R.C.H.M.(E.), *County of Gloucester i: Iron Age and Romano-British Monuments in the Cotswolds* (HMSO, 1976), lv; K. Field, 'Ring-Ditches of the Upper and Middle Great Ouse Valley', *Arch. Journ.* 131 (1974), 58 ff.

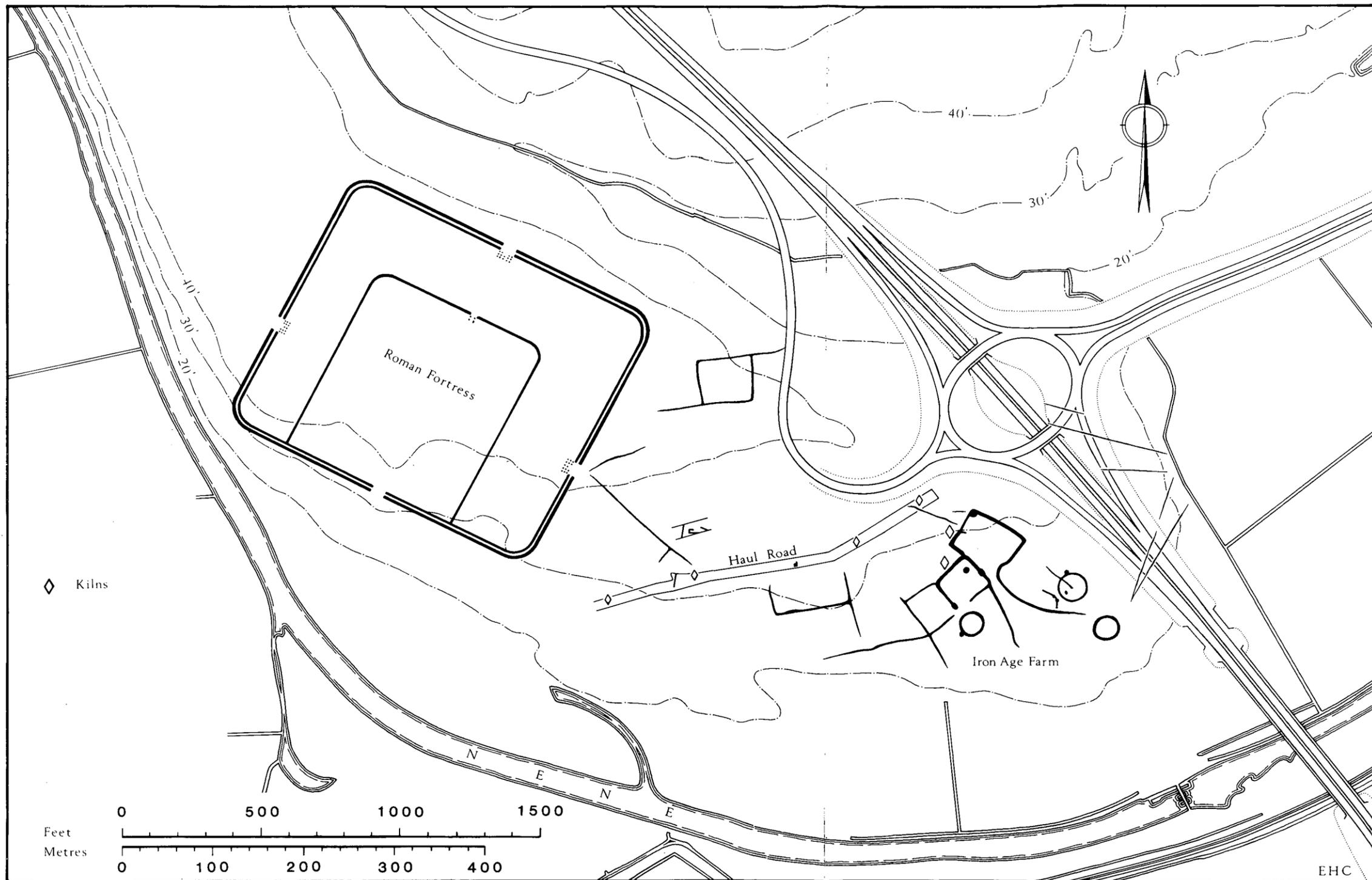


FIG. 2 The archaeological topography of Longthorpe. (The outline of the Iron Age farm, the ring ditches and the isolated linear ditches shown on this figure are plotted from the aerial photographs). Scale 1:50,000.

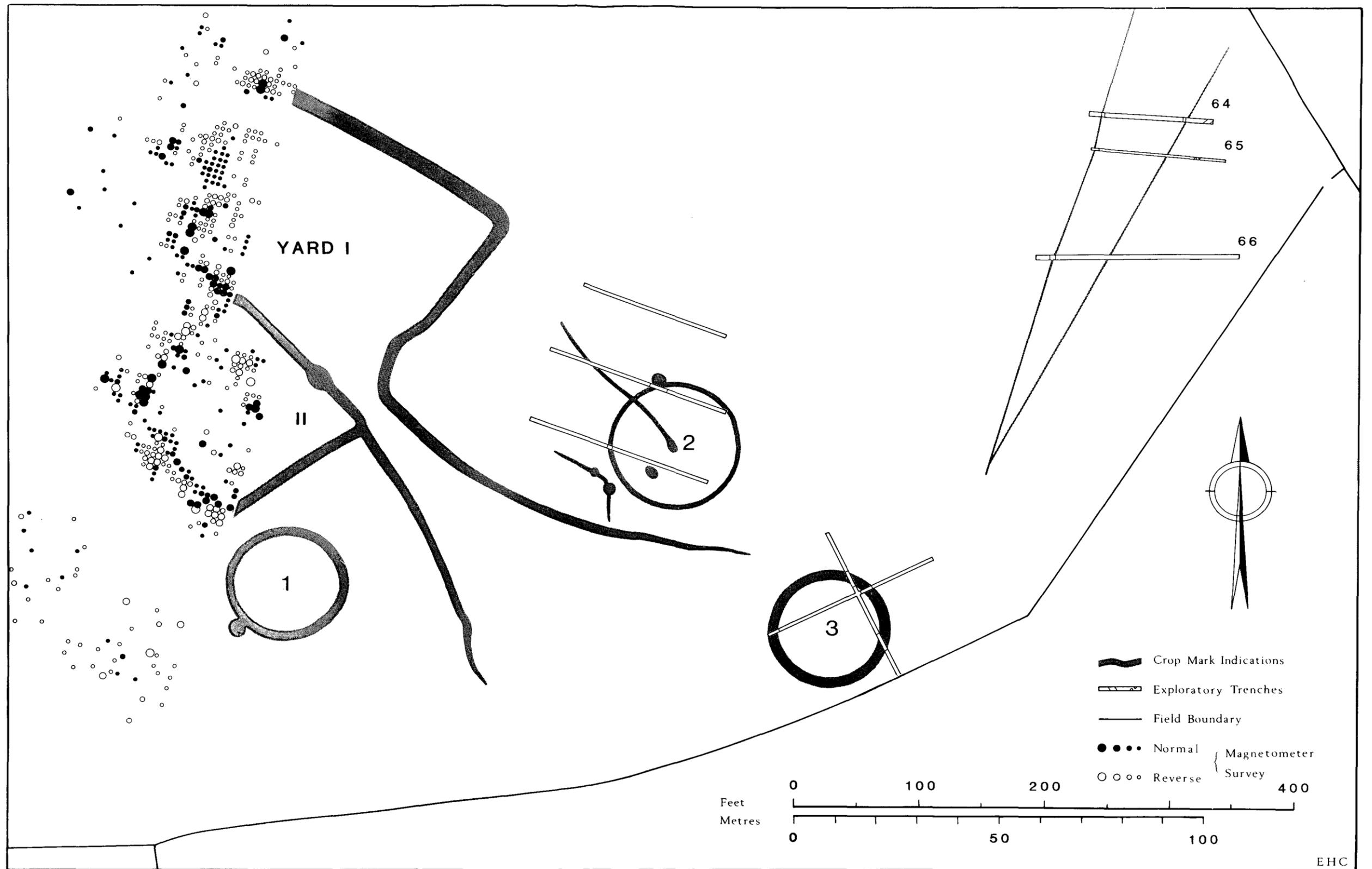


FIG. 3 The ring ditches, Iron Age farm and magnetometer survey: composite plan based on the aerial photographs, the magnetometer survey and the excavation. Scale 1: 1000.

CHAPTER 2

THE IRON AGE FARM

The Iron Age farm consisted of two conjoined sub-rectangular enclosures (Yards I and II) at the eastern end of the Longthorpe ridge (FIGS. 2–4). The ditches promoted prominent crop-marks that were masked in places by the underlying geology.⁹ Nearby, several other linear features can be plotted from the aerial photographs (FIG. 3), but none is equally distinct. In 1969 Mr C.C. Taylor identified a third enclosure on the strength of a rather indistinct crop-mark; but it probably represents a later Roman gully (see p.72).¹⁰

A. *The Enclosure Ditches*

Excavation of the enclosure ditches began in August 1970; but since the western half of the site carried a root crop, only the eastern sector was explored. Work on the western ditches took place in 1971, 1972 and 1974. Since the land was actively farmed until 1972, open-area excavation was not feasible. Consequently, while the ditches were sectioned on all sides (except the SE ditch of Yard II which was located in 1972 by proton-magnetometer survey), only a small area was stripped within the enclosures. In some sections we had to be content with plotting the position of the ditch without emptying it.

Yard I on the north was the larger (FIG. 4). Its NE ditch (measured along the inner lip) was 210 ft. (64 m) long, the SE ditch 196 ft. (59.74 m) the SW ditch *c.* 212 ft. (64.62 m) and the NW ditch 146 ft. (44.5 m). The internal area was approximately 0.81 acres (0.33 ha). The north corner lay just above the 30 ft. contour, the south corner (the droveway entrance) at about 27 ft. OD. Yard II shared the southern two-thirds of the SW ditch of Yard I, a length of *c.* 140 ft. (42.67 m). Its SE ditch was *c.* 125 ft. (38.1 m) long, the SW ditch *c.* 100 ft. (30.48 m), and the NW ditch 116 ft. (35.36 m). A total of 0.3 acres (0.12 ha) was thus enclosed.

The enclosure ditches proved on excavation to be as substantial as the aerial photographs had indicated. Soil cover was deepest (*c.* 1½ ft. = 0.46 m) and agricultural interference least at the north end of the site, the highest point. Here the NE ditch of Yard I was found to be up to 7 ft. (2.13 m) deep and 14 ft. (4.27 m) wide, with a weathered open V-shaped profile (PL.II and FIG. 5,a). Its original dimensions were probably smaller, the sides steeper and the profile sharper. The SE ditch was similar; but its dimensions were reduced after it had turned east at the droveway entrance in the south corner. On the NW side of Yard I there was much disturbance caused by the Roman military activity which included the digging of a wide working terrace or platform (Pit 7, FIG. 4) and a large pit (Pit 1). The ditch (FIG. 5,d) was still recorded as 7 ft. (2.13 m) deep, but the top had been planed off and the maximum width was only about 8 ft. (2.44 m). On the SW side of Yard I the ditch remained 7 ft. (2.13 m) deep and 12 ft. (3.66 m) wide, but where it became the common boundary between Yards I and II it was less regular. (The junction between this ditch and the NW ditch of Yard II is discussed below.) It dropped in

9. Principally Cambridge University air-photograph neg. nos. AF 22, AF 23, ZP 27.

10. Taylor (1969), 10, fig. 2. A ditch located in 1971 in the appropriate position to be the SE ditch of a third enclosure was probably second-century in date (FIG. 4).



PL. II View from inner (SW) edge of the NE ditch of Yard I in the Iron Age farm (for drawn section see FIG. 5,a). Scale in feet.

Trench 54 to just over 4 ft. (1.22 m) deep and 8 ft. (2.44 m) wide; but in Trench XIX, 60 ft. (18.29 m) further south-east, it widened to 15 ft. (4.57m (FIG. 5,b) and became almost flat-bottomed.

Yard II was bounded by slightly smaller ditches averaging 5 ft. 6in. (1.68 m) deep by 9–10 ft. (2.74–3.05 m) wide (FIGS. 5,e,f,g). The SW ditch was not sectioned, but its line was plotted by proton-magnetometer. Mr C.C. Taylor suggested from the aerial photographs that there might be a break at the south end of the SE ditch, forming an entrance to Yard II.¹¹ In fact, the ditch had been capped with stone here in about A.D. 200 (see pp. 72–3), hence the interrupted crop-mark.

The open ditches of the two enclosures accumulated up to 1 ft. 3 in. (0.38 m) of rapid silt, varying according to the geology. At the top of Yard I it was finely-divided sandy loam with some gravel; further downhill in Yard II the clay lenses in the gravel subsoil leached out into the ditch bottoms. Occupation-material (charcoal, animal bone, snail shells, calcite-gritted potsherds) was noted in the silt occasionally (70.VIII.7; XIV.8, FIG. 5,a). As the ditch sides weathered (see FIG. 5 *passim*), sand and gravel slipped down to fill the hollow. Thereafter, erosion slowed down and the upper deposits became hard and compacted.

It was not clear where the upcast from the ditch-digging had been dumped, and the ditch sections were carefully examined for indications of an internal or external bank. In Yard I the infilling of the NE, NW and SW ditches appeared to have taken place more rapidly from inside than from outside the enclosure, regardless of the natural slope of the ground (72.3; 74.B2/1; 71.50, 53, 52; 70.XIV, FIG. 5,a). An internal bank therefore may be tentatively suggested. In Yard II, however, signs of an internal bank were only seen in a section of the NW ditch (72.1, FIG. 5,f), and it is uncertain whether this yard had a bank.

11. *Ibid.*, 9.

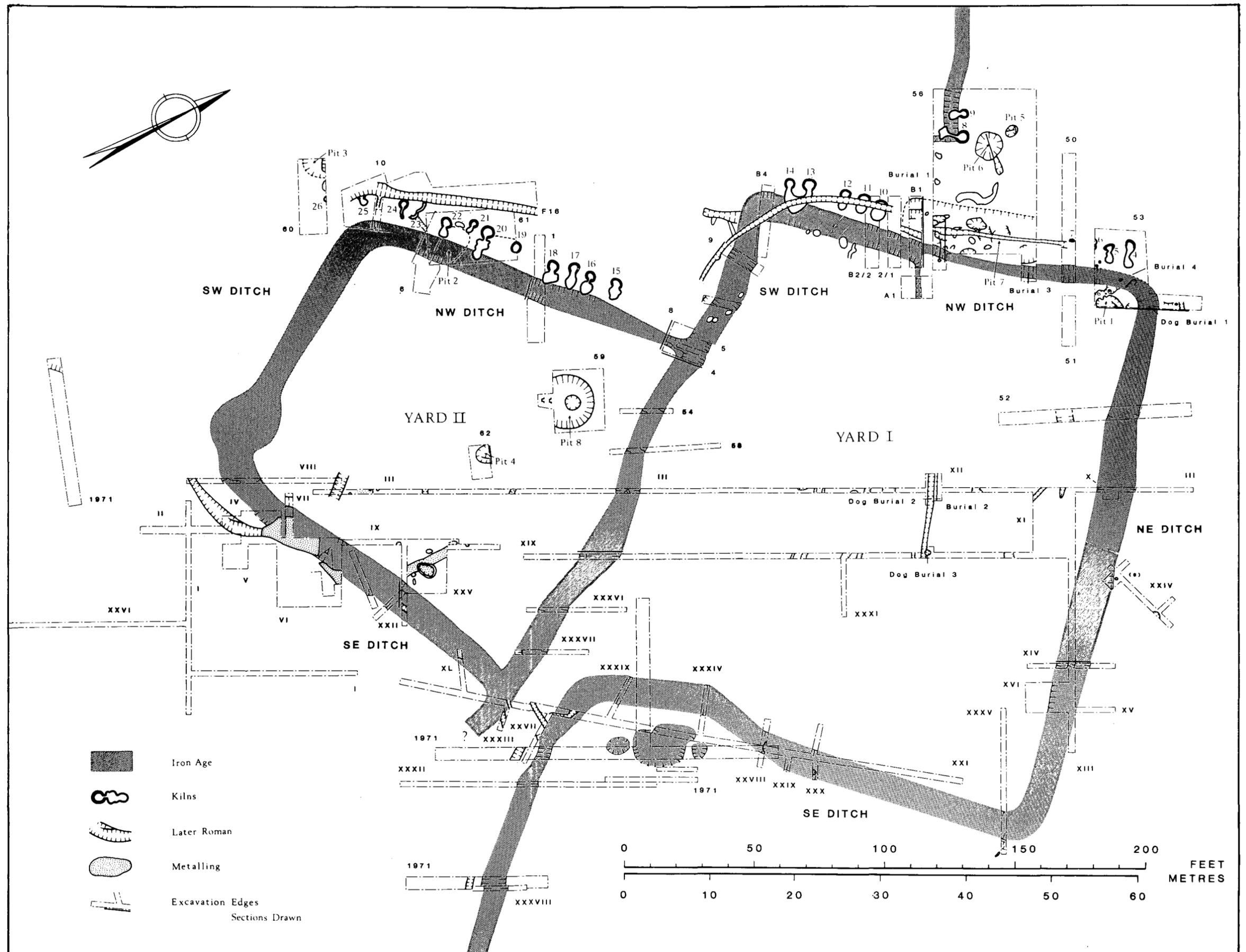


FIG. 4 The Iron Age farm and the Roman industrial and agricultural features which overlie it. Scale 1:480.



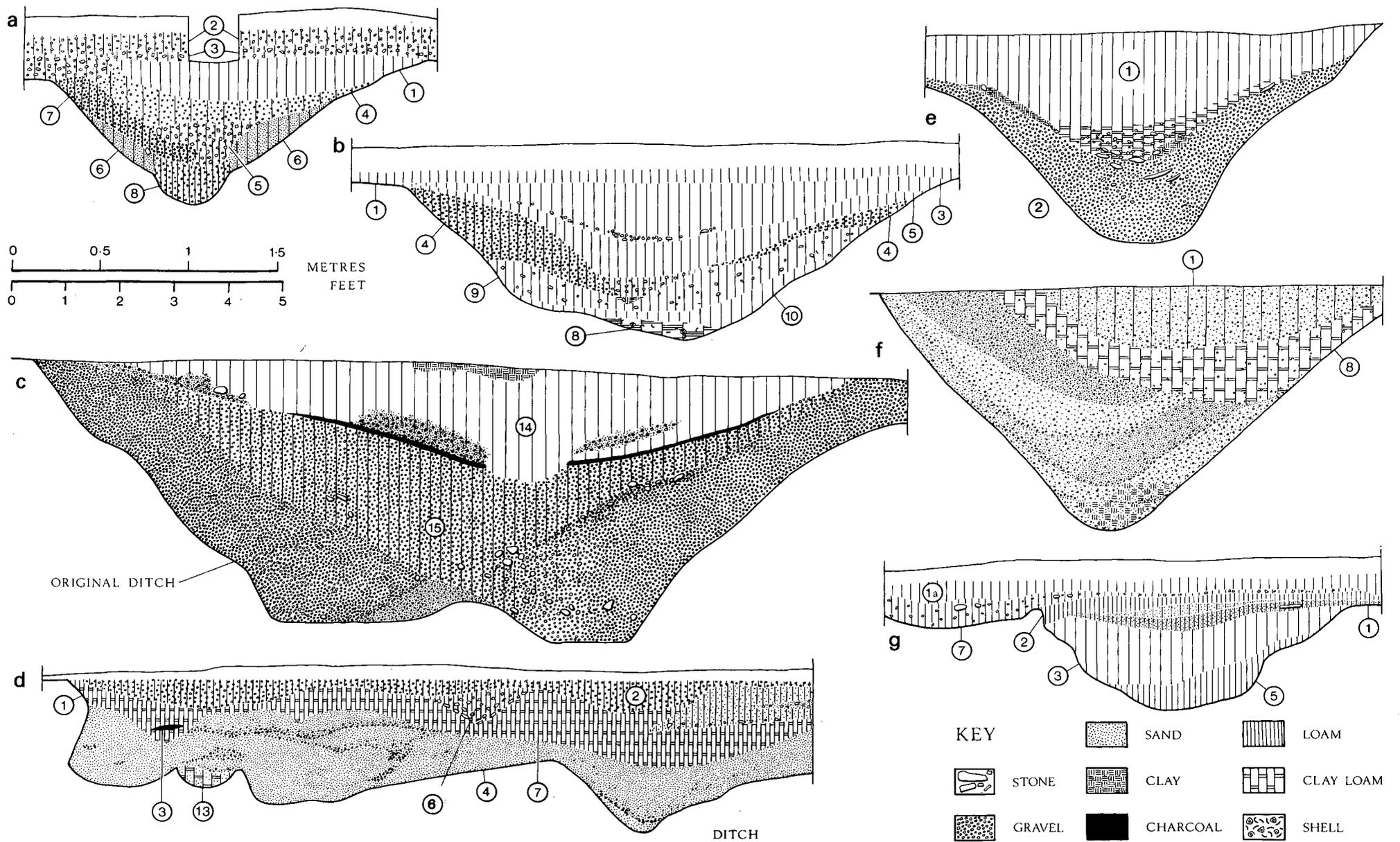


FIG. 5 Sections of Iron Age farm-enclosure ditches. Scale 1:100

a. NE ditch of Yard I (70.XIV NW face)

c. Yard I/II ditch (72.4. E face)

e. NW ditch of Yard II (72.4/8 SW face)

g. SE ditch of Yard II (70.XXII SW face)

b. Yard I/II ditch (70. XIX NW face)

d. NW ditch of Yard I (74.B1. NE face)

f. NW ditch of Yard II (72.1 SW face)

For key to layers, see p. 22

Evidence that the ditches were cleaned out or re-cut was sought, but only noted in two places. The ditch common to both yards (70.XIX; FIG. 5,b) had almost completely filled with compacted gravel, sand and silt, including some occupation-debris, when it was recut to a shallower V-profile. The recut, too, gathered silt, occupation-material and slipped gravel before the beginning of the Roman occupation.

Recutting evident at the T-junction between the NW ditch of Yard II and the SW ditch of Yard I introduces a second problem, the relative dates of the two yards (FIG. 4). Aerial photographs reveal that the SW ditch of Yard I swings south just before it joins the north corner of Yard II and is not on the same alignment here as the ditch common to Yards I and II (FIG. 2). We do not know, however, what the original form of the junction was; for all that survives is the bottom of the original E-W ditch in the east section of 1972 Trench 4 (FIG. 5,c) with its weathered gravel filling lying slightly to the north of the later re-cut line. The shape and filling of the recut of the ditch between Yards I and II is identical with that of the SW ditch of Yard I further west, which we presume to have been recut at the same time. Both are 12–13 ft. (3.66–3.96 m) wide and over 6 ft. (1.84 m) deep with flattened soles. The NW ditch of Yard II by contrast is only *c.* 7 ft. (2.13 m) wide and 5 ft. (1.52 m) deep, and its bottom is over 1 ft. (0.31 m) higher than that of the ditch between Yards I and II (FIG. 5,e,f). Excavations showed that this length of ditch as it approached the junction sloped down to link directly with the recut E-W ditch between the two yards. It was impossible to establish the order in which the recutting had taken place; but it was plain that all three branches at the junction had been cleaned out at the same time. There is no proof that either of the yards was at any time independent of the other.

The recutting of the ditches at the junction seems to have been a purely local feature. No Roman material was found in the gravel and sand which later gathered in the recuts.

A pair of antenna ditches according to the aerial photographs leads up like a funnel from the flood-plain of the river towards the south corner of Yard I. The north ditch passes between Ring Ditches 2 and 3 while the south ditch leads due north from the Nene (FIGS.2,3). The point where the driveway between the ditches entered Yard I is obscured on the aerial photographs, and the results of our trial-trenches here in 1970 and 1971 were not satisfactory.

The entrance-way itself had been disturbed by the digging of gullies in the second century A.D. and later. The situation in the Iron Age, however, was as follows. The main SE ditch of Yard I swings inwards before turning south to take up the line of the north antenna ditch (FIG. 4). In doing so it passes round one large and two small shallow pits (see below). Where it was sectioned at the angle in 1970 (70.XXI) the ditch was about 5 ft. (1.52 m) deep and 11 ft. (3.35 m) wide. The antenna ditch proper, sectioned further south-east in 1971, was only 2 ft. (0.61 m) deep and 5 ft. (1.52 m) wide. Its line was followed for a further 52 ft. (15.85 m) where it had increased to 8 ft. (2.44 m) wide. Parallel to the north antenna ditch and 5–6 ft. (1.52–1.83 m) south-west of it ran a smaller V-shaped ditch (2 ft. (0.61 m) deep and 3 ft. (0.91 m) wide) which was filled with dirty sand and burnt clay particles. It was probably not of Iron Age date.

A similar shallow ditch (70.XXI.2,7,) may be taken as the south antenna ditch at its point of junction with the SE corner of Yard II. It was 8 ft. (2.44 m) wide (its recorded depth of 3 ft. (0.91 m) may mean that we failed to recognise and excavate the lower sand and gravel filling). There was second-century Roman material in the top of the ditch and a later gully from Trench XXXIII debouched into its upper levels. In 1971 a machine-cut trench 18 ft. (5.49 m) further south-east did not pick up the antenna ditch, so it may have turned south already.

B. Pits and Gullies

A group of shallow pits, one large and two small, was uncovered in the angle between the SE ditch of Yard I and the north antenna ditch (FIG. 4). The larger pit was found in 1970 to be just over 4 ft. (1.22 m) deep. Trial trenches suggested that its maximum diameter was about 20 ft. (6.1 m). It was filled with brown sandy soil in layers, one containing a good deal of charcoal. There was no dating evidence; but the absence of Roman pottery and of the ubiquitous greeny-grey material (see below, p.58) hints that it may have been an Iron Age feature. The two small pits were about 6 ft. (1.83 m) and 9 ft. (2.74 m) in diameter.

An isolated shallow hollow 6 ft. (1.83 m) in diameter and 8 in. (20 cm) deep was cut by the

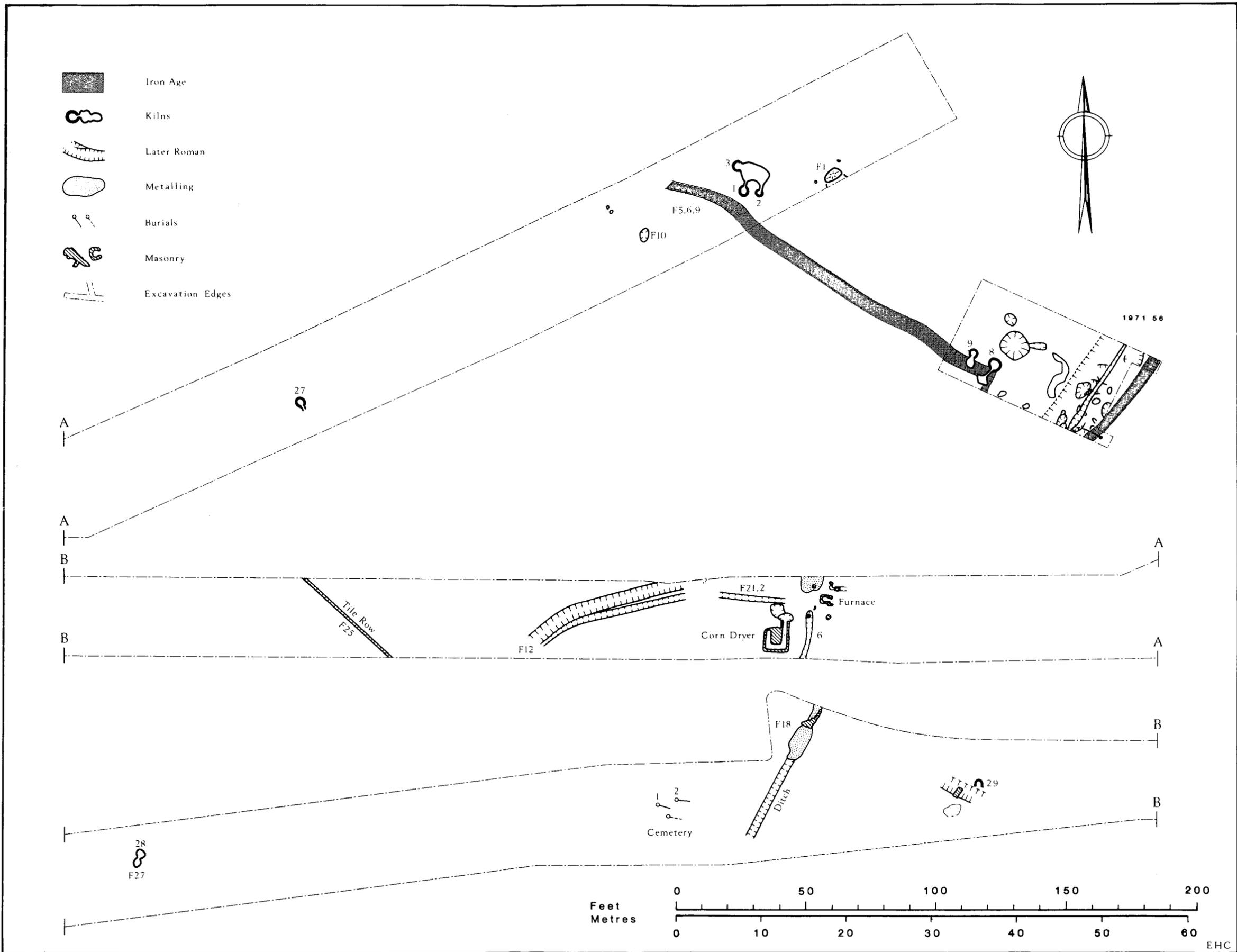


FIG. 6 The archaeological features along the Haul Road. Scale 1:480.

stokehole dug for the later Roman corndrier on the Haul Road about 550 ft. (167.64 m) west of the Iron Age farm (LHR72.F21.16, FIG. 19). It contained seven sherds of calcite-gritted pottery, probably of Iron Age date.

None of the many small gullies within Yards I and II can be shown to belong to the Iron Age.

During the excavation of Kiln 9 (FIG. 4) an underlying gully (71.56.71) full of brown sand (1 ft. (0.30 m) deep and 5 ft. (1.52 m) wide) was encountered west of the working platform (Pit 7) NW of Yard I. It was followed for 20 ft. (6.1 m) eastwards, where it appeared to turn sharply south. It contained only animal bones; but its stratigraphical position under the kiln indicates that it could be an Iron Age feature.

C. Structural Evidence

No post-holes or other definite structural features could be assigned to the Iron Age.

North of the later Roman furnace on the Haul Road (FIG. 19) a streak of red burnt daub, possibly within a beam-slot, was found associated with sherds of a bead-rimmed bowl (FIG. 32 No.22, LHR72.F21.17) and a sherd of cordoned jar. A date at the end of the Iron Age would fit this feature.

D. Burials

Human Burial 1. The first burial (71.56.3, FIG. 7,1) was discovered about 25 ft. (7.62 m) west of the NW ditch of Yard I during the mechanical stripping of the topsoil (FIG. 4). It was unfortunately damaged at the time of discovery. The skeleton lay on its right side, crouched in a shallow kidney-shaped depression cut less than 1 ft. (0.30 m) into the gravel subsoil. The head pointed ENE, the knees were drawn up towards the chest touching the elbows, and the chin rested in the right hand. The left arm was slightly flexed and the left was at the knee. There were no grave-goods. A small fragment of calcite-gritted jar was found well down among the bones.

The burial was of an elderly person aged between 40 and 50, 5 ft. 6 in. (166 cm) to 5 ft. 8 in. (174 cm) in height. Dr Scheuer regards the sex as male, Mr Rowbotham as female, for reasons

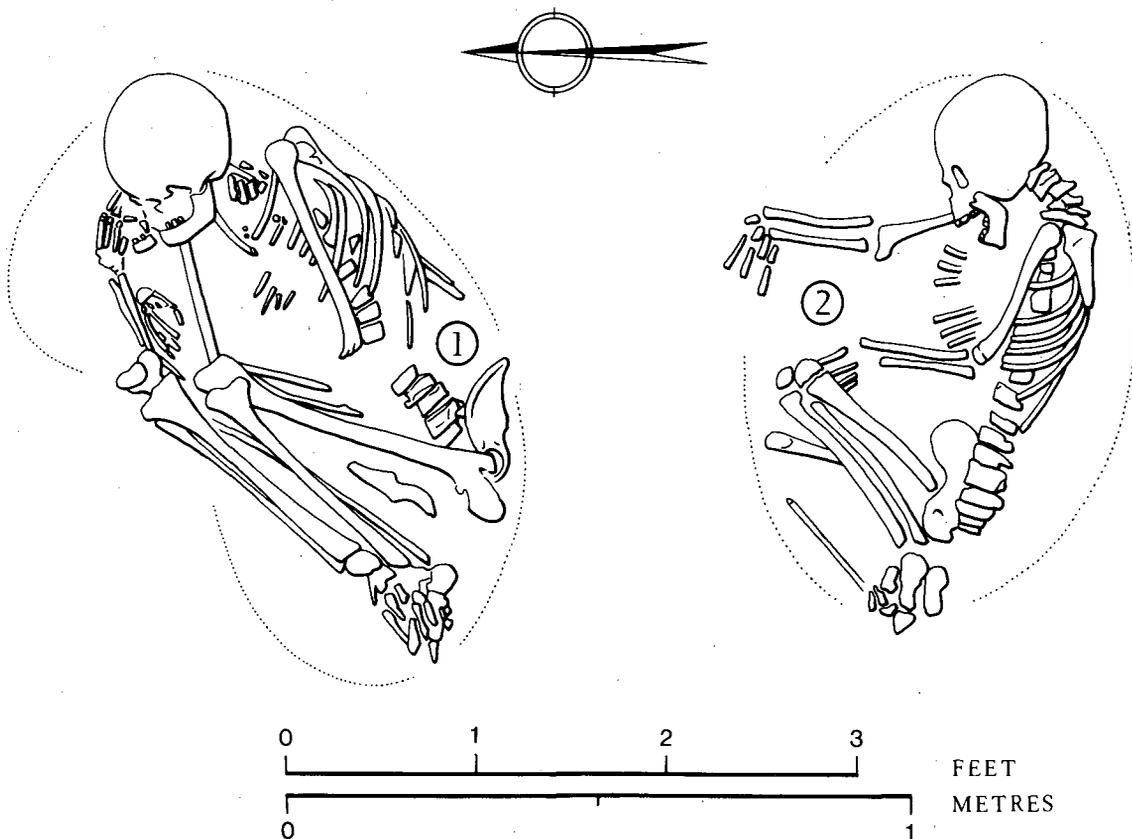


FIG. 7 Crouched Burials 1 and 2. Scale 1:12.

which they discuss below (p.182). The individual suffered from a bone-growth on the neck of the left femur and from chronic osteo-arthritis. The dental state was poor. The cause of death, however, could not be deduced.

Human Burial 2. The second crouched burial (70.XII.4, FIG. 7,2) was discovered near the centre of Yard I, about 126 ft. (38.40 m) east of Burial 1. The skeleton lay on its right side on an E-W axis in a shallow oval grave cut *c.* 1 ft. 6 in. (0.46 m) into the gravel. The knees were not drawn up far and the left hand rested upon them. The right arm was flung forwards. A later gully (70.XII.1), probably of early Roman date, crossed the south part of the grave and had disturbed the skeleton. There was no grave-furniture. A rim-sherd of apparently wheel-made calcite-gritted jar found with the bones may have been introduced when the gully was dug.

The burial was of a juvenile about 5 ft. (153 cm) tall. Dr Scheuer regards it as male, aged 13–15 (p.172), while Mr Rowbotham identifies the sex as female and the age as 16–18 years (p.180). The teeth were in good order and there was no indication of the cause of death.

Human Burial 3. Crushed remains of an infant burial were found in the silted gravel filling of the NW ditch of Yard I (71.56.61). The child had died at or just after birth (p.174). The bones were placed in the ditch after this had begun to weather, and a burial date in the late Iron Age seems likely.

Dog Burial 1. The extended burial of a dog, laid out E-W on its right side (Dog 6, p.188) was noted within the filling of the main ditch of Yard I at its north corner. The estimated shoulder-height (51.41 cm) suggests that the animal was slightly larger than the Roman dogs discussed below (p.187), but of the same general type, resembling a modern sheep-dog. Associated tiny sherds of calcite-gritted jar suggest on balance that this burial is of late Iron Age rather than early Roman date.

THE IRON AGE FARM: DISCUSSION

i. *Date*

There is little direct evidence to date the two ditched enclosures which make up what we have called the Iron Age farm at Longthorpe. Single rim-sherds of calcite-gritted jars were recovered from the primary silt of the NE ditch of Yard I (FIG. 32 No.30, 70.XVI.8, FIG. 5,b), from the top of the backfilling of the SE ditch of Yard II (FIG. 31 No.9, 70.VI.6) and from the slipped brown gravel in the recut SW ditch of Yard I (FIG. 32 No.41, 72.15). They may be dated to between the third and first centuries B.C. (see p.117); but they come from layers representing the later phase of use or the subsequent pre-Roman disuse of the farm. The pottery gives no hint of earlier Iron Age occupation.

Some support for a third- to first-century date for the farm is given by the collection of Iron Age sherds dumped during the second century A.D. into the SW ditch of Yard I and the NW ditch of Yard II. Most are from hand-made calcite-gritted vessels and the proportion of Category 2 types (see p.116), which may be assigned to the immediately pre- or post-Conquest years, is very small.

The farm ditches had largely filled with weathered sand and gravel before the Roman military authorities took control of the site. The filling seems to have been a natural process, and may have been rapid. We favour the view that the farm had a relatively short life, and had been abandoned before the fortress was built. Nevertheless, the disarticulated child's skeleton (Burial 4 (p.175)) buried in the post-Conquest period at the north corner of the farm seems more likely to have been of a native than of a Roman. The Claudio-Neronian dogs (p.188) are more likely to be related to the Iron Age dog described above than newly brought to the site by the troops. So the possibility of some continuity of site-use exists.

ii. *The Economy*

Yards I and II together enclose about 1.11 acres (0.45 ha). The problem of their purpose is highlighted by recent excavations of three nearby Iron Age farms. At Monument 97 (Orton Longueville) about 2 km south of Longthorpe across the Nene, at Fengate on the Fen Edge about

5 km to the east, and at Werrington about 6.5 km to the north, the main ditched enclosure contained a series of round houses marked by penannular gullies.¹² Structural evidence of this kind was not found at Longthorpe; but it cannot be ruled out, since no large areas within the yards were stripped. There were no marked concentrations of Iron Age occupation-material in the ditches to indicate a domestic focus.

The antenna ditches which funnelled movement from the floodplain of the Nene up into Yard I are suggestive of stock-raising. The land on the north bank of the river (flooded in winter), and on the south- and east-facing slopes of the ridge would have been available for grazing. Cattle are represented by 59% of the meat-bones from the stratified Iron Age deposits (p.185), against sheep 32% and pig only 8%. The disturbed Iron Age deposits had fewer cattle (52%) and more sheep (39.5%). Only a few definitely Iron Age bones showed signs of butchering. The figures may be accepted, with caution, as a reflection of the stock that was kept.

Lack of woodland nearby may have made pig-raising difficult; but the high proportion of cattle is unexpected. The trend in general in the later Iron Age was towards larger flocks of sheep at the expense of cattle. At Twywell on the upper Nene, for example, the bones represented a minimum of 8 cattle, 20 sheep and 6 pigs.¹³ There is no obvious explanation of the anomaly at Longthorpe. As at Twywell, the Longthorpe farmer kept at least one horse and a dog.

We do not know what arable crops were grown at Longthorpe in the Iron Age, or where; for the farmyards are perhaps best assigned to stock and domestic use. There were no Iron Age storage pits.

The landholding of this farm may have been limited by the proximity of its neighbours. Another group of ditched enclosures can be seen on aerial photographs along the ridge about 250 m NW of the farm (FIG. 2). There was Iron Age occupation-material beneath the fortress still further west.¹⁴ Iron Age features near the later Roman corndrier on the Haul Road may also have belonged to an independent unit.

There were some indications of domestic industry. The corner of a triangular baked-clay loom-weight was found with Claudio-Neronian pottery in Pit 6 (71.56.35) NW of the NW ditch of Yard I.¹⁵ Others came from the upper filling of the stokehole attached to the dug kilns 1-3 (FIG. 30 No.171, LHR72.F4.3), from the greeny-grey layers in the NE ditch of Yard I (FIG. 30 No.172, 70.III.27) and from topsoil (FIG. 30 No.174, 74.A4; FIG. 30 No.173, 70.XXI). None was in an Iron Age context. Numerous fire-reddened 'pot-boilers' came from the disturbed upper filling of the SW ditch of Yard I and NW ditch of Yard II.

Across the Nene about 1 km to the west we found signs in 1972-1974 that Iron Age settlers had extracted iron pan from the gravels and had boiled brine for salt.¹⁶

iii. *The Burials*

The three burials noted above were probably of the farm's inhabitants, although precise dating evidence is lacking. Burials 1 and 2 belong to Group 1 in R. Whimster's classification of Iron Age inhumations in southern Britain.¹⁷ Following the norm both have heads pointing north or east of north, and lie on their right side, in contrast to the preference for the left side in central Wessex. Too much should not be made of the distinction between inhumation and the Belgic cremation rite in SE England. Longthorpe in the years before the Claudian invasion may have been on the

12. Monument 97: *Durobrivae* 3 (1975), 26 f.; Fengate: *Durobrivae* 6 (1978), 10 f., fig. 13; *Northamptonshire Archaeology* 13 (1978), 16 ff., fig. 5; Werrington: *Durobrivae* 8 (1980), 23. For sites further up the Nene: B. Cunliffe, *Iron Age Communities in Britain* (London, 2nd ed., 1978), 172, fig. 11.6; for the Welland Valley: W.G. Simpson, 'Romano-British Settlement on the Welland Gravels', in A.C. Thomas (ed.), *Rural Settlement in Roman Britain*. CBA Research Report No. 7 (London, 1966), 15 ff.

13. *Twywell*, 88 f.

14. Taylor (1969), 9, site 5; *Longthorpe* I, 28, 111

15. See my discussion in *Fengate* iv, forthcoming.

16. Lynch Farm, Site 2: *Durobrivae* i (1973), 20 f.

17. R. Whimster, 'Iron-Age burial in southern Britain', *Proceedings of the Prehistoric Society* 43 (1977), 317 ff., fig. 1.

northern fringe of Catuvellaunian territory;¹⁸ but the farm itself may have been abandoned before Catuvellaunian expansion.

The height of the person in Burial 1 (5 ft. 6 in. – 5 ft. 8 in., 166–174 cm.) is noteworthy. In Roman York this was average for males, well above average for females.¹⁹

Nearby parallels for the crouched burials may be quoted from the Iron Age farm at Fengate and from Twywell.²⁰ Even closer is the burial in Pit D of the pit-alignment at Lynch Farm.²¹

18. Unpublished coins and pottery: *Durobrivae* 7 (1979), 29.

19. L.P. Wenham, *The Romano-British Cemetery at Trentholme Drive, York*. MPBW Archaeological Report No. 5 (London, 1968), 148, 159 ff.

20. *Northamptonshire Archaeology* 13 (1978), 25; 10 (1975), 60, pl. 6.

21. *Ibid.*, 159.

CHAPTER 3

THE EARLY ROMAN PERIOD: THE WORKS DEPOT

THE EXCAVATED FEATURES

The construction of a vexillation fortress on the Longthorpe ridge soon after the Conquest of A.D. 43 must have had an immediate impact on the surrounding communities. The prime objective of our first season of excavation (1970) was to define the relationship between the new fortress (then being excavated by Professors Frere and St Joseph) and the site of the Iron Age farm less than 375 m (1230 ft.) from its eastern perimeter. Results were inconclusive. But in 1971 the first surface-built kilns were identified and finds of military bronzes provided the link that we sought. The first unequivocal pottery kilns were found on the Haul Road in 1972, and more surface-built kilns were located later that year and in 1974.

A. THE KILN GROUP ON THE HAUL ROAD AND ASSOCIATED FEATURES

At Easter 1972 we excavated some important Claudio-Neronian industrial features lying c.150 ft. (45.72 m) NW of the NW ditch of Yard I (FIGS. 2,5). They were threatened and ultimately destroyed by the building of a temporary haul road to serve traffic bringing gravel for the embankments of the Soke Parkway (FIG. 2). We removed the topsoil from a strip about 30 ft. (9.14 m) wide with a self-elevating scraper and then cleaned the surfaces with a JCB fitted with a toothless ditching bucket. It was not possible to dig beyond the road's zone of disturbance.

The focal point was a group of three potters' kilns (PLS.III, IV) set on the south and west sides of a common stokehole (FIG. 8). Two of them (1 and 2) had been sunk into a bed of clayey sand and gravel in the manner standard to later Roman kilns in the Nene Valley. We have classified them as dug kilns. The third kiln (3) was shallower and may represent an intermediate stage between dug kilns and the surface-built type found elsewhere at Longthorpe (see below).

The order in which the kilns went out of use is plain from the stratigraphy of the stokehole and deposits in the kiln chambers. We have followed it in our numbering. There is reason to think that only one kiln was in use at once, but overlap is possible. The order in which they were built may be the same, but that cannot be demonstrated. A fragment of pale buff flagon in Longthorpe Ware 1A (p.134) found embedded in the pedestal of Kiln 1, probably the earliest of the three, proves that they were not the first kilns on the site.

Kiln 1, the largest and deepest, had a firing chamber 23 in. (0.58 m) deep and 45 in. (1.14 m) in internal diameter (PL.V and FIG. 9). Its hard blue clay lining was 2 in. (5.08 cm) thick and the heat had affected the surrounding sand to a depth of 4 in. (10.16 cm). In the centre of the firing chamber stood the pedestal which supported the intermediate floor of the oven chamber. It was a bollard, c. 10 in. (0.25 m) in diameter, composed of four circular fire-bricks luted together with clay. The intermediate floor consisted of roughly wedge-shaped clay firebars, of which two survived *in situ* but depressed. The apex of each firebar rested on the pedestal and the base was linked into the kiln wall. There were originally perhaps ten such firebars (averaging 1 ft. 6 in.



PL. III Kilns 1-3 and their associated stokehole, seen from NW. Scale in feet.



PL. IV Kilns 1-3 viewed from SW. Scales in feet.

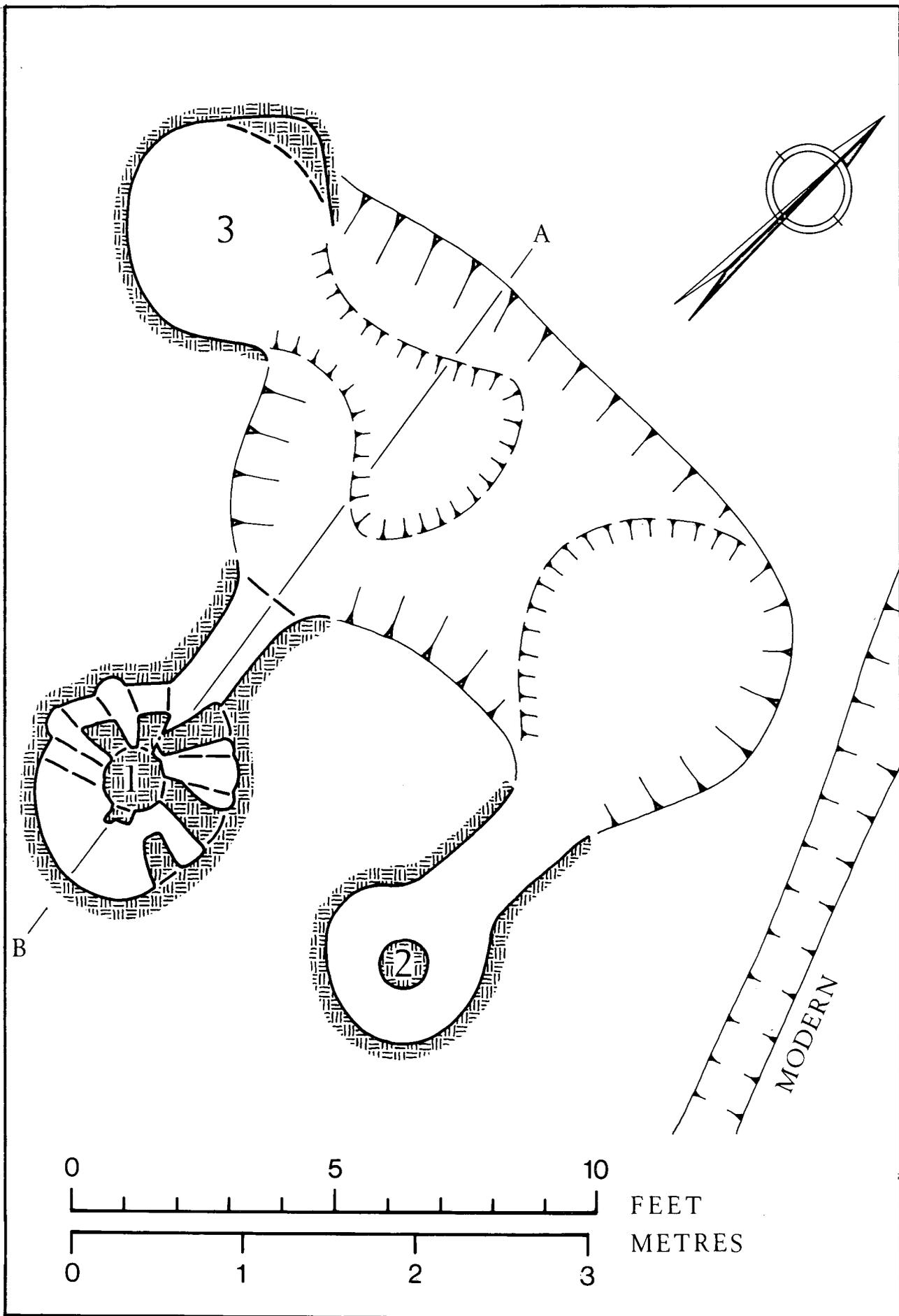


FIG. 8 Plan of kilns 1-3 on the Haul Road. Scale 1:30.



PL. V Kiln 1 and (in background) Kiln 2 from NW. Scale in feet.

(0.46 m) long by 9 in. (22.86 cm) wide at the base). The clay of the pedestal and firebars was much more coarse and friable than that of the kiln lining.

The narrow flue (16 in. (0.41 m) wide by 45 in. (1.14 m) long) had been cut down to the natural shelly limestone. It was once at least 15 in. (0.38 m) high, provided (presumably) with a clay arch that may have been demolished at the end of the kiln's working life-time. There were no flue-checks. A thick layer of yellow clay and sand (FIG. 9, F4.15) lying directly on the burnt natural limestone extended from the flue into the stokehole. It is unlikely to have been in position while the kiln was being fired. It underlay a deposit of burnt clay and other debris from the kiln structure (F4.2) which spilled from the filling of the lower part of the firing chamber. The pottery from the debris (F4.2) included sherds of reeded-rim bowl, mortarium and jars with moulded rims and lids (FIG. 35, 2, 3; FIG. 41, 57a, 57b; FIG. 44, 103d; see p. 196). These may be taken as part of the range of vessels being fired in Kiln 1; the principal product seems to have been flagons, to judge by the waster sherds. Some sherds of wasters had split in firing, others had been reduced instead of oxidised. No calcite-gritted ware was present. The flue was finally blocked by a dump of light grey-brown sand flecked with charcoal and burnt clay which reached the level of the contemporary ground surface (FIG. 9, F4.13).

Kiln 2 was similar to Kiln 1, but smaller and less well preserved (PL. VI). The clay lining of the firing chamber was *c.* 2 in. (5.08 cm) thick, but on the floor only a thin skim of clay had been laid over the natural sand. The chamber was about 35 in. (0.89 m) in diameter and the surviving height of the wall to the top of the intermediate floor was 14 in. (0.36 m). The pedestal consisted of four round bricks, *c.* 11 in. (27.9 cm) in diameter, luted with clay. One wedge-shaped firebar was still *in situ*. The intermediate floor was on exactly the same level as that of Kiln 1, presumably marking the Roman ground-surface. The badly damaged flue was 33 in. (0.83 m) long, about 19 in. (0.48 m) wide and at least 13 in. (0.33 m) high.

On the floor of the firing chamber, stretching through the flue and spreading out in the eastern half of the stokehole, was a layer of debris from the firing of the kiln, comprising ash, burnt and

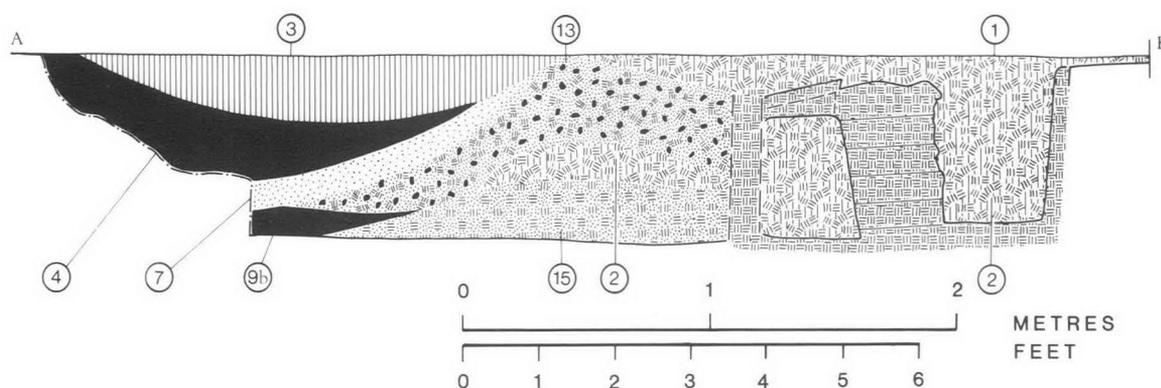


FIG. 9 Section A-B through Kiln 1 and stokehole. Scale 1:30
For key to layers, see p.22

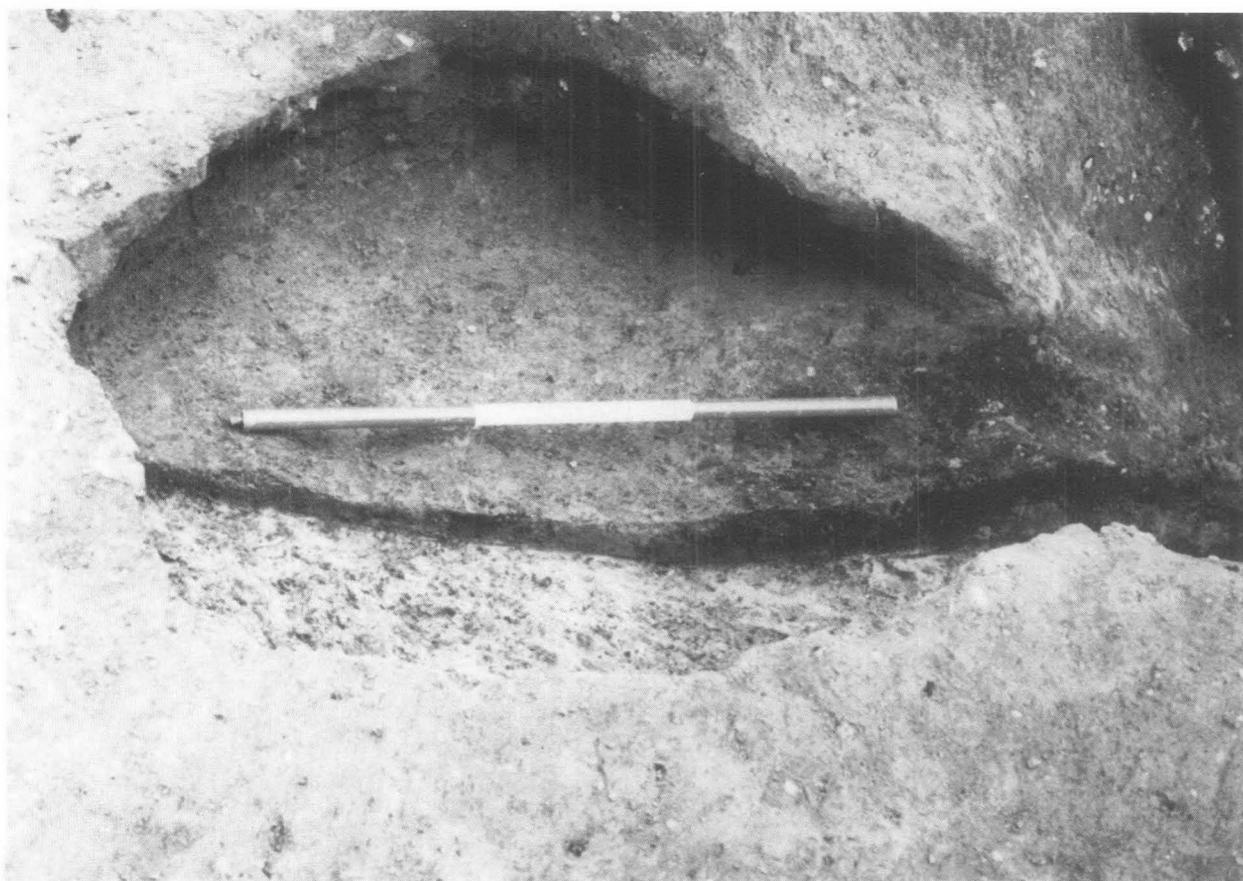


PL. VI Kiln 2 from SW. Scale in feet.

unburnt clay and much waster pottery (F4.14,17,6). The vessels included flagons (Types 1c, 1f, 10a: FIG. 38), red slip-coated dishes imitating samian form 15/17R and plates (Types 30a, 32, 33: FIG. 39), a handled cup (Type 63: FIG. 41), necked jars (Type 84d: FIG. 43), a lid (Type 117b: FIG. 45), and sherds of plain-rimmed bowls. Clay blocking the kiln mouth above the debris (F4.16) contained mortarium fragments (FIG. 35,1,4). All were in the familiar Longthorpe Ware 1 (p.134), and there was no calcite-gritted ware. The types listed above were probably fired in Kiln 2. The filling of the firing chamber above the industrial deposit (F4.11) contained a preponderance of jar and flagon sherds, probably tipped there after the kiln had gone out of use.

Kiln 3 on the west of the main stokehole was of a different build (PL. VII). Its maximum depth in the centre was about 10 in. (0.25 m) below the excavated ground-surface, and it was about 45 in. (1.14 m) across. Few traces remained of clay lining. The chamber was a hollow without a clear angle between floor and walls. The mixture of clay and sand on the chamber floor was heat-reddened to a depth of 2 in. (5.08 cm). There was no proper flue.

Signs were absent of any arrangement for an intermediate floor, and we assume that the kiln-furniture was portable. A curious mushroom-shaped object in Longthorpe Ware 1, found



PL. VII Kiln 3 from SW. Scale in feet.

on the clay dump near these kilns (see below), may perhaps be the top of a portable pedestal (FIG. 30, 179). The pedestal's height might have been adjusted by additional clay rings. A number of fragments of small square-sectioned firebars discovered elsewhere on the site (FIG. 30, 175–177) may have been used with the pedestal.

A thin layer of ash and charcoal in the mouth of the kiln (FIG. 9, F4.9b) extended into the stokehole and overlay a dump of clay and sand (F4.15) on the floor of the flue of Kiln 1. It was sealed beneath the tail of the main sand deposit (F4.13) which blocked Kiln 1's flue. A second layer of charcoal and ash (F4.9a), indistinguishable in the mouth of Kiln 3 from the first layer, joined a heavy black deposit of charcoal, soot and ash in the western part of the stokehole (F4.4) where it was eventually overlain by a darker brown deposit of similar material (F4.3). The latter also filled the hollow marking the firing chamber of Kiln 3 and seems to be the latest deposit in the stratigraphic sequence within the stokehole and surrounding kilns.

About 20 ft. (7 m) E of the kilns the potters had left a stockpile of clean pale blue clay (FIG. 6, F1), possibly derived from the Blisworth beds which outcrop on the ridge. It measured *c.* 7½ ft. (2.24 m) by 4 ft. (1.22 m) and was up to 12 in. (0.30 m) deep. It lay in a slight hollow in the natural sand, and there was no hint of any container. To judge by its quality the clay had been brought to the spot for building or repairing kilns, but its use for pottery cannot be excluded.

The surface of the clay stockpile was covered with waster sherds embedded in it – presumably rejects from the three dug kilns. A wide range of vessels in Longthorpe fabrics was represented: beakers (Types 19a, 20: FIG. 39), cups (Types 59a, 59b: FIG. 41), flanged and reeded-rim bowls (Types 55b, 58a, 58b: FIG. 41), jars (Types 76c, 84c, 84d, 84e: FIGS. 42, 43), lids (Types 117b, 117e: FIG. 45), flagons (Types 1a, 1b, 1c: FIG. 38) and three types of cheese-press (Types 65a, 65c, 66: FIG. 41). There were, significantly, no calcite-gritted vessels.

North-west of the clay pile a single post-hole (F1.3) was noted for a round post *c.* 7 in. (17.78 cm) across and 1ft. (0.31 m) deep. Its post-pit (*c.* 11 in. (27.94 cm) across) was packed with clay and three sherds of Longthorpe flagon. Close by, two small hollows were uncovered in

the contemporary ground-surface, the one (F20) containing a lamp-stand (FIG. 36,5), the other (F19) fragments of cheese-press.

West of the kilns lay a ditch curving gently from west to south (FIG. 5, F5, F6, F9). It varied in width from 3½ ft. (1.07 m) to 5 ft. (1.52 m), but was no more than 1 ft. (0.31 m) deep. The profile was W-shaped in part, and the homogeneous brown sandy filling held no pottery. Where the filling had subsided, furnace rakings and a small quantity of Longthorpe pottery had been dumped into it. The ditch is likely to have been the earliest feature of this part of the site, but its date is unknown. The aerial photographs suggest that it may link up with the early ditch noted beneath Kilns 8 and 9 (71.56) further to the south-east as indicated on FIG. 6. Further west three small sand-filled hollows of unknown purpose (F3, F10) held a few sherds of Longthorpe pottery.

B. THE SURFACE-BUILT KILNS

i. *The Standard Type: Structural Details*

The remains of the surface-built kilns were ephemeral; but there was considerable structural uniformity among the 28 or 29 examples recorded (see TABLE 1). The kiln-chamber was marked by a ring of heat-reddened gravel and fragments of friable burnt clay, set on or into the surface of the gravel subsoil. On excavation the typical chamber was revealed as a shallow hollow 3–10 in. (7.6–25.4 cm) deep (measured from the top of the surrounding gravel). Its original depth was presumably greater; for the chamber must have been cut through the contemporary topsoil. On its floor lay a mixed layer of burnt gravel and burnt clay, *c.* 2 in. (5.08 cm) thick; the burnt clay, derived – we presume – from kiln lining, was unexpectedly friable; there were no hard-fired patches of blue clay such as one finds in later kilns. The burnt gravel, up to 2 in. (5.08 cm) thick, was the subsoil. To judge by its colour (red rather than purple), it had not been subjected to very



PL. VIII The surface-built Kiln 13 viewed from SE. Scale in feet.

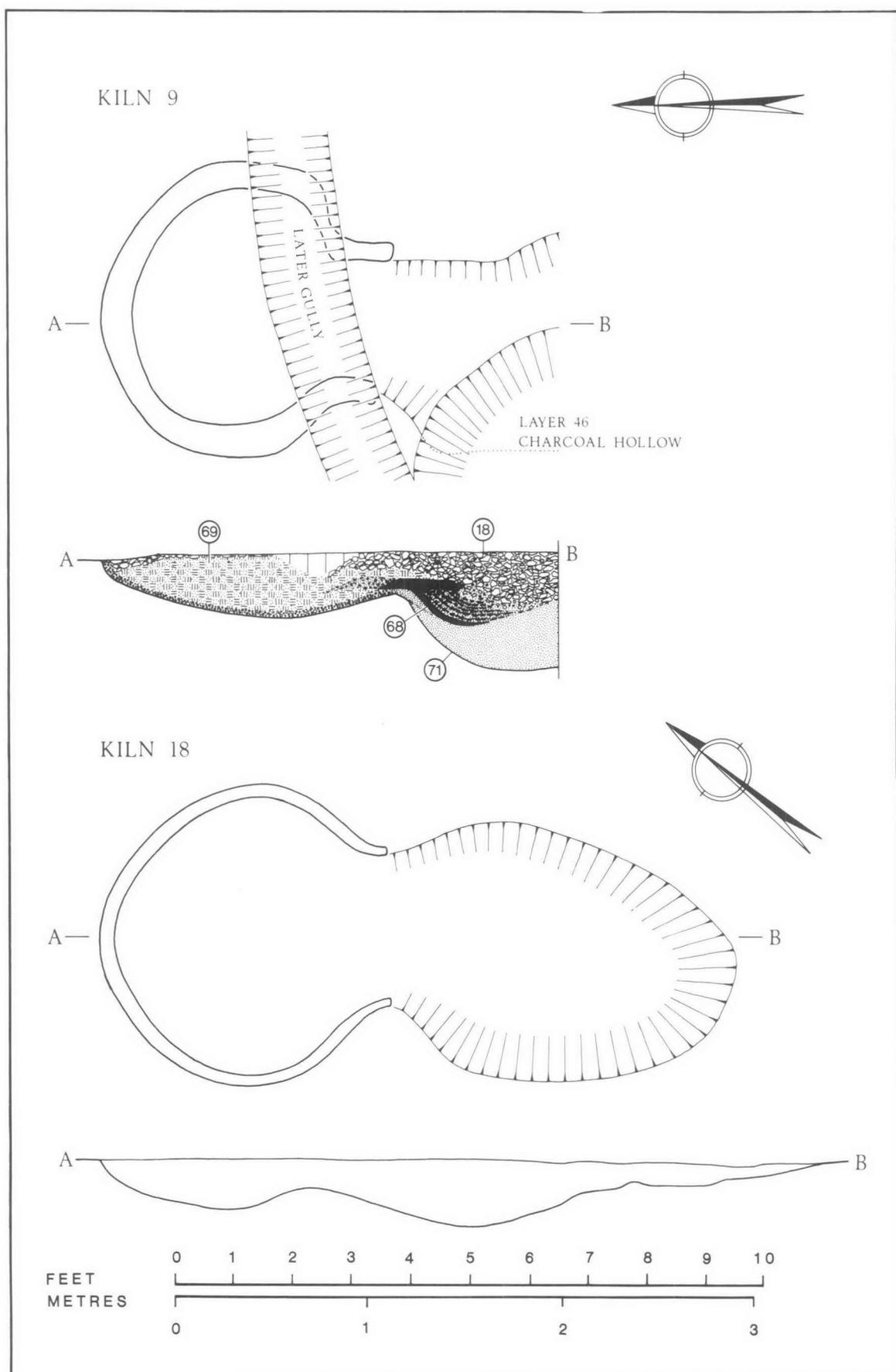


FIG. 10 Selected surface-built kilns: plans and sections of Kilns 9 and 18. Scale 1:30.

intense heat. It may have been shielded by clay lining, or the temperature in the kiln itself may have been comparatively low.

The internal diameter of the kiln-chamber lay between 3 ft. 6 in. (1.07 m) and 5 ft. (1.52 m). Most kilns were close to the average of 4 ft. 3 in. (1.30 m) (see TABLE I). Only two (Nos. 12,14) were as little as 3 ft. 3 in. (0.99 m) wide. The figures suggest that there was no standard Roman dimension laid down for the kilns.

The plans of the kiln-chambers and the stokeholes together resembled either a figure-of-eight or an hour-glass. 'Hour-glass kilns' with a flue of measurable length were few (Nos. 4,8,13,14). Maximum flue length was about 2 ft. (0.61 m). The majority of kilns were 'figure-of-eight', having no flue, but an aperture *c.* 1 ft. 6 in. (0.49 m) across in the front of the kiln-chamber. The floor at this point was normally soot-stained natural gravel, and its level tended to be just above that of the kiln-chamber floor.

The stokeholes, noted as ill-defined dark stains in the soil, varied in shape and size. Most were oval, *c.* 4 ft. (1.22 m) long by 4½ ft. (1.37 m) wide. Often the deepest point was lower than the level of the kiln-chamber floor, possibly to ease drainage or access to the flue aperture.

A relationship between the kiln stokeholes and the partially backfilled Iron Age ditches was evident (FIG. 4). While the kiln-chamber lay on firm ground on the outer lip of the ditch, the stokehole often extended down its western slope (Nos. 13,14,16,17,18, 20). Occasionally, where the stokehole lay outside the ditch (e.g. No.5), rakings had spread from it into the ditch. The stokeholes of Kilns 8 and 9 overlay a small back-filled ditch of Iron Age date west of the NW ditch of Yard I (FIG. 4). The stokehole of Kiln 23 likewise overlay an earlier, probably Roman, gully. The potters clearly took advantage of the existing hollows to reduce the amount of digging they had to do and to improve drainage.

After the surface-built kilns had gone out of use, the depressions that they left filled or were filled with dark brown earth containing a few potsherds. The amount of debris left in the stokeholes was generally small, and they, too, were levelled with gravel or earth containing Roman artefacts. Kiln 9 had evidently been deliberately and carefully backfilled with solid crushed limestone.

ii. *Details of Selected Kilns*

Kiln 9

Kiln 9 (FIG. 10), the best preserved and most informative of the surface-built kilns, lay *c.* 50 ft. (15.24 m) west of the NW ditch of Yard I (FIG. 4) (71.56.68,69,18,46). Its axis ran NNE-SSW, and the stokehole was on the south. The kiln chamber measured 4 ft. 8 in. (1.40 m) across externally, and 3 ft.9 in. (1.14 m) internally. It survived as a shallow depression *c.* 10 in. (25.4 cm) deep in the gravel subsoil, which showed signs of burning 2 in. (5.08 cm) deep. Filling it was a mixture of orange-red burnt clay and sand (56.69) including a sherd of indeterminate calcite-gritted pottery. The burnt clay was presumably all that was left of the lining. Above it had been spread a fairly thin deposit of pale yellow crushed limestone. A shallow gully, probably later in date, ran obliquely across the kiln mouth.

The kiln flue was about 1½ ft. (0.46 m) wide and debouched directly into the stokehole. Its sandy floor was heavily burnt and carried an accumulation of charcoal, ash and furnace rakings (56.68) extending down into the stokehole. The bottom of the stokehole was about 6 in. (15.24 cm) lower than the floor of the kiln-chamber, and it occupied a hollow over an earlier (probably Iron Age) ditch (56.71). The stokehole measured *c.* 3 ft. (0.91 m) N-S by *c.* 4 ft. (1.22 m) E-W. The firing debris remaining had been sealed by a dump, 9 in. (22.86 cm) thick, of crushed limestone (56.18) like that in the kiln-chamber. The packing contained a few abraded sherds of calcite-gritted pottery and Longthorpe ware.

The western side of the stokehole was cut away by a pit *c.* 4 ft. (1.22 m) wide and 1 ft. (0.31 m) deep, filled with black soot and furnace rakings (56.46). Finds from it included a Hod Hill fibula (FIG. 21,8), a sherd of Neronian samian form 29 and sherds of Longthorpe pottery. The black filling was separated from the crushed limestone filling the stokehole by a thin layer of orange-brown sand (56.67) not visible in section. The pit (56.46) probably belongs to the series of

enigmatic charcoal hollows described below; but its presence indicates that after the kiln and its stokehole had been abandoned, backfilled and carefully consolidated, industrial activity continued on this part of the site.

Kiln 18

Kiln 18 (72.F8) is one of a battery of kilns along the outer edge of the NW ditch of Yard II (FIG. 10). The kiln-chamber, *c.* 8 in. (20.32 cm) deep, had a burnt natural gravel floor, with few traces of clay lining. It measured internally *c.* 4 ft. 4 in. (1.32 m) in diameter. The flue, *c.* 2 ft. (0.61 m) wide, gave out directly into the stokehole, which was 4 ft. (1.22 m) wide and up to 5½ ft. (1.67 m) long. The latter was filled with mixed soot and burnt gravel, sealed later with clean brown earth.

Although the deepest part of the stokehole was cut like the kiln chamber into the sandy natural gravel on the edge of the ditch, black furnace rakings spread from it into the strata in the ditch. The implication of this is that the greeny-grey deposit over the edge of which the rakings lay may have started to form during the working lifetime of the kiln (see below p.58).

Kiln 22

The internal diameter of Kiln 22 was 4 ft. 6 in. (1.37 m) and its depth below the stripped gravel surface was 1 ft. (0.31 m), that is to say about 2 ft. (0.61 m) below the modern field surface (FIG. 11). There was no clay lining apparent on the burnt gravel floor of the chamber which sloped upwards towards the back. A ring of burnt gravel and clay *c.* 1½ in. (3.8 cm) thick marked its outline.

The flue (*c.* 1½ft. (0.46 m) wide) had a patch of red clay on its floor, but sloped almost immediately down into the stokehole to the east. In plan the stokehole measured *c.* 3 ft. (0.91 m) by 4 ft. (1.22 m), but its bottom was at least 1 ft. 6 in. (0.46 m) below the level of the kiln-chamber floor and it formed a significantly lower working area. Associated with the furnace rakings in it were lenses of burnt clay and grey wood ash. They in turn overlay a series of deposits within a large pit (Pit 2) cut through the NW side of the NW ditch of Yard II (FIG. 11).

Kiln 27

Kiln 27 was one of a small number of isolated kilns set at a considerable distance from the majority which cluster along the western side of the Iron Age farm enclosures (FIGS. 6,11). It lay about 300 ft. (91.44 m) west of the W corner of Yard I, and was orientated N-S, the stokehole being at the south. Both kiln-chamber and stokehole were cut into natural sandy gravel to the same level.

The kiln-chamber formed a shallow bowl 9 in. (22.86 cm) deep and about 4 ft. 2 in. (1.42 m) across. Particles of burnt clay survived from its lining. The flue was about 2 ft. (0.61 m) wide and the stokehole (possibly truncated, certainly ill-defined) was *c.* 2 ft. 6 in. (0.76 m) across. The filling of the abandoned chamber contained dark sandy earth with no pottery, but a bronze stud-head (p.91, No.41) was present.

iii Disposition and Function of the Kilns

Most surface-built kilns were ranged along the outer lip of the NW ditches of Yards I and II. Nine of them are disposed along the NW ditch of Yard I, in two groups, separated by the working terrace (Pit 7, FIG. 4). All are orientated NW-SE. Eleven kilns have a similar relationship to the NW ditch of Yard II. Kiln 26, at the south end of this row, lies with its stokehole to the west. It may be related in some way to Pit 3 which was probably dug in the Claudian period, although most of its filling is later Roman.

