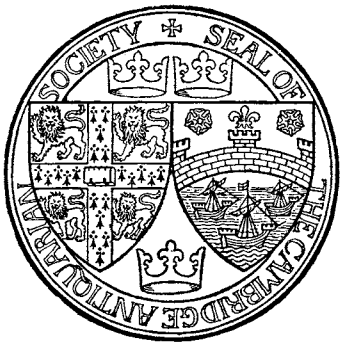
PROCEEDINGS
OF THE
CAMBRIDGE ANTIQUARIAN SOCIETY

(INCORPORATING THE CAMBS & HUNTS ARCHAEOLOGICAL SOCIETY)



VOLUME LX

JANUARY 1967 TO DECEMBER 1967

CAMBRIDGE
DEIGHTON BELL
1967

PROCEEDINGS OF THE CAMBRIDGE ANTIQUARIAN SOCIETY

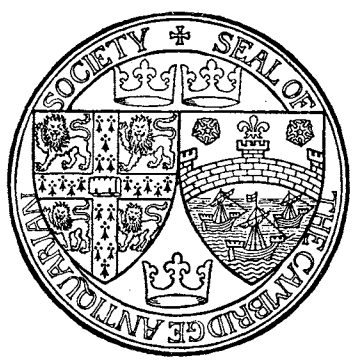
(INCORPORATING THE CAMBS & HUNTS ARCHAEOLOGICAL SOCIETY)

PROCEEDINGS

OF THE

CAMBRIDGE ANTIQUARIAN SOCIETY

(INCORPORATING THE CAMBS & HUNTS ARCHAEOLOGICAL SOCIETY)



VOLUME LX

JANUARY 1967 TO DECEMBER 1967

CAMBRIDGE
DEIGHTON BELL
1967

Published for the Cambridge Antiquarian Society (incorporating the Cambs and Hunts Archaeological Society) by Deighton Bell, 13 Trinity Street, Cambridge

Printed in Great Britain at the University Printing House, Cambridge

CONTENTS

Proc. Camb. Ant. Soc. Vol. LX (1967), pp. 39-80.

EXCAVATIONS AT HOCKWOLD-CUM-WILTON, NORFOLK, 1961-62

PETER SALWAY, F.S.A.

[*This paper is published with the aid of a grant from the Ministry of Public Building and Works.*]

THIS report describes excavations carried out on behalf of the then Ministry of Works at Grange Farm, Hockwold, for six weeks in 1961 and five weeks in the following year (Fig. 1). A R.A.F. vertical air photograph had revealed an extensive system of rectilinear crop- and relief-marks straddling the intended course of the new Cut-Off Channel,[1] a major fen drain intended to relieve flood-pressure from the rivers entering the Fenland Basin from the east, of which other sections were already under construction for the Great Ouse River Board. The work was therefore planned by the Ministry as a rescue operation. Permission to dig was given in 1961 by Mr O. Peacock and in 1962 by the River Board, to whom the land required for the Channel and its banks had passed. To both of these our thanks are due. To the River Board thanks are also due for supplying large-scale plans of the area and of the projected works and for general co-operation throughout.

Grateful thanks are owed to all who worked on the excavations, particularly the assistant supervisors, Mr Christopher Potter, Mr Aidan Macdonald and Mrs Gillian Salway, to the farmers who provided camping sites, Mr O. Peacock and the late Mr A. W. Simpson, and to the officers and men of the U.S.A.F. stationed at R.A.F. Mildenhall, and especially their base commander Colonel Thomas C. Kelly, for an immense amount of practical assistance of every kind. In addition I am much indebted to the various people who have provided specialist reports and whose names are recorded in the appropriate places, and especially to Mr Leslie Cram who was present on the excavation for the whole of the second season.

THE SITES

Further aerial reconnaissance in 1961 by Dr J. K. St Joseph and by myself revealed that the crop- and relief-marks noticed on the R.A.F. photograph taken during the floods of 1947 (Pl. VII) formed the central elements of a continuous complex stretching for nearly a mile and a half. The excavations were concentrated on the central elements, which seemed likely to produce occupation material: this area is plotted on Fig. 2. The bulk of the marks lay on the lower slopes of the chalk ridge

[1] *J.R.S.* LII (1962), p. 177. fig. 24, has been rendered obsolete by new photographs and further interpretation, and should be disregarded. The centre of the area is at approximately TL 710883.

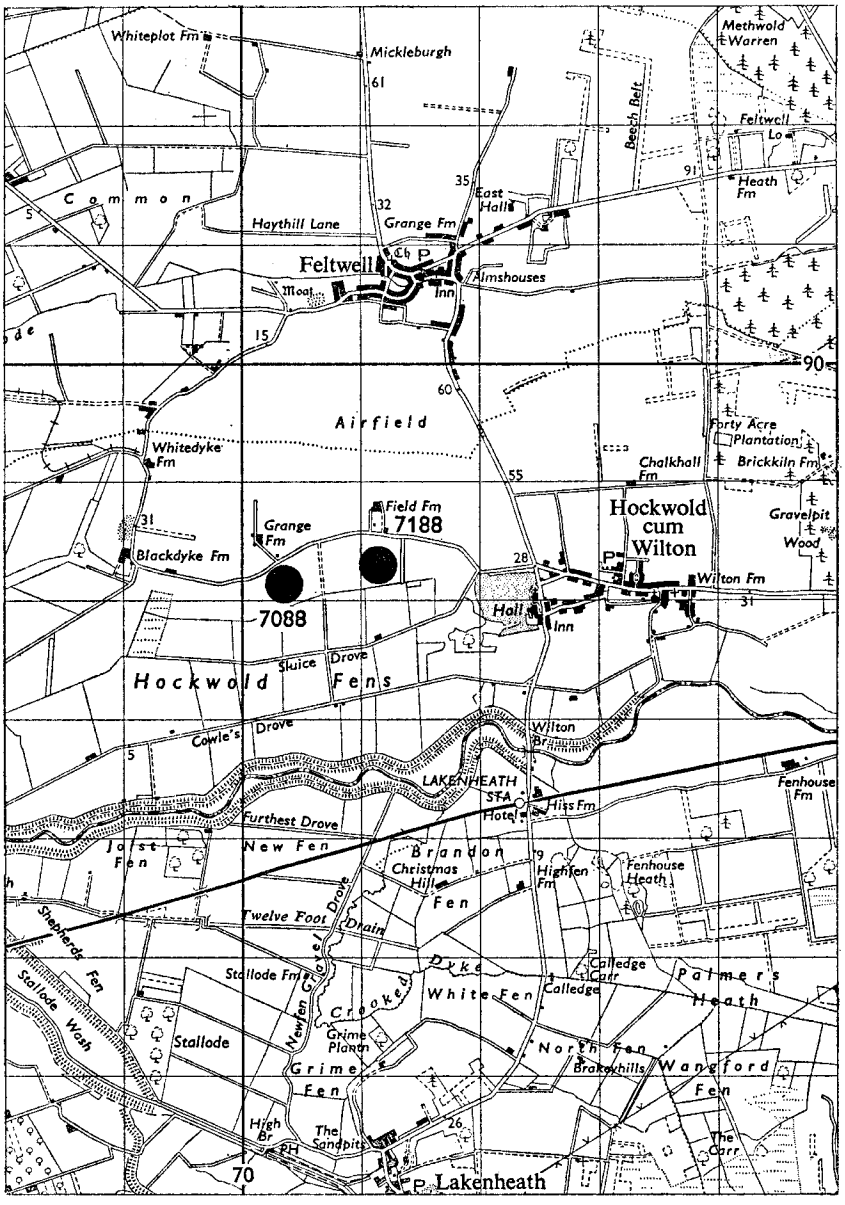


Fig. 1. Situation of the Hockwold sites 7088 and 7188. (Reproduced from the 1 in. Ordnance Survey Map, sheet 135, by permission of the Director General.)

forming the north side of the mouth of the Little Ouse valley as it opens out into the fens. These lower slopes are so gentle that they form a sort of shelf or platform about 500 yards wide at between about 10 and 15 ft. O.D., just above the probable ancient limit of peat fen, nowadays represented by pockets of peat in the natural and artificial hollows in and south of the shelf. The probable Roman origin of the marks was suspected both from their similarity to other Fenland sites (though on a larger scale) and by reports of the finding of Roman material in the vicinity (for example a

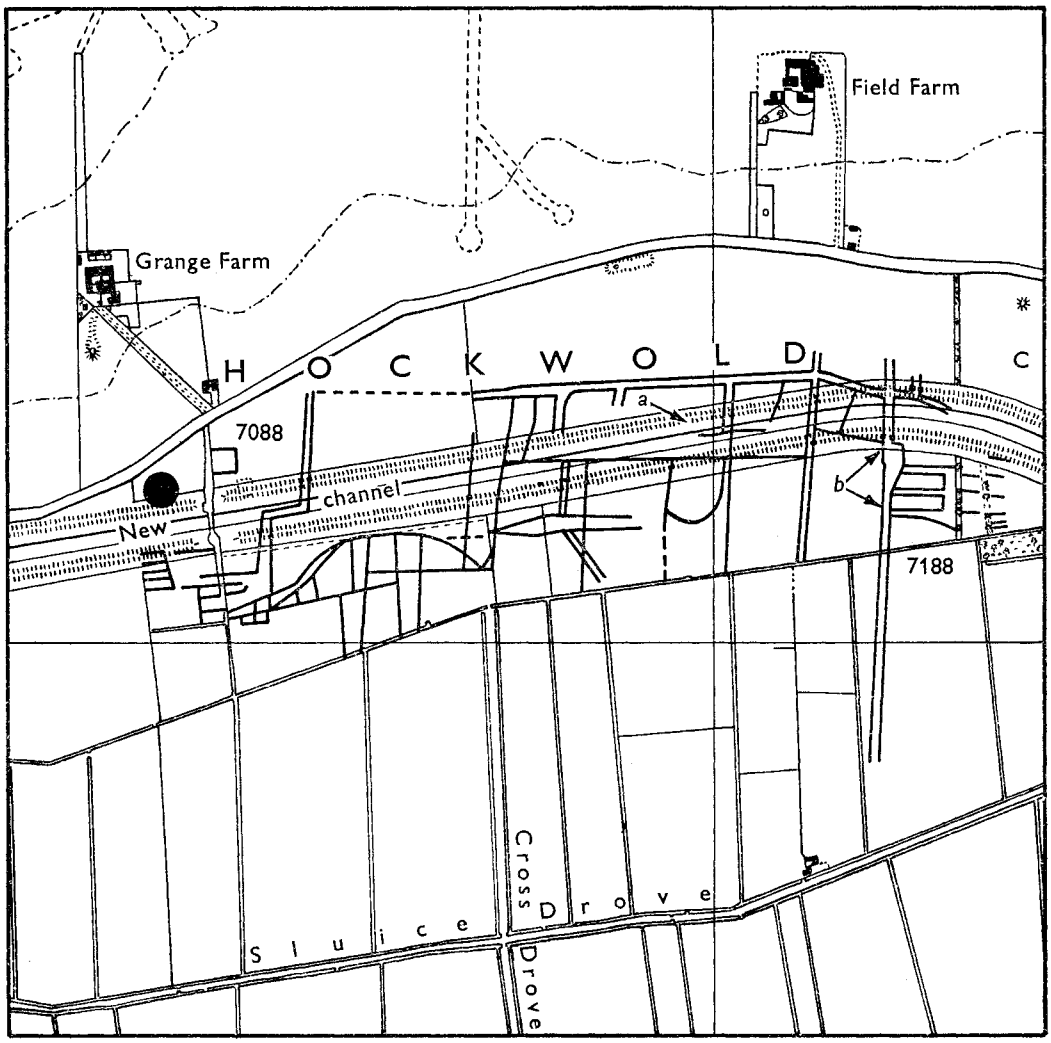


Fig. 2. Plan of the central part of the Hockwold sites, from the air photographs taken by the R.A.F. and Dr J. K. S. St Joseph. The solid circle marks the approximate point from which a substantial quantity of tiles has been reported. (The base-map is reproduced from the 6 in. Ordnance Survey Map by permission of the Director General.)

cremation, apparently from the western end of the area,[1] and a puddingstone quern from somewhere on Grange Farm (see Small Finds list, under site 7188, area *b*, no. 15)). Surface finds were not forthcoming because the fields had been little ploughed and were at the time of the investigation under grass over the whole of the central area, but we were to learn from Mrs S. J. Hallam after the excavations were completed that a substantial number of Roman tiles had been found south of Grange Farm at the western end of the central area (see Fig. 2). This is sufficiently unusual in the Fenland to indicate a substantial building, likely in a Fen-Edge context to be a villa or a bath-house (which may, as at Little Oulsham Drove, Feltwell, imply a villa as well).