Not all kilns fit this pattern. Kilns 8 and 9, orientated NE-SW, are 50 ft. (15.24 m) from the boundary ditch of Yard I, and overlie an earlier, probably Iron Age, ditch which may run towards Kilns 1-3 on the Haul Road (FIG. 6).

Kilns 27 and 28 on the Haul Road are more isolated (FIG. 6). They are 300 ft. (91.44 m). and 1200 ft. (365.76 m) respectively west of the W corner of Yard I, and Kiln 28 is not far from the

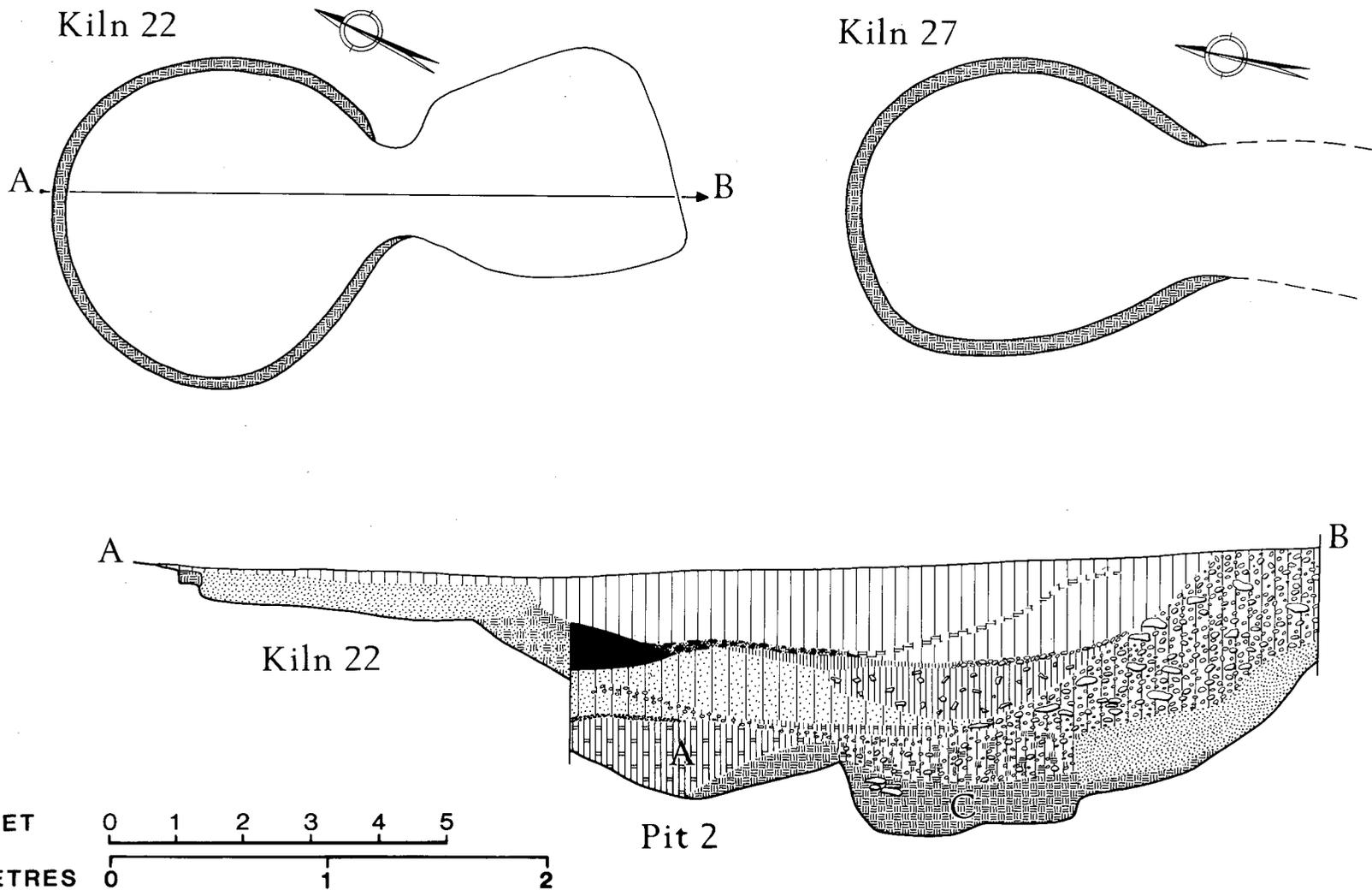


FIG. 11 Selected surface-built kilns: plan and section of Kiln 22, plan of Kiln 27. Scale 1:30.

LONGTHORPE II

TABLE I
 DETAILS OF THE SURFACE-BUILT KILNS AT LONGTHORPE
 Note: 1' (= 1ft.) represents 30.48 cm; 1" (= 1 inch) represents 2.54 cm.

Kiln No.	Site Code	Kiln Chamber Internal Diameter	Depth of Kiln Chamber	Lining of Kiln Chamber	Filling of Kiln Chamber	Finds in Kiln Chamber	Flue Length
4	71.53.5	c.4'×c.5'	10"	some burnt clay	brown earth burnt gravel	1 Longthorpe flagon sherd	2'
5	71.53.6	c.4'×4'8"	6"	c.2" burnt clay frags	brown earth	Longthorpe flagon sherds	-
6	71.53.21	(burnt clay, visible only in section of trench)		burnt clay fragments			
7	71.50.5	(cut away)					
8	71.56.16	5'4"×c.5	c.2	c.4" burnt clay	brown earth	-	2'
9	71.56.69	c.3'9"	c.10"	c.5" burnt clay and gravel	crushed limestone	-	c.1'
10	74.B2.4	4'6"	1'9"	burnt clay fragments	brown earth	-	
11	74.B2 Trench 2	4'	-	burnt clay	brown earth	-	
12	74.B2 'Kiln 1'	3'4"	c.3"	2" burnt clay	prob. brown earth	-	destroyed
13	74.B3 'Kiln 2'	4'6"	c.10"	burnt clay fragments	brown earth	1 Longthorpe sherd; bronze sheet FIG. 24.59)	2'6"
14	74.B3 'Kiln 1'	3'3"	c.9"	burnt clay fragments	brown earth charcoal and clay flecks	-	c.2'
15	72.F5	3' (damaged)	(shallow)	burnt gravel	brown earth	-	-
16	72.F3	c.4'	c.3"	burnt clay rim	brown earth	-	-
17	72.F2	c.4'	(shallow)	burnt gravel rim	brown earth	-	(damaged)
18	72.F8	c.4'4"	(shallow)	burnt gravel rim	brown earth	-	-
19	72.F7	c.5'	-	burnt gravel rim	-	-	(outside the trench)
20	72.F1 71.61 'Kiln B'	c.4'8"	c.3"	burnt clay fragments	brown earth	-	-
21	LTH72; 71.61	c.4'	-	burnt clay fragments	-	-	-
22	LTH 72; 71.61 'Kiln A'	4'6"	1'	1½" burnt gravel and clay	brown earth	-	-
23	72.F13	c.4'6"	-	burnt gravel	-	-	-
24	72.F14	c.3'6"	(shallow)	burnt clay rim	-	-	-
25	72.F15	c.3'4"	-	burnt gravel	-	-	-
26	71.60	c.3'	-	burnt clay	-	-	-
27	LHR72. F26	4'2"	9"	2" burnt clay	dark sandy earth	bronze stud head (no.41)	-
28	LHR72. F27	4'6"	c.10"	burnt natural clay rim on stone natural floor	brown sandy earth	bone, shds of amphora and calcite grit	-
29	LHR72.F23	4'	(shallow)	burnt clay rim	brown earth	-	-

SE corner of the fortress. The Haul Road cutting, however, was only a sample of the landscape, and there may once have been more kilns there.

Stratigraphic relationships between kilns, and between kilns and other features, could rarely be established. The partially filled Iron Age ditches, as we have already emphasised, were a significant feature of the industrial terrain, and many of the kilns can be shown to overlap the ditches directly. The early Roman pit (Pit 1) in the N angle of Yard I and the contemporary pit or pits near the west corner of Yard II (Pit 2) were both open and being gradually filled during the working lifetime of the adjacent kilns. Thus relationships can be demonstrated between Kilns 4 and 5 and Pit 1, and between Kilns 21,22 (and perhaps also 23) and Pit 2.

Kilns 13 and 14 shared a stokehole and may have been in use simultaneously (FIG. 4). The variable spacing between the other kilns sheds no light on the crucial question of how many kilns were in operation at once. Kiln 9 was carefully backfilled after abandonment (p.43), and the clean brown earth in most other kilns may reflect deliberate clearing up. The charcoal-filled hollow (56.46) over the backfilled Kiln 9 hints that a sequence of kiln use did exist.

The function of the surface-built kilns was debated at length during the excavation, and for a while they were regarded as corndriers or bread-ovens – the latter a particularly attractive hypothesis. No waster pottery or other industrial debris was found in or around them. However, the following points may be made in favour of their being pottery kilns.

- (a). Kiln 3, which shared a stokehole with the unequivocal pottery Kilns 1 and 2, had all the hallmarks of the surface-built kilns (p.39). Its role as a pottery kiln seems likely in view of its context, and it is but a short step to attribute the same function to the surface-built kilns.
- (b). The sheer mass of waster pottery from the site, especially from the NW ditches of the yards and nearby pits and hollows, points to large-scale pottery production. It is easier to suppose that the surface-built kilns had a role to play in this than to attribute the whole production to Kilns 1,2, and probably 3 – or to other dug kilns missed in survey and excavation.
- (c). Fragments of three firebars were recovered, one from a Claudio-Neronian and two from later contexts on the site of the Iron Age farm (FIG. 30, Nos.175–177). The last two had a considerable admixture of straw or grass in the fabric, like the firebars used on Roman saltern sites in the Fens. The largest bar (FIG. 30, No.175) from the filling of Pit 1 in the N corner of Yard I, however, is more likely to be kiln furniture and probably carries the other two with it. All can be paralleled at other early Roman pottery production-sites on the Upper Nene.²²
- (d). Close structural parallels to the Longthorpe surface-built kilns can be found at Rushden and other sites on the Upper Nene.²³ At Rushden the link between surface-built kilns, kiln furniture and waster dumps was beyond doubt, and provides strong circumstantial evidence for the function of the Longthorpe kilns.

C. PITS

Pit I

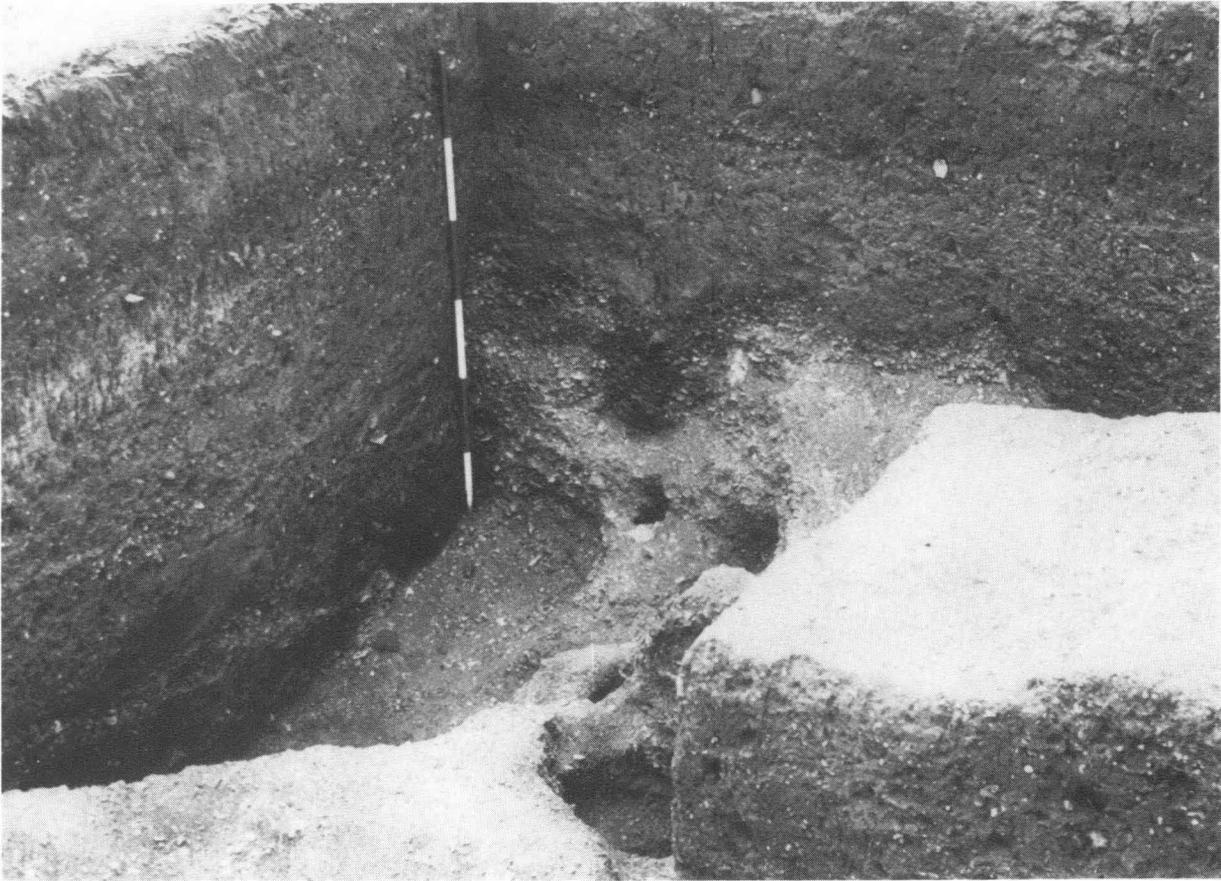
The aerial photographs clearly indicated a large pit in the north angle of Yard I (FIG. 4). Crop-marks suggested that it overlapped the rounded corner of the enclosure ditch, and excavation confirmed this. The north quadrant of the pit was taken out in 1971; but, while all the deposits within it were examined, not all were stripped out entirely.

The layer sequence demonstrated that Pit 1 was gradually filling up long after the enclosure ditch itself had been completely backfilled (PL. IX and FIG. 12). Moreover, it seems likely that the pit was excavated at a time when the ditch had been at least partially filled. The dating provided by the pottery and other finds from the relevant deposits confirms the relative sequence.

The floor of the pit, cut into pale yellow gravel, had been left very uneven by its original excavators. The main hollow in the estimated centre of the pit was 8 ft. (2.44 m) deep, measured from the present topsoil (FIG. 12). The lower 3 ft. (0.91 m) had almost vertical sides. The small

22. P.J. Woods, 'Types of late Belgic and early Romano-British Pottery-kilns in the Nene Valley', *Britannia* v (1974), 262 ff.

23. *Ibid.*, 265 f.



PL. IX Pit 1 in the N corner of Yard I on the Iron Age farm, seen from N. Scale in feet.

holes on the gravel ledge around its western perimeter (71.53.27,28) are probably natural: no finds were made in their brown sand filling. The irregular floor of the pit sloped upwards and outwards until it reached the inner lip of the Iron Age ditch which lay at $3\frac{1}{2}$ ft.—4 ft. (1.07–1.22 m) below the ground surface.

On the bottom of the hollow in the pit was a layer of brown sandy silt (71.53.38), *c.* 9 in. (22.86 cm) thick, directly over natural gravel. It contained no finds. Over it, and following upwards the uneven floor of the pit was a series of interleaved layers of charcoal, red burnt clay, burnt gravel and stone and carbonised wood (71.53.13,20,36) which linked up on the north across the backfilled ditch with a thin spread of furnace rakings from the stokehole of Kiln 4 (71.53.3). The major part of the deposit may be attributed to the activities of the potters; it contained Longthorpe pottery and Claudio-Neronian samian.

Throughout the central area of the pit, oversailing in part the burnt deposit (71.53.13) was a layer of dark brown sand (71.53.18) 1 ft. (0.31 m) thick. Where it reached natural in the SE corner of the lower hollow, it mingled with slipped natural gravel. The profile of the hollow (FIG. 12), however, was unexpectedly fresh and little weathering had taken place before the sand (71.53.18) was deposited. Sealing the sand and the burnt debris (71.53.13) was a thick layer of brown stony earth with silt bands (71.53.10). It contained a firebar fragment (FIG. 30, No.175), a small collection of Longthorpe pottery, amphora sherds and the disarticulated skeleton of Dog 5 (Burial 5, p.188). The adjoining layers of similar material (71.53.19,22,26) over the Iron Age ditch may properly be regarded as upper ditch filling: they contained either no pottery or sherds of indeterminate calcite-gritted ware. (Layer 71.53.19 contained Burial 1 of Dog 6, p.188.) Although they are likely to antedate the main filling of the pit, the precise relationship between them and pit layer 10 was not absolutely clear.

A wide shallow hollow was left, or developed through settlement of the stony layer (10) in the centre of the pit. It filled to a depth of *c.* 1 ft. (0.31 m) with fine greeny-grey matter (71.53.9, see p.58), which contained Longthorpe pottery, decorated samian (FIG. 34, No.5), a fragment of

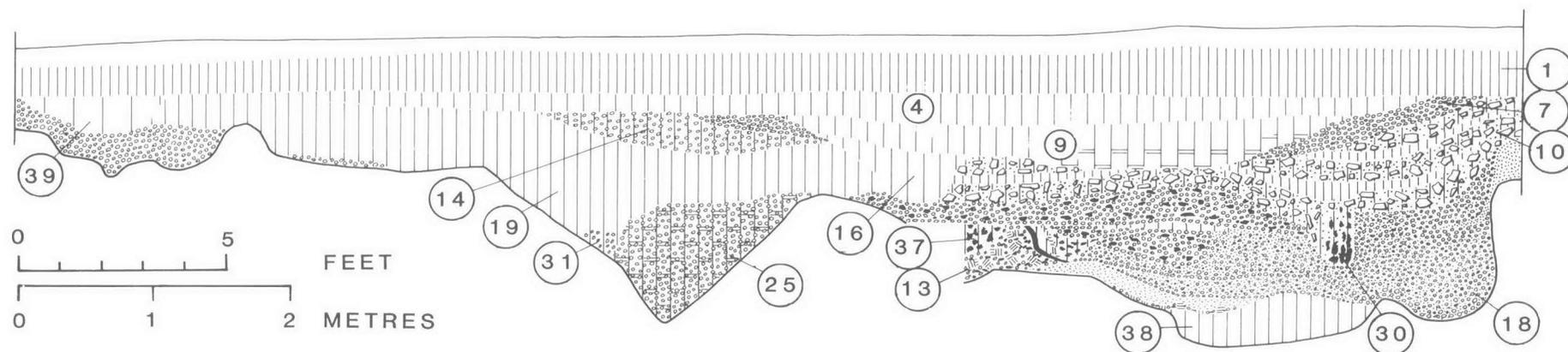


FIG. 12 Section of Pit 1 (71.53 E face). Scale 1:48.
 For key to layers, see p.23

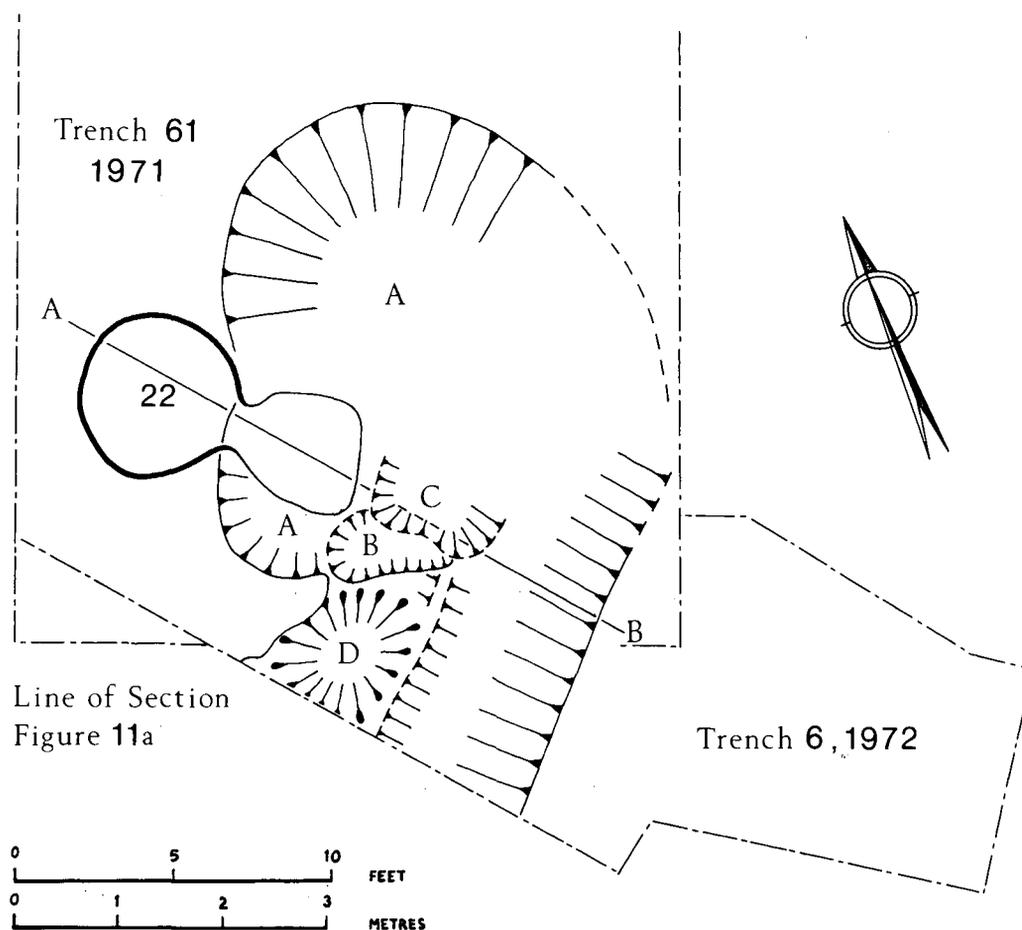


FIG. 13 Plan of Pit 2 complex. Scale 1:72.

glass pillar-moulded bowl (Isings form 3a) and sherds of a Lyon cup (FIG. 41, Type 62, p.150). The lower part of this deposit was noticeably more clayey than the rest. Associated with layer 9 was a bowl-shaped depression (17) and a possible gully (16) overlying the burnt deposit (13) and upper ditch deposits above the north angle of the yard ditch. They, too, had a greeny-grey filling.

The final layer over the pit beneath the later Roman ploughsoil (71.53.1) was hard compacted greeny-grey material (71.53.4) with stones, samian, a fragment of pillar-moulded glass (Isings form 3c) and military metalwork (FIGS.22, No.22; 24, No.57; 28, No.126).

The pit was probably dug at the outset of the Roman occupation, but a late Iron Age date cannot be ruled out completely. Its purpose was presumably the winning of gravel or possibly clay. Later, potters' waste was dumped into it (71.53.13) and there may have been attempts to level it with layers 18 and 10 before the greeny-grey material (71.53.9,4) began to accumulate in the hollow.

Pit 2

Excavation in 1971 (Trench 61) and 1972 (Trench 6) brought to light a complicated group of intercutting pits and hollows along the NW ditch of Yard II (FIGS.4, 11, 13). They were sectioned, but not completely explored. The order of their original digging and subsequent backfilling is not certain; the order adopted below, however, seems the most plausible.

Intrusion A extending from Trench 6 into Trench 61 (FIG. 13) removed the outer edge of the Iron Age ditch. It was at least 4 ft. (1.22 m) deep, 9 ft. (2.74 m) wide and up to 16 ft. (4.88 m) long. Its filling was reddish-brown sandy silt over a thin slick of greeny-grey clay on gravel subsoil. Hollow B lay within it. Intrusion C (3 ft.6 in. (1.07 m) by 2 ft. (0.61 m) by c. 1 ft.4 in. (0.41 m) deep) was cut through the floor of A before it had filled far; it contained blue-grey clay and mixed earth, cobble and clay. The wide depression left by A and C had limestone rubble

tipped into it from the west, and over that was sandy loam and the first debris from potters working at Kiln 22.

On the south side of Trench 6 the Iron Age ditch was almost full when Intrusion D was sunk into it (FIG. 13). The outer lip of the ditch was removed by the new feature which extended further west. It measured at least 5 ft. (1.52 m) E-W by 6 ft. (1.83 m) N-S. Intrusion D cut through a layer of limestone tipped from the east over the Iron Age ditch. If this corresponds to the limestone dumped into the depression A/C, then D may be late in the sequence.

The intrusions postdate the filling of the Iron Age ditch, but antedate the earliest Roman industrial working on the spot. There is no independent dating evidence. They may perhaps have been gravel or clay pits opened at the beginning of the Roman occupation.

Pit 3

Pit 3 lay just outside the west corner of Yard II and did not impinge on the Iron Age ditches (FIG. 4). Its radius was estimated at about 10 ft. (3.05 m) from a segment taken in 1971 from the south-east corner.

The pit had been dug to 7 ft. 6 in. (2.27 m) beneath the present ground surface through strata in which yellow clay predominated over gravel. Its southern slope had been left, perhaps deliberately, as a series of steps ending at the bottom in a square or rectangular depression. The open pit had evidently weathered for some time and a layer of clayey silt (1 ft. 6 in. (0.46 m) deep (71.60.6)) was sealed by thick iron pan. The silt contained part of a handmade carinated bowl (FIG. 40, Type 41), a sherd of possibly Iron Age calcite-gritted pottery and a fibula of Colchester type III (FIG. 21, No.6) of Claudio-Neronian date.

Pit 4

Pit 4 (FIG. 4, 71.62) was first noted as an anomaly centering at 25 gamma on the 1971 magnetometer survey. The southern half of the pit was excavated in the same year (FIG. 14,a).

The pit, almost 8 ft. (2.44 m) wide and over 5 ft. (1.52 m) deep, had a flat bottom and gently sloping sides. The primary silt (71.62.7) was sandy brown clay leached from the clay in the gravel subsoil; it had heavy inclusions of burnt and decayed limestone, and contained a piece of triangular Iron Age loomweight (not illustrated) and sherds of handmade calcite-gritted jar. After the pit had filled to a depth of 3 ft. (0.91 m) with more sandy silt, a deposit of greeny-grey matter (71.62.2) accumulated in the hollow. It held some large sherds of handmade calcite-gritted jar, an unused crucible (FIG. 30, No.169) and a fragment each of Nene Valley grey ware and early colour-coated beaker.

The lower half of the pit contained nothing definitely Roman, although the presence of pieces of burnt limestone should be noted. The pit could have been dug in the Iron Age or in the early Roman period. It was still being consolidated in the second century. We would prefer to assign its digging to an early Roman date, to accord with what we know of Pits 1-3.

Pit 5

A patch of dark stony earth and charcoal (71.56.38) drew attention to the position of Pit 5 when topsoil was stripped from Trench 56 west of the NW ditch of Yard I (FIG. 4). The mouth of the pit was a circle just over 5 ft. (1.52 m) across, and its maximum depth was *c.* 5½ ft. (1.68 m) below the modern field surface. It had a flat bottom and almost vertical sides in compact natural gravel; but the upper part of the south side sloped downward and inward, restricting the lower 3 ft. (0.91 m) of the pit to 3 ft.3 in. (0.99 m) N-S (FIG. 14,b).

Beneath the upper level of consolidation (71.56.38) was a thick layer of greeny-grey matter (71.56.42) which contained a small collection of Longthorpe sherds and a bone awl (FIG. 25, No.101). It sealed 3 ft. (0.91 m) of yellowish-brown sandy silt (71.56.56) which was one of the few undisturbed Claudio-Neronian deposits on the site. The pottery from it (p.195) was an important group and included the only complete vessels from the site, a jar (FIG. 44, Type 101) and a two-handled flagon (FIG. 38, Type 8a). Some of the sherds were probably overfired. With them were found sherds of pre-Flavian Dr.15/17, a Nauheim-derivative fibula (FIG. 21, No.3) and an early dragonesque brooch (FIG. 21, No.9). The pit was probably dug during the opening

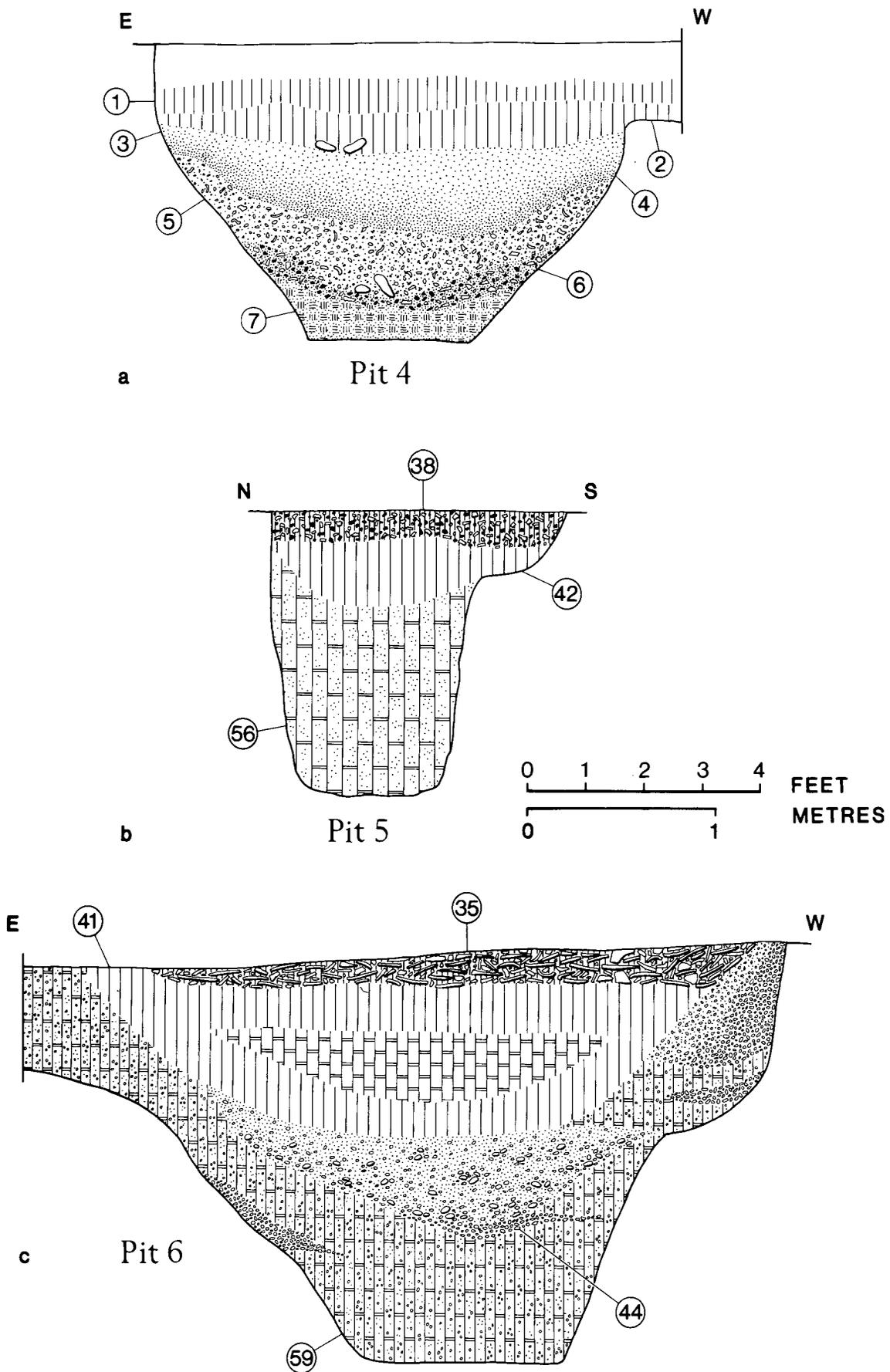


FIG. 14 Sections of Pits 4-6. Scale 1:30.
 a. Section of Pit 4 (71.62.N face)
 b. N-S section of Pit 5 (71.56.38)
 c. E-W section of Pit 6 (71.56.35)
 For key to layers, see p.23

phase of the Roman occupation. The filling must have been rapid, for there was no sign of frost action on the sides.

Pit 6

Pit 6, lying between Pit 5 and Kiln 8 (FIG. 4) was up to 12 ft. (3.66 m) wide and 6 ft. (1.83 m) deep. The profile sloped gently; but it had been heavily weathered while the pit was open. Brown sandy silt and gravel (71.56.59) filled the lower 2 ft. (0.61 m), interleaved with lenses of displaced gravel. In the silt were a few sherds of calcite-gritted and Longthorpe pottery. A patch of charcoal (56.44) in the top of the silt (56.59) contained two bone points (FIG. 25, Nos.99, 100). Light brown pebbly sand overlay the dark silt and that was sealed by a series of deposits of greeny-grey material varying from clayey to powdery in composition (71.56.41). They had evidently accumulated over a period of time and contained Claudio-Neronian samian ware and a group of coarse pottery in which native-style jars predominated (FIGS.39, Type 126; 41, Type 65e; 42, Types 72, 73; 43, Types 90a, 90b; 44, Type 108; 35, No.4). There were two residual Iron Age vessels (FIGS. 31, No.5; 33, No.50). The finds represent rubbish cast into the hollow before it was finally levelled with earth and small stones (71.56.35) perhaps in the second century.

Pit 6 cut the clean sandy filling of a channel (*c.* 2 ft. (0.61 m) wide and 8 in. (20.3 cm) deep) (71.56.39, 52), the sinuous and interrupted course of which was traced across the stripped gravel surface. It did not drain into Pit 6, and may even have been a natural feature.

Pit 7: Working Platform or Terrace

A conspicuous feature of the aerial photographs of the Iron Age farm (PL I) is a dark zone of disturbance along the NW ditch of Yard I. Excavation showed that the crop-mark was promoted by a wide platform or terrace extending west from the outer lip of the ditch and measuring up to 60 ft. (18.29 m) NE-SW and 20 ft. (6.1 m) NW-SE (FIGS. 4,16). Its maximum depth (on the outer lip of the ditch) was *c.* 5½ ft. (1.68 m) below the present land-surface; but the floor was uneven and while it sloped up gently to the west, the profile on the SW was much steeper (FIG. 5,d). The eastern flank was not fully investigated; but the terrace probably stretched no further than the inner lip of the Iron Age ditch.

The floor of the terrace (FIG. 16), which sloped down towards the south following the contour of the hillside, lay on a stratum of white natural gravel; but the original excavators had left piles of redeposited darker gravel and sand strewn across it, particularly at the SW end (FIG. 5,d). Few finds were made in the redeposited material and the silt-filled hollows on the terrace floor (e.g. 71.56.37, FIGS. 15,16), but they were of early Roman date. The terrace is perhaps best

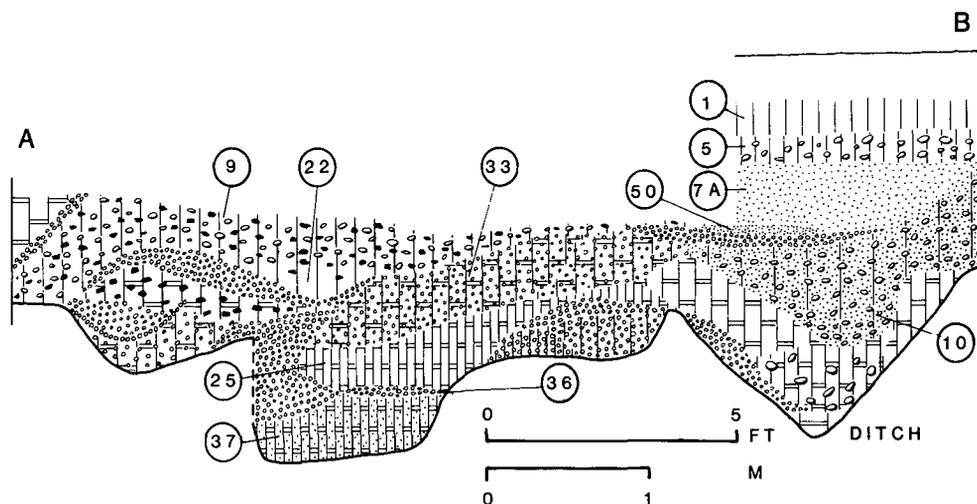


FIG. 15 Section A-B across lower deposits on E side of working terrace (Pit 7) (71.56). Scale 1:46.
For key to layers, see p.23

interpreted as a gravel quarry from which material was extracted by the construction gangs from the fortress.

The abandoned depression soon began to be used for tipping industrial waste from the nearby pottery kilns (FIGS. 15,16). Excavation revealed an extremely complex sequence of patches of furnace rakings (e.g. 71.56.11-14) and burnt sand and gravel (e.g. 71.56.47,49,50), interspersed with lenses of cleaner gravel. The patch of furnace debris 71.56.12 in the centre of the western slope of the terrace may serve as an example. It consisted of burnt sand, charcoal, and ash and it contained a considerable quantity of Longthorpe pottery (FIG. 39, Types 22, 24b, 28b; FIG. 41, Type 65d; FIG. 42, Types 69, 70a; FIG. 44, Types 95a, 100; FIG. 45, Type 117a), glass, a fibula pin (p.87, No.14), and iron objects (FIG. 29, No.150; p.105, No.168). In the same sequence of industrial deposits were layers of burnt clay and charcoal (e.g. 71.56.26,43). A few of the hollows left during the tipping (e.g. 71.56.60) were used to dump domestic refuse. The overall depth of the tipped deposits rarely exceeded 2 ft. (0.61 m).

Once the tipping had slowed down or ceased, the deposits which had built up on the terrace were blanketed with a layer of greeny-grey material. It was at its thickest (c. 18 in. (45.72 cm)) over the northern half of the terrace, but spread into the southern section too, filling open hollows (such as 71.56.17) and any other features dug through it subsequently (e.g. the small pit 71.56.23). The lower part of the layer (71.56.9, FIG. 15) contained pebbles, some charcoal and lumps of raw 'green' clay, while the upper part was more finely divided (71.56.6) as one would expect of material that had settled naturally. The whole deposit contained a great deal of Longthorpe pottery, Claudio-Neronian samian ware (forms Dr. 15/17, 18, 27, 24/25, 29, Ritt.12), glass and items of military metalwork (for example, from 56.9: FIG. 22, No.20; FIG. 23,

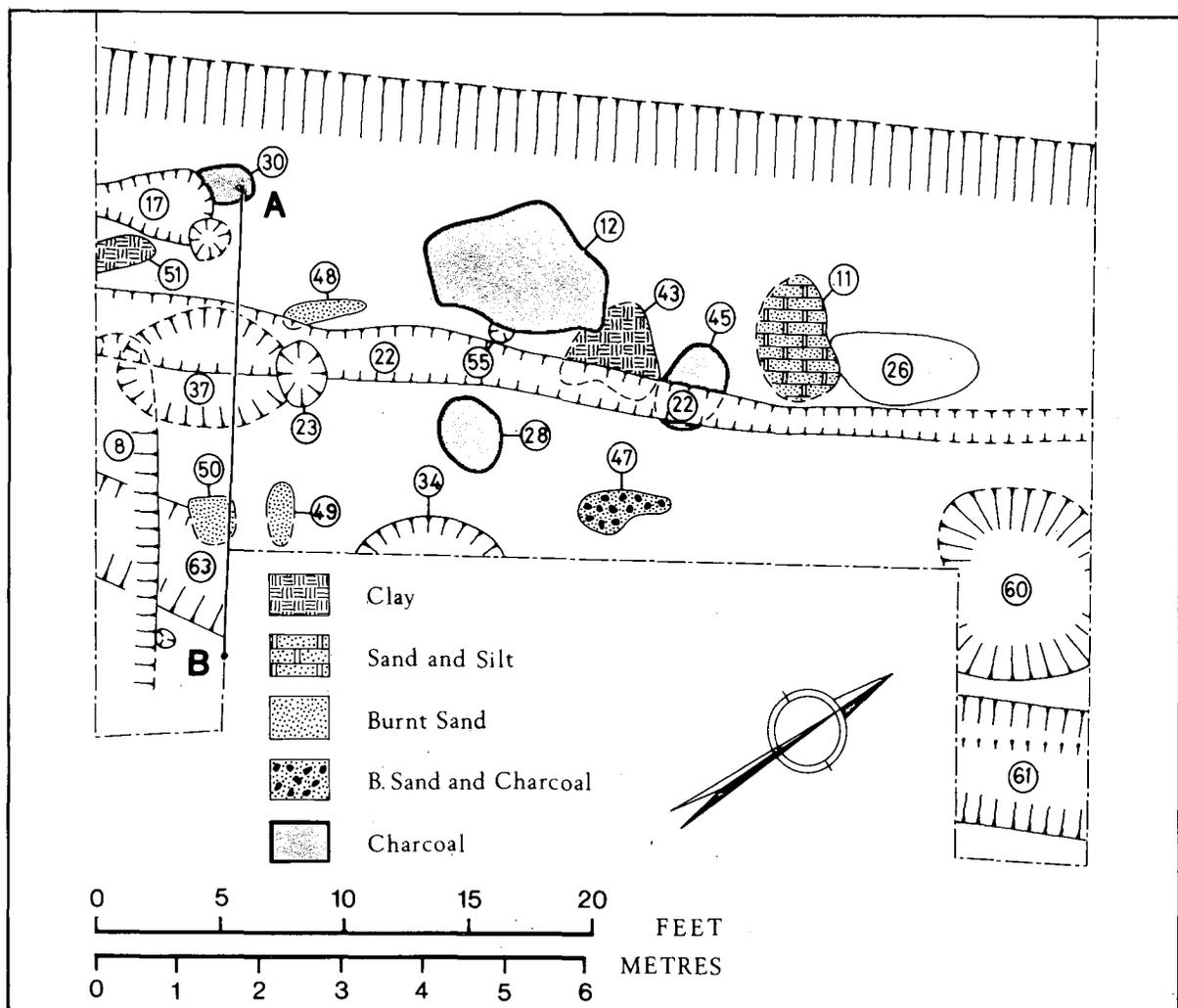
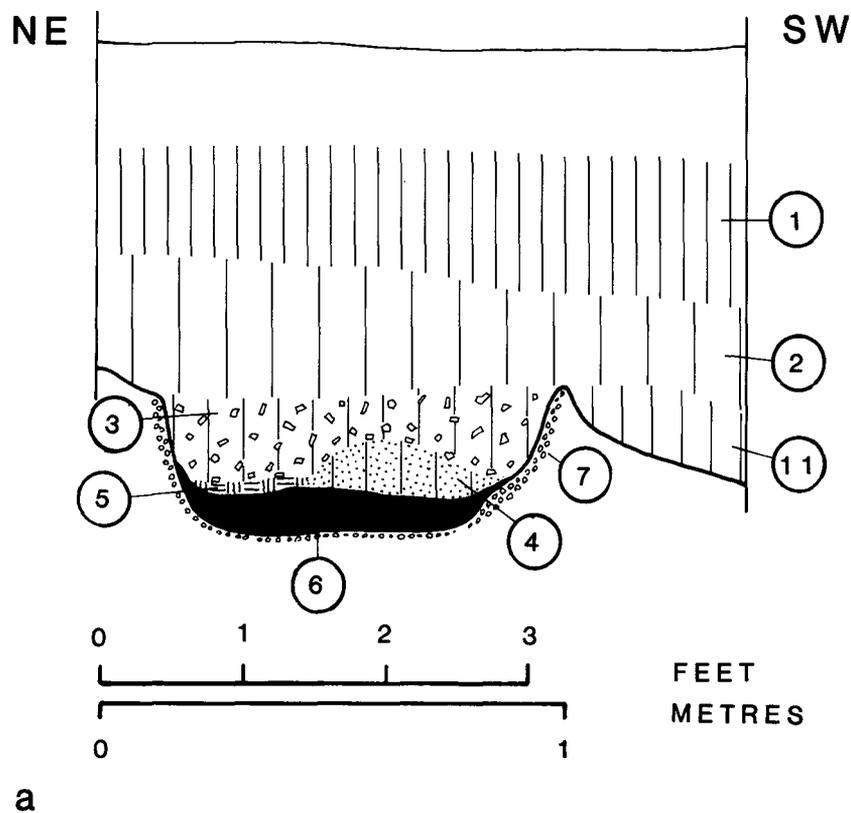
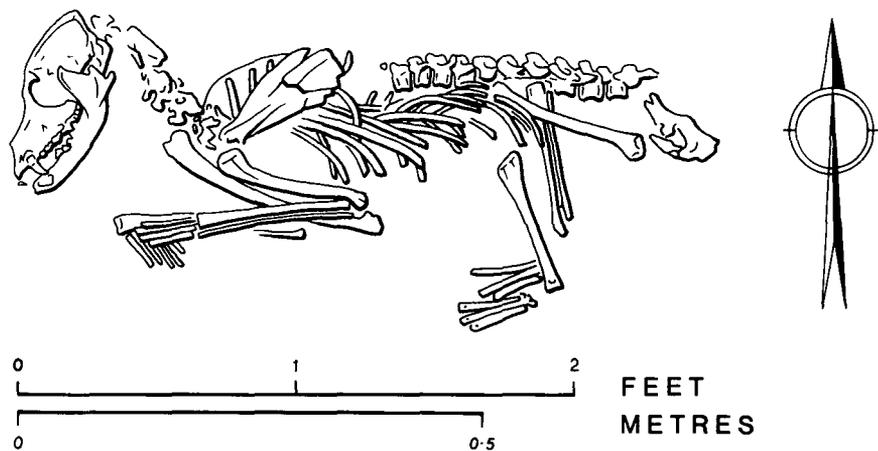


FIG. 16 Plan of main features on working terrace (Pit 7). Scale 1:90.



a



b

FIG. 17 a. Section NE-SW through a charcoal-filled hollow (70.XXIV.8). Scale 1:16.
 b. Dog Burial 2. Scale 1:8
 For key to layers, see p. 23

Nos.29, 32, 39; FIG. 28, Nos.130, 139; and Nos.43, 73, 76, 152 (not illustrated, p.105); from 56.6: FIG. 23, No.33; FIG. 28, Nos.127, 140; FIG. 29, No.142; and Nos.40, 74 (not illustrated, p.94). The skull and a few post-cranial bones of Dog 4 (Burial 6, p.188) were also recovered from the layer.

The greeny-grey material was not a sealed Claudio-Neronian deposit; for the upper layer (71.56.6) contained not only 23 sherds of slashed-cordon grey-ware jars of early to mid second-century date, but also 3 sherds of colour-coated beakers which must date to the latter half of the second century at the earliest. The lower greeny-grey layer (71.56.9) contained two sherds

of grey-ware jar (FIG. 46, Type 140) and a sherd of slashed-cordon jar, both second-century. There were few rims of Longthorpe pottery compared to the number of body sherds. The implication is that some at least of these objects found their way into the depression on the terrace in the second century. In the gravel dumped on the southern end of the terrace (between 74.B1 and 71.56, FIG. 4) was a cremation burial in a slashed-cordon jar dating to before *c.* 150 (p.183) (FIG. 46, Type 142).

D. CHARCOAL-FILLED HOLLOWES

A number of charcoal-filled hollows cut into the natural gravel was uncovered when topsoil was stripped along the eastern lip of the NW ditches of Yards I and II (FIG. 4). Although there were no stratigraphical links between the hollows and the pottery kilns, we regard it as significant that they lay opposite one another (for instance those opposite Kilns 10–14, shown on FIG. 4). Some were round (*c.* 2½ ft.–3 ft. (0.76–0.91 m) in diameter), others were irregular in plan, and they varied in depth from 7 in. (17.78 cm) to 1 ft. (0.31 m) (measured from the bottom of the modern topsoil). One hollow (70.XXIV.8) which lay, exceptionally, on the outer edge of the NE ditch of Yard I may serve as an example (FIG. 17,a). It was 2 ft.9 in. (0.84 m) across, *c.* 1 ft. (0.31 m) deep, with flat bottom and steep sides. The natural gravel had been heavily burnt around the bowl and a residue of charcoal and furnace rakings (70.XXIV.6), 6 in. (15.24 cm) thick, still lay on its floor. The depression contained patches of hard greeny-grey clay (5) topped with grey soil and a good deal of small stone (3). A sherd of late colour-coated bowl came from the latter.

No significant finds were made in any of the hollows excavated and their purpose remains obscure. They appear to have been dug to take burning or burnt material, presumably from the kilns. In the filling of the short length of ditch on the SW side of Yard I three more hollows were recorded. Each contained charcoal, ash, burnt gravel and lumps of raw green clay; but there was also greeny-grey silt, as if they had been dug after greeny-grey material started to accumulate in the ditch. These latter hollows seem to have had a different function from the charcoal-filled hollows and were not directly associated with kilns.

E. GULLIES

Two trial-trenches cut in 1970 across Yards I and II from south to north (III, XIX, FIG. 4) revealed a series of gullies in both yards. They seemed to be oriented NW-SE, roughly parallel to the main farm ditches. All were 1½ ft.–2 ft. (0.46–0.61 m) wide and no more than 9 in. (22.86 cm) deep. Most had a homogeneous filling of greeny-grey material and small stones. It was not possible to strip a wider area in pursuit of them.

A gully 2 ft. 6 in. (0.76 m) wide passing across the centre of Yard I (FIG. 4, 70.XII.I, XIX.2) disturbed a crouched burial of presumed Iron Age date (Burial 2, p.172). Its greeny-grey filling contained a skeleton of Dog 1 (Dog Burial 2, p.188), almost directly over the grave-pit of the human interment, and also yielded sherds of calcite-gritted jar, much Longthorpe pottery and a sherd of glass bottle dated A.D. 60–130 by Miss D. Charlesworth. A small pit was found on the line of the same gully about 22 ft. (6.71 m) further east (70.XIX.2) and in it were the disturbed remains of Dog 2 (Dog Burial 3), associated with Longthorpe pottery, a fragment of bronze and the neck of a calcite-gritted storage jar. The gully may have cut the pit, but both were full of the same greeny-grey powder. A gully found in 1974 (74.A1, B1, FIG. 4) debouched directly into the main NW ditch of Yard I, its level dropping as it approached the ditch. It was filled with sand and gravel, not greeny-grey material and so it may not be related to the other gullies.

We do not know the purpose of the gullies. Drainage seems unlikely, for the gravels of the hillside are permeable. Nor does the layout of the gullies show regular planning. In date, they fit best into the period of the early military occupation, but they could just conceivably be the work of the first civilian farmers.

F. THE GREENY-GREY DEPOSITS

The greeny-grey material which was found in most of the dug features on the site of the Iron Age farm deserves special comment. It was easily recognised – but not fully understood. Sampling unfortunately was put off until 1974; but in that season none of it was found in a pure form. When moist and freshly exposed, the material was dark brown in colour, but on drying it became pale greeny-grey. It was found in the main enclosure ditches on all sides of the two farmyards (except for the southern stretch of the NW ditch of Yard I), in small gullies within the yards and in Pits 4,5 and 6. In the ditches it had evidently accumulated over a period of years; for the lower levels contained small stones and were slightly clayey in texture whereas the upper levels were more finely divided and uniform, although they, too, sometimes contained stones that had rolled in (for example 70.XXVII.2,3; 70.III.18,19,20). In some features nearer the kilns (for instance on the working terrace (Pit 7)) lumps of raw greeny-grey clay were found in the layer.

No greeny-grey material was directly associated with the industrial working of the kilns; but where industrial waste had been tipped into a convenient depression, it often directly underlay a greeny-grey deposit, as has been described above in connection with the working terrace (Pit 7). It was noted, however, that furnace rakings from Kiln 18 (see above p.44) spread over the edge of the lowest greeny-grey deposit in the NW ditch of Yard II.

Accumulation of the greeny-grey material probably began at the end – or shortly before the end – of the pottery-manufacturing phase, and continued into the second century. A small number of sherds of second-century pottery (usually of Nene Valley grey ware) was found in many of the greeny-grey ditch deposits (for instance 70.XXVIII.3, SE ditch of Yard I). The second-century drainage gullies which ran down the hill beside the NW ditches of the two farmyards (FIG. 4) were full of greeny-grey material and in the SE ditch of Yard II greeny-grey soil was sealed beneath rubbish deposits and stone capping which probably date to the early third century. The most likely period for the accretion of the greeny-grey deposits therefore lies between the cessation of military pottery-making and the beginning of civilian farming in the early second century.

G. THE HUMAN BURIALS

Burial 4

The skull and sundry fragmentary long bones of a disarticulated human skeleton (p.175) were found at the northernmost end of the NW ditch of Yard I (FIG. 4). They lay in a hard brown sandy soil which appears to be the topmost layer of backfilling or gravel consolidation in the Iron Age ditch (71.53.34). In the same layer were sherds of Longthorpe pottery, and from a layer which probably extended below the burial came two pieces of Roman bone hinge (FIG. 25, Nos.97,98).

The remains were laid out E-W, with head to the west. The dentition suggested that the remains were of an individual of almost 10 years of age (p.180). Mr Rowbotham noted what appeared to be a fluoride mottling of the teeth, a defect which the child developed between the age of 1½ and 2½ years. During this time it was drinking water with an unusually high concentration of fluoride, such as one would not encounter in the Nene Valley.²⁴

It seemed likely to us at the time of the excavation that the burial was of the already disarticulated parts of a skeleton – partly, but not wholly, decomposed. Nevertheless, there may have been further disturbance during the early Roman period when Pit 1 was being dug. The remains however reached the position in which they were found long after the Iron Age ditches had been abandoned.

24. Information from the Anglian Water Authority through Mr A. Challands.

Scattered Human Remains

Remains of small babies (principally long bones and skull fragments) were found in several features of Claudio-Neronian date along the NW ditch of Yard I. Some were in the filling of the working terrace (Pit 7, 71.56. 21; 74.B1.3,8), others in pits and hollows further west (71.56.46,56). While the babies might represent disturbed Iron Age burials, it is more likely that they were early Roman.

H. DOG BURIALS

There was no obvious pattern to the dog burials, except that the animals had all been carefully interred in existing open features within the northern part of Yard I. All seems to have shared the same physical characteristics and differed little from one another in size (p.188).

Dog Burial 2. The complete skeleton of a mature dog (FIG. 17,b), oriented E-W with head to the west and lying on its right side, was uncovered in a gully (filled with greeny-grey material) in the centre of Yard I (*Dog 1* in the Bone Report, p.188, 70.XII.2). The small finds with it were of Claudio-Neronian date (FIG. 22, No. 23; No. 167), but an early second-century date for the burial, although unlikely, cannot be ruled out.

Dog Burial 3. The third dog (*Dog 2* in the Bone Report, p.188) was a disarticulated partial skeleton lying in a small pit with greeny-grey filling (FIG. 4, 70.XIX.2) on the line of the same gully as held Burial 2. It was the same size and age as the dog in Burial 2, and the two animals may have been buried at about the same time.

Dog Burial 4. The fourth skeleton (*Dog 3* in the Bone Report, p.188) was complete, but not fully grown. It was found in 1970 in the eastern area of the Iron Age farm, but the precise provenance is not known.

Dog Burial 5. A skull with a few attached vertebrae and dispersed long bones was all that was left of Burial 5 (*Dog 5* in the Bone Report, p.188). It lay in the stony filling of Pit 1 (71.53.10) directly beneath the greeny-grey deposits, and so dates unequivocally to the Claudio-Neronian period.

Dog Burial 6. Disarticulated remains of a dog (*Dog 4* in the Bone Report, p.188) were found in the greeny-grey deposits on the working platform (Pit 7) NW of Yard I (71.56.9). The layer had been disturbed in the second century, but it was probably a Claudio-Neronian burial.

I. DATING EVIDENCE

A word should be said about the dating evidence for the phase of the site's occupation which has been broadly referred to above as 'Claudio-Neronian'. Comparatively few deposits assigned to the early Roman industrial phase could be described as stratigraphically sealed. None of the early coins was found in a significant stratified position (see p.85). The greeny-grey material found in the majority of dug features on the site of the former Iron Age farm (see above) regularly contained a very small but consistent and so significant proportion of second-century sherds, pointing to interference by the later farmers at Longthorpe.

The dug kilns (Nos. 1-3) and their stokehole were undisturbed. They contained no samian, but a considerable quantity of coarse ware made on the spot and datable through parallels to the pre-Flavian period (see p.196). A sherd of Longthorpe flagon was embodied in the bollard-pedestal of Kiln 1. In a sealed layer of stokehole filling associated with Kiln 3 was a brooch of Camulodunum type IV, dated at Colchester to c. 49-65 (FIG. 21, No.10).

The primary weathering layers in Pits 5 and 6 both contained Longthorpe pottery, and nothing later. Pit 5 held a sherd of pre-Flavian Dr. 15/17, a Nauheim-derivative brooch of Camulodunum type VII (Claudio-Neronian, FIG. 21, No.3) and an early dragonesque brooch (FIG. 21, No.9).

Deposits on the working terrace (Pit 7) beneath the enveloping greeny-grey layer contained pre-Flavian samian (p.124, Dr. 15/17, 24/25, 27 and a Claudian Ritterling 1), the stamp of P.S. Avitus on a globular amphora (FIG. 36, No.4, p.131, dated 61/65 at Colchester) and pre-Flavian bronzes (FIG. 23, Nos. 30–35). There was a great deal of Longthorpe pottery on the terrace, additional to the more closely datable finds just listed. The packing of the surface-built kilns contained disappointingly few datable finds. An exception is the stokehole of Kiln 20 which contained two pieces of *lorica segmentata* (FIG. 28, No.122).

The majority of the pre-Flavian finds on the site came from layers, such as the greeny-grey pit- and ditch-fillings which were still open in the second century. Nevertheless, the samian ware from the site as a whole (p.124) points clearly to a peak of activity in the Claudio-Neronian period between *c.* 45 and 65. There is little purely Claudian material. The evidence of the amphorae (p.131) supports this conclusion. The most plentiful (if not precise) indicator of date, however, remains the pottery made at Longthorpe and datable on the basis of comparable vessels and comparable type-series to the pre-Flavian period.

CHAPTER 4

THE MILITARY WORKS DEPOT: DISCUSSION

A. THE MILITARY CONNECTION

The first two seasons of excavation on the Iron Age farm and potteries at Longthorpe coincided with the later work of Professors Frere and St Joseph on the fortress, and there was much discussion and argument at the time about the relationship between the two sites. It became obvious that they were broadly contemporary; but their functional relationship was not so well defined. The small finds, however, throw some light upon it.

There were few metal items in the securely stratified Claudio-Neronian deposits, but a high proportion of them had military overtones. Two pieces of *lorica segmentata* were found in the sand at the bottom of the stokehole of Kiln 20 (FIG. 28, No.122) and strips of iron, perhaps from another, were found at the bottom of Pit 5 (71.56.56) (No.150). A button-and-loop fastener of early military type was found in a charcoal patch on the working terrace (Pit 7, 71.56.28) (FIG. 23, No.35) and the handle of a small mess-tin came from a similar feature nearby (71.56.30) (FIG. 23, No.30).

The main Claudio-Neronian assemblages, which showed signs of later interference, contained further military metalwork. Included were *lorica segmentata* fragments (No.152, p.105), studs and mounts (FIG. 22, No.22; FIG. 23, No.39; and Nos.40, 42, 43, 46, 152 (not illustrated)), a baldric hinge (FIG. 22, No.20), a balista-bolt head (FIG. 28, No.125) and a *pilum* head (FIG. 28, No.126). Most of these types are represented among the finds from the fortress, as is indicated in the catalogue entries below (p.89 ff.).

The occupants of the fortress used the pottery made at Longthorpe on a large scale, as Miss M. Wilson has indicated.²⁵ The same types of imported fine ware were noted on both sites. The samian on our site is perhaps more likely to represent rubbish from the fortress than vessels broken in use on the spot. Two of the Dr.29 bowls (Nos. 1 and 2, p.125) are closely similar to, but not identical with, two bowls from the fortress.

There is, in sum, good reason to think that the industrial site at Longthorpe was part of the Claudio-Neronian military complex, the focus of which was the fortress. It lies only 375 m (1230 ft.) from the defences and must have been on the legionary *territorium*. The surviving remains of industrial plant and the waste products (principally connected with pottery manufacture) do not have an intrinsically military character; but they are not difficult to interpret or to parallel in a military context.

Professor Frere has suggested that the fortress was occupied from soon after the invasion (perhaps in A.D. 48) until c. 61 or 62.²⁶ It is conceivable that the beginnings of industrial activity are somewhat later than the foundation-date of the fortress: but such working is most unlikely to have continued on the spot after the fortress was abandoned.

25. *Longthorpe* 1, 96.

26. *Longthorpe* 1, 5.

B. POTTERY MANUFACTURE

A considerable amount of fruitful research has been carried out recently on the military pottery of Britain and neighbouring northern provinces.²⁷ The place of the Longthorpe pottery typology within that context is discussed below (p.133). Comparatively little is known, however, about the kilns producing military pottery, and so attention is directed here primarily to the structural evidence for pottery-making which Longthorpe provides.

The Structure of the Kilns

In the excavations of 1970–74 twenty-eight (or perhaps twenty nine) kilns were recorded, three of them dug kilns and twenty-five or twenty six surface-built (Table 1, p.46). We do not know what proportion of the original total of working kilns this represents: it could be less than 50%.

Dug Kilns

The characteristics of the Longthorpe dug kilns may be summarised as follows:

1. the kiln-chamber was round in plan (not pear-shaped), and a long flue linked furnace and stokehole;
2. the furnace-chamber was lined with a single 'skin' of coarse clay;
3. the intermediate floor was supported on a free-standing central pedestal composed of pre-dried round clay bricks luted together with clay;
4. the intermediate floor was of fixed wedge-shaped firebars, probably with 'spacers' between to control the upward passage of hot gasses.

The key feature is probably the prefabricated central pedestal. No kilns of this precise form are known on military sites of the pre-Flavian period in Britain.²⁸ Parallels may nevertheless come to light; for we still know nothing of the kilns which produced the military pottery of Lincoln, Usk and Wroxeter which has a marked resemblance to the Longthorpe material.²⁹

A search for comparable kilns associated with the Augustan-Tiberian and Claudio-Neronian fortresses in the Rhineland was equally frustrating. Kilns with floors supported on tongue-pedestals attached to the rear wall are recorded from Haltern (after 8 B.C. to c. A.D. 9),³⁰ Remagen (c. A.D. 50–100),³¹ Mainz³² and the Flavian phase of the legionary works depot at Königshoffen.³³ In other kilns the floor rested on short lengths of wall, either free-standing (as in early Augustan Dangstetten)³⁴ or bonded into the kiln wall (as at Neuss (Claudian)³⁵ and Xanten-Vetera I (Augustan-Tiberian)³⁶). Three of the pre-Claudian kilns south of the defences of Roman Cologne also had short lengths of walling as their floor-supports.³⁷ Kiln 1 in the Augustan-Tiberian group from the Lungengasse in Cologne had four small brick pedestals as floor supports.³⁸

Professor H. von Petrikovits has argued that potters migrated from the heart of Gaul to work

27. Darling (1977), 57–100; Greene (1977), 113–132; (1979a), 99 ff.; Peacock (1982), 136 ff.
28. Mrs V. G. Swan kindly drew our attention (Swan (1984), 62) to the late Neronian or early Flavian Kiln IV at Dragonby, Lincs (*Antiq. Journ.* 1 (1970), 229, pl. xxxb) and a kiln of similar date from Morley St Peter, Norfolk, which had floors supported on 4 pilasters of pre-fired blocks.
29. Darling (1977), 57 ff., 68 f.
30. *Germania* 16 (1932), 112 ff., Abb. 1–2.
31. *Bonner Jahrbücher* 119 (1910), 322 ff.; 122 (1912), 247 ff.
32. *Mainzer Zeitschrift* 6 (1911), 142 f., Abb. 2; *Rei Cretariae Romanae Fautores, Acta xvii/xviii* (1977), 178–191, fig. 1–9.
33. *Gallia* 30 (1972), 395, fig. 21, 396, fig. 23.
34. 51–2. *Bericht der Römisch-Germanischen Kommission* (1970–71), 212 f.
35. *Novaesium* v, 50 ff., Abb. 2, Taf. 97.
36. *Bonner Jahrbücher* 122 (1912), 343 ff., Taf. XLIX.
37. *Kölner Jahrbuch* 7 (1964), 7 ff., Abb. 1, 5.
38. *Kölner Jahrbuch* 3 (1958), 26 ff., Abb. 1.

for the Rhine army in the Augustan period.³⁹ One or more of the kiln types discussed above may have been introduced by them at this time.

Updraught kilns with central pedestals were in use in central Gaul in the late Iron Age. A kiln in Clermont-Ferrand (Rue Descartes) had a central pedestal consisting of two round bricks (70 cm deep by 25 cm in diameter) crowned by a clay amalgam supporting the ends of cigar-shaped firebars.⁴⁰ The earliest kilns at Lezoux (before A.D. 50) were of broadly similar form.⁴¹ Later Iron Age kilns from Sos (Aquitaine) may have been comparable⁴² and the divided central pedestal recorded at several early Roman sites in Gaul may be a related feature.⁴³

A circular prefabricated central pedestal may have been characteristic of late Iron Age and early Roman kilns in Central Gaul. It would be attractive to seek the origin of the Longthorpe kiln structure in this region, but the evidence is still very weak. If the surface-built kilns at Longthorpe had central pedestals (as seems likely), then the form of the dug kilns may owe something to them. A sectional pedestal and an intermediate floor of re-usable firebars have obvious practical and economic advantages.

Examples of kilns with central brick pedestals and firebars are found later in Roman Britain (as at West Stow, Mucking and Mancetter),⁴⁴ But it would be unwise at the moment to regard them as continuing the Longthorpe tradition directly.

Surface-built Kilns

The characteristic features of the Longthorpe surface-built kilns are:

1. the circular furnace-chamber (up to 5 ft. (1.52 m) in diameter) was set on the contemporary ground-surface from which only the topsoil had been removed. On excavation it could be distinguished by a ring of orange-red burnt clay representing the outline of the now-vanished kiln-walls;
2. there was a small stokehole, usually at a lower level than the furnace-chamber and in many cases set over or on the edge of a ditch. There was no separate flue, except in Kilns 4, 8, 13, 14.

In 1974 Mr P.J. Woods drew attention to the existence of early Roman surface-built kilns and discussed the problems of their above-ground structure.⁴⁵ They were first recognised at Rushden and Hardingstone on the Upper Nene, and others have since come to light elsewhere. While some of the fine distinctions which he draws between types and sub-types may be illusory, the classification provides a valuable reference point for the Longthorpe kilns. Most Longthorpe kilns were of Type 1C. Our 'hour-glass' kilns (Nos. 4, 8, 13, 14) approximate most closely to his Type IIIB.⁴⁶ None of the Upper Nene kilns appears to have a stokehole at a lower level than the kiln chamber.

Mrs K. Rodwell has excavated a row of three surface-built kilns at Kelvedon, Essex, the stokeholes of which lie in an abandoned early military ditch.⁴⁷ There were a few wasters with them. Flavian kilns of similar style, but more deeply set in the ground (like Longthorpe Kiln 3) have been noted at Gun Hill, West Tilbury, Essex.⁴⁸ A number of surface-built kilns or furnaces

39. H. von Petrikovits, 'Der Wandel römischer Gefäßkeramik in der Rheinzone', *Landschaft und Geschichte: Festschrift für Franz Petri* (Bonn, 1970), 385 f.

40. *Gallia* 25 (1967), 309, fig. 21-2.

41. H. Vertet in *Gallia* 25 (1967), 319.

42. *Gallia* 27 (1969), 368, 369, fig. 36.

43. *Gallia* 33 (1975), 424, fig. 1 (Coulanges, Allier); 31 (1973), 386, fig. 16 (Naintré); *ibid.*, 320, fig. 15 (La Buissière).

44. West Stow: *Journal of the British Archaeological Association* xxxvii (1881), 152; Mucking: *Essex Archaeology and History* 5 (1973), 13-47, fig. 2; Mancetter: *Britannia* i (1970), 286; ii (1971), 263 and information kindly provided by Mrs K.F. Hartley.

45. Woods (1974), 262 ff.

46. Woods (1974), 264, fig. 2, 280 f., Table I.

47. *Britannia* v (1974), 442, fig. 16.

48. *Essex Archaeology and History* 5 (1973), 48 ff.; 61 ff.

(with bowl-shaped furnace-chambers) have been recorded along ditch edges at the pre-Flavian military base of Rhyn Park, Chirk, where they have been interpreted as field-ovens.⁴⁹

No surface-built kilns have yet been recognised on the Continent. Features of this type are sometimes regarded as the bases of tandouri ovens!⁵⁰

Mr Woods has argued cogently that the kilns were built in turf on the ground-surface, had firebars and a removable central pedestal. Experimental firings of kilns built to this specification suggest that they are a practical proposition and are capable of producing sound oxidised and reduced pottery.⁵¹ Kiln furniture from Longthorpe includes firebars, square in section as those from Rushden Kiln III⁵² (FIG. 30, Nos.175–177), a terracotta ring as at Wood Burcote Farm⁵³ (FIG. 30, No.178), and a hollow terracotta mushroom which may have been a pedestal (FIG. 30, No.179). Rushden Kiln III contained a one-piece clay bollard-pedestal, while the floor of Kelvedon Kiln II had a square central socket from which the pedestal had been removed.⁵⁴

The Siting of the Kilns

We have reviewed above the arguments for a close chronological and functional relationship between the potters' kilns and the Longthorpe fortress. The spatial relationship between the two is another question. Professor H. von Petrikovits pointed out in 1960 that the location of early military pottery kilns *vis-à-vis* the defended sites which they served follows an interesting line of development.⁵⁵ In Augustan times kilns are regularly found within the defences. In Haltern (before A.D. 9) they were dug at convenient spots alongside the roads⁵⁶ and at Oberaden-Beckinghausen they lay within the western sector of the fort.⁵⁷ In Dangstetten (before 9 B.C.) two potters' kilns seem to have belonged to an industrial quarter within the SW corner of the fortress, together with evidence for metalworking and bone-carving.⁵⁸

The Augustan kilns at Neuss were grouped around a large pit inside one of the earlier defensive lines.⁵⁹ On the current received view of the layout of the fortress at Cologne before A.D. 50 most of the military pottery kilns lie along the back of the north and west ramparts.⁶⁰ In the largest group in the Lungengasse some 12 kilns are set in two rows, their stokeholes to the south.⁶¹

In the Claudian period, according to H. von Petrikovits and P. Filtzinger, there was a change of policy towards the potters and from then on their kilns are found outside the defences.⁶² Three individual kilns dated to before A.D. 50 – and possibly of the Tiberian period – lie outside the defences of Cologne on the road south to Bonn.⁶³ They could be the earliest evidence for the policy change, although German scholars prefer not to associate them with the fortress at all. Longthorpe remains the earliest closely datable site at which potters' kilns were recognised as a fire hazard and no longer built within the defended circuit. Evidence for pottery manufacture has recently been found close to the defences of the Flavian fortress at Nijmegen; but the main

49. Information kindly provided by Professor G.D.B. Jones.

50. *Das Rheinische Landesmuseum Bonn* (1979), 17 ff. In a tandouri oven the fire-chamber is directly below the cooking compartment.

51. Swan (1984), fig. VIII; Woods (1974), 268 ff.; C.R. Fanthorpe, *Experimental Archaeology in School: a replica of a Romano-British above-ground turf-built pottery kiln* (Doncaster, 1977), 8 ff.

52. Woods (1974), 277, fig. 6F.

53. Woods (1974), fig. 6A.

54. Woods (1974), 275, fig. 5C; *Britannia* v (1974), 442, fig. 16.

55. von Petrikovits (1960), 56.

56. *Germania* 16 (1932), 112 ff., Abb. 1–2, 40, Abb. 3; *Westfälische Forschungen* 21 (1968), 183; *Germania* 52 (1974), 77 ff.

57. Chr. Albrecht, *Das Römerlager in Oberaden und das Uferkastell in Beckinghausen an der Lippe. Veröffentlichungen aus dem Städtischen Museum für Vor- und Frühgeschichte Dortmund 2.1* (Dortmund, 1938), 22 ff.

58. 51–2. *Bericht der Römisch-Germanischen Kommission* (1970–71), 212 f.

59. *Bonner Jahrbücher* 161 (1961), 478, Abb. 12. More details may be expected in the final excavation report in *Novaesium*.

60. *Bonner Jahrbücher* 172 (1972), 281, Abb. 7 (with further literature).

61. *Kölner Jahrbuch* 3 (1958), 26 ff.; cf. *Novaesium* v, 43 f.

62. von Petrikovits (1960), 56 f.; *Novaesium* v, 106; cf. *Germania* 42 (1964), 260 ff.

63. *Bonner Jahrbücher* 172 (1972), 281, Abb. 7, Nr. 14, 16, 17; *Kölner Jahrbuch* 7 (1964), 7 ff.

production-centre connected with the garrison is at Groesbeek-Holdeurn.⁶⁴ One might argue on the evidence of Nijmegen and Holdeurn, Chester and Holt, and Strassburg and Königshoffen that when pottery manufacture became closely linked to tile-making, the distance between fortress and kilns became ever greater.⁶⁵

C. OTHER INDUSTRIES

Pottery manufacture is the only military industry which has left structural remains at Longthorpe. Waste products from other industries, however, were found, but only in small quantities and almost always in layers where there was a possibility or likelihood of post-military Roman interference. The layers nevertheless contained an overwhelming proportion of military pottery, and it is reasonable to conclude that the other debris, too, is of Claudio-Neronian date.

Ironworking (See pp. 106–13)

Small amounts of iron slag and partially roasted ore persistently occurred in Roman features on the Iron Age farm site. Representative samples were examined by Dr J.H. Cleland and Miss J.A. Todd.

Roasted ore, perhaps from two different sources, was being brought to the site, but there is no direct evidence of where it was smelted. Analysis indicates that the slag had a low liquidus temperature and contained little phosphorus – both signs of considerable technical expertise. Supplies of ore, easily worked, were available about 9 km further up the Nene at Bedford Purlieu, where Roman exploitation is well attested by the second century.⁶⁶ In 1972–4 we excavated a series of irregular quarry-pits sunk into the gravel deposits at Lynch Farm, just across the Nene from the fortress, and interpreted them as attempts in the late Iron Age or early Roman period to exploit the local iron pans.

The Longthorpe slag was of standard Roman type (p.107) and included fragments of porous furnace-cinder from a definite military context. The absence of tap-slag perhaps suggests that smelting took place in a furnace of Cleere's Group A.⁶⁷ Examination of a nail of probable military manufacture showed that it was made by sequential heating and forging at c. 950°C (p.109).

Bronzeworking

The sole hint of bronzeworking (or, less likely, working of a precious metal) is a crucible found in Pit 4 (71.62.2) (FIG. 30, No. 169) in Yard II. It was associated with Claudio-Neronian pottery, but had been disturbed in the second century. A proportion of the bronze small finds can only be described as scrap, but none is obviously derived from a founder's hoard.