[1] Information from the late R. R. Clarke.

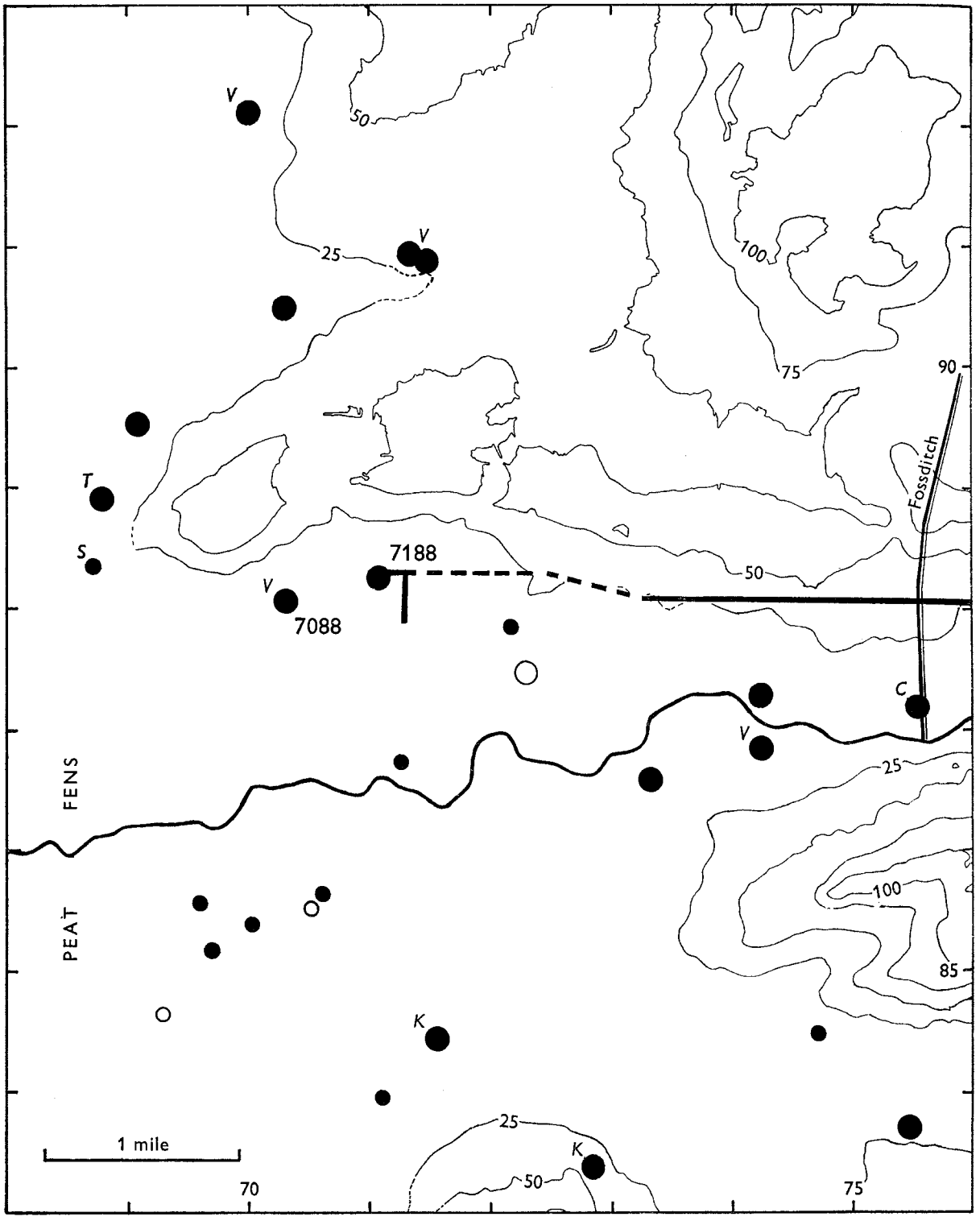


Fig. 3. Roman occupation at the mouth of the Little Ouse valley. *Large circles*, occupation sites; *small circles*, isolated finds; *open circles*, not definitely of Imperial period. 7088, Hockwold, Peacock's Bridge; 7188, Hockwold, Grange Farm east; *V*, villas and probable villas; *T*, Sawbench temple; *S*, Hockwold Treasure (silver); *C*, Wilton crowns; *K*, sites with kilns.

A glance at Fig. 3 will show that such a siting of Roman occupation between the high ground and the peat fen was normal for the district and Mr John Bromwich and I shall be showing in the forthcoming Royal Geographical Society research memoir on the Roman Fenland that this pattern was the regular one around the margins of the Southern Fenland. It emphasizes the *attraction* of the Fens for settlers in the Roman period. There are no actual settlement sites on the peat fen but they cluster close around the edge, more or less ignoring the slightly higher ground behind. In the Little Ouse Valley this higher ground is chalk or breckland and can hardly have been such dense forest as to deter settlement. There must have been a positive pull towards the fen, likely to have been the abundance of wildfowl, eels, fish and rich pasture for cattle, horses and sheep. The settlements *may* have grown corn on the higher ground, but there is no sign of field-systems and at Hockwold the ditch-marks run down towards the fen, not up onto the ridge.

The ditch-marks of the central area at Hockwold seemed to fall into two distinct parts. At the western end there was a complex just east of the find-spot of the tiles, bounded by a road or track winding in a general north–south direction. In the Royal Geographical Society memoir this area is called site 7088 (Grange Farm, Peacock's Bridge) and this number will be used for convenience in this report. This site was separated by an open space, bounded on the south by enclosures, from the main block of crop-marks 250 yards to the east. These latter are roughly rectilinear in the manner of many Fenland Roman settlements and seem to depend upon an east–west road which must surely be a continuation (perhaps the end) of the so-called Drove Road (Margary 332). At the eastern end of the site there is a branch from this road running south in the direction of the river, perhaps a route by which travellers along the Drove Road could pick up water transport for a journey further into the Fens. As visible from the air and—in the summer of 1961—on the ground, this block of crop-marks covered about 40 acres almost entirely south of the east–west road, but there were traces of cross-roads projecting north of it and it seems probable that the site formerly extended further north where heavier ploughing has erased all trace. This site as a whole has been numbered 7188 (Grange Farm east).

The chief tasks which these sites presented were to confirm their suspected Roman date, to discover whether site 7188 was a block of agricultural enclosures ('Celtic fields'?) or a large settlement (if so, the largest yet known in the Fenland), and to ascertain if the whole development was occupied at the same time. In addition it was desirable to learn as much as possible about the nature and standard of the occupation.

THE EXCAVATIONS

In 1961 work was concentrated on large-scale excavation at the eastern end of site 7188 (area *b*—see Figs. 2 and 10). In 1962 the opposite end of the site (area *a*—see Figs. 2 and 7) was tested on a smaller scale and extensive area excavation undertaken in the south-eastern part of site 7088 (area 2—see Figs. 4 and 6). Also in 1962, to the north of this latter area, one of the hollows which are a feature of the landscape

was examined by deep trenching (area 1), and also one side of a rectangular enclosure was investigated (the rest lying outside the area available for excavation). The area of the suspected villa was not excavated because the information about the find of tiles did not reach us until after the end of our second season.

SITE 7088, AREA 1

Before excavation the features of this site were a large, roughly rectangular hollow, represented schematically on Fig. 4, and north-west of it the surface indication of what appeared to be a shallow ditch forming part of a rectangular (probably square) enclosure, the west side of which was obscured by a modern track.

Large-scale trenching in the hollow down to the natural chalk proved that it was originally much wider. It was almost certainly irregular in shape and natural in origin, like the many depressions which show up so clearly on the R.A.F. air photograph (Pl. VII). The rectangular shape on the surface is probably due to comparatively recent cleaning out, perhaps as a cattle-pond. On the natural chalk surface at the bottom of the hollow (Fig. 5, layer *B*), and in pits cut into it, were many flint flakes, some rather poor tools and one good tanged and barbed arrowhead, suggesting a Neolithic/Early Bronze Age working site, supported by the discovery of scraps of Secondary Neolithic and Beaker pottery (see *Pottery Report*). Numerous pieces of wooden stakes lying tumbled in the fill of pit VI (Fig. 5) suggested some form of shelter. Molluscs from a depression in the surface of the chalk suggested an environment characterized by thin woodland or bush with some open spaces and there were no signs of marsh life (see p. 71, below). In the *Animal Bone Report* (p. 75 ff.) bones associated with Neolithic material have been kept separate from those associated with the Bronze Age, and this has suggested that the Neolithic woodland may have decreased in the Early Bronze Age, but there is no way of proving any break or change in occupation or, for that matter, a very lengthy overall period of life for the site. For Fenland history the most significant feature is the indication of a comparatively dry period in which such hollows were habitable, doubtless providing a comfortable shelter from the wind.

This is in sharp contrast to the picture presented by upper layers in the section. Layers 9, 10*a*, 10*b*, *A* and *B* all represent clayey deposits clearly water-borne. Though this is not the Blue Clay of the Bronze Age Fen marine transgression, it does represent a wet phase or phases stratigraphically comparable to it on this site just off the edge of the fen proper. Above this, around the rim, is layer 4, a loam deposit perhaps indicating a brief dryer period, followed by the extremely interesting shelly layers 3*a* and 3*b*. 3*b* was not only extremely rich in molluscs indicating wet marshy conditions but also produced fragments of probably fairly late Iron Age pottery. It therefore seems certain that in the Iron Age the hollow was a shallow pond or patch of marsh. The variety of molluscs suggested variations in the degree of marshiness, perhaps due to drying out in summer. It was probably in such a dry period that a ditch was cut through layer 3*b*. However, instead of this ditch filling with the shelly deposit, it and much of the pond layers were covered by a very heavy grey chalky

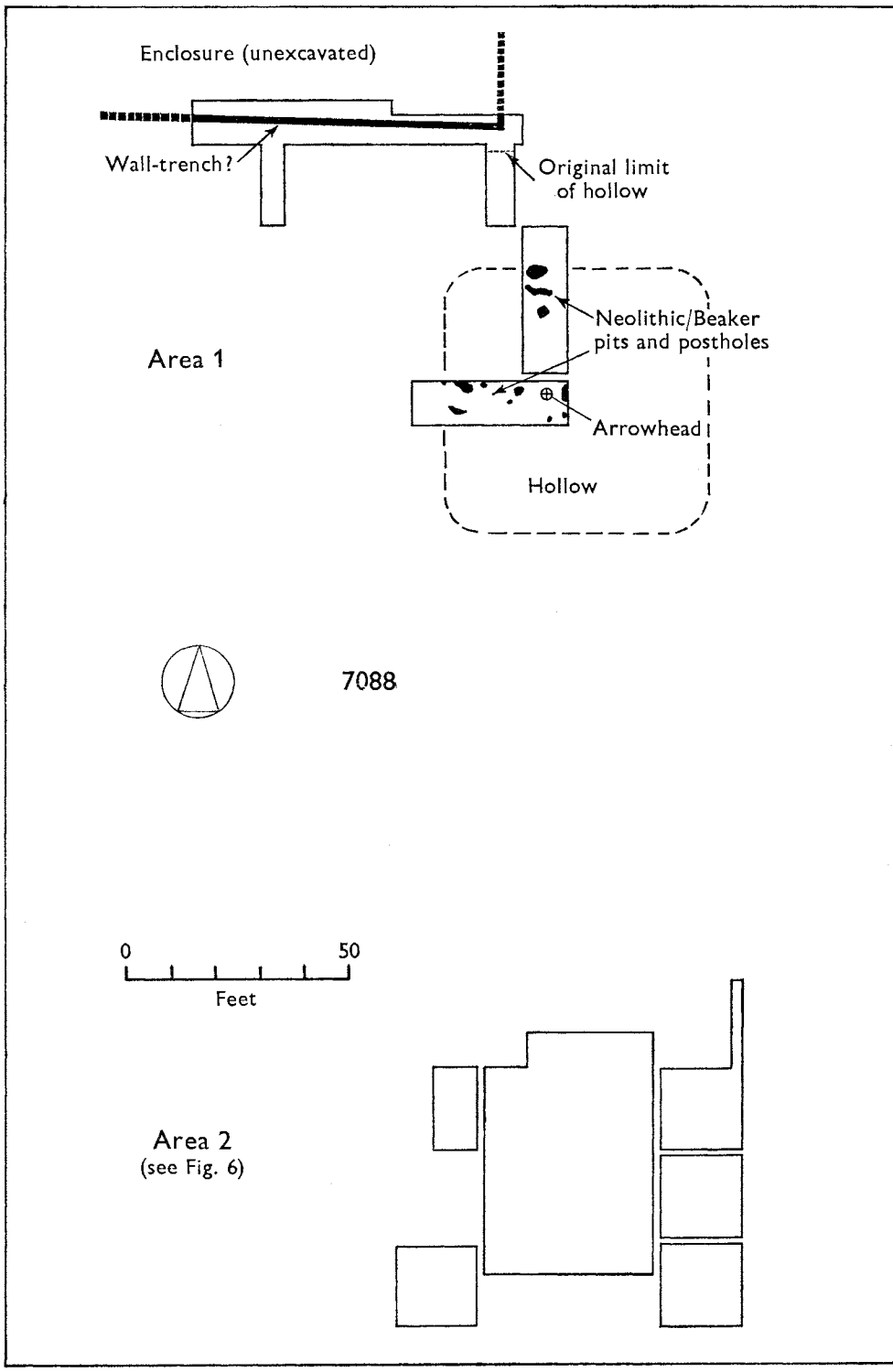


Fig. 4. Site 7088: plan of trenches, showing relationship between areas 1 and 2.

silt, indicating considerable erosion of the surrounding chalk and probably of the ridge behind the site as well. This contained a very few scraps of possibly Roman pottery—the pond proper had no Roman material.