D. THE MILITARY LANDSCAPE

The fortress at Longthorpe is the focal point of what might best be called a military landscape. Several significant elements in it can now be identified.

The fortress itself was explored by Professors S.S. Frere and J.K.S. St Joseph in 1967–73 and its defences and some internal buildings are now known in detail. Dating evidence from the site, combined with the structural evidence, has provided the means by which the fortress can be assigned to its historical context. Light has been shed on its role in the conquest of eastern Britain,

64. J.K. Haalebos, J.R.A.M. Thijssen, 'Some remarks on the legionary pottery ('Holdeurn ware') from Nijmegen', in B.L. van Beek *et al.*, *Ex Horreo. Cingula* iv (1977), 101 ff. cf. *Noviomagus: auf Spuren der Römer in Nijmegen* (1981), 21.

65. J.H. Holwerda, W.C. Braat, *De Holdeurn bij Berg en Dal: Centrum van Pannenbakkerij en Aardewerkindustrie in den romeinschen Tijd* (Leiden, 1946); Haalebos, *op. cit.*, (note 64), for recent literature; Holt: *Y Cymmrodor* lxi (1930), 1 ff.; Koenigshoffen: *Gallia* 30 (1972), 395 f. with literature.

66. For references: *Arch. Journ.* 131 (1974), 165 ff.

67. *Antiq. Journ.* lii (1972), 8 ff.

in keeping watch from a discreet distance on the Icenian client kingdom and (ultimately and ignominiously) in providing a refuge for Petillius Cerealis and his troops as they recoiled from the Icenian uprising of A.D. 60–61.⁶⁸ Our recent excavations have revealed something of the local context and the mundane but essential activities of the garrison. It is apparent that the troops had made most, but not all, of their own pottery, both table-ware and kitchen-ware, in kilns sited east of the fortress. We would argue that the work was done by a handful of civilian specialist potters under the supervision of a master potter who was probably a legionary. Although at least 28 kilns have been uncovered, we are not in a position to estimate their output nor to say how many of them were functional at any given time. The scale of work was nevertheless considerable. Moreover, debris recovered from the kiln field indicates that ironworking and bronze-casting were probably taking place nearby. One may therefore speak of a military works-depot rather than just kilns – although the latter must have been the most obtrusive part of the industrial scene.

On the low-lying ground across the Nene at Lynch Farm (Ferry Meadows), about 0.8 km SW of the fortress, ditches were found in 1972–4 which may be interpreted as remains of practice camps.⁶⁹ The earliest element, a pair of ditches running parallel for perhaps 60 m, can be seen on an aerial photograph taken by Professor St Joseph. At their south end the ditches show a return eastwards and a rounded corner. Another, later, system of ditches perhaps representing two successive recuts of a single V-shaped ditch, was traced on the ground, but was not visible from the air. The ditch-lines form three sides of a perhaps subrectangular enclosure, of which the complete north side was 35 m long. Again, there were rounded corners. Apart from three small pits, there were no internal features. The dating evidence, including Longthorpe pottery, indicated that the ditches were open for a relatively short time in the Claudio-Neronian period and that dumping to level them off took place in the Flavian period.

Immediately west of the ditch systems at Lynch Farm, but in an area unlikely to have been enclosed by them, Mr A. Challands located in 1972 two cremation-burials.⁷⁰ Both included vessels made in the Longthorpe kilns, and one was accompanied by fragments of a first-century brooch. Burning around the edges of the burial pits may echo a mode of cremation practised in the Rhineland in the first century A.D. The burials are likely to be of soldiers from the Longthorpe garrison.

We have argued below that if the garrison were to be self-sufficient in corn (which seems inherently unlikely), then its *territorium* should be taken to contain at least 3 square miles of arable land (see pp.67, 70). The alluvial deposits and undrained lower gravel terraces of the river valley would not have been suitable – but must nevertheless have been within the garrison's control. The ultimate size and geographical extent of the *territorium* is impossible to guess. Native farms, such as Monument 97 in Orton Longueville on rising ground south of the Nene, may well have lain within it, but excavation would not necessarily reveal military control.⁷¹

We know something of the military landscape around the Roman fortresses at Neuss on the Lower Rhine frontier and around the first-century fortress at Vindonissa on the Hochrhein;⁷² but they are not exact parallels. The Longthorpe fortress is now effectively sealed against further excavation; but there is more to be learnt about the activities of its garrison *extra muros*.

E. THE MILITARY FOOD SUPPLY AT LONGTHORPE

Professor Frere has collated the evidence for the diet of the Longthorpe garrison as it was revealed by his excavations inside the fortress and has reviewed it in the light of the late Dr R. W. Davies'

68. *Britannia* v (1974), 1 ff.; *Arch. Journ.* 131 (1974), 141 ff.

69. *Northamptonshire Archaeology* 9 (1974), 92 f.; 10 (1975), 159 ff. A full report on the site will be published in due course.

70. We are grateful to Mr A. Challands for allowing us to mention this in advance of his final publication.

71. *Durobrivae* 3 (1975), 26.

72. C.B. Rieger, *Germania Inferior* (Köln, 1968), 56 ff.

important study of the military diet throughout the empire.⁷³ The new information provided by our work on the industrial sites east of the fortress makes it worthwhile to reopen the discussion.

1. Cereals

Cereals were the staple food of the Roman soldier; much of his spare time must have been spent in milling his corn-ration, sieving the flour and baking bread or hard tack.⁷⁴ The soldiers of the garrison at Vindolanda-Chesterholm, for example, in the early Trajanic period were indenting for quantities of barley and wheat from store, presumably for their own consumption.⁷⁵

The lack of querns and quern fragments from the Longthorpe fortress and from its environs is strange. Perhaps querns were less often jettisoned in the days before the Pennine gritstone quarries were opened up in the Flavian advance northwards. Even mortaria which could be used for kneading dough were in short supply in pre-Flavian Longthorpe.⁷⁶ The third-century corndrier discussed below (p.78) indicates that cereal crops could be grown and harvested within the boundaries of the later farm at Longthorpe.

Military granaries are traditionally taken as proof of the importance of a reliable grain supply to the army. In the Longthorpe fortress Granary A has a capacity of 407 cubic yards (8791.2 bushels)⁷⁷ – sufficient corn, perhaps to last for 4 months, if the contingents present were at full strength. The question then arises: what acreage of land must have been devoted to arable crops to restock this granary each summer?

Three sources may be used to provide this information. Varro (c. 30 B.C.) gives a figure equivalent to c. 17.5 bushels per acre as an average yield – perhaps 12 bushels after deduction for seed corn.⁷⁸ On this showing, Granary A held the product of c. 732 acres (296 ha) or just over 1 square mile. The English average yield in 1600 was about 5½ to 7 bushels after seed corn deduction,⁷⁹ and on this figure c. 1256 acres (508 ha) of arable (c. 2 square miles) would have been required for Granary A. Results from the experimental Iron Age farm at Butser Hill indicate that yields as high as 14 cwt. per acre (c. 18 bushels per acre after seed corn deduction) may have been possible.⁸⁰ If this is so, Granary A may represent the product of only 488 acres (197 ha or about ¾ square mile).

If Professor Frere is right to suggest that Longthorpe contained two further granaries of approximately the same capacity as Granary A, then at least 1464 acres (592.5 ha) or 2¼ square miles of corn-growing land (on the Butser estimate) was solely devoted to the needs of the garrison. The other estimates (2196 acres and 3768 acres) suggest that this figure is too low. If we take 3 square miles (777 ha) as a working minimum, the implications of this for native farmers in the valley and for growers further removed from Longthorpe are considerable.⁸¹

2. Meat

Meat formed a substantial element in the Longthorpe military diet. This is demonstrated both by the animal bone found within the fortress⁸² and by the vast quantity of bone dumped outside on the industrial sites (see p.185). The proportions of bone recorded for the fortress are: oxen 56%,

73. *Longthorpe I*, 39; Davies (1971), 122–42.

74. K.D. White, 'Food requirements and food supplies in classical times in relation to the diet of the various classes', *Journal of Progress in Food and Nutrition Science* 2 (1976), 143 ff., 151 ff.; Davies (1971), 123 ff.

75. *Britannia* v (1974), 365 ff., 477 ff.

76. Cato, *de agri cultura* 74; W. Hilgers, *Lateinische Gefässnamen* (Düsseldorf, 1969), 227; K.D. White, *op.cit.* (note 74), 148 ff.

77. Revised estimate: *Britannia* vi (1975), 218; cf. W.H. Manning, 'The Roman Military Timber Granaries in Britain', *Saalburg-Jahrbuch* xxxii (1975), 115 ff., 120.

78. *Antiquity* xxxvii (1963), 211.

79. *Ibid.*, 210; S. Piggott, 'Native Economies and the Roman Occupation of North Britain', in I.A. Richmond (ed.), *Roman and Native in North Britain* (Edinburgh, 1958), 23.

80. CBA, *Archaeology in Britain 1975–76. Annual Report* 26 (1976), 102; *Archaeology in Britain 1983* (1984), 43; Fulford (1984), 130.

81. See A.L.F. Rivet (ed.), *The Roman Villa in Britain* (London, 1969), 195 ff.

82. *Longthorpe I*, 39, 122 ff.

sheep 29%, pig 14%. The comparative figures for the industrial sites are: oxen 58.1%, sheep 36.2%, pig 5.7%, and the correspondence is therefore close. (The figures refer to proportions of meat animals noted in the closed Claudio-Neronian Group 3 (see p.186); disturbed Claudio-Neronian deposits (4 and 5) showed similar values.) Animals in similar proportions provided meat for the garrison at Great Casterton, as Professor Frere has noted. At Hod Hill sheep were the main meat source, but at Valkenburg (Period I) oxen were dominant (64.3%) and sheep negligible (7.9%) – but pig significant (26.2%).⁸³

Animals were reaching Longthorpe whole, as Mrs King has argued, and presumably on the hoof. They were then expertly butchered.⁸⁴ Half of the oxen taken for meat were mature, and there is little sign that veal was popular. On the other hand, lamb was preferred to mutton. Curiously, there were very few pigs to be had by the soldiers, and they were mostly eaten young. (At Vindolanda soldiers ate pork, ham and pork fat.)⁸⁵ In the bone analyses, goat was not distinguished from sheep, except in a few cases. The Vindolanda garrison ate goat,⁸⁶ and before disparaging it as a meat animal one should remember that Roman mutton and pork would have had a much stronger flavour than the bland flesh to which we are accustomed today.

Few horse bones were noted in the fortress, but many more were found on the industrial sites (p.187). Butchering marks indicate that horse was used for meat. Horsemeat might have been made more tender by long slow cooking with herbs in the modern Italian style, but the soldiers may nevertheless have disliked it.⁸⁷ More likely, it was fed to the dogs which roamed the site.

There is evidence that the Longthorpe troops hunted deer and hare.⁸⁸ They kept domestic fowl for meat and eggs on a large scale, and trapped or shot a wide variety of birds for the pot (see p.189). The list includes: swan (Bewick's and Mute), goose, duck (Longtailed duck, Gadwall, Pochard, Goldeneye, Wigeon and Mallard or domestic duck), woodcock and woodpigeon.⁸⁹ The Sarus crane (noted only in an Iron Age deposit) may also have been caught by the Romans;⁹⁰ for flocks of cranes were found in the Fens until the seventeenth century (p.189). Apicius has some excellent recipes for crane and duck.⁹¹

The Nene was presumably the hunting ground for water birds; but only two fish, mullet and dogfish, both salt-water fish, are known to have been eaten in the fortress.⁹² The river, however, was vital in the Roman period, and the occasional flat fish is still caught as far upstream as Longthorpe.

On the basis of the butchering techniques attested at the military site of Zwammerdam, Lower Germany, Dr P.J.A. van Mensch has recently argued that soup was on the local menu.⁹³ Such broth is an attractive proposition for Longthorpe.

Quantities of bone and food refuse were dumped south-east of the fortress close to the industrial working. The heaps attracted various scavengers – dogs, fox, badger, raven, kite and perhaps sea-eagle.

3. Other Foodstuffs

Dr Davies's paper points to the dangers inherent in generalisations about the military diet. For many facets of the resident soldier's diet Longthorpe can provide no archaeological evidence –

83. W. Prummel, 'Some reflections on the faunal remains of the Roman castellum Valkenburg, excavation 1962', in A.T. Clason (ed.), *Archaeozoological Studies* (Amsterdam, 1975), 225 ff.

84. For carcass weights see Grant (1975), 383.

85. *Britannia* v (1974), 365 ff., 477 ff.

86. *Ibid.*, 479.

87. Tacitus, *Annales*. ii, 24.

88. *Longthorpe* I, 124; for Vindolanda: *Britannia* v (1974), 477 ff.

89. *Longthorpe* I, 124.

90. The bones have knife-cuts visible.

91. Apicius, *de arte magirica* (ed. B. Flower, E. Rosenbaum, 1958), vi, ii.

92. *Longthorpe* I, 39, 124; *ibid.*, fig. 32, No. 84 for a fish-hook of approximately size 10.

93. P.J.A. van Mensch, 'A Roman soup-kitchen at Zwammerdam?', *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 24 (1974), 159–65.

there is, for instance, no evidence for the fruit and vegetables grown or gathered and eaten. On a number of disconnected topics, however, some comments may be made.

It is certain that the Longthorpe garrison was in regular receipt of oysters. It is perhaps unlikely that they ate the small local snail *Cepaea hortensis* in default of the larger *Helix pomatia*. Salt, an essential for cooking and preserving foodstuffs of all kinds, was being refined at sites along the Fen Edge in the Iron Age. Pieces of briquetage indicative of salt boiling have been found in Roman levels at Lynch Farm across the Nene from the fortress and within presumed military enclosures. They may be residual Iron Age material, but it is possible that the military authorities had their own refining plant on the spot.⁹⁴

The Longthorpe potters produced at least three varieties of cheese-press, some with, some without a lid (see p.151, FIG. 41, Types 65–67). Sherds of cheese-press were common in the waster-deposits. In the Fenland, where animal husbandry played an important part in the local economy, cheese-presses were also abundant.⁹⁵ Accounts of cheese-making in Iron Age Britain are contradictory,⁹⁶ but there can be no doubt that the soldiers or their followers made cheese in quantity at Longthorpe.⁹⁷

The cheese-making season ran from May to mid July, according to Varro.⁹⁸ Cheese made at this time could be dried and kept for a long period. Sheep's milk was probably used as much if not more than cow's milk; for it has twice the fat content (7.5 against 4% for cows), although the animal is harder to milk.⁹⁹ Sheep's cheese was a particularly popular ingredient of the many types of Roman cheese-cake.¹⁰⁰

There may have been no functional difference between the conical and the flat cheese-presses (*faisselles*) made at Longthorpe (FIG. 41); for all kinds of cheese can be made in any of them.¹⁰¹ Technically, the cheese is not pressed, but the whey is allowed to run off through the holes.

Fish-sauces were the *sine qua non* of Mediterranean cookery and found their place in camp cooking, too. Amphorae containing *garum* produced on the southern coast of Spain near Cadiz reached Longthorpe (see p.131).¹⁰² A cheaper variety called *muria* was in demand at Vindolanda.¹⁰³ Olive-oil travelled to the site in globular amphorae from the Guadalquivir valley between Cordoba and Seville (see p.131).¹⁰⁴ Butter might occasionally have been used as a substitute as well as bacon fat.

4. Drink

Wine was an expensive commodity, although there was a well-established wine-trade between the Mediterranean and Britain before the Conquest.¹⁰⁵ Soldiers drank a mixture of cheap wine and water (*posca*), but the higher ranks may have been able to afford vintage wine.¹⁰⁶ Wine was brought to Longthorpe in Koan-style amphorae (p.131), but in small quantities.¹⁰⁷ The potters

94. Unpublished: *Arch. Journ.* 131 (1974), 167.

95. C.W. Phillips (ed.), *The Fenland in Roman Times* (London, 1970), 168.

96. Strabo, iv, 5, 2; cf. Pliny, *NH* xi, 239; A.L.F. Rivet, 'The Rural Economy of Roman Britain', in H. Temporini (ed.), *Aufstieg und Niedergang der römischen Welt* II, 3 (Berlin, 1975), 336.

97. Davies (1971), 128, note 42.

98. Varro, *de re rustica* II, XI.

99. Information from Dr M.L. Ryder; information on modern milk-sheep's yields from Landesverband Rheinischer Schafzüchter in Bonn.

100. Cato, *de agri cultura*, 76.

101. Information from Monsieur R. Sauvaget.

102. *Antiq. Journ.* liv (1974), 234; cf. *Geoponica* xx, 46 for fish-sauce production; M. Ponisch, M. Tarradell, *Garum et Industries Antiques de Salaison dans la Méditerranée Occidentale* (Paris, 1965), 81 ff., 98 f.

103. Bowman, Thomas (1984), 89, 4.33.

104. *Longthorpe* I, 97.

105. D.P.S. Peacock, 'Roman amphorae in Pre-Roman Britain', in M. Jesson, D.H. Hill (eds.), *The Iron Age and its Hillforts* (Southampton, 1971), 161 ff. A. Fitzpatrick, 'The distribution of Dressel I Amphorae in North-West Europe', *Oxford Journal of Archaeology* iv (1985), 305–40.

106. Davies (1971), 124; cf. *Britannia* v (1974), 369.

107. *Longthorpe* I, 97.

manufactured flagons in plenty, but the capacity of the cups and beakers on the site is relatively small! The garrison at Vindolanda appears to have drunk more beer (*cervesa*) than wine¹⁰⁸ and this may be the picture at Longthorpe too.

5. *The Food Supply*

A crucial question is how far the Longthorpe garrison became self-sufficient in foodstuffs and what impact this had on the surrounding population. The farms on the Longthorpe ridge had certainly ceased to function, and much land must have been taken into the military *territorium*.¹⁰⁹ On a minimal estimate the crop from at least 3 square miles (777 ha) of arable land would have been required to keep the Longthorpe granaries replenished. The lower terrace gravels along the Nene would have been too wet to be productive arable, and the higher clay lands may not have been high yielding. Analysis of botanical remains from the small Iron Age farm in Orton Longueville (Monument 97)¹¹⁰ and excavation of the comparable sites at Castor may ultimately give some information on this point; but it seems probable that the *praefectus* would have been reliant on grain supplies from a distance.¹¹¹ The immediate military *territorium* could not have met the requirements.

Soldiers often feature as farmers in the ancient sources¹¹² and one may assume that domestic animals and fowl were kept both officially by the unit (under the care of *pecuarii*) and unofficially by individuals.¹¹³ No civilian settlement grew up at Longthorpe matching that at the auxiliary fort of Durobrivae – Water Newton, and so commercial sources of extra food would not be to hand.

All these agricultural activities would have required a good deal of space, whether they were undertaken by military personnel or tenant farmers. If the Longthorpe *territorium* approached the size of some attested continental examples, it must have embraced most of the lower Nene Valley and many of the known settlement sites such as Fengate. How the land was divided between the Longthorpe fortress and the Water Newton fort may never be known, even when the relative chronology of the sites has been settled.

108. Bowman, Thomas (1984), 89 f., 4.12,15,16,29.

109. On military *territoria*: C.B. Rüger, *Germania Inferior* (Köln, 1968), 51 ff.

110. *Durobrivae* 3 (1975), 26 f.

111. On problems of military supply: J.P. Wild, 'The Gynaecae', in R. Goodburn, P. Bartholomew (eds.) *Aspects of the Notitia Dignitatum* (Oxford, 1976), 55.

112. R. McMullen (1963), 1 ff.

113. *Pecuarii*: *ibid.*, 10; for troops as unwelcome neighbours: H.I. Bell *et al.*, *The Abinnaeus Archive* (Oxford, 1962), *passim*.

CHAPTER 5

THE MIDDLE AND LATER ROMAN FARM

On archaeological grounds it may be argued that the contingent posted in the reduced fortress, Longthorpe II, had moved on by about A.D. 65. The most convenient historical horizon is the absorption of the Icenian kingdom into the Roman province soon after 61.¹¹⁴ The land around the fortress thereafter reverted to agriculture.

Traces of the farming activities of the second, third and possibly fourth centuries were found at points throughout the area which we surveyed and excavated. Stratigraphic links between the features, however, were tenuous or non-existent, and their absolute chronology lacked precision. Consequently, in our description below, we have treated the features on the site of the former Iron Age farm separately from those on the Haul Road (1972); but in the final paragraphs we have attempted to describe what we regard as the probable overall agricultural development.

A. LATER FEATURES ON THE SITE OF THE IRON AGE FARM

There is no evidence for any positive activity in the vicinity of the Iron Age farm during the Flavian period and the land may have lain fallow. A copy of a Gallo-Belgic platter dated *c.* 60–90 (p.129, FIG. 36, No.1) probably reached Longthorpe before the military withdrawal. None of the Flavian-Trajanic samian ware (p.125) dates necessarily before 100; but it suggests that some time after that date occupation of the site had been resumed. Moreover, a cremation burial in a grey-ware pot with slashed cordon decoration (p.166, FIG. 46, No.142) was set into the upper filling of the working terrace (Pit 7) NW of Yard I. It probably dates to before 150.

i. *Second-century Backfilling*

The greeny-grey deposits in the military pits (1–7) and the boundary ditches of Yards I and II lay exposed until the end of the second century, to judge by occasional sherds of Nene Valley grey ware and early colour-coated ware found in them. But there was little sign of deliberate backfilling, except in some clearly defined stretches along the NW sides of both yards and, perhaps later, in the SE ditch of Yard II (see below) (FIG. 4).

Pit 1 at the N corner of Yard I took longer to silt up than the adjacent boundary ditch (p.48), and its final compacted greeny-grey deposits (71.53.4, FIG. 12) directly underlay the later Roman ploughsoil (PL.IX, p.49). The nearby working terrace (Pit 7, p.54) accumulated in its uppermost levels sherds of second-century grey ware, slashed-cordon jars and three sherds of late second- or possibly early third-century colour-coated beaker – in addition to a mass of residual military pottery and bronzework, which might have been tipped in (71.56.6,9). The early second-century cremation burial noted above was set into Pit 7 after the backfilling had started. Two shallow trenches of unknown purpose, one running E-W (71.56.8, FIG. 16), the other N-S (74.B1.6; FIG.

114. *Longthorpe* 1, 38 f.

4, FIG. 5,d) were dug into the filling of the terrace at its south end. They contained a handful of second-century pottery and a fragment of human skull.

The length of ditch south of the working terrace examined in 1974 contained little greeny-grey material, but compacted strata of loam and gravel with much pulverised pottery. Most of it was of Longthorpe military origin, but there were sherds of second-century grey ware and early colour-coated vessels. Round the corner in the SW corner of Yard I the situation was similar, but the pottery (except for two sherds of Nene Valley grey ware) was of Iron Age date (p.114). Evidently there had been an attempt in the second century – perhaps even as late as the Severan period – to consolidate the ditch-filling in the W corner of Yard I with material carted from elsewhere.

ii. *Second-century Gullies*

At the point where the Iron Age farm driveway entered the SE corner of Yard I between flanking antenna ditches (FIG. 4) there were indications of later Roman activity. Our excavation here was limited and piecemeal; but it emerged that in the second century the driveway and the partially filled ditches on either side of it were crossed by several minor gullies. All were full of greeny-grey soil and most had second-century pottery in them. They may have been for drainage; but there is no sign that the yard entrance was still in use. A disturbed cremation burial, presumably of the second century, was found in the north antenna ditch (70.XXXII.2). After all the earlier features had been filled, in part deliberately, two new drainage gullies were cut north-west of Yards I and II (FIGS. 4,16). The upper gully began outside the NW corner of Yard I and ran across the filled working terrace (Pit 7) (71.56.22), through Kilns 10-14 and over the SW corner of the yard. It was V-shaped, about 2 ft. (0.61 m) wide and 1½ ft. (0.46 m) deep, containing greeny-grey matter, stones and a few sherds of grey ware. The lower gully (72.F16) was slightly larger and passed round the SW corner of Yard II. There was less greeny-grey material in its filling. The latest material from the gullies was an early colour-coated indented beaker, and so they had probably gone out of use by the early third century. To judge by the datable finds from the features which they traverse, the gullies may not have been dug much before 200 and perhaps had a fairly short life.

A ditch which on the aerial photographs appears to continue the line of the SE ditch of Yard II south-westwards may be of the same date. It was located in 1971 (FIG. 4) and had a silty grey filling with burnt clay inclusions.

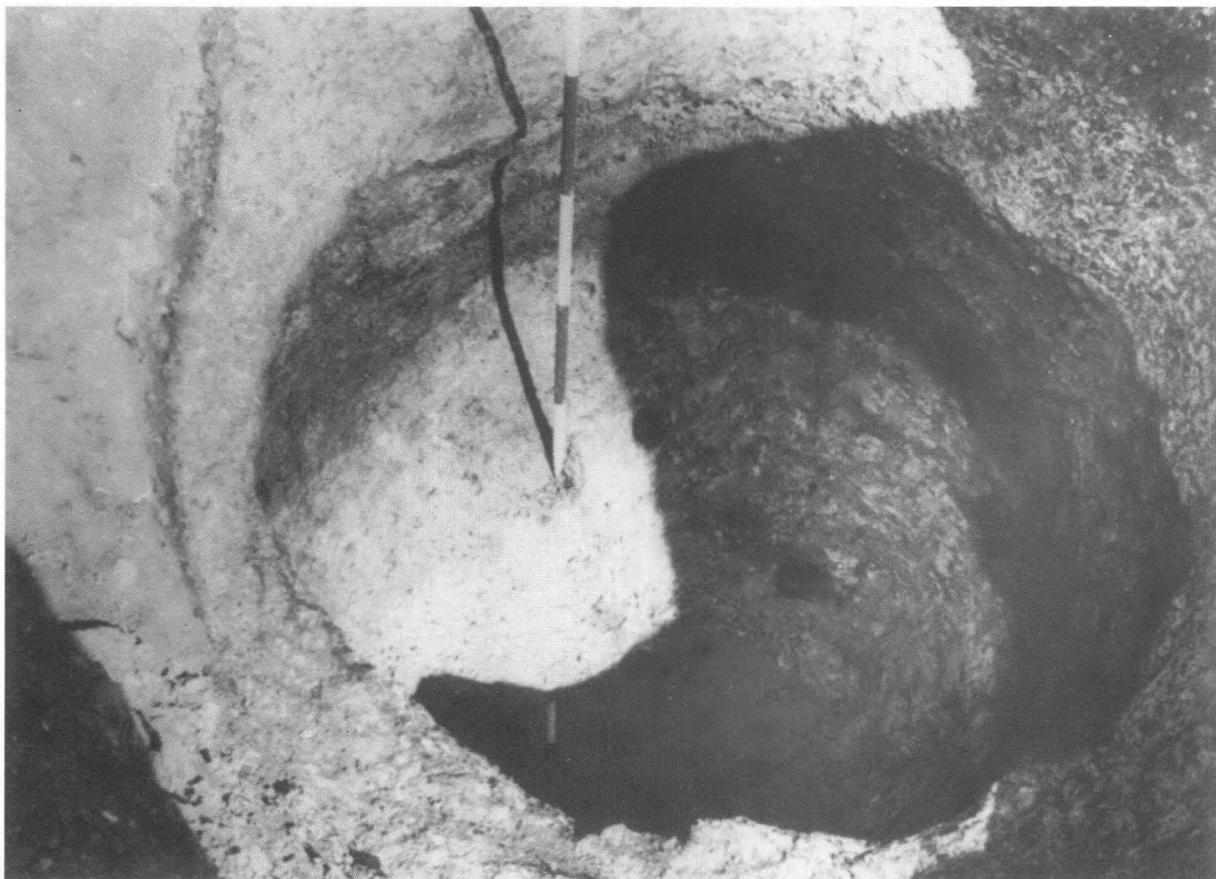
It was not possible to strip open areas within Yards I and II; but the trenches cut across them revealed gullies filled with greeny-grey material. On balance we regard them as belonging to the military phase – but they could be later.

iii. *The Farmyard Surface*

A trench opened in 1970 (XXV, FIG. 4) just inside the SE ditch of Yard II showed second-century occupation. The central feature was a shallow hollow (10 in. (25.4 cm) deep) in the natural sand filled with hard occupation-material (including tegula fragments and late Antonine samian) and capped by small stones. Around it was a thin spread of clay. The east side of the hollow impinged upon a band of scattered gravel which might have been an ill-defined archaeological feature. There were patches of clay and small hollows nearby, and in the NE corner of the trench a group of small stones associated with second-century potsherds (70.IX.2). Dark sandy loam, which appears to have been the farmyard surface over these features, was washed into the nearby boundary ditch, sealing a greeny-grey layer containing second-century pottery. Too small a sample was uncovered to allow detailed interpretation.

iv. *The Limestone Capping*

A short length of new ditch was dug near the south corner of Yard II (FIG. 4), branching SE from the main ditch and possibly passing round the south corner (70.IV.5; VIII.8). It had a rounded



PL. X The lower part of Pit 8 in Yard II, showing the two holes in which the uprights of the ladder stood. Scale in feet.

bottom and its maximum dimensions were 4 ft. 6 in. (1.37 m) wide by 2 ft. 8 in. (0.81 m) deep. It was backfilled, possibly in a single operation, with occupation-debris containing colour-coated sherds – none necessarily later than 200. At the same time occupation-material was dumped into the main SE ditch to consolidate the filling and to carry a level limestone capping (c. 9–12 in. 22.8–31 cm) thick) which extended for c. 52 ft. (15.85 m) E-W and at least 20 ft. (6.1 m) N-S. Another layer of occupation-material 6–12 in. (15.24–31 cm) thick) overlay the limestone. It incorporated tile and second-century pottery, but also sherds of colour-coated dish and Nene Valley mortarium which may be late third- or early fourth-century in date. The limestone capping was presumably a hard stand, but its precise context is obscure. It was not laid before the early third century, possibly later, and the late potsherds on it suggest its use into the early fourth century.

v. Pits 8 and 3

In the northern part of Yard II aerial photography and a magnetometer survey revealed a large pit (Pit 8, 71.59) which proved on excavation to be shaped like an inverted bell (FIG. 18). It was 25 ft. (7.62 m) wide at the mouth with sloping weathered sides where it cut the natural gravel. When its diggers had reached first yellow clay, then a blue clay with harder dark bands, they had cut steeper sides; the lower shaft was c. 5 ft. (1.52 m) wide and c. 4 ft. (1.22 m) deep (PL. X). The bottom, on limestone, was c. 11 ft. (3.35 m) below the modern ground surface.

The lower shaft was filled with a homogeneous black organic deposit, still wet (71.59.7), sealed by iron pan. It contained no Claudio-Neronian pottery, but a grey-ware flask (FIG. 46, Type 143), a colour-coated scroll beaker (FIG. 46, Type 121) and a jug handle, dated not later than c. 240. The pit was probably dug in the late second century, was used and then gradually allowed to silt up in the third century, and then in the fourth century was speedily filled with debris including stone.

Pit 8 was evidently a water-hole (PL. X); for the lower portion of a wooden ladder was found *in*

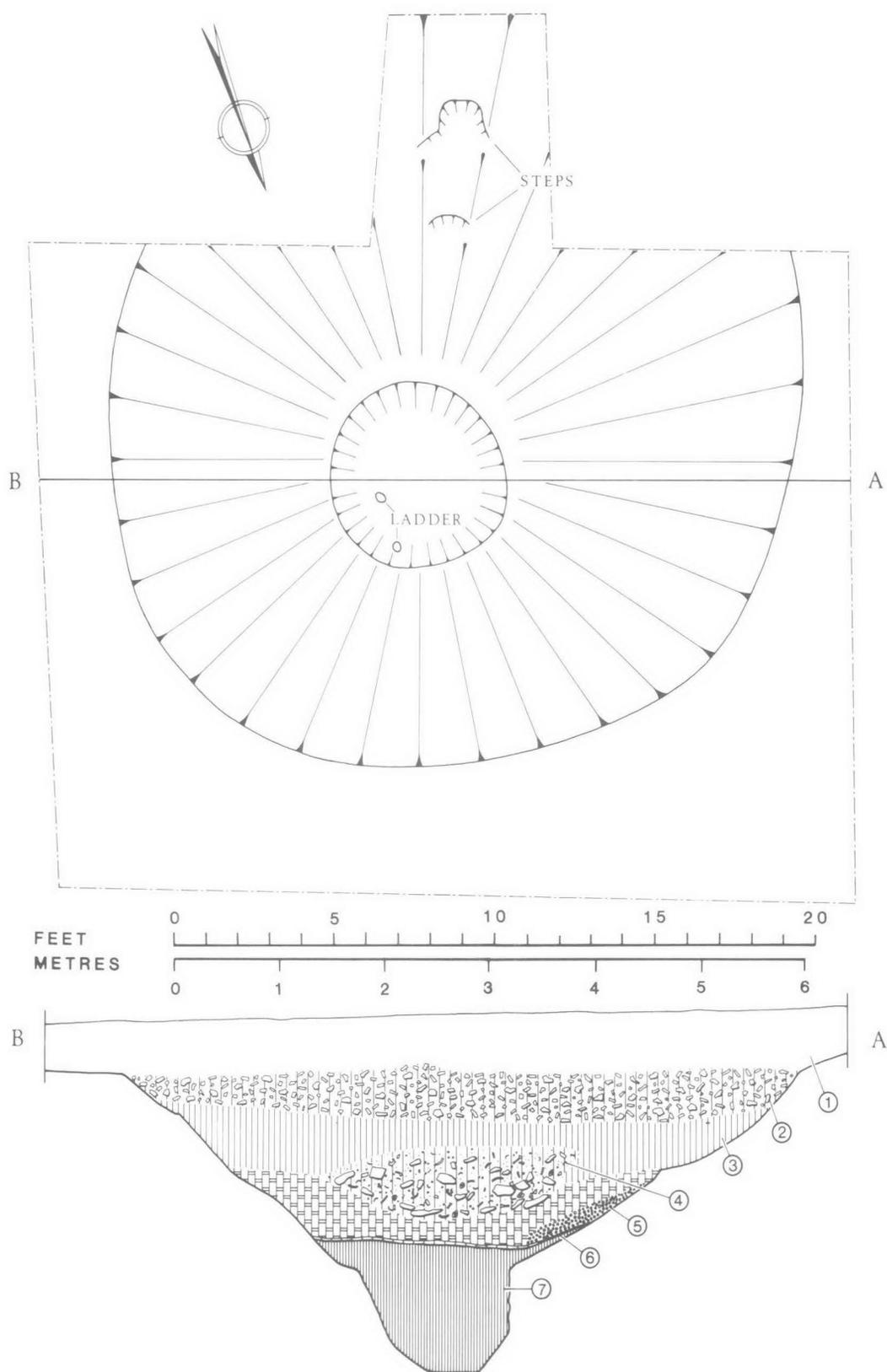


FIG. 18 Plan and section of Pit 8 (71.59). Scale 1:60. For key to layers, see p. 23

situ against its NE side (see p.168, FIG. 47). The south flank of the pit sloped more gently and there were traces of two steps as if it were approached from this angle.

Pit 3 outside the W corner of Yard II (FIG. 4) may have begun as a military clay-pit (see p.52), but from the late second century was used for tipping building-debris such as stone, roof tiles and nails. The first dumped layer (71.60.5) contained Nene Valley grey ware and a sherd of third- or fourth-century colour-coated ware; but the late layers above it (71.60.2,3,4) held much residual Claudio-Neronian pottery and an array of small finds, mostly of military origin.

vi. *Ditches East of the Iron Age Farm*

Aerial photographs of the principal field at Longthorpe show a series of minor ditches between the Iron Age farm and a small stream on the eastern field-boundary (FIGS. 2,3). Exploratory trenches cut by JCB to locate and date them proved inconclusive. But in 1971 Trenches 64–66 picked up two straight gullies converging on the site of Ring Ditch 3. The western gully was V-shaped, *c.* 4–5 ft. (1.22–1.52 m) wide, 3 ft. (0.91 m) deep and full of grey silt. Another gully (71.64,65) which may correspond to the eastern ditch of the aerial photograph was of similar character. The western gully contained Longthorpe military pottery, so its Roman date is assured; but it could be later than the date of these finds.

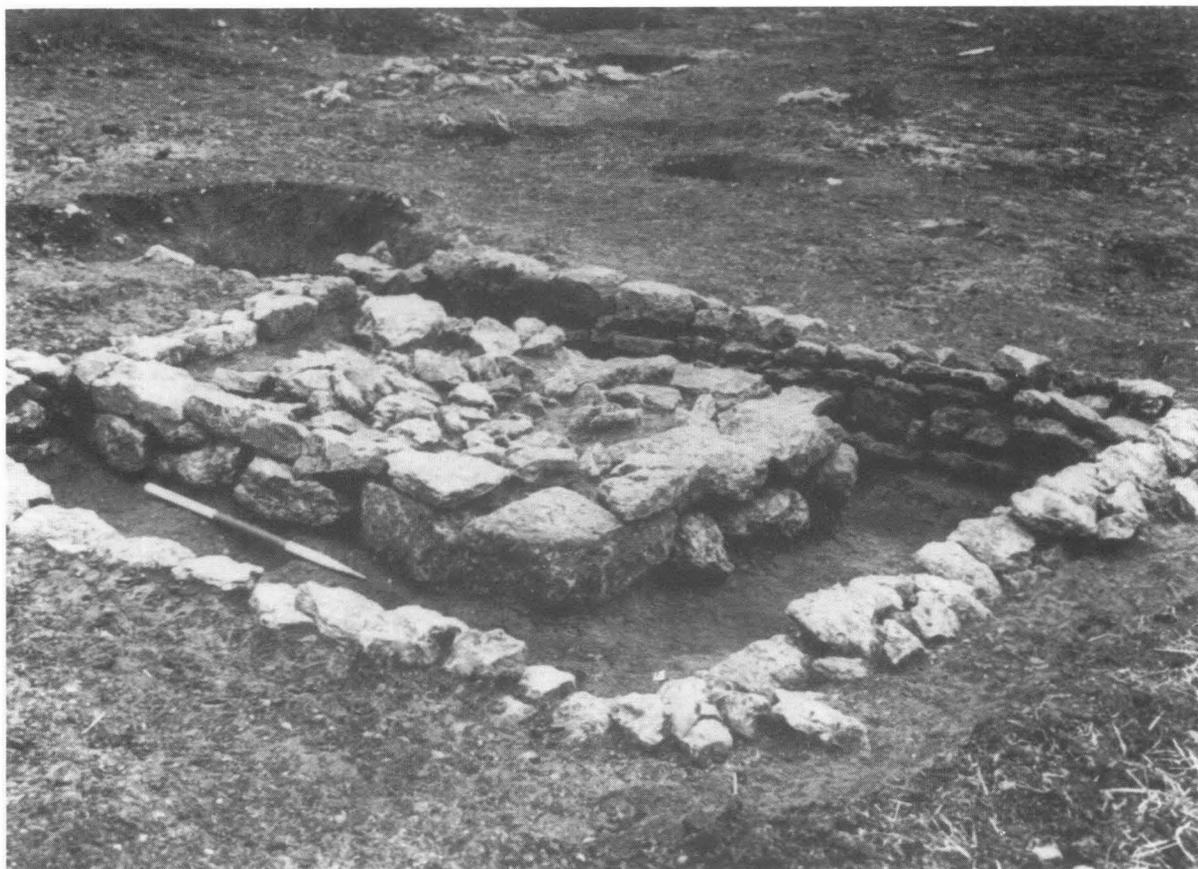
vii. *Burials*

In 1974 a cremation burial in a grey-ware jar with slashed cordon decoration (FIG. 46, Type 142) (before *c.* A.D. 150) was found in the upper consolidation at the south end of the working terrace (Pit 7) NW of Yard I. The bones were of a poorly cremated adult, probably female, aged 30–35 years (p.183). A disturbed cremation burial was noted in 1970 in the N antenna ditch leading to Yard I (70.XXXII.2). It was in an undatable calcite-gritted jar, largely destroyed.

Two infants (Scheuer Nos. 5,6 p.176) were buried side-by-side in the backfilled SE ditch of Yard II (70.VIII.2). One was slightly bigger than the other, but both had died at, or shortly before, birth. They were probably second-century or later in date.

B. FEATURES ON THE HAUL ROAD

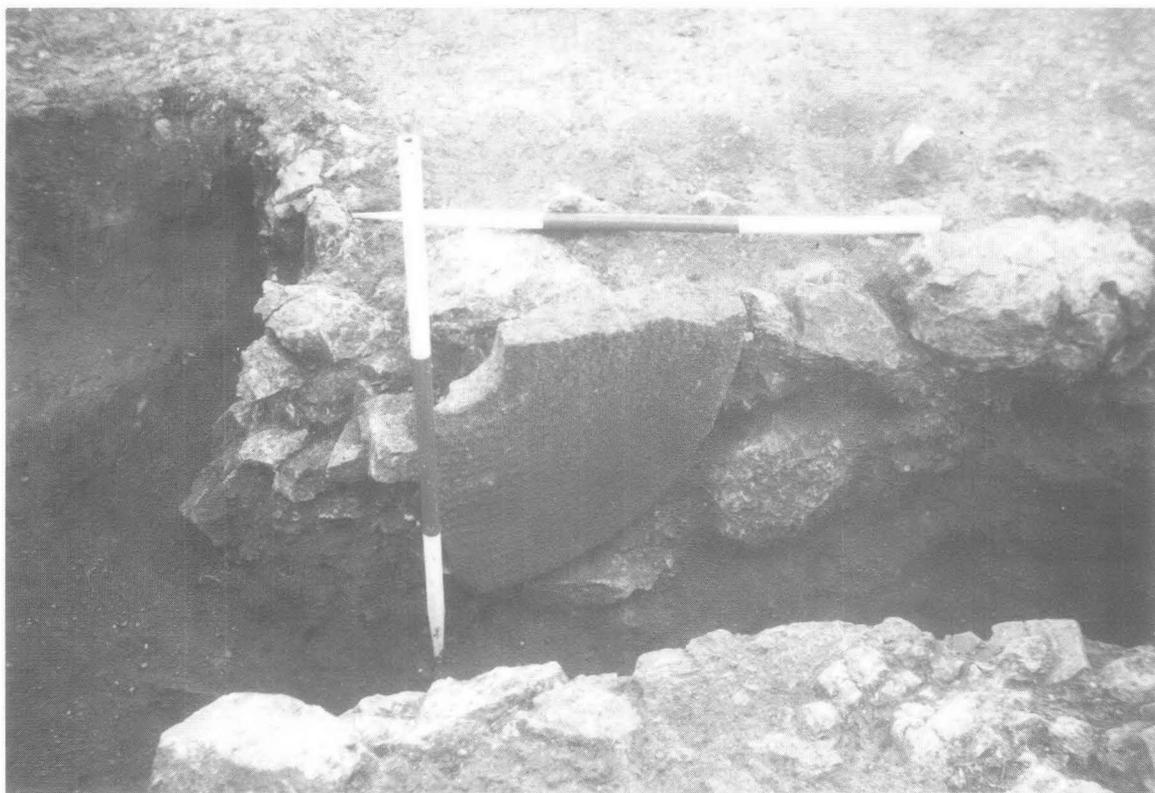
The precise line to be taken for the Haul Road from a point north of the Iron Age farm to the area south of the fortress was not fixed in advance and we were able to chart a course that avoided the obvious surface scatters of archaeological material within the boundary of the Scheduled



PL. XI The corndrier on the Haul Road, seen from SE. Scale in feet.



PL. XII The flue-lining and central platform of the corndrier on the Haul Road, viewed from SE. Scale in feet.



PL. XIII The extended flue-channel on the corndrier which incorporated a broken millstone (see FIG.26). View taken from E. Scales in feet.

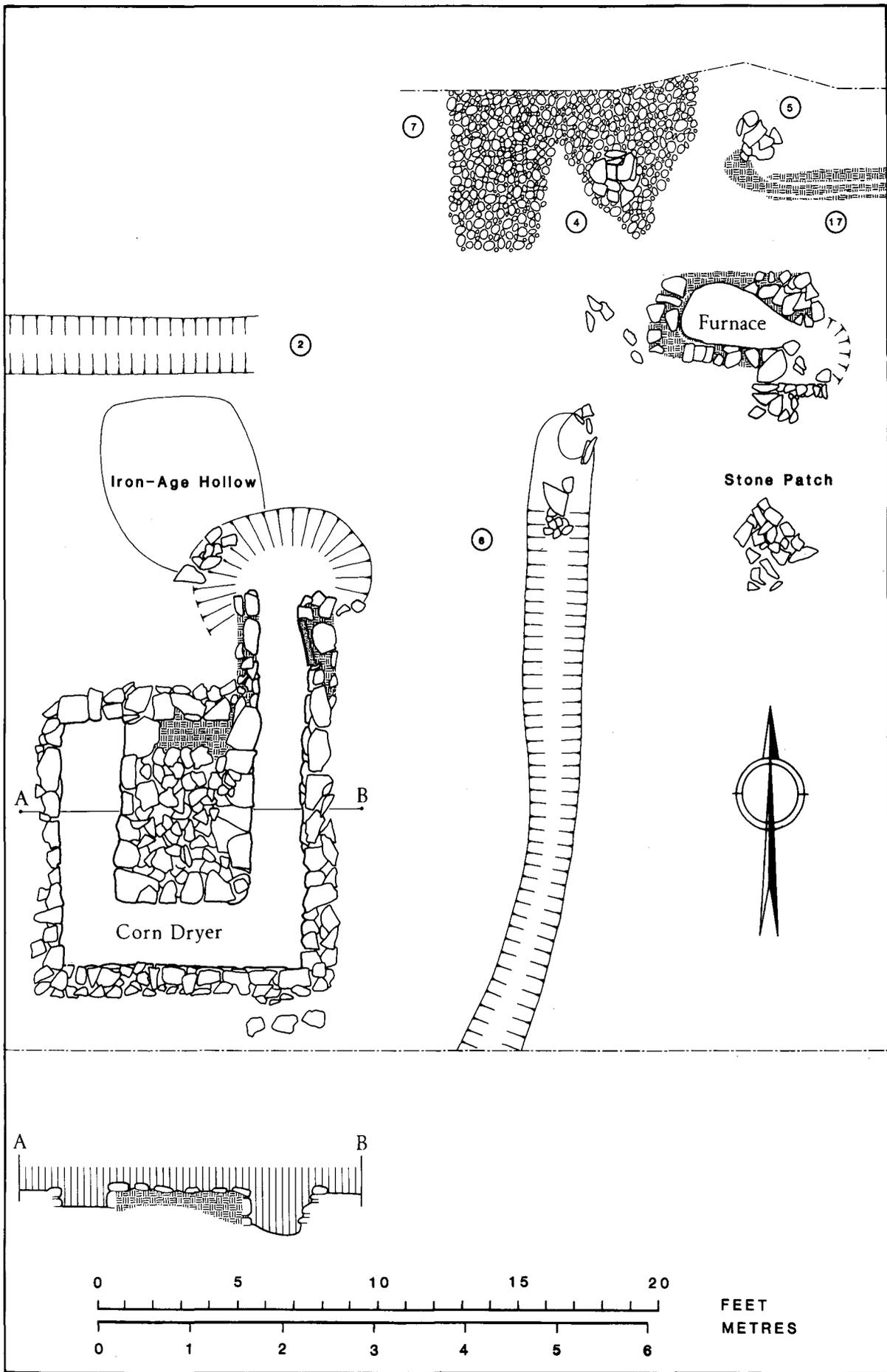


FIG. 19 Plan and section of the corndrier and associated features on the Haul Road. Scale 1:60.

Monument (FIGS. 2,6). We recovered tangible evidence of later Roman farming; and an unfortunate attempt by the sub-contractors to improve on our road-line revealed, briefly, remains of a substantial Roman stone building (FIG. 20).

i. *The Corndrier, Furnace and Related Features*

The principal agricultural structures on the Haul Road lay about 550 ft. (167.64 m) west of the Iron Age farm (FIG. 6). The first to be encountered under thin topsoil was a well-preserved stone-built corndrier (PL.XI). It consisted of a central platform surrounded on three sides by a flue-channel, fired from a stokehole on the north (FIG. 19). The flue-channel, varying in width from 2 to 2 ft. 3 in. (0.61–0.69 m), had been constructed first. It was lined with 2–5 courses of roughly-dressed limestone slabs and blocks incorporating a few tegula fragments. It had been designed to pass round all four sides of a central platform (PL. XII) 5 ft. (1.52 m) square; but before it was fired, the northern leg was blocked off by a stone at each end, separated by relatively clean clay packing. The floor of the flue rose steadily from 2 ft. (0.61 m) below the top of the surviving stonework at its mouth to *c.* 11 in. (28 cm) below at the NW corner. The central platform consisted in part of undisturbed natural clay, heightened with more clay and a spread of burnt clayey material 1 in. (2.54 cm) thick, apparently derived from the furnace nearby (see below). The packing was then capped with a layer of stone and tile. The tiles were identical in character with those in the tile-drain to the west (F25, see below).

The flue debouched directly into a bowl-shaped stokehole, *c.* 6 ft. (1.83 m) in diameter and *c.* 2 ft. (0.61 m) deep, which overlapped an earlier filled hollow (72.F12.16) probably of Iron Age date. The side of the stokehole was revetted with stone at the point of overlap. The floor of the flue on a gravelly clay subsoil was heavily blackened with soot for the first 6 ft. (1.83 m) from its mouth. The fire had evidently been inside the flue, not in the stokehole. Traces of heat on the stone lining were minimal, except in the flue-mouth.

After several firings the draught was found to be insufficient. An extra section of stone lining, *c.* 3 ft. (0.91 m) long was added to the flue mouth within the stokehole and at the same time the aperture was narrowed from 1 ft. 9 in. (0.53 m) to *c.* 1 ft. 3 in. (0.38 m). Quarter of a large millstone (black on FIG. 19) was embodied in the extension (PL.XIII and FIG. 26, p.97).

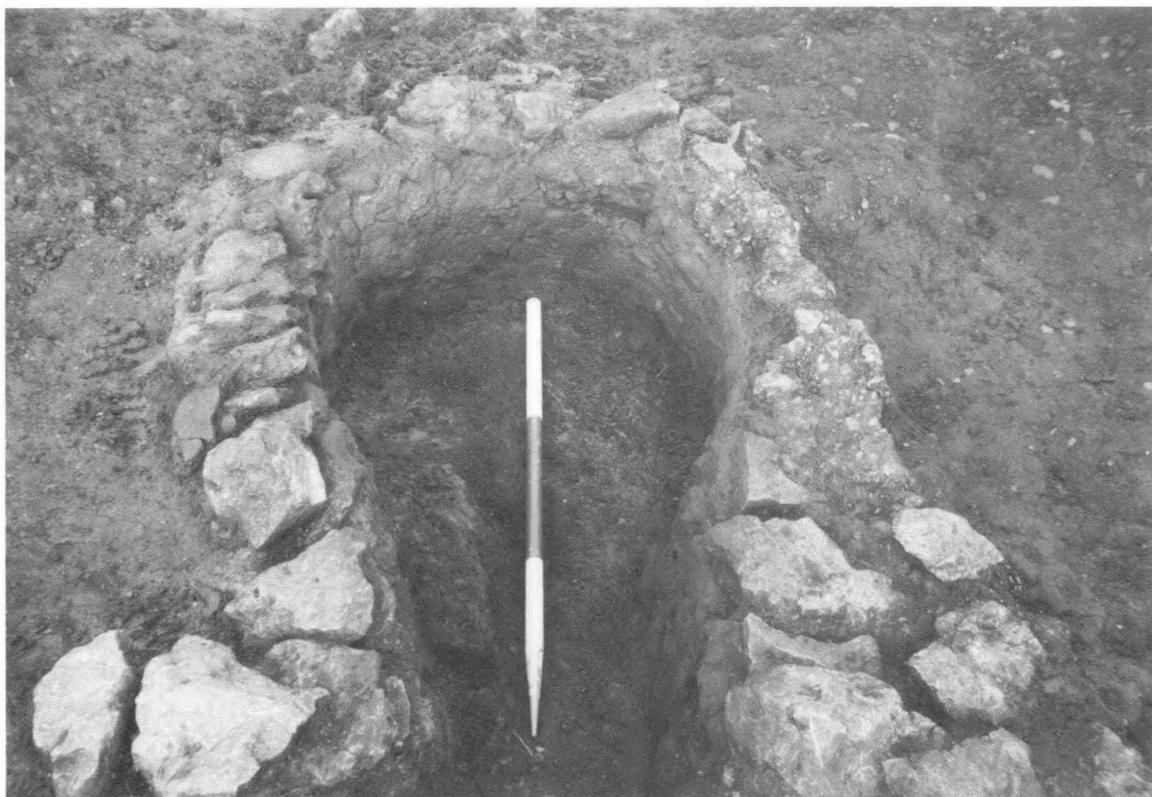
A few pieces of limestone flag up to 2 ft. (0.61 m) across were found in the backfilling of the flue-channel, which they may once have bridged. There were no other pointers to the corndrier's superstructure, which was presumably a (?timber) hopper. Contemporary corndriers in the Nene Valley were often within roofed buildings,¹¹⁵ but there was no sign of an aisled barn or comparable structure on the Haul Road. The function of 'corndriers' remains controversial;¹¹⁶ and the Longthorpe example furnishes no new evidence on the question.

The corndrier went out of commission before the end of the Roman period. The flue was carefully packed with stone and the site left level. Topsoil over the drier contained an illegible radiate of 260–290 (p.85), and the packing contained a single sherd of rouletted colour-coated jar, apparently burnt. It may be dated to the third century. No finds to suggest a construction date were made in the parts of the corndrier which we dismantled; but construction and demolition broadly within the third century would accord with what we know of corndriers elsewhere in the Nene Valley (see note 115).

About 17 ft. (5.18 m) NE of the corndrier (FIG. 19) lay a small clay-lined furnace of a familiar local type (PL XIV). Pear-shaped in plan, it was orientated E–W, with the stokehole to the east. Internally it measured *c.* 2 ft. 1 in. (0.64 m) across by 4 ft. (1.22 m) long. The vertical furnace walls (now standing *c.* 1 ft. (0.31 m) high) were about 8 in. (20.2 cm) thick and the heat had penetrated to a depth of *c.* 3 in. (7.6 cm). They were of roughly-coursed and in part pitched

115. *Arch. Journ.* 131 (1974), 155; D.F. Mackreth, 'Orton Hall Farm, Peterborough: A Roman and Saxon Settlement', in M. Todd, (ed.), *Studies in the Romano-British Villa* (Leicester, 1978), 209 ff., 214 f.

116. P. Morris, *Agricultural Buildings in Roman Britain*. British Archaeological Reports 70 (1979), 5 ff. The view that they were malting ovens has been aired recently; *Arch. Journ.* 136 (1980), 27–42.



PL. XIV The clay-lined furnace on the Haul Road, 'see from E. Scale in feet.

split-limestone fragments. The west end of the furnace-chamber still retained its coarse clay lining (c. ½ in. (1.3 cm) thick). The clay floor, hard and blue with heat, survived where it had not been raked away. The mouth of the furnace (c. 1 ft. (0.31 m) wide) opened directly into a small stone-revetted stokehole which still contained soot and ash (F21.13).

The furnace had seen considerable use; but not such as to require relining. Soot and grey ash about 1 in. (2.54 cm) deep covered the furnace-chamber floor (F21.15), and over that lay a deep deposit of the same coarse yellow clay as had been used in the construction of the furnace. It probably represented both smashed furnace and deliberate levelling. The clay packing contained sherds of Hadrianic-Antonine samian, and a few sherds of second-century coarse pottery. The stokehole contained a sherd of Hadrianic or Antonine Dr.33. No later pottery was associated with the furnace and its working lifetime probably falls within the late second and early third centuries. If debris incorporated in the corndrier is indeed derived from this furnace, then it may be marginally earlier than the drier.

No waste was directly associated with the furnace, but a few nodules of ironstone came from the ditch (F21.6) nearby and point to a link with metalworking. Similar furnaces, claimed as smithing hearths for the forging of iron tools from prepared blooms, are well attested in the Nene Valley and in the Northamptonshire ironstone belt from the second century onwards.¹¹⁷ The best parallels were found in 1969 in Workshop A, Normangate Field, Castor, about 4.5 km further west up the valley.¹¹⁸ The contemporary Roman farm at Lynch Farm, across the Nene from Longthorpe, included an aisled barn in which smithing was carried out in closely similar furnaces.¹¹⁹ At the small town of Ashton near Oundle on the Middle Nene an ironworkers' shop contained numerous furnaces associated with smithing residues.¹²⁰

Two stone-packed post-holes and a layer of cobble were noted immediately NW of the furnace (FIG. 19). The packing for the western post surrounded a grey silt-filled post-hole 6 in.

117. *Arch. Journ.* 131 (1974), 165.

118. *Bulletin of the Northamptonshire Federation of Archaeological Societies* 5 (1971), 7 ff.

119. *Durobrivae* 1 (1973), 7 ff.; *Bulletin of the Northamptonshire Federation of Archaeological Societies* 8 (1973), 11.

120. *Durobrivae* 3 (1975), 13 f.

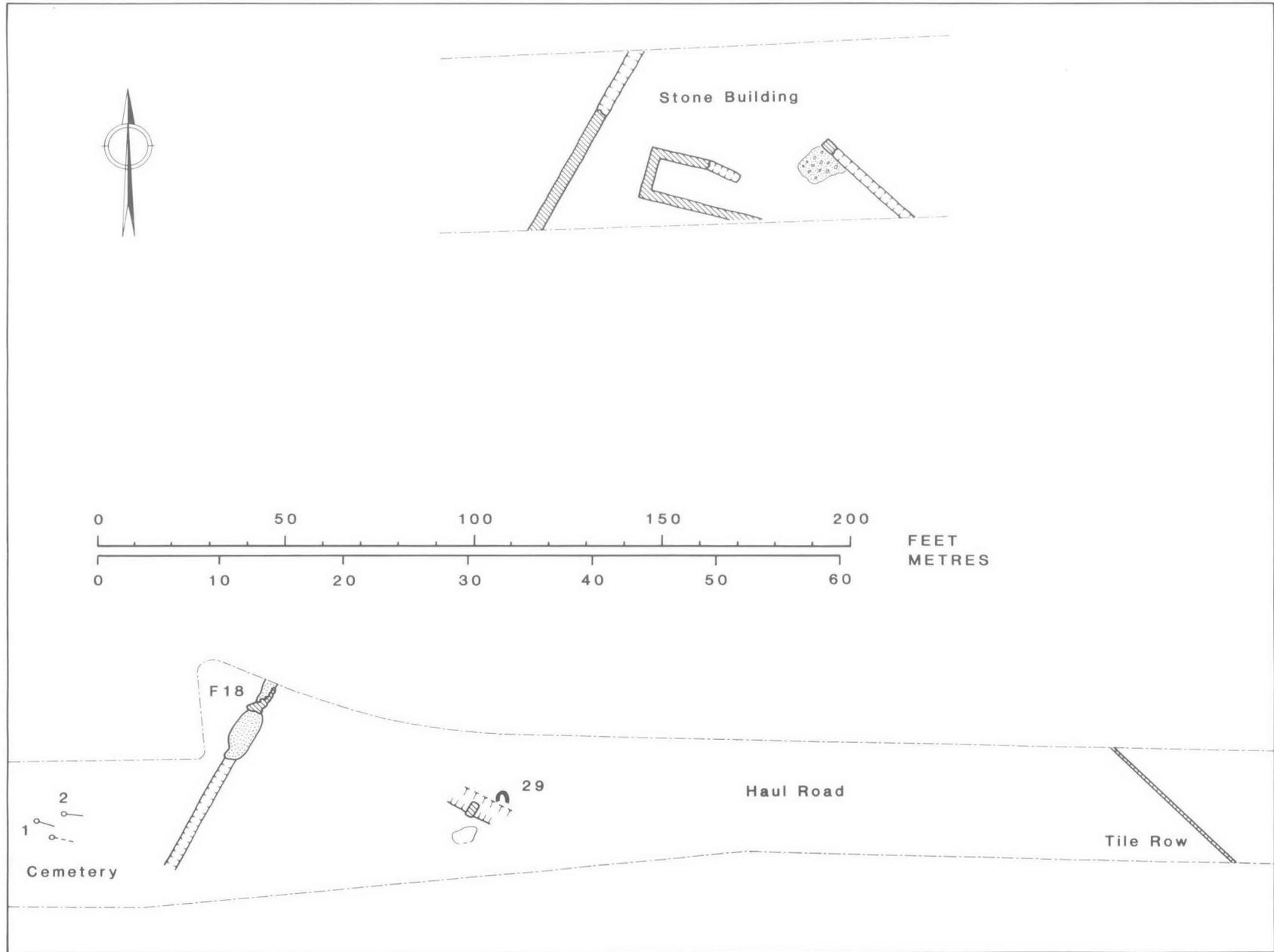


FIG. 20 Plan of the later Roman farm buildings on the Haul Road (see FIG. 6 for position). Scale 1:480.

(15.24 cm) wide and 8 in. (20.32 cm) deep (F21.4). The post on the east (F21.5) was packed likewise and cut an earlier, probably Iron Age, clay-filled slot (F21.17). The thin cobbled surface (F21.7) which extended north out of the trench possibly floored a structure bounded by the post-holes. The furnace may not have been an outdoor feature; but it was not possible to identify remains of a covering structure.

Two minor ditches (F21.6,2, FIG. 19), running at right-angles to one another but leaving a gap for access to the corndrier's stokehole, drained the working area. The N-S ditch (F21.6) had a rounded profile (*c.* 2 ft. (0.61 m) wide and 9 in. (22.8 cm) deep), and in its grey clayey silt were pebbles from the cobbled surface F21.7 and a sherd of late second- or early third-century colour-coated indented beaker. The upper black silty filling had tile fragments and third- or fourth-century colour-coated ware. The E-W ditch was the same size and ran westwards for at least 96 ft. (29.26 m), curving gently. Its clayey silt held a sherd of second-century grey ware. Although no archaeological features were noted immediately W of the corndrier, the ditch appears to have been dug to catch surface water flowing downhill into this zone. It was later replaced by a much larger ditch (F12, FIG. 6), 4 ft. (1.22 m) wide by 2 ft. (0.61 m) deep, which had accumulated later third- or fourth-century colour-coated pottery in its black organic filling.

ii. *The Stone Building*

After the end of our Easter excavation in 1972 the sub-contractors began to clear a new Haul Road line, north of our strip. After representations, the work was halted and backfilled. In the brief interval Mr Adrian Challands was able to record some lengths of well-built limestone wall lying *c.* 340 ft. (103.63 m) NW of the corndrier (FIG. 20). The walls were of coursed stone set in mortar, the west wall of the rectilinear structure being 3 ft. 4 in. (1.01 m) thick, the rest 2 ft. 6 in. (0.76 m). The building was presumably domestic. No dating evidence was found, but it could well be contemporary with the corndrier and furnace.

iii. *Drains, Ditches and other Linear Features*

The most impressive linear feature was F25, a row of large flanged roof-tiles (PL.XV) set end to end, crossing the Haul Road just below the topsoil (FIGS. 6, 20). We followed its course for 10 ft. (3.01 m) north of the Haul Road, but were unable to locate it to the south. the total length uncovered was 37 ft. (11.28 m) or 28 tiles. The average tile measured 1 ft. 6 in. (0.46 m) long by 1 ft. 3 in. (0.38 m) wide. Some had round, some square nail-holes at one end: most had halfmoon tilemaker's marks at the other end. There were canine pawprints on two tiles, the hoof-print of a calf on another.

The purpose of the tile-row is open to debate. Although the tiles had been damaged by ploughing and frost, there was no sign that they had been covered. They may nevertheless represent the base of a surface-built open timber drain. They lead downhill from the stone building noted above, perhaps to carry off surface water or slurry.

A short length of ditch was uncovered *c.* 150 ft. (45.72 m) W of the tile-row F25 (FIGS. 6, 20). On its edge lay the possible military potter's Kiln 29. The ditch was consolidated in the post-military phase by a layer of pitched herringbone masonry and cobbles. Further west still lay a shallow V-shaped ditch (F18) (3 ft. (0.91 m) wide by 1 ft. (0.31 m) deep), running NE-SW across the Haul Road (FIGS. 6, 20). It was cut into the natural Blisworth clay, presumably for drainage. It ended on the north edge of our Haul Road cutting against a spread of tile, mortar and small stones on the clay subsoil. North of this debris was a platform of massive undressed limestone slabs, which could not be fully investigated.

iv. *The Cemetery*

At least four shallow extended inhumation-burials were found just beyond the ditch F18 approximately 200 ft. (60.96 m) SW of the stone farm buildings (FIG. 20). They were orientated E-W, with heads to the west. The outline of the graves was difficult to see in the weathered



PL. XV A short length of the tile drain (F25) crossing the Roman farmyard on the Haul Road, seen from S. Scale in feet.

natural limestone, but there was no hint of coffins. Plough damage and our scraper crushed two skeletons beyond recognition. The remaining two lay on their backs with hands crossed over their stomachs. Skeleton 1 (Burial 7, p.177) was of a young adult male, Skeleton 2 (Burial 8, p.177) was a tall (5 ft. 10 in. (178 cm)) adult male. A few sherds of orange colour-coated pottery were found with Skeleton 2, suggesting perhaps a third- or fourth-century date for the cemetery. It seems probable that the cemetery was in use by the inhabitants of the farm buildings to the NE.

C. THE DEVELOPMENT OF THE ROMAN FARM: DISCUSSION AND SUMMARY

There is little activity to record on the site in the thirty years after the military withdrawal; but by 150 at latest the land had been put to agricultural use again. The earliest datable second-century features do not give a precise picture of the pattern of contemporary farming. On the site of the former Iron Age farm the open ditches were filling, or being filled up, in the latter half of the second century, and new drainage gullies were being cut west of the original farmyards.

By A.D. 200 the focus of local farming was clearly on the Haul Road site, where stone buildings and various items of agricultural plant were located. The corndrier and the smithing furnace, protected by drainage ditches from hillwash, probably belong together. The furnace may be the earlier of the two, and date to the last years of the second century. Both corndrier and furnace show signs of intensive use, but neither lasted beyond the late third century, and the furnace at least may have been abandoned much earlier. The stone buildings to the north cannot be dated, but may well be contemporary with the corndrier and furnace. Certainly, the quality of their structure, compared with that of other buildings of similar date in the Nene Valley, points to a relatively early date. Drainage ditches and a tile drain (F25) ran down the hill from these farm buildings. The western ditch, F18, with its enigmatic stone platform may be on the farmyard boundary; for just to the west lay a small third- or fourth-century cemetery.

The Haul Road farm was on such a scale that it is not unreasonable to attribute to it

contemporary features on the Iron Age farm site further east. A length of the SE ditch of the former Yard II was capped with stone about 200 or some years after, sealing a previous bypass ditch around the S corner of that yard. No structures were observed here, but excavation was limited. The bell-shaped Pit 8 at the top of Yard II was dug as a water-hole in the later second century, silted up gradually in the third century and was finally masked by fourth-century dumping.

Seeds in samples taken from the silt of Pit 8 (71.59.7) shed light on the agricultural environment of Longthorpe. They stem, according to Dr D.G. Wilson,¹²¹ from weeds of disturbed ground, grassy waste, arable and pasture. The arable weeds are mostly characteristic of dry soils on the upper slopes of the Longthorpe ridge, while the pasture species reflect the wetter conditions of the flood plain of the Nene. Cereal grains were rare (spelt and oat), but weeds of cultivation were more plentiful and the presence of the corndrier (and large millstone) confirms that cereals played a significant part in the farm's economy.

The water-meadows almost certainly carried stock, and cattle slightly outnumbered sheep among the bones from most of the post-military deposits on the excavation. Few pigs were kept – perhaps because of lack of woodland, which is also revealed by the botanical record.

The farm was large enough to need its own forge.

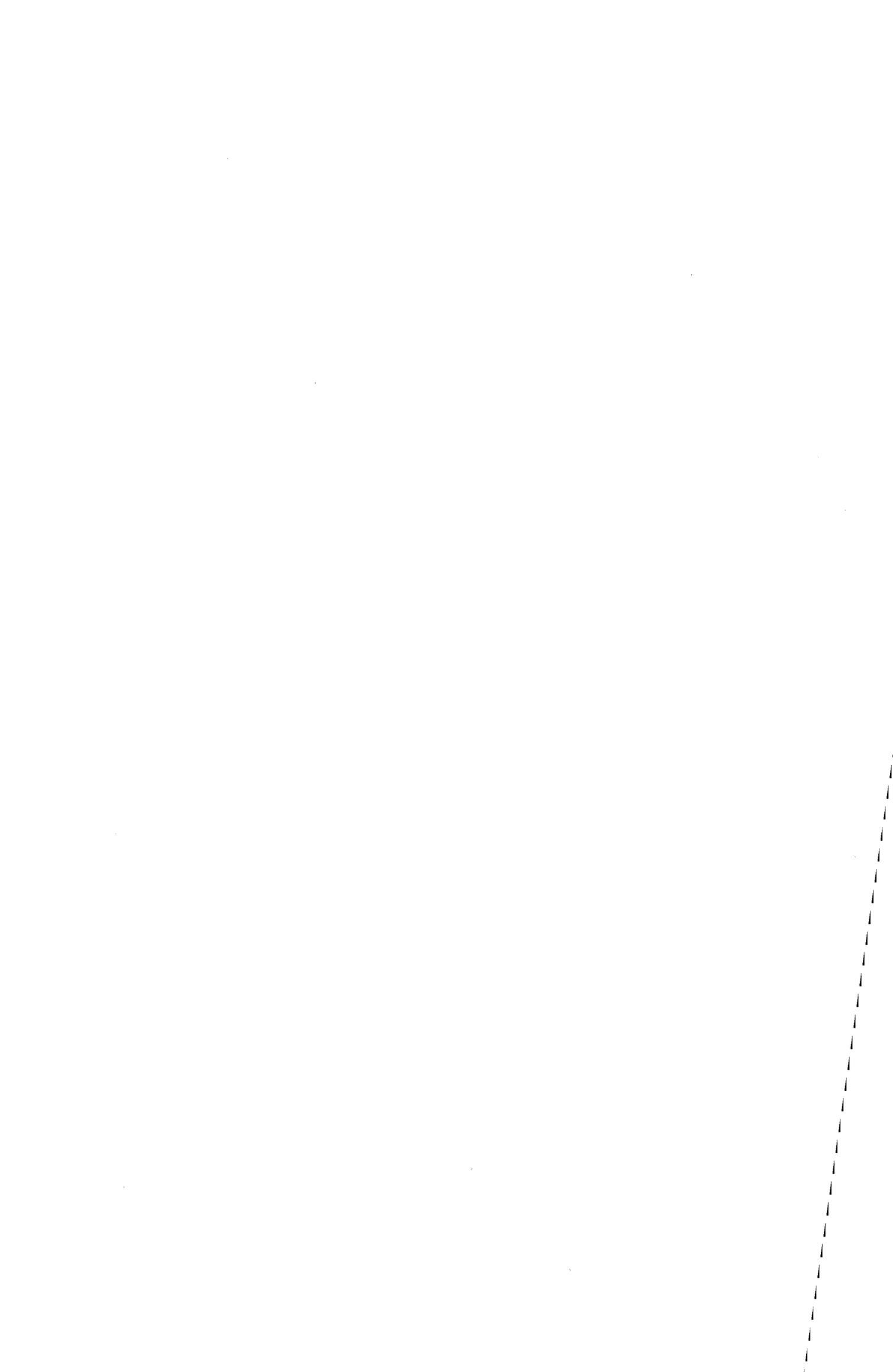
Excavations in 1972–74 across the Nene at Lynch Farm (about 1 km away) uncovered remains of a comparable agricultural holding.¹²² It had only a small corndrier, but in its impressive aisled barn were remains of many industrial furnaces. The domestic buildings were some distance away and may have been of a similar standard to those at Longthorpe. There was a small late Roman cemetery there.¹²³ Much of the land belonging to the farm was regularly waterlogged, despite extensive drainage works, and so the mainstay of its economy was probably stock-raising.

The heyday of the Longthorpe farm was in the first half of the third century. Fourth-century building-debris was found in Pits 3 and 8 on the east; but no contemporary structures were discovered. The land may have been absorbed within a still larger farming unit, centred away from the Longthorpe ridge.

121. *Durobrivae* 6 (1978), 17 f.

122. *Durobrivae* 1 (1973), 7 ff.

123. *Northamptonshire Archaeology* 10 (1975), 94 ff.



PART II: THE FINDS

1. THE COINS. By Richard M. Reece

1. Augustus, 22 B.C. (*RIC* i, 81).
70.III.26: greeny-grey filling of NE ditch of Yard I Claudio-Neronian).
2. Claudius, A.D. 42–52 (*RIC* i, 67). Identified by A. Challands.)
74.B1.1: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
3. Radiate, A.D. 260–290, illegible. LHR72.F21: topsoil over corndrier.
4. Third- or fourth-century coin, illegible.
70.III.1: topsoil.
5. Rechenpfenning of Hans Krauwinckel, Nürnberg, 1586–1635. LHR72.F21: topsoil over corndrier.

2. OBJECTS OF BRONZE AND LEAD

A. THE BROOCHES (FIG. 21). By J.P. Wild

The *fibulae* found within the fortress (*Longthorpe* I, 42 ff.) and in the rubbish deposits on the industrial site form only a small group; but even so it is clear that they cast no light on the precise origin of the garrison force. The relatively high proportion of Nauheim-derivative and Colchester brooches reflects the situation at Colchester itself. It is evident (for example in the groups of brooches from Hod Hill and Fishbourne) that the British army units rapidly developed their own brooch-repertoires which differed on a regional basis from one another and even more markedly from the forms in contemporary use on the Rhine and Danube frontiers.

1. Iron brooch of Nauheim form with flat tapering bow, solid catch-plate and four-turn spring with internal chord. Cf. *Cranborne Chase* ii, 126, p1. C1, 4; *Hardingstone*, 39, fig. 15, No. 106; *Skeleton Green*, fig. 66, No.3. From 74.B1.1 SF 5: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
2. Fragmentary iron bow brooch, lacking head and pin. Cf. *Cranborne Chase* ii, 126, p1. C1, 2. From 72.19 SF 1: sandy filling of NW ditch of Yard II (Claudio-Neronian).
3. Nauheim-derivative brooch, cast as one piece. The spring coil has four turns. Cf. *Hod Hill* i, fig. 7, C18, C19; *Camulodunum*, Type VII, pl. XCII, 57; *Fishbourne* ii, fig. 37. From 71.56.56 SF 145: silt at bottom of Pit 5 (Claudio-Neronian).
4. Two-piece brooch in La Tène III tradition. The bow, which is practically straight, turns through a sharp angle to join the head. Half of the coil, the pin and the catch-plate are missing. Cf. Ettlinger (1973), Type 9, Taf. 4, 10. From 71.60.5 SF 135: fourth-century building-rubble in Pit 3.