Excavation of the shallow ditch marking the only side of the rectangular enclosure within the area available for excavation revealed a flat-bottomed, cleanly cut trench into the chalk, in places no more than 6 in. deep and varying between 18 in. and 2 ft. in width. At the west end there were clear signs that it had subsequently been cleared or robbed out. There seems little doubt that it represents the footings trench

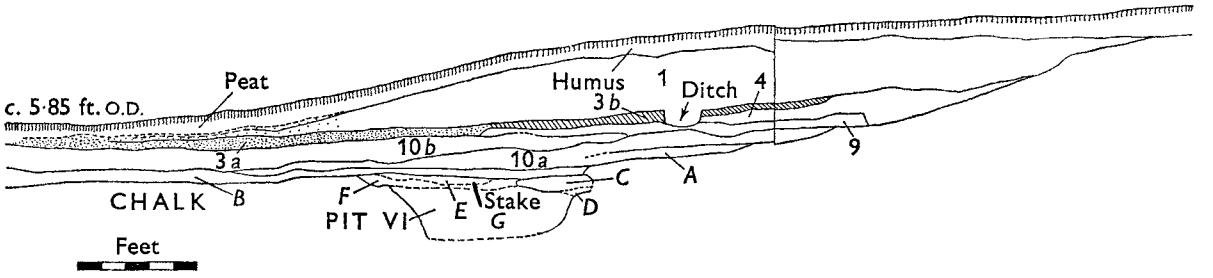


Fig. 5. Site 7088, area 1. Section of north half of natural hollow in chalk, showing relation of Iron Age Pond to earlier and later deposits (right-hand end of section projected from next north–south trench). 1, Light grey chalk-flecked silt, probably wash from hill-slope to north; 3*a*, dark peaty layer with very large number of shells and some Iron Age pottery; 3*b*, clayey grey-black layer with shells and flecks of carbonized wood (3*a*, *b*, *Iron Age pond*); 4, clayey brown loam; 9, light grey clay with chalk lumps; 10*b*, dark grey clay, small chalk lumps and fragments of wood, rather peaty and clearly infiltrated by water from above; 10*a*, dark grey clay, small chalk lumps and fragments of wood; *A*, dark grey clay and much chalk rubble; *B*, medium grey clay, flecked with chalk, *sealing extensive spread of Secondary Neolithic/Beaker occupation debris on chalk surface*; *C*, heavy grey-black mixture of clay, carbonized wood and flecks of chalk; *D*, lighter grey-blue mixture of clay, carbonized wood and flecks of chalk; *E*, dark grey-brown band of clay containing carbonized and uncarbonized wood and chalk; *F*, light grey chalky clay and chalk rubble; *G*, main fill of pit VI: grey moist clay and chalk débris (*C–G*, fill of pit: *Secondary Neolithic/Beaker occupation debris*).

for a narrow wall of which it is not surprising to find in this Fenland country that every scrap of material has been removed. There was absolutely no dating material, but the temptation is to associate the enclosure with the supposed villa.

SITE 7088, AREA 2

The finds from this area give little assistance in determining the relative dating of the various features. This has to be done chiefly by considering the relation of them one to another. The earliest features seem to be the irregular series of postholes marked *A* on Fig. 6, overlain by the Roman track or road and cut by its side-ditch, and the three pits marked *A* 2 and *A* 3. The postholes formed no recognizable pattern (unless they were part of a palisade much renewed) and were filled with yellow clay and sometimes levelled with sand. There were no finds from the body of the postholes. At the top of some of them there was a little black ashy material, apparently debris from Roman structures. The pits *A* 2 were similarly filled with yellow clay and

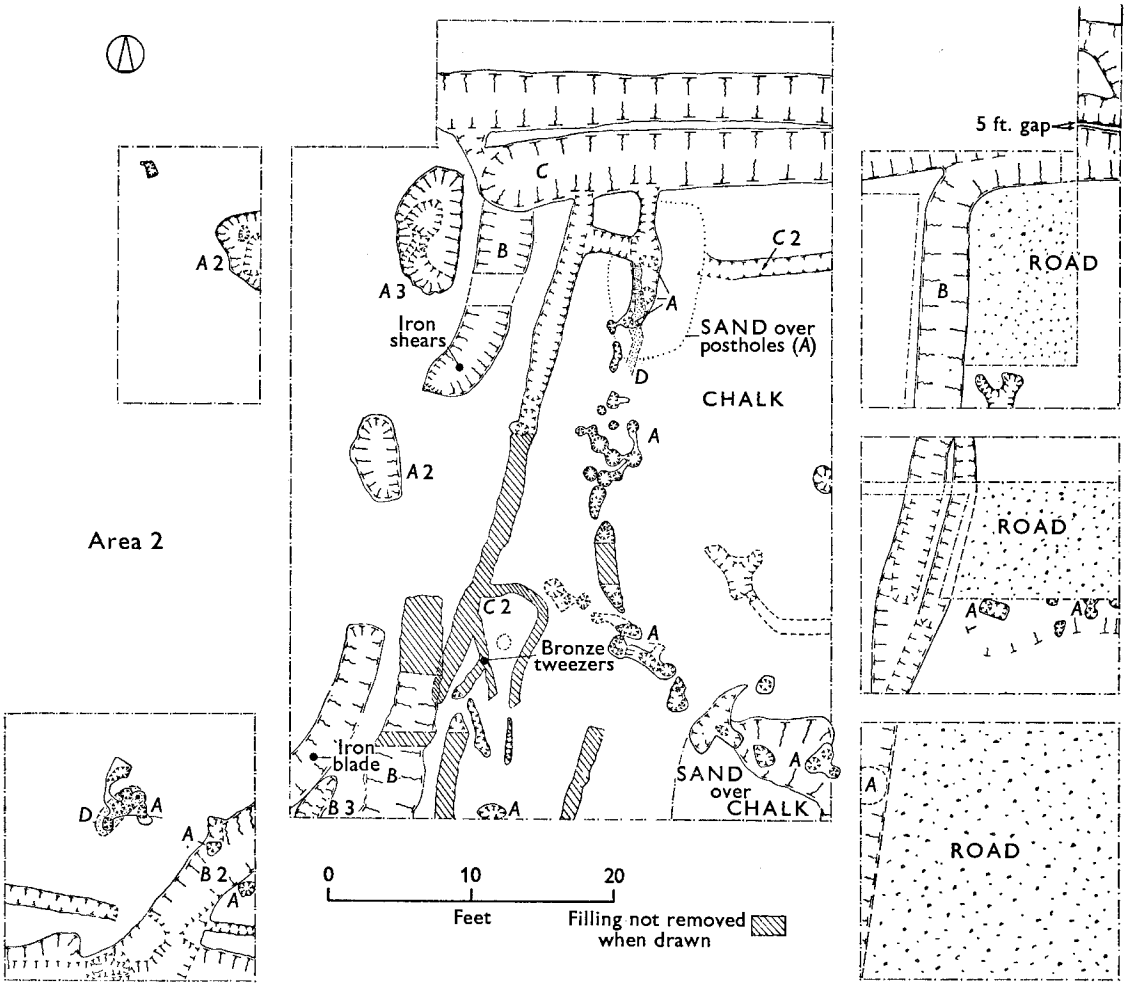


Fig. 6. Site 7088, area 2.

sand, and Pit *A* 3 with yellow clay containing worked flints similar to those from area 1, including a flint 'saw', probably a Beaker pottery-impressing tool. There is no way of knowing whether these flints have any significance for dating the pit or whether they came in with the filling material. The impression given by the whole series is that the posts were removed from the postholes and they and the pits deliberately filled and levelled, presumably in preparation for Roman occupation. This implies that the pits were open and the posts standing when Roman occupation started, however derelict their condition might have been. Since the beginning of Roman occupation will be shown to be probably in the second century it is difficult to put the features discussed earlier than the first century A.D. If the pottery from the pond in area 1 is connected with the same occupation it follows that that is probably first century as well.

The earliest Roman features on the site seem to be the road or track and its side-

ditch (*B*) and the curved ditches *B* and *B* 2, though their relative dating cannot be discovered. *B* 3 is perhaps in the same series, having the same fill as the neighbouring ditches *B* and *B* 2. The structure of the road was simply beaten earth and chalk, very hard. The next features seem to have been the large double ditch *C* draining into the road-ditch and the associated gulleys *C* 2. These gulleys had much wattle-and-daub and ash in their fill, clearly debris from Roman buildings which the gulleys had presumably served. There was no sign of walls, postholes or sleeper trenches. This baffling lack of structural remains is not uncommon on Fenland sites, where the former presence of buildings is clearly proven by the presence of wattle-and-daub. It is almost certainly to be explained in terms of the unpublished discoveries at Welney Washes (site 5394) and those made by Lady Briscoe at Wangford (site 7583)[1] where the structures were founded on low sill walls of clay. At the latter site timber framework and wattling seems only to have been present in the upper part of the building, so that no postholes or sleeper trenches will have been necessary. Very little disturbance of the surface will have been necessary to destroy such a structure completely and make recovery of its ground-plan impossible.

The latest feature was a fragment of a gutter (*D*) near the centre of the site overlying the gulley complex *C*, and possibly of the same phase was a shallow pit also marked *D* in the south-west corner. About the dating of the Roman occupation as a whole it is not easy to be precise, of particular features impossible. There seems some reason to put the primary fill of the road-ditch into the second century, perhaps the first half (*Pottery Report*, Group D), and the presence of a small quantity of second-century samian and three coarse sherds from widely separated spots which can be paralleled in the mid-second-century Group I makes occupation in the second century reasonably certain. The presence of a single sherd of first-century samian seems too slender a foundation on which to build a first-century occupation, particularly as it came from the upper fill of the road-ditch, and the absence of all but a single sherd of Castor ware makes occupation in the late second century or third to any extent unlikely. Occupation probably lasted after A.D. 160 but not very far.

The nature of this area's occupation is obscure. The ditch-system *B* and *B* 2 seems to be part of an enclosure (with an entrance) which presumably lay to the west. The road is perhaps contemporary with this. Subsequently gulleys and ditches were dug, leading into the road-ditch and it seems highly likely that a wattle-and-daub building stood between the gulley-system *C* 2 and the road. If there was a villa to the north-west, this was probably the area of farm buildings and farm workers' cottages.

SITE 7188, AREA *a*

This area was examined to see whether the centre of the main block of crop-marks was occupied like the eastern end (area *b*). Excavation was concentrated on a slight rise in the ground which seemed most likely to produce domestic occupation. The earliest feature identified was in fact at the lowest point of the area (Fig. 7). This was

[1] *Proc. C.A.S.* LI (1957), pp. 19 ff.

a wicker-lined storage pit in trench Q 13/15 containing a large portion of the rear end of a cow and Iron Age pottery (*Pottery Report*, no. F 4). The pot itself suggests a simple forerunner of the Colchester olla type (*Camulodunum*, pp. 271 ff.) and can perhaps be reasonably put into the first century. The possibility that in a Fenland context such a type might have overlapped into the Roman period cannot be ruled out. A single fragment of rough-cast ware (A.D. 80–180 in north Britain) came from this pit, and may or may not have been a stray.

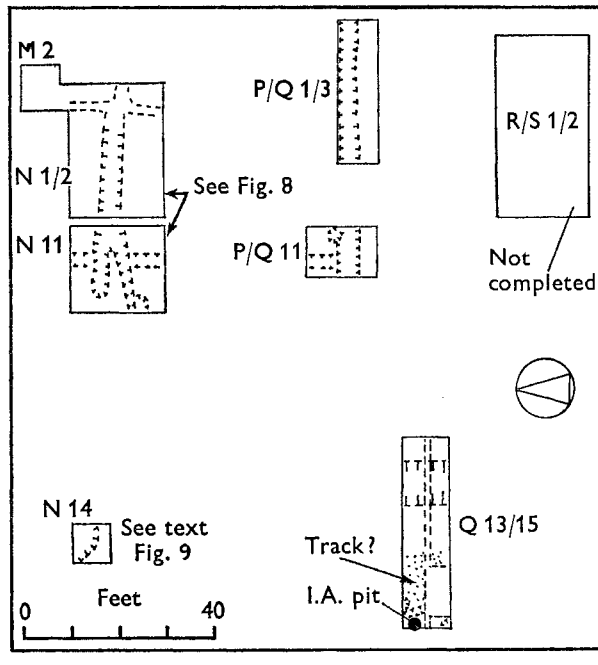


Fig. 7. Site 7188, area *a*.

All the ditches illustrated (Figs. 7 and 8) contained Roman material which could not be dated sufficiently closely to allow differential dating of the individual features. In trench N 11 the earliest feature seemed to be the shallow trench *A* which had traces of a possible sleeper trench down the middle. This was cut by the large ditch *B*, which also cut a ditch or trench *A* 2 in the adjacent excavation. This ditch *B* was clearly intended to improve drainage and was entirely filled with chalky silt, containing fragments of wattle-and-daub. This latter suggests some sort of a structure in the middle period. Subsequent to the ditch *B* becoming completely choked with silt there was some structural activity over it marked by the soil-marks and streaks of wattle-and-daub *C*. It is not clear what relation with this was represented by the gulley and postholes *C* 2 or by the soil-marks (or probable ditch system) *D*. Besides the streaks of wattle-and-daub there was also a large quantity of the same material in the topsoil over these two trenches *N* 11 and *N* 1/2, indicating a structure at a late stage in the occupation. The most remarkable feature of the immediate area

was the 'hoard' of samian in the depression *C* 3, in the baulk north of it, and beyond in trench M 2.

In trench P/Q 11 the trench found in N 11 seemed to continue (though no sign of the supposed sleeper trench was detected). This was cut by a deep ditch, which continued in trench P/Q 1/3, where it contained a large quantity of coarse pottery, and which perhaps corresponded with ditch *B*. Parts of other ditches were found in R/S 1/2, but they did not obviously correspond to those in the other trenches.

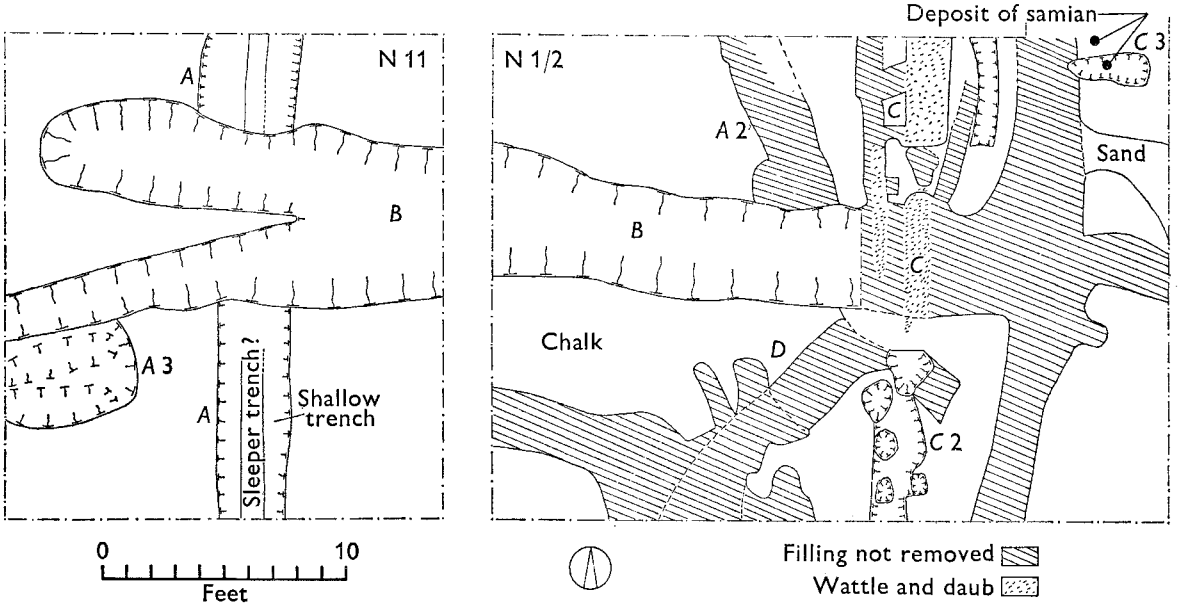


Fig. 8. Site 7188, part of area *a*.

Further possible evidence of an Iron Age occupation were two sherds of native pottery from the ditch in P/Q 1/3, but as in the 'Iron Age Pit' there was also Roman material present, this time in large amounts. The group of pottery from the north-east corner of the area, including the remarkable and surely deliberately preserved samian, was largely Antonine despite containing a single 'heirloom' bowl of Flavian-Trajanic date. This group included colour-coated material of the late second or early third century and possibly of the third century proper. Apart from a single first-century fragment from topsoil all the rest of the samian from this area could be of the second half of the second century. The general impression of occupation in the middle and second half of the second century is strengthened by the pots from the ditch which ran through P/Q 1/3 and P/Q 11 (nos J 4, J 11 and J 14 in the *Pottery Report*). The same ditch also produced Rhenish ware, which cannot be dated before the late second century. In addition, from this ditch and from various other points in the area came pottery which can be paralleled in group I in the *Pottery Report* which appears to be dateable to the Antonine period.

Perhaps the most interesting feature in Area *a* was the pit in trench N 14 which

seems to have acted as a sump. As the section (Fig. 9) shows, after the pit had already received a considerable deposit the pottery of Group H was dropped into it. This group cannot be dated earlier than A.D. 190 and it should probably be put into the third century. The group was sealed by a deposit apparently representing weathering of the chalk under quiet conditions and containing large quantities of willow leaves (see *Organic Material Report*). Above this was a mixture of peat and silt, topped by a thick deposit of unmixed peat. This gave a radiocarbon date of

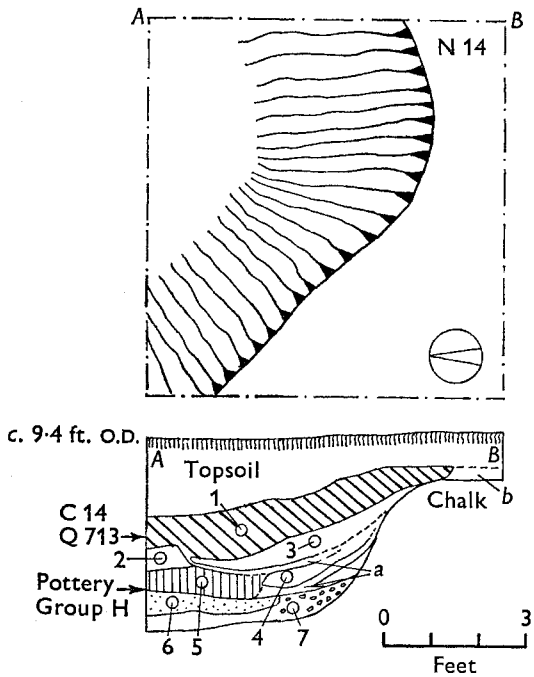


Fig. 9. Site 7188, area *a*, trench N 14. 1, Peat; 2, peat and loose grey clay; 3, grey silt with flecks of chalk; 4, similar to 3, but slightly darker; 5, loose dark grey-brown silty chalk mud, with marsh plants; 6, light sand with flecks of chalk; 7, dark grey clay with chalk; *a*, dark brown peaty loam; *b*, dark brown loam

A.D. 239 ± 145 (Q 713), which indicates that the peat in this pit and probably in the hollows elsewhere at Hockwold formed not later than the end of the fifth century. It is therefore a Late Antique rather than a Medieval feature and may have started as early as the third century.

Summarizing briefly, it is clear that there were structures of more than one date in the Roman period and that Roman occupation was active in the Antonine age, starting about the middle of the second century and probably continuing into the early third. The small finds do not suggest a very high standard of life and the 'hoard' of samian suggest that it was regarded as very precious and kept a long time. It seems, indeed, that the Flavian-Trajanic bowl was kept till the end of the occupation, since the 'hoard', which was mostly just below topsoil, must date from a late stage. Perhaps the most important small find was no. 12, the iron plough coulter, in Roman Britain

most commonly associated with towns and villas, in other words the more Romanized types of settlement. The only other place in the southern Fenlands producing a coulter is Wimblington, site 4692, where, as at Hockwold, there is some evidence for a more substantial structure than the norm in Fenland settlements, raising suspicion of a villa.

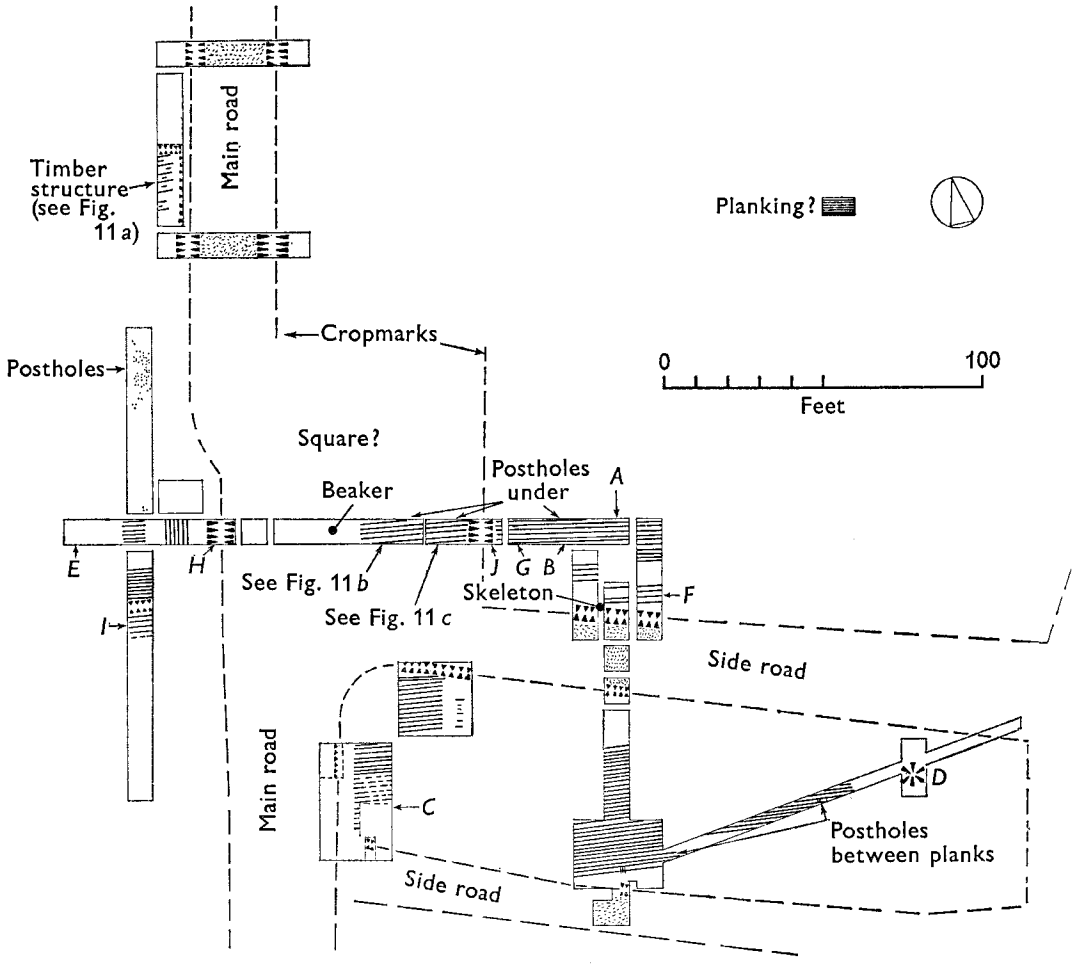


Fig. 10. Site 7188, area *b*.