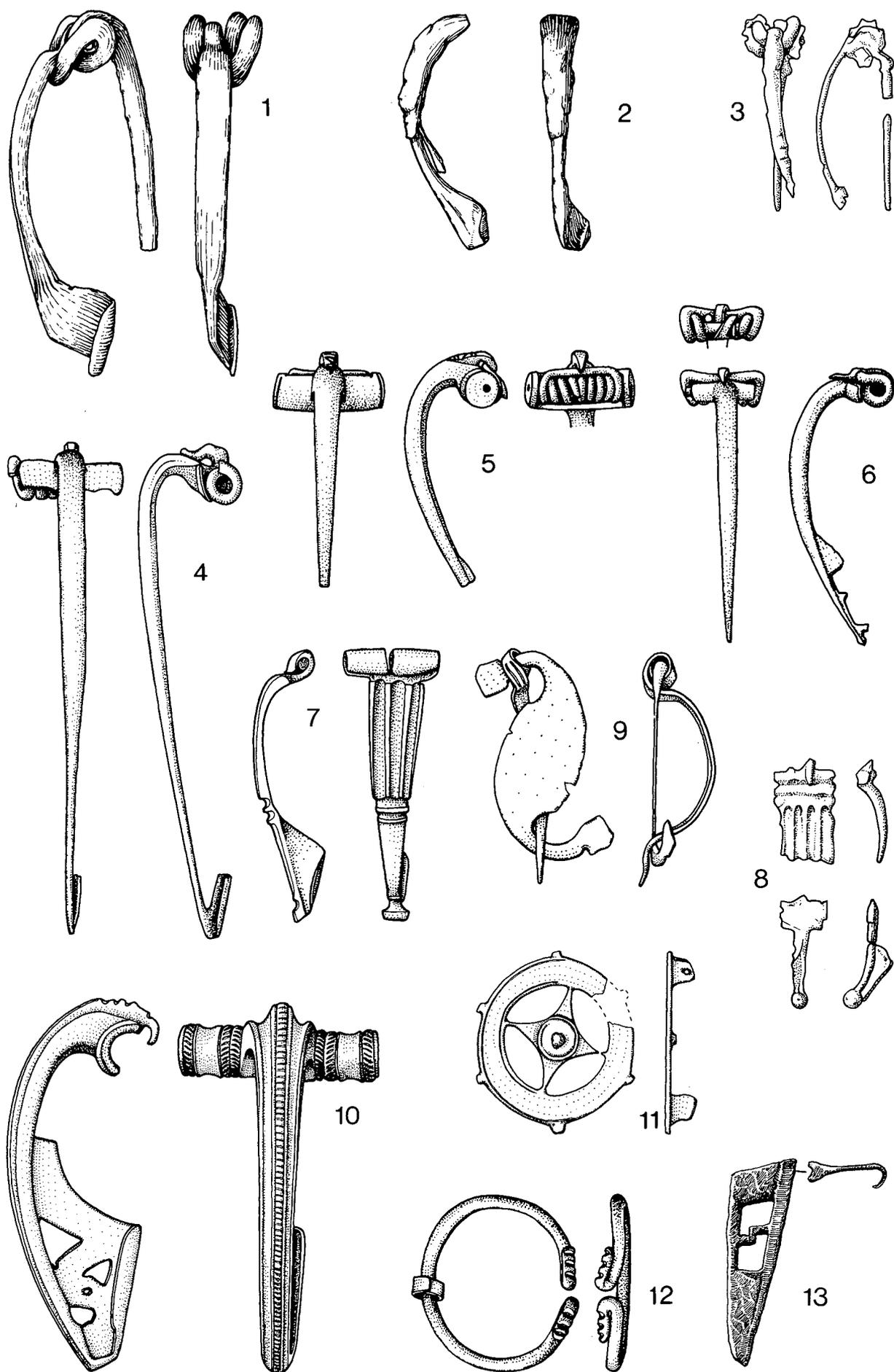


FIG. 21 The Brooches: Nos 1-2 Iron, 3-13 Bronze. Scale 1:1.

5. A Colchester brooch with rounded bow humped over the surviving coil of eight turns. A decorated hook cast with the brooch holds the spring, the coil of which is housed under side-wings. Cf. *Camulodunum*, Type III, pl. XC. From 71.50.2 SF 56: consolidation over upper filling of NW ditch of Yard I (Claudio-Neronian assemblage).
 6. A Colchester brooch with rounded bow, pierced catch-plate, six coils and vestigial side-wings. Cf. *Camulodunum*, Type III, pl. XC, 21. From 71.60.6 SF 136; primary silt in Pit 3 (Claudio-Neronian).
 7. Hod Hill brooch with a prominently-fluted tapering bow. The head is folded back over an iron axis, but the pin is missing. The foot terminates in a small bar in place of the usual knob. Cf. *Camulodunum*, Type XVIII A; *Hod Hill* i, Fig. 8, C54; Ettliger (1973), Type 31. From 74.B1.10 SF 36: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
 8. Hod Hill brooch in two pieces. The frail bow has simple fluting and the foot ends in a knob. Cf. *Camulodunum*, Type XVIII A; *Hod Hill* i, fig. 8, C53. From 71.56.46 SF 131: soot filling of hollow over limestone packing of Kiln 9 (Claudio-Neronian, disturbed).
 9. Flat dragonesque brooch in two joining parts. There are very faint traces of incised cross-hatched decoration across the centrepiece. Cf. Collingwood, Richmond (1969), fig. 106, No.111. From 71.56.56 SF 137: silt at bottom of Pit 5 (Claudio-Neronian).
 10. Brooch of *Camulodunum* Type IV, lacking the spring and pin. There are three knurled cordons on each side wing and a single knurled cordon runs down the bow. The catch-plate is pierced to leave a snake-like head. Cf. *Camulodunum*, pl. XCI, 43; *Southwark*, 91, fig. 41. No.3. From LHR72.F4.4 SF 13: lower stokehole filling associated with Kiln 3 (Claudio-Neronian).
 11. Plate brooch in the form of a wheel with four spokes. The pin, part of the rim and the centrepiece are missing. Cf. *Camulodunum*, pl. XCVIII, 177; Ettliger (1973), Type 40,1. From LHR72.F6.1 SF 10: upper filling of drainage ditch (Claudio-Neronian).
 12. Penannular brooch with terminals folded back and grooved. It is a common type on Claudian military sites in Britain. (There were four in the fortress: *Longthorpe* I, 45, fig. 24, Nos.12-15.) Cf. *Hod Hill* i, fig. 11, E17; *Proc. Dorset Arch. Soc.* 82 (1960), fig. 7, Nos. 21, 22 (from Waddon Hill); Ettliger (1973), Type 51; *Skeleton Green*, fig. 72, No.56. From 71.50.2 SF 55: consolidation over upper filling of NW ditch of Yard I (Claudio-Neronian assemblage).
 13. Pierced catch-plate of a brooch. The bow had a groove down the centre. 71.53.3 SF 64: soot filling of Kiln 4 stokehole (Claudio-Neronian).
- Nos. 14-18. *Not illustrated:*
14. Pin, 3.2 cm long, flattened at one end, probably from a brooch. 71.56.12 SF 96: hollow in working terrace (Pit 7) (Claudio-Neronian assemblage).
 15. Hinged brooch pin, 2.8 cm long. LHR72.F4.3 SF 12: upper filling of stokehole of main kiln group 1-3 (Claudio-Neronian).
 16. Pin, 2.3 cm long, turned and flattened at one end, probably from a brooch. 71.60. + SF 105: topsoil over Pit 3.
 17. Fragment of brooch pin, 3.5 cm long. 70.XI.3 SF 40: surface of Yard I (undated).
 18. Pin from a small brooch. 74.B1.1 SF 9: upper filling of NW ditch of Yard I (Claudio-Neronian disturbed in fourth century).

B. OTHER OBJECTS OF BRONZE (FIGS. 22-24). By G. A. Webster

19. Pendant consisting of a rounded strip, possibly phallic, with two tangs on the inside for attachment to leather. From a cross-piece hang two elongated diamond-shaped plates with knobbed terminals. For an almost exact parallel, cf. *Camulodunum*, 339, pl. CIII, 18; cf. *Mainzer Zeitschrift* vii (1912), 87, Abb.3, 24. From 72.34 SF 12: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
20. Pair of split-hinged strips with rivets for attachment to leather. This is an example of a common fitting from a baldric. Cf. *Rheingönheim*, Taf. 34; *Richborough* iii, pl. XIII, fig. 2.

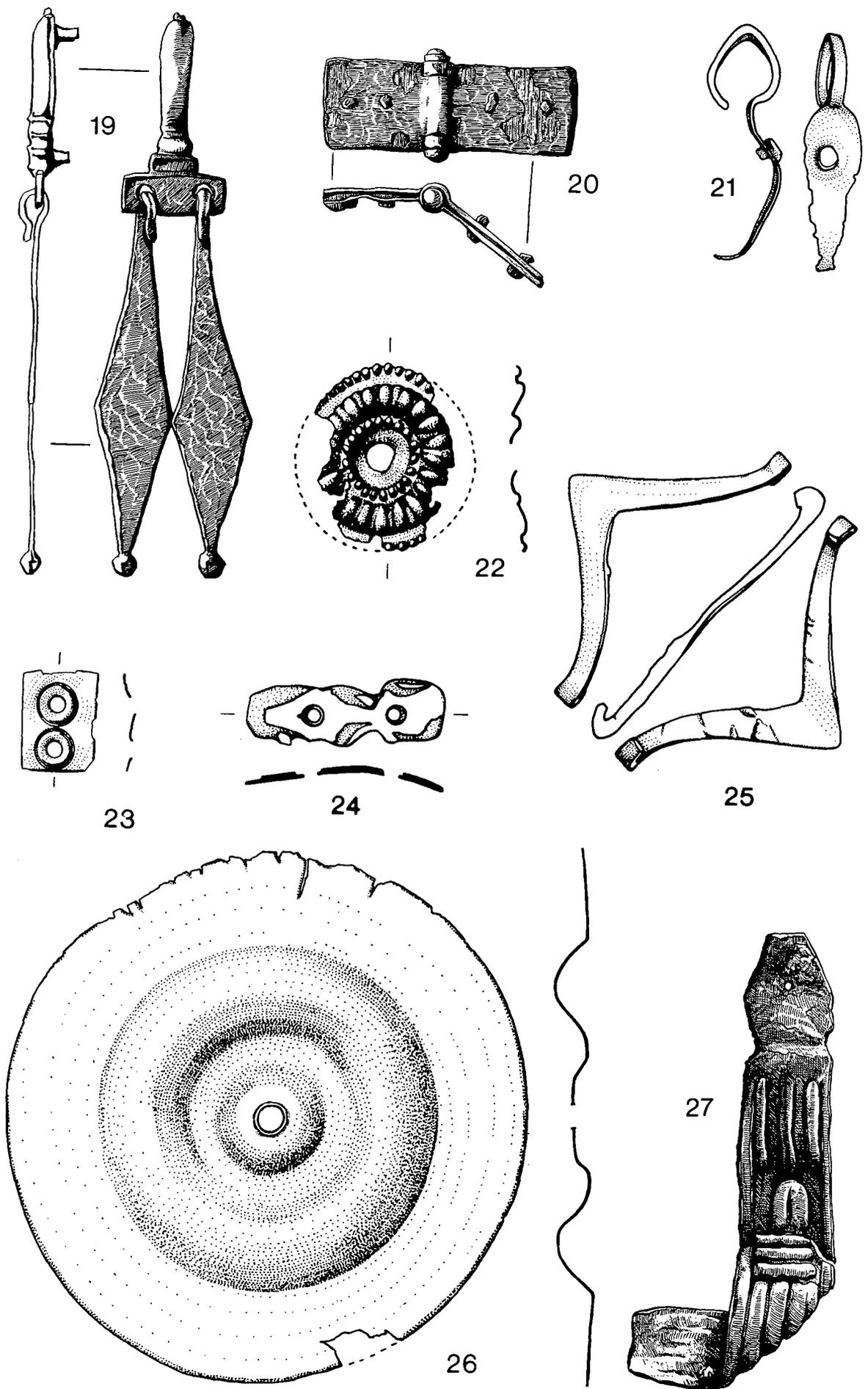


FIG. 22 Bronze Objects. Scale 1:1.

- From 71.56.9 SF 66: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
21. Part of a bronze cuirass hook. One rivet remains. Cf. *Longthorpe I*, 49, fig. 6, No.31; *Rheingönheim*, Taf. 34. From 74.B2.10 SF 38; upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
 22. A thin bronze mount with moulded relief in a rosette pattern, with a central hole for attachment. This is a decorative mount from a *lorica segmentata*, best illustrated by examples from the Longthorpe fortress (*Longthorpe I*, fig. 25), Richborough (*Richborough iii*, pl. XII, 2) and Carnuntum (*Der römische Limes in Österreich ii* (1901), Taf. xvii–xix). Cf. *Rheingönheim*, Taf. 29, 1–4; *Aislingen*, Taf. 19, 10; Taf. 63, 8 (from Aislingen and Risstissen); *Risstissen*, Taf. 5; *Archaeologia* lvii (1901), 245 (from Silchester). 71.53.4 SF 58: upper filling of ditch and Pit 1 at N corner of Yard I (Claudio-Neronian assemblage).
 23. Rectangular piece of thin bronze with two small holes and a trace of the metal being turned over at one end to form a hinge. Cf. *Rheingönheim*, Taf. 34, 8. From 70.XII.1 SF 9: filling of gully in Yard I, with Dog Burial 2 (Claudio-Neronian).
 24. Decorated strip from a belt or baldric with niello inlay and two rivet holes for attaching stud heads. These are very common on legionary sites, but it is more usual for these strips to have a central rivet hole. Cf. *Rheingönheim*, Taf. 28, 24–26. From 70.II SF 17: topsoil.
 25. A V-shaped mount with traces of tinning or silvering on the outer face. The terminals have been bent back sharply, as if to attach the mount to wood or leather. It could have been from the scabbard of a legionary *gladius*, but normally these are in the form of thin pierced or fretted sheets. More substantial mounts occur at the base of the scabbard. Cf. *Germania* 47 (1969), Taf. 19. From 72.24 SF 8: greeny-grey layer in NW ditch of Yard II (Claudio-Neronian).
 26. Sheet bronze roundel with raised cordon and pierced central boss. Tool marks are visible on the reverse side. It was presumably an ornament for leatherwork, but may be too wide for a belt. Cf. *Risstissen*, Taf. 1, 17; *Hofheim*, 154, Taf. XI.43; *Aislingen*, Taf. 51, 27. From LHR72.F26 SF 18: topsoil.
 27. Tinned or silvered sheet bronze, perhaps a decorative mount for a box. The strip is decorated with raised cordons and ends in a triangular tongue, pierced by a single central rivet hole. The other end is straight cut. Cf. *Hod Hill i*, fig. 1, A7; *Rheingönheim*, Taf. 43, 12–21; *Aislingen*, Taf. 25, 15. From 72.30 SF 11: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
 28. A well-made tube with central constriction. One end swells into a cup-shape 2.8 cm in diameter while the other end has been carefully formed into a square socket. Probably the terminal of an iron lynch-pin, the square socket fitting the pin itself. Cf. *Camulodunum*, 332, fig. 60, No.3. From 71.53.16 SF 72: greeny-grey filling of hollow in filling of NW ditch of Yard I (Claudio-Neronian).
 29. A complete instrument with swelling at one end and small circular spoon-like extractor at the other, inclined to the axis of the shaft. The latter for most of its length is octagonal in section. This type of instrument has often been identified as medical, but it is for extracting cosmetics or ointment from a bottle and mixing on a palette with the swollen end. They are common on both civil and military sites. Cf. *Rheingönheim*, Taf. 42, 8–15; *Camulodunum*, pl. C, 24. From 71.56.9 SF 83: Greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
 30. Handle of a small vessel with a half-moon aperture at the expanded end. The two rivet holes at the ends suggest a secondary use. There are grass or straw impressions in the surface corrosion. 71.56.30 SF 95: charcoal patch on working terrace (Pit 7) (Claudio-Neronian).
 31. Small decorated guard from the top of a knife-sheath. It is too small to be from a dagger scabbard, and the wrong shape: it could have taken a blade 2 cm wide. It is decorated on both sides, and has holes 3 mm in diameter. At each side of the main aperture there are slight circular expansions to take leather or wooden pegs for attachment to the sheath.

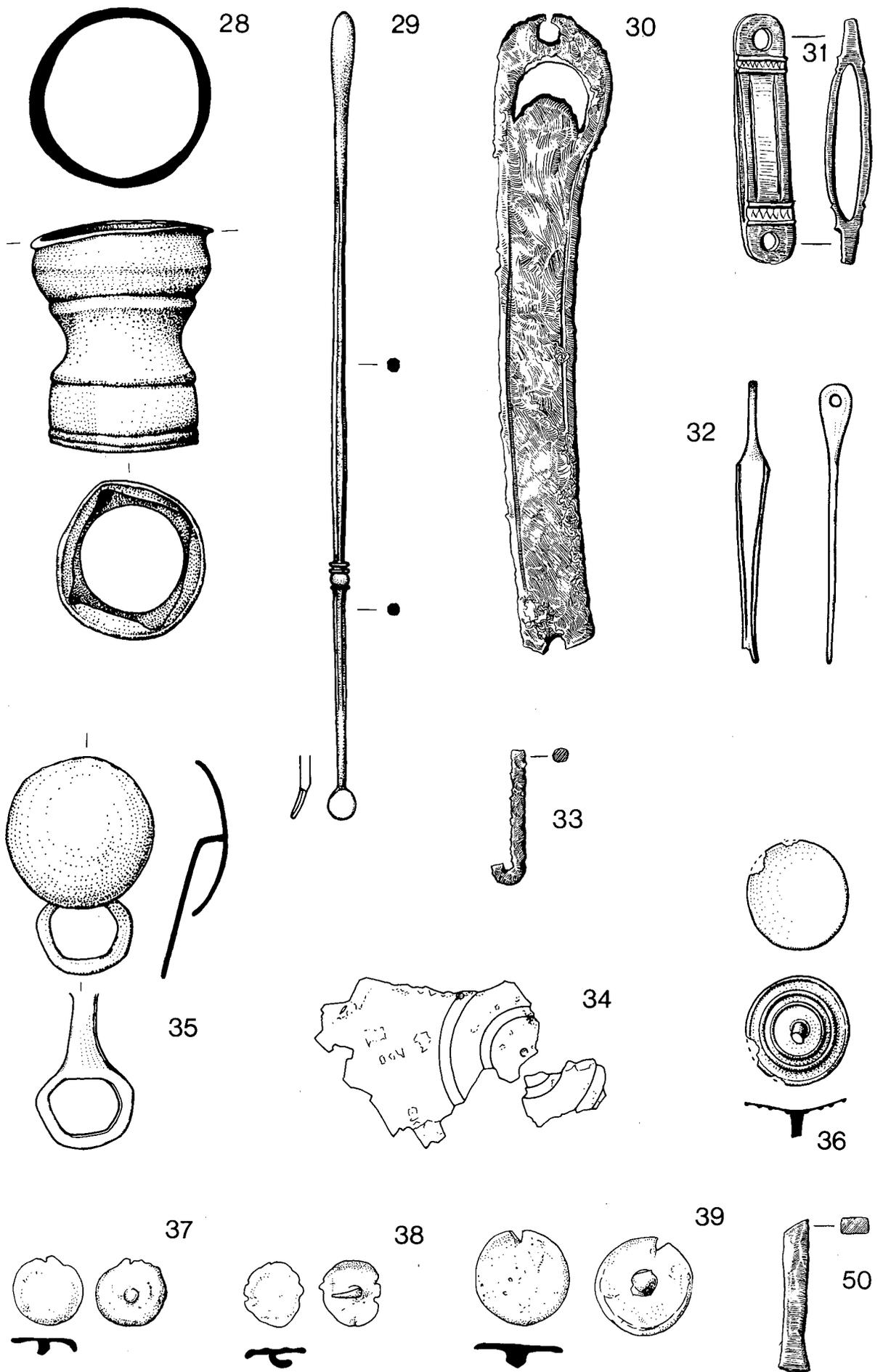


FIG. 23 Bronze Objects. Scale 1:1.

- This would leave the side holes free for hanging from a belt. 71.60.3 SF 114: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
32. Nail cleaner from a chatelaine. The broken end shows the expansion for two prongs. Cf. *Richborough* v, pl. XLIII, 178. From 71.56.9 SF 140: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
 33. Small hook, round in section, in poor-quality alloy, probably from a chatelaine. 71.56.6 SF 76: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
 34. Fragments of a mirror with a white metal surface and mirror with engraved concentric grooves on both faces. Cf. *Hofheim*, 185, Taf. XVI, 50. From 71.60.4 SF 128: upper filling in Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
 35. Circular mount with an attached projecting ring. It is probably plain but corrosion prevents certainty. Such objects are very common on military sites and have been regarded as cloak fasteners (*Arch. Journ.* 115 (1960), 96). The earlier pieces are not as large as the better-known later types (J. P. Gillam in I. A. Richmond (ed.), *Roman and Native in North Britain* (1958), 80), nor is the metal of their loops so thick. In the Longthorpe example the loop is now pressed tight against the stud. The type is seen in its proper shape at Hod Hill (i, fig. 5, A127–A130) and falls into Wild's category VIIIa (*Britannia* i (1970), 142, fig. 2). Cf. *Hofheim*, Taf. XV, 13, 15, 16; *Rheingönheim*, Taf. 29, 44–47. Two specimens decorated with a human face-mask (*Arch. Journ.* 115 (1960), fig. 8, No. 255 from Wroxeter; *Hofheim*, Taf. XII, 39) show that the fastener was to be so arranged that the loop was above the stud. Argument against use with a cloak has been put by Dr Wild. The fact that it had Celtic prototypes suggests, as Dr Wild has postulated, more likely use with horse gear involving cloth. There are two small examples and one large from the fortress: *Longthorpe* I, 60, fig. 32, Nos. 68, 69, 70. From 71.56.28 SF 94: charcoal patch in working terrace (Pit 7) (Claudio-Neronian).
 36. Small flat stud, 1.8 cm in diameter, with tang. The surface is probably plain, the back has concentric ridges. Cf. *Rheingönheim*, Taf. 29, 27–31. From 70.XIV.3 SF 24: Roman ploughsoil.
 37. Slightly convex stud with tang. 71.53.16 SF 73: greeny-grey filling of hollow in filling of NW ditch of Yard I (Claudio-Neronian).
 38. Stud with slightly convex head and tang. 71.60.3 SF 108: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
 39. Stud for attachment to leather. 71.56.9 SF 147: greeny grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).

Nos. 40 – 49. Not Illustrated.

40. Small solid domed stud, 1.3 cm in diameter, pierced by a 4 mm hole. 71.56.6 SF 69: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
41. Small domed stud head, 8 mm in diameter. LHR72.F26.1 SF 17: upper filling of Kiln 27 chamber (Claudio-Neronian).
42. Fragmentary domed stud, 18 mm in diameter. Cf. *Risstissen*, Taf. 12, 187; Taf. 24, 371; *Rheingönheim*, Taf. 29, 22. From 74.B1.3 SF 19: charcoal patch in upper filling of NW ditch of Yard I (Claudio-Neronian).
43. Flat plain circular stud, 3 cm in diameter, with a tang projecting from it. The tang has a flat hammered top, where it was fastened to a leather strap. There are circular ridges on the back formed when the metal was hammered into a mould. This type of mount is very common on military sites. Cf. *Hofheim*, Taf. XV; *Rheingönheim*, Taf. 29, 27–37. From 71.56.9 SF 141: greeny grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
44. Plain stud, 1.5 cm in diameter, with tang for fastening to leather and a trace of concentric ridges on the back. Cf. *Rheingönheim*, Taf. 29, 28. From 70.XXI SF 16: topsoil.

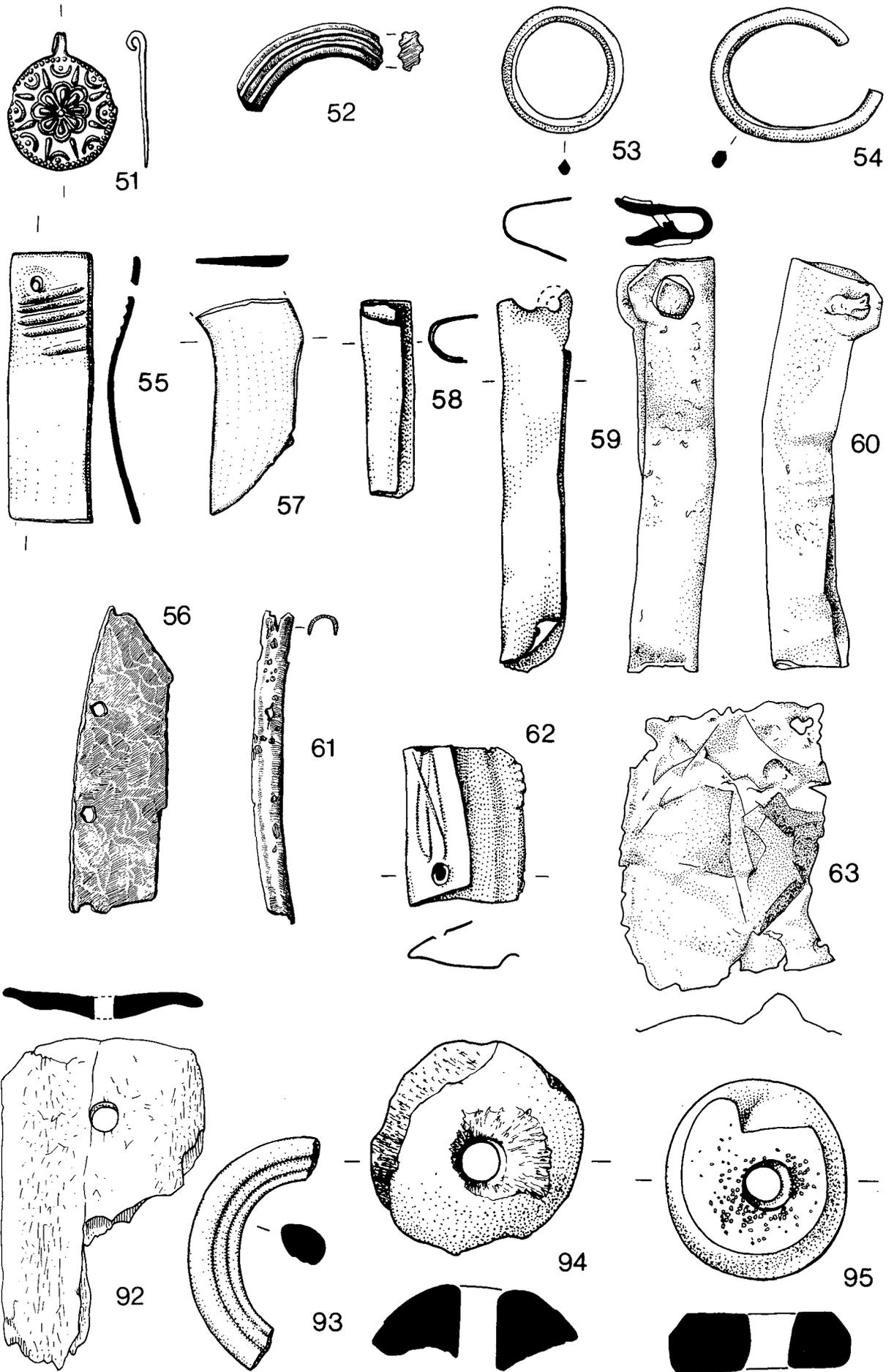


FIG. 24 Bronze Objects (51-63) and Worked Bone Objects (92-95). Scale 1:1.

45. Stud with plain head, 1.8 cm in diameter, and tang for attachment. Cf. *Rheingönheim*, Taf. 29, 31–2. From 70.XII SF 6: topsoil.
46. Head of small plain stud, 8 mm in diameter. Cf. *Risstissen*, Taf. 12, 215. From 74.B2.4 SF 23: filling of Kiln 10 stokehole (Claudio-Neronian).
47. Head of a plain stud, tang missing. Cf. *Rheingönheim*, Taf. 29, 31–5. From 71 SF 75: unstratified.
48. Head of small plain stud or rivet, 8 mm in diameter. 74.B2.1 SF 18: top of NW ditch of Yard I (Claudio-Neronian, with fourth-century tipping).
49. Crudely made tack, 1.6 cm long, square in section, with a small head. 71.60.2 SF 100: upper filling of Pit 3 (Claudio Neronian assemblage, moved in fourth century).
50. Part of an object with rectangular section, flattened and slightly expanded at one end; the other end is broken where it is beginning to thicken. Probably the end of a long ointment spoon. Cf. *Rheingönheim*, Taf. 42, 10–15. From 71.61.2 SF 122: upper filling of NW ditch in Yard II (Claudio-Neronian).
51. Small round decorated disc with small hook attached. Cast decoration in the form of a rosette with egg-and-tongue motif round the edge. It is typical of the late Middle Ages, or later, and is probably a clothing hook. Cf. *London Museum Medieval Catalogue*, pl. LXXVI, 9, 10. From 71.60.3 SF 106: over Pit 3 (Claudio-Neronian assemblage, disturbed).
52. Fragment of well-made ring with mouldings on both sides.
This is the kind of ring found attaching the legionary sword-scabard to the baldric. Cf. *Germania* 47 (1969), Taf. 33. From 71.50.1 SF 54: Roman ploughsoil.
53. Small ring, fairly roughly finished. LHR72.F4.1 SF 6: upper filling of Kiln 1 (Claudio-Neronian).
54. Broken ring. LHR72.F22 SF 15: topsoil.
55. Rectangular strip, 1 mm thick, with asymmetrical hole, 1.5 mm in diameter, at one end, and some crudely cut grooves, presumably decorative. It seems to be complete, and is probably a mount for wood or leather. 70.XVI.2 SF 12: upper filling of NE ditch of Yard I (second century).
56. Strip with curved, turned, edge showing three rivet holes. These indicate that it is a repair piece, perhaps from the flange of a small vessel. Cf. den Boesterd (1956), Nos. 159, 160, 164, 194. From 71.56.41 SF 123: greeny-grey silt in Pit 6 (Claudio-Neronian).
57. Flat piece of bronze, varying in thickness between 1 mm and 2 mm. One edge is definitely broken, the others are original. The shape, like a beak or claw, is reminiscent of the prong-like terminals found on silver spoons or the related 'forks'. Cf. *Journ. Brit. Arch. Assoc.* 28 (1965), 8–9. The attachment of a similar claw to a silver strainer from Richborough (*Richborough* iv, pl. XXXVII, 26) seems to have been more functional. If the metal was strong enough, it could have been used for opening shell-fish – perhaps mussels where a firm pointed end is needed. A more remote possibility is that the object may have been part of a bronze letter C or G. From 71.53.4 SF 63: upper filling of ditch and Pit 1 at north corner of Yard I (Claudio-Neronian assemblage).
58. Short length of edging, probably from a scabbard. There are two thicknesses of sheet bronze. 74.B1.1 SF 29: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
59. Piece of plain sheet-bronze edging with traces of silvering, bent into a rough V-shape. A 2-mm rivet hole has been punched through one end. 74.B3.3 SF 32: bottom of demolished chamber of Kiln 13 (Claudio-Neronian).
60. Bronze edging with traces of tinning or silvering. There is an inward expansion at one end to take a rivet. This could be part of a scabbard edge (cf. *Rheingönheim*, Taf. 31.11; *Aislingen*, Taf. 20, 20; *Risstissen*, Taf. 2) or alternatively a shield-binding. Cf. *Longthorpe* I, fig. 29, 51. From 71.56.60 SF 148: burnt area on working terrace (Pit 7) (Claudio-Neronian).
61. Short length of half-round edging, probably from a leather strap. 71.59.3 SF 86: dark upper filling of Pit 8 in Yard II (fourth century).

62. Plain rectangular plate of thin sheet with a 2-mm rivet hole in one corner. It has been folded, probably for scrap. 74.B1.6 SF 24: filling of second-century gully.
63. Rectangular piece of thin bronze sheet with rivet holes in three of the four corners. The surface is plain, but there are two creases at right angles where the sheet has been folded. Probably a decorative mount for a box or leather belt. 71.61.2 SF 121: upper filling of NW ditch of Yard II (Claudio-Neronian).

Nos. 64–89. *Bronze Objects not illustrated*

64. Complete ring, 1.1 cm in diameter and semicircular in section. LHR72.F8 + SF 3: upper filling of stokehole of main kiln group 1–3 (Claudio-Neronian).
65. Piece of wire with a flattened section, c. 15 cm long. 74.B1.1 SF 4: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
66. Small fragment of pin. 74.A1.1 SF 2: top of NW ditch of Yard I (Claudio-Neronian, with fourth-century tipping).
67. Scrap of wire, bent to form a ring c. 1 cm in diameter. 74.B3.9 SF 1: filling of Kiln 14.
68. An incomplete pin, pointed at one end and 4 mm thick at the other. It seems too thick to be a brooch pin. 70.IV.2 SF 11: upper filling of subsidiary farm ditch, SE of Yard II (early third century).
69. Bent fragment of pin, flat in section, 2 cm long. 74.B2.4 SF 26: filling of Kiln 10 stokehole (Claudio-Neronian).
70. Strip, 1 mm thick, perhaps part of a plain bracelet. 70.IV.2 SF 2: upper filling of subsidiary farm ditch, SE of Yard II (early third century).
71. Scrap of wire. 70.XI.3 SF 38: surface of Yard I (undated).
72. Three small fragments of flat sheet with edges turned over, probably pieces of a knife handle. Cf. *Rheingönheim*, Taf. 44, 45–51. From 71.60.3 SF 115: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
73. Two thin rectangular pieces of sheet, 2.5 cm by 1.5 cm, attached as if on each side of a leather strap-end. 71.56.9 SF 87: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
74. Two much-corroded fragments of sheet. One piece has two edges forming a corner and a square hole, the other a rivet hole. They may have belonged to a key-plate from a box. Cf. *Richborough* iv, pl. XLVIII. From 71.56.6 SF 65: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
75. Three distorted broken and non-joining fragments which give little indication of their original shape. One has a triangular terminal with a rivet hole. The other two could have been part of the metal rim of a small vessel such as an ink-pot, a suggestion strengthened by the traces of lead on the inside by which the rim could have been attached to the rest of the vessel. 71.61.2 SF 112: upper filling of NW ditch of Yard II (Claudio-Neronian).
76. Double thickness of sheet surviving as a slightly curved broken strip. 71.56.9 SF 90: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
77. Bent strip of thin edging, probably for leather or cloth. 74.B2.5 SF 27: patch in upper filling of NW ditch of Yard I (Claudio-Neronian).
78. Rectangular fragment of sheet, 3.5 cm by 2.8 cm. There are small pin or rivet holes in two adjacent corners. Cf. *Aislingen*, Taf. 25.14. From 74.B2.4 SF 21: filling of Kiln 10 stokehole (Claudio-Neronian).
79. Rectangular fragment of thin sheet, 3.2 cm by 2.1 cm. From 74.B1.1 SF 10: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
80. Folded rectangular piece of sheet, 3.5 cm by 2 cm, with a trace of solder at one end. 72.26 SF 9: filling of second-century gully.
81. Small fragment of thin sheet of indeterminate shape. 71.60.3 SF 113: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
82. Fragmentary strip of sheet with traces of raised cordon decoration. 74.B1.8 SF 33: on floor of working terrace (Pit 7) (Claudio-Neronian).

83. Fragment of thin sheet, now folded in half, once measuring 3.7 cm by 1.6 cm. From 74.B1.1 SF 42: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
84. Strip of sheet. 74.B1.6 SF 22: filling of second-century gully.
85. Broken strip of sheet, 3 cm long. 70.XXV.2 SF 37: farmyard surface in Yard II (second to fourth century).
86. Strip of sheet, 5 cm long. 72 SF 6: from spoil heap.
87. Folded fragment of strip. 70.XI.2 SF 41: surface of Yard I (second century).
88. Flat strip, 3 mm wide, coiled round two strands of the same material. Perhaps a bracelet or ring. Cf. *Risstissen*, Taf. 12, 223. From 72.19 SF 4: sandy filling of NW ditch of Yard II (Claudio-Neronian).
89. Small piece of scrap cast bronze. 72.B2.4 SF 28: filling of Kiln 10 stokehole (Claudio-Neronian).

C. OBJECTS OF LEAD (*Not Illustrated*)

90. Fragment of plain lead strip, 5 cm long and 3 mm wide. 71.62.1 SF 68: consolidation in top of Pit 4 in Yard II (Claudio Neronian, disturbed in late second century).
91. Small fragment of scrap lead. LHR72.F1. + SF 1: in clay dump on Haul Road (Claudio-Neronian).

3. OBJECTS OF BONE. By J.P. Wild

92. Fragmentary bone plaque (FIG. 24) with rounded corners and gently curved section (5.7 cm by 3.6 cm). The single hole pierced through it may have been matched by another in the piece now missing. 71.62.1 SF 158: consolidation in top of Pit 4 in Yard II (Claudio-Neronian, disturbed in late second century).
93. Half of a polished bone ring (FIG. 24), 4 cm in diameter, bearing traces of compass scoring. 71.53.10 SF 91: brown stony filling of Pit 1 in N corner of Yard I (Claudio-Neronian).
94. The knob end of a long bone (FIG. 24) with a 7-mm hole through the centre. It is too light for a spindle-whorl. 70.XVI.2 SF 26: upper filling of NE ditch of Yard I (second century).
95. Another bone disc (FIG. 24) with a central perforation. 70.XVI.2 SF 27: upper filling of NE ditch of Yard I (second century).
96. Toggle (FIG. 25) from a horse bit, 9.5 cm long, with a slot 3 cm by 7 mm cut through both sides. First, holes were drilled at each end and then the intervening pieces were cut out with a knife. There are indications of wear on the sides. Cf. *Richborough* iv, pl. LIV, 227. From 72.53.16 SF 70: greeny-grey filling of hollow in filling of NW ditch of Yard I (Claudio-Neronian).
97. Sawn length of bone with rough ends, perhaps an unfinished hinge-section. Cf. *Aislingen*, Taf. 66, 21 (from *Risstissen*). 71.53.35 SF 124: silted gravel in ditch at N corner of Yard I (Claudio-Neronian).
98. Length of bone with a 12-mm central hole and saw-marks at both ends. Cf. *Verulamium* i, 149 f., fig. 54. From 71.53.35 SF 125: silted gravel in ditch at N corner of Yard I (Claudio-Neronian).
99. Fragment of bone, flat and spatulate at one end and possibly pointed at the other. Probably a potter's tool. 71.56.44 SF 126: charcoal near bottom of Pit 6 (Claudio-Neronian).

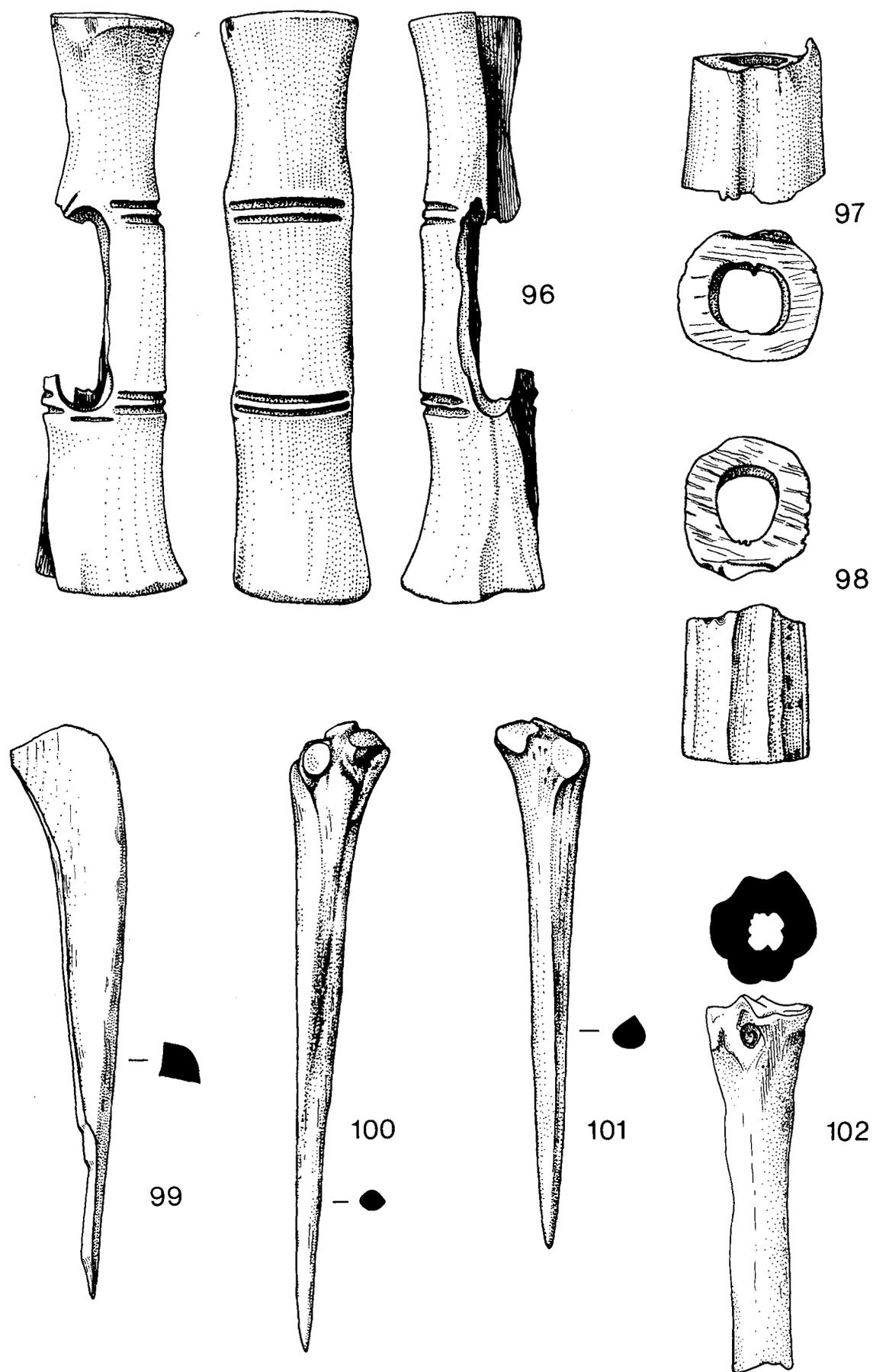


FIG. 25 Worked Bone Objects. Scale 1:1.

100. Metatarsal of horse used as awl. It could have served as a potter's tool. 71.56.44 SF 127: charcoal near bottom of Pit 6 (Claudio-Neronian).
101. Metatarsal of a horse used as an awl. 71.56.42 SF 149: 'green' silt in Pit 5 (Claudio-Neronian).
102. Proximal end of broken metatarsal of sheep or goat. The bone has been hollowed out with a drill longitudinally and a small hole pierced laterally near the end. In this context it is probably *not* a weaving implement. Cf. *Cranborne Chase* i, 175, fig. 1. From 71.53.2 SF 161: soot filling of Kiln 5 stokehole (Claudio-Neronian).
103. (*Not illustrated*). Piece of split bone used as awl or point. The tip is worn. 74.A1.2 SF 50: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).

4. OBJECTS OF STONE. By J. P. Wild

104. Segment of a millstone with original diameter of *c.* 80 cm. The grinding surface, almost flat, appears only slightly worn. It bears a pattern of concentric grooves, replaced by a band (7 cm wide) of radial grooves round the outer edge. The outer surface of the stone is unworked and slightly convex; around its outer edge is a very smooth band, *c.* 15 cm wide, apparently worn by contact with hand or foot. The central hole is bordered by a shallow ledge on the grinding side.

On balance this seems to be an upper millstone; for some lower stones have a central raised collar which would fit neatly into the ledge of this specimen (*Antiquity* xi (1937), 149, fig. 39). The spindle may have been secured to the stone by a rynd or by a single dovetail of iron, but not by a double dovetail, such as is seen on a parallel from Fishbourne (*Fishbourne* ii, 154). While very large hand-querns (fitted with vertical wooden handles) are attested (*Antiquity* xi (1937), 150), the

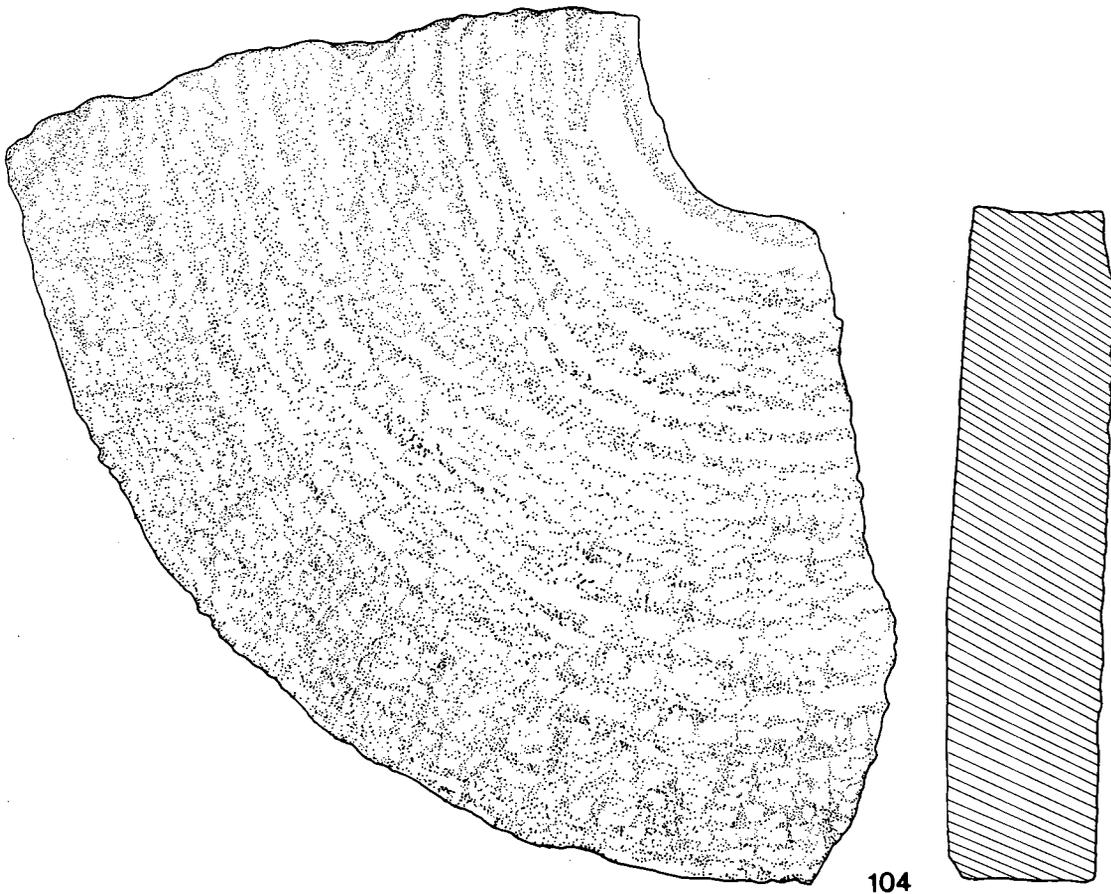


FIG. 26 Segment of Millstone, Grinding Surface Uppermost. Scale 1:4.

Longthorpe piece is best taken as a millstone for use in a geared Vitruvian mill (Moritz (1958), 122, pl.13,b; cf. *Arch. Camb.* xciii (1936), pl.II B) powered by hand (cf. Scheuermeier (1956), 192 ff.).

The material of the stone is millstone grit from the north to mid Pennine region, and Kinder Scout, N Derbyshire, is the most likely source (information from Dr R.M.C. Eagar, Manchester Museum). There was a wide-ranging trade in Pennine gritstone in the Roman period (*Shakenoak* i, 38; *Verulamium* i, 158; *Gadebridge*, 194). From LHR72.F21 SF 22: built into reduced stokehole of corndrier (third century).

Nos. 105–8. Objects of Stone not illustrated

(Geological identifications by Dr R.M.C. Eagar and Dr J. Wadsworth, Manchester University)

105. Fragment of whetstone of quartz-mica sandstone with silica cement. 74.B1.1 SF 14: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
106. Fragment of whetstone of mudstone, perhaps from the coal measures. 71.59.4 SF 159: fourth-century dumped material in Pit 8 in Yard II.
107. Fragment of whetstone composed of quartz sandstone, probably from the coal measures. 74.B1.1 SF 13: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
108. Corner fragment of a stone used for grinding or sharpening blades. Millstone grit. 74.B1.6 SF 48: second-century drainage gully.

5. THE INTAGLIO (PL. XVI) By Martin E. Henig

109. The intaglio, a glass setting from the bezel of a finger-ring, has been cast in a mould and the waste material around the edges subsequently trimmed away.¹²⁴ Its colour is amber to light brown, and the shape is slightly ovoid with a convex upper surface (Shape A3,¹²⁵ 11 mm by 10 mm by 2.5 mm). The intaglio was found on the spoil heap, adjacent to the Haul Road, but is very probably to be associated with the Claudio-Neronian kilns. Glass gems, in a range of colours, are especially common in the first century B.C. and in the Julio-Claudian period.¹²⁶



PL. XVI The Longthorpe intaglio (left) and an impression taken from it (right). Scale 4:1.

(Photographs by Robert Wilkins, by permission of the Institute of Archaeology, Oxford)

124. P. Gercke, 'Die Gemmensammlung im Archäologischen Institut der Universität Göttingen', *Antike Gemmen in Deutschen Sammlungen* iii (Wiesbaden, (1970), 63–176, Nos. 14, 25, 39, 45, 74, 91, 97, 118 (unfinished examples or wasters where this final trimming was never carried out).
125. M. Henig, *A Corpus of Roman Engraved Gemstones from British Sites*, British Archaeological Reports 8 (Oxford, 1974), i, fig. 1.
126. G. Sena Chiesa, *Gemme del Museo Nazionale di Aquileia* (Aquileia, 1966), 35 ff.

Seen in impression – as the recipient of a letter would have seen it – the device is Cupid walking towards the right and holding a long staff in his hands. He pokes this up into the branches of a tree. A small bird perches upon an upper bough, and it is very likely that Cupid is trying to capture it by means of birdlime on the end of the pole. A late Roman sarcophagus in the church of S. Lorenzo in Rome shows a similar putto with a fowling-stick.¹²⁷ The device is reasonably common on gems, although sometimes other creatures (notably insects) are depicted rather than birds.¹²⁸ On other intagli, however, Cupid is evidently using a pole to harvest olives by knocking them off the tree.¹²⁹

LHR72 unstratified SF 24. The gem was found after the end of the excavation by Mr D. F. Moffat, Custodian of Longthorpe Tower, to whom warmest thanks are due.

6. THE FLINTS (FIG. 27). By F. M. M. Pryor

Twelve flints were recovered from the excavations of 1970–74. The flint used is of good quality and black in colour. Most pieces, however, show clear signs of abrasion around sharp edges, suggesting that the collection under review is probably residual and not contemporary with the Iron Age and Roman phases of the site.

The collection comprises:

A. Utilised Flakes (Not illustrated)

(a). whole flakes (four)

110–111. 71.50.+ : two flakes from topsoil NW of the Iron Age farm.

112. LHR72.F5.+ : topsoil W of Kilns 1–3 on Haul Road.

113. 74.B3.5: dark patch near Kiln 13 (associated with fourth-century pottery).

(b). broken flake (one)

114. 70.XXV.2: farmyard surface in Yard II (second century, but with fourth-century interference).

B. Retouched Flakes (two) (Not Illustrated)

115. 71.50.+ : topsoil NW of the Iron Age farm.

116. 74.B2.6: filling of NW ditch of Yard I (Claudio-Neronian).

C. Blade (one) (Not Illustrated)

117. 70.XXI.1 upper filling of SE ditch of Yard I (associated with fourth-century pottery).

127. G. Rodenwalt, 'Der Klinensarkophag von S. Lorenzo', *Jahrbuch des Deutschen Archäologischen Instituts* xlv (1930), 116–89, esp. Abb.1, S.168; cf. R. Stuveras, *Le putto dans l'art romain* (Brussels, 1969), 90, pl. LVIII, fig. 131.
128. Sena Chiesa, *op. cit.* (note 126), No.303; G. M. A. Richter, *Engraved Gems of the Romans* (London, 1971), No.150; A. Furtwängler, *Königliche Museen zu Berlin: Beschreibung der Geschnittenen Steine im Antiquarium* (Berlin, 1896), No.7478; H. B. Walters, *Catalogue of the Engraved Gems and Cameos, Greek, Etruscan and Roman . . . in the British Museum* (London, 1926), No.2869; A. Hamburger, 'Gems from Caesarea Maritima', *Atiqot viii* (1968), No.96. All depict Cupid as a fowler. Cf. Furtwängler, *op. cit.*, No.7477; E. Zwierlein-Diehl, 'Staatliche Museen Preussischer Kulturbesitz, Antikenabteilung Berlin', *Antike Gemmen in Deutschen Sammlungen* ii (München, 1969), No.453 (with an insect, perhaps a butterfly representing Psyche, instead of a bird).
129. Sena Chiesa, *op. cit.* (note 126), No.301 f.; A. de Ridder, *Collection de Clercq* vii (II), *Pierres Gravées* (Paris, 1911), No.3102; cf. a gem from Corbridge, Northumberland: Henig, *op. cit.* (note 125), ii, No.136; D. Charlesworth, 'Roman Jewellery found in Northumberland and Durham', *Arch. Ael.*⁴ xxxix (1961), 32, No.14, pl.IX, 7.

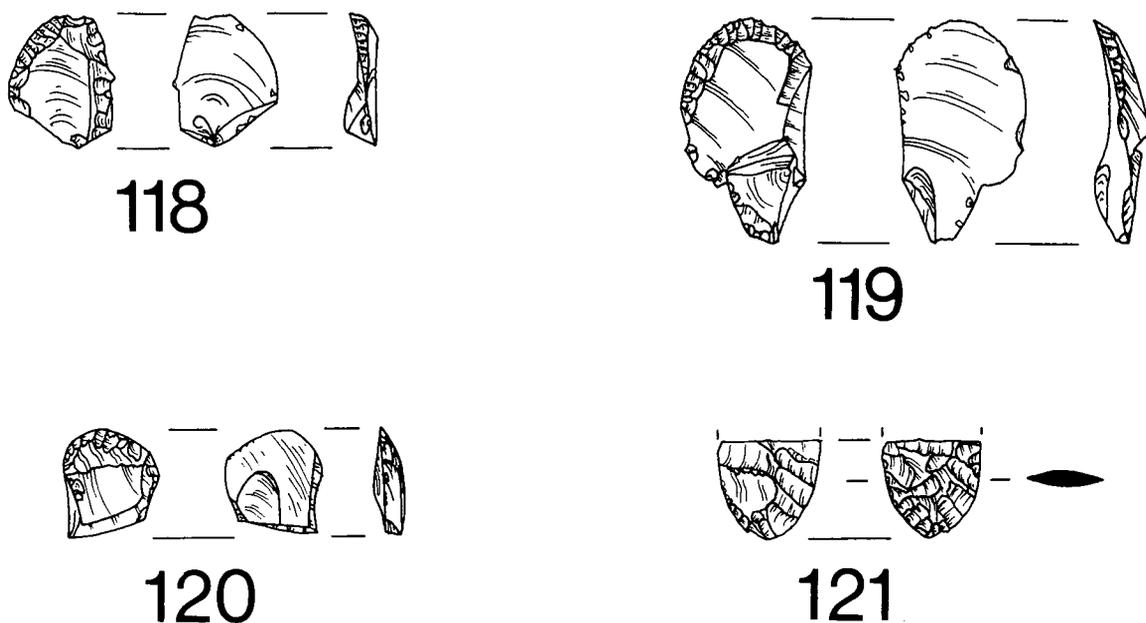


FIG. 27 Worked Flints: Nos. 118, 119 Scrapers of Class A 2; No. 120 Scraper of Class E; No. 121 Leaf-Shaped Arrowhead. Scale 2:3.

D. Scrapers (after Clark, Higgs, Longworth (1960))

(a). Class A2 (two)

118. 70.IV.5: filling of bypass ditch SE of Yard II (early third century).

119. 70.XIX.3: upper filling of ditch between Yards I and II (second or early third century).

(b). Class E (one)

120. 70.XXI.+ : topsoil at SE entrance to Yard I.

E. Leaf-shaped Arrowhead (one)

121. 70.XXII.3; filling of SE ditch of Yard II (associated with second-century pottery).

The dating of so small a collection must of necessity be difficult, but the fragment of a leaf-shaped arrowhead (FIG. 27, No.121) and the broken blade (No.117) both suggest that there was probable Neolithic activity in the area, whereas other flints might be considered as more typical of the Bronze Age. The absence of waste flakes, hammerstones, cores or irregular workshop-waste argues against prolonged settlement of the site in Neolithic and Bronze-Age times.

IRON-AGE FLINT-WORKING IN THE NENE VALLEY

This sparse collection of flints from Longthorpe provides good evidence that flint-working was no longer taking place in the later Iron Age of the Lower Nene Valley. Other local sites of this period which have also failed to yield significant quantities of flintwork include Monument 97 (Orton Longueville), Lynch Farm and Fengate (Cat's Water sub-site) (*Durobrivae* 3 (1975), 26 f.; 1 (1973), 22 f.; 4 (1976), 10-12).

When we turn to the middle part of the Iron Age, large-scale excavation of a long-lived settlement at Twywell, Northants., again failed to produce contemporary flintwork. The dating of this site is somewhat imprecise, but the pottery is all of the scored tradition and would appear

to postdate the angular La Tène I-derived forms so common in the Upper Thames basin, but to antedate the wheel-thrown 'Belgic' types. One radiocarbon date (280 ± 90 bc) from grain in a pit belonging to an early phase of the settlement supports Professor Harding's dating of the pottery. Large pits containing quantities of similar scored pottery have been found at Fengate (Padholme Road sub-site). These pits were packed with domestic refuse, but only a few flints were found and these were probably derived from Bronze-Age contexts (*Fengate* i and iv).

Excavation of an extensive Early Iron Age settlement at Fengate (Vicarage Farm sub-site), possibly dating to the fifth century B.C., also produced very few fresh flints. West Harling, Norfolk, however, still remains the type-site for Early Iron Age flintworking in Eastern England (Clark, Fell (1953)). The site was thoroughly excavated and was shown to belong to the earliest Iron Age and to have been occupied for a considerable length of time. The flintwork was fresh and unpatinated, but the quantities recovered seem remarkably small (200 flakes, 7 cores and 15 scrapers), especially when one considers the site's longevity and the large amounts of pottery found. By way of comparison, the Neolithic settlement at Hurst Fen yielded about 16,500 flints in just one season of excavation, a density of about 40 flints per square yard (Clark, Higgs, Longworth (1960), 214). The flint assemblages selected for comparison with West Harling (Thorny Down and Mildenhall Fen) are now seen to be of Middle rather than Late Bronze Age date and there seems to be no good reason to suppose that the West Harling flints are not of that date also.

On present evidence the case for flintworking in the Iron Age of northern East Anglia and the East Midlands has still to be proved convincingly, but the recently-discovered Late Bronze Age site at Flag Fen (Pryor (1983)) has produced crude 'bashed' flint flakes and nodules that are undoubtedly contemporary with the timber platform which has been dated by radiocarbon (BM 2123) to 660 ± 60 bc. On the whole it would seem that flintworking in the Peterborough area ceased with the widespread adoption of iron tools. This new tool-making technology probably finished off an earlier tradition that had already been extensively modified to accommodate the general availability of bronze edge-tools (Ford *et al.* (1984)).

7. OBJECTS OF IRON. By. G. A. Webster

122. Two pieces of a *lorica segmentata* with an attached bronze hinge. As demonstrated by H.R. Robinson (1972) these belong to the shoulder-strips which have hinges at the top. If the hinges are central, these strips were quite broad (8–9 cm) and one is tapered. Cf. *Longthorpe* I, 46, FIG. 25. From 72.18 SF 2: sand at bottom of Kiln 20 stokehole (Claudio-Neronian).
123. Corner-piece of shoulder-strip from a *lorica segmentata*, with bronze hinge attached. Cf. No. 122. From 72 SF 7: spoil heap.
124. Socket and lower part of a small spearhead. The wooden shaft would have been 1.3 cm thick, and thus could have been used for throwing. 70.VI.5 SF 21: greeny-grey filling of SE ditch of Yard II (Claudio-Neronian assemblage).
125. Ballista-bolt with a long pyramidal point and socket for the shaft. Cf. *Hod Hill* i, pl. VI, B118; *Rheingönheim*, Taf. 46, 7–23. From 74.B1.1 SF 34: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
126. Pilum head with blunted tip and bent broken shaft. Cf. *Longthorpe* I, 76, No.10; *Germania* 29 (1951), 198 ff. The possibility that it is the head of a mason's drilling bit cannot be ruled out. 71.53.4 SF 60: upper filling of ditch and Pit 1 at N corner of Yard I (Claudio-Neronian assemblage).
127. Socket with flattened tip, perhaps from a spearhead. 71.56.6 SF 85: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
128. Stylus with point broken away. 74.B1.1 SF 3: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
129. Stylus, too corroded to show any decoration. 70.XXVIII.1 SF 34: Roman ploughsoil.

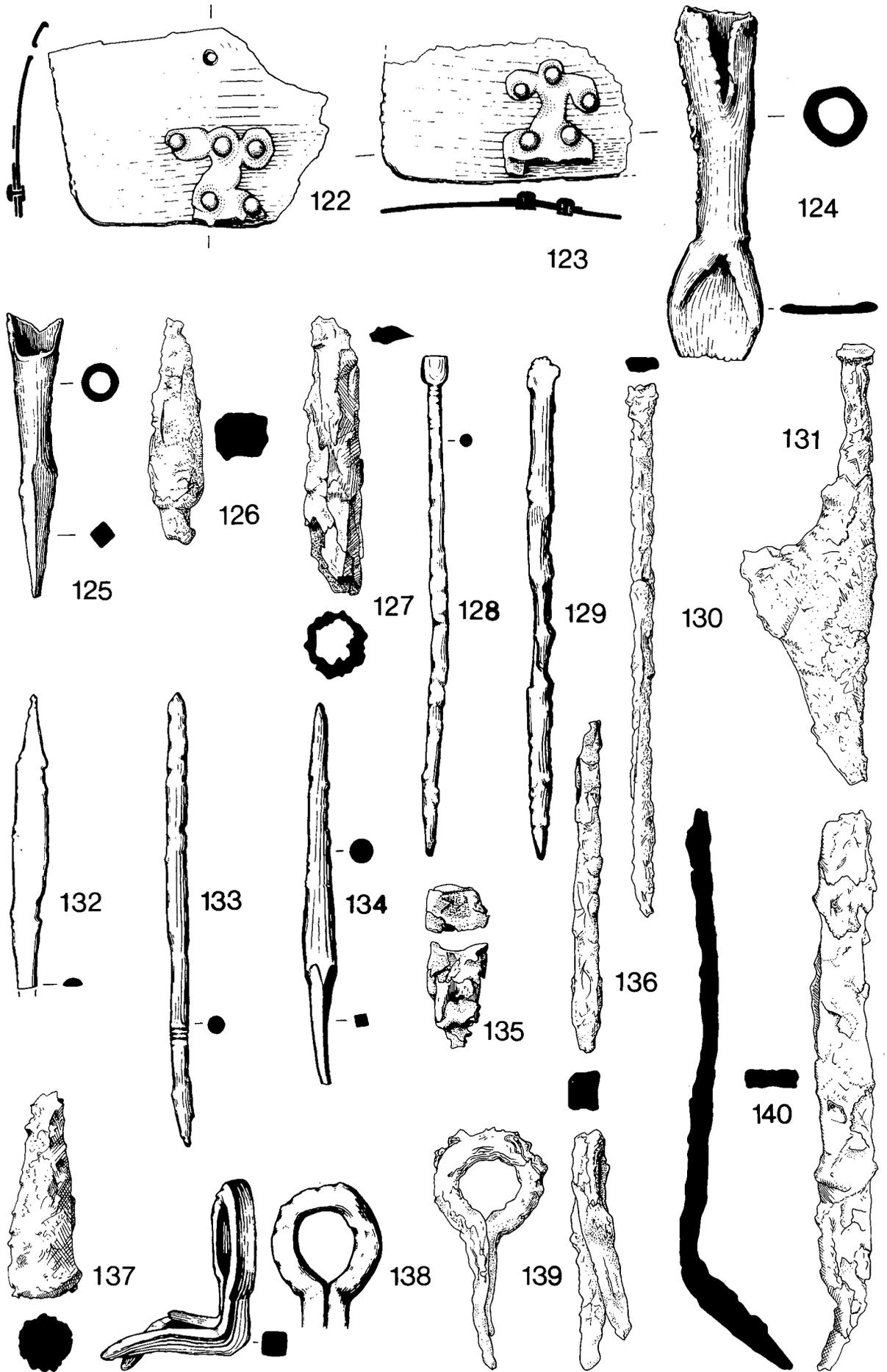


FIG. 28 Iron Objects. Scale 2:3.

130. Stylus. The flattened end for erasing is slightly damaged. 71.56.9 SF 118: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
131. Small knife. The tang ends in a knob. Cf. *Gadebridge*, 168, Nos. 406, 411, 415. From 71.60.2 SF 99: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
132. Small knife-blade. 70.XIV.1 SF 30: greeny-grey filling of NE ditch of Yard I (Claudio-Neronian, disturbed).
133. Drill with carefully-formed point and square section at the other end for the wooden socket. 74.B1.1 SF 7: upper filling of the NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
134. Piece tapering at both ends, one to a point, the other to a tang. Probably a carpenter's bit. 70.IV.2 SF 31: upper filling of subsidiary bypass ditch SE of S corner of Yard II (early third century).
135. Small fragment from the junction of the blade and handle of a knife or small implement. It has traces of bone sheathing on both sides of the handle. 71.60.4 SF 130: upper filling in Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
136. Carpenter's bit with broken tip. 71.56 SF 162: topsoil.
137. Small (metalworker's?) punch or drift with a square striking surface giving way to a rounded shaft. Cf. *Verulamium* i, 164, No.5; *Gadebridge*, 183, Nos. 605, 607. From 71.56.21 SF 146: sandy layer in E side of working terrace (Pit 7) (Claudio-Neronian).
138. Split spiked-loop for attachment to a fixture and from which could be hung a chain: possibly a door fitting. Cf. *Rheingönheim*, Taf. 57,16. From 70.XXXVI.2 SF 42: upper filling of ditch between Yards I and II (undated).
139. Complete split spiked-loop: cf. *Longthorpe* I, 80, Nos. 44-7; *Verulamium* i, 184, Nos. 90-4. From 71.56.9 SF 80: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
140. Clamp, one tine missing. Cf. *Longthorpe* I, 78, No.30. From 71.56.6 SF 67: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
141. (Not illustrated). Curved bar, 7 cm long, with tapering rectangular section. 71.60.3 SF 104: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
142. End of heavy spiked clamp. 71.56.6 SF 84: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
143. Staple, now distorted; the ends of both tines missing. Cf. *Longthorpe* I, 79, No. 30; *Fishbourne* ii, 137, Nos. 67-8. From 71.53.10 SF 102: brown stony filling of Pit 1 in N corner of Yard I (Claudio-Neronian).
144. Large nail or clamp with asymmetrical head. 70.XXI.1 SF 22: upper filling of SE ditch of Yard I (associated with fourth-century pottery).
145. T-shaped latch-lifter or key. As it appears to have a finished shank, it presumably fitted into a wooden handle. Cf. *Rheingönheim*, Taf. 50, 27-30; *Longthorpe* I, fig. 43, No. 33. 74.B1.1 SF 40: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
146. Tool with tang at one end and a flat expansion at the other, showing traces of teeth. It may be a type of curry-comb, although the recognised form of handle is quite different. 74.B2.1 SF 11: top of NW ditch of Yard I (Claudio-Neronian, with fourth-century tipping).
147. Short ferrule. Cf. *Longthorpe* I, 76, No. 12. From 71.56.37 SF 109: silt on bottom of working terrace (Pit 7) (Claudio-Neronian).
148. Flat D-shaped chain link or possibly a buckle. 74.B1.1 SF 45: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
149. Broken bucket-handle. Cf. *Longthorpe* I, 78, No. 31; *Brampton*, 27, No. 34. From 71.53.2 SF 61: sooty filling of stokehole of Kiln 5 (Claudio-Neronian).
150. Horse-shoe-like object, flat on one side, bevelled on the other. One end is rounded, the

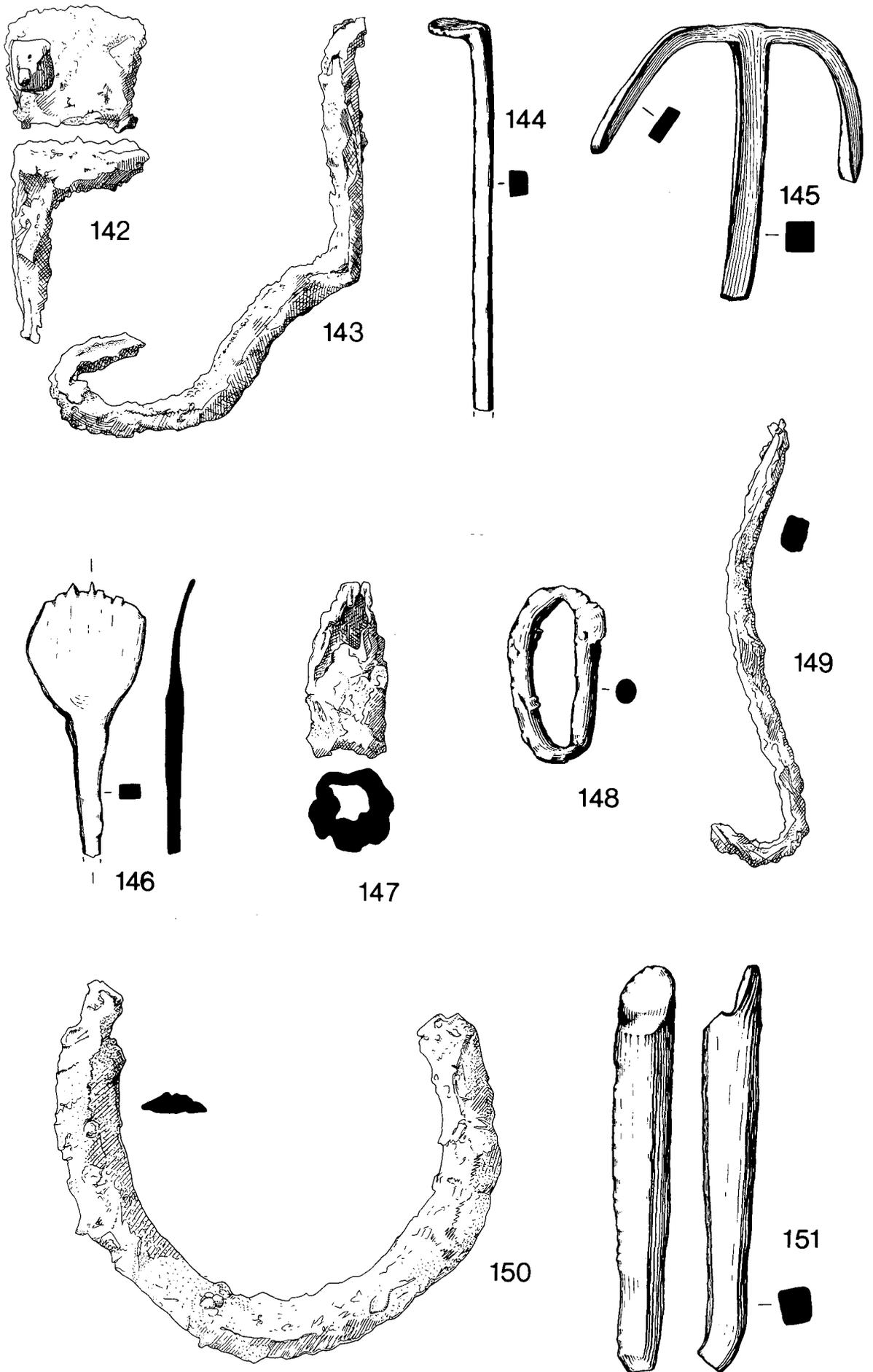


FIG. 29 Iron Objects. Scale 2:3.

other has a tang. Slight traces of wood in the corrosion-products on the flat side. 71.56.12 SF 101: hollow in working terrace (Pit 7) (Claudio-Neronian).

151. Object with square section tapering slightly towards one end, where there is an indication of it turning. Probably a tool. 70.XXXVI.2 SF 44: upper filling of ditch between Yards I and II (undated).