SITE 7188, AREA *b* (Fig. 10)

Early occupation in this area is indicated by the discovery of the long-necked Beaker (*Pottery Report*, F 1) from a small pit in the natural chalk and a scatter of flints (hammer-stones, flakes and tools similar to those found on site 7088) well spread over the area. The small number of flints found (19 stratified and 19 in topsoil) and the fact that there was no concentration indicates that the main focus of occupation was not found. This area, however, seems too far from 7088 for these flints to be merely strays. This part of the Hockwold sites is notable on the surface for being

rather more low-lying than the rest and marked by pockets of peat becoming more pronounced southwards. North of the area excavated the chalk bedrock comes to the surface, but over much of the area itself the chalk is covered by a substantial deposit of clean sand. This sand sealed the pit containing the Beaker and from it came the only other stratified fragment of Beaker pottery (F 2) and a few of the flints. It seems probable that this sand was deposited during or after the Early Bronze Age, while a *terminus ante quem* is provided by the Roman ditches cut into it. No later Bronze Age or Iron Age material was found either in the sand or elsewhere in this area.

In 1961 before excavation started the cropmarks seen on the air photographs (Pls. VII–IX) were clearly visible on the ground as contrasting areas of parched grass and rank weeds. A resistivity survey by the Ministry of Works and a gradiometer survey by the Department of Geodesy and Geophysics of the University of Cambridge both confirmed the evidence of the cropmarks. The marks seemed to indicate a north–south road, broadening at one point, and a series of side-roads joining it from the east. Excavation was aimed at examining these features and determining what lay beside and between them.

The main road may not have been the earliest Roman occupation in this area. An early ditch, displaying two phases, was discovered under the body of the road. This ditch had clearly been open for some time, as it was filled with the chalky silt characteristic of the Hockwold sites. There was, however, no dating evidence. The main road itself was 19 ft. across, well cambered and provided with highly irregular side-ditches varying in their width from 3 to 12 ft. In their original form the ditches were shallow, flat-bottomed cuttings between 1 ft. 9 in. and 2 ft. 3 in. deep, but the eastern ditch had been recut a further 9 in. down to a rather more angular profile. The body of the road consisted of a single layer of very hard rammed chalk and earth laid directly on the natural chalk and a foot thick at the centre. No significant quantity of dating material was recovered from the road material or the ditches. A trench on the western side of the road revealed traces of a fairly lightly built timber structure, roughly but not exactly aligned on the road. This perhaps represents a veranda in front of a more substantial structure (Fig. 11 *a*).

Of the side-roads only the northern was examined to its full width. It proved to be 20 ft. wide, and the southern ditch, which was examined in detail, was 4 ft. 6 in. wide and 3 ft. deep with a fairly angular profile. The ditches had probably originally been cut fairly close to a V-shape. The ditches were cut into the clean sand overlying the natural chalk and the material lifted was spread out to form the road surface without any bottoming. These side-roads were thus simply sandy tracks and there was no evidence that they had taken heavy traffic. It was, however, clear from the large quantity of pottery in the ditches that there had been fairly intense occupation alongside these roads. An idea of the date when these roads were constructed can be obtained from the fairly extensive group of pottery from the primary silting of the north ditch of the northern road (*Pottery Report*, group I). This group seems to be Antonine, probably around the middle of the second century. The ditch was later re-cut, but from below the re-cutting and above the primary silt came a barbotine

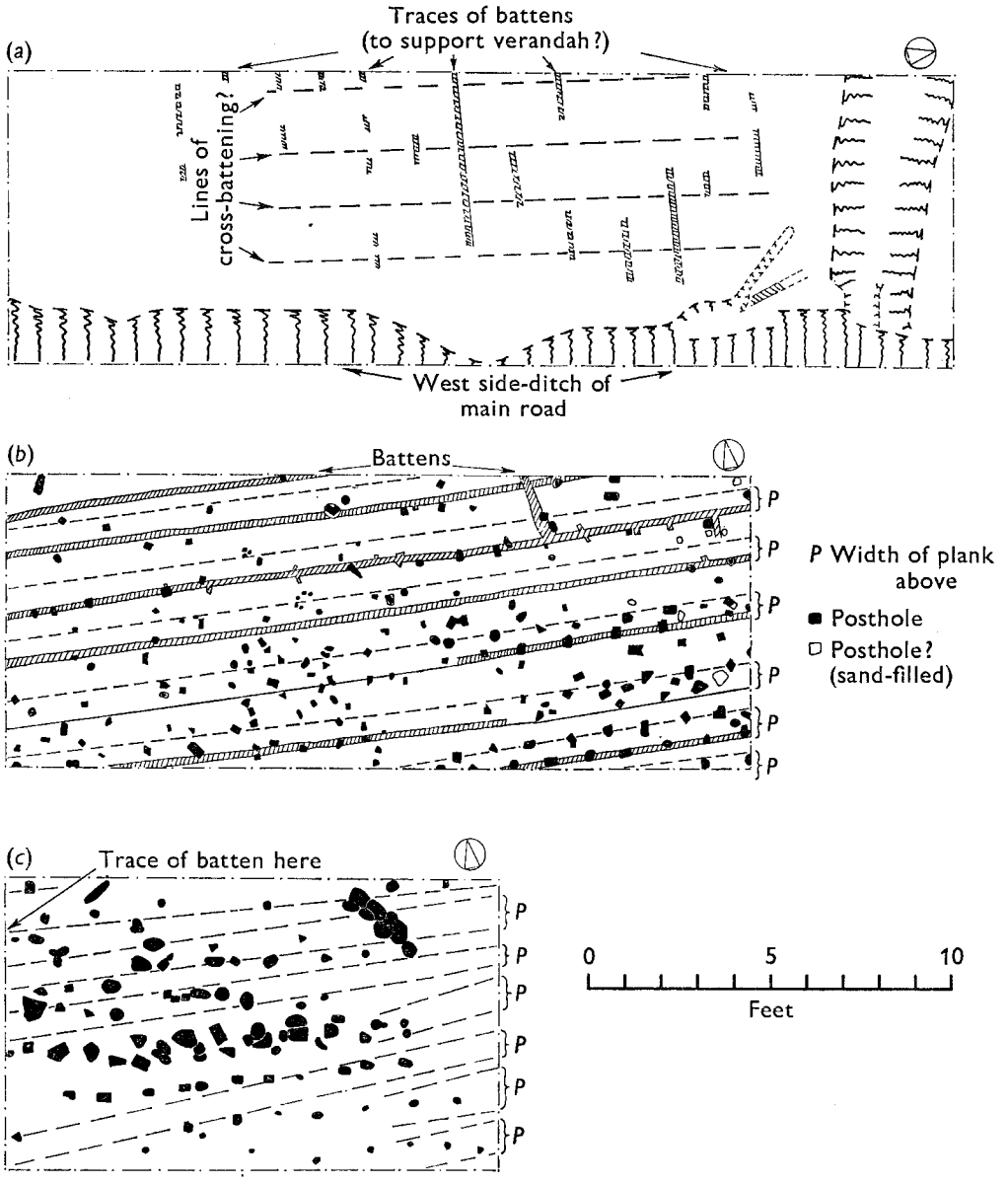


Fig. 11 *a–c*. Site 7188, area *a*. Timber constructions (see Fig. 10 and Pl. X).

jar of about A.D. 150 (J 6), Late Flavian/Antonine samian and a mortarium (J 1) of the second half of the second century (probably fairly late in it). From the southern ditch a peat layer sealing the primary silt produced part of a small rough-cast beaker which in north Britain would be dated between A.D. 110 and 180. No Castor ware came from the road-ditches. It may be surmised that the ditches had completely silted up with their chalky wash by or probably before the end of the second century.

The contents of the silts in the main-road and side-road ditches help to illuminate

settlement conditions. In the *Report on Organic Material* Mr Sparks, commenting on the molluscs from the primary silting of the northern ditch of the southern side-road, says that 'this could be the deposit of something like a slow-moving peaty fen drain'. Of the grey chalky silt in the east ditch of the main road, which can perhaps be taken as typical of this deposit which is present over much of the Hockwold sites, he says 'this seems to be a deposit of a very small and perhaps rather muddy slow stream, with some marsh adjacent, though this may have been no more than a yard-wide strip adjoining the stream'. It is clear that life on this site must have involved a continuous struggle against damp, fen-like conditions. This is underlined by the re-cutting of ditches and the fact that all of them filled up to the top with the grey chalky sediment. No brackish mollusca were found, nor any undoubted Holocene foraminifera, so there is no question of a marine transgression directly affecting the site. As in the pit in area *a* everything points to slow silting in quiet conditions, resulting eventually in the site becoming largely waterlogged.

Structural traces of the occupation of this period are few, but some at least of the postholes shown on Figs. 11 *b* and *c* are clearly not related to the later timber structures above. It is not possible to isolate any significant patterns, but their position in the presumed open space or 'square' might suggest market stalls. The postholes found at the western edge of the area a little back from the main road may also date from this occupation-period. There were also slight traces of early occupation in the south-west corner south of the point marked '*I*' on Fig. 10. Over the rest of the excavation postholes were occasionally found between the later features, but these features were not removed to a sufficient depth to be sure that further postholes did not lie beneath them. Further evidence for structures of this period is provided by the discovery of wattle-and-daub in the primary silt of the northern ditch of the northern side-road and, higher up, in the re-cut part of the same ditch. It was also found under the later timber structures in the same part of the site.

We have already noted that the road-ditches became completely filled with chalky silt. There is some reason to suppose that this marks a period of abandonment, presumably in the late second century, and was either a result or a cause of that abandonment. The gap in occupation is made more probable by the situation in which the human skeleton marked on Fig. 10 was found. This was lying on one side on the lip of the northern ditch of the northern road, completely buried in the silt which had spilled over from the ditch. It was clear that it had not been interred but had lain as an unburied corpse until eventually covered with sediment from the overflowing watercourse. Evidently the later builders were quite unaware of the skeleton which was by then entirely concealed. Presumably at the same time, the main road was covered by a layer of the grey chalky silt, suggesting that at times it was impassable. It is possible that traffic through the settlement ceased temporarily, though perhaps only in the winter.

The resumption of regular traffic seems to be implied by the re-surfacing of the road on top of the silt. It seems likely that this was done at the same time as the re-occupation marked by the remarkable constructions of the final period. Over large

areas of the site were traces of what appeared to be planking. Where the chalk came up to topsoil these were present as dark marks on the chalk surface; where the subsoil was sand they appeared as flat-bottomed, vertical-sided trenches filled with dark brown material and varying slightly in size but averaging 9 in. across and 3 in. deep (Pl. X). It was not possible to explore under these features everywhere, and one point where such an investigation was made (Fig. 11*c*) showed only earlier, unrelated postholes, but in at least one area (Fig. 11*b*) there was a corresponding series of narrow battens with some vertical pegs. This seems to confirm the interpretation of the plank-like marks above as a form of timber structure. Over the earlier ditches the 'planking' was not preserved—which in view of subsidence is not surprising—but it ran over the lip of the excavated ditch of the southern side-road. It seems certain that the ditches were by this time full of silt and no longer in use. It is clear that the 'planking' covered too large an area to represent a single building. It is likely that it represents an attempt to consolidate a large patch of wet ground. There was no direct trace of any buildings which may have stood on this substructure, but the presence of wattle-and-daub in the topsoil is a strong indication that they did exist. This cannot be debris from the earlier buildings, as there was no sign of disturbance through the 'planking' to the layers below. The dating of this phase is difficult. The quantity of pottery associated with it was small, suggesting only a brief occupation. There was one sherd of Castor, datable not earlier than A.D. 190, associated with the 'planking'. Moreover, three-quarters of all the colour-coated pottery found came from topsoil, as against only half of the samian. It seems likely that this occupation is to be dated to the very end of the second century or early third, though this is no more than an impression. What is clear is that it only lasted a short time.

AREA K (Sluice Drove)

South-east of site 7188 and probably dependent on it are a further series of crop-marks, chiefly a large irregular enclosure marked *K* on Pl. VII. Excavation was carried out here by Colonel Kelly in 1962 without positive results. There was no evidence for habitation and only a few fragments of Iron Age or Roman pottery were recovered. It seemed probable that this was an agricultural area, possibly an enclosure for cattle.

SOME CONCLUSIONS ON THE ROMAN OCCUPATION

The evidence presented in the foregoing sections shows that the large area excavated at the eastern end of site 7188 and the smaller area in the centre were both the site of occupation in the Roman period and at the same time. This makes it reasonably certain that the 40-acre block of crop-marks represents a single settlement and quite clear that this is not a field-system. Although the life of site 7088 is not so well dated it is clear that at least for part of the second century this was occupied at the same time as 7188. It seems worth while making the suggestion that in the Antonine period

the relation between these sites was that of villa and vicus, or manor house and village. There is a very strong possibility that on the other side of the valley there was a similar relationship between sites 7486 (Brandon, Fenhouse Farm) and 7386 (Brandon, Hiss Farm). The complete absence of coins from the Hockwold sites suggests an economy based on service and payments in kind and perhaps indicates a village of dependent labourers rather than an independent settlement. This pattern of villa estates was perhaps characteristic of the Little Ouse Valley, but it does not of course preclude the area coming at some time under a wider Fenland Imperial Estate.