Nos. 152–68. *Iron objects not illustrated*

152. Six small fragments of thin plate with associated bronze. Possibly from shoulder-strip of a *lorica segmentata*. 71.56.9 SF 142: greeny-grey deposit in gully on working terrace (Pit 7). Claudio-Neronian, moved in late second century).
153. Fragment of plate, slightly curved, with hole. Perhaps a piece of *lorica segmentata*. Cf. Nos. 122, 123. From 72.19 SF 3: sandy filling of NW ditch of Yard II (Claudio-Neronian assemblage).
154. Three thin strips, perhaps originally joining. Perhaps fragments of *lorica segmentata*. 71.56.56 SF 139: silt at bottom of Pit 5 (Claudio-Neronian).
155. Fragmentary stylus, c. 12 cm long. 71.56.35 SF 116: rubble consolidation over Pit 6 (Claudio-Neronian assemblage).
156. Flat strip tapering at one end. It measures 11.5 cm by 1.4 cm and may be a narrow knife-blade. Cf. *Aislingen*, Taf. 28, 15. From 71.60.3 SF 107: upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century).
157. Fragment of ring, 2 cm in diameter. 74.B1.1 SF 43: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
158. Small U-shaped collar or clamp, 3.5 cm in diameter, perhaps to bind a wooden shaft or handle. The iron strip of which it is made is concave in section, 8 mm wide. Cf. *Verulamium* i, fig. 69, No. 123. From LHR72.F22.1 no SF: occupation-debris over furnace on Roman farm (second century or later).
159. Small portion of clamp, 4.5 cm long. 74.B1.1 SF 44: upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century).
160. L-shaped piece, 8 cm long, with flattened rectangular section. Perhaps a fragment of T-shaped holdfast or key. 71.56.14 SF 81: charcoal-filled hollow in working terrace (Pit 7) (Claudio-Neronian, but second-century disturbance).
161. Corner-piece of an angle-iron, formed from a flat band 1.5 cm wide, now 6.5 cm long. LHR72.F21.2 SF 21: farmyard ditch (second century).
162. Ferrule attached to a small coil of three turns. The (pointed) ferrule is broken off. Cf. *Longthorpe* I, 76, fig. 41, Nos. 13, 14; *Gadebridge*, 167, fig. 71, No. 404; *Cranborne Chase* ii, 137, pl. CV, No. 12. From 72.10 no SF: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed).
163. Pointed ferrule projecting from a coil 1.7 cm in diameter which is made from a flat band, c. 5 mm in width, showing three turns. Cf. *Longthorpe* I, fig. 41, Nos. 13, 14. From LHR72.F21.3 SF 16: upper ditch filling, later farm (fourth century).
164. A strip, broken at both ends, 23 cm long by 3.5 cm wide and slightly curved in section. Perhaps a tyre fragment, Cf. *Brampton*, 22, No. 22. From LHR72.F4.4 SF 14: lower stokehole filling associated with Kiln 3 (Claudio-Neronian).
165. Fragment of band, 7.5 cm long by 1.8 cm wide. One end is broken, the other tapers into a loop which is bent back upon the band. Perhaps the end of a latch-lifter's handle. Cf. *Aislingen*, Taf. 28, 22; *Gadebridge*, 166, fig. 71. No. 397. From 74. B1.4 SF 17: slipped gravel in top of filling of working terrace (Pit 7) (second century?).
166. Short length of flat bar. 9.5 cm long and c. 1 cm wide, broken at both ends. 70.XVI.3 SF 29: greeny-grey filling of NE ditch of Yard I (Claudio-Neronian assemblage).
167. Two pins, each 2.8 cm long. They are pointed and have a slightly thickened head. 70.XII.1 SF 18: filling of gully in Yard I, with dog burial 2 (Claudio-Neronian).
168. Strip, 18 cm long by 8 mm wide, widening to 1.1 cm at one end. 71.56.12 SF 89: hollow in working terrace (Pit 7) (Claudio-Neronian assemblage).

7A. THE NAILS. By J. P. Wild

The rubbish deposited on the site of the former Iron Age farm during and shortly after the Roman military occupation contained many iron nails. While the majority may have come from nearby timber buildings – or even from structures within the fortress – comparatively few of them show signs of use. Their state of preservation is generally poor.

The vast majority fall into H. F. Cleere's Class E (*Journal of the Iron and Steel Institute* 200 (1962), 956 ff., 958, Table 1). They vary in length from 3.5 cm to 5.5 cm, have a square shank (3 cm square) and a disc-shaped head (c. 1.2 – 1.8 cm in diameter). There are a few large square-headed nails, up to 12 cm long with a shank c. 0.8 cm square; but none larger. (For an analytical examination of a large nail, see below, pp.109–12). The triangular-headed 'coffin' nails characteristic of the later Roman period (Manning's Type II: *Gadebridge*, 173) are absent.

7B. AN APPRAISAL OF IRONWORKING REMAINS FROM LONGTHORPE

By J.H. Cleland and Judith A. Todd

Investigation of a number of artefacts has yielded evidence of iron-production which spanned all the operations from ore roasting through smelting to smithing of the resultant bloom. The site yielded about 10 kg of ore and slag. Metallographic examination of a large nail and electron-probe microanalysis of inclusions entrained in it have provided some interesting data.

1. *The Roasted Ore*

The roasted ore was present in the form of magenta-coloured nodules of c. 30 mm diameter,¹³⁰ which exhibited a structure of roughly concentric layers. The samples examined were: 74.B1.1: from upper filling of the NW ditch of Yard I (Claudio-Neronian, but with a little later material); 74.B1.9 and 74.B2.1: from top filling of the NW ditch of Yard I (later Roman dumping of earlier material). These nodules were slightly magnetic, indicating the presence of magnetite (Fe_2O_3) caused by the reduction of some of the haematite (Fe_2O_3) during roasting.¹³¹ They readily broke into small chips about 3 mm square and in the excavated form were most probably the feed for the smelting furnaces.

TABLE II

Composition of roasted ore samples (all values in weight %, n.d. = not detected.)

Findspot	Longthorpe Roasted ore			Sacrewell Roasted ore		Ashwick Roasted nodules
	B1.1	B1.9	B2.1	II	II	–
SiO_2	8.6	8.6	31.6	25.7	17.1	20.02
Fe_2O_3	73.7	63.3	65.6	69.7	66.4	72.5
Al_2O_3	4.3	2.3	2.5	3.6	9.6	4.21
TiO_2	0.3	0.2	0.4	0.4	0.5	–
CaO	trace	2.0	2.4	n.d.	0.3	1.28
MgO	trace	trace	trace	trace	trace	1.10
MnO	0.08	2.8	0.04	0.23	0.15	0.86
P_2O_5	1.10	1.85	0.63	0.46	0.55	0.31
S	0.02	n.d.	0.02	n.d.	0.03	–

130. H.F. Cleere, *The Romano-British Industrial site at Bardown, Wadhurst*. Sussex Archaeological Society Occasional Paper No.1 (1970).

131. H.F. Cleere, 'Ironmaking in a Roman Furnace', *Britannia* ii (1971), 203–17.

Representative analyses of these nodules and comparative material from Sacrewell and Ashwicken¹³² (see Table II) indicate that the Longthorpe roasted ore has an acceptable haematite content, is low in alumina (Al_2O_3) and, except for 74.B2.1, is low in silica (SiO_2). The low alumina and silica contents combined with the haematite and the relatively high lime (CaO) values ensure a slag of lower than normal liquidus temperature, thus making the Longthorpe roasted ore nodules particularly suitable feedstock for the bloomery process. On treating ore sample 74.B1.9 by the method proposed by Bestwick and Cleland¹³³ a liquidus temperature of *c.* 1140°C was obtained, lower than the average figure of *c.* 1170°C for a Roman slag.

One additional feature of the analyses requires comment and at the same time raises some interesting speculation on the degree of expertise enjoyed by the artisans: namely, the high phosphorus levels, which on smelting would partition between the slag and metal. Tylecote¹³⁴ writes that phosphorus is an undesirable constituent in iron, and that by the Roman period phosphorus-containing ores were used only when no alternative source existed.¹³⁵

The current treatment for high phosphorus iron is exposure to a lime-containing basic slag which causes the phosphorus to react with lime and form calcium phosphate which is then slagged off. Norwich¹³⁶ remarked upon the basic calcareous nature of the clay used for furnace construction at Sacrewell. With respect to its unsuitability for furnace construction, especially when more suitable clay was locally available, he concluded that its use was deliberate. This choice he ascribed to the fluxing action of lime on iron-silicate slags. It is, however, difficult to visualise how this would have worked, since the rapid slagging of the lining which occurs on firing the bloomery would effectively stifle any transfer of lime from the lining to the charge.

2. The Slag

Longthorpe has yielded an example of an iron slag, the bulk analysis of which (TABLE III), on comparison with other analyses,¹³⁷ showed it to have a composition similar to that of other Romano-British iron-making slags. It came from 72.16: the main NW ditch of Yard II (largely Claudio-Neronian, but moved in the second century).

TABLE III
Bulk composition of slag (all values in weight %)

	Longthorpe	Sacrewell	Ashwicken
SiO_2	23.93	32.80	21.2
FeO	66.39	48.44	65.56
Al_2O_3	5.38	14.82	3.2
TiO_2	—	0.57	—
CaO	2.33	1.85	0.4
MgO	—	trace	1.4
MnO	—	0.33	0.5
P_2O_5	0.95	1.11	1.72
S	—	0.05	—

Treatment of this slag analysis by the method of Morton and Wingrove¹³⁸ yielded a liquidus temperature of *c.* 1135°C, in reasonable agreement with the method of Bestwick and Cleland on

132. Ashwicken: *Norfolk Archaeology* xxxii (1960), 142–62.

133. J.D. Bestwick, J.H. Cleland in G.D.B. Jones (ed.), *Roman Manchester* (Altrincham, 1974), 143–58.

134. R.F. Tylecote, *Metallurgy in Archaeology* (London, 1962), 244.

135. *ibid.*, 253.

136. *Durobrivae: A Review of Nene Valley Archaeology* 2 (1974), 18 f.

137. Tylecote, *op. cit.* (note 134), 246 f.

138. *Journal of the Iron and Steel Institute* 207 (1969), 1556–64.

the roasted ore (see above). A similar treatment of the other slag analyses quoted in Table III indicated liquidus temperatures of *c.* 1140°C and *c.* 1180°C for Sacrewell and Ashwicken respectively.

Electron-probe analysis of the Longthorpe slag identified four distinct phases, of which the analyses are given in TABLE IV.

TABLE IV
Micro-analyses of the phases present in the slag (all values in weight %; n.d. = not detected)

Phase	I	II	III	IV
SiO ₂	n.d.	28.26	52.75	29.88
FeO	101.60	60.41	1.70	40.45
Al ₂ O ₃	n.d.	n.d.	24.84	6.41
CaO	n.d.	12.91	n.d.	21.01
P ₂ O ₅	n.d.	n.d.	n.d.	4.41
K ₂ O	n.d.	n.d.	21.66	0.63
Na ₂ O	n.d.	n.d.	n.d.	2.11
Approx. liquidus °C	1369	1115	1100	1180

The diversity in composition is immediately apparent as is the 'masking' effect of the bulk analysis (for example, the FeO distribution in the phases is very diverse). These micro-analyses allow identification of the phases present and hence a full chemical description of the slag.

Phase I and II constitute the bulk of the slag, 29% and 65% respectively, Phase I being present as dendrites and globules of wustite (FeO) and Phase II as a 4:1 mixture of fayalite (2FeO.SiO₂) and calcium disilicate (2CaO.SiO₂). These compounds are common slag constituents.

The presence of Phase III, which appears as small angular particles accounting for *c.* 1% of the total slag is interesting. Approximating in composition to the oxide compound leucite (Al₂O₃.K₂O.4SiO₂) with a small percentage of wustite, this phase should have a liquidus temperature of *c.* 1600°C. However, this temperature was not attained in the bloomery process and it must therefore be postulated that this phase had been entrained in the slag by pick-up from either the ore or, more probably, the furnace lining. The angular habitat of this is indicative of lack of melting and supports the entrainment postulation.

The remainder of the slag, Phase IV, is a complex mixture of wustite, fayalite, anorthite glass (CaO.Al₂O₃.2SiO₂) and gehlenite (2CaO.Al₂O₃.SiO₂). Two points are noteworthy:

(a). This phase contains the unbonded alkali oxides Na₂O and K₂O (as opposed to the bonded K₂O of leucite). As pointed out by Tylecote:¹³⁹ 'many early bloomery slags contain a substantial alkali content (1–4%) which could have a marked effect on the melting point. Such alkali will normally be in solution in the glass phase and should be identified on analysis'. This alkali content is probably derived from the charcoal.

(b). Phase IV also contains all the phosphorus (quoted as P₂O₅).

This is an interesting combination, since a current treatment for ladle dephosphorisation of steel is the addition of soda-ash, the stability of the alkali oxide phosphates thus formed being high.¹⁴⁰ It is therefore no coincidence that the alkali oxides and phosphorus are present in the same phase.

To conclude these remarks on analyses: attention should be drawn to the fact that, as

139. R.F. Tylecote, private communication to Morton and Wingrove (*op.cit.* note 138); *idem*, *Metallurgy in Archaeology* (London, 1962), 190.

140. J.A. Charles, T.C. Churcher in *Iron and Coal Trades Review* 174 (1957), 667–72; C. Bodsworth, *Physical Chemistry of Iron and Steel Manufacture* (London, 1963), 451.

inspection of TABLES II, III, and IV reveals, no direct correlation exists between the composition of the roasted ore, the resultant slag and the phases present in the slag, so far as the major constituents of these materials are concerned.

The other slag samples were representative of the type known as cinder: a porous, light-brown material produced in the upper zones of the furnace. They were from 74.B1.8: the filling of the working terrace (Pit 7) NW of Yard I (Claudio-Neronian). None of the samples was magnetic and no tap-slag was found. This last fact suggests that the furnace type in use may be ascribed tentatively to Cleere's Group A.¹⁴¹

3. The Nail

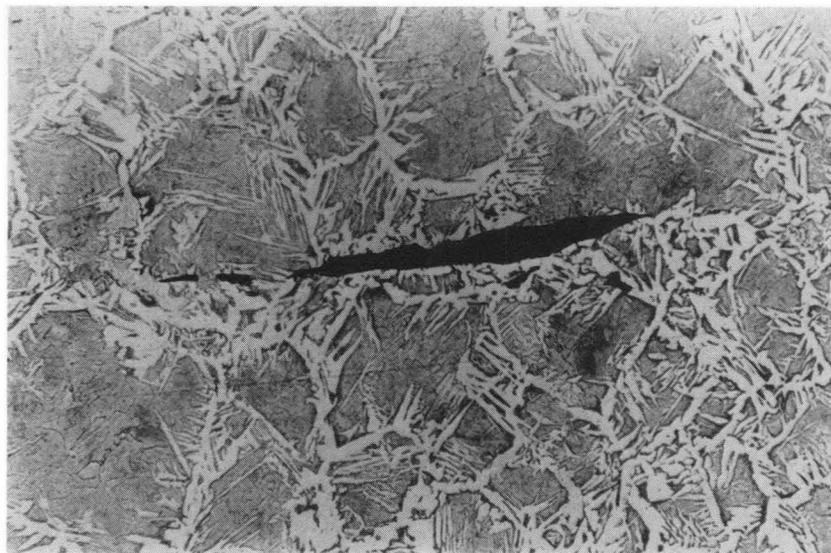
One of the Longthorpe finds was a well-preserved iron nail from 72.16: the main NW ditch of Yard II (largely Claudio-Neronian, but moved in the second century). It has been subjected to thorough metallographic and analytical examination in an attempt to elucidate the nature of the slag inclusions entrained in the nail (for the other Longthorpe nails see p.106). Additionally, the nail yielded information on the mode of manufacture which supports the conclusions of Angus, Brown and Cleere.¹⁴²

Length, cross-section and shape of head indicate that the nail belongs to Category C of the classification of Angus *et alii*:

overall length	102.5 mm
section of shank 12 mm below head	7.9 mm square
diameter of head	20.6 mm
thickness of head	2.4 mm
shape of head	disc

The surface of the nail was covered in corrosion-products varying in thickness from 1.6 to 3.2 mm.

Longitudinal sections through the head and upper shank and the tip, and a transverse section of the head, were polished by conventional metallographic techniques, etched in 2% Nital¹⁴³ and examined by optical microscopy. Both the carbon distribution and grain size were found to vary over the width of the specimens.



PL. XVII Photomicrograph through nail-shank showing corrosion products, fine-grain zone and central large grain zone (2% Nital, scale 120:1).

141. *Antiq. Journ.* lii (1972), 8–23.

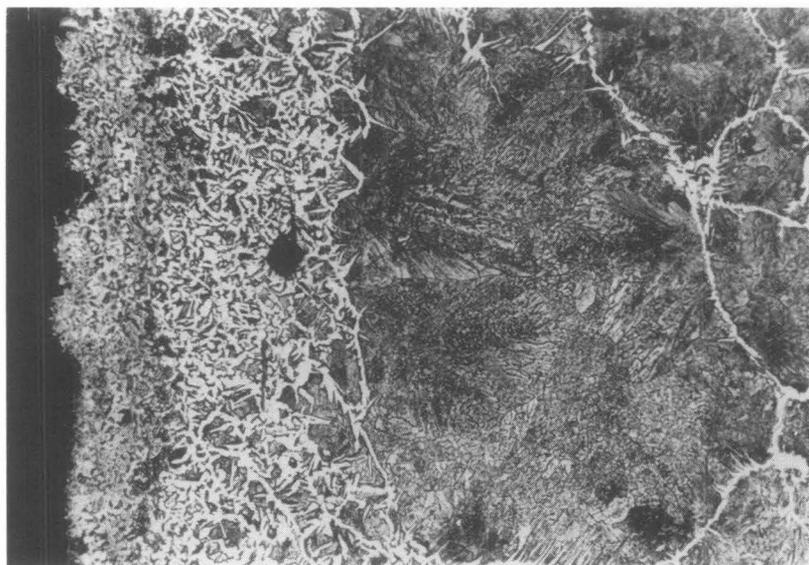
142. N.S. Angus, G.T. Brown, H.F. Cleere in *Journal of the Iron and Steel Institute* 200 (1962), 956.

143. A 2% V/V solution of nitric acid in ethyl alcohol.

Plate XVII is a representative microphotograph. It may be described as follows: from left to right can be seen:

- a. a layer of corrosion products
- b. a zone of fine grain low in carbon, in which a micro-hardness impression is visible¹⁴⁴
- c. a central core of large-grain size and high carbon content.

Macro-examination of the longitudinal section of the shank showed elongated slag stringers running parallel to the nail edges with small slag inclusions present at the grain boundaries (PL. XVIII).



PL. XVIII Slag stringer in central zone of nail shank (2% Nital, scale 120:1).

The transverse section through the head showed a low carbon, fine-grain-size zone in the centre surrounded by a ring of larger grains with an even lower carbon content. In the head the slag stringers ran in a direction normal to those of the shank.

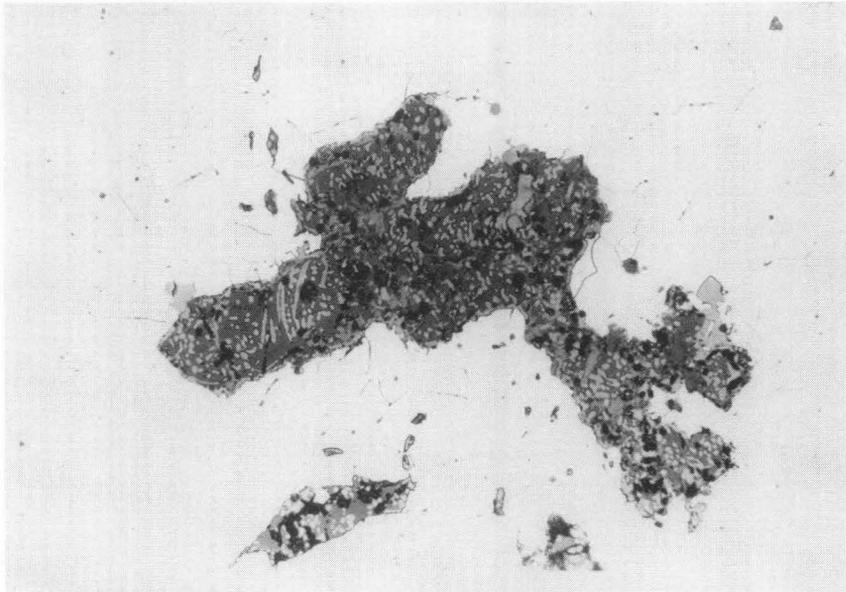
These data can be generally interpreted as showing the nail to have been made by sequential reheating and forging to the required shape at *c.* 950°C. A detailed discussion of the micro-structure is being carried out and will be reported at a later date.

Some of the larger inclusions in the nail were enclosed in a layer of ferric oxide (Fe_2O_3), indicating that inclusions weakly bonded to the metal can provide internal corrosion-paths and, as the shank cross-section narrowed towards the tip, the external layer of corrosion-products had penetrated as far as the large-grain-sized zone.

Micro-hardness testing gave the following mean values:

Shank	VPN
high carbon central zone	283.8
decarbonised, fine-grain-sized zone	196.9
matrix, close to inclusions	156.4
Head	
fine-grain-sized central zone	216.6
decarburised large grains at edge	152.5

144. Hardness is usually defined as resistance to penetration, and several testing procedures are available. In this instance the text used was the Vickers Pyramid number (VPN), in which the lengths of the diagonals of an indentation formed by a diamond pyramid are taken as a measure of hardness.



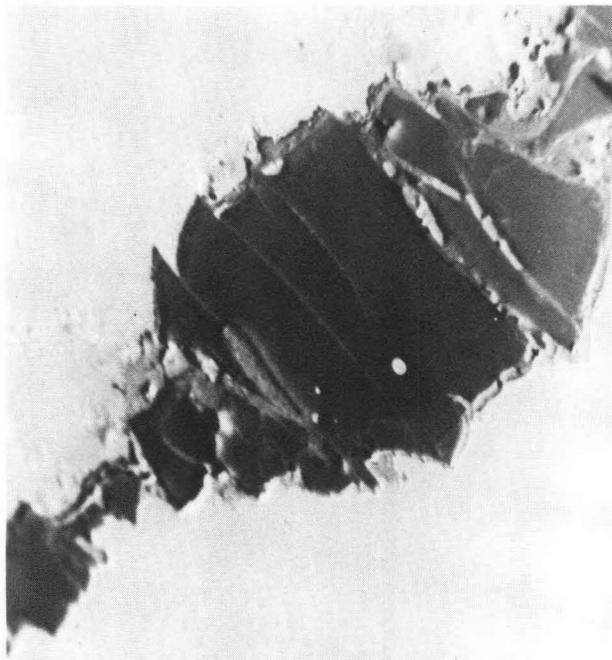
PL. XIX Elongated three-phase inclusion in the central zone of the nail-head (2% Nital, scale 120:1).

These values are consistent with the metallographic summary given above and the subsequent treatment of the nail. The low VPN value for the matrix close to the inclusions is probably due to yielding of the matrix at the matrix-inclusion interface.

Analysis of the nail showed that the only other element present in significant quantities was phosphorus (0.037%), and this will be discussed in the final section of this paper.

4. *The Inclusions*

Slag inclusions entrained in iron can provide useful information. For example, in the previous section, consideration of the macro-structure led to an understanding of the smithing technique employed for the nail. Data fundamental to a proper understanding of the chemical and mechanical properties of inclusions may be deduced from a micro-analytical examination and will be discussed in the context of this paper.



PL. XX Anorthite inclusion showing brittle fracture mode, from fine-grain region at the edge of the nail-shank. Scale 1760:1.

Plates XIX and XX show the two types of inclusions observed. Plate XIX is an example of the inclusions found in the central region of the nail head and it is clear that some elongation has occurred during deformation. This indicates hot-working above the inclusion transition temperature¹⁴⁵ which is consistent with the metallographic conclusions. This type of inclusion is complex, the micrograph showing three distinct phases, typical analyses of which are given in TABLE V. Some haematite (Fe_2O_3) was also identified, but this is probably an artefact introduced during sample preparation. One noteworthy point is that in 15 inclusions analysed only one had a detectable phosphorus content of 1.77% (quoted as P_2O_5).

TABLE V
Analyses of inclusion phases in weight % (n.d. = not detected)

Phase	I	II	III
FeO	100	74.50	3.56
SiO ₂	n.d.	21.16	54.45
CaO	n.d.	0.44	15.85
Al ₂ O ₃	n.d.	2.21	11.71
K ₂ O	n.d.	0.42	9.88
TiO ₂	n.d.	0.67	0.57
MgO	n.d.	0.54	3.78
approx. liquidus °C	1368	1148	1300

Phase I, the white laths and globules of PL. XIX, is composed wholly of wustite, and Phase II, the matrix, is mainly a mixture of wustite and fayalite, in the proportions of 25% and 70% respectively, with the residue being anorthite glass. These two phases show a marked resemblance to Phases I and II of the slag micro-analysis.

Phase III is a complex mixture of wustite, fayalite, anorthite glass and gehlenite and therefore resembles Phase IV of the slag. The most striking difference between the inclusion phase and the slag phase is the high alkaline-earth oxide content (lime, CaO and magnesium oxide, MgO), which is present in solution in the anorthite glass. In a study of the behaviour of inclusions in a steel during hot work, Ekerot¹⁴⁶ concluded: 'calcium seems to stabilise the glassy inclusions phase and thus promote deformable inclusions'. It is not unreasonable to assume that the chemically related MgO would have a similar effect. Thus the high CaO and MgO contents of Phase III over the slag Phase V may be explained in terms of their inclusion-stabilising behaviour.

The anorthite inclusion in PL. XX exhibits pronounced brittle fracture, indicating deformation below the transition temperature. Unfortunately, data on these transition temperatures are not available and no estimate of the temperature of working may be made. However, since such inclusions occurred in the cold-worked zone and the edges of the nail shank, this brittle-fracture behaviour is again in agreement with the metallographic conclusions.

The inclusions found in the central large-grain-sized region of the nail shank are of the elongated type shown in PL. XIX. The comments on Phase III of TABLE V apply equally to these inclusions since their chemical composition is similar.

5. Phosphorus partition

Attention was drawn to the high phosphorus content of the ore and to the deleterious effect of that element on iron. The phosphorus partition coefficient, that is, the ratio of the phosphorus content of the metal to either the slag or the inclusions, may not be calculated. The metal/slag partition coefficient is 0.178 and the metal/inclusion partition coefficient is 0.170. These values

145. The transition temperature referred to is the glass transition temperature below which the inclusions fracture in a brittle manner and above which they may elongate on deformation.

146. *Scandinavian Journal of Metallurgy* iii (1974), 21-27.

are lower than the two other partition coefficients (0.50 and 0.25) known at present,¹⁴⁷ and a high phosphorus ore has been successfully smelted to an iron of acceptable phosphorus levels, which is indicative of a high degree of technical skill. Was this due to the choice of clay and the construction of the furnace?

6. *Laboratory trial*

Comparison of the lime content of the ore, bulk slag and bulk inclusion analyses (1.46%, 2.33%, and 4.05% respectively) appears to show an increase in the lime content of the system on smelting, an increase which could promote the proposition that lime had been added as a flux. Although a lime-balance may be drawn up, this requires information on the relative proportions of each of the above and clearly such information cannot be obtained with any degree of accuracy. Accordingly, a laboratory reduction of a specimen of Longthorpe roasted ore was performed at 1200°C in a reducing atmosphere of carbon monoxide at one atmosphere of pressure. Iron and slag were produced and the lime content of the latter was 5.29%. Thus the contents quoted above can be obtained solely from the ore and are consistent with the generally accepted conclusion that there was no deliberate addition of lime as a flux.¹⁴⁸ The reason for the choice of the calcareous clay for furnace-construction remains open.

8. OBJECTS OF CLAY (FIG. 30). By J.P. Wild

169. A crudely made thick-walled crucible in yellow-brown (A4) calcite-gritted fabric. It had a capacity of *c.* 12 ml. There is slight damage to its underside, and a small blackened patch, but no real indication that it was ever used. Cf. *Verulamium* i, 366, Nos. 12–14. From 71.62.2 SF 88: consolidation in top of Pit 4 in Yard II (Claudio-Neronian, but disturbed in second century).
170. Terracotta object resembling a left foot stepping forward. The fabric is slightly sandy in texture, different from the products of the Longthorpe kilns, red-brown (B3) externally and yellow-brown (B5) in the core. The 'foot' is 'shod', but there are no markings on it. 71.53.2 SF 77: sooty filling of Kiln 5 stokehole (Claudio-Neronian).
171. Conjoining fragments of a triangular Iron Age loomweight. It was wedge-shaped, is now 5.5 cm thick and shows traces of a transverse hole pierced through it. The fabric has coarse grog and calcite in it, but no burnt-out vegetable matter. LHR72.F4.3 no SF number: upper filling of stokehole of kiln group 1–3 (Claudio-Neronian).
172. Similar fragment, with hard-fired blue-grey fabric, but few obvious inclusions. 70.III.27 lacking SF number: bottom of greeny-grey layer in NE ditch of Yard I (Claudio-Neronian).
173. Fragment of loomweight, blackened on one face. There are grog inclusions and impressions of burnt-out grass or straw, and a transverse hole. 70.XXI no SF: topsoil over SE ditch of Yard I.
174. (*Not illustrated*). Fragment of loomweight; one flat surface and a transverse hole are visible. The fabric is hard-fired. 74.A4 no SF number: topsoil over NW ditch of Yard I.
175. Unequivocal remains of a medium-sized firebar, 5 cm square in section. Streaky orange-buff fabric, with traces of burnt-out grass or straw and chaff. 70.53.10 no SF number: brown stony filling of Pit 1 in N corner of Yard I (Claudio-Neronian).
176. Fragment of firebar similar to No.175, 4 by 4.5 cm in section. 70.VI.2 no SF number: occupation-material in upper filling of SE ditch of Yard II (second century, disturbed).

147. Tylecote, *op.cit.* (note 134), 253.

148. The authors would like to thank Professor R.W.K. Honeycombe for encouragement and provision of laboratory facilities, Dr J.A. Charles for helpful discussion, and Mrs E. Smart and Mr J. Sturton for the analyses.

177. Piece of firebar; 3.5 cm square in section, with much burnt-out grass or straw and chaff. 71.59.1 no SF number: topsoil over Pit 8 in Yard II.
178. Fragment of terracotta ring, original external diameter *c.* 20 cm. Perhaps kiln furniture. Cf. Woods (1974), 277, fig. 6A. The fabric is sandy, blackened in patches. 71.56.23 no SF number: small pit in greeny-grey filling of working terrace (Pit 7) (Claudio-Neronian, but possibly disturbed in second century).
179. Half of a mushroom-shaped terracotta object, the walls of which were twice pierced, *ante cocturam*, by a circular point, once by a knife-blade. The cap is well finished, and there are signs that the object was wheel-turned. The lack of internal finish suggests that it was not used as a receptacle. The fabric is Longthorpe 1B, externally red-brown (B5) and in the core brown-yellow (A6). The function is uncertain; but it could be the top of a portable kiln-pedestal, perhaps combined with a series of eke-like rings. LHR72.F1 SF 2: embedded in dump of potters' clay (Claudio-Neronian).
180. (*Not illustrated*). Small fragment of baked clay with fingerprints and positive straw impressions. Probably from a kiln. 70.XV no SF number: upper filling of NE ditch of Yard I (undated).

9. THE POTTERY

A. The Iron Age Pottery. By J.P. Wild

The first problem presented by the pottery reviewed below is one of context. Only four drawn sherds (FIG. 31, No.9; FIG. 32, Nos. 22, 30, 41) are likely to have reached the positions in which they were found during the Iron Age: the rest were disturbed or re-deposited during the Roman period. The bulk of the material was dumped into the hollow left by the partially back-filled SW ditch of Yard I at the point where the NW ditch of Yard II joined it (FIG. 4). Here, it was associated with numerous fire-reddened 'pot-boilers', presumably of Iron Age origin. Tell-tale sherds of Nene Valley grey ware and residual military pottery suggest that the clearance was the work of a Roman farmer in the latter half of the second century A.D. Excavation of the SW ditch of Yard I was not complete; but the main concentration of finds lay within the excavated area and the collection described here may be taken as representative of what was dumped.

It is not clear what the source of the dumped pottery was – or indeed whether it came from several different sources. But, as a working hypothesis, it is accepted here that the most of the pottery reflects what was in use on or immediately around the Iron Age farm at a date before the Claudian works-depot was founded.

The second problem concerns the finer wheel-turned vessels whose date, whether Roman or pre-conquest, cannot yet be confidently decided (Williams (1974), 25). On the basis of his excavations at Fengate, F.M.M. Pryor is inclined to accept as of the Iron Age wheel-made vessels which I feel are possibly Roman at Longthorpe. It may be argued that the conquest had no immediate effect on the repertoire of forms and techniques used by the native potters. The Longthorpe pottery can make no fresh contribution to this debate, since the possibility of virtually unbroken occupation of the site exists.

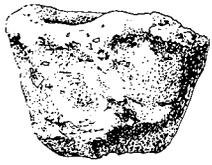
I have divided the pottery into two general categories:

Category 1: handmade vessels presumed to be of Iron Age date (FIGS. 31, 32)

Category 2: Wheel-turned (or, exceptionally, handmade) vessels presumed to be of late Iron Age or early Roman date (FIG. 33)

1. Fabric

The dominant fabric is tempered with calcite particles, mostly splintered shell, but with some



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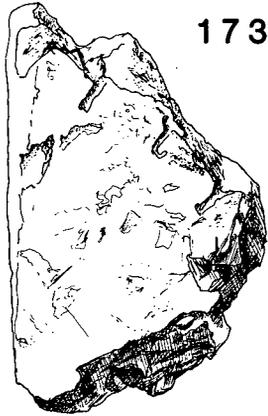
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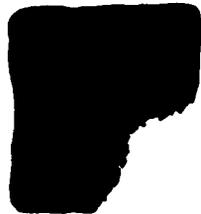
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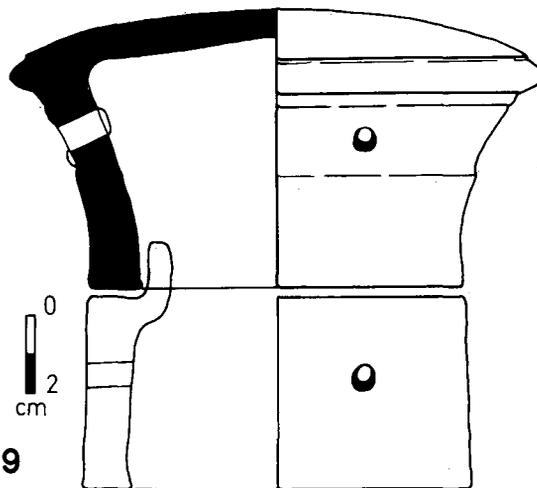
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FIG. 30 Objects of Clay. Scale 1:2.

angular fragments of limestone. The size of these inclusions varies. I have distinguished below between heavy calcite grit (prominent grits of 2–3 mm diameter, medium calcite grit (1–2 mm) and fine calcite grit (mostly under 1 mm). A very small quantity of quartz is present in some sherds (noted in the catalogue below), and an even smaller quantity of reddish-brown grog. There is no reason to suppose that the variations in temper are significant. The fabric is generally hard and reveals a laminated structure in the break. The external surfaces of many vessels in Category 2 appear to have been carefully wiped while still damp and they have a soapy feel. In Category 1 pottery there is considerable colour-variation on the surfaces and in the core, suggesting that the firing was not minutely controlled. Some of the wheel-made vessels of Category 2 have a fabric identical to that described as Longthorpe (Roman) Ware 2 (for the Roman fabrics, see TABLE VII, p.134). This does not necessarily shed any light on their date.

2. Forms and Decoration

Parallels for many of the Longthorpe vessel forms can be found in stratified groups of pottery from sites on the Middle and Upper Nene, such as Twywell, Moulton Park, Blackthorn, Hardingstone and Wakerley (*Twywell*, 69 ff.; Williams (1974); *Wakerley*, 115 ff.). Fengate, 5 km east of Longthorpe offers more contrasting than comparable material (*Fengate* i, 26 ff.: I am grateful to F.M.M. Pryor for discussing his views on the Fengate Iron Age pottery with me.) Since the status of the Longthorpe group of pottery is obscure, it would not be profitable to compare complete assemblages; but some remarks may be made here on some of the classes of vessel.

(a). Category 1

Bowls of Category 1 (Nos. 1–10) have both simple slightly everted rims (No.1) and more-sharply profiled rims (No.9). Both types are found at Hunsbury and have a long life (*Hunsbury*, 57 ff., fig. 10, C9, C10, FT11; fig. 9, FT9, F14). The single barrel-jar (No.11) represents a class which is widely distributed in the Midlands and the South and is correspondingly long-lived (Harding (1972), 99 f., pl.6, pl.60). Smaller, but less well finished examples are recorded at Twywell and Moulton Park (Williams (1974), fig. 14, Nos. 26–28) and there are some closer parallels from Wakerley (*Wakerley*, fig. 37, Nos. 34–50). The straight-sided pie dishes (Nos. 12–14) are distinctive; those with internally expanded rims can be paralleled at Twywell (*Twywell*, fig. 22, No. 30) and Fengate. The heavy handmade dishes (Nos. 15–18) may be associated with this vessel class.

The jars in Category 1 may be divided into four groups:

- a. jars with strongly-marked angular shoulder (Nos. 19–20)
- b. bag-shaped jars with bead rims and occasionally with surface decoration (Nos. 21–25)
- c. jars with everted, often beaked, rims (Nos. 26–30)
- d. slack-profiled jars with various simple everted and upright rim-forms and occasionally with lightly scored decoration (Nos. 31–44).

They are broadly comparable with the types of jar found on Iron Age sites on the Upper Nene. Precise parallels for individual pieces are quoted in the pottery catalogue.

There is surprisingly little decoration on the vessels of Category 1. The bowls, for example, which at Hunsbury are enlivened with scoring and various wiping and burnishing techniques, are almost all plain at Longthorpe. Two of the bag-shaped jars (Nos. 21–22) carry herringbone and cross-hatched scoring. Lightly-scored lines are found on the jar No.32 and marks of surface wiping on No.31. Fingertip decoration appears on the rim of jar No.41. Two body-sherds (Nos. 45–46) have very faint wavy-line and scroll decoration, reminiscent of that on the Hunsbury style of bowl.

(b). Category 2

The Category 2 vessels are characterised by the use of the wheel and by a generally competent surface finish. There are three bowls in a fine calcite-gritted fabric (Nos. 47–49), one of which at

least has parallels in the later Iron Age. A group of probably handmade jars (Nos. 50–52) with smoothed and burnished outer surfaces are all in Longthorpe Roman Ware 2, and may be described loosely as ‘native’ without answering the question of whether they are pre- or post-conquest in date. Some fragmentary jar-rims (Nos. 53–56) – everted, beaded and carefully finished – point to vessels that were turned, or at least finished, on a slow wheel. More clearly wheel-turned is a group of necked bowls (Nos. 57–62) which bear a strong resemblance to the necked carinated bowls of Group 2 at Moulton Park (Williams (1974), fig. 18) and to vessels of the later Iron Age at Fengate (cf. *Camulodunum*, PL. LXXV, 214–18).

The larger calcite-gritted jars are hard to categorise. Nos. 63–66 occur with pottery of Category 1 in the dumped layers, and at least Nos. 63 and 64 are handmade.

Two well-finished jars (Nos. 67, 68) and a probable necked bowl (No. 69), all in Longthorpe Roman Ware 2, are typical borderline pieces which may or may not be of the Iron Age. Their forms certainly point forward into the Roman period.

3. Dating

The vessels of Category 1 are likely to have been in circulation between the third and first centuries B.C. Had there been no subsequent Roman occupation at Longthorpe, one would have been happy to accept as late Iron Age most of the vessels of Category 2. As it is, one must harbour doubts; for we do not know what native potters were supplying to the garrison at the beginning of the occupation of the fortress.

I am grateful to A.K. Gregory and F.M.M. Pryor for reviewing the dating of the Longthorpe pottery with me; but they cannot be held responsible for my published views.

Catalogue of Iron Age Pottery

a. Category 1 (FIGS. 31, 32)

1. Bowl, mixed fine and heavy calcite grit in fabric, patchy brown-red A5 and neutral 3 on external surfaces, neutral 3 core, soot on exterior. 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
2. Bowl, heavy calcite-gritted fabric, patchy brown-red A5 and neutral 3 on exterior, neutral 3 in core, soot adhering to shoulder externally (cf. Williams (1974), fig. 14, No.43). 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
3. Carinated bowl, with medium calcite grit, neutral 3–4 throughout (*Hardingstone*, fig. 22, No.116). From 72.10: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed).
4. Bowl with heavy calcite grit, neutral 3 throughout, but some external surface patches brown 3, soot on rim and neck (*Twywell*, fig. 24, No.21). From 72.21: upper filling of NW ditch of Yard II (Claudio-Neronian but disturbed in second century).
5. Bowl, medium calcite grit, neutral 3, burnished exterior with sooting. 71.56.41: greeny-grey silt in Pit 6 (Claudio-Neronian).
6. Bowl, heavy calcite grit, neutral 2 to brown, irregular burnished surface. 74.B2.6: filling of NW ditch of Yard I (Claudio-Neronian).
7. Bowl, fine calcite grit, external surface neutral 4, internal brown A5, core neutral 3 (*Hardingstone*, fig. 22, No.113). From 72.33: greeny-grey silt in top of NW ditch of Yard II (Claudio-Neronian, disturbed in second century).
8. Bowl or jar, medium calcite grit, external surface red-brown A3/4, internal surface and core neutral 4. From 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
9. Bowl, heavy calcite grit, exterior patchy neutral 3/brown B5, core grey over red-brown B5 (cf. *Madmarston*, fig. 14, No.3). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century). Another from 70.VI.6: top of Iron Age backfilling of SE ditch of Yard II.



FIG. 31 Iron Age Handmade Pottery (1-20). Scale 1:4.

10. Bowl, heavy to medium calcite grit, surfaces neutral 4 to brown B4, core mixed grey and brown B4 (Williams (1974), fig. 13, No.1;cf. *Hunsbury*, fig. 9, FT9). From 72.11; upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
11. Barrel jar, heavy calcite grit, smoothed exterior red-brown B5, core neutral 3/red-brown A3 (cf. Harding (1972), pl. 60; *Wakerley*, fig. 37, No.34). From 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
12. Dish with internally expanded 'pie-crust' rim, heavy calcite grit, surfaces brown A2/B5, core neutral 4 (cf. *Fengate i*, fig. 14, No.22). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
13. Dish or jar with internally expanded rim, heavy calcite grit, surfaces brown B5 to yellow/brown A5, core neutral 4. From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
14. Dish or jar with internally expanded rim, heavy calcite grit, roughly smoothed exterior neutral 3, core neutral 3. From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
15. Dish, heavy calcite grit, wiped exterior, patchy neutral 4 to yellow-brown A6, core neutral 4. From 72.23: upper filling of SW ditch of Yard I (undated).
16. Dish, heavy calcite grit, brown B5 throughout. 72.21: upper filling of NW ditch of Yard II (Claudio-Neronian but disturbed in second century).
17. Dish or jar, heavy calcite grit, surfaces yellow-brown A4/B3, core neutral 4. From 72.10: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed).
18. Dish or bowl, heavy calcite grit, interior and core neutral 3, exterior brown-red A6 (cf. *Fengate i*, fig. 21, No.15). From 72.19: sandy filling of NW ditch of Yard II (Claudio-Neronian).
19. Jar, heavy calcite grit, sooted on shoulder, core and interior neutral 2/3, exterior neutral 4/5 (cf. *Hardingstone*, fig. 22, Nos. 114–115). From 72.13: upper filling of SW ditch of Yard I (disturbed in second century).
20. Jar, heavy calcite grit, exterior smoothed but uneven, neutral 3 throughout (*Twywell*, fig. 22, No. 34). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
21. Jar, medium to heavy calcite grit, lightly scored lines on exterior below rim, internal surface yellow-brown A3, external neutral 3 (undecorated example: *Hardingstone*, fig. 8, No. 20). From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
22. Jar, medium calcite grit, pattern of lightly scored lines on shoulder and body, exterior neutral 5 to yellow-brown A5, interior neutral 3. From LHR72.F21.17: burnt daub in fragmentary sleeper-trench NE of corndrier.
23. Jar, heavy calcite grit, irregular partially smoothed surface, surfaces near rim neutral 3 to yellow-brown A5 with neutral 4 core (cf. *Wakerley*, fig. 39, No.86). From 71.52.3: greeny-grey filling of NE ditch of Yard I (Claudio-Neronian, perhaps disturbed).
24. Jar, medium calcite grit, exterior smoothed but uneven, exterior neutral 3 to brown A3, interior neutral 3. From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
25. Jar, heavy calcite grit, neutral 2/3 throughout. 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
26. Jar, heavy calcite grit, neutral 3 throughout (cf. *Twywell*, fig. 24, No.16; Williams (1974), fig. 13, Nos. 7, 9). From 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
27. Jar, heavy calcite grit, exterior neutral 3, interior brown B4 (cf. *Wakerley*, fig. 36, No.8). From 72.20: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
28. Jar, medium to heavy calcite grit, exterior neutral 1, interior and core brown A3 (*Twywell*, fig. 24, No.6). From 72.33: greeny-grey silt in top of NW ditch of Yard II (Claudio-Neronian, disturbed in second century).

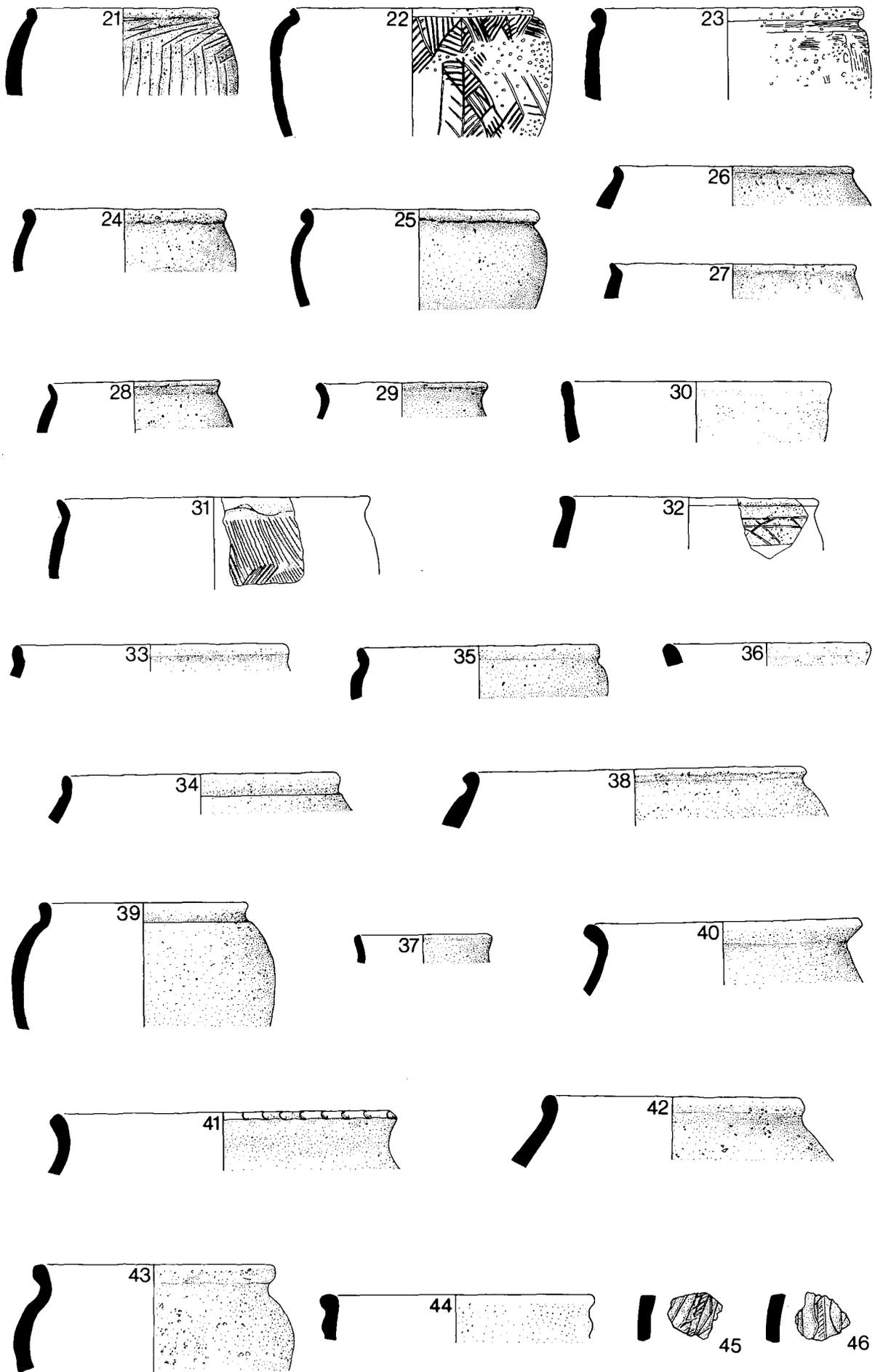


FIG. 32 Iron Age Handmade Pottery (21-46). Scale 1:4.

29. Jar, medium size but sparse calcite grit, neutral 3 throughout (*Twywell*, fig. 23, No.25). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
30. Jar, sparse calcite grit, surfaces brown A2, core neutral 4. From 70.XIV.8: primary silt in N ditch of Yard I (presumed Iron Age context).
31. Jar, medium calcite grit, exterior smoothed with bundle of grass (?), interior smooth but uneven, neutral 3 throughout. 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century) and 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
32. Jar or bowl, heavy calcite grit, scored lines below shoulder, exterior neutral 3, interior yellow-brown B4, core B3. From 72.23: upper filling of SW ditch of Yard I (undated).
33. Jar, heavy calcite grit, exterior neutral 3, interior patchy neutral 3 and brown A3/yellow-brown A2. From 72.13: upper filling of SW ditch of Yard I (disturbed in second century).
34. Jar, heavy calcite grit, exterior and core neutral 3, interior neutral 3 to brown A2, sooted externally. 72.10: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed) and 72.32 greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
35. Jar or bowl, heavy calcite grit, exterior neutral 3, core and interior a darker brown. 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
36. Jar, heavy calcite grit, exterior neutral 3, interior and core brown B4. From 72.33: greeny-grey silt in top of NW ditch of Yard II (Claudio-Neronian, disturbed in second century).
37. Jar, medium calcite grit, exterior wiped with ? grass, black core and surfaces (cf. *Wakerley*, fig. 39, No.109). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
38. Jar, medium calcite grit, surfaces neutral 4, core neutral 4 to red-brown A3. From 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
39. Jar, medium calcite grit, neutral 3 throughout, but patch of brown A5 on exterior, which has been wiped smooth. Non-joining sherds from (i) 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century). (ii) 72.30: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century). (iii) 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century). (iv) 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
40. Jar, medium to fine calcite grit, surfaces carefully smoothed, neutral 2/3 throughout with tinges of brown on surface (*Twywell*, fig. 22, No. 9). From 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
41. Jar, medium calcite grit, regularly-spaced indentations on top of everted rim, neutral 3 throughout. 72.15: brown gravel filling recut SW ditch of Yard I (presumed Iron Age context).
42. Jar, medium calcite grit, slight external burnishing, exterior yellow-brown A4, interior and core brown B4. From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
43. Jar, coarse calcite grit, exterior neutral 4, smoothed unevenly, interior yellow-brown A5, core red-brown A3. From 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
44. Cordoned jar or bowl, medium calcite grit, exterior neutral 3, wiped, core yellow-brown A3 (cf. Williams (1974), fig. 19, No.147). From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).

Sherds with linear and hatched decoration, medium calcite grit.

45. 71.56.9: greeny-grey deposit in gully on working platform (Pit 7) (Claudio-Neronian, moved in later second century).

46. 71.60.2: upper filling of Pit 3 (Claudio-Neronian, moved in fourth century).

b. Category 2 (FIG. 33)

47. Bowl, probably wheelmade, fine calcite grit, exterior surface and top of rim burnished, neutral 3 to brown B3/4, core neutral 3 (cf. *Wakerley*, fig. 39, No. 83). From 72.14: greeny-grey filling of SW ditch of Yard I (Claudio-Neronian, possibly disturbed in second century).
48. Bowl, probably made on a slow wheel, medium calcite grit, neutral 3 to yellow-brown A4 in patches throughout. 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
49. Bowl, probably wheelmade, fine calcite grit, exterior brown A2/3, inside sooted, core neutral 4. (There is a close parallel at the late Iron Age and Roman site at Ashton, Oundle, unpublished.) 72.10: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed).
50. Rim and pierced base of handmade jar, Longthorpe Ware 2, burnished exterior soapy to the touch, brown-red A6 to brown A5, interior and core neutral 3 (cf. Williams (1974), fig. 19, No. 144). From 72.20: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century) and 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century). Another vessel from 71.56.41 in Ware 2C: greeny-grey silt in Pit 6 (Claudio-Neronian). For these Wares see TABLE VII, p.134.
51. Jar, handmade, smoothed surfaces, Longthorpe Ware 2C, neutral 3 to brown B4 throughout. 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
52. Jar, handmade, close to Longthorpe Ware 2, originally burnished on exterior, outer surface and core brown B4, inner surface neutral 3. From 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
53. Jar, made on a slow wheel, medium calcite grit, dark brown surfaces, core brown A4, burnished on rim and interior. 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
54. Jar, handmade, medium calcite grit, exterior neutral 3, interior neutral 3 to yellow-brown A4. From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century) and 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
55. Jar, probably made on a slow wheel, fine calcite grit, top of rim burnished, neutral 3 to yellow-brown A4 throughout. 72.33: greeny-grey silt in top of NW ditch of Yard II (Claudio-Neronian, disturbed in second century).
56. Jar, probably handmade, medium calcite grit, surfaces neutral 3/4, core yellow-brown A4 with thin grey centre. 72.14: greeny-grey filling of SW ditch of Yard I (Claudio-Neronian, possibly disturbed in second century).
57. Necked bowl or jar in Longthorpe Ware 2D, burnished surfaces, yellow-brown B4, core neutral 4. From 72.20: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
58. Necked bowl or jar, probably Longthorpe Ware 2D, burnished externally, core and exterior neutral 5, interior yellow-brown A4. From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
59. Necked bowl or jar, wheelmade, fine calcite grit, exterior brown B3, interior red-brown B5. From 72.17: ashy filling of stokehole of Kiln 20 (Claudio-Neronian).
60. Necked bowl, wheelmade, Longthorpe Ware 2, neutral 3 throughout with brown tinges. 72.8: greeny-grey loam in NW ditch of Yard II (Claudio-Neronian, possibly disturbed).
61. Bowl, probably wheelmade, fine calcite grit, exterior brown B3, interior yellow-brown A6, core grey. 72.30: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
62. Bowl, handmade, probably Longthorpe Ware 2, burnished exterior brown B5 with neutral

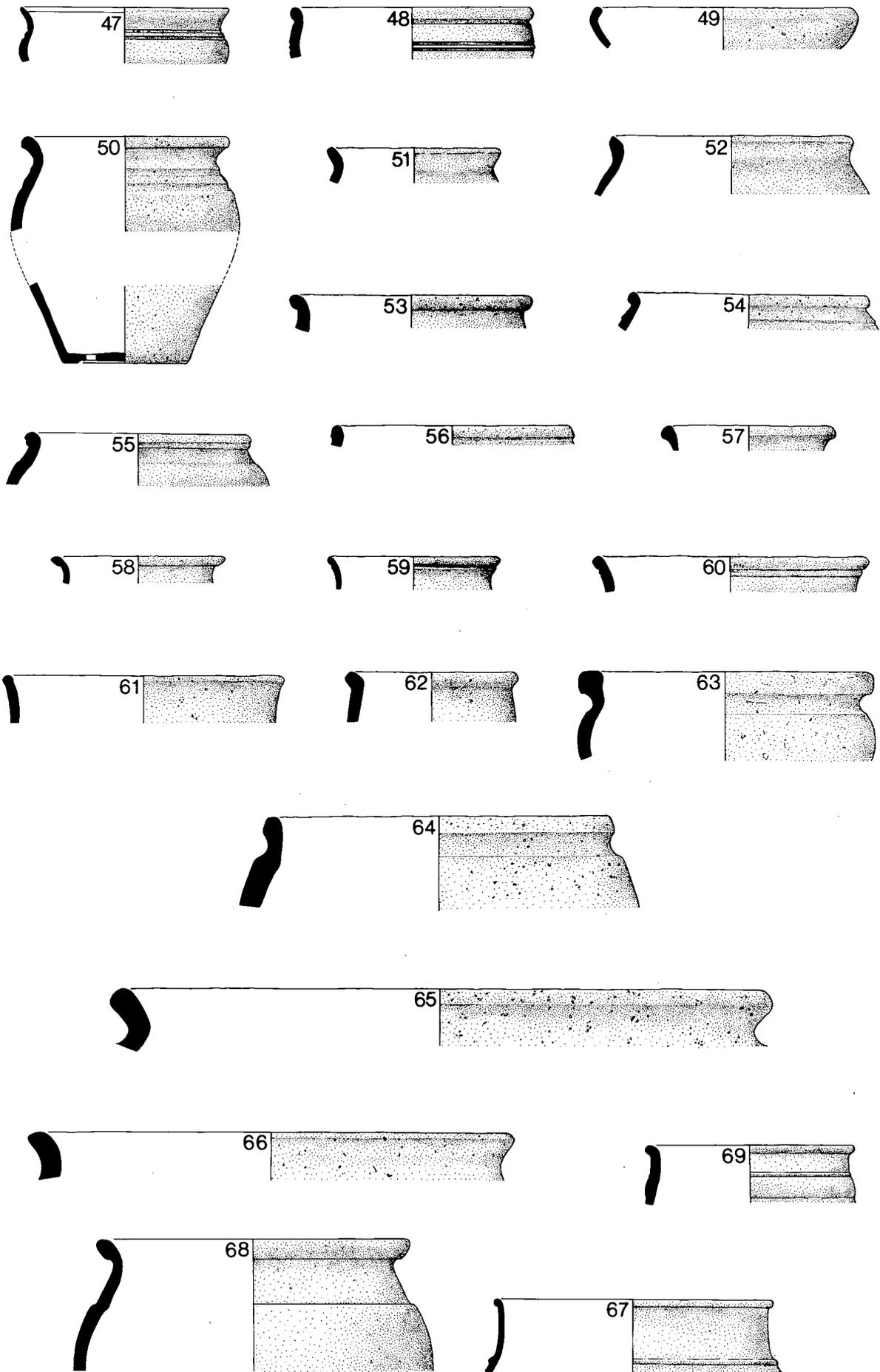


FIG. 33 Pottery of Category 2: vessels, normally wheel-turned, of late Iron Age or early Roman date (47-69). Scale 1:4.

- 4/5 patches, core and interior brown B5. From 72.10: upper filling of NW ditch of Yard II (Claudio-Neronian assemblage, disturbed).
63. Jar or bowl, handmade, heavy calcite grit, uneven surface neutral 5 to brown B4, core neutral 4. From 72.32: greeny-grey silt in top of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
 64. Jar, handmade, heavy calcite grit, surfaces neutral 3, core neutral 4 with patches of yellow-brown A4/5, traces of soot. 72.20: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).
 65. Jar, probably handmade, heavy calcite grit, exterior yellow-brown A5, interior brown B5, smoothed, core neutral 5. From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
 66. Jar, handmade, heavy calcite grit, exterior brown A2/3, smoothed with bunch of ? grass, interior and core red-brown B5. From 72.31: upper filling of SW ditch of Yard I (Claudio-Neronian, moved in second century).
 67. Jar, wheelmade, burnished finish, Longthorpe Ware 2, interior yellow-brown B5, exterior brown-yellow A5, centre of core neutral 3. From 72.30: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
 68. Jar, wheelmade, Longthorpe Ware 2A, burnished finish, exterior yellow-brown A5, interior yellow-brown B4, centre of core neutral 4. From 72.34: upper filling of SW ditch of Yard I (Claudio-Neronian, but much disturbed in second century).
 69. Necked bowl, wheelmade, Longthorpe Ware 2C, exterior brown B5, burnished on cordons only, interior grey but brown B5 beneath surface, centre of core neutral 4 (Williams (1974), fig. 19, No. 144). From 72.11: upper filling of SW ditch of Yard I (Claudio-Neronian, disturbed in second century).

B. The Samian Ware. By Felicity C. Wild

From the site as a whole there was a small quantity of samian ware, representing some 110 vessels, mainly in small fragments. Its main interest lies in the sizable group of Claudio-Neronian material, about 64% of the whole, from about 70 vessels. This material clearly dates from the occupation of the fortress, when the site was used as a works-depot and as a dumping ground for military rubbish. A proportion of the samian was stratified in pits and ditches on the site (it is quoted where relevant in the excavation report above); but much had apparently been included in material used to level up surface depressions, and appears in context with much later material. Because the stratification is not particularly significant and the material as a whole clearly reached the site as debris from the occupation of the fortress, all the early material from the site has been taken together in the statistics below, regardless of context.

1. *The Claudio-Neronian Material*

Form 29 (eleven examples), 27 (twelve), 24/25 (eleven), 15/17 (nineteen), 15/17 or 18 (seven), 18 (three), 36 (one), Ritterling 12 (three), Ritt. 1 (one), Ritt. 8? (one), Ritt. 9? (one).

The material in general appears to be similar in nature and date to the samian from the fortress (*Longthorpe I*, 91), there dated *c.* 45–65. It is interesting to note the connection between the upper zones of the two decorated bowls, Nos. 1 and 2 below, and the two bowls from the fortress (*Longthorpe I*, fig. 49, Nos. 1, 2). The stamp and six decorated pieces published below all fall later rather than earlier in the period. There are, however, a few pieces among the plain ware which suggest a Claudian or Tiberio-Claudian date. There is one example of the Claudian form Ritterling 1, and one possible example each of forms Ritt. 8 and 9. Of the seven examples of form 27 with a surviving rim, five are of the flat-topped beaked type of Claudian date; the other two are slightly more rounded, with upturned rather than downturned profile, and are probably slightly later. Forms 27 and 24/25 are represented in almost equal proportions. Of the dish forms,

only three examples are certainly from form 18, one showing a flattened and slightly beaked rim profile suggesting Claudian date. The other two examples of the form, although in South Gaulish fabric, appear to be later, and may not have reached the site until after the end of the military occupation. The pale fabric with matt glazes of the Claudian period and the bright glazes typical of the Neronian period are both represented.

2. *The Later Material*

Form 37 (four examples), 27 (two), 33 (eight), 18/31 (eleven), 31 (nine), 18/31R (one), 35 and 36 (four), Curle 11 (one).

Among the later material are a few sherds of South Gaulish ware, clearly of Flavian or more probably Trajanic date. These include form Curle 11, and one example of forms 18/31, 35 or 36 and 37 (base), and possibly the two examples of form 18 mentioned above. It is uncertain whether these arrived on the site during the second-century occupation, or whether they should be attributed to chance loss in the period between the evacuation of the fortress and the resumption of regular farming, which appears to have started by the middle of the second century. There are about six sherds from the site in the fabric of Les Martres-de Veyre, including the decorated sherds in the style of Cettus (No. 7 below), which must date to the period before A.D. 160. The examples of form 27 and 18/31 also point to a starting date in the early Antonine period. Although the samian clearly goes on through the late Antonine period, the amount recovered was very small. As one might expect, the site then was much less well provided with samian than during its earlier military occupation.

Catalogue of Samian

1 THE STAMPS. By B.R. Hartley

PERRIM[N] Perrus 6a, form 27. This stamp has been recorded from La Graufesenque and is always on cups, including Ritt. 9, 24 and 27. It is clearly pre-Flavian in the main, but it also turns up at Carlisle and York, and the closely similar stamp 6b appears at Caerleon, Chester and the Nijmegen fortress. In view of this a date in the range A.D. 55–75 seems clear. 70.XXXIV.2: upper greeny-grey filling of SE ditch of Yard I (Claudio-Neronian, but possibly disturbed).

VOSECVN[NI] Vosecunnus 2a, form 33. Only eight stamps of Vosecunnus are known, and this particular one only appears otherwise at Lincoln (form 33) and Feurs (form 79/80). One of his other stamps is known on form 27, so he was presumably a mid to late Antonine potter. The distribution implies Central Gaulish origin, very probably at Lezoux. 71.61.1: unstratified.

2. THE DECORATED WARE (FIG. 34)

1. Form 29, South Gaulish, showing upper zone, with slightly blurred impression of a horizontal wreath identical to that on the bowl stamped **CELADI.MAN** from Longthorpe fortress (*Longthorpe I*, FIG. 49, No. 1). The lower zone differs from that on the fortress bowl, showing a scroll with bifid binding, such as occurs on a bowl with the same early stamp of Celadus from Bregenz (Knorr (1952), Taf. 16E). The date is likely to be similar to that of the fortress piece. *c.* A.D. 55–65. From 71.60. +; unstratified.
2. Form 29, South Gaulish, showing upper zone with leaf scroll identical to that on another bowl from the Longthorpe fortress (*Longthorpe I*, fig. 49, No. 2). Parallels are there drawn to the work of Albinus and Crestio, and an identical upper zone is cited on a bowl stamped by

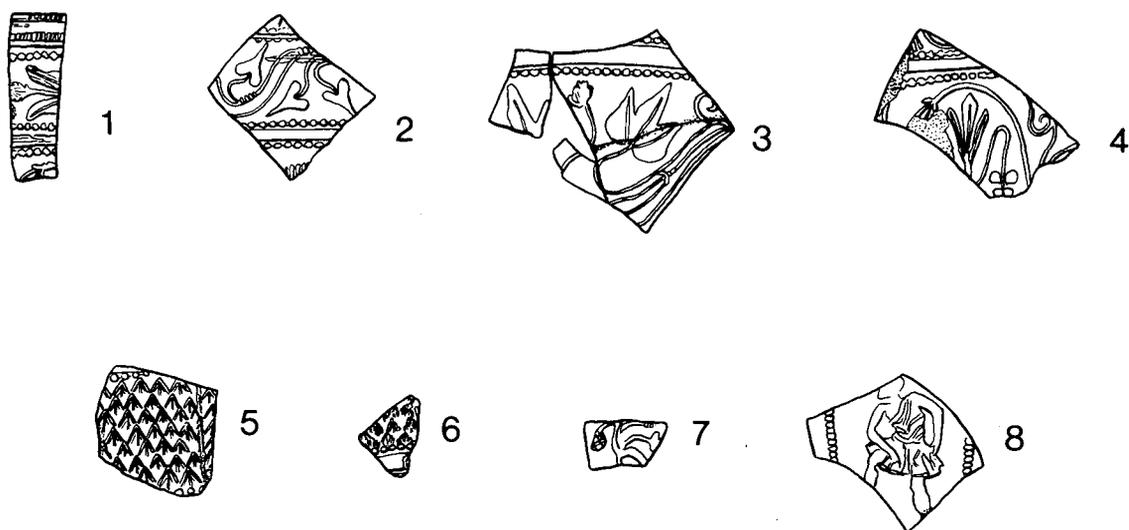


FIG. 34 Decorated Samian. Scale 1:2.

- Carus (Knorr (1919), Taf. 20D: the bowl apparently stamped by Fabus is Taf. 20E). A bowl from the same mould as the fortress bowl occurs at Margidunum (Oswald (1948), pl. I, 3) and another at Exeter (TS 1973 B10, unpublished, information from Mr. G. B. Dannell). Insufficient remains here to identify the decoration in the lower zone, but it is clearly not the scale decoration that appears upon the other bowls. The occurrence of the bowl at Exeter helps to reinforce the date of the piece as Neronian, rather than the Claudian date attributed to it by Oswald. *c.* A.D. 55–65. From 74.B2.4: filling of stokehole of Kiln 10 (Claudio-Neronian).
3. Form 29, South Gaulish. Six fragments in red fabric with dull glaze, showing lower zone with scroll decoration. The leaf is probably closest to, though not identical with, that on a bowl from Hofheim (Knorr (1952), Taf. 52E), connected by Knorr with the work of Galicanus or Aquitanus. The leaf also occurs on a bowl from Köln (Knorr (1919), Taf. 91F). Most of the other features can be found in the work of Aquitanus; the poppy-head (Knorr (1952), Taf. 4E), the spiral tendril (*ibid.*, Taf. 3B) and bifid binding (*ibid.*, Taf. 4F). A Claudio-Neronian date seems probable. *c.* A.D. 50–65. From 74.B2.5: patch in upper filling of NW ditch of Yard I (Claudio-Neronian).
 4. Form 29, South Gaulish, in light pink fabric with dullish dark red glaze. The lower zone shows a leaf scroll with upright motif in the lower concavity. A leaf probably similar to that used in the scroll was used by Felix (Knorr (1919), Taf. 32A), who also used a similar trident bud (*ibid.*, Taf. 32, No. 14). The latter occurs on a bowl stamped **OFFELICIS** from the second pottery shop at Colchester, destroyed in A.D. 60/1 (Hull (1958), fig. 101, No. 3), which shows a scroll in similar style to the Longthorpe piece, with the same tendril binding. The small leaf is probably that on another bowl from the second pottery shop (Hull, fig. 102, No. 5), and was used by Primus. A Neronian date seems probable. 71.59.4: fourth-century dumped material in bell-shaped Pit 8 in Yard II.
 5. Form 29, South Gaulish, in reddish fabric with dull red glaze, showing upper zone with panels of leaf-tips produced with an oval, plain-edged, pointed leaf. Similar impressions occur on a bowl from the first Colchester pottery shop (Hull (1958), fig. 74, No. 9), and on the work of many potters, such as Masculus (Knorr (1919), Taf. 52, No. 26), Murranus and Bassus-Coelus. A bowl with similar leaf-tips in Bassus-Coelus style was found at the pre-Flavian site at Kingsholm near Gloucester. A Neronian date is likely. 71.53.9; greeny-grey material in Pit 1 (Claudio-Neronian assemblage with post-military silting).
 6. Form 29, South Gaulish, in red fabric, showing part of upper zone with leaf-tips produced by a feathery leaf. It is not possible to identify the exact impression, but similar leaf-tips are

common in the Colchester pottery shops (Hull (1958) fig. 74, Nos. 2–5, 12), and a date similar to that of the last sherd seems probable. 71.56.46: sooty filling of hollow over limestone packing of Kiln 9 (Claudio-Neronian, disturbed).

7. Form 37, Central Gaulish, in the fabric of Les Martres-de-Veyre. A small scrap showing part of the tree (Rogers (1974), N.6) used by Cettus (Stanfield and Simpson (1958), pl. 143, Nos. 34, 37), to whom this piece should probably be assigned. Early Antonine. LHR72.F22.1: occupation-debris over furnace on Roman farm (second century or later).
8. Form 37, Central Gaulish, showing the Vulcan (O.66) without tongs, as used by Cinnamus. Antonine, and if attributable to Cinnamus, c. A.D. 150–175. From 70.IV.2: upper filling of subsidiary bypass ditch, SE corner of Yard II (early third century).

C. The Mortaria. By Katherine F. Hartley

(For Fabrics see TABLE VII (p.134))

(a). *Mortaria of Longthorpe Type A* (FIG. 35, No. 1–4):

1. Joining fragments (including spout) in Longthorpe Ware 1. From LHR72.F4+: topsoil over Kilns 1–3; LHR72.F4.16: dumped clay in Kiln 2 (Claudio-Neronian).
2. Mortar in Ware 1A (diameter c. 27 cm). From LHR72.F21.2: filling of a drainage ditch near Roman farm (second century), and LHR72.F4.2: lower filling of Kiln 1 (Claudio-Neronian). There is a different vessel in Ware 1A from 74.B.2.1: top filling of NW ditch of Yard I (Claudio-Neronian, with third- or fourth-century tipplings).
3. Joining fragments in Ware 1, from LHR72.F4.7 and F4.6: dumped layer in bottom of stokehole of Kilns 1–3 (Claudio-Neronian). A different vessel from 71.56.41: greeny-grey silt in Pit 6 (Claudio-Neronian). Another in Ware 1A from LHR72.F4.2: lower filling of Kiln 1 (Claudio-Neronian).
4. Mortar in Ware 1 (diameter c. 33 cm). From LHR72.F4.16 dumped clay in Kiln 2 (Claudio-Neronian) and LHR72.F4.6: dumped layer in bottom of stokehole of Kilns 1–3 (Claudio-Neronian).

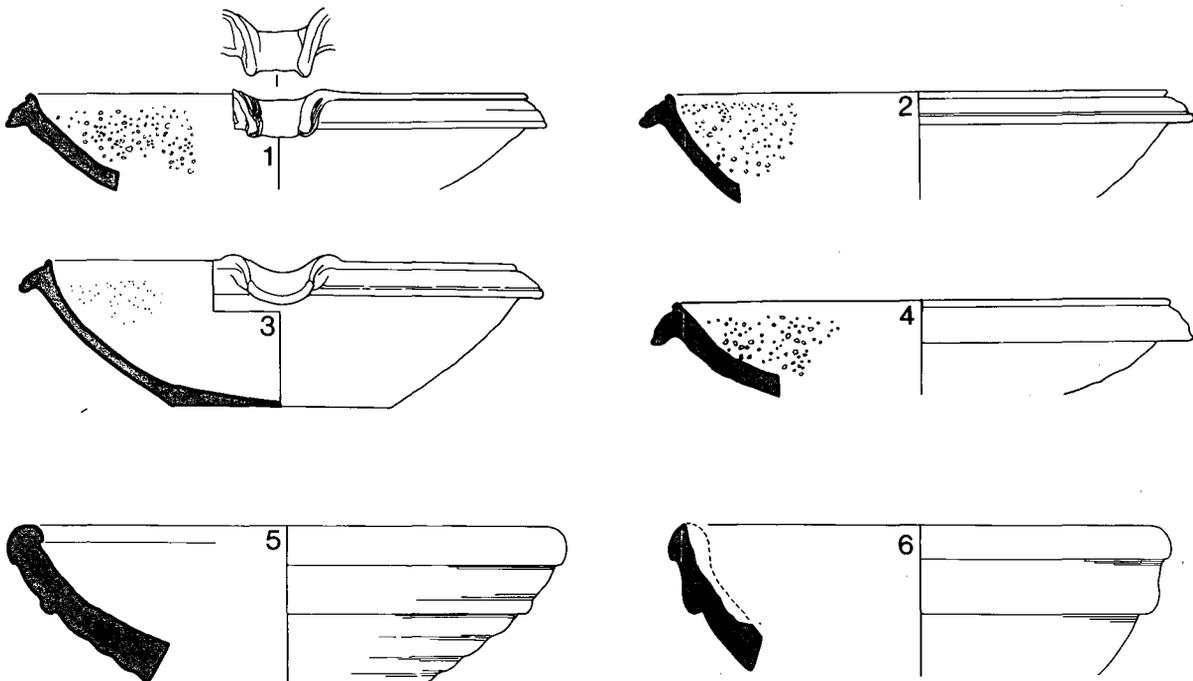


FIG. 35 Mortaria. Scale 1:4.

The six mortaria included under Nos. 1–3 are in cream and pink sandwich fabric with pale grey core, tempered throughout with tiny gritty particles which give a slightly abrasive surface. There is abundant tiny and small mixed trituration grit including flint, quartz, and brown and black haematite fragments. The grit has been applied in a manner which is unusual in mortaria of later date and gives almost the impression of an accretion of very fine grit. The bold slightly projecting spouts of Nos. 1 and 3 survive intact and the beginning of the spout of No. 2.

These six mortaria are basically identical in form and fabric, while No. 4 differs only superficially in its surface colouring. The fabric used in these mortaria is unrecorded elsewhere and the form itself is very rare in Britain. The only published example I know of is from Colchester (*Camulodunum*, fig. 53, No. 21, Type 193A) and this is very close indeed in rim profile, although the fabric is totally different, presumably being made in the Colchester area. This form is dated by the excavators to c. A.D. 49–65. The wall-sided form in use in the west of the Empire (with the possible exception of Italy) from Augustan to Claudian times was certainly giving way to new flanged forms during this period, although A.D. 65 may be a little late for manufacture of the Longthorpe type as the hooked-rim forms had established themselves in Britain by this date. The findspots of these vessels suggest strongly that they were made in the dug kilns 1–3 excavated in 1972.