The crop-marks show no signs of 'Celtic fields'. West of site 7088 air photographs show some large rectilinear enclosures of more than one period but these do not look like arable field systems except in one part. The presence of grain and of millstones and querns on the site does not, of course, prove that corn was grown here; but the plough coulter indicates some arable farming. The animal bones may give a clue to the economy. These are studied in detail in the *Report on Animal Bones* below. In summary it is clear that not only were cattle the most numerous but they supplied the bulk of the meat eaten. Sheep or goats became much more common than in previous periods and the object of keeping them was probably wool. Pigs were fewer than had earlier been the case, reflecting a decrease in forest and growth of settled farming land. Horses were numerous and the manner in which their bones were scattered over the sites equally with the other animal bones suggests that they too were killed for food. Some of these animals may have been allowed to range freely on the fen in the summer or been kept in the large enclosures to the west and south-east, others were perhaps penned in the small enclosures which link site 7088 to site 7188. Elsewhere in the Fenland the pattern is normally a cluster of small enclosures like gardens or stockyards around the settlement nucleus, with large open spaces, sometimes delineated by running ditches, between the settlements. The picture is of a pastoral rather than an arable landscape. The conclusions here drawn about the type of agriculture practised would fit the Fenland region as a whole.

This occupation seems to have superseded an Iron Age or 'native' occupation, and from the evidence for demolitions and levelling on site 7088 it seems likely that it followed on fairly closely in time though not necessarily indicating continuous occupation. Although it is not easy to determine a starting date for site 7088 there is nothing inconsistent with a beginning for the two sites together in the middle of the second century. The single sherd of Castor from 7088 suggests that the site survived after about A.D. 160, but probably not very long after. On site 7188, however, there is some evidence for survival into the early third century, with an interruption on at least one part of the site (and probably the whole) due to waterlogging in the later second century. The short life of the site in the third century after the large-scale attempt at restoration remains somewhat of a puzzle, but it seems likely that a renewed onset of waterlogging made the site uninhabitable. Similar abandonment of sites at about this time was happening over much of the southern Fenland and it is therefore not surprising here. There is no evidence that these Hockwold sites were ever occupied again.

APPENDIX

In his discussion of the course of Iter V of the Antonine Itinerary, Mr Margary has indicated that the roads between *Icinos* (almost certainly Venta Icenorum, Caistor-next-Norwich) and *Durolipons* (probably Cambridge) need a good deal of supposition.[1] He postulates a road from Tasburgh through New Buckenham to Thetford to provide a link between Caistor and the Icknield way, and places *Camboricum* or *Camboritum*, which comes between *Icinos* and *Durolipons* in the Itinerary, at Icklingham on the Lark. The Itinerary distances between *Icinos* and *Camboritum* and *Camboritum* and *Durolipons* are 35 and 25 Roman miles respectively, the actual distances about $35\frac{1}{2}$ and 26. Given the uncertainty about the actual roads, this would seem to be a reasonable identification. Some doubts, however, are raised by the nature of the Roman occupation at Icklingham, which seems at present to have been a villa with a number of kilns. This does not seem very appropriate as a road station, if the Itinerary really represents official tours. In general the points on the Itinerary seem to be rather more substantial settlements. It seems worth raising the possibility that the route in fact went further north, via the 'Drove Road' (Margary 332) and then by water or along the bank of the Little Ouse Roddon to join Akeman Street near Littleport, thence to Cambridge. This would put *Camboritum* at Hockwold, though the actual distances (about 39 and 29 Roman miles) are rather further from the text. In the early third century, apparently after the supposed villa site was out of action, the main settlement at Hockwold was the subject of extensive, if short-lived, works, and as the largest of the Fenland settlements it may have been a suitable point for an inspecting official to halt. The name itself ('the ford at the bend in the river') gives no help, for although Icklingham is the point at which the Icknield Way crosses the Lark, at Hockwold too there is a road running towards the river (the Little Ouse here), heading close to a crossing of some antiquity. The Iron Age material from Hockwold indicates native occupation in the area and the presence in the immediate neighbourhood of the Joist Fen and Lakenheath finds of Icenian coins and the discovery of the first-century Hockwold Treasure hoard of Roman silver, probably loot in the troubles of A.D. 47, a few hundred yards west of site 7088, all suggest that Hockwold was already a centre of some importance before the Roman settlement was founded. The importance of Hockwold as a centre of population is undoubted, but the name can only remain a very tentative suggestion.

THE FINDS

POTTERY

SITE 7088, AREA I (see Fig. 12)

(i) *Neolithic and Bronze Age*

From the natural hollow in the chalk, found in pits into the chalk and form the chalk surface (see Fig. 5).

A 1. Large black cooking pot, from pit VII.
A 2. Cream-coloured Beaker pottery, from pit III.
A 3. Secondary Neolithic bowl (?), black, from pit II.
A 4. Very friable cream-coloured pot, from pit VII.
A 5. Grey pot, from pit VI.
A 6. Black pot in a shelly fabric, very thin wall, from pit VII.
A 7. Pot in a gritty black fabric with a creamy-brown surface.
A 8. Heavily-cordoned black pot.

Sherds A 2–8 are too small to estimate the rim diameters accurately.

[1] *Roman Roads in Britain*, I (1955), pp. 245 f.

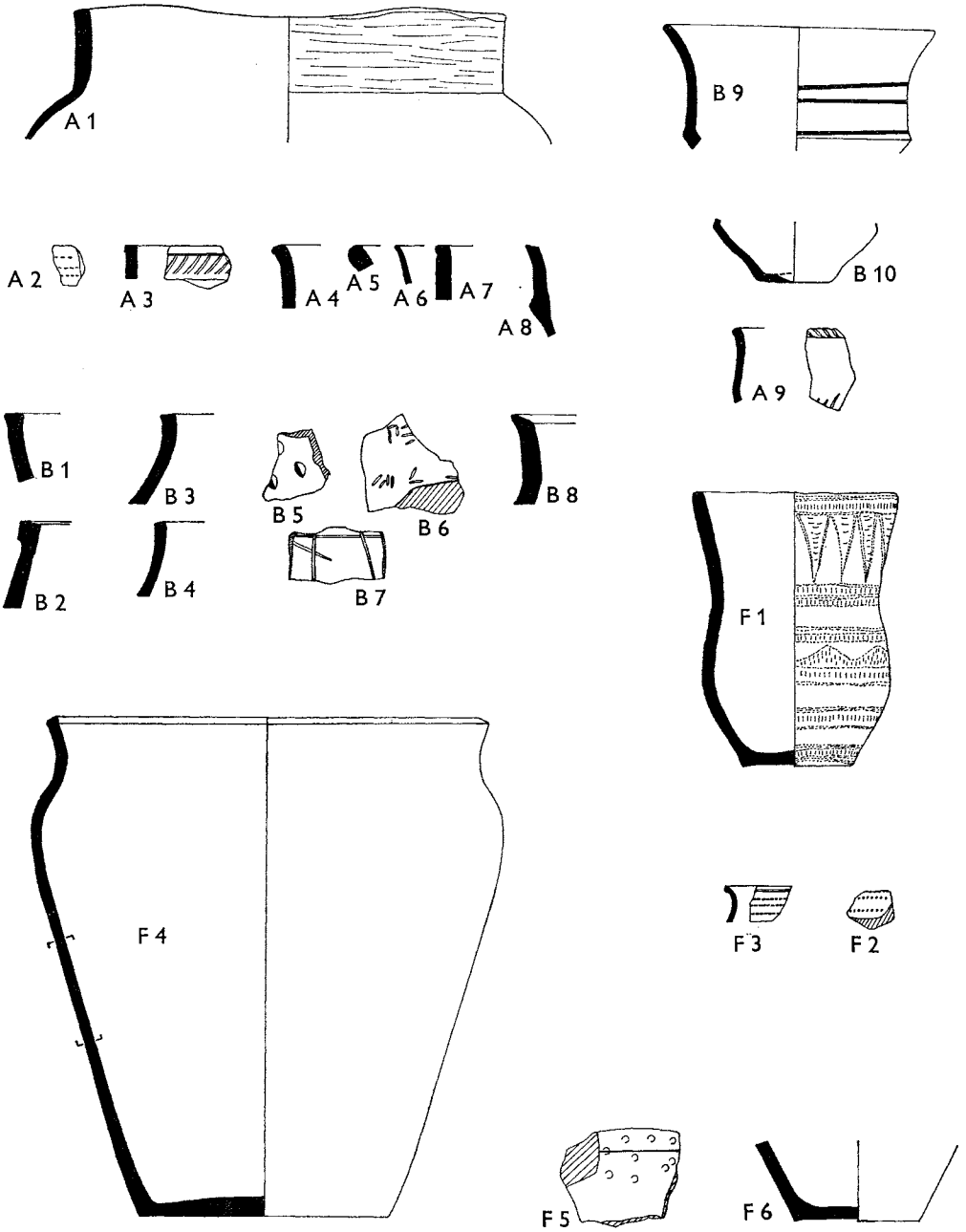


Fig. 12. Neolithic, Bronze Age and Iron Age pottery. Scale ¼.

(ii) *From layer 4 in the hollow* (see Fig. 5)

A 9. Grey jar (?) with cord-type decoration on rim—date?

(iii) *Iron Age*

From layers 2 and 3 in the hollow (see Fig. 5).

B 1. Buff-grey dish, shelly fabric, rim diameter *c.* 12 in., from layer 3.

B 2. Grey cooking pot, very shelly fabric, rim diameter *c.* 11 in., from layer 3.
B 3. Grey jar, rim diameter *c.* 12 in., from layer 2.
B 4. Grey jar, rim diameter *c.* 6 in., from layer 3.
B 5. Buff pot, thumbnail decoration, from layer 3.
B 6. Buff pot, impressed decoration, from layer 3.
B 7. Brown sandy pot, incised decoration, from layer 3.
B 8. Heavy jar in grey fabric, slightly greasy dark grey surface, from layer 3.
B 9. Dark grey bowl, from layer 3.
B 10. Base of a dark grey bowl, from layer 3.

SITE 7088, AREA 2

C. *Samian and colour-coated wares*

Only a very small quantity of samian came from area 2 (11 sherds). Most of it came from topsoil, or was otherwise unstratified, or from the grey chalky wash present over most of the site and subsequent to the occupation. One sherd of a second-century Dragendorff Form 33 came from the fill of the ditch marked 'B 2' on Fig. 6, from the vicinity of the findspot of the iron blade. The supper fill of the road-ditch produced a single small sherd of what appeared to be a form 29, presumably not dateable after A.D. 85, However, in view of the probably second-century date of the primary fill of this ditch this fragment is perhaps from an 'heirloom'. Decorated samian is extremely rare on all these sites: indeed, except for two fragments of the lip of a barbotine-decorated vessel, probably from the same pot, this is the sole example from area 2.

There was only one unmistakable sherd of colour-coated ware from area 2, a fragment of a Castor vessel of uncertain shape. This came from burnt material near the ditch-complex marked 'C 2' on Fig. 6.

D. *Stratified group of Roman coarse pottery* (see Fig. 13)

From primary fill at bottom of road ditch (see Fig. 6).
D 1. Buff cooking pot, micaceous sheen on surface.
D 2. Jar, orange surface, creamy-grey fabric.
D 3. Wide-mouthed grey cooking pot.
D 4. Black dish, greasy surface, burnished decoration.
D 5. Cooking pot in grey fabric, black burnished surface with micaceous sheen.
D 6. Orange storage jar, grey core, rim diameter 13 in.
D 7. Grey jar, rim diameter $11\frac{1}{2}$ in.
D 8. Grey jar, rim diameter 7 in.
D 9. Small dark grey cooking pot, micaceous sheen on surface.
D 10. Dark grey lid, diameter 6 in.
D 11. Buff mortarium, similar to a mortarium found at Caistor-next-Norwich in a pit filled in the second century but containing much Flavian material (*Caistor*,[1] R 2 facing p. 230, and p. 210). A second-century date, perhaps in the first half of the century, seems likely. It is worth noting that the large surviving portion makes it virtually certain that the vessel was unstamped. Two fragments of a similar mortarium came from topsoil on site 7188, area *a* (K. F. Hartley).
D 12. (Not illustrated.) Base of a jar in pink shell-gritted ware.

It is not possible to be certain about the date of this group. There is no obviously early material and it seems reasonable to follow the dating of D11 and put it into the second century, perhaps the first half.

Caistor = D. Atkinson, 'Roman Pottery from Caistor-next-Norwich', *Norfolk Archaeology*, XXVI (1938), pp. 197–230.

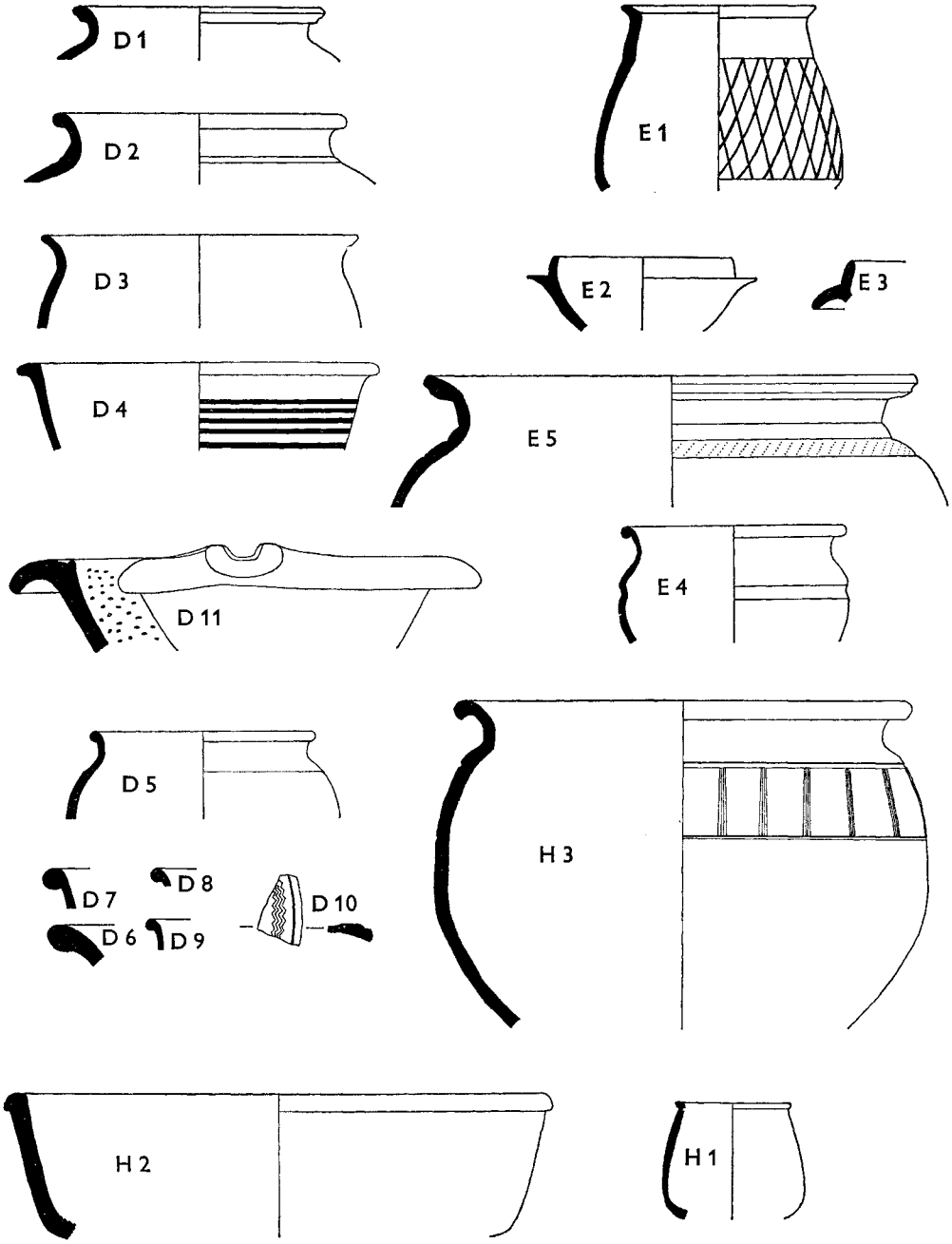


Fig. 13. Roman pottery from site 7088, area 2, and site 7188, area *a*. Scale ¼.

E. *Miscellaneous Roman coarse pottery from area 2* (see Fig. 13)

E 1. Very dark grey wide-mouthed jar, from one of the gutters.

E 2. Small bowl in hard grey ware with a micaceous sheen, from chalk wash above Roman occupation level.

E 3. Grey flanged bowl, rim diameter excluding flange 7½ in., from upper part of road ditch fill.

E 4. Wide-mouthed jar in hard dark grey ware with a little mica, from road ditch fill.

E 5. Buff storage jar with pinkish interior and punched decoration, from phase C 2 gutter running north–south in centre of area 2.

SITE 7188

(i) *Bronze Age* (see Fig. 12)

F 1. Long-necked beaker, from small pit in natural chalk in area *b*, see Fig. 10.

F 2. Beaker pottery, from clean sand over chalk in area *b*.

F 3. Beaker pottery, not securely stratified, from area *b*.

(ii) *Iron Age* (see Fig. 12)

F 4. Large black wide-mouthed jar, from Iron Age pit in area *a*.

F 5. Very friable pottery in black fabric with grey-brown surface and stamped decoration, found (probably as a rubbish survival) with large quantity of Roman pottery in fill of southern east–west ditch in area *a*, trench P/Q 1/3.

F 6. Base in same fabric and from same place as F 5, but not necessarily the same pot (two other, rougher bases came from the same deposit).

It is possible that this pottery of Iron Age type was manufactured in the Roman period, but the existence of an Iron Age horizon without any mixture of Roman material on site 7088 suggests that site 7188 may also have had a pre-Roman Iron Age occupation.

G. *Samian and colour-coated wares*

In all the areas excavated on the two sites the largest amount of samian came from 7188 area *a*, though this (just under 100 sherds) was still infinitesimal compared with the coarse pottery. All the samian except two pieces was certainly of second-century date. Those two pieces were a large part of a Dragendorff Form 37 of Flavian/Trajanic date and a small section of a Dragendorff Form 29, presumably not later than about A.D. 85. The fact that these two pieces comprise about one-third of all the decorated samian found in these excavations suggests that they might well have been preserved as precious pieces from a previous home. Apart from these pieces it would not be impossible to put the samian as a whole into the second half of the second century. An interesting feature was that a considerable proportion of the samian came from a single small area in the north-east corner of trench N 1/2, the balk between it and M 2 (and a little way from this in the north-east corner of M 2 itself). Most of it came from a depression in the chalk, forming a group that included all the best pieces from these excavations, including the Form 37 already mentioned, a large portion of another of Antonine date and an almost complete large Form 33 probably to be similarly dated. This concentration is so unusual on these sites that the possibility of deliberate concealment arises.

The quantity of colour-coated pottery from 7188 area *a* was very small, being only a third as much as the samian. Of this quantity only a quarter was in Castor white fabric. From the same deposit as the samian in the north-east corner of M 2 (which included fragments of a Form 18) came a sherd of a 'Hunt Cup' in pink fabric, perhaps of the late second century or early third. The area which produced the large deposit of samian also produced eight sherds of colour-coated wares including one which appears to be from a red-fabric version of Gillam Form 89, and therefore perhaps of the first half of the third century, and two of Castor. The wattle-and-daub debris on trench N 1/2 produced a single fragment of red colour-coated and a piece of a small beaker in a finer version of the same ware came from the fill of the ditch in trench P/Q 1/3. Both the ditch

at the north end of Q 13/15 and the east–west ditch in P 11 produced pieces of Rhenish suggesting that they were still open in the late second century or later. Rather oddly there was a single fragment of a rough-cast beaker, which would be somewhere between A.D. 80 and 180 on Hadrian's Wall, from the Iron Age pit. As for the poppy-head beaker from the pit in N 14 seen below, group H, Mr Hartley is slightly inclined to put it into the third century.

The total quantity of samian from 7188 area *b*, was slightly less than from area *a* (about 90 sherds) but there were no concentrations and no large portions of vessels. Moreover, the finds were made over a much larger area. Only two decorated sherds were found, both undateable. A high proportion of the recognizable sherds were of the late Flavian/Antonine Form 18/31 (some possibly the mid-second-century 31), with a few definitely second-century Form 33s. Only one sherd came from a well-stratified deposit which can reasonably be associated with the laying-out of the road system (see group I, no. 25): this piece seems to be Hadrianic/Antonine. From the same road-ditch came an 18/31 from the fill which had accumulated before the ditch was partially recut. Other 18/31s came from the ditch marked *H* on Fig. 10 from above and in the layer containing the carbonized grain (*Small Finds*, 7188 area *b*, no. 21), and from the large pit marked *D*.

Unlike area *a* the colour-coated wares totalled as much as half of the samian, but it is perhaps significant that well over three-quarters of this was from topsoil or otherwise unstratified. Only two sherds (from the same pot) came from a relatively early level, from the bottom of a peaty layer sealing the primary deposit in the south ditch of the northern side-road. These sherds were wall fragments of a small rough-cast beaker, which in North Britain might be any date between A.D. 110 and 180 (cf. group J, no. 1). One sherd of Castor from a late layer (associated with the planking at the western end of the site (*I* on Fig. 10) is probably from a Gillam Form 93 or possibly Form 53 and would not be dated in the North before A.D. 190. Of the total, Castor sherds made up about a quarter and there was no Rhenish.

H. *Stratified group of Roman pottery from pit in area a, trench N* 14 (see Figs. 9 and 13)

H 1. Poppy-head beaker in red colour-coated local ware, red paste, not earlier than about A.D. 190, quite likely third-century (B. R. Hartley).

H 2. Black dish, grey fabric.

H 3. Black cooking pot, sandy fabric. This pot had burnt grain adhering to the inner surface. Not accurately datable; on general grounds, third-century rather than second (B. R. Hartley).

I. *Stratified group of Roman pottery from primary fill of the ditches of the northern side-road* (*area b*) (see Figs. 14 and 15)

I 1. Black cooking pot, gritty fabric.
I 2. Deep dish, black surface with slight micaceous sheen.
I. 3. Black cooking pot.
I 4. Large buff jar in gritty fabric.
I 5. Dark grey wide-mouthed jar.
I 6. Cooking pot, black surface with slight micaceous sheen.
I 7. Jar in buff-orange fabric with grey slip.
I 8. Jar, medium grey surface and buff-grey core, rim diameter 10 in.
I 9. Jar, medium grey surface, buff-grey core, rim diameter 6 in.
I 10. Jar, rim diameter 7 in.
I 11. Grey jar, rim diameter 10 in.
I 12. Jar, rim diameter 8 in.
I 13. Buff jar, rim diameter *c.* 11 in.

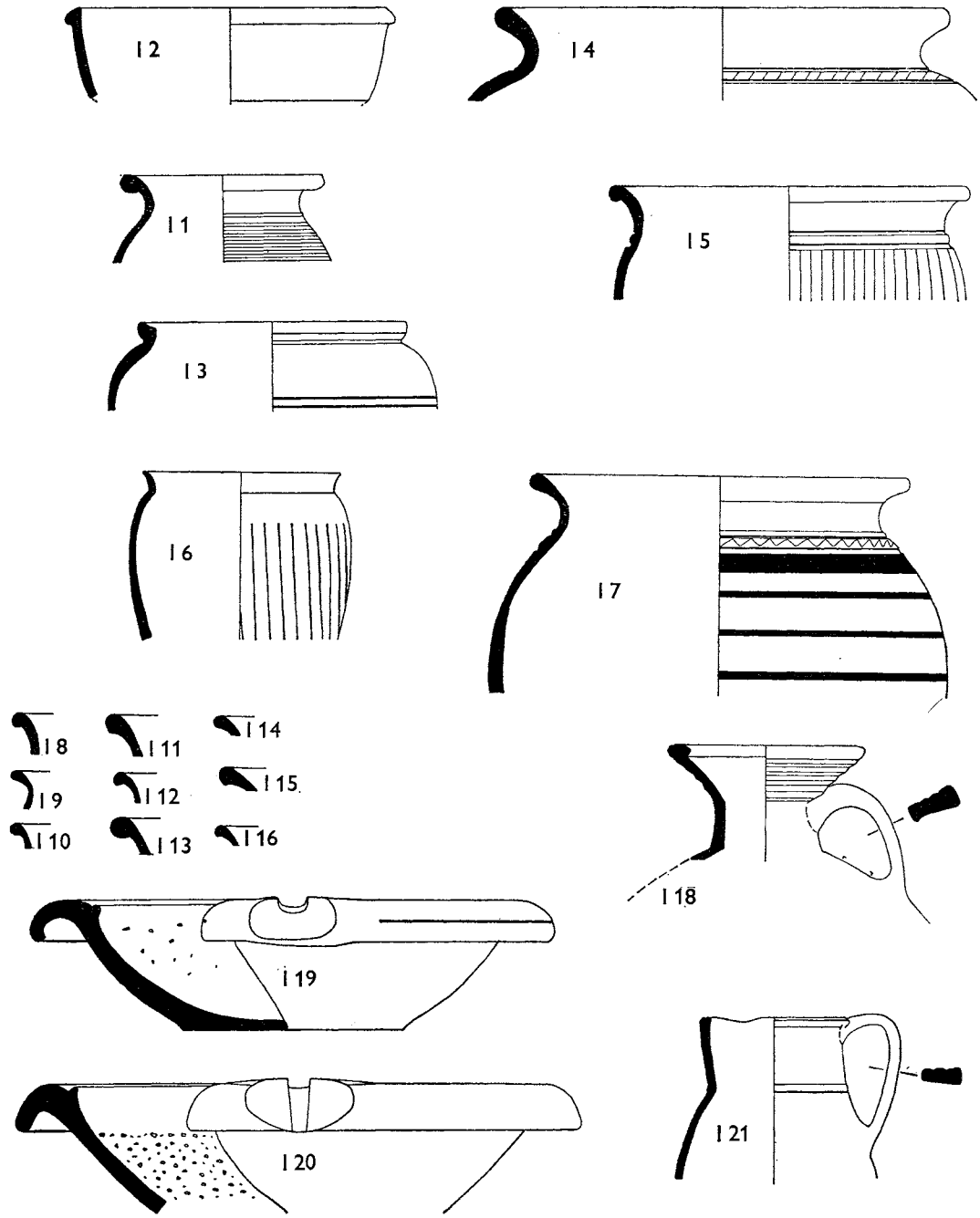


Fig. 14. Roman pottery from site 7188, area *b*. Scale $\frac{1}{4}$.