(b). *Mortaria of Longthorpe Type B* (FIG. 35, Nos. 5–6):

5. Wall-sided mortarium in fine cream fabric (Ware 1H) with fine concentric scoring on the inside instead of trituration grit. 71.56.9: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
6. Wall-sided mortarium in fine-textured slightly brownish-cream fabric (Ware 1A) (brown-yellow A6) (cf. *Longthorpe I*, fig. 56, No. 146). The inner surface has flaked off, so that the treatment of the inside is uncertain. 71.53.2: sooty filling of Kiln 5 stokehole (Claudio-Neronian assemblage, but possibly moved later).

This wall-sided type of mortarium with relatively little variation in the rim profile was the accepted form for pottery mortaria from the period of Augustus until the end of Claudius's reign in the west of Europe, with the possible exception of Italy. They are very rare on sites of Neronian foundation such as the Lunt and Usk, which must indicate that they were obsolescent in the period 50–65 (Hartley (1981)). There is little evidence available for dating individual wall-sided forms of this early period, but trituration grit was used in some wall-sided mortaria and it seems reasonable to suppose that the gritted ones are the latest. This would mean that No. 5 with its internal scoring was made before c. A.D. 50 at the latest, although it may of course have survived a long time in use.

The fabric of No. 6 points to manufacture at Longthorpe. Such wall-sided forms are, incidentally, much more common in England than Nos. 1–4.

(c). *Other Mortaria* (not illustrated):

7. A flange and bead fragment in drab yellow-cream fabric. The inclusions are small black ferric particles and larger red haematite lumps in a yellow-green matrix (brown-green 7). Probably Neronian. 71.56.60: burnt area on working terrace (Pit 7) (Claudio-Neronian).
8. A flange fragment in fine-textured white fabric with a few dark brown haematite grits embedded in it. Indeterminate. 70.XXV.2: farmyard surface in Yard II (second century).

D. Stamps on Coarse Wares (FIG. 36). By Valery Rigby

1. A potter's mark placed centrally on the upper surface of a platter, within a broad shallow incised circle. Brown fine-grained smooth core; very dark brownish grey surfaces, slightly micaceous; smoothly burnished finish with a soapy feel.

No other stamps from this die have been identified in Britain. Although the basic type of the mark comprising dotted V-motifs within a border is fairly common on coarse wares and

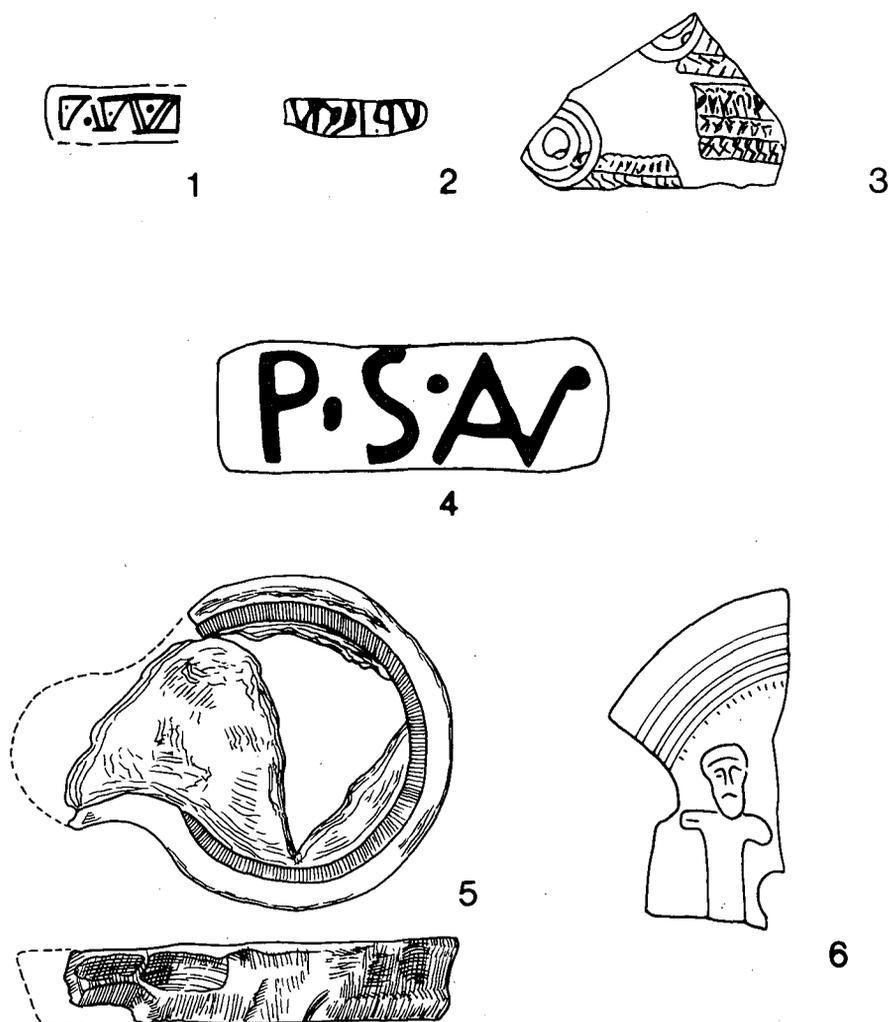


FIG. 36 Stamps on Coarse Wares (1–3) and on an Amphora (4); Open Lamp (5) and Lamp Fragment (6) (Nos 1–4, 6 at 1:1, No. 5 at 1:2). For the Lamps see p.168.

occurs also on imported TN (terra nigra) vessels, the Longthorpe stamp is almost unique in having double strokes for some arms of the V-motifs. There is a shorter stamp with a double arm on an imported terra nigra cup (*Camulodunum* Type 56) from Silchester and a fragment of a TN platter from Colchester, so imports could have been the prototypes for this particular variant of the basic type of stamp in Britain. The only other example is a small fragment on a platter similar in form to *Camulodunum* Type 24Ca which was found at Baldock, Herts (Stead (1986), p.243, No. 4). There is little doubt that both the Longthorpe and the Baldock pieces are from the same source. Although the stamps are from different dies, the texture, colour and finish of the fabrics are identical. Sherds from at least two other examples were also found at Baldock in late first to mid second-century contexts. In addition there is a platter in identical fabric, but bearing the basic type of the mark, with single strokes. It was found in a first-century context. All but one of the marks of this type so far identified were found to the north of the Thames – in Hertfordshire, Cambridgeshire, Essex, and Norfolk – and this is one of the few styles of potter's mark to show any degree of regional concentration; the exception is from Upchurch, Kent. It seems likely that the source lies north of the Thames, possibly in the Nene Valley, and a tentative date for the manufacture of the platters of this type is c. A.D. 60–90. From LHR72.F8.1: top of filling of common stokehole belonging to Kilns 1–3 (Claudio-Neronian, but not sealed).

2. A stamp placed centrally on the inside of a hemispherical cup, with a tall footring, probably a copy of the samian form 27. Very dark blue-grey fine-grained core and surfaces with a thin

pale grey cortex between. The burnished exterior has a soapy feel, the inside is so worn and pitted that no finish survives, both the cortex and the core being exposed. The footring is very worn. Because of the degree of wear the stamp is difficult to read. It may be a name or a poorly executed 'copy' of a name. It appears to read **VOSI AV**, so that there are many possible interpretations. The simplest is **VOSI AV(OTIS)**. If the final two letters are the shortened version of *avotis*, then this is only the second example on coarse-ware vessels to be identified in Britain, although potters' names on such wares are not particularly rare. However, the reading remains doubtful.

Not only has no other stamp from this die been identified, but no other name stamp or 'copy' has been found on a cup which combines this particular form and fabric. The similarity of the fabric in texture and finish to No. 1 suggests that it could be from the same source and of similar date. 70.XXI.1: upper filling of the SE ditch of Yard I (undated).

3. A body-herd from a bowl, with a brown fine-grained core, dark blue-grey slightly micaceous surfaces and smoothly burnished finish on the outside only. The decoration comprises off-set impressions of a roller-stamp with an intricate 'lace' pattern, over-stamped on at least one corner with a stamp of two concentric circles.

No other bowls combining identical stamps have been identified, although jars and bowls with a combination of the same motifs are fairly common. The double-circle motif was the most widely used of all. It was in the ranges of the stamps used by potters at West Stow, Suffolk, on bowls copying samian forms, those used by the 'parisian ware' potters at Market Rasen, Lincs., on small jars and beakers manufactured in the second century, and by others working at different, unidentified, centres. Later it emerged as a motif used in the Nene Valley potteries to stamp bowls and cups in colour-coated ware, and it even occurs on so-called 'Romano-Saxon' wares, frequently over-stamping raised bosses. Stamped decoration appears to be concentrated on sites to the north of the Thames, in central and eastern England but with outliers in Scotland and to the South. Examples of 'roller-stamped' decoration have a more limited distribution, and, at present, are confined to the East Midlands and East Anglia.

A bowl similar to form 37 found at Orton Longueville is decorated with a similar arrangement of double circles and rectangular blocks of 'roller-stamping'. Perrin has illustrated a further eight sherds from related vessels found on various sites in the Nene Valley and has argued persuasively for at least one source there, possibly Water Newton (Perrin (1980)). 70.XXI.1: upper filling of SE ditch of Yard I (undated).

E. Imported Fine Ware Sherds (Not illustrated). By J.P. Wild

1. Sherds of a Lyon ware cup in greeny-brown (A7) fabric with a brown-red (A4) colour-coat. 71.56.6: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian assemblage, moved moved in late second century).
2. Sherd of Lyon ware cup (Greene (1979b), fig. 5, type 3.1) in brown-red (A7) fabric and dull brown (B5) colour-coat. 71.50.1: Roman ploughsoil.
3. Sherds of a single Lyon ware cup (Greene (1979b), fig. 5, type 3.1) in brown-red (A7) fabric and lustrous brown (B5) colour-coat. 71.56.6; 71.53.9; 71.53.4: from filling of Pit 1 at N corner of Yard I (Claudio-Neronian) and from greeny-grey deposit on working terrace (Pit 7) (disturbed Claudio-Neronian assemblage). For a complete vessel of this type see FIG. 41 No. 62.
4. Rim sherd of a Lyon ware cup (Greene (1979b), fig. 6, type 4.1) in brown-red (A7) fabric and lustrous but patchy brown-red (A4/5) colour-coat. Apparently rough-cast inside. 74.B1.5: patch in upper filling of NW ditch of Yard I (Claudio-Neronian).

F. The Amphorae. By D.P.S. Peacock

Nearly nine kilograms of amphora sherds were recovered in the excavation, much from deposits dated to the Claudio-Neronian period (c. A.D. 50–65). The material is thus of considerable importance and an attempt was made to make a statistical assessment by identifying and weighing fabrics. The results, presented in TABLE VI, demonstrate an overwhelming preponderance of globular oil amphorae (Dressel 20) from Baetica, with lesser quantities of fish-sauce amphorae from the Cadiz region. Other types are comparatively unimportant.

TABLE VI
THE PROPORTIONS OF AMPHORAE PRESENT

Groups	Globular	Southern Spanish	Dressel 28/30	Dressel 2-4	Unidentified	Weight total (grams)
Iron Age	—	—	—	—	—	—
Claudio-Neronian	81%	12%	1%	—	6%	5258
Disturbed but mainly Claudio-Neronian	78%	2%	—	20%	—	3050
Levelled Claudio-Neronian deposits	36%	37%	—	—	27%	578

1. Globular

The rims (FIG. 37, Nos. 1–5) are all of the rounded variety which are to be anticipated in deposits of this period (Tchernia (1967), FIG 2.). The only stamp from the site (fig. 36, No. 4; see below) is on a vessel of this type and its date elsewhere accords with the Claudio-Neronian context at Longthorpe.

2. Southern Spanish

Most of the amphora fragments ascribed to an origin on the southern Spanish coast are in a fabric that compares well with kiln material from Puerto Real near Cadiz (Peacock (1974)). The two rims (FIG. 37, Nos. 6–7) are of *Camulodunum* Type 186A, a type which was made at Cadiz and would be entirely appropriate to a Claudio-Neronian context.

3. Dressel 28/30

One piece of a flat-bottomed amphora was found. It is in a fine reddish and buff fabric with a few flecks of mica. A southern Gaulish origin is likely.

4. Dressel 2-4 (?)

A few body sherds and a spike from disturbed levels are tentatively ascribed to this form. They were not examined petrologically, but in the hand specimen they appear similar to some of the fabrics of Koan style (Dressel 2-4) amphorae.

5. Unidentified

Unidentified material comprises a few body sherds, mainly in a fine reddish fabric with paler outer surfaces.

Amphora Stamp (FIG. 36, No. 4) (note by J.P. Wild)

Stamped handle from an amphora made on the estate of P.S. Avitus, probably in Baetica. Apart from the stops (which are abraded) it is identical with a stamp found at Colchester, dated A.D. 61–65 (*Camulodunum*, 214, fig. 45, No. 11; Callender (1965), 217, No. 1395 (b)). From 71.56.27 SF 134: industrial waste on working terrace (Pit 7) (Claudio-Neronian).

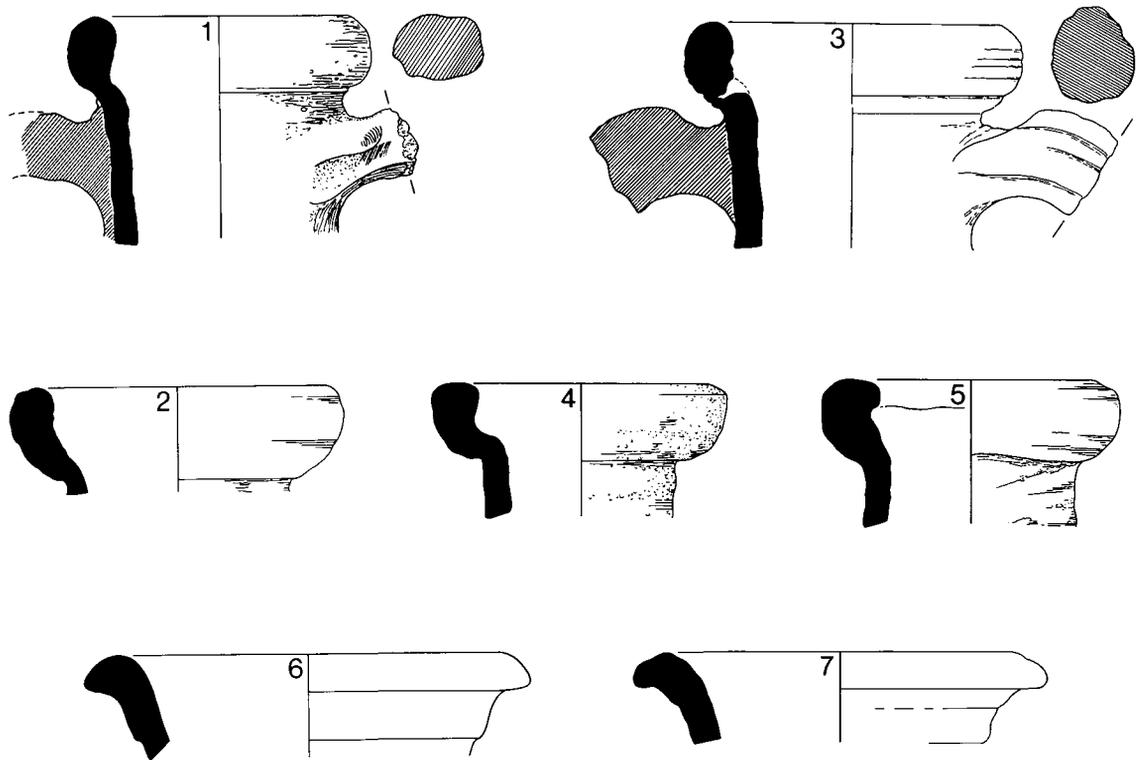


FIG. 37 Pottery: Amphorae (1-7). Scale 1:4.

The Drawn Amphorae (FIG. 37)

A. Globular amphorae of Dressel Form 20 with cupped and rounded rims. They are in a hard buff granular ware with a smoothed surface (brown-red A5, but lighter). The drawn rims are:

1. Two identical vessels from 71.53.9: greeny-grey filling of Pit 1 in N corner of Yard I (Claudio-Neronian with post-military silting) and from 71.56.56: silt at bottom of Pit 5 (Claudio-Neronian).
2. A rim from 71.56.9: greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century).
3. Amphora (fabric brown B7) (cf. *Longthorpe I*, fig. 51, No. 5) from 71.56.42: green silt in Pit 5 (Claudio-Neronian).
4. From 71.64.1: filling of a drainage gully near stream east of the main excavation (undated).
5. Rim (fabric smooth, hard buff ware, brown-red A7) from 74.B1.3: charcoal patch in upper filling of NW ditch of Yard I (Claudio-Neronian). Another in hard buff granular ware with smoothed surface from 70.XXV.2: farmyard surface in Yard II (second to fourth century).

B. Southern Spanish amphorae (*Camulodunum*, Type 186A) in a smooth hard cream ware:

6. Rim (green-brown A7) (cf. *Longthorpe I*, fig. 51, No. 1) from 71.56.6: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian assemblage, moved in late second century). A fragment of handle in identical fabric from 71.53.10 (Pit 1) (Claudio-Neronian) is a flattened ovoid in section, flatter on the inside than the outside.
7. Rim (brown B7) from 71.56.42: green silt in Pit 5 (Claudio-Neronian).

G. Coarse Pottery. By G.B. Dannell

INTRODUCTION

The pottery found on the site outside the fortress adds extensively to the series published by Miss Marion Wilson (*Longthorpe I*, 96–110). The kilns make it clear that for a period, and probably for the entire life of the first fortress at least, much of the pottery in daily use was produced in close proximity to the defences and so military control or activity must be assumed. This should not be a surprising conclusion any longer. There is ample evidence from the Western Empire (cf. Greene (1977), in discussion of Holt) that large quantities of clay products were made by the army, using comparatively simple technology (cf. MacMullen (1963), 28).

The question of military participation or supervision is harder to resolve without firm epigraphic evidence. It takes but one master-potter to ensure that a group of competent workers produce vessels of a particular form. Whether the gaffers be soldiers or hired or conscripted civilians is open to conjecture, and the balance of probabilities may be different in each case. At Longthorpe there is no evidence which can distinguish the Roman from the native hand; however, there are some interesting dichotomies. First, the kilns are of two types, surface-built and dug. Next, there are two vessel-groups: one which broadly contains the flagons, fine beakers and jars, plates, cups, flanged and reeded-rimmed bowls and cheese-presses, has military connections; the other, comprising mainly butt-beakers, medium-mouthed bowls, and native jars, has mixed origins. Further, the wares follow this division. Ware 1 is associated with the first group, Ware 2 with the second, and there is not much overlap. In this context, the use of the word 'ware' encompasses surface treatment and firing technique. It will be seen from the descriptions (TABLE VII, p.134) that the fabrics are not dissimilar.

It is tempting to see these differences between the 'table-wares' and the more utilitarian vessels (for one should not ignore the extensive gritted series, which can only be local) as evidence for two distinct potting traditions, and thus two groups of potters, one 'military' the other 'native' (cf. Darling (1981), 404 based on kiln types). However, this may be a false trail. While the dug kiln is no doubt more sophisticated than the one built on the surface, it may only represent a difference of function and/or permanence. Surface kilns were in use at Lezoux in Central Gaul in the Tiberian period for making samian ware, and more locally at Rushden they were associated with highly-decorated painted ware (cf. Woods (1974); Woods, Hastings (1984)). Equally, the dug kiln is a well-known late La Tène type. There seems little reason to suggest complicated long-distance migration of potters to account for the differing kiln types; their construction may well reflect a good working knowledge of the technology needed to produce the range of vessels required by the army pottery master.

While some imported pottery is found at Longthorpe (Type 62 from Lyon and of course samian) there is no group of identifiable fine or coarse-ware imported vessels, such as the Raetian types demonstrated at Usk (Greene (1979b)). On the other hand there are quite distinctive traits in the moulding of the lips of the flagons and some jars and beakers, which hark back to pre-conquest models. One of the problems is not knowing the movements of Legion IX Hispana immediately before the invasion. Following its activities in Africa (Tacitus, *Annales* iii,9,1) it appears to have returned to Pannonia (*ibid.* iv,23,2 but for an alternative interpretation, cf. Darling (1977), 408). Taken with Plautius's position as governor of Pannonia, and the fact that three other legions were withdrawn from Germany, it does seem likely that Legion IX came from Pannonia with him (cf. Frere (1967), 61). However, in the pottery, no links are traceable (cf. Bonis (1942)). Rather, bases like Hofheim and Nijmegen on the lower Rhine offer general and sometimes specific parallels. There is strong circumstantial evidence for the pottery master having seen service in Germania Inferior.

Now to the vexed subject of the hands: a number of theories have been rehearsed (cf. Greene (1977), 124–7), but hard evidence is lacking. All we can say for Longthorpe is that the native element in the assemblage, if it was made on site, is biased towards south-eastern Britain. Given a construction date of c. A.D. 44/5–48 for the fortress, there was ample time for the organisation of local labour, local in the context of bringing up natives from the supply base at Colchester for

TABLE VII: FABRIC DESCRIPTIONS OF THE POTTERY

Type Sherds	Vessel	Colour	Feel	Hardness	Texture	Composition-Inclusions	Technique	Ware No.
8a	2-handled flagon	Cream to Pink	Smoothed surface with dragged grit scoring	Fairly hard	No voids	Common 1. Rounded quartz sand, pink, white and transparent, 0.1–0.4 mm 2. Small haematite inclusions. >0,75 mm Scarce 3. Calcareous 4. Grog (some appears to have white inclusions within it) 5. Mica	Oxidised throughout Wheel made Burnished	1.
19a	Corniced-rimmed beaker	Cream to Pink	As 1	As 1	As 1	Similar matrix to 1, but particles reduced in size to accommodate a wall thickness >1,25 mm	As 1	1A
117a	Lid	Pink to Red	As 1	As 1	As 1	As 1	Often highly burnished	1B
65c	Cheese-Press	Cream	As 1	Soft	Voids left by decayed or burnt-out calcareous matter	Common 1. Large, soft limy particles <0,4 mm 2. Quartz sand as 1	As 1	1C
117a	Lid	Pink with white paint	Smooth	Soft	Voids	Similar matrix to 1, but the red haematite is replaced by abundant mica	As 1	1D
79a	Jar	Pink	Smoothed surface externally, finger impressions internally	Hard	No voids	Close to 1, but some additional calcareous particles	Oxidised on surfaces, signs of turning on a slow wheel, knife trimming and burnishing	2
1a	Single-handled flagon	Pink with white flecks of calcite? showing through surface	Similar to 2	Less hard	A few voids	Similar to 1, but the rounded quartz is virtually replaced by calcareous fragments <1,5 mm	As 2, but no signs of knife trimming	2A
75	Necked jar	Buff-Pink	Smoothed surface over hand work?	Soft	Few voids	Common 1. Soft calcareous fragments with iron oxides attached 2. Red haematite fragments	Oxidised through Hand made or slow-wheel turned	2B/ 2C
39a	Bowl	Buff/Pink	Smoothed surface	Soft	Some voids	Common 1. Fine sand 2. Black ferric inclusions Scarce 3. Small calcareous inclusions	Oxidised on surface Wheel made	2D
12a	Devolved butt/beaker	Buff	Burnished surface	Hard	Some voids	Similar to 2B/2C but with mica on surface	Oxidised on surface Wheel made	2E
59a	Cup	Dark grey with red paint	Sandy with some smoothing	Hard	No voids	Common 1. Quartz sand in two sizes <0,5 and <0,2 mm Scarce 2. Haematite 3. Calcareous particles	Oxidised on surface so that the reduction is lightly diminished and also oxidised through, wheel made Some problems because of burning	4

The letters cc denote 'colour-coated', wp 'white paint' and SG 'shell-gritted'. The codes NV (Nene Valley (grey) ware), NVcc (Nene Valley colour-coated) and NV1,2 etc. denote wares which are subject of study in the NVRC Field Centre and will be described in a subsequent publication.

instance (cf. *Britannia* v (1974), 442 for similar kiln batteries at Kelvedon). Given patterns to work to, and perhaps a little specialist help with the clay-body and the slips, potters capable of producing the Camulodunum series would have little difficulty in making the standards set by the Longthorpe garrison.

The next question is: what happened after Longthorpe? Miss M. Darling has covered the matter in some detail (cf. Darling (1981), 403–4). It must be said at this point that while there are vessel similarities between Longthorpe and Lincoln, the general overview is also very different (*ibid.*, fig. 2.3.2). The like vessels are basically those which imitate imported fine wares and samian, and so could represent necessary replacements (for the supply of samian to Longthorpe at least was somewhat scant). Vessels such as the deep bowls in slipped ware (*ibid.*, fig. 23.2.15 and 17) and the slipped beakers (*ibid.*, fig. 23.2.28 and 29) are unknown at Longthorpe. One would like to see the flagon series to be more sure, and particularly the Lincoln equivalents of the jars with overhung shoulders (cf. Type 84 below).

It is clear, however, that the arrangements at both Longthorpe and Lincoln were similar, with Romanised table-ware designs, and native general-purpose pottery. At Longthorpe the Romanised forms frequently have antique traits, and although Ware 1 is usually harder than Ware 2 used for the native forms, both are fairly soft when compared with those from Holdeurn (cf. Holwerda (1944)) or York (cf. Perrin (1977)). These are definitely harder and have a more orange surface, presumably derived from a better firing technique. The products are also more clearly standardised for both sites. It seems that just as the legionary vexillation fortresses of the Claudio-Neronian period show irregularities in their internal arrangements (no doubt adapting to the exigencies of available resources and field displacements), so the pottery supplies exhibit a similar variety of forms and manufacture. This appears to have been rectified as long-term fortresses were established. If this suggestion has validity, it would be tempting to see a reorganisation before c. A.D. 70–75, when 'legionary ware' is found in the earliest levels at York (cf. Perrin (1977)), and Holdeurn ware in the Period V deposits at Nijmegen (cf. Bogaers, Haalebos (1977)). A major shake-up under Nero seems unlikely, particularly for Britain, which he considered abandoning. Greene has suggested more plausibly Vespasian as a more likely candidate to initiate the reorganisation in view of his fiscal policies (cf. Greene (1977), 125; Suetonius, *Vesp.* 16; Dio lxxv, 5).

Notes on the Pottery Report

The pottery report is presented as a type series of the vessels found at Longthorpe. The number in parenthesis after the type-number heading each entry denotes the total number of vessels of that type found in our excavations at Longthorpe. The parallels are quoted by site and type-number on that site (eg Camulodunum 112 is Type 112 in the *Camulodunum* series), unless otherwise specified, when the figure is preceded by p., fig., or pl.).

Context and layer-code are given for the vessels drawn to illustrate each type; explanation of the codes will be found on p.22 and classification and description of the wares (cited by number in the text) in TABLE VII (p.134). The contents of important Claudio-Neronian groups are listed in Appendix 1 (p.195) and all occurrences of all vessel-types are listed in Appendix 2 p.196.

For Fabrics, see TABLE VII (p.134)

A. EARLY VESSELS (Types 1 – 119)

FLAGONS AND JUGS

Two features are common to the Types (1 and 8) most frequently represented among these vessels from the Longthorpe kilns: the lips are carefully moulded externally, while internally the mouths are cupped to take a stopper. Both traits are archaic and infrequent on British examples of the same period. The very considerable series from Camulodunum (pls.LX, LXI) does not have the same characteristics. There, only Type 134 (2) approaches a Longthorpe profile for 1, while the lip on 8 is unrepresented. On the other hand, comparison with the Augustan/Tiberian

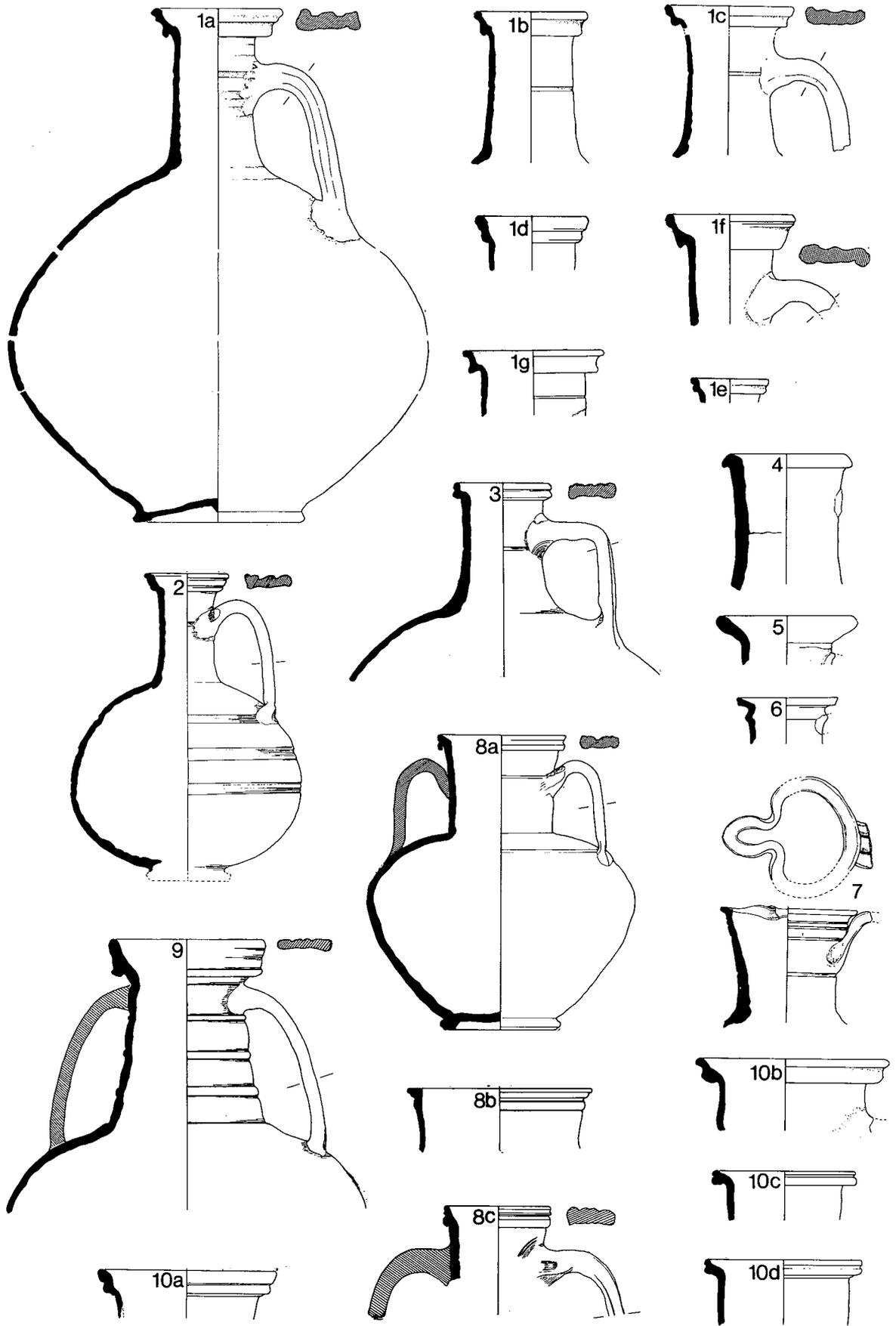


FIG. 38 Coarse Pottery Types 1a-10d. Scale 1:4.

material from Friedberg (cf. *Rödgen*, Vergleichs-Taf. 7) shows clearly how the lip developed out of the earlier rilled versions found at Oberaden (*Rödgen, ibid.*).

Type 1 (thirty-six)

Single-handled flagon with moulded rim: only two complete profiles exist, but sufficient pieces survive to suggest that there were three sizes, with mouth-diameters of *c.* 40–45 mm, 65–85 mm, and 110 mm. The handles are generally three-ribbed, some have four ribs and most bases have a pronounced omphalos. The care taken over the seatings for the stoppers and the fine external mouldings are not found at Camulodunum or at Hofheim. The trend towards these features appears at Oberaden (*Oberaden* ii, Taf. 29.45) and at Haltern (Abb. 26), both in rilled-lip types. The low centre of gravity is dictated by the need for stability when filled, and is common to the vessels at all periods. The detailed discussion of the flagons from Nijmegen (viii, pp.45–50) tends to strengthen the view that our Longthorpe Type 1 equates with Hofheim 50B, but that the detail derives from considerably earlier types; compare the lips from Nijmegen (vi, 103/4) with Hofheim 50. In Britain, the closest parallels for the lip is from Eccles (58), but few are cupped there.

- 1a. from LHR72.F1.1: in Ware 1C? (See TABLE VII, p.134)
- 1b. LHR72.F1.1 : in Ware 1C.
- 1c. LHR72.F1.1 : in Ware 1.
- 1d. LHR72.F4.10: in Ware 1.
- 1e. LHR72.F4.10: in Ware 1C.
- 1f. 71.56.56: in Ware 1C.
- 1g. 74.B1.1: in Ware 1D.

Type 2 (one)

A globular flagon, single-handled with three burnished girth grooves. It may be related to the more pear-shaped forms, cf. Hofheim 51, but the body treatment is found on *Longthorpe* I 15; but cf. the smaller Hofheim 53.

- 2. from LHR72.F21.2 : in Ware 1C.

Type 3 (four)

Single-handled flagon with moulded lip and upright or slightly belled neck. Unfortunately the profiles of all of those present are incomplete. The body appears to be ovoid. If one allows for the 'Longthorpe lip', the lineage stretches through Camulodunum 140 to Haltern 45. The shape is present in the Schutthügel (429), at Nijmegen (vii,81), at Hofheim (50A) and at Eccles (51).

- 3. from LHR72.F21.2 : in Ware 1C.

Type 4 (two)

The nearest relative to these fragments is from Hofheim (Abb.64.8), although that seems to belong to a more 'bottle-mouthed' series. The Schutthügel (435) provides another similar type.

- 4. from 71.56.9 : in Ware 1.

Type 5 (one)

A very simplified, everted lip, and part of the neck showing the scar of the handle. Presumably part of the small series, cf. *Longthorpe* I, 24 and 35. Everted rims are rare at this period elsewhere, cf. Camulodunum 140.

5. from 71.56.6 : in Ware 1.

Type 6 (two)

Sharply-cut chamfered lip with shaped cordon in the neck to take the handle. Similar features can be seen at Hofheim (Abb.64.7); and cf. generally Hofheim 53. Related material comes from Nijmegen (vi,115), but the lip is usually found on two-handled vessels, cf. *Rödgen*, Vergleichs-Taf. 8.

6. from 71.56.7 : in Ware 1.

Type 7 (one)

Pinch-necked flagon, found widely on both continental and British sites. Its advantages when pouring made it a standard item of table-ware, and it is noticeable that the lip performs rather better than many modern types. The shape emerged in the Augustan period at Haltern, and at Friedberg, cf. *Rödgen* Vergleichs-Taf. 8 (also for an extensive review of similar vessels).

The moulding on the rim is an extension of the decoration found at Camulodunum (158). However, the closest is Hofheim 86A.

7. from 71.53.7 : in Ware 1A.

Type 8 (three)

Types 8a and 8b have been classified on the basis of the differences in the diameters of their necks and the angles at which their handles are attached to the necks. The general form is seen at Oberaden (49), and later at Haltern (50). Neither of these have the upswept handles, but do have the outward- rather than inward-splayed neck, cf. Haltern 51. At Rödgen, No.36C, though a little globular, is the clear ancestor of Hofheim 57C, having together a wide mouth, moulded lip, upswept handles and outward splayed neck.

Type 8c, insofar as can be judged, is a different type with handles attached at right-angles to the neck, which is narrower than on 8a. The straightness of the interior of the neck is different from Hofheim 58: cf. Type 10, which it otherwise resembles; its origin lies with Oberaden 49/50.

8a. from 71.56.56 : in Ware 1.

8b. 71.53.9 : in Ware 1.

8c. 74.B1.10 : in Ware 1.

Type 9 (one)

Double-handled flagon with moulded rim and tapered neck with three bold cordons. The white slip on the neck and shoulder is characteristic. It is a distinctive vessel, which appears in the Augustan period, cf. *Rödgen*, Vergleichs-Taf. 8,37. There it is suggested that the type is related to Oberaden 51 and Haltern 53, but these have other features, notably the attachment of the handles to shaped rather than moulded cordons, and seem to be related more to the double-handled type 1b. The progenitor is at Friedberg, cf. *Rödgen*, Vergleichs-Taf. 8,30, and a clear parallel is Hofheim 58. Both there and at Longthorpe the neck is inward-splayed, while on the earlier vessels it is more upright. The British service is well described under Camulodunum 161A and 162, where the same difference is noted for the splaying of the neck in later examples; also cf. *Richborough* iv, 366. There are indications that the type was more popular on the lower Rhine and in S.E. Britain.

9. from 71.56.9 : in Ware 1D.

Type 10 (six)

Double-handled flagon with upright moulded lip, with enough of the neck to show a slight convexity. Almost certainly derived from Oberaden 51. Types 10c and 10d are included here, but it is possible that they belonged to a single-handled series, cf. Type 1d.

- 10a. from LHR72.F4.11 : in Ware 1.
 10b. LHR72.F8.+ : in Ware 1.
 10c. 71.56.9 : in Ware 1.
 10d. 71.56.30 : in Ware 1B.

Type 11 (two)

Native flagon, presumably two-handled, similar to *Longthorpe* I 21 and *Camulodunum* 161A. The recurving of the lip is unusual.

- 11a. from 71.56.14 : in Ware 2.
 11b. 71.56.42 : in Ware 2.

BEAKERS

The beakers made in the kilns form a homogeneous group and are typically Claudio-Neronian. Some traits are shared with jars, particularly the overhung grooves on the shoulders; and the rims mirror the mouldings on the flagons. Without more material from the fortress, it is difficult to know to what extent the numbers reflect a shortage of wares from abroad or whether they represent an average proportion for similar military deposits of the period.

The early beakers in native forms could have been made at the kilns, but the appearance of black ferric particles in some of the wares may mean that they were imported to the site, although still from the locality, since the basic matrix is the same. This is a subject which should be clarified when the early civilian farms from the area are published (e.g. *Monument 97; Durobrivae* 3 (1975), 26 f.).

Type 12 (six)

Devolved butt-beaker, very similar to *Camulodunum* 13; the degree of eversion of the rim does not seem to be chronologically significant, cf. *Skeleton Green*, fig. 21, Nos. 37, 41.

- 12a. from LHR72.F5.1 : in Ware 2C (see TABLE VII, p. 134).
 12b. 71.56.41 : in Ware 2E.

Type 13 (one)

Devolved butt-beaker, similar to *Camulodunum* 115D.

13. from 71.53.16 : in Ware 2D.

Type 14 (one)

Butt-beaker with everted rim, probably made on a slow wheel, and well burnished. The body decoration is of sharply angled lines in a double chevron between two bold cordons. This is a native form, cf. *Camulodunum* 115C.

14. from 71.56.9 : in Ware 2C.

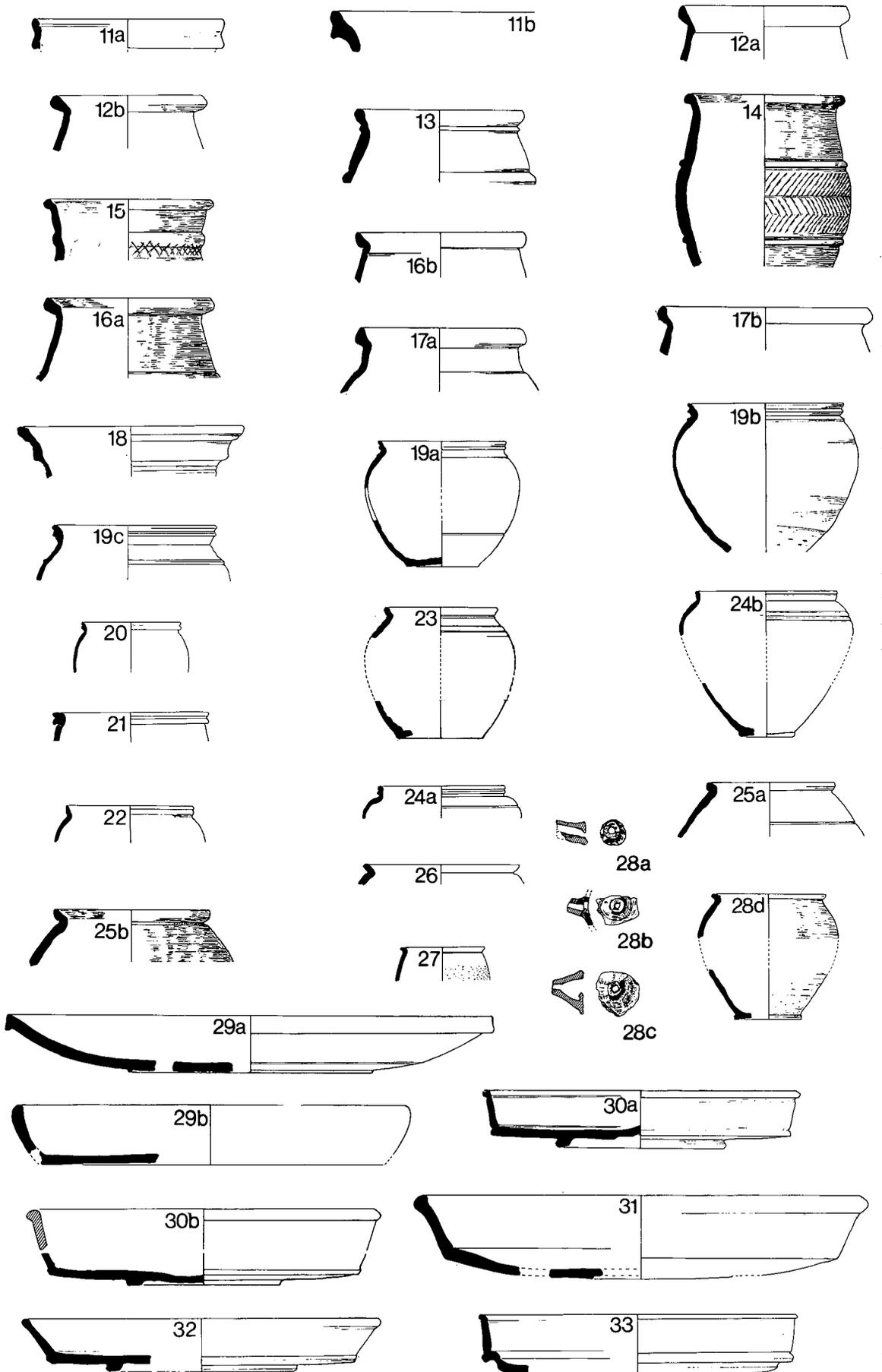


FIG. 39 Coarse Pottery Types 11a-33. Scale 1:4.

Type 15 (one)

(A local type of Romanised girth-beaker. Very similar shapes occur at Fishbourne (fig. 88, 63.2 and 3). This vessel appears to have remains of a red slip.

15. from 71.56.21 : in Ware 2C.

Type 16 (two)

Simplified butt-beaker with everted rim and straight, tapered neck, cf. *Longthorpe I* 40 and Kingsholm: Darling (1977), fig.6.9.27.

16a. from 70.XXX.1: in Ware 2D.

16b. LHR72.F6.+ : in Ware 2C.

Type 17 (three)

An unusual butt-beaker with a constricted neck, but the cupped rim with internal offset makes the attribution almost certain.

17a. from 71.56.6 : in Pipeclay.

17b. LHR72.F6.+ : in Ware 2D.

Type 18 (three)

These vessels may come from Romanised girth-beaker forms and at least one appears to be in a kiln fabric, but the rest approach Nene Valley grey ware, being lightly reduced.

18. from 74.B1.1 : in Ware ?

Type 19 (thirteen)

Cornice-rimmed beaker with a girth-groove on the shoulder. The mouth is generally lid-seated. The bases invariably show a slight rise, probably due to sagging in firing upside down. There are two sizes: 19a, with a rim-diameter of c. 90 mm, and 19b and 19c which are rather larger at c. 110 mm. Their origins are clear. The illustrations of Lyon beakers in roughcast ware from Usk (Greene (1979b), fig. 14) show the essential features. There is no sign of any attempt to grit the outside, cf. *Longthorpe I* 8, 10, 52.

19a. from LHR72.F1.1 : in Ware 1A.

19b. 71.56.21 : in Ware 1B.

19c. 71.56.12 : in Ware 1.

Type 20 (three)

This beaker has a slightly everted cornice-rim, but the body is ovoid and the mouth larger in proportion to width than Types 19 or 24. It is similar to Hofheim 85B; *Longthorpe I* 48,50 probably belong to this series, cf. *Nijmegen* viii, fig. 53.4. *Longthorpe I* 55, which is similar, is in fact white-slipped.

20. from LHR72.F1.1 : in Ware 1A.

Type 21 (one)

Only one example of this heavy cornice rim survives, and its true morphology is therefore difficult to assess, but cf. *Nijmegen* viii, fig. 53.5 for something similar unless in fact we are dealing with a folded beaker, cf. Greene (1979b), fig. 8.21.

21. from 74.B1.6 : in Ware 1.

Type 22 (six)

An upright-rimmed beaker with external groove; there are no shoulder mouldings. Similar to *Longthorpe I* 56, which is more constricted in the neck. There may be Lyon affinities, cf. Greene (1979b), fig. 8.20.3.

22. from LHR72.F4.11 : in Ware 1.

Type 23 (one)

A particularly squat beaker with a plain, slightly cupped, rim and external shoulder grooves, similar to a Lyon form, cf. Greene (1979b), fig. 13.5; Darling (1977), fig. 6.7.23 (Wroxeter).

23. from 71.56.9 : in Ware 1.

Type 24 (three)

These beakers with high shoulders differ slightly, 24a having an upright cornice rim, while 24b has an upright plain rim. They belong to the series represented by Hofheim 85A. Another variant is *Longthorpe I* 50, which is itself close to Darling (1977), fig. 6.7.26.

24a. from 71.56.9 : in Ware 1A.

24b. 71.56.12: in Ware 1A.

Type 25 (two)

Narrow-mouthed ovoid beaker with everted rim and shoulder groove. This is a native type: cf. Camulodunum 249, which is in the soapy fabric characteristic of the pre-conquest potters. Type 25b is in a soft, grey-black, reduced fabric with smoothed external surface.

25a. from 71.56.9 : in Ware 1A.

25b. 70.XVI.2 : -

Type 26 (one)

Beaker with plain, everted rim, cf. generally Greene (1979b), fig. 12.10,12. The wares indicate that these vessels were probably not Longthorpe products.

26. from 74.B2.1 : in Ware 2 type.

Type 27 (one)

A roughcast beaker, almost certainly from Lyon, cf. Greene (1979b), fig. 13.2 and 3 for similar profiles.

27. from 71.56.9 : in Lyon Ware.

LAMP-FILLER OR FEEDING BOTTLE

The function of these vessels remains in debate (Webster (1981), 249–55; Santrot (1979), 442); both authors seem to prefer the feeding-bottle hypothesis. However, if so, it is strange that the vessels are found on campaign fort sites such as Longthorpe, apparently without *vici*, and here made in the kilns producing the military pottery. It is true that the spouts are frequently extremely narrow and thus surface tension and sheer viscosity appear to make them unsuitable for pouring liquids, but perhaps their use was as a drip-fed or indeed to be sucked when only very small quantities were required – and a medical application has been suggested (Lacaille (1950)). (I am indebted to P. V. Webster for this reference.)

Type 28 (four)

Small spouted vessel with well-turned foot. It is rather more open than Hofheim 33B, Schutthügel 251 or Darling (1977), 6.4.16 (Usk).

28a. from	71.56.9	in Ware 1B.
28b.	71.56.12	in Ware 1B.
28c.	71.56.22	in Ware 1B.
28d.	71.56.46	in Ware 1B.

PLATES AND PLATTERS

The majority of plates and platters made in the kilns find their origins in samian forms. In the case of 34a, the exaggerated external offsets at the junction of the wall and bottom show the pre-Flavian trait. The frequent use of red colour-coating indicates the attempts of the potters to produce a service which could take its place with the imported samian and Pompeian Red wares.

Type 29 (two)

29a. from	71.56.6 :	in Ware 1.
29b.	74.B1.9 :	in Pompeian Red ware.

Dr D.P.S. Peacock kindly examined a sherd of 29b and reports that it is of his Fabric 2 which comes from an area of metamorphic rocks, perhaps in the Mediterranean region (Peacock (1977), 147 ff., 153 f., Table 1). *Longthorpe* I 18 from the fortress is in his Fabric 3 (*ibid.*).

Type 30 (eight)

An imitation of samian form 17 or 17R which, allowing for the use of coarse ware finished with red colour-coating, represents the originals quite faithfully, cf. Oswald, Pryce (1920), pl.XLII. 9/11. In samian the vessel is fairly common in the Claudian period, although not so popular as 15/17, and the details displayed in Type 30 are noted as being early, cf. plates by Salvetus and Balbus from Aislingen and Mainz, *ibid.*, p.174. Type 30b is more open and shows later influences, but is recognisably the same type, cf. Darling (1981), fig. 23.2.2, from Lincoln.

30a. from	LHR72.F1.1 :	in Ware 1cc (see TABLE VII p.134).
30b.	74.A1.2 :	in Ware 1cc.

Type 31 (three)

A platter (or shallow dish) derived from a native form well established at Camulodunum (28) where it is shown to start in the Claudio-Neronian period. The slightly incurved rim resembles Camulodunum 12 (*ibid.*, fig. 48). The red colour-coating is seen as a formal assignation of this native vessel to the service of the other samian imitations.

31. from	71.56.9 :	in Ware 1.
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Type 32 (four)

Plate with slightly swollen rim, everted sides and flat bottom, with a marked offset at the external junction of the wall and bottom; it almost certainly is the footed version of 31.

32. from	LHR72.F4.6 :	in Ware 1cc.
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Type 33 (two)

Probably a coarse-ware imitation of samian form 15/17. The difference in the fineness of the clay body tends to exaggerate the normal samian profile into humps and bumps, but the sense is there, cf. Oswald, Pryce (1920), pl.XLIII.

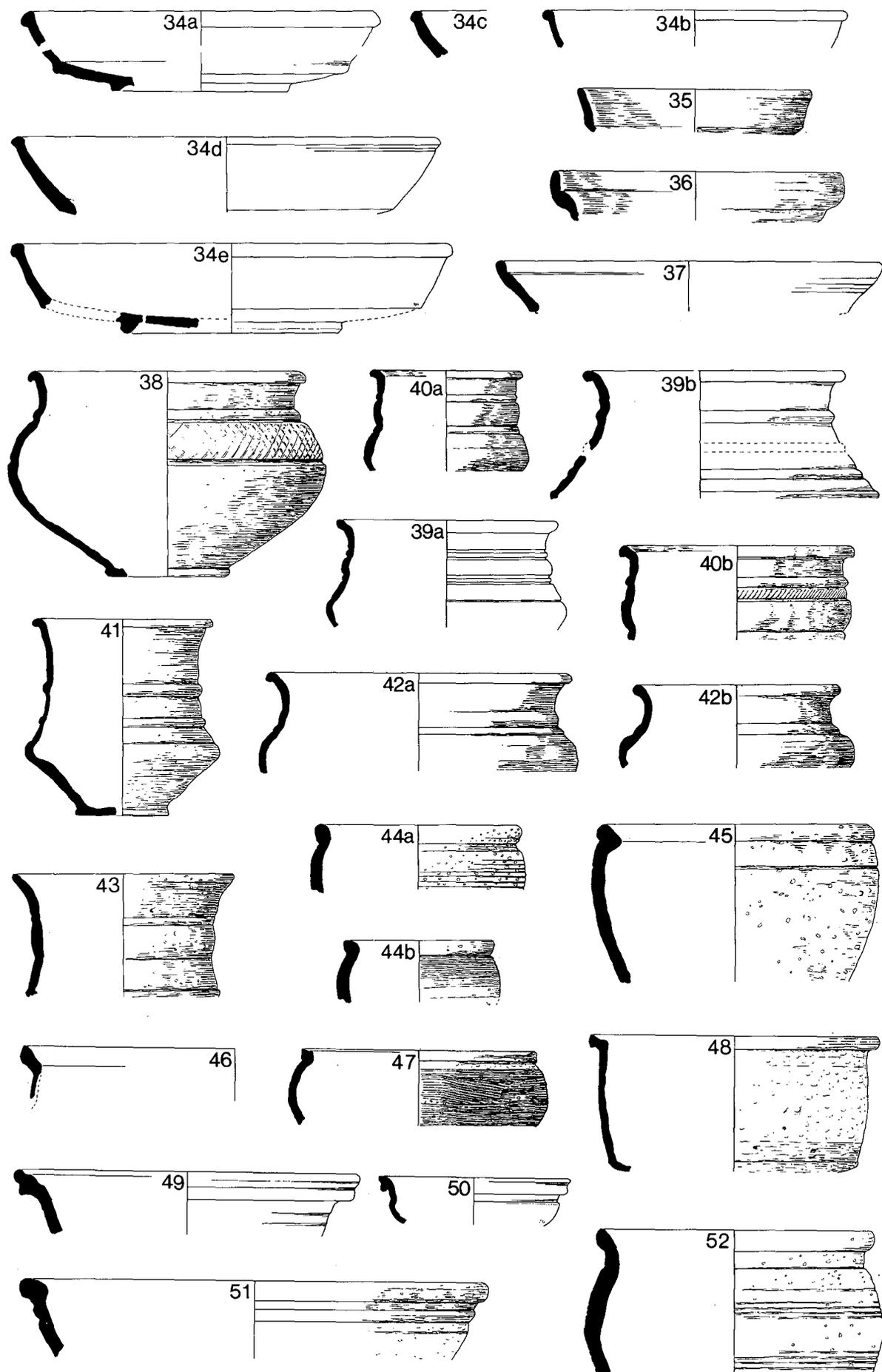


FIG. 40 Coarse Pottery Types 34a-52. Scale 1:4.

33. from LHR72.F4.6 : in Ware 1cc.

Type 34 (eleven)

A number of variants have been assembled together on the basis that they approximate, insofar as the character of the body material allows, to samian forms 18 and 18R. Native influences can be seen: in the 'clubbed' rims of 34d and 34e, fading in 34a; also in the low footrings and sagging bottoms. At the same time, development, or perhaps attention to detail, is present: 34a has a clumsy external offset, and the internal offset of the pre-Flavian samian vessels. The red colour-coating usually extends all over the interior and ends externally at the wall-bottom junction. Since the type is a copy, no reference other than to Oswald, Pryce (1920), pl. XLV is necessary.

34a. from	71.56.6	in Ware 1cc.
34b.	71.56.9	in Ware 1cc.
34c.	71.56.9	in Ware 1cc.
34d.	71.56.11	in Ware 1cc.
34e.	74.B1.1	in Ware 1cc.

Type 35 (two)

Simple platter with gently everted wall in smooth burnished grey ware (but note that the context contained much burnt material). Basically a native form, cf. Camulodunum 21C and p.222.

35. from 71.53.13 : in Ware 1D?

Type 36 (one)

Copy of a Gallo-Belgic platter in smooth, dark-grey ware. The type is widely known in S.E. Britain, cf. Camulodunum 24A and p.222, and *Longthorpe* I 141.

36. from 71.56.46 : in Ware NV10 (see TABLE VII, p.134)

Type 37. (two)

Open platter with ledged rim and concave sides: smooth micaceous fabric, with reduced firing; cf. Camulodunum 28C.

37. from 71.56.9: in Ware NV10.

BOWLS

The bowls fall into two main classes: those derived from native forms, on the whole carinated, cordoned or groove-rimmed products, closely resembling those from Hofheim.

The native vessels are a popular class, and have close links with similarly dated products from the locality, particularly Monument 97 and Ashton (publications forthcoming). However, the Longthorpe vessels are almost entirely oxidized by the secondary process, so that they have 'sandwich' cores. At Monument 97 the assemblage (conversely) is reduced, and oxidised surfaces stand out as obvious rarities (cf. Woods, Hastings (1984)). Comments upon the overall morphology are limited by the lack of comparative published groups, but the main thrust is clear: comparison with earlier and contemporary groups from Wheathampstead (cf. Wheeler (1936), pls. XLIX, L), from Camulodunum (quoted in the text by vessel number), and from *Verulamium* i (cf. fig. 100), indicate a basically south-eastern origin.

The fabrics associated with Ware 2, in which most of the native bowls are made, are compatible with the clays used for the military wares. It is the surface treatment which differs obviously, with a great deal of energetic burnishing, giving a smoothed, rather than turned, appearance.

The flanged and reeded-rimmed bowls need little comment. They have no idiosyncrasies to distinguish them from their fellows on other contemporary British military sites.

Type 38 (one)

Bulbous medium-mouthed bowl with everted overhung rim, neck cordon and decoration, either lattice or diagonal line, above a girth-groove. The foot is turned. These bowls occur in a wealth of profiles in S.E. Britain, cf. *Camulodunum*, fig. 54. A similar shape comes from *Verulamium* i (fig. 101.66), with undecorated neck.

38. from LHR72.F23.2 : in Ware 2B.

Type 39 (three)

Medium-mouthed carinated bowl with neck cordons. The rim is slightly lid-seated; *Camulodunum* 218B is close to 39a and 219 to 29b; the comments (*Camulodunum*, p.261) are relevant; cf. *Longthorpe* I 72.

39a. from LHR72.F9.+ : in Ware 2D.

39b. from LHR72.F6.+ : in Ware 2A.

Type 40 (two)

Medium-mouthed carinated bowl with neck cordon and everted, overturned rim, cf. *Longthorpe* I 122, which has a decorated neck like 40b. The upright shape is a local trait.

40a. from 71.56.2 : in Ware 2D.

40b. 74.A1.2 : in Ware 2D.

Type 41 (one)

Long-necked, medium-mouthed, sharply carinated bowl, with two neck cordons; the foot is moulded. The type is again general in S.E. Britain, cf. *Camulodunum* 211–216, but the long neck is a local feature, cf Type 43. This one appears to be hand-made.

41. from 71.60.6 : in Ware 2D.

Type 42 (two)

Carinated bowl with double neck cordon and everted rim. This is a fairly common shape in mid first-century contexts, cf. *Great Casterton*, fig. 17.35; *Camulodunum* 218Cb, *Verulamium* i, fig. 100.38 and particularly fig. 101.76.

42a. from 71.53.2 : in Ware 2D burnt?

42b. 71.53.13 : in Ware 2D.

Type 43 (one)

Long-necked, carinated, medium-mouthed bowl with neck constrictions and plain everted rim. At *Camulodunum* (211A and B) comparable vessels are rather more squat.

43. from 74.B2.9 : in Ware SG (see TABLE VII, p.134).

Type 44 (two)

Bead-rimmed bowls with upright walls and constrictions or grooves below the rims. They are in coarse calcite-gritted fabrics and are presumably cooking vessels. The variant 44b is very small and more pear-shaped. Both are from upper levels.

44a. from 71.60.3 : in Ware SG.

44b. 74.B1.1 : in Ware SG.

Type 45 (one)

High-shouldered bowl with bead rim, carried over internally to give a ledge, presumably as a lid-seat. Among the everted-rim bowls there are similar treatments, cf. Types 46 and 51, cf. *Verulamium* i, fig. 105.198–199.

45. from 71.56.9 : in Ware SG.

Type 46 (one)

Wide-mouthed bowl with slightly cupped rim, below which are fine girth-grooves. The ware is one of those used for cheese-presses, so the vessel should come from the kilns. *Longthorpe* I 127 probably comes from the same series.

46. from LHR72.F4.10 : in Ware 1C.

Type 47 (one)

Grooved-rim bowl in calcite-gritted ware with constricted neck and bulbous body. The morphology is not certain, but a good series of similar bowls comes from Period 1 at Fishbourne (fig. 102.167); cf. *Camulodunum* 250.

47. from 71.53.2 : in Ware SG.

Type 48 (one)

Grooved-rim bowl with deep, upright sides, perhaps with a carinated or rounded bottom; difficult to parallel, cf. *Camulodunum* 52A.

48. from 71.56.46 : in Ware 2A burnt.

Type 49 (two)

A pedestalled bowl with moulded rim and internal ledge, almost certainly an unfrilled tazza. A similar vessel has been found at Lincoln (East Bight) (information kindly provided by Miss M.J. Darling).

49. from 71.56.9 : in Ware 1.

Type 50 (three)

A small, shallow segmental bowl with cornice rim. A similar vessel comes from Kingsholm (Darling (1977), fig. 6.9.32) and the Longthorpe examples confirm the date and thus the originating context. Part of the white-painted service.

50. from 74.B1.3 : in Ware 1D.

Type 51 (one)

Heavy bowl with hammer-head rim and deep external cordon immediately below. Not a Longthorpe kiln product. The fabric is coarse, granulated, yellow-buff ware with a grey core.

51. from 71.56.5 : in Ware ?

Type 52 (one)

Medium-mouthed, necked bowl with everted, chamfered rim and rilled body, which is slightly carinated. The only example is well sooted. Everyday vessels like these belong to local series, cf. *Longthorpe* I 104 (classed there as a jar) and cf. *Great Casterton*, fig. 18, for a number of similar ones.

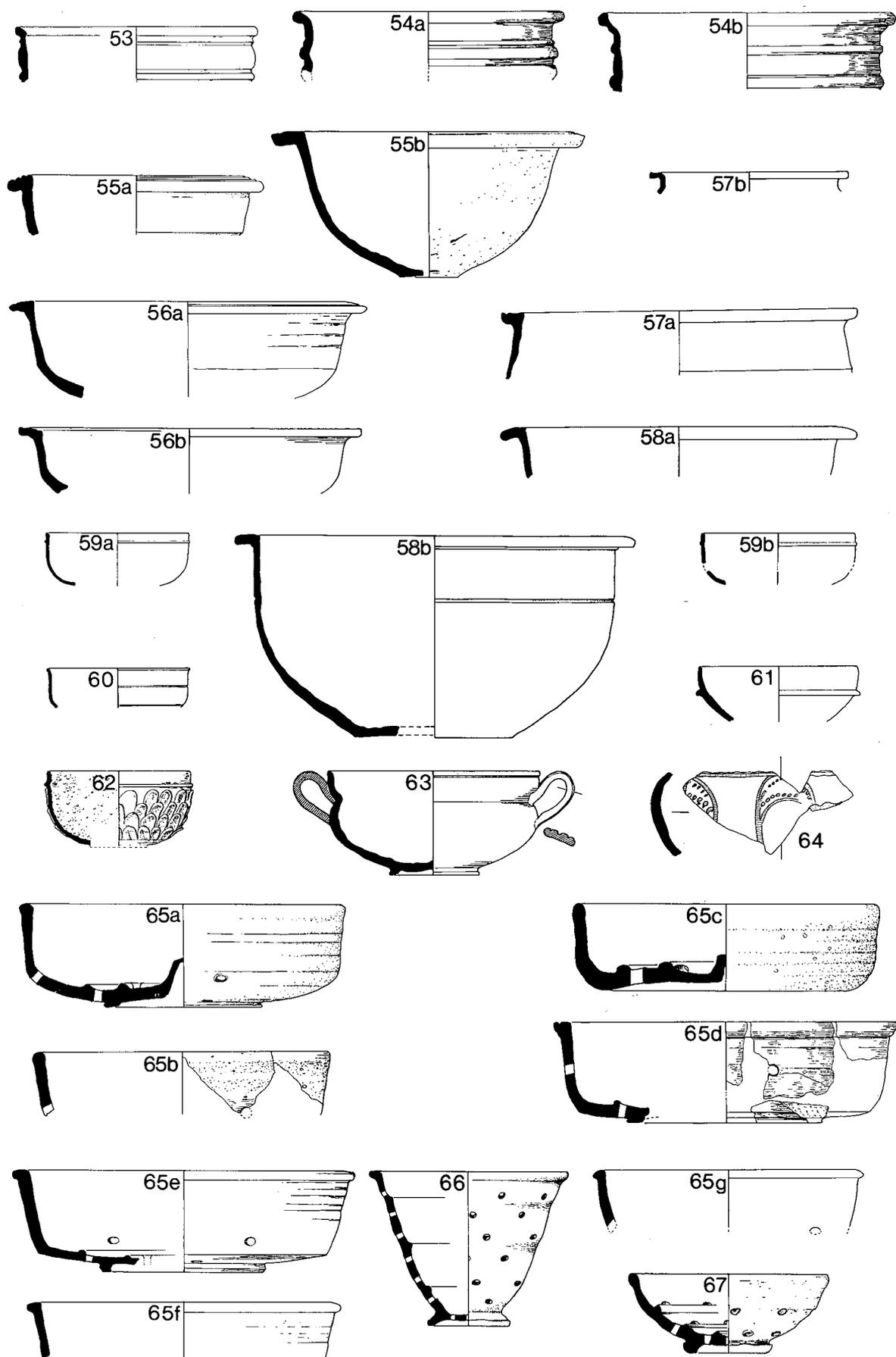


FIG. 41 Coarse Pottery Types 53-67. Scale 1:4.

52. from 71.60.4 : in Ware SG.

Type 53 (one)

Cordoned bowl in burnished orange-buff ware with a grey core. The mouldings are fine and clean. The type appears to be local and is derived from a S.E. British tradition, cf. *Camulodunum*, pl. LXXVII. In the lower Nene Valley, the rims are often vertical rather than everted and the collars decorated. They are wheelmade, cf. *Longthorpe I* 122.

53. from 74.B1.6 : in Ware 2D.

Type 54 (four)

Cordoned bowl with everted rim in burnished red-buff ware with grey core. There is always considerable variation in the rims and shoulders. The type is probably derived from a pedestalled Belgic tradition, cf. Wheeler (1936), fig. 23.3, and *Verulamium i*, fig. 100.35. Similar vessels occur at Ashton and Peterborough, Monument 97 and for 54a cf. *Longthorpe I* 72. Again probably but not certainly kiln products.

54a. from 71.53.16 : in Ware 2D.

54b. 71.53.20 : in Ware 2D.

Type 55 (two)

Reeded-rim bowl with sturdy, curved upper wall. This is the Longthorpe version of Hofheim 91A, where the downward stepping of the reeding is clear. 55b is a relation, with an outward-sloping wall and a marked carination. The rim is flatter and longer, cf. *Verulamium i*, fig. 106.211.

55a. from LHR72.F22.1 : in Ware 1.

55b. LHR72.F1.1 : in Ware 1.

Type 56 (five)

Shallow bowl with carinated wall and reeded rim. At Hofheim the two equivalent vessels, 94A and B, have flat bottoms and are really more like dishes. The sequence at Camulodunum is relevant (p.265) and particularly the variant 246. Taking into account the treatment of the wall of Hofheim 91A on other sites where the degree of carination or rounding varies considerably, this feature should not be relied upon as an absolute dating criterion. It is interesting that a similar vessel was found at the *Lincoln Gate* (fig. 13.7).

56a. from 72.F4.1 : in Ware 1.

56b. 71.56.9 : in Ware 1C.

Type 57 (two)

Deep bowl with outward-sloping sides and reeded rim, cf. *Verulamium i*, fig. 106.213; note the handled bowl from Fishbourne (fig. 92,90.2). The wall is similar to *Longthorpe I* 129.

57a. from LHR72.F4.2 : in Ware 1.

57b. LHR72.F4.2 : in Ware 1.

Type 58 (three)

Bowl with plain flange, flat or sloping, cf. *Longthorpe I* 129–132. It is not clear if the body is bag-shaped or carinated. The origin is Augustan, and early vessels have a sharp, flat rim, cf. *Rödgen*, Taf.45.171 and 53.39. Camulodunum 243 has an upright wall with a flat-bottomed base. At Usk the wall is slightly incurved (Darling (1977), fig. 6.4.2) and the rim stubby, as Camulodunum 243, although a shallower bowl has a wider, flatter rim, cf. Camulodunum 246B. Gloucester profiles resemble those at Usk (Darling, fig. 6.11.10), while at Wroxeter the rim form

is absent as at Hofheim, where only the reeded variety occurs. Wide, flat rims also come from the Schutthügel (Taf.3.47).

58a. from LHR72.F1.1 : in Ware 1.

58b. LHR72.F1.1 : in Ware 1.

CUPS

The cups represent a totally Roman tradition and are clearly made in imitation of fine-ware imports, which were presumably under-supplied. The range and quality of the Longthorpe replacements indicates a familiarity with the originals not borne out by their numerical representation from the excavations, but this is no doubt fortuitous. In comparison with the plates it is noticeable that the copies are of non-samian forms for the most part; there is just one copy of form 24/5, and none of form 27, which was by far the most popular vessel by the Neronian period. One small cup is in white fabric, highly burnished, with a red colour-coating (70.XXVIII, not illustrated). The double-handled 'Surrus' cup (Type 63) is present on military sites to the end of the Neronian period, although never in great quantity.

Type 59 (five)

Small flattened hemispherical cups imitating Gaulish originals. The potters have transferred the detail of the small ridges, which normally marked off the area of roughcasting from the lip, to the shape of the bowl which is sanded to the rim, cf. Greene (1979b), fig. 10,1-3 with 6-9, and cf. *Longthorpe I* 13 and 15. However, Central Gaulish examples are nearer to the Longthorpe profile, cf. Greene (1979b), fig. 17.1. There are traces of red colour-coating present, but not sand. The extreme fineness of the wall is a tribute to the skills of the Longthorpe potters; in examples of 59a some grits actually appear on both sides of the wall, so heavy is the loading. Perhaps the appearance given by this rough body made sanding superfluous.

59a. from LHR72.F1.1 : in Ware 4.

59b. LHR72.F1.1 : in Ware 1cc.

Type 60 (two)

Small bowl with upright wall and slightly out-turned rim, probably carinated at the wall/base junction. Similar profiles come from *Nijmegen* viii, pl. 54.8 and Wroxeter (Darling (1977), fig. 6.7.31 and 33)

60. from LHR72.F9.+ : in Ware 1.

Type 61 (one)

An ill-contrived copy of samian form 24/5; there is no sign of a colour-coating extant, cf. Darling (1981), fig. 23.2.24 and 25 and *Lincoln Gate*, fig. 13,14. Similar vessels also come from Usk (Darling (1977), fig. 6.5.23), and Wroxeter (Darling (1977), fig. 6.7.34).

61. from LHR72.F1.1 : in Ware 1.

Type 62 (one)

Lyon-ware scale-decorated cup. The scales are a little long but probably belong to the 'round' service, cf. Greene (1979b), fig. 5.3. (For Lyon Ware sherds, see p.130).

62. from 71.56.6 : in Lyon Ware.

Type 63 (five)

This double-handled campanulate cup appears at Haltern (55), but not at Oberaden. It is found at

Hofheim (69), but the Neronian period seems to be the end of its date-range, cf. Darling (1977), fig. 6.4.20 and *Longthorpe* I 123.

63. from 71.53.15 : in Ware 1.

Type 64 (one)

Imitation of a Lyon 'strawberry' cup, cf. Greene (1972), fig. 11.7–12. The appliqué barbotine panels have been replaced by red paint. The ware is close to 2D, but is buff rather than red.

64. from 74.B1.1 : in Ware ?

CHEESE-PRESSES

Of all the vessels found on the kiln site, perhaps the most surprising numerically are the cheese-presses. Of diverse shapes, they appear in three Types: 65 produces a disc-cheese; 66 is conical, while 67 is bowl-shaped and must have produced a low 'pudding'. All versions show internal ridging and drainage holes. The disc-shapes are well known in Britain throughout the Roman period, and are produced in colour-coated ware by the later Nene Valley potters (Wisbech Museum). They are utilitarian vessels, but one, 65e, has traces of colour-coating too, and (taken in conjunction with the carefully turned footings of the other two shapes) perhaps we are wrong to assume that the presses did not come to table. We are not used to conical and hemispherical cheese shapes in the country today, but they are widely popular in France, where they are associated particularly with goat's and sheep's milk.

Type 65 (thirty-five)

Disc-shaped cheese-press, generally with two basal ridges, between which are drainage holes. Similar holes are found in the side wall, or sometimes at the wall/base junction. Again, a few have an extra ring of holes within the diameter of the innermost basal ridge.

Variant 65a is footed and has a high central 'kick', the resultant cheese probably appearing as a ring when turned out. Type 65c rests on the external wall/base junction and has a concave bottom. Type 65d (cf. *Longthorpe* I 138) is carefully made with moulded rim and a low foot; it also has the highest-placed drainage holes in the wall. Type 65e is bead-rimmed, higher-footed and one retains a little red colour-coating.

Because of their rugged construction and unmistakable features, cheese-presses are instantly recognisable, and unlikely to be overlooked even as small fragments. There is a danger that they have thus become over-represented, but the comparative numbers from the Longthorpe kiln-site are still surprising, contrasting sharply with similarly dated sites elsewhere.

At Camulodunum (199), just seven were noted, all Roman and dating after *c.* A.D. 60–65. Two are recorded from *Eccles* (fig. 3.4.97) from the 'enormous amount of pottery present'; they have three ridges and six sets of holes. At Usk (Darling (1977), fig. 6.5.28), the form is present, but numbers are not stated, and it is unrepresented in the latest collections from Gloucester, Kingsholm and Wroxeter.

More remarkable is the apparent paucity of material from the near continent. Gose (1950) does not record the vessel. It is not present in the more recent summaries published with Rödgen, or at Nijmegen or from the Schutthügel. In Holland a few are known from Limburg (information J.K. Haalebos).

65a. from LHR72.F1.1 : in Ware 1.

65b. 74.B3.3 : in Ware 1.

65c. LHR72.F1.1 : in Ware 1.

65d. 71.56.9 : in Ware 1 or 1B.

65e. 71.56.41: in Ware 1cc.

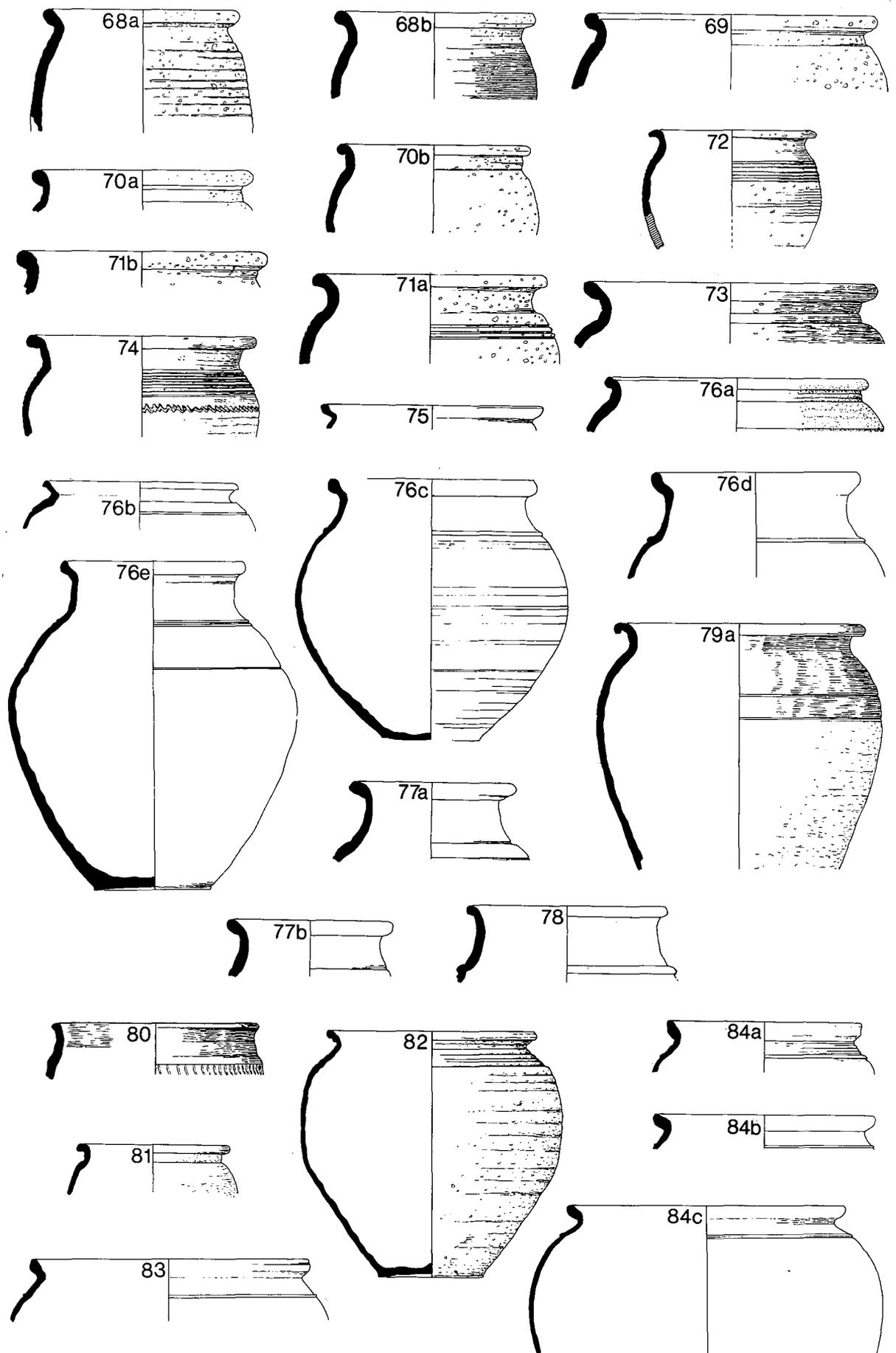


FIG. 42 Coarse Pottery Types 68a-84c. Scale 1:4.

- 65f. 71.56.56: in Ware 1.
65g. 74.B1.1 : in Ware 1.

Type 66 (one)

Conical cheese-press, with three internal ridges on the wall and seven rings of holes. The implication of this design is that there is more liquid to strain off than from the disc-shaped presses, and the comparative depth to surface-area ratio would ensure that the lowest drainage holes evacuated the surplus. A possible parallel from Woerden (WRD 1976,106cc: information from J.K. Haalebos) unfortunately only has the foot with the innermost holes: otherwise I have not been able to find a parallel.

66. from LHR72.F1.1 : in Ware 1.

Type 67 (two)

Bowl-shaped cheese-press with three internal ridges and three rings of holes. This is for a small cheese, presumably curing more like the disc-shaped one.

67. from 74.B1.3 : in Ware 1.

SHELL-GRITTED JARS

These jars form a ubiquitous background to the fine-ware series. They are well made and, where they show signs of use, for the most part they are burned or sooted. It is always difficult to provide a meaningful morphology for these vessels, which were made for local and immediate use. They seem to come in two basic shapes: ovoid (68a,b and 72), and more globular, with proportionately wider mouths. The latter are always 'necked'. The filler to the clay body is always shell, but it is not easy to see whether this is from fresh-water mussels or other molluscs which abound in the Nene, or from crushed shelly limestone which is also available locally. The natural colour of the vessels is buff-grey to red, and this suggests that they may well have been made in the oxidizing kilns on the site. It is interesting that these jars are more easily comparable with similar vessels from the fortress itself than many of the other types.

Type 68 (seven)

Jar with restricted neck and rilled body, cf. *Longthorpe* I 106, 107 and 112.

- 68a. from 71.56.46 : in ware SG (see TABLE VII, p.134).
68b. 71.53.9 : in ware SG.

Type 69 (one)

A groove-rimmed jar with upright, restricted neck, cf. *Longthorpe* I 95.

69. from 71.56.12 : in Ware SG, coarse.

Type 70 (three)

Moulded-rim jar with upright neck and small external ridge on the neck, perhaps related to *Longthorpe* I 98, which is lid-seated; 70b is closer to *Longthorpe* I 100 in outline.

- 70a. from 71.56.12 : in Ware SG, coarse.
70b. 71.56.42 : SG, coarse.

Type 71 (two)

Moulded-rim jar with slight evidence of a lid-seat cf. *Longthorpe* I 100.

- 71a. from 71.60.5 : in Ware SG, coarse.
 71b. LHR72.F9.1 : SG.

Type 72 (two)

While the simple over-turned rim of this jar does appear in the fortress (cf. *Longthorpe* I 99) and both the shape and body treatment are common features, the ware, which is dark grey, may indicate another source than the local kilns, cf. *Great Casterton*, fig. 18.45.

72. from 71.56.41 : in Ware SG, coarse.

Type 73 (one)

Jar with everted moulded rim and upright neck with a median constriction. This trait can be seen on *Longthorpe* I 101. Another reduced type.

73. from 71.56.41 : in Ware SG, coarse.

Type 74 (one)

Jar with everted, moulded rim on a long out-turned neck. The shoulder is rilled above a wavy-line frieze. Not clear that this is a kiln product, cf. *Longthorpe* I 113.

74. from 71.56.6 : in Ware SG, coarse.

Type 75 (one)

Necked jar with cupped rim in fine shell-gritted ware, cf. *Longthorpe* I 83 and 85 for similar jars in plain fabrics.

75. from 71.56.16 : in Ware 2B/2C.

Type 76 (nine)

Lid-seated jar with moulded shoulder; the clearest profiles are of 76b (cf. *Longthorpe* I 65, Hofheim 87B) which has close affinities with 84b and 76c,d, which are themselves similar to 84d. The body is globular, although a taller variant, 76e, exists. The rim appears at Rödgen (Vergleichs-Taf. 10.53.D) and among the Oberaden jars (Taf.32.58 and 59). At Hofheim (87A and B), as with our 77-88 series, the body shape and rim profile are exchanged, which suggests that the general forms were common and the individual features non-specific. There are clear connections to Nijmegen Types 2 and 5 (viii, fig. 52).

In Britain it is difficult to find comparable material, and thus the versions with colour-coating from Eccles are very interesting (cf. 76a with *Eccles*, fig. 3.1.12-14). There the shoulder moulding is more in the form of a groove.

- 76a. from 71.60.4 : in Ware 1? Burnt.
 76b. 71.53.2 : in Ware 1.
 76c. LHR72.F1.1 : in Ware 1.
 76d. LHR72.F21.2 : in Ware 1.
 76e. 71.56.56 : in Ware 1.

OTHER JARS

Type 77 (four)

Devolved butt-beaker forms with simple moulded rims and shoulder cordons. Type 77b retains the slight internal rim-cupping as Camulodunum 119B: cf. *Verulamium* i, fig. 105.172 and *Longthorpe* I 63. One of the 77b vessels appears to have traces of white paint.

- 77a. from 71.56.9 : in Ware 2B.
 77b. 74.B1.1 : in Ware 2D.

Type 78 (one)

Necked jar with shoulder cordon in grey ware. There is a similar vessel from Great Casterton in a native fabric (fig. 17.27), and the general relationship to butt-beakers is clear. The lack of local early reduced types makes the dating difficult, but cf. *Longthorpe I 63*, which also may be imported.

78. from 74.B2.2 : in Ware NV11.

Type 79 (two)

A rare, apparently hand-made jar, with undercut rim and shoulder grooves. There are internal finger-impressions and external knife-cutting and burnishing. The general shape is close to *Longthorpe I 101*, but the rim is more carefully turned out. Type 79b is a similar vessel, more finely made in a fabric like our Ware 1.

- 79a. from 71.56.56: in Ware 2.
 79b. not illustrated, from LHR72.F4.3 : in Ware 1.

Type 80 (one)

Hand-made necked jar with everted rim and burnished neck in a rather coarse grey-brown ware. Below a slight shoulder cordon are slashed, shallow, diagonal lines.

80. from 71.53.9 : in Ware ?

Type 81 (one)

A similar shape to 71 but the fabric is granular not shell-gritted.

81. from 71.60.5 : in Ware 4.

Type 82 (one)

Medium-mouthed, necked jar, with everted and slightly moulded rim. The wall is very thin for such a large vessel and the choice of ware seems deliberate in its heavy temper. This vessel comes from the same source as *Longthorpe I 65*: note again the extreme thinness of the walls. A close parallel comes from Kingsholm (Darling (1977), fig. 6.9.20).

82. from 71.56.56 : in Ware 4.

Type 83 (one)

Jar with slightly cupped rim, chamfered externally; small shoulder cordon. The body falls smoothly away from the neck-constriction and was presumably globular, a relative of 76b and 84a.

83. from LHR72.F4.3 : in Ware 1.

Type 84 (thirty-two)

Necked jar with overhanging moulded shoulder. In some variants the moulding devolves to a cordon or even an incised groove. The rims vary considerably but are generally everted, cf. 84d-h, *Longthorpe I 86* and Hofheim 87A. The body is globular, except for 84k, which may be a sport, but cf. *Nijmegen viii*, fig. 52.8 for a larger example. There is no clear progenitor from the Rhineland Augustan sites, cf. *Rödgen*, Vergleichs-Taf.10.40, where the shoulder is marked by an

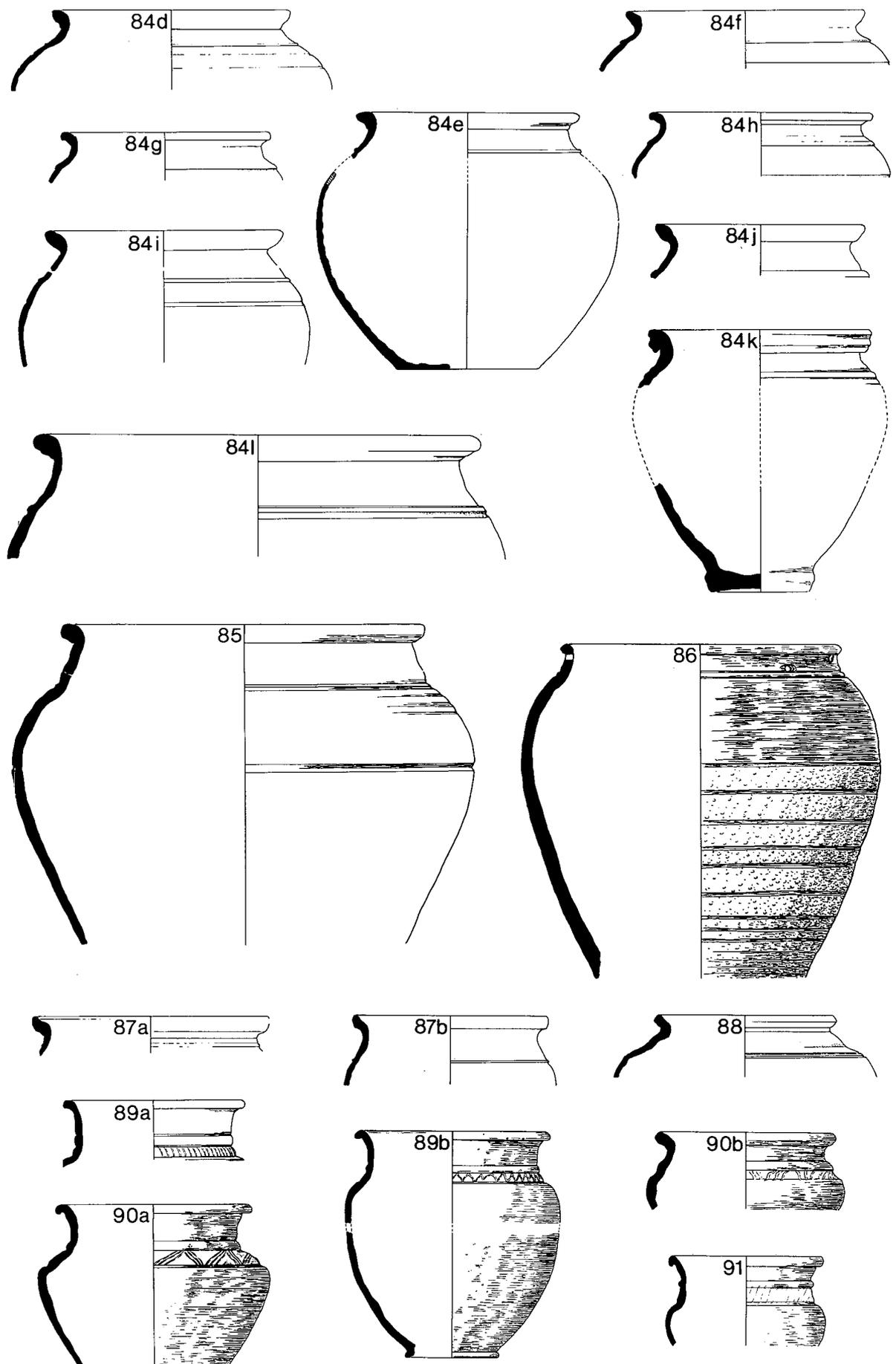


FIG. 43 Coarse Pottery Types 84d-91. Scale 1:4.

external groove, adopted as standard at Hofheim. Whether the moulded overhang is a significant trait is open to question, cf. *Nijmegen* viii, fig. 52.5, for its use on a rather different jar. It may only be the result of differing techniques to achieve the same effect. Four examples of 84d-h appear to have red colour-coating below the external rim.

84a.	from 74.B1.1	in Ware 1A.
84b.	74.A1.2	in Ware 1.
84c.	LHR72.F1.1	in Ware 1.
84d.	LHR72.F1.1	in Ware 1Ccc.
84e.	LHR72.F1.1	in Ware 1Ccc.
84f.	LHR72.F4.10	in Ware 1.
84g.	71.56.9	in Ware 1.
84h.	71.56.30	in Ware 1.
84i.	LHR72.F4.10	in Ware 1.
84j.	71.56.9	in Ware 1.
84k.	74.B2.7	in Ware 1.
84l.	LHR72.F4.16	in Ware 1.

Type 85 (two)

Necked jar with everted rim and shoulder-moulding marked off by two incised grooves. This is the largest form of the jars with moulded shoulders, cf. *Longthorpe* I 82. There are faint painted lines in red on the shoulder.

85. from 70.XII.1 : in Ware 1.

Type 86 (one)

Narrow-necked jar with upright rim and hard-fired black granular fabric with polished external bands. The clay body is shell-gritted with very fine fragments. There are also calcareous inclusions and sparse pink quartz fragments. Whatever the origin of this individual pot, its connections are with types like *Camulodunum* 262.

86. from 70.XXXIV.3 : in Ware ?

Type 87 (two)

Small jar with cupped rim and long body. Clearly it could fall into the Type 76 series, and in this respect is nearer to the Tiberian forms.

87a. from LHR72.F4.10 : in Ware 1.
87b. 74.B1.1 : in Ware 1B.

Type 88 (one)

Jar with an almost carinated shoulder, the change of angle holding the overhung moulding to a groove. *Longthorpe* I 80, a necked jar, shows the same hunched irregular section. A hard, finely-granulated grey ware.

88. from 74.B2.9 : in Ware ?

Type 89 (four)

Carinated jar with high shoulder and moulded neck, which has two cordons, the lower one generally decorated. 89a shows slashed, 89b wavy-line decoration. The rims are out-turned and lightly moulded.

89a. from 71.53.2 : in Ware 2D.
89b. 71.56.9 : in Ware 2C.

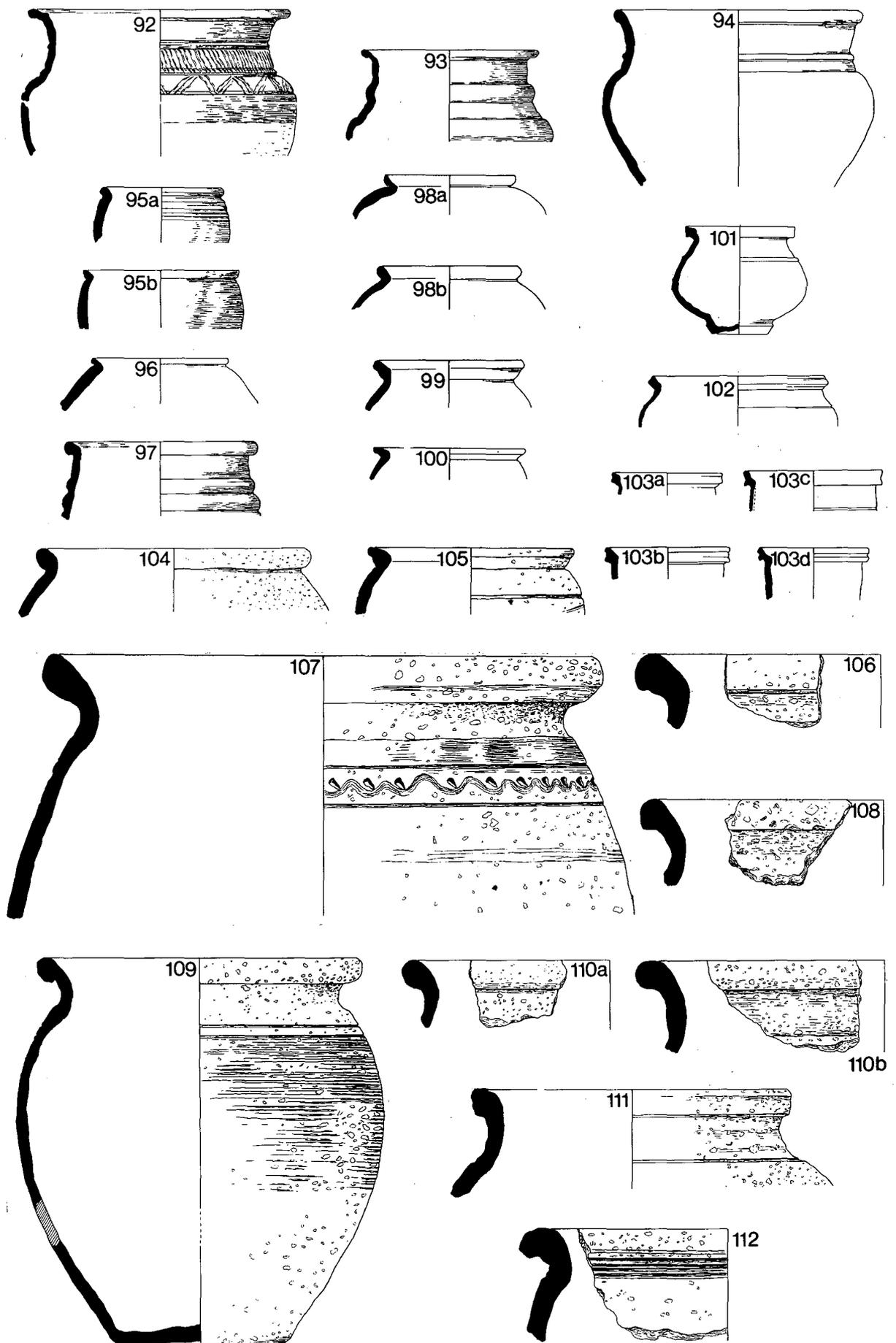


FIG. 44 Coarse Pottery Types 92-112. Scale 1:4.

Type 90 (eleven)

Squat, burnished, carinated jar with moulded rim and slight shoulder-cordon, usually decorated with 'blind A' motifs made of triple strokes. It was clearly popular and related to the bowl series (Types 38–43). It is not present at Camulodunum, but similar vessels occur at Verulamium (*Verulamium* i, fig. 104.151–3). One 90a has red-painted girth-rings.

90a. from 71.56.41 : in Ware 2D.

90b. 71.56.41 : in Ware 2B.

Type 91 (one)

Carinated jar with upright neck and moulded rim. Below a neck-cordon there is a decorated zone of oblique S motifs.

91. from 74.B2.10 : in Ware 2, burnt.

Type 92 (two)

Large carinated jar with everted rim, cordoned neck and lid-seat ridge. The large decorated area allows for diagonal S motifs on the neck and the 'blind A' motifs on the shoulder.

92. from 71.56.44 : in Ware 2D.

Type 93 (two)

Carinated jar with upright neck above a bulbous cordon, moulded rim and sloping shoulder. The elaborate mouldings echo contemporary bowl forms like Type 39.

93. from 74.B1.1 : in Ware 2D.

Type 94 (two)

Large, medium-mouthed, carinated jar (but cf. Bowl Types 38–43), with narrow neck-cordon. A large selection of similar profiles comes from Camulodunum (fig. 54, especially 54.19, on a small vessel).

94. from 71.60.5 : in Ware 2D.

Type 95 (two)

Small, rather coarse, bead-rimmed jar with rilled shoulder and, presumably, a pear-shaped profile. Type 95b is a little less coarse and rather more burnished, with shelly inclusions which have burnt out in firing.

95a. from 71.56.12 : in Ware SG.

95b. 74.B3.5 : in Ware SG.

Type 96 (one)

Narrow-mouthed, bulbous, bead-rimmed jar. The native form of this vessel is known from Camulodunum (249). It appears as a standard Roman type at Hofheim (26).

96. from 71.56.6 : in Ware 1 or 2, burnt.

Type 97 (one)

Jar with moulded rim and three body-cordons. The rim is bevelled internally. It is clearly related to the butt-beaker series, and the grey-ware fabric suggests that it is not a Longthorpe kiln product; cf. *Verulamium* i, fig. 101.77 and *Margidunum*, fig. 11.14.

97. from 71.53.9 : in Ware NV8 (see TABLE VII, p.134).

Type 98 (four)

Type 98a is a high-shouldered, narrow-mouthed jar with cupped, moulded rim, in hard, burnished grey ware. These vessels are usually thought to be Flavian at the earliest, cf. *Verulamium* i, fig. 107.259; but cf. *Eccles*, fig. 3.1.13/14, and *Longthorpe* I 83. Type 98b in the softer oxidized fabric is a related type (cf. Types 96 and 25a).

98a. from 71.53.9 : in Ware NV4.

98b. 71.56.53 : in Ware 2B.

Type 99 (one)

Narrow-mouthed jar with moulded, everted rim, slightly lid-seated.

99. from 71.56.56 : in Ware 2E.

Type 100 (one)

Narrow-mouthed jar with everted flattened rim, slightly bevelled on the inside.

100. from 71.56.12 : in Ware 1B.

Type 101 (one)

Squat, medium-mouthed jar, with moulded rim, shoulder-ridge and bag-shaped body. An individual kiln product.

101. from 71.56.56 : in Ware 1.

Type 102 (one)

Medium-mouthed jar with chamfer-moulded rim, and shoulder-ridge characteristic of Types 68–88.

102. from LHR72.F4.11 : in Ware 1A.

Type 103 (seven)

Only the necks of these jars survive, and no obvious lower parts have been attributed. The rims are reminiscent of the flagons, Types 1–11, the bodies (or necks) gently convex. Types 103c,d are clearly lid-seated. There must be some doubt about the ascription. Miss Wilson notes 'could be flagon' against 103b, but, on the whole, if there is doubt, perhaps it is about the horizon, cf. *Nijmegen* vi, pl. 20.313–5, where similar rims and walls are found on narrow-necked jars.

103a. from 71.56.6 : in Ware 1A.

103b. 71.56.6 : in Ware 1A.

103c. LHR72.F4.10 : in Ware 1A.

103d. LHR72.F4.2 : in Ware 1.

Type 104 (one)

Jar with moulded rim in shell-gritted ware, a little unusual in not having a proper neck.

104. from 71.53.2 : in Ware SG.

Type 105 (three)

Medium-mouthed, moulded-rim jar with shoulder-groove. The rim is bevelled internally. The fabric is grey and shell-gritted.

105. from 71.56.9 : in Ware SG.

Type 106 (four)

Large storage jar with slightly everted rim and thickened lip. The context suggests that this is a fort-period product. cf. *Longthorpe* I 119.

106. from 71.53.2 : in Ware SG.

Type 107 (four)

Large storage jar with everted rim. The neck has a burnished zone below which there is wavy-line decoration with oblong stabs in the upper concavities, cf. *Longthorpe* I 117 for shape. As usual in vessels of this sort, the detail varies considerably from one to another.

107. from 71.53.13 : in Ware SG.

Type 108 (three)

Large storage jar with everted rim and moulded lip, which occurs on smaller vessels, cf. *Longthorpe* I 110.

108. from 71.56.41 : in Ware SG.

Type 109 (one)

Storage jar with everted rim and moulded lip with a hint of lid-seating. The shoulder is marked by two grooves, cf. *Longthorpe* I 115 for shape.

109. from 74.A2.F1 : in Ware SG.

Type 110 (four)

Storage jar with heavy moulded rim, cf. *Longthorpe* I 118/9.

110a. from 71.56.37 : in Ware SG.

110b. 74.B2.1 : in Ware SG.

Type 111 (one)

Narrow-necked jar with squarely-moulded rim and shoulder-groove. The general shape recalls Type 101.

111. from 74.B1.9 : in Ware SG.

Type 112 (one)

Storage jar with over-turned rim and short, rilled neck.

112. from 71.60.5 : in Ware SG.

DISHES

These are noticeably less popular than plates. Whether this is an accidental result is problematical. The two obviously military types 114 and 115 have close affinities to the plate shapes.

Type 113 (one)

Small dish with pronounced bead rim and flat base with slight 'heel' at the wall/base junction: first century?

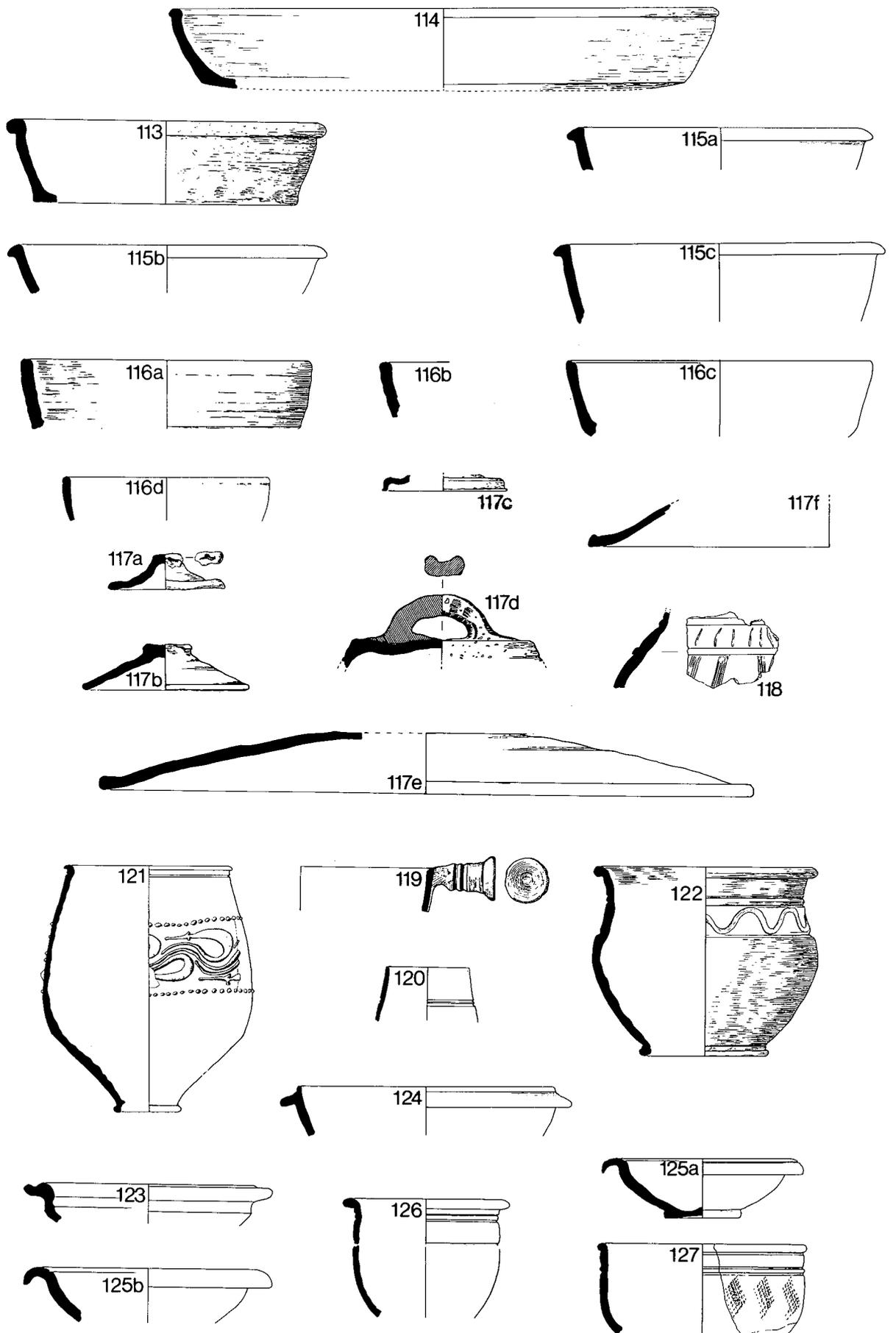


FIG. 45 Coarse Pottery Types 113-127. Scale 1:4.

113. from LHR72.F22.1 : in Ware SG.

Type 114 (one)

Dish with bead rim and chamfered base. Miss Wilson has presumed that there is no foot in the reconstruction, but cf. Type 34a.

114. from LHR72.F21.2 : in Ware 1, burnt.

Type 115 (seven)

Deep dish with triangular rim, closely related to the plate series Type 34, but note that the walls are generally a bit more thick.

115a. from 71.56.9 : in Ware 1C.

115b. 71.56.27 : in Ware 1C.

115c. 74.B1.1 : in Ware 1C.

Type 116 (four)

Straight-sided dish ('dog-dish'), in burnished kilnware. These ubiquitous vessels are known widely in a variety of fabrics, dependent presumably upon whether they were used for preparing or serving food.

116a from 71.53.13: in Ware 1?

116b 71.56.5 : in Ware 1?

116c 71.53.16 : in Ware 1?

116d 74.B1.1 : in Ware 1.

LIDS

Type 117 (eleven)

The lids from Longthorpe are quite varied. The simplest type is 117a,b with a small knob for lifting, and a gently convex profile, cf. *Camulodunum*, pl. LXXXV.12 and Hofheim 91A. Type 117c is an externally fitting lid, cf. *Camulodunum*, pl. LXXXV.19, while 117d has a similar shape, but is handled; 117e,f is a much larger form, cf. *Camulodunum*, pl. LXXXV.20 and Hofheim 45. Not enough fragments are available to match lids to pots, but in view of the proportion of flagons, jars and bowls which are lid-seated, it is clear that insufficient lids are present; presumably a large proportion were of wood. The most popular diameters are c. 140 mm and c. 380 mm.

117a. from 71.56.55 : in Ware 1D.

117b. LHR72.F1.1 : in Ware 1D.

117c. 71.56.30 : in Ware 1?

117d. 71.56.46 : in Ware SG.

117e. LHR72.F1.1: in Ware 1.

117f. 71.56.42 : in Ware 1A.

MISCELLANEOUS VESSELS

Type 118 (one)

It is not easy to place this wall fragment. It might come from a butt-beaker with incised decoration, cf. *Camulodunum* 119, or even from an ovoid beaker (cf. *ibid.* 92), depending upon the exact angle of the horizon. Finely granulated grey ware.

118. from 74.B1.1 : in Ware ?

Type 119 (one)

Patera handle with wall fragment. The fine moulding follows the metal prototype faithfully. A fine range of handles are shown from the Schutthügel, Taf.9.167–173, but they are never common.

119. from 71.59.3 : in Ware 1A.

B. LATER VESSELS (Types 120–144)**Type 120** (one)

Plain-rimmed beaker with two girth-grooves, in white body with orange/grey metallic coating, cf. *RPNV* 45 but narrower and longer; thus, according to Gillam's Law, later. Later third century?

120. from 71.59.5 : in Ware NVcc.

Type 121 (one)

Scroll beaker with cornice rim, in white body with yellow-brown slip, cf. *RPNV* 29, which has the same proportions. Last quarter of second century.

121. from 71.59.7 : in Ware NVcc.

Type 122 (two)

Medium-mouthed bowl with everted, rolled rim, neck cordon and wavy-line decoration on a burnished background. The footring is carefully turned. There is a link back to *Longthorpe* I 122, which is markedly carinated. The present vessels are in smooth, hard burnished, slightly patchy, grey ware, a well-known lower Nene Valley fabric of the late first to later second century.

122. from LHR72.F24.1: in Ware NV (failed grey).

Type 123 (one)

A local flanged bowl with undercut rim and brown colour-coat, cf. *RPNV* 80.

123. from LHR72.F21.3 : in Ware NVcc.

Type 124 (one)

Flanged bowl with short rim in grey ware with black coating. A local product of the late second or early third century, cf. *Jewry Wall*, fig. 22.3.

124. from 71.60.5 : in Ware NV.

Type 125 (two)

Derived from samian form 35/6, in the shape of a flanged bowl with grooved rim they are usually in grey ware, sometimes with a blackish coating. These vessels appear to be common in the later second century, cf. *Jewry Wall*, fig. 22.8 and their currency stretches into the third century when they are overtaken by the segmental bowl.

125a. from 71.60.5 : in Ware NV4.

125b. 74.B2.1 : in Ware NV4.

Type 126 (one)

Small medium-mouthed bowl with neck-mouldings and shoulder-groove. The fabric is standard Nene Valley hard grey ware and the date is probably second-century.

126. from 71.60.5 : in Ware NV2.

Type 127 (one)

An imitation samian form 37 with impressed lozenge decoration (cf. p.130 above). The die is struck deeply to the right and faintly to the left. This is a lower Nene Valley product: the ware is indistinguishable from the third-century products from Stanground, cf. Dannell (1973), pp.139–42, with the same slightly iridescent black coating, which may be produced by fuming: cf. *Durobrivae* 8, 1980, 8–10. The date is problematical, second to early third century.

127. from 74.B1.6 : in Ware NV5.

Type 128 (one)

Imitation samian form 30 in grey ware with rouletted decoration, cf. *RPNV* 25. Probably a local product, second century.

128. from 71.56.46 : in Ware NV5.

Type 129 (one)

Plain-rimmed 'dog-dish' in white fabric with orange-brown coating, cf. *RPNV* 87, there dated to the fourth century.

129. from 71.59.3 : in Ware NVcc.

Type 130 (one)

Straight-sided dish in buff fabric with dark brown 'metallic' coating. This is the true derivative from the earlier grey-ware form, cf. *RPNV* 19, and comments to 87. Fourth century.

130. from 71.59.4 : in Ware NVcc.

Type 131 (one)

Straight-sided dish with chamfered base, in hard light-buff fabric and burnished orange coating. This looks like a Stibbington product; late third to fourth century.

131. from LHR72.F21.3 : in Ware NVcc.

Type 132 (one)

Small dish or bowl with moulded rim, slightly undercut, in hard burnished grey ware. Second century.

132. from LHR72.F22.1 : in Ware NV.

Type 133 (one)

Dish with wide, flattened, over-turned rim and chamfered base, in hard, burnished, light grey ware. This should be a second-century vessel.

133. from 71.56.8 : in Ware NV.

Type 134 (one)

Dish or bowl with over-turned, almost hooked rim, in burnished light grey ware. The wall has a constriction. Typologically later than Type 133; probably late third century to fourth century.

134. from 71.59.4 : in Ware NV.

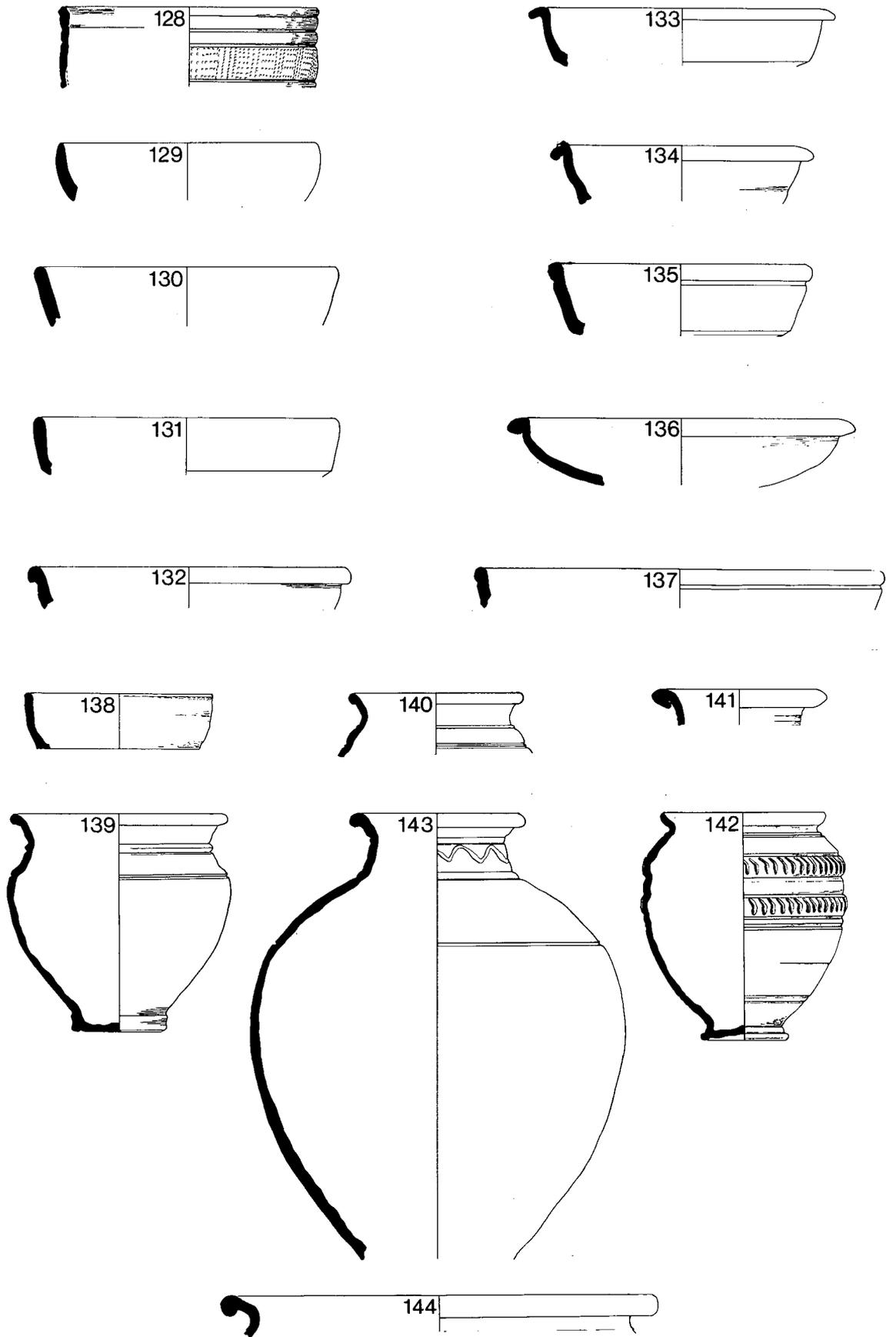


FIG. 46 Coarse Pottery Types 128-144. Scale 1:4.

Type 135 (one)

Small, thick-walled dish with rounded rim marked by a groove, and a chamfered base in hard burnished grey ware with a fugitive reduced coating. Dishes of this kind appear in the later second century, and then go through into the later third century, cf. *RPNV*, fig. 2.20.

135. from 71.59.3 : in Ware NVcc.

Type 136 (one)

Open dish with rounded rim, marked by a groove, in grey ware. Of similar pedigree to 135 and of similar date.

136. from 70.IV.2 : in Ware NV.

Type 137 (one)

Open dish with rounded rim, marked by a groove, in grey ware. Of similar pedigree to 135 and of similar date.

137. from LHR72.F21.2 : in Ware NV.

Type 138 (one)

'Dog-dish' in grey ware. The incurved wall and 'heeled' base suggest a second-century date.

138. from 71.56.5 : in Ware NV.

Type 139 (one)

Medium-mouthed, carinated jar with everted, moulded rim, neck-cordon and sloping shoulder delineated by a sharp groove. The base is turned to give a solid foot with a small groove. This grey-ware jar belongs to the main Lower Nene Valley industry; second century.

139. from 71.60.5 : in Ware NV4.

Type 140 (one)

Medium-mouthed, carinated jar with moulded rim and bulbous undecorated shoulder-cordon in hard burnished grey-brown ware. A rather larger example of the same sort comes from Verulamium (*Verulamium* i, fig. 101.66) and cf. *Margidunum*, fig. 17.35.

140. from 71.56.9 : in Ware ?

Type 141 (one)

Narrow-necked jar with folded rim, in grey ware. A Lower Nene Valley product, probably third century.

141. from 71.56.6 : in Ware NV.

Type 142 (one)

Medium-mouthed jar with slashed decoration on two cordons. The fabric is a hard burnished grey ware with a lighter core, distinct from, and earlier than, the main Nene Valley grey-ware series. The type was made on local kiln sites, including Old Sulehay (cf. *Durobrivae* 3, 1975, 15-18, fig. 7,9).

142. from 74.B1.+ : in Ware NV.

Type 143 (one)

Handsome narrow-necked jar with moulded rim and wavy-line decoration between two neck-cordons; the shoulder is grooved. This vessel is made from the Oxford Clays which were being worked from the late second century through to the fourth century in the Lower Nene Valley. Probably late third to early fourth century.

143. from 71.59.7 : in Ware NV.

Type 144 (one)

Jar (or bowl) with widely everted rim, in whitish fabric with grey-brown 'metallic' coating. Probably a Stibbington product and fourth-century in date.

144. from LHR72.F21.3 : in Ware NVcc.

H. The Lamps. By J.P. Wild

1. Fragments of the base and discus of a terracotta lamp (FIG. 36, No. 6, p.129) in a yellowish-buff fabric (brown-yellow A6) with a patchy brown colour-coat (brown-yellow A5). The extant piece of the discus shows a bearded herm standing left, and part of the edge of the filler-hole. The profile of the lamp is Loeschcke-Vegas form 3a. On the underside of the base is a fragmentary factory mark (cf. *Novaesium* ii, 98, No. 187; Loeschcke (1919), Abb.9, Nos. 233, 406). No parallel for the herm has been noted in the published collections of lamps from the north-west provinces (for bibliography see *Novaesium* ii, 64 f.); but its first-century date is assured. The fabric and colour-coat closely resemble those of Lyon-ware cups. 74.B1.4 SF 20: slipped gravel in the top of filling of working terrace (Pit 7) (second century).
2. (*Not illustrated*). Fragment of the discus of a lamp in a buff fabric (brown-red A7) with pale orange colour-coat (yellow-brown B5). 71.56.6 SF 160: greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century).
3. Open lamp in a pottery fabric akin to Longthorpe fabric 1 (FIG. 36, No. 5, p.129). It was hand-made, but not well finished; diameter *c.* 92 mm. There is heavy sooting on the upper part of both sides of the channel for the nozzle. The type is relatively common on early Roman sites: *Cirencester* i, 103, Nos. 75, 76; *Usk* i, 211, type 27.

10. THE LADDER. By J.P. Wild

In the silt at the bottom of Pit 8 in Yard II remains of a wooden ladder came to light, comprising the lower part of a single ladder pole and fragments of two or perhaps three rungs. The pole is of oak (kindly identified by Dr Gay Wilson) and is now in four pieces (FIG. 47, 1-4), three of which certainly join. The maximum length is 1.14 m and at the thickest point (the original foot of the ladder) it measures 7 cm in diameter. The front and rear surfaces of the pole were planed flat in antiquity, but there are no other signs of working. The only complete surviving mortise for a rung is at 63 cm from the foot of the ladder. The hole is rectangular, measuring approximately 5 cm high by 2.5 cm wide and 4 cm deep. It appears to taper slightly. At the top end of the broken pole is the trace of another mortise, *c.* 45 cm from the other.

The rungs were of birch, split from a branch or branches *c.* 7 cm in diameter. The bark is still attached in places. The largest surviving fragment (FIG. 47,c) is 39.5 cm long, flattened in section and trimmed at one end to form a tapering rectangular tenon. The two smaller pieces, each with a tenon, are similar in character and may perhaps have belonged originally to a single rung.

Most of the pole lay on the bottom of the pit (see p.73), but one piece rested against the NE

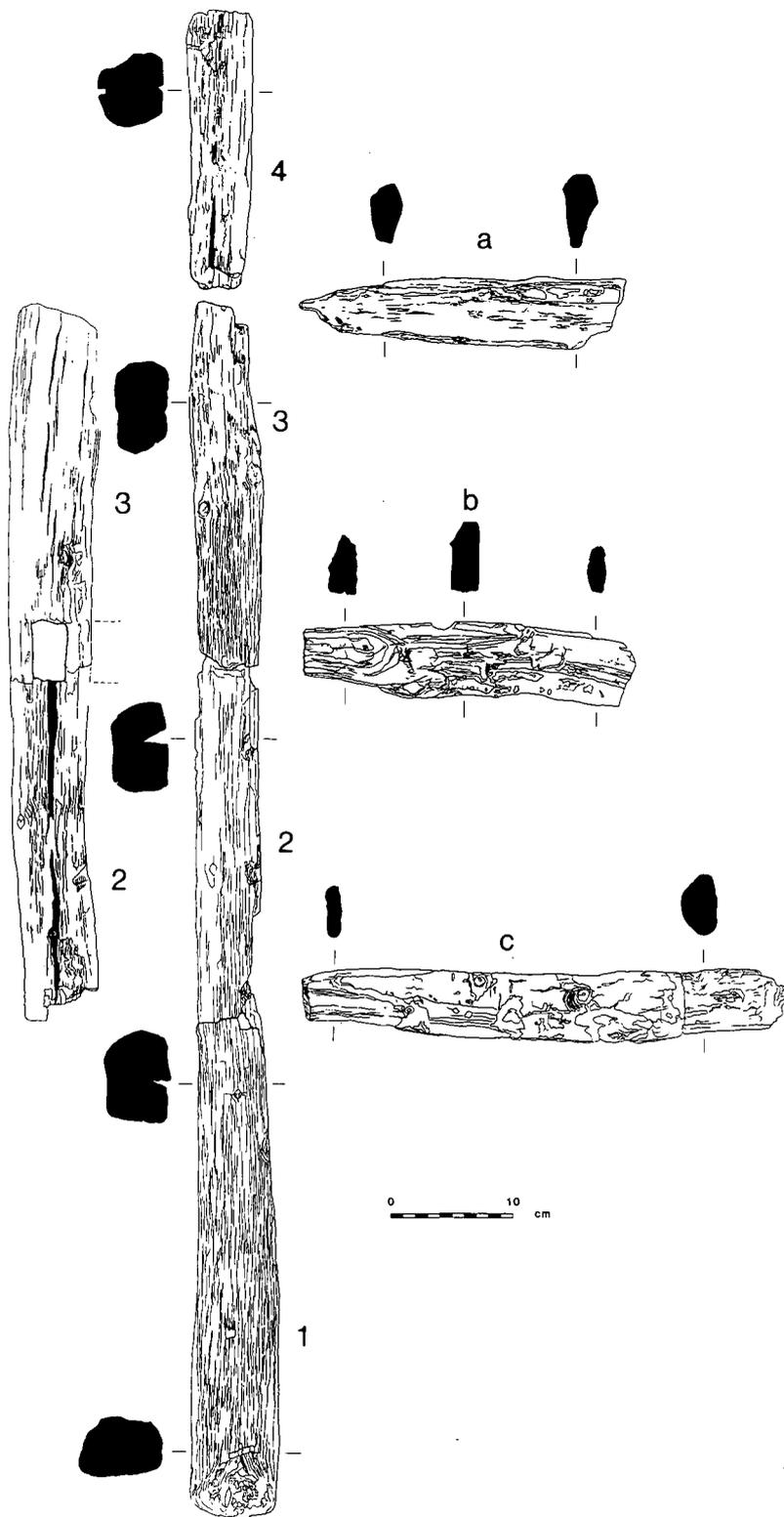


FIG. 47 The ladder from Pit 8. Scale 1:5.

wall. (There were indications at a higher level that users of the pit would approach it from the south.) The foot of the ladder had rested on the bottom of the pit, where it had left a clear indentation (PL.X, p.73). The mark of the missing upright was noted, too, about 60 cm from the other. This measurement presumably represents the approximate width of the ladder.

The dark organic deposit in which the ladder was embedded (71.59.7) has a *terminus ante quem* of the mid to late third century. The date of the ladder could be considerably earlier than this.

There is a notable lack of parallels for the Longthorpe ladder. The best-known example is the ladder from a first-century well discovered at the corner of Queen Street and Queen Victoria Street in the City of London (*JRS* xlv (1955), 138–9; Weeks (1978)). It was found in position at the bottom of the well and is now preserved in the Museum of London, where I was able to examine it through the kindness of Mr Hugh Chapman. The ladder is 5.59 m long and over 42 cm wide. The poles, of oak, are rectangular in section (7–8 cm by *c.* 4 cm) and show rectangular mortises (*c.* 4 cm by *c.* 3 cm) at approximately 53-cm intervals (measured centre to centre). There were 8 rungs, on average 45 cm long and 5 cm by 4 cm in section. They end in rectangular tapered tenons, set into the mortises, without any other surviving device to secure them.

Jane Weeks cites as further parallels a late Iron Age ladder from Glastonbury ((1978), 108, FIG. 2b) and a ladder of the second century A.D. from Silchester ((1978), 108, fig. 2c). The former has pegs through the tenons of its rungs, the latter has tenons wedged into the mortises with wooden wedges. An eleventh- or twelfth-century ladder from Pevensey (Dunning (1958), 211–12) has oval rungs of beech and is held together by pegs through the tenons.

11. THE HUMAN SKELETAL REMAINS. By J. L. Scheuer

Burial 1

Iron Age crouched burial (71.56.3) (FIG. 7, 1, p. 31)

This collection of bones consisted of a mostly complete adult skeleton. The skull and lower jaw were broken into numerous pieces, but when reconstructed were found to be complete except for two small portions of the cranial vault, delicate bones of the nasal cavity and the right mandibular condyle.

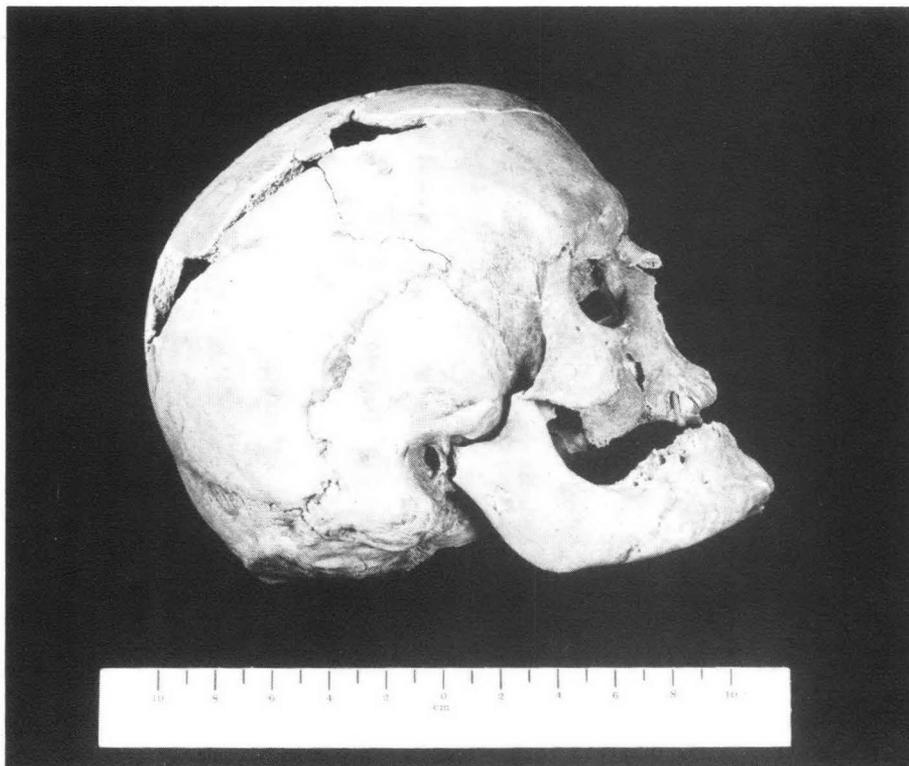
The postcranial skeleton was in fairly good condition (see TABLE VIII). The skull (PL. XXI) was fairly massive, the bones of the vault being thick, although not pathologically so. It presented predominately male features, having prominent brow ridges, a sizable nuchal torus and large mastoid processes. The cranial sutures were partly obliterated on the internal aspect. The length, breadth and height in mm were as follows: glabella-opisthocranium 187; biparietal width 146; basion-bregma 147. This gave a cephalic index of 78 (the mesocephalic range). Two teeth, a lower left premolar and an upper right premolar, reduced to mere pegs were *in situ*. There were also nine separate teeth, all of which were worn right down to the dentine, 5+ or 5++ on Brothwell's ((1972), 69, fig. 30) scale for pre-medieval British skulls. Two were carious (see p. 179).

The postcranial skeleton consisted of large bones with muscular markings suggesting again that the skeleton was that of a male. The stature estimation from the complete long bones gave a height of between 166 and 174 cm (5 ft. 6 in. – 5 ft. 8 in.). The pelvis also looked typically male (but see p. 182) with an acute subpubic angle and narrow sciatic notch. However, there was a pre-auricular sulcus on the left side, a factor said to be normally associated with female ilia, whilst its significance remains unknown. There was an exostosis measuring 15 by 20 mm on the lower edge of the neck of the left femur. These exostoses sometimes occur quite early in life and there was no indication to show that this had caused any disability. There were, however, numerous osteophytic outgrowths indicative of chronic rheumatic disease in other parts of the skeleton including the tibiae, the right patella and the fourth lumbar vertebra. There was quite severe 'lipping' on many of the vertebral bodies. A modern skeleton with this degree of osteoarthritis would probably be in the 60 to 65 year-old range, but in Iron Age Britain the skeleton was not likely to be more than 45–50 years. This agrees with an age estimate based on bones of the cranial vault, tooth attrition and the condition of the pubic symphysis (Todd's (1920) classification IX).

This is thus a skeleton of a well-built but elderly man of about 5 ft. 6 in. to 5 ft. 8 in. in height. He had suffered from osteoarthritis for a number of years and was at the time of death 45–50 years old. There was no indication of the cause of death.



PL. XXI Skull of Burial 1: frontal view.



PL. XXII Skull of Burial 1: right lateral view.

TABLE VIII
HUMAN BURIAL 1: POSTCRANIAL BONES

- a. Most of the long bones, undamaged except for the left radius and ulna which were missing both their ends. These are tabulated below with their lengths in mm where complete.

<i>Bone</i>	<i>Right side</i>	<i>Left Side</i>
Femur	442 (greater trochanter broken)	435 (exostosis on inferior edge of neck)
Tibia	350	351
Fibula	345	345
Humerus	330	(distal end damaged)
Radius	245	(both ends missing)
Ulna	262	(distal end missing)

- b. An almost complete vertebral column including the atlas, a damaged axis and the sacrum missing parts of both alae.
 c. Most of both scapulae and both clavicles, the right one missing its lateral end.
 d. Pelvis whose left side was complete and whole right side was missing most of the iliac blade.
 e. Both patellae, the right one having an exostosis on its lateral border.
 f. A sternum with complete manubrium and a small fragment of sternebra.
 g. Assorted ribs, some of which were complete but most in fragments
 h. A large part of the skeletal elements of both hands and feet missing the carpus of both hands except for the right hamate, capitate and triquetral bones and some phalanges of both hands and feet.

Burial 2

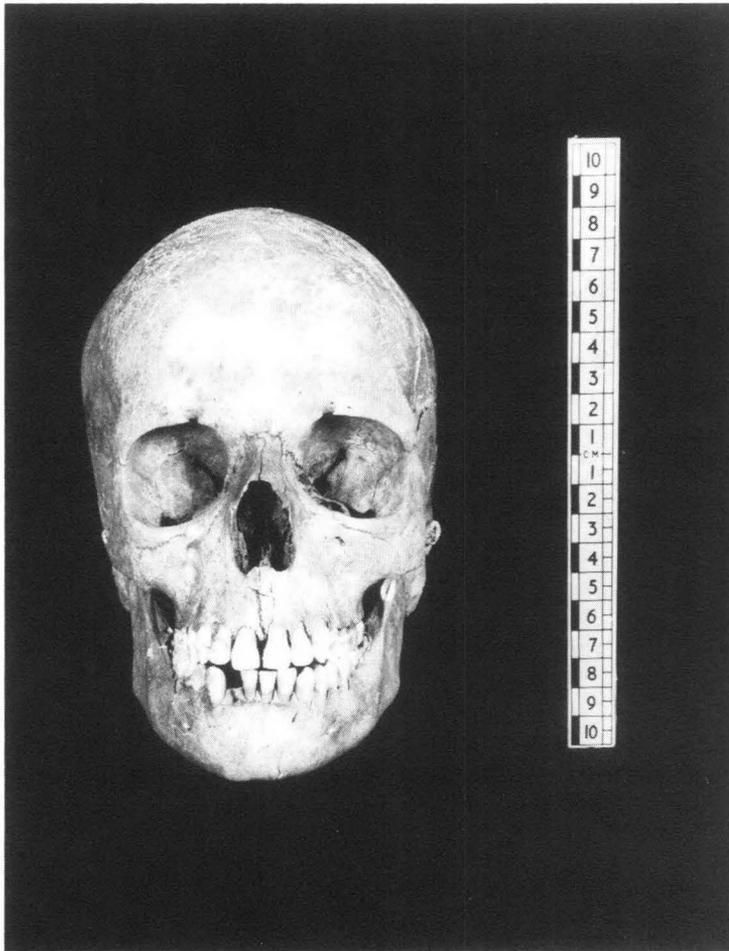
Iron Age crouched burial (70.XII.4) (FIG. 7,2, p.31)

This collection of bones consisted of an almost perfect skull and lower jaw and an incomplete set of postcranial bones (see TABLE IX). From the condition of the dentition and the state of ossification and size of the bones this skeleton was obviously that of a juvenile in the early teens.

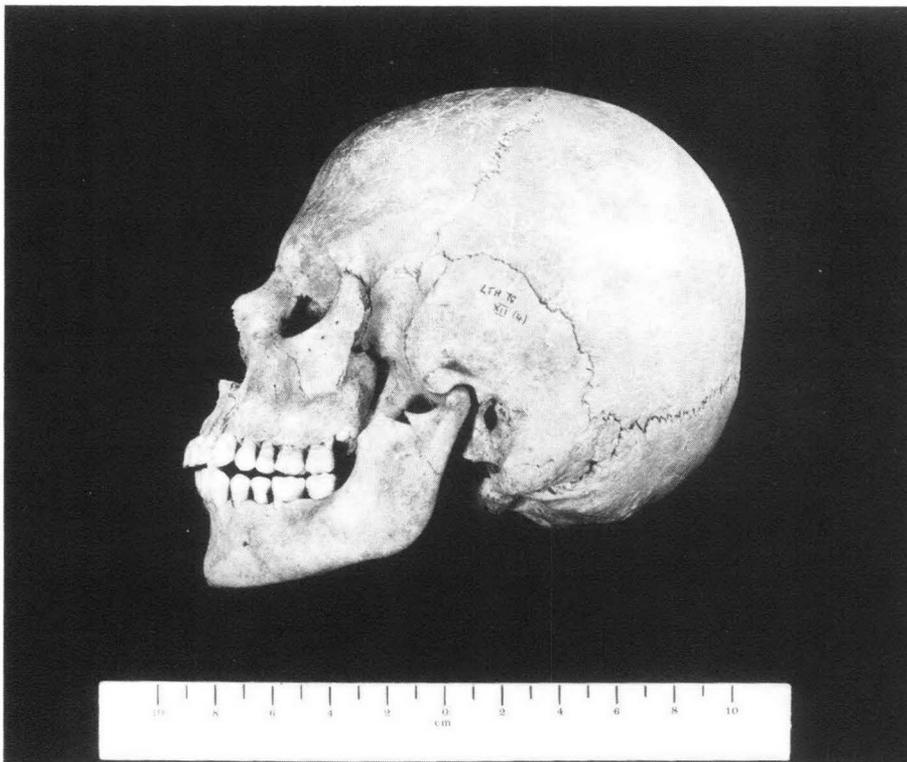
The skull and mandible (PL. XXIV) were almost perfectly preserved except for small pieces of the zygomatic arch on both sides. On the mandible a small piece of the coronoid was broken off and the right lower lateral incisor was missing. Both jaws contained the complete permanent dentition in occlusion except for the third molars which were present in their sockets (see p.180). There was no evidence of dental disease. The second permanent molars, which normally erupt at age twelve, had very small wear facets and so had not been in occlusion for very long. An age of 13–15 years would be compatible with this finding. The length, breadth and height of the skull in mm were as follows: glabella-opisthocranion 171; biparietal width 130; basion-bregma 125. This gave a cephalic index of 77 (the mesocephalic range) which is the same type as Burial 1 above. All the sutures including the spheno-occipital were open. The skull already had noticeable supraciliary ridges which suggest that it would be that of a male (but see p.182). The post-cranial skeleton consisted of a collection of damaged bones and separate epiphyses. When these were replaced they provided an interesting anatomical picture of a growing skeleton that is not often seen. Notably, the left pelvic bone showed its constituent three parts beginning to join by an ossifying cartilage (*os acetabuli*) (PL.XXV).

From an estimated femur length (reconstructed from the two halves) of 370 mm and from the length of the other complete long bones, this would give a stature of about 153 cm (5 ft.). This would be a reasonable height for a juvenile male of 13–15 years and would agree with the state of ossification of the bones. There was no identification of the cause of death.

This is thus a skeleton of a juvenile, probably male, who was 13–15 years old at the time of death.



PL. XXIII Skull of Burial 2: frontal view.



PL. XXIV Skull of Burial 2: left lateral view.

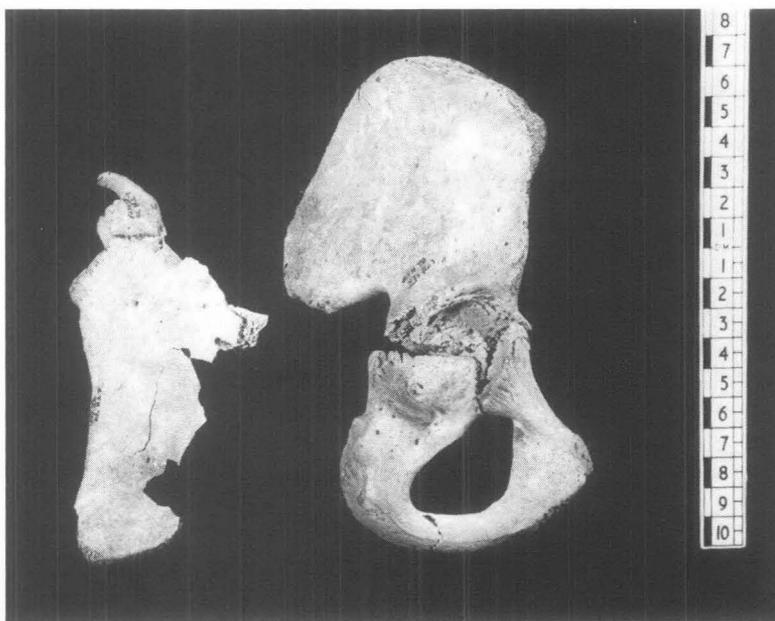
TABLE IX

HUMAN BURIAL 2: POSTCRANIAL BONES

a. Long Bones:

<i>Bone</i>	<i>Right Side</i>	<i>Left Side</i>
Femur	distal end missing, head and greater trochanter replaced	proximal half missing, distal epiphysis missing
Tibia	only three distal fragments of shaft present, lower epiphysis replaced	complete, proximal and distal epiphyses replaced
Fibula	distal end of shaft and both epiphyses missing	proximal epiphysis missing distal epiphysis replaced
Humerus	complete, proximal and distal epiphysis replaced	distal epiphysis missing, proximal epiphysis replaced
Radius	proximal epiphysis missing, distal epiphysis replaced	proximal epiphysis missing distal epiphysis replaced
Ulna	both epiphyses missing	both epiphyses missing
Clavicle	both epiphyses missing	both epiphyses missing

- b. An almost complete vertebral column except for a damaged atlas.
- c. Lateral parts of both scapulae with the most fragile medial borders missing. Both coracoid epiphyses were replaced.
- d. Left pelvic bone with its constituent three parts beginning to join by an ossifying cartilage (*os acetabuli*). The right pelvis consisted of separate pubis, ischium and a fragment of ilium.
- e. A left patella.
- f. Two fragments of the body of the sternum.
- g. Miscellaneous complete and damaged ribs.
- h. The calcaneus, with posterior epiphysis replaced, and talus of each foot. The metacarpals and some phalanges of both hands all lacking their epiphyses. There were no carpal bones.

PL. XXV Burial 2: right scapula fragment with coracoid epiphysis (left), pelvic bone showing *os acetabuli* (right).*Burial 3*

Iron Age infant (71.56.61) (p.32).

This appears to be a fully developed newborn baby, the size of its bones being slightly larger than the bigger one of the other two infants described below (femoral length – 80 mm). It falls into the upper part of the newborn range (TABLE X). The teeth were well calcified, all cusps of the

TABLE X

HUMAN BURIAL 3: SURVIVING BONES

- a. Skull - body of sphenoid and both of the greater wings, petrous and squamous parts of both temporal bones, basioccipital and right exoccipital, both maxillae, fragments of both frontals, right zygomatic, numerous fragments of the skull vault.
- b. Right half of the mandible with crowns of a central incisor and two molar teeth, and part of the body of the left half of the mandible.
- c. Twenty-six vertebral arch halves and six vertebral bodies. Numerous broken ribs.
- d. Both scapulae and the lateral half of the left clavicle.
- e. The right ilium and left pubis.
- f. The shafts of the long bones of both sides except the right fibula.
- g. Four fragments of hand or foot long bones and a first metatarsal.

second, as well as the first deciduous molar being joined together. It was thus an infant who died at, or shortly after, birth.

None of the infant skeletons showed any indication of disease, nor was it possible to determine the sex or the cause of death.

Burial 4

Disarticulated skeleton, probably Claudio-Neronian (71.53.34) (p.58)

This group of bones consisted of a fragmented skull, teeth of the deciduous and permanent dentition and some pieces of the post cranial skeleton. Enough of the latter remained to show that the skull and other bones belonged to the same juvenile skeleton.

Remains of the skull included most of the base, the calvaria and parts of the orbits. When the fragments were pieced together a curiously-shaped, squashed cranium was revealed demonstrating plastic deformation caused by earth-pressure during its long burial in wet soil. It was astonishing to find, in spite of the damaged state of the skull and the number of years that it must have lain in the ground, that the left middle ear cavity contained all three auditory ossicles in a



PL. XXVI Burial 4: auditory ossicles from the left side: left to right: stapes, incus, malleus. Scale 7.8:1.



PL. XXVII Burial 4: positive print of radiograph of mandible.

perfect state of preservation (PL. XXVI). The face and jaws were represented by a piece of the left maxilla and part of the left mandibular body and ramus, both of which had teeth *in situ*.

The mandibular fragment contained a permanent lateral incisor, two deciduous molars and a first permanent molar in occlusion. From the radiograph (PL. XXVII) it was obvious that the permanent canine, the two premolars, the crown of the second molar and a shadow of the crown of the third molar were in their crypts in the bone (see p.180).

The rest of the skeleton consisted of fragments of long bones, none of which was complete, and a few pieces of the axial skeleton. There were pieces of femur, tibia, fibula and humerus from both sides and parts of the right radius and ulna and the left clavicle. The pectoral limb girdles were represented only by the glenoid and spine of the left scapula, whereas the pelvis was complete except for part of the blade of the left ilium. The calcaneus, talus and first metatarsal of both feet were preserved but there were no hand remains. There were also fragments of ribs and vertebrae, including half of the atlas and part of the axis with its odontoid peg. No separate epiphyses of any of these bones were recovered.

The dentition gave an estimate of the age of this individual at the time of death, although there was no indication of sex or the cause of the death. What remains of the rest of the skeleton was not incompatible with an age of 10–11 years.

Burials 5 and 6

Two infants (70.VIII.2) (p.75)

These bones, labelled Baby 1 and Baby 2, consisted of the remains of two infants found in the same place whose skeletons had become mixed together. When sorted and measured, it became obvious that there were indeed two individuals, one of which was larger than the other (see TABLE XI).

The larger of these two infants, Baby 2, (femur – 73.5 mm) falls into the lower end of the birth-size range for measurements of long bones, and this is confirmed by the state of development of the tooth crowns, all the cusps of the deciduous molar teeth being joined together. Baby 1 was considerably smaller (femur – 61.5 mm) and measurements compared with X-rays of premature infants place it in the seven months intra-uterine age range. It must therefore be the remains of a very premature baby which died at birth or an aborted dead foetus, there being no maternal remains associated with it.

There are thus the remains of two very small infants who died before, at, or shortly after birth. Their chance of survival at this size must in any case have been very slight.

TABLE XI

HUMAN BURIALS 5 AND 6: SURVIVING BONES

Baby 1 comprised the following parts:

- a. Broken fragments of the parietal, frontal and squamous occipital bones of the skull, and a complete right squamous temporal and a left zygomatic.
- b. Both halves of the body of the mandible but no tooth remains.
- c. Portions of several vertebrae, the bodies and neural arches being separated. Many broken ribs.
- d. Fragments of both scapulae.
- e. Both iliac bones and a left ischium.
- f. The shafts of the femur, tibia, fibula, humerus, radius and ulna of both sides, the right fibula lacking its distal half. All the extremities of the long bones being cartilagenous at this stage were missing.

Baby 2 comprised the following parts:

- a. broken fragments of bones of the vault of the skull and a complete basioccipital and both exoccipital bones.
- b. Both halves of the mandible with the crowns of the central and lateral incisors and the first deciduous molars calcified.
- c. Numerous vertebral bodies, neural arches and ribs.
- d. A complete right scapula, blade of the left scapula and both clavicles, the right one lacking its medial end.
- e. The three separate bones of the pelvis complete on both sides.
- f. The shafts of the long bones of the limbs from both sides, the right fibula missing both ends.
- g. Five fragments of long bones of hands or feet.

Burial 7

Late Roman burial (LHR72.SK1) (p.82)

This collection consisted of the incomplete remains of a large adult skeleton. Apart from some pieces of skull, fragments of vertebrae and two teeth, the remaining bones were from the limbs.

Some of the skull fragments were pieced together and formed parts of both parietal bones bordering on the posterior segment of the sagittal suture and the medial segments of both lambdoid sutures. The serrations were very marked and there was no sign of obliteration of the sutures, indicating that the individual was probably a young adult. The teeth were a right and a left upper molar with the cusps relatively unworn, indicating that they were probably both second molars. The first molars, erupting during early childhood, normally bear more signs of wear by adult life than these teeth. The vertebral remains were very scanty, but it was possible to recognise pieces of the atlas and the axis.

The rest of the bones were from the limbs, but unfortunately there was no complete long bone. Thus it was not possible to extrapolate a height, although it was obvious that the pieces were from a fairly large, robust individual. Fragments of femur, tibia, humerus, radius and ulna of both sides were identified. The feet were represented by the talus and calcaneus from both sides and by the three cuneiform bones and a first proximal phalanx from the left. From the upper limb there were several metacarpal fragments, phalanges and also a right trapezium and hamate and a left scaphoid bone.

This is part of the skeleton of a young adult, probably male.

Burial 8

Late Roman burial (LHR72.SK2) (p.82)

The remains of this skeleton were in a mixed condition. Many of the pieces could be fitted together to form whole bones, whereas some of the parts were completely shattered and only held together by caked soil. However, all the pieces appeared to be compatible and formed part of the skeleton of a tall male of robust build (see TABLE XII).

Thirteen cranial fragments were identified and pieced together to form a similar piece of calvaria to the last skeleton. There were parts of both parietal bones, most of the squamous section of the occipital and the mastoid part of both temporal bones. This revealed the serrated edges of the posterior section of the sagittal suture and most of both lambdoid sutures. There were no signs of obliteration, indicating that the individual was probably a young adult. Internally, the transverse and sigmoid sinuses were visible.

TABLE XII

HUMAN BURIAL 8: MEASUREMENTS OF SURVIVING LONG BONES

<i>Bone</i>	<i>Right Side</i>	<i>Left Side</i>
Femur	503	500
Tibia	distal third missing	distal half missing
Fibula	fragments only	fragments only
Humerus	proximal third missing	head missing
Radius	250	distal end missing
Ulna	268	265
Clavicle	both ends missing	medial half missing

The stature estimation from the complete bones gave a height of between 147 cm and 182 cm (5 ft. 10 in. – 5 ft. 11½ in.).

The repaired remains of the pelvis showed a nearly complete left side except for the superior pubic ramus, and fragments of ilium and ischium of the right side. This was a typically male-looking robust pelvis with a narrow sciatic notch and everted inferior pubic ramus. The only other complete part of the skeleton was a left hand with all the bones present except the distal phalanges. Again this was of large size. Amongst the many crushed fragments of bone, many of which were unidentifiable, there were pieces of both scapulae, the manubrium sterni, both patellae and many ribs and vertebrae.

This, then, is the skeleton of a large adult male of about 5 ft. 10 in. in height. There was no indication of the cause of death.

TABLE XIII

METHODS OF MEASURING PALATAL INDEX, GRADING OCCLUSAL ATTRITION AND ASSESSING PERIODONTAL CONDITION

The *palatal index* was calculated using the formula first suggested by Flower (1881) and later used by Turner (1884) and Campbell (1925).

The measurement of the breadth of the palate includes the dentary arcade and is taken between the outer surfaces of the second molars at the level of the alveolar margin.

The palatal indices are divided into three groups:

Brachyuranic Index	above 115 in Europeans
Mesuranic Index	110–115 in Malays
Dolichuranic Index	below 110 in Australian Aborigines

The method of grading the *occlusal attrition* was that suggested and used by Cooke and Rowbotham (1968) and is as follows:

Grade I	Enamel wear only
Grade 2A	Cusps flattened and dentine facets exposed
2B	All occlusal enamel worn away
2C	Considerable reduction in height of the crown of the tooth
Grade 3	Pulp of the tooth exposed

The method of assessing the *periodontal condition* (Cooke and Rowbotham (1968)) was as follows:

Grade I	No alveolar absorption evident
Grade IIa	Loss of alveolar crest of interdental septum
Grade IIb	Up to one third of root of tooth denuded of bone
Grade IIc	Between one third and two thirds of roof of tooth denuded of bone
Grade III	More than two thirds of root of tooth denuded of bone

12. DENTAL REPORT. By T.C. Rowbotham

Burial 1 (71.56.3)

The maxilla was complete with a fracture of the distal $\overline{87}$ region and the mandible was complete except for a fractured right condyle (see TABLE XIV).

The teeth present at death were : $\frac{4321 \overline{1} \ 4 \ 6}{8765 \ 3 \ 1 \ 123 \ 5678}$

The teeth lost after death were: $\frac{21 \overline{1} \ 4 \ 6}{8 \ 1 \ 1 \ 3}$

$\frac{4}{8} \frac{6}{3}$ were only roots, probably the result of extensive dental caries.

There were three carious lesions in the other 11 teeth examined. Two interproximal lesions and one Class V lesion. The interproximal cavities were mesial surface $\overline{61}$ and mesial surface of $\overline{6}$. The Class V cavity was on the buccal surface of $\overline{71}$ and had progressed to the pulp. There was bone destruction in the periapical regions of $\frac{54 \overline{1} \ 345}{71}$ indicating periapical bone infection from alveolar abscesses on these teeth. $\overline{6}$ had overerupted indicating that its antagonists, i.e. $\overline{56}$, had been either lost some years previously or the crowns had been destroyed by caries leaving the teeth unapposed and therefore free to over-erupt. There was slight supra-gingival calculus on the lingual surfaces of the posterior teeth. There was no evidence of overcrowding and the development of the jaws was good. The occlusion appeared to be normal with an edge to edge anterior bite.

TABLE XIV

DETAILS OF DENTAL CONDITION OF BURIAL 1

There was considerable attrition of the teeth:

In the anterior region	$\frac{3 \overline{1} \text{and} \overline{2}}{3 \overline{1}}$	2C
		2B
In the posterior region	$\frac{76 \overline{1} \ 7}{5 \overline{1} \ 56}$	2B
		2C
	$\frac{4 \overline{1}}{\overline{8}}$	3
		2A (mesial lingual cusp)

Periodontal condition of the alveolar bone was assessed as:

IIb	$\frac{43 \overline{1}}$
IIc	Lower anterior region and $\overline{5}$
III	$\frac{765 \overline{1} \ 678}$

Dental Index	not measurable
Gnathic Index	85.2
Palatal Index	not measurable
Facial Index:	
Total	88.9
upper	54.5
Facial Angle	90°

Cuspal pattern of the lower molar teeth was:

$\overline{616}$	5 cusps
$\overline{717}$	4 cusps
$\overline{8}$	5 cusps ($\overline{8}$ missing)

There is a slight diastema between $\overline{32}$ of approximately 3 mm at the level of the gingival margin of the teeth – possibly due to a deciduous tooth retained into adult life, but this is pure speculation. The reason for the loss of $\overline{42|4}$ during life is unknown. There is no evidence of infection of the alveolar bone in the apical area of the teeth. This individual was placed in the 40+ age group as assessed by the degree of wear on the teeth and the periodontal bone loss. The supraorbital ridges were not particularly prominent, and this together with the size of the skull and the teeth and development of the jaws would indicate this individual was female, in conflict with the findings of Dr Scheuer (p.170).

Burial 2 (70.XII.4)

The dentition was complete except for $\overline{2}$ which had been lost after death and the $\frac{8|8}{8|8}$ which were unerupted (for index measurements see TABLE XV).

There was no dental caries, but a small amount of supra-gingival calculus was present. There was no overcrowding of the teeth and the development of the jaws was good. There was a slight bi-maxillary protrusion with an overbite of approximately 15 mm (normal), but the overjet was in the order of 3.5 mm compared with the normal of 1.5 mm. The attrition of the teeth was Grade I except on $\frac{1|1}{1|12}$ and $\overline{6}$ when it was Grade 2A (see TABLE XIII). There is a rudimentary cusp of carabelli on $\overline{6|6}$ and lingual tubercles on $\overline{2|2}$ and $\overline{3|3}$. The condition of the alveolar bone was classified as IIa, i.e. very slight resorption of the alveolar crest. Comparing the wear of the various teeth and the degree of development of the $\frac{8|8}{8|8}$ gave an estimated age of 16–18 years of age. In view of the size of the skull, jaws, and teeth and small supra-orbital ridges it was thought that this individual was female, although this was not in agreement with the conclusions of Dr Scheuer (see p.172).

TABLE XV

INDEX MEASUREMENTS OF BURIAL 2

The Dental Index is	43.4
Gnathic Index is	96.9
Palatal Index is	144.1 Brachyuranic
Facial Index is	85°
Total Facial Index is	91.5
Upper Facial Index is	56.0

Burial 4 (71.53.34)

The specimen consists of upper maxilla left hand side with teeth present $\overline{2|3|4|5|6|7}$ (the $\overline{134}$ and $\overline{17}$ are unerupted) and $\overline{7654321|1}$ and \overline{EDJ} loose teeth. The roots of the canine are not quite two-thirds calcified, the first premolar approximately half calcified, the second premolar and second molar less than half calcified. A portion of the mandible is complete with ascending ramus and damaged condyle extended from the $\overline{3|}$ area to the $\overline{8}$. Teeth present are $\overline{2|1|1234567}$ with the $\overline{3457}$ unerupted. One can see the crypt for the developing $\overline{8}$ (PL. XXVII) and there are in addition loose teeth $\overline{76543|}$ and \overline{EDC} .

The roots of the upper and lower teeth are at an identical stage of development and the degree of resorption of the roots of the deciduous teeth is similar. The upper first deciduous molar shows slight resorption of the distal root, the upper second deciduous molar slight resorption of the disto-buccal and palatal roots. The lower first deciduous molar and the lower second deciduous molar have slight resorption of the distal root. The upper first deciduous molar has three separate roots – in modern whites the disto-buccal and palatal roots are usually joined. The upper deciduous canines show slight resorption of the palatal apical portion of the root. The roots of the $\frac{1|1}{1|1}$ are fully calcified and the $\frac{2|2}{2|2}$ almost fully calcified. All these factors would indicate that the subject was about 9–10 years of age at the time of death.

There is some slight imbrication of the lower incisor teeth – the lower laterals are slightly lingual to the lower centrals and are not in full occlusion with the upper laterals as there is no evidence of any wear. The degree of attrition on these teeth (i.e. $\frac{61}{61} \frac{16}{16}$) is Grade I – slight enamel wear only. The attrition of the deciduous teeth (i.e. $\frac{E D C}{E D C} | \frac{C E}{C D E}$ is Grade 2A on the $\frac{E D C}{E D C}$). It is Grade I on the $\frac{C E}{C D E}$ indicating that the individual probably had an unilateral chewing habit.

There is slight enamel hypoplasia of the upper central incisors in the middle third of the teeth and considerable mottling of the enamel on the labial surface with very slight dark brown mottling of the upper lateral incisors. The lower incisor teeth are similarly affected, but to a lesser degree.

There is slight supra-gingival calculus present in both upper and lower jaws in the $\frac{E 6}{E 6}$ region both buccally and lingually and a very slight deposit of calculus on $\frac{61}{61}$ on the buccal surface only.

The mottling of the incisor teeth and the enamel hypoplasia are interesting and probably occurred at about 18 months to 2.5 years of age. There is a suggestion of mottling on the $\frac{61}{61}$ and it is almost certain that it was some systematic factor, operating over a period of about one year from the age of 1.5 to 2.5 years which was responsible for both conditions. It is not unlike fluoride mottling which is endemic in regions where fluoride is ingested when the teeth are calcifying, and it affects the enamel if the concentration exceeds two parts per million in the drinking-water.

Fragmentary Mandible (LHR72.F4.1)

This specimen (from the upper filling of Kiln 1) consists of a mandible which is fragmentary. The left-hand side of this mandible is missing. There is no indication from the teeth or jaws as to the sex. The age is estimated to be 35+ years.

The teeth present at death were: $\frac{654321}{654321} \frac{12}{12}$ with possible minute root fragments in $\frac{7}{7}$ region. There is no evidence of caries and there is slight overcrowding as evidenced by slight imbrication of the teeth in $\frac{321}{321}$ region. The general development of the mandible is classified as good. The occlusal relationship is unknown as the maxilla is missing.

TABLE XVI

DETAILS OF DENTAL CONDITION OF FRAGMENTARY MANDIBLE LHR72.F4.1

The attrition is	Anterior	2A – 2B	$\frac{11}{11}$
	Posterior	1 – 2A	$\frac{54}{54}$
		2B	$\frac{6}{6}$

There is no evidence that $\frac{8}{8}$ ever existed and it was probably congenitally missing. There is some evidence of alveolar bone destruction in $\frac{7}{7}$ region which is compatible with small root fragments (and associated infection) being present at death and after death. The reason for destruction of the crown is unknown but it should again be pointed out that there is no evidence of caries in any of the remaining teeth.

There is slight supra-gingival calculus on the lingual side of the posterior teeth and moderate supra-gingival calculus in the $\frac{321}{321}$ region. The periodontal bone loss is classified as IIb except in $\frac{11}{11}$ region where it is IIc and it is thought unlikely that $\frac{7}{7}$ would have been lost through periodontal disease. There is only one molar present, i.e. $\frac{6}{6}$ and this has the normal five cusp pattern.

The Human Remains: Discrepancies between the Specialist Reports. By J.L.Scheuer

Burial 1 (71.56.3)

J.L. Scheuer: Age: 45–50 years
Sex: male

T.C. Rowbotham: Age: 40+
Sex: female

T.C.R. writes: 'Supraorbital ridges were not particularly prominent and this, together with the size of the skull and teeth and development of the jaws would indicate this individual was a female, in conflict with the finding of Dr Scheuer.'

J.L.S. writes: Skull – fairly massive with thick bones, prominent brow ridges, sizeable nuchal torus, large mastoid process.
Postcranial – large bones, heavily marked; height calculated from all complete long bones 166–174 cm (5 ft. 6 in. – 5 ft. 8 in.); pelvis with acute subpubic angle, narrow sciatic notch.

According to Krogmen there is a percentage accuracy for sexing adult material of 95% with the pelvis alone and 98% with the skull and pelvis present, whereas with the skull alone this drops to 90%. Apart from the distinctly male characteristics of the pelvis the long bones were heavily marked for muscular attachment and, with a femur length of 450 mm, the height was estimated at 166–174 cm (5 ft. 6 in. – 5 ft. 8 in.) which is rather tall for a female. Ultimately, Mr. Rowbotham and I disagree about the relative bulk of the skull and its supraorbital ridges.

Burial 2 (70.XII.4)

J.L. Scheuer: Age: 13–15 years
Sex: probably male

T.C. Rowbotham: Age: 16–18 years
Sex: thought to be female

T.C.R. thinks this to be a female adolescent of about 16–18 years of age.

J.L.S. notes that

- (i) the oldest age at which epiphyses of upper end of ulna, upper end of radius, lower end of humerus, and head of femur are still unfused is 14 years in females; in males the oldest age is 16 years for epiphyses of upper end of ulna and lower end of humerus.

In this specimen all these epiphyses were unfused.

- (ii) height extrapolation makes the individual 153 cm (5 ft. 0 in.)
- (iii) here is present in this skeleton the triradiate bone of the developing pelvis, rarely seen because its life (as an individual bone) lasts for a relatively short period and has usually fused by the age of 16 years.

I do not feel strongly over the sex of the juvenile skeleton as it is well known that the attribution of sex is difficult on the basis of juvenile skeletal remains, because neither the skull nor the pelvis, which are the chief markers, is fully developed. However this particular postcranial skeleton is valuable as an indicator of the probable *age* since many of the epiphyses were recovered and could be matched to their appropriate bones. Those which fuse earliest are the most important in this case. Thus, since the lower ends of the radius and ulna have usually fused to the shaft by the 14th year in females and by the 16–18th year in males (and had *not* done so in

Burial 2), the child was likely to be less than 14 years old if a girl and less than 16–17 if a boy. In essence, I do not disagree with Mr. Rowbotham about the sex; but, if it should be female as he believes, than I feel that there has been an overestimation in age of some 3–4 years.

13. REPORT ON THE 1974 CREMATION. By the late Calvin Wells

The cremated bone was contained in a grey-ware jar with slashed cordons (FIG. 46, Type 142) which can be dated to the first half of the second century A.D. It was buried in the upper filling of the working terrace (Pit 7) NW of Yard I (p.75).

This cremation consists of many dozens of fragments, almost all of which are small. The largest is from the proximal end of a right femur, including the head, neck and lesser trochanter; it is 90 mm in length. The femoral head is incomplete, but the maximum surviving diameter, 39.9 mm, must be virtually what it would have been, had the bone been intact. Other identifiable pieces include: scraps of cranial vault up to 9.1 mm in thickness and showing only a very early stage of endocranial sutural fusion; fragments of the atlas, the dens of the axis, the ?C6 and ?C7 vertebrae (the ?C6 has a strongly bifid spinous process; in ?C7 the process is deflected to the right); a few other vertebral scraps.

Also present are: the infero-posterior quadrant of the right acetabulum, with the ischial tuberosity, measuring 71 mm overall; fragments from the shafts of both humeri; a piece of humeral head; scraps of forearm bones; short splintered lengths of femoral and tibial shaft; small pieces of tarsalia; a metacarpal and phalangeal fragment; a few splinters of ribs.

Although the surviving evidence suggests that markings for muscle attachments were moderately well-developed, the skeleton seems to have been lightly built. It is probable that this was a woman, but some slight doubt must remain because no fragments strongly diagnostic of sex have survived. The evidence of fused epiphyses leaves no doubt that she was fully adult, and the condition of the cranial sutures would suggest that she was likely to be in the 30–35 age range, although this must remain somewhat uncertain.

These remains have not been very well cremated. Evidence of slight but widespread underfiring is present, e.g. on fragments of vault, pelvis, the femoral head and neck, and shafts of long bones. This suggests a parsimonious use of fuel, with inadequate stoking of the pyre.

The large size and good condition of a few of these fragments almost certainly indicates that much else must originally have been retrievable in similar form. That so little is now present suggests that interest in recovering fragments from the pyre was perfunctory or, if recovered, that they were later dispersed in some way – perhaps as souvenirs to friends and relatives.

No duplication of anatomical fragments is detectable and the evidence points to this having been the cremation of only one person. No trace of non-human remains was found.

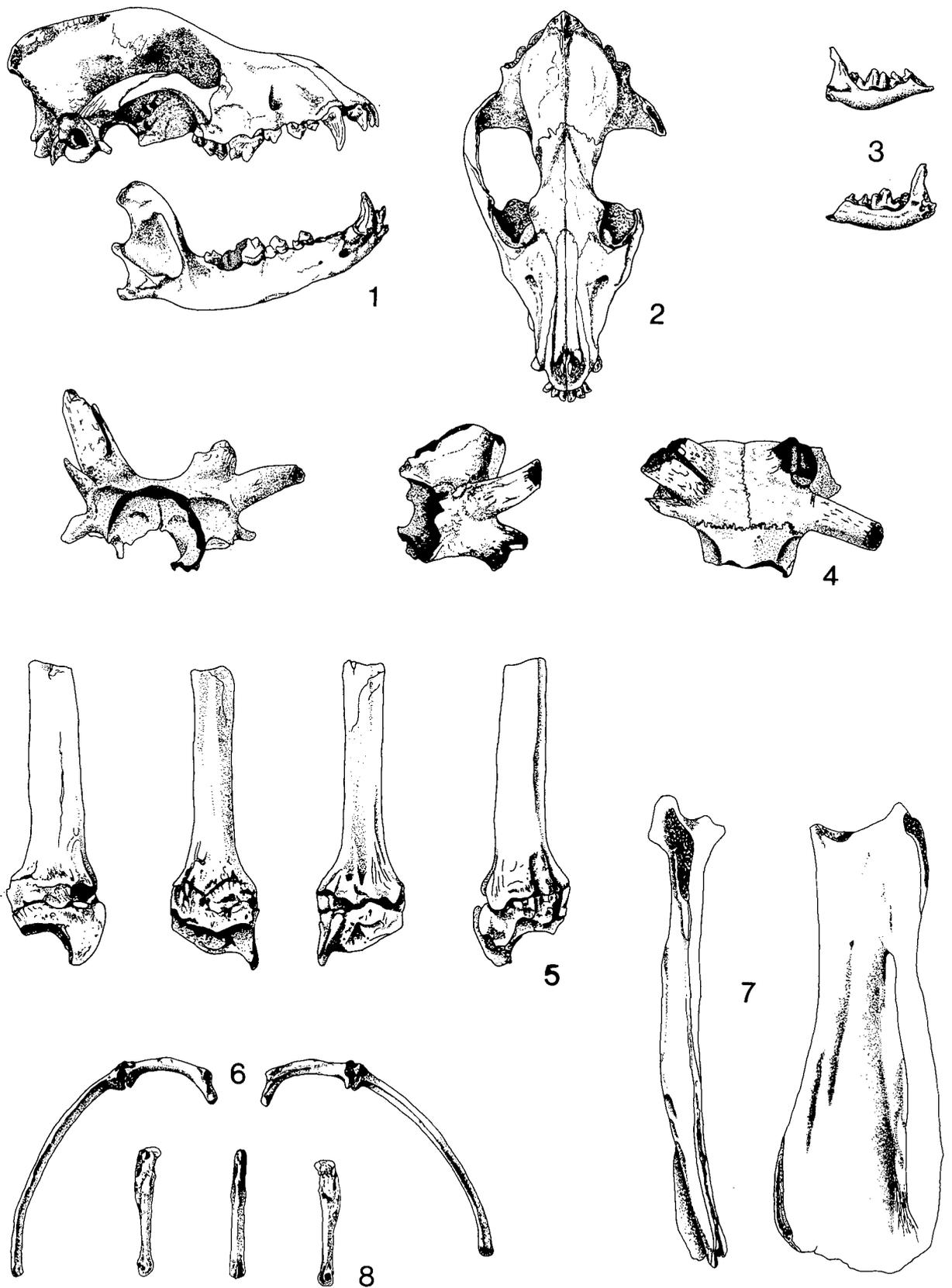


FIG. 48 Selected animal bones: 1-2, skull of Dog 6; 3, mandible of miniature dog; 4, three views of the four-horned sheep skull; 5, fused ox metatarsal and tarsal; 6, rib fracture of Dog 1; 7, horse scapula with butchery cuts; 8, deformity on metatarsal of Dog 1.

14. THE ANIMAL BONES. By Joan M. King

INTRODUCTION

The animal bones from the site were in a good state of preservation and all were examined. Mature bones were measured (see TABLE XVII p.190). The material has been presented in its dated or approximately dated groups (see below); bones from the topsoil, however, are not published here. Each group has been studied for any differences in content, type of animal, size, age and relative proportions. Details of butchering and indications of disease are noted.

Minimum numbers of animals present have not been determined, since only a representative sample of the site was excavated and statistical analysis would be meaningless. Some comparison with the bone count and sizes of animals from Longthorpe fortress (reported by Professor B.J. Marples in *Longthorpe I*, 122 ff.) has been made and similar tables and measurements are used here to facilitate cross-reference.

The species found are set out in TABLES XVIII and XIX (pp.192-3). The number of complete dog skeletons found is noteworthy (their burial inside the fortress during its full-time occupation could hardly be expected). There is little evidence to show that preferential joints of meat were being sent to the fortress during its occupation (but there is an apparent shortage of neck vertebrae, especially atlas and axis bones). Horse was being used for food in this period – one articulated haunch of mature horse demonstrated this well.

The groups of bone according to date are:

Group 1: undisturbed Iron Age deposits, not closely dated.

Group 2: Iron Age deposits, dumped into the main ditch between Yards I and II of the farm, slightly contaminated by Roman material.

Group 3: Claudio-Neronian stratified deposits (before A.D. 50 to c. 65).

Group 4: an important Claudio-Neronian group containing the occasional piece of second-century grey-ware.

Group 5: material derived from the second-century levelling of Claudio-Neronian deposits – virtually all was Longthorpe military pottery and (presumably) military bone.

Group 6: debris from the second-century farm, together with Claudio-Neronian potters' waste.

Group 7: early third-century material from the bottom of Pit 8 in Yard II (71.59.7).

Group 8: disturbed, but valuable, deposits associated with third- or fourth-century farming.

As is clear from the foregoing, the problem of isolating and excluding residual material on this site is formidable. The Claudio-Neronian Group 3 may contain some earlier material, but is likely to reflect fairly accurately the range of animals available in the military phase. The vast amount of animal bone jettisoned by the soldiers at this time was constantly being recirculated as rubbish in the subsequent agricultural activity (Groups 4-6). It is difficult to reach firm conclusions on the relative proportions of animals kept by later farmers at Longthorpe (Groups 7-8).

SUMMARY OF THE CONTENT OF THE GROUPS

1. *Iron Age*

Cattle made up 59%, sheep 32%, pigs 8% of the bone. Of the cattle 17% were killed very young, but sheep and pigs were killed at an older age (see TABLE XIX). One complete dog skeleton was found (Dog 6, p.188) (FIG. 48, 1-2). It was slightly larger, but similar in build to those in Groups 3-4. Red deer is present in this group.

2. *Disturbed Iron Age*

Sheep formed a greater proportion of the bone here than in the stratified Iron Age collection; but there is less evidence that cattle were killed young. A greater proportion of pig was noted than in the Claudio-Neronian groups.

3. *Claudio-Neronian* (before A.D. 50 to c. 65)

This was numerically the largest group of bone from the site. 94% of the total number of animals were cattle and sheep. Half of the cattle were not killed until mature, showing that herds were maintained throughout the winter in the Nene Valley. However, 75% of the sheep were killed young. Relatively few bones of pig were present; most of these animals were killed young. Domestic dogs were found in this group, including four complete skeletons (see below).

4. *Disturbed Claudio-Neronian*

The total number of sheep found was almost equal to that of cattle, and no very young cattle were killed. Pigs on the other hand were killed young. There was one complete dog skeleton (Dog 4, p.188).

5. *Badly disturbed Claudio-Neronian*

Almost 60% of the animals found were cattle, none killed very young. Pigs were few.

6. *Second century, with earlier rubbish survivals*

There is a slightly higher percentage of cattle and pig than in the Claudio-Neronian groups 3-4. No young sheep or old pigs were noted.

7. *Early third century*

There were only 4 bones in this pit layer.

8. *Third or fourth century*

There is a higher proportion of sheep to cattle, but no pigs are present. Half of the sheep were killed when very young, and young cattle, too, were found.

THE SPECIES PRESENT

1. *Cattle*

Cattle (56.2% of all meat bone from the site) were predominant in all groups, except Group 8, where sheep were the commonest species found. The cattle were of small stature, with short forward-curving horns, and were as light-boned as those found on other Romano-British sites (Jewell (1963)).

They were similar in build to those recorded in the Longthorpe fortress (*Longthorpe I*, 122) (for measurements see TABLE XVII). There was a fairly even distribution of bones from all parts of the body, demonstrating that whole animals came to the site and were completely used up there (Grant (1975)). Osteoarthritis was present in the tarsal bones of the older beasts, one being completely fused (FIG. 48, 5). The scapula joints of three animals were also affected, perhaps as the result of being used as draught oxen. Few cattle were killed for veal, and over half were kept until mature. During the Claudio-Neronian period there were several animals which were larger in stature than all the others. Perhaps these were bulls (which could not be distinguished in any other periods by sexual dimorphism) or a larger breed of imported animal.

2. *Sheep*

Sheep (37.5%) were small light animals, with horns, typical of Iron Age and Roman Britain (Jewell, Milner, Morton Boyd (1974); *Gadebridge*, 258). No distinction has been made here between sheep and goat, except where it is shown in skull sutures. Nine goat fragments were

found in the Claudio-Neronian Groups 3–4. One skull was of a four-horned sheep (FIG. 48,4) (see below). More young lambs were killed in the later periods of the site than in the military phase (3–4) (but the sample is small).

3. Pig

Pigs (6.3%) were not important meat-producers at Longthorpe; the majority were killed young, and in the Claudio-Neronian period a few were killed very young. Skulls were of a similar type to the wild pig and several long boars' tusks were found (for sizes see TABLE XVII).

4. Horse

Horses were present in all periods, but most noticeably in the Claudio-Neronian Group 3. While this may reflect Cerealis's cavalry (*Longthorpe I*, 38 f.), the animals were also used for meat, as is demonstrated by the butchering marks on one articulated hind quarter and on a scapula (FIG. 48, 7). In size, they were similar to a small pony of the present-day Exmoor type, but there is one tibia of a much larger animal like a small carthorse. One small skull of a thirteen-year old animal was noted, and all the bones were of mature animals. One metatarsal showed a healed fracture.

5. Dog

Complete skeletons of dogs were found buried on the site, mostly in open gullies and ditches (see p.188). At least four are dated to the Claudio-Neronian period, one probably to the Iron Age and scattered remains to later periods (FIG. 48, 1, 2, 6, 8). There was also a jaw of a 'miniature' animal (for details see below), with a shoulder height of about 50 cm. They had a long narrow head, similar to a modern sheep dog. The Iron Age dog is slightly larger, but similar in shape (Harcourt (1974)).

6. Other animals present

Red deer were found infrequently in Iron Age, Claudio-Neronian and disturbed Claudio-Neronian groups (cf. *Longthorpe I*, 124). Fragments of skull, shoulder and loin joints were found. One antler of roe-deer was noted with a circumference at burr of 104 mm. Hare was found in the late Roman deposit (Group 8). In the Claudio-Neronian material there were rodent remains and the mandible of a badger and a fox.

BUTCHERING

Only a small proportion of bones was burnt. Many long bones had been chopped through, presumably with a sharp cleaver, and some ends of humerus and femur of ox and horse may have been used for scraping. Many of the ox astragali had cuts across the centre, showing disjointing of the hind limb at this point. One horse femur and tibia (71.56.42) (Group 3) were articulated when found, and from the cut and chopping marks had been hung up by the distal end of the tibia, so that meat could be cut from them; for all cuts slanted that way and parts of the knee articulation were chopped off, both from tibia and femur. Many ox ribs had been cut or chopped through. Gnawed bones were mainly of sheep or feet bones of cattle. The low number of lower limb bones of sheep may perhaps be attributed to the activities of the domestic dogs. In the Iron Age butchering-marks were found only on cattle.

NOTES ON SPECIFIC ANIMALS

1. The four-horned sheep

The Claudio-Neronian filling of Pit 1 in the north corner of Yard I (71.53.10) contained the fragmentary skull of a sheep with four horn-cores (FIG. 48, 4). Miss Barbara Noddle has kindly reported that this is at present the earliest known four-horned sheep in England. She compares it with a Bronze Age skull from Jarlshof (found 1915) and with an early post-Roman skull from Buckquoy, Birsay, Orkney (Noddle (1976–7), 208). Common in medieval Scotland, four-horned sheep are still found among the Black St Kilda (Hebridean). Dr M.L. Ryder kindly

comments on the possible confusion between the straight fronto-parietal suture of goats and that of this four-horned sheep; but straight sutures, he notes, are not universal in four-horned sheep, since a specimen from Vindolanda (Hodgson (1977)) has the sutures characteristic of sheep.

2. *The dogs*

Dog 1 (Burial 2, pp.57,59 FIG. 17,b)

Mature, articulated skeleton. Crest on skull prominent and skull sutures united. Nose deviating to right. Teeth little worn, except incisors which have broken off leaving roots in jaw. Lower premolar 1 lost in life and alveoli sealed over. Cervical vertebrae show arthritis frilling at body articulations. One rib and fibula broken and partially united in life (FIG. 48, 6). Three metatarsals of the left foot show deformity and overgrowth on anterior proximal surface (FIG. 48, 8). Right metatarsals 2 and 5 show overgrowth above articulation and wear at distal end. Estimated shoulder height: 50.36 cm. From 70.XII.2: filling of a gully in Yard I (Claudio-Neronian).

Dog 2 (Burial 3, pp.57,59)

Disturbed burial of a mature dog, similar in size to Dog 1. Head, neck and ribs are articulated. Wear on teeth moderate. 70.XIX.2: filling of a gully in Yard I (Claudio-Neronian).

Dog 3 (Burial 4, p.59)

Articulated immature dog. Very low crest on skull, skull sutures easily defined. Teeth unworn. Left upper carnassial seems to be embedded in jaw. Proximal epiphysis of a humerus is not fused, but all other long bones fused. Estimated shoulder height: 48.76 cm. 1970: from the area of the Iron Age farm, but date uncertain.

Dog 4 (Burial 6, pp.56,59)

Head of a young dog, low crest on skull, sutures easily seen. Teeth little worn. Disarticulated or disturbed skeleton with a few dog bones in surrounding layers. 71.56.9: greeny-grey deposit in gully on working terrace NW of Yard I (Claudio-Neronian assemblage, disturbed in second century).

Dog 5 (Burial 5, pp.49,59)

A larger skull than previous dogs, with prominent crest. Teeth little worn. Disarticulated or disturbed skeleton, as head is complete with vertebra and there are fragments of long bones in same layer. 71.53.10: brown stony filling of Pit 1 in N corner of Yard I (Claudio-Neronian).

Dog 6 (Burial 1, p.32)

Articulated skeleton of a slightly larger size than Dog 5. Skull crest prominent (FIG. 48, 1-2). Cephalic index 56.9%, snout index 49.5%, snout width index 43.4%. Teeth little worn. Right distal end of femur and tibia are crumbling, perhaps through degeneration of diseased bone. The same feature was noted in small areas on other bones on the right side. Estimated shoulder height: 51.41 cm. From 71.53.19: hard brown earth lens within filling of main ditch at N corner of Yard I (probably Iron Age).

Miniature dog

Mandible of a miniature dog with cramped large teeth in a small jaw (lower carnassial tooth length 16.5 mm) (FIG. 48, 3). From 74.B2.3: filling of main NW ditch of Yard I (Claudio-Neronian).

15. THE BIRD BONES

The majority of the bird bones were of domestic fowl (Mrs King reports) and came from Claudio-Neronian deposits. They represent a small breed, such as was found in Antonine contexts in Normangate Field, Castor (1969–70).

Mr W. Metcalfe has kindly identified the bones of a raven (*corvus corax*) (carpometacarpus, tarsometatarsus, ulna, radius) (LHR72.F4.3) and a wood pigeon (*columba* sp.) (LHR72.F4.10) from a Claudio-Neronian deposit. Remains of at least four ravens were found in the fortress (Longthorpe I, 124).

Mrs E.M. Northcote of the University Museum of Zoology, Cambridge, examined a number of bird bones and kindly reports as follows:

1. Proximal phalanx of the middle digit of the right pes of a swan. From the data given below it would seem to belong to a Mute Swan.

	<i>length</i>	<i>width of head</i>
Mute Swan (N=16)	5.36–6.17 cm	1.24–1.50 cm
Whooper Swan (N=11)	4.97–6.12 cm	1.40–1.53 cm
Longthorpe specimen	5.56 cm	1.25 cm

from 70.VI.5: filling of the main SE ditch of Yard II (Claudio-Neronian assemblage).

2. Middle shaft of the right ulna of a swan, probably a Mute Swan. The only other bird of this size it resembles is a crane; but it is too stout and rounded in cross-section to be a crane and it lacks the extremely well-marked feather follicles of the crane ulna. 72.13: filling of the SW ditch of Yard I (Claudio-Neronian deposit, moved in second century).

3. Two conjoined pieces of the distal shaft of the right tarsometatarsus of a crane. Mr G.S. Cowles of the British Museum (Natural History) who kindly examined it identified it as from the Sarus Crane (*grus antigone*). He notes straight cuts at the distal and proximal ends, indicating that the bird had been prepared for the pot.

The common crane, a smaller bird than the Sarus Crane, was probably indigenous to Britain and was still to be seen in the seventeenth century in large flocks in the Lincolnshire and Cambridgeshire fens (A. Newton, H. Gadow, *Dictionary of Birds* (London, 1893–96), 109). From 72.31: disturbed Iron Age deposit in the ditch between Yards I and II.

Mr G.S. Cowles examined further bird bones and reports as follows:

1. Left femur of a White-tailed Eagle (Sea Eagle) (*haliaetus albicilla*). In the eighteenth century this eagle was a resident breeding bird, but became extinct as a breeding species about 1916. It is now recorded as a 'scarce visitor'. The species usually frequented coastal areas, inland lakes and marshes. As well as fish and small mammals, it has been recorded as taking carrion, domestic poultry and rabbits. 72.32: disturbed Iron Age deposit in the ditch between Yards I and II.

2. Proximal end of the incomplete right ulna of a kite. From its size it is closest to the Red Kite (*milvus milvus*). It was probably not eaten as food, but perhaps killed because of its scavenging habits around habitation. 72.21: filling of NW ditch of Yard II (Claudio-Neronian deposit, moved in second century).

TABLE XVII
MEASUREMENTS OF MATURE ANIMAL BONES

Measurements (in mm) of the largest and smallest animals are given on the basis of complete bones

Abbreviations L length, PW proximal width, PD proximal depth, SW shaft width, SD shaft depth at nutrient foramen, DW greatest distal width, DD greatest distal depth, CL condylobasal length, ZB zygomatic breadth, PAL palate length, PAW palate width, TC maxillary toothrow with canines, RW rostral width over canines, NL length of nasal bones.

	L	PW	PD	SW	SD	DW	DD	Findspot	Group
Cattle									
Horn core	Circumference 120-180			Length of outside curve 80-160					
Humerus	252	92	78	27	35	65	65	71.56.60	3
	274	120	85	31	35	73	70	LHR72.F4.2	3
	others, largest			35	45	82	70		
	smallest			27	31	64	50		
Radius	275	74	39	46	25	68	40	71.50.6	3
	248	67	34	34	19	59	40	71.56.60	3
	279	81	41	45	23	67	41	71.34	2
others, largest	294	89	41	45	28	76	50		
smallest	248	70	34	26	15	57	38		
Metacarpal	213	50	31	27	21	51	27	70.IV.5	3
	183	58	30	31	23	60	31	71.53.9	3
	181	50	31	28	20	51	28	71.56.42	3
	171	46	31	28	20	51	27	72.21	5
others, largest	213	58	37	31	23	70	34		
smallest	164	40	23	23	13	46	27		
Femur	-	-	-	27	26	30	39	71.53.1	unstrat. but Roman
Tibia largest	-	85	71	34	38	60	45		
smallest	-	80	65	33	37	45	34		
Metatarsal	185	42	35	21	22	44	25	71.53.4	4
	206	45	42	26	26	47	28	71.53.9	4
	195	42	42	23	25	47	30	71.53.9	4
	219	44	40	25	26	49	28	71.56.6	4
	203	41	40	24	26	50	28	74.B1.3	3
	200	41	40	25	25	47	27	72.30	2
others, largest	240	48	45	28	29	54	31	71.53.16	3
smallest	185	38	35	21	22	44	42	71.53.4	4
Phalange I	63	29	33	-	-	25	22	71.53.35	1
	57	27	27	-	-	27	21	71.50.8	5
smallest	49	26	20	-	-	20	16	71.53.10	3
Phalange II	53	35	33	-	-	29	31	71.53.10	3
smallest	31	22	25	-	-	20	22	71.56.42	3
Phalange III	50	Height	38	Width	23	-	-	70.XIX.3	unstrat. but Roman
largest	68	"	45	"	22	-	-	71.53.2	3
smallest	40	"	39	"	17	-	-	71.60.4	unstrat. but Roman
Calcaneus	126	Greatest width	42	Tuberosity width	33			71.56.38	3
	115	"	"	34	"	"	26	71.60.3	unstrat. but Roman
	119	"	"	36	"	"	29	70.XVI.5	unstrat. but Roman
Astragalus	71	-	-	-	-	45	-	70.XXX.1	unstrat. but Roman
	66	-	-	-	-	44	-	71.53.4	4
	60	-	-	-	-	36	-	71.56.6	4
	56	-	-	-	-	37	-	71.53.20	3
Sheep									
Horn core	Circumference 105-175			Length of outside curve 100					
Humerus, largest	-	-	-	15	17	28	25	72.32	2
smallest	-	-	-	11	12	24	20		
Radius, largest	-	35	20	18	11	27	18	70.XIV.1	unstrat. but Roman
	-	27	14	17	9	26	17	74.B1.10	unstrat. but Roman
smallest	-	24	11	14	7	16	14		

	L	PW	PD	SW	SD	DW	DD	Findspot	Group		
Metacarpal	120	20	15	14	10	23	14	71.56.9	4		
	106	19	13	11	9	22	13	71.53.20	3		
	113	19	14	12	10	22	14	74.B2.4	3		
	110	17	14	11	9	20	13	74.B3.3	3		
largest	120	23	19	14	11	23	14				
smallest	106	17	11	11	9	20	13				
Femur, largest	—	—	—	14	14	35	40				
smallest	—	—	—	11	11	33	32				
Tibia,	178	34	34	13	12	21	17	72.11	5		
largest	178	45	36	19	20	29	25				
smallest	149	33	34	10	10	20	16				
Metatarsal	128	19	17	—	—	21	19	71.53.20	3		
	130	18	18	11	11	22	14	71.56.5	unstrat. but Roman		
	135	27	—	11	11	23	15	74.B1.10	unstrat. but Roman		
	114	16	16	10	9	21	13	72.21	5		
	117	16	16	10	10	20	17	74.B1.4	unstrat. but Roman		
largest	135	27	19	12	12	23	19				
smallest	114	15	15	9	9	20	13				
Phalange I	35	11	13	—	—	11	10	71.56.38	3		
	31	10	12	—	—	9	8	71.56.38	3		
smallest	29	10	12	—	—	9	8				
Astragalus	25	—	—	—	—	23	—	70.XXI.1	unstrat. but Roman		
Calcaneus	51	Greatest width		15	Tuberosity width		11	71.53.1	unstrat. but Roman		
	43	Greatest width		16	Tuberosity width		12	71.53.9	4		
Pig											
Humerus	—	—	—	15	13	38	42	71.53.9	4		
Radius	—	26	17	20	19	—	—				
	—	27	19	18	11	—	—	71.60.3	unstrat. but Roman		
Metacarpal	68	18	14	—	—	9	14	71.53.35	1		
Femur	—	—	—	21	23	31	35				
	—	—	—	—	—	30	35	70.XXII.3	5		
Tibia	—	—	—	20	22	—	—	70.53.4	4		
	—	—	—	20	19	26	22	71.53.10	3		
Metatarsal	81	14	21	—	—	15	16				
	77	13	21	—	—	15	15				
Phalange I	30	15	15	—	—	13	9				
Calcaneus	Greatest width			19							
Astragalus	35	—	—	—	—	23	—				
Horse											
Humerus	278	82	90	77	77	35	42	71.53.10	3		
	255	77	79	69	67	—	—	71.53.10	3		
Radius	315	72	40	40	26	65	40	LHR72.F4.3	3		
	—	—	—	31	23	60	37	72.34	2		
Metacarpal	232	52	35	37	26	49	37	71.56.27	3		
	—	—	—	28	21	42	27				
Femur	340+	94	—	39	37	97	122	71.56.42	3		
	—	—	—	25	31	81	91	70.XXI.1	unstrat. but Roman		
Tibia	332	86	83	46	50	65	41	71.56.42	3		
	387	—	—	54	62	84	51	71.53.10	3		
	325	—	71	57	49	—	41	LHR72.F4.3	3		
Metatarsal	251	50	41	29	29	46	35	74.B2.9	3		
	223	40	32	26	23	40	30	71.56.5	unstrat. but Roman		
	224	40	31	27	23	40	30	71.56.60	3		
Phalange I	67	48	32	—	—	40	21	74.B1.10	unstrat. but Roman		
	71	48	30	—	—	43	21	72.13	5		
Phalange III	58	Height		29	Width		67	—	—	72.21	5
Calcaneus	91	Greatest width		52	Tuberosity width		37	71.56.60	3		

		L	PW	PD	SW	SD	DW	DD
Dog								
Humerus, Dog	1	154	—	—	12	14	30	22
	3	151	—	—	10	13	28	21
	5	—	—	—	—	—	32	24
	6	163	—	—	13	15	34	25
Radius,	1	156	17	11	17	—	—	—
	3	148	15	10	11	—	—	—
	5	—	18	13	—	—	—	—
	6	152	19	13	15	—	—	—
Femur, Dog	1	166	—	15	13	13	28	32
	3	162	—	13	11.5	11.5	27	29
	6	174	—	16.5	13	13	32	36
Tibia,	1	169	30	32	11.5	14.5	—	—
	3	168	30	32	11	14	—	—
	6	174	34	37	12	17	—	—
Metacarpal	1	Lengths	48, 56, 57, 50					
	3	"	47, 58, 59, 50					
	6	"	48, 57, 57, 50					
Metatarsal	1	"	55, 62.5, 63, 55					
	3	"	55.5, 65.5, 64, 56					
	6	"	55.5, 63, 61.5, 55.5					
		CL	ZB	PAL	PAW	TC	RW	NL
Dog								
Skull, Dog	1	169	108	86	52	L76,R72	33	—
	2	—	—	85	50	76	32	—
	3	160	80	83	52	77	30	—
	4	147	88	75	49	65	33	—
	5	178	103	93	56	81	39	—
	6	185	100	88	58	80	37	88
Scapula	1	Neck width		24				
	3	" "		23				
	6	" "		32				

TABLE XVIII

TOTAL NUMBERS OF ANIMAL BONES OF EACH SPECIES (INCLUDING LOOSE TEETH)

<i>Species</i>	<i>Bone Count</i>	<i>Percentage of meat animals</i>
Cattle	1903	56.2
Sheep	1270	37.5
Pig	211	6.3
Horse	124	
Dog	165 (+ 6 skeletons)	
Goat	9	
Red Deer	7	
Roe Deer	5	
Bird	27	
Badger	1	
Rodent	7	
Hare	1	
Fox	1	

TABLE XIX

BONE-COUNT ACCORDING TO DATED GROUPS

Age-group codes: A are new born animals ('very young' in text), B immature animals with epiphyses not fused or molar eruption not complete ('young'), C mature animals ('mature'). Many bones were not assigned to age groups because of chopping or chewing of their ends.

Groups	1	2	3	4	5	6	7	8
Cattle								
Number of bones	174	90	1221	184	103	92	2	37
% of meat animals	59.1	52.3	58.1	47.1	58.2	61.3	66.6	43.6
Age A animals	6	3	10	—	—	1	—	3
% age A	17.1	6.6	4.5	—	—	—	—	27.3
Age B animals	16	21	105	25	17	7	—	3
% age B	45.7	45.6	46.8	65.7	53.1	—	—	27.3
Age C animals	13	22	109	13	15	1	—	5
% age C	37.2	47.8	48.7	34.3	46.9	—	—	45.4
<i>Butchering of Cattle</i>								
Burnt	—	4	7	1	—	—	—	—
Chopped	6	32	76	9	—	6	—	2
Chewed	2	12	20	4	—	1	—	3
Sheep								
Number of bones	96	68	772	176	64	45	1	48
% of meat animals	32.6	39.5	36.2	45.1	36.2	30	33.3	56.4
Age A animals	—	5	41	12	5	—	—	7
% age A	—	10.4	21.8	24	15.6	—	—	50
Age B animals	9	28	97	26	13	4	—	1
% age B	45	58.3	51.6	52	40.6	—	—	7.2
Age C animals	11	15	50	12	14	5	—	6
% age C	55	31.3	26.6	24	43.7	—	—	42.8
<i>Butchering of Sheep</i>								
Burnt	—	2	7	1	—	—	—	—
Chopped	—	2	18	12	—	—	—	—
Chewed	—	6	9	4	—	—	—	—
Pigs								
Number of bones	24	14	120	30	10	13	—	—
% of meat animals	8.3	8.2	5.7	7.8	5.6	8.7	—	—
Age A animals	—	—	5	4	—	2	—	—
% age A	—	—	9.1	40	—	—	—	—
Age B animals	5	5	40	6	3	4	—	—
% age B	83.3	62.5	72.7	60	50	—	—	—
Age C animals	1	3	10	—	3	—	—	—
% age C	16.7	37.5	18.2	—	50	—	—	—
<i>Butchering of Pigs</i>								
Burnt	—	—	—	1	—	—	—	—
Chopped	—	4	8	—	—	—	—	—
Chewed	—	3	1	1	—	1	—	—
Bones of Other Animals								
Horse	8	2	96	1	5	6	1	5
Dog (incl. skeletons)	17	2	90	13	1	19	—	8
Goat	—	—	6	3	—	—	—	—
Deer	5	—	6	—	1	—	—	—
Bird	1	2	24	—	—	—	—	—
Fox and Badger	—	—	2	—	—	—	—	—
Rodent	—	—	7	—	—	—	—	—
Hare	—	—	—	—	—	—	—	1

PART III

APPENDICES

APPENDIX I

CONTENTS OF THE MOST IMPORTANT CLAUDIO-NERONIAN GROUPS

Groups 1-2 from Pit 6

For description see p.54, for position see FIG. 4, for section see FIG. 14,c.

1. The primary sandy filling (71.56.59) contained a patch of charcoal (71.56.44) in which were found:
 1. vessel Type 65f (one example), Type 92 (one) and other sherds of Longthorpe military pottery
 2. a scrap of pre-Flavian South-Gaulish cup
 3. two worked bone points (FIG. 25, Nos. 99, 100)
2. The main pit filling (71.56.41) was a series of deposits of greeny-grey material that had evidently accumulated during the period of military activity and immediately after it. It contained:
 1. vessel Types 12b (one example), 65e (one), 72 (two), 73 (one), 90a (two), 90b (one), 108 (one), mortarium Type A (FIG.35, No. 4)
 2. scraps of South Gaulish form 15/17, SG Ritterling 12, SG form 24/25, footstand fragment of SG form 15/17 or 18. All are pre-Flavian.
 3. sherds of two Iron Age vessels (FIG. 31, No.5, FIG. 33, No. 50)
 4. fragment of riveted bronze strip (FIG. 24, No.56) and two nails

Groups 3-4 from Pit 5

For description see p.52, for position FIG. 4, for section FIG. 14,b.

3. The main brown sandy deposit on the bottom of the pit (71.56.56) contained:
 1. vessel Types 1f (one example), 8a (one), 65f (one), 76e (one), 79a (one), 82 (two), 99 (one), 101 (one). One flagon sherd had been grossly overfired, so that its calcareous temper had exploded. (A sherd apparently of Type 128 from this layer is probably intrusive. If not, we may either be dating it too late (see p.165) or the group may not after all be a closed one.)
 2. Two fragments of pre-Flavian (possibly Claudian) South Gaulish form 15/17
 3. a Nauheim-derivative fibula (FIG. 21, No.3), a dragonesque fibula (FIG. 21, No.9) and three strips of iron, perhaps from a *lorica segmentata* (p.105, No.154, not illustrated)
4. It was sealed by greeny-grey silt (71.56.42) which contained:
 1. vessel Types 11b (one example), 54a (one), 70b (one), 117f (one) and amphorae (FIG. 37, Nos.3,7)
 2. a bone awl (FIG. 25, No.101)

Groups 5–8 from the dug Kilns 1–3 and associated stokehole

For description see pp.35–41, for plan FIG. 8, for section FIG. 9.

5. The brown earth filling the upper part of Kiln 1 (LHR72.F4.1) contained:
 1. vessel Type 56a (one)
 2. small bronze ring (FIG. 24, No. 53.)

6. The lower filling, burnt clay and damaged kiln lining (LHR72 F4.2) contained:
 1. vessel Types 1c (one), 56a (one), 57a (one), 57b (one), 76b (one), 103d (one), mortarium Type A (FIG. 35, Nos. 2,3)
 2. Five large and two small reduced waster flagon-handles, some split in firing (not illustrated)

7. The sandy earth filling Kiln 2 (LHR72.F4.10 and 11) contained:
 1. vessel Types 1b (one), 1d (one), 1e (one), 10a (one), 22 (one), 32 (one), 46 (one), 84f (one), 84i (two), 87a (one), 102 (one), 103c (one)

8. The filling overlay a layer of firing debris on the floor of Kiln 2 which also spread across the floor of the stokehole (LHR72.F4.14,17 and 6). The debris contained:
 1. vessel Types 1c (15 examples), 1f (one), 10a (one), 30a (two), 32 (two), 33 (two), 63 (two), 84d (one), 117b (one), sherds of plain-rimmed bowls and mortarium Type A (FIG. 35, Nos. 3,4)

Group 9 from the clay dump

For description see p.40, plan FIG. 6.

9. The dumped clay (LHR72.F1) associated with Kilns 1–3, although not strictly a sealed deposit, had a quantity of pottery from the military kilns embedded in it (and nothing later):
 1. vessel Types 1a (two), 1b (two), 1c (one), 19a (one), 20 (one), 30a (one), 55b (one), 58a (one), 58b (one), 59a (three), 59b (two), 61 (one), 65a (one), 65c (one), 66 (one), 76c (one), 84c (two), 84d (two), 84e (two), 117b (two), 117e (one)
 2. small fragment of scrap lead, terracotta 'pedestal top' (FIG. 30, No. 179)

APPENDIX II

COMPLETE LIST OF POTTERY VESSELS ACCORDING TO TYPE, CONTEXT AND QUANTITY

Notes

For a full description of each vessel type see the main report on the coarse pottery (p.135). The letters and numbers in the 'variant' column refer to the codes given to each vessel type in Miss Marion Wilson's unpublished index of types. The vessels drawn as representative of the individual types are marked by an asterisk against their context codes in the third column. For a description of the fabrics listed under 'ware' see TABLE VII (p.134).

Type	Variant	Context	Ware	Number	Total	Type	Variant	Context	Ware	Number	Total
EARLY VESSELS											
						1b	FM2A/2	*LHR72.F1.1	1C	2	
								F4.10	1C	1	
						1c	FM2A/3	71.56.9	1	1	
1a	FM2A/1	71.50.+	1	1				*LHR72.F1.1	1	1	
		56.9	1	1				F4.2	1	1	
		56.22						F4.6	1	1	
		56.40	2A	1				F4.6	1A	6	
		*LHR72.F1.1	1C?	2				F4.6	2A	8	

Type	Variant	Context	Ware	Number	Total	Type	Variant	Context	Ware	Number	Total
		.17	1cc	1	2	55b	BR2A	*LHR72.F1.1	1	1	2
34a	P6E	* 71.56.6	1cc	1		56a	BR3A	71.B1.10	1	1	
		.14	1cc	1				*LHR72.F4.1	1	1	
34b	P6F/1	* 71.56.9	1cc	2				.2	1C	1	
34c	P6F/2	71.56.9	1cc	1				.7	1	1	
		* 74.B1.3	1cc	2		56b	BR3B	* 72.56.9	1C	1	5
		.10	?LTH	1							
34d	P6H	* 71.56.11	1cc	1		57a	BR4A/1	*LHR72.F4.2	1	1	
		60.3	1cc	1		57b	BR4A/2	*LHR72.F4.2	1	1	2
34e	P6J	* 74.B1.1	1cc	1							
		.3			11	58a	BT1A	71.56.6	1A	1	
								*LHR72.F1.1	1	1	
35	P7A	* 71.53.13	1D?	1		58b	BT1B	*LHR72.F1.1	1	1	3
		56.14	?	1	2						
36	P7B	* 71.56.46	NV10	1	1	Cups					
						59a	BI1A	*LHR72.F1.1	4	3	
37	P8A	* 71.56.9	NV10	1		59b	BI1B	*LHR72.F1.1	1cc	2	5
		74.B1.1	2?	1	2	60	BI2A	71.53.15	1	1	
								= 56.9			
Bowls								*LHR72.F9.+	1	1	2
38	BA2A	*LHR72.F23.2	2B	1	1	61	BF1A	*LHR72.F1.1	1	1	1
39a	BA3A/1	LHR72.F6.+	2A	1		62	C4A	* 71.56.6	Lyon	1	1
		*LHR72.F9.+	2D	1		63	C1A	71.53.9	1	1	
39b	BA3A/2	*LHR72.F6.+	2A	1	3			.10			
40a	BA3B	* 71.53.2	2D	1				* 71.53.15	1	1	
40b	BA3C	* 74.A1.2	2D	1	2			LHR72.F4.6	1	2	
41	BA3D	* 71.60.6	2D	1	1			LHR72.F9.+	1	1	5
42a	BA4A/1	* 71.53.2	2D burnt?	1		64	BP1	* 74.B1.1	?	1	1
42b	BA4A/2	* 71.53.13	2D	1	2						
43	BA5	* 74.B2.9	SG	1	1	Cheese-Presses					
44a	BB1B/1	* 71.60.3	SG	1		65a	S1A/1	*LHR72.F1.1	1	1	
44b	BB1B/2	* 74.B1.1	SG	1	2	65b	S1A/2	71.53.13	1	1	
								56.5	1	1	
45	BB1C	* 71.56.9	SG	1	1			.6	1	1	
								LHR72.F10.+	1	1	
46	BE2A	*LHR72.F4.10	1C	1	1			F19.+	1	1	
								74.B1.1	1	1	
47	BG1A	* 71.53.2	SG	1	1			* 74.B1.3	1	1	
48	BG2A	* 71.56.46	2A burnt	1	1	65c	S1B	71.56.9	1C	3	
								*LHR72.F1.1	1	1	
49	BM1A	* 71.56.9	1	1				F4.3	1	1	
		74.B1.1	1D	1	2	65d	S1C	71.56.6	1	2	
								.7	1	1	
50	BM1B	74.B1.1	1D	1				* 71.56.9	1or1B	2	
		* 74.B1.3	1D	1				.12	1C	1	
		B1.10	1D	1	3			.14	1C	1	
								.21	1C	1	
51	BM2A	* 71.56.5		1	1			.22	1	1	
								.23	1C	1	
52	BN1A	* 71.60.4	SG	1	1			.29	1B	1	
								.60	1	1	
53	BO2A	* 74.B1.6	2D	1	1			74.B1.5	1	1	
						65e	S1D/1	* 71.56.41	1cc	1	
54a	BO2C	* 71.53.16	2D	1				.60	1	1	
		56.42	2D	1				74.B1.1	1	1	
54b	BO2D	* 71.53.20	2D	1				.10	1	1	
		56.35	2C	1	4			71.56.5	1	1	
						65f	S1D/1	71.56.44	1	1	
55a	BR1A	*LHR72.F22.1	1	1				* 71.56.56	1	1	
								.59	1B	1	
						65g	S1D/3	* 74.B1.1	1	1	35

Type	Variant	Context	Ware	Number	Total	Type	Variant	Context	Ware	Number	Total
66	S2A	*LHR72.F1.1	1	1	1			74.B1.1	1	1	
								B1.3	1A	2	
67	S3	* 74.B1.3	1	2	2			B1.5			
								74.B1.9	1	2	
								.10	1?	1	
								.11	1	1	
								.13	?	1	
						84g	JN26C/4	* 71.56.9	1	1	
						84h	JN26C/5	* 71.56.30	1	1	
						84i	JN27A	71.56.9	1	1	
								*LHR72.F4.10	1	1	
								.11	1	1	
69	JG3A	* 71.56.12	SG coarse	1	1	84j	JN27B	* 71.56.9	1	1	
						84k	JN28	* 74.B2.7	1	1	
70a	JN3A	* 71.56.12	SG coarse	1		84l	JN40A	*LHR72.F4.16	1	1	32
		74.B1.9	SG	1							
70b	JN3B	* 71.56.42	SG coarse	1	3	85	JN41	* 70.XII.1	1	1	
71a	JN3C/1	* 71.60.5	SG coarse	1				71.56.9	1	1	2
71b	JN3C/2	*LHR72.F9.1	SG	1	2						
72	JN3D	* 71.56.41	SG coarse	2	2	86	JN42	* 70.XXXIV.3	?	1	1
73	JN4A	* 71.56.41	SG coarse	1	1	87a	JN26E	*LHR72.F4.10	1	1	
74	JN5A	* 71.56.6	SG coarse	1	1	87b	JN26F	* 74.B1.1	1B	1	2
75	JN6A	* 71.56.16	2B/2C	1	1	88	JN26G	* 74.B2.9	?	1	1
76a	JG7A	* 71.60.4	1? burnt	1		89a	JA1A	* 71.53.2	2D	1	
76b	JG9A	* 71.53.2	1	1		89b	JA1B	* 71.56.9	2C	2	
		LHR72.F4.2	1 burnt	1				74.B1.3	?	1	4
		F4.3	1	1		90a	JA2A	71.56.5	NV	1	
76c	JG10A	71.53.1	1	1				.6	NV	1	
		*LHR72.F1.1	1	1				.9	NV	1	
76d	JG10B	71.56.6	1B	1				.9	NV	1	
		*LHR72.F21.2	1	1				.27	NV	1	
76e	JG10C	* 71.56.56	1	1	9			* 71.56.41	2D	2	
								60.+	?	1	
								74.A1.3	2C	1	
								B1.10	2D	1	
						90b	JA2B	* 71.56.41	2B	1	11
						91	JA2C	* 74.B2.10	2 burnt	1	1
						92	JA3A	* 71.56.44	2D	1	
								74.B1.10	2D	1	2
78	JN16C	* 74.B2.2	NV11	1	1	93	JA4D	LHR72.F6.+	2D	1	
								* 74.B1.1	2D	1	2
79a	JN18A	* 71.56.56	2	1		94	JA5D	70.XII.1	2D	1	
79b	JN18B	LHR72.F4.3	1	1	2			* 71.60.5	2D	1	2
80	JN19A	* 71.53.9	?	1	1						
81	JN22B	* 71.60.5	4	1	1	95a	JB6A	* 71.56.12	SG	1	
82	JN23A	* 71.56.56	4	2	1	95b	JB6B	* 74.B3.5	SG	1	2
83	JN26D	*LHR72.F4.3	1	1	1	96	JB8A	* 71.56.6	1 or 2 burnt	1	1
84a	JN25	* 74.B1.1	1A	1		97	JC2A	* 71.53.9	NV8	1	1
84b	JN26A	* 74.A1.2	1	1		98a	JE1A/1	70.XVI.2	NV4	1	
84c	JN26B	*LHR72.F1.1	1	2				LHR72.F10.+	NV4	1	
		74.B1.4	1	1				* 71.53.9	NV4	1	
84d	JN26C/1	*LHR72.F1.1	1Ccc	2		98b	JE1A/2	* 71.56.53	2B	1	4
		LHR72.F4.6	1	1							
84e	JN26C/2	*LHR72.F1.1	1Ccc	2		99	JE4A	* 71.56.56	2E	1	1
84f	JN26C/3	71.56.6	1	3		100	JE5A	* 71.56.12	1B	1	1
		71.56.9	1	2							
		*LHR72.F4.10	1	1							

Type	Variant	Context	Ware	Number	Total	Type	Variant	Context	Ware	Number	Total
101	JM1	* 71.56.56	1	1	1	117d	L3A	* 71.56.46	SG	1	
102	JM1A	*LHR72.F4.11	1A	1	1	117e	L4A/1	*LHR72.F1.1	1	1	
103a	JM1B	* 71.56.6	1A	1		117f	L4A/2	* 71.56.42. .46	1A 1D	1 1	11
103b	JM1C	* 71.56.6	1A	1		Miscellaneous Vessels					
103c	JM1D	71.56.6 71.56.9 *LHR72.F4.10	1 or 1A 1 1A	1 2 1		118	B6	* 74.B1.1	?	1	1
103d	JM1H	*LHR72.F4.2	1	1	7	119	PA1	* 71.59.3	1A	1	1
104	JM2A	* 71.53.2	SG	1	1	LATER VESSELS					
105	JM2D	* 71.56.9	SG	3?	3	120	KA1A	* 71.59.5	NVcc	1	1
106	JS1A	* 71.53.2 .9 56.6	SG SG SG	1 2 1	4	121	KA2A	* 71.59.7	NVcc	1	1
107	JS1B	* 71.53.13 .15 56.6 .21 60.5	SG SG SG SG	1 1 1 1	4	122	BA1A	*LHR.F24.1	NV (failed 2 grey)		2
108	JS1C	* 71.56.41 60.5	SG SG	1 2	3	123	BCA1A	*LHR72.F21.3	NVcc	1	1
109	JS1D	* 74.A2.F1	SG	1	1	124	BF2A	* 71.60.5	NV	1	1
110a	JS2A	* 71.56.37	SG	2		125a	BF4A/1	* 71.60.5	NV4	1	
110b	JS2B	* 74.B1.1 * 74.B2.1	SG SG	1 1	4	125b	BF4A/2	* 74.B2.1	NV4	1	2
111	JS2C	* 74.B1.9	SG	1	1	126	BN2A	* 71.60.5	NV2	1	1
112	JS3A	* 71.60.5	SG	1	1	127	B04	* 74.B1.6	NV5	1	1
Dishes						128	KR1A	* 71.56.46	NV5	1	1
113	DB1A	*LHR72.F22.1	SG	1	1	129	DA1A	* 71.59.3	NVcc	1	1
114	DB2A	*LHR72.F21.2	1 burnt	1	1	130	DA1B	* 71.59.4	NVcc	1	1
115a	DM4B/1	* 71.56.9 .59	1C 1	1 1		131	DA1C	*LHR72.F21.3	NVcc	1	1
115b	DM4B/2	* 71.56.27 .35 74.B1.1	1C ? 1	1 1 1		132	DM1A	*LHR72.F22.1	NV	1	1
115c	DM4B/3	* 74.B1.1 B1.6	1C ?	1 1	7	133	DM2A	* 71.56.8	NV	1	1
116a	DS2A/1	* 71.53.13	1?	1		134	DM2B	* 71.59.4	NV	1	1
116b	DS2A/2	* 71.56.5	1?	1		135	DM3	* 71.59.3	NVcc	1	1
116c	DS2B	* 71.53.16	1?	1		136	DM5	* 70.IV.2	NV	1	1
116d	DS3B	* 74.B1.1	1	1	4	137	DS1A	*LHR72.F21.2	NV	1	1
Lids						138	DS3A	* 71.56.5	NV	1	1
117a	L1A/1	* 71.56.12 * 71.56.55 74.B2.1	1B 1D 1B	1 1 1		139	JA4A	* 71.60.5	NV4	1	1
117b	L1A/2	*LHR72.F1.1 F4.6	1D 1A	2 1		140	JA4B	* 71.56.9	?	1	1
117c	L2A	* 71.56.30	1?	1		141	JK7A	* 71.56.6	NV	1	1
						142	JC3A	* 74.B1.+	NV	1	1
						143	JK8A	* 71.59.7	NV	1	1
						144	JO1A	*LHR72.F21.3	NVcc	1	1

APPENDIX III

LIST OF LAYER-CODES AND CONTEXTS FOR DRAWN POTTERY

70.IV.2	upper filling of subsidiary bypass ditch, SE corner of Yard II (early third century)
70.XII.1	filling of gully in Yard I, with dog-burial 2 (Claudio-Neronian)
70.XVI.2	upper filling of NE ditch of Yard I (second century)
70.XXX.1	upper filling of SE ditch of Yard I (associated with fourth-century pottery)
70.XXXIV.3	greeny-grey soil in SE ditch of Yard I (Claudio-Neronian, possibly disturbed)
71.53.2	soot filling of Kiln 5 stokehole (Claudio-Neronian, but possibly disturbed)
71.53.7	gravel slipped into Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.9	greeny-grey material in Pit 1 (Claudio-Neronian assemblage, with post-military silting)
71.53.13	burnt material in lower filling of Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.15	silty gravel filling in Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.16	greeny-grey filling of hollow in filling of NW ditch of Yard I (Claudio-Neronian)
71.53.20	charcoal patch in filling of NW ditch of Yard I (Claudio-Neronian)
71.56.5	pebble consolidation in top of working terrace (Pit 7) (Claudio-Neronian assemblage, with later disturbance)
71.56.6	greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century)
71.56.7	sandy patch in filling of working terrace (Pit 7) (Claudio-Neronian)
71.56.8	filling of second-century gully W of Yard I
71.56.9	greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian moved in later second century)
71.56.11	sand-filled hollow in working terrace (Pit 7) (Claudio-Neronian)
71.56.12	hollow in working terrace (Pit 7) (Claudio-Neronian assemblage)
71.56.14	charcoal-filled hollow in working terrace (Pit 7) (Claudio-Neronian, but second-century disturbance)
71.56.16	filling of Kiln 8 (Claudio-Neronian)
71.56.21	sandy layer in E side of working terrace (Pit 7) (Claudio-Neronian)
71.56.22	gully down working terrace (Pit 7) (Claudio-Neronian assemblage, moved in second century)
71.56.27	industrial waste on working terrace (Pit 7) (Claudio-Neronian)
71.56.30	charcoal patch on working terrace (Pit 7) (Claudio-Neronian)
71.56.37	silt on bottom of working terrace (Pit 7) (Claudio-Neronian)
71.56.38	consolidation in top of Pit 5 (Claudio-Neronian)
71.56.41	greeny-grey silt in Pit 6 (Claudio-Neronian)
71.56.42	green silt in Pit 5 (Claudio-Neronian)
71.56.44	charcoal patch near bottom of Pit 6 (Claudio-Neronian)
71.56.46	sooty filling of hollow over limestone packing of Kiln 9 (Claudio-Neronian, disturbed)
71.56.53	spread from consolidation layer in top of Pit 6 (Claudio-Neronian)
71.56.55	charcoal patch on working terrace (Pit 7) (Claudio-Neronian)
71.56.56	silt at bottom of Pit 5 (Claudio-Neronian)
71.59.3	dark upper filling of Pit 8 in Yard II (fourth century)
71.59.4	fourth-century dumped material in Pit 8 in Yard II
71.59.5	clayey filling of Pit 8 in Yard II (fourth century)
71.59.7	black organic layer in Pit 8 in Yard II (third century)
71.60.3	upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century)
71.60.4	upper filling in Pit 3 (Claudio-Neronian assemblage, moved in fourth century)
71.60.5	fourth-century building-rubble in Pit 3)
71.60.6	primary silt in Pit 3 (Claudio-Neronian)
LHR72.F1.1	clay dump on Haul Road (Claudio-Neronian)
LHR72.F4.1	upper filling of Kiln 1 (Claudio-Neronian)
LHR72.F4.2	lower filling of Kiln 1 (Claudio-Neronian)
LHR72.F4.3	upper filling of stokehole of main kiln group 1-3 (Claudio-Neronian)
LHR72.F4.6	dumped layer in bottom of stokehole of Kilns 1-3 (Claudio-Neronian)
LHR72.F4.10	upper filling of Kiln 2 (Claudio-Neronian)
LHR72.F4.11	lower filling of Kiln 2 (Claudio-Neronian)
LHR72.F4.16	dumped clay in Kiln 2 (Claudio-Neronian)
LHR72.F5.1	upper filling of drainage ditch W of Kiln group 1-3 (Claudio-Neronian, perhaps disturbed)
LHR72.F6.+	topsoil over upper filling of drainage ditch W of Kiln group 1-3
LHR72.F8.+	upper filling of stokehole of Kiln group 1-3 (Claudio-Neronian, but not sealed)

LHR72.F9. +	topsoil over upper filling of drainage ditch W of Kiln group 1–3
LHR72.F9.1	upper filling of drainage ditch W of Kiln group 1–3 (Claudio-Neronian, perhaps disturbed)
LHR72.F21.2	filling of drainage ditch near Roman farm on Haul Road (second century)
LHR72.F21.3	upper filling of ditch near Roman farm on Haul Road (fourth century)
LHR72.F22.1	occupation debris over furnace on Roman farm (second century or later)
LHR72.F23.2	dark earth in upper filling of ditch adjacent to putative Kiln 29
LHR72.F24.1	upper filling of drainage ditch at W end of Haul Road (second century)
74.A1.2	upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century)
72.A1.F1	burnt gravel E of NW ditch of Yard I (unstratified)
74.B1. +	topsoil over NW ditch of Yard I
74.B1.1	upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century)
74.B1.3	charcoal patch in upper filling of NW ditch of Yard I (Claudio-Neronian, perhaps disturbed)
74.B1.6	filling of second-century gully W of Yard I
74.B1.9	top of NW ditch of Yard I (Claudio-Neronian, with fourth-century tipping)
74.B1.10	upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century)
74.B2.1	top of NW ditch of Yard I (Claudio-Neronian, with third- or fourth-century tipping)
74.B2.2	sandy layer in filling of NW ditch of Yard I (probably Claudio-Neronian)
74.B2.7	gully W of Yard I (late second century)
74.B2.9	filling of NW ditch of Yard I (Claudio-Neronian)
74.B2.10	upper filling of NW ditch of Yard I (Claudio-Neronian, disturbed in fourth century)
74.B3.5	dark patch near Kiln 13 (associated with fourth-century pottery)

APPENDIX IV

LIST OF LAYER-CODES AND CONTEXTS FOR POTTERY LISTED IN APPENDIX 2

70.IV.2	upper filling of subsidiary bypass ditch, SE corner of Yard I (early third century)
70.VI.5	greeny-grey filling of SE ditch of Yard II (Claudio-Neronian assemblage)
70.XII.1	filling of gully in Yard I, with Dog burial 2 (Claudio-Neronian)
70.XII.2	filling of gully in Yard I (Claudio-Neronian)
70.XIV.1	greeny-grey filling of NE ditch of Yard I (Claudio-Neronian disturbed)
70.XVI.2	upper filling of NE ditch of Yard I (second century)
70.XIX.2	filling of a gully in Yard I (Claudio-Neronian)
70.XIX.3	upper filling of ditch between Yards I and II (second or early third century)
70.XXII.3	filling of SE ditch of Yard II (associated with second-century pottery)
70.XXX.1	upper filling of SE ditch of Yard I (associated with fourth-century pottery)
70.XXXIV.3	greeny-grey soil in SE ditch of Yard I (Claudio-Neronian, possibly disturbed)
70.50. +	topsoil NW of Iron Age farm
70.50.8	greeny-grey stony gully filling in Yard I (second century)
71.53.1	Roman ploughsoil over Yard I
71.53.2	sooty filling of Kiln 5 stokehole (Claudio-Neronian, but possibly disturbed)
71.53.4	upper filling of ditch and Pit 1 at N corner of Yard I (Claudio-Neronian assemblage)
71.53.7	gravel slipped into Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.9	greeny-grey material in Pit 1 (Claudio-Neronian assemblage, with post-military silting)
71.53.10	brown stony filling of Pit 1 in N corner of Yard I (Claudio-Neronian)
71.53.13	burnt material in lower filling of Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.15	silty gravel filling in Pit 1 at N corner of Yard I (Claudio-Neronian)
71.53.16	greeny-grey filling of hollow in filling of NW ditch of Yard I (Claudio-Neronian)
71.53.19	hard brown earth lens within filling of main ditch at N corner of Yard I (probably Iron Age)
71.53.20	charcoal patch in filling of NW ditch of Yard I (Claudio-Neronian)
71.53.35	silted gravel in ditch at N corner of Yard I (presumed Iron Age, but Claudio-Neronian date not ruled out)
72.56.5	pebble consolidation in top of working terrace (Pit 7) (Claudio-Neronian assemblage, with later disturbance)
71.56.6	greeny-grey deposit on working terrace (Pit 7) (Claudio-Neronian, moved in late second century)
71.56.7	sandy patch in filling of working terrace (Pit 7) (Claudio-Neronian)
71.56.8	filling of second-century gully W of Yard I

- 71.56.9 greeny-grey deposit in gully on working terrace (Pit 7) (Claudio-Neronian, moved in late second century)
- 71.56.11 sand-filled hollow in working terrace (Pit 7) (Claudio-Neronian)
- 71.56.12 hollow in working terrace (Pit 7) (Claudio-Neronian assemblage)
- 71.56.14 charcoal-filled hollow in working terrace (Pit 7) (Claudio-Neronian, but second-century disturbance)
- 71.56.16 filling of Kiln 8 (Claudio-Neronian)
- 71.56.21 sandy layer in E side of working terrace (Pit 7) (Claudio-Neronian)
- 71.56.22 gully down working terrace (Pit 7) (Claudio-Neronian assemblage, moved in second century)
- 71.56.23 small pit in greeny-grey filling of working terrace (Pit 7) (Claudio-Neronian, but possibly disturbed in second century)
- 71.56.27 industrial waste on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.29 sandy layer on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.30 charcoal patch on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.35 rubble consolidation over Pit 6 (Claudio-Neronian assemblage)
- 71.56.37 silt on bottom of working terrace (Pit 7) (Claudio-Neronian)
- 71.56.38 consolidation in top of Pit 5 (Claudio-Neronian)
- 71.56.40 sandy layer on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.41 greeny-grey silt in Pit 6 (Claudio-Neronian)
- 71.56.42 green silt in Pit 5 (Claudio-Neronian)
- 71.56.44 charcoal patch near bottom of Pit 6 (Claudio-Neronian)
- 71.56.46 sooty filling of hollow over limestone packing of Kiln 9 (Claudio-Neronian, disturbed)
- 71.56.53 spread from consolidation layer in top of Pit 6 (Claudio-Neronian)
- 71.56.55 charcoal patch on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.56 silt at bottom of Pit 5 (Claudio-Neronian)
- 71.56.59 sandy silt on bottom of Pit 6 (Claudio-Neronian)
- 71.56.60 burnt area on working terrace (Pit 7) (Claudio-Neronian)
- 71.56.65 silt-filled hollow on bottom of working terrace (Pit 7) (Claudio-Neronian)
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- 71.59.4 fourth-century dumped material in Pit 8 in Yard II
- 71.59.5 clayey filling of Pit 8 in Yard II fourth century)
- 71.59.7 black organic layer in Pit I in Yard II (third century)
- 71.60.+ topsoil over Pit 3, outside W corner of Yard II
- 71.60.3 upper filling of Pit 3 (Claudio-Neronian assemblage, moved in fourth century)
- 71.60.4 upper filling in Pit 3 (Claudio-Neronian assemblage, moved in fourth century)
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- LHR72.F4.3 upper filling of stokehole of main Kiln group 1-3 (Claudio-Neronian)
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