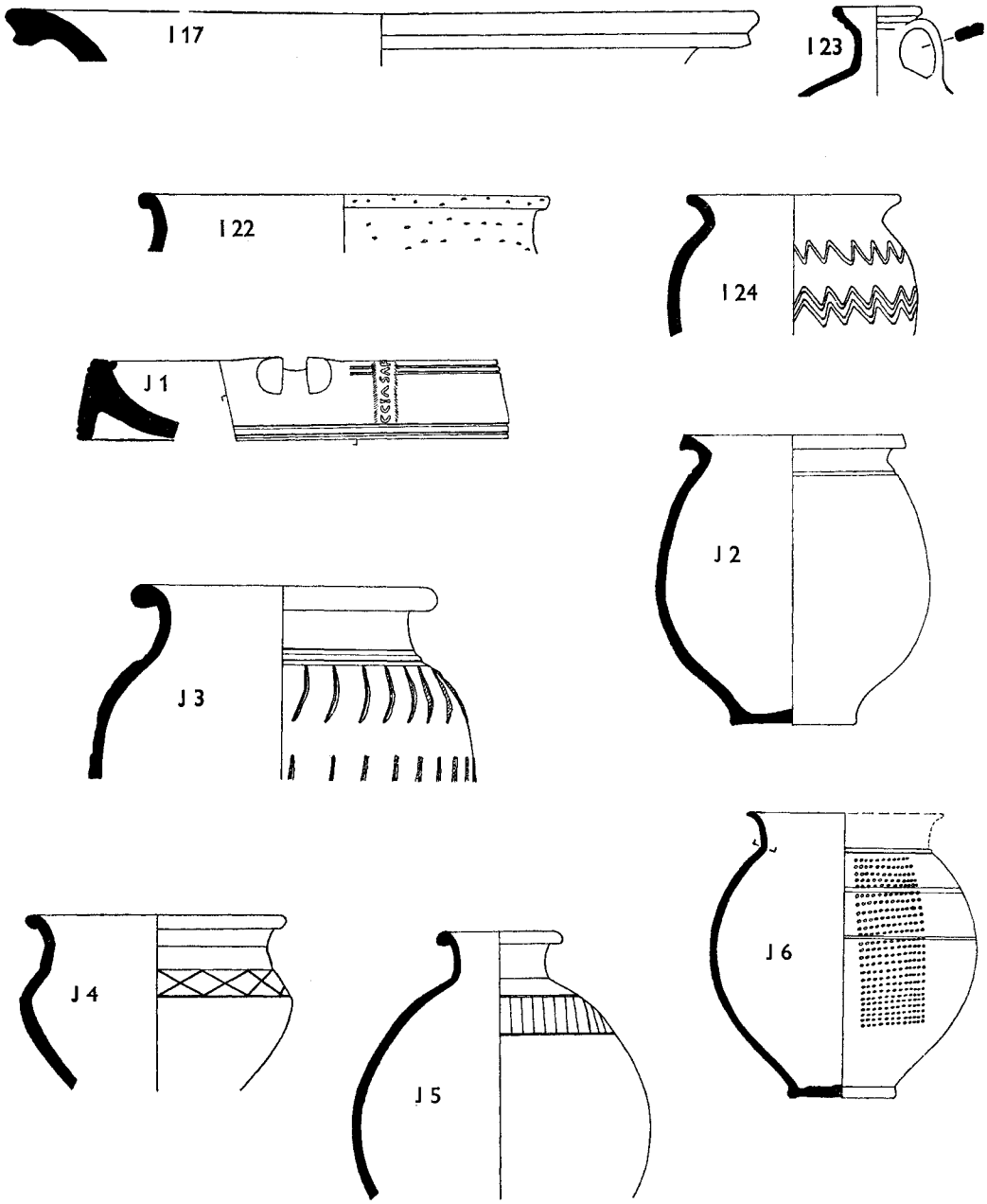


Fig. 15. Roman pottery from site 7188, areas *a* and *b*. Scale ¼.

I 14. Black jar, greasy surface, grey core, rim diameter 8 in.

I 15. Dark grey jar, buff core, rim diameter 9 in.

I 16. Dark grey jar, rim diameter $7\frac{1}{2}$ in.

I 17. Grey storage jar.

I 18. Large buff flagon.

I 19. Mortarium, cream fabric: rim-forms beaded on the distal end of the flange were much favoured by the potters of Norfolk and perhaps Suffolk in the second century. This can be closely matched in a mortarium by AESVMINVS from Caistor-next-Norwich (*Caistor*, R 29, facing p. 230). One of his mortaria was found (burnt) almost complete, in the destruction deposit believed to be of the late second century at Corbridge (*Archaeologia Aeliana*, 4th ser., XXVIII, fig. 9, no. 61, and p. 192; the stamp has been identified since publication). The life of the form is not necessarily closely fixed by this evidence for AESVMINVS (who almost certainly worked in East Anglia, presumably in the late Antonine period), but it seems likely to have been Antonine (K. F. Hartley).

I 20. Mortarium, cream fabric, stamped RESPEC with S reversed. The stamp may well be complete and is clearly to be expanded to RESPECTVS. His work is unrecorded elsewhere. There is a close parallel to the form from Caistor-next-Norwich (*Caistor*, R 24, facing p. 230, and p. 213) in a deposit dated A.D. 150–190 by Professor Atkinson. The life of this form is not known but the general typology of Norfolk mortaria points to a *floruit* within the period A.D. 130–180 (K. F. Hartley).

I 21. Jug with pinched spout, red fabric with creamy light-brown slip.

I 22. Coarse black jar, in native tradition.

I 23. Small cream flagon.

I 24. Coarse black jar.

I 25. (Not illustrated.) Samian fragment, apparently from a Ludovici Form Tb: Hadrianic/Antonine?

I 26. (Not illustrated.) Fragments of barbotine spotted grey ware in micaceous fabric.

J. *Miscellaneous Roman coarse pottery from site* 7188 (see Figs. 15 and 16)

J 1. Mortarium, from fill of original cutting of the northern ditch of the northern side-road, area *b*. Cream fabric with dark-brown surface: the incomplete stamp reads]CCIASAF, with probably not more than one letter missing at the beginning. It is the only example known and the full name of the potter must remain uncertain, though A or U are most likely judging from Holder's records (*Altceltischer Sprachschatz*). In size and type of border the stamp is markedly like one of ABISSO on a very similar mortarium found at Gayton Thorpe villa (*Norfolk Archaeology*, XXIII, pt. ii, pl. XIV, no. 13). Six other similar mortaria were found there (*ibid.* nos. 12 and 15, and p. 200; the incorrect dating given there was later emended in *Caistor*, p. 214, R 31). ACCEPTVS, the Colchester potter who also made colour-coated ware and samian, used this form in the second half of the second century. It is clear from general evidence that the practice of stamping mortaria had ceased entirely by about the end of the second century, and in many places earlier. The Hockwold mortarium may be dated with certainty to A.D. 150–200 and it is likely to belong to the latter half of this period (K. F. Hartley).

J 2. Dark grey cooking pot, distorted in firing but used, from lower fill of northern ditch of northern side-road, area *b*. It is similar to *Caistor*, S 25, dated by Professor Atkinson to A.D. 120–160.

J 3. Grey rusticated cooking pot, found in the southern ditch of the northern side road, area *b*, in a peat layer and lying on top of the primary silting (cf. notes on colour-coated, p. 62).

J 4. Grey carinated cooking pot, from area *a*, from the fill of the southern east-west ditch,

P/Q 1/3. Its shape is in the general class of *Caistor* group G, dated by Professor Atkinson to A.D. 110–150.[1]

J 5. Large grey flask, unstratified, from Area *b*.

J 6. Barbotine-decorated jar in buff fabric with black polished outer surface and grey inner, from the original cutting of the northern ditch of the northern side-road in area *b*. The form seems to be a larger version of the beakers number T 9 and T 10 at Caistor and dated in the Caistor pottery report as *c.* A.D. 150.

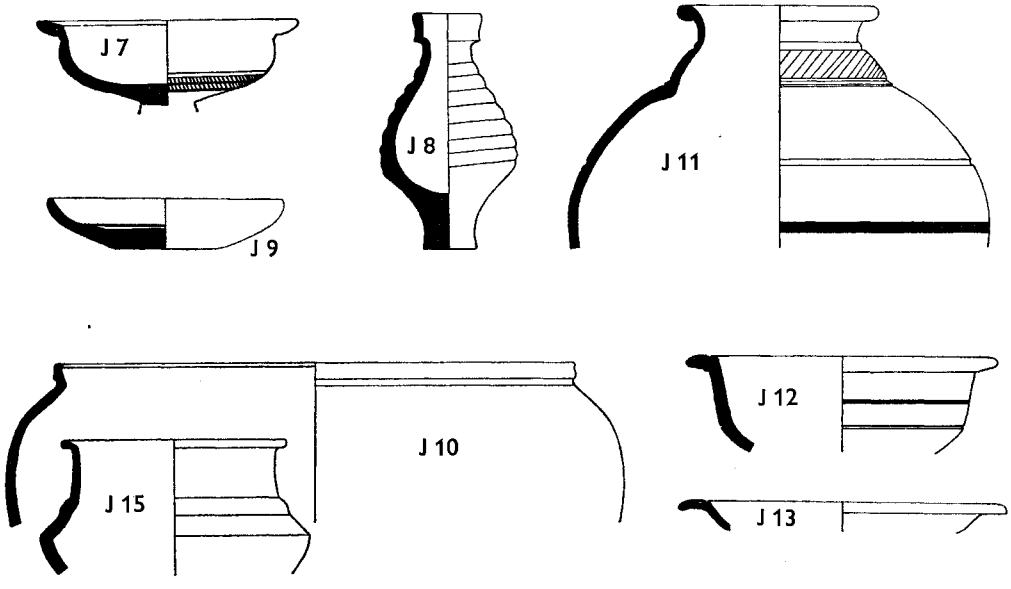


Fig. 16. Roman pottery from site 7188, areas *a* and *b*. Scale ¼.

J 7. Small black dish with black core, rouletted decoration, from the fill of the northern ditch of the northern side-road in area *b*.

J 8. Small cream flask, from topsoil in the north-east part of area *a* (trench N 1).

J 9. Grey dish, grey fabric, from the same location as J 4.

J 10. Shell-gritted buff-pink storage jar, from the same location as J 4. Compare D 12.

J 11. Large narrow-mouthed jar with hard dark grey surface and grey fabric, from north–south ditch in southern part of area *a* trench P 11. It is in the same general class as *Caistor* S 8 (*c.* A.D. 120–150) but not a close parallel.

J 12. Black micaceous bowl, in topsoil close to location of J 11.

J 13. Grey dish, from area *b*, from level of 'planking'.

J 15. Carinated jar in grey micaceous ware. Although it has a longer neck it is in the same general class as *Caistor* S 14 and S 15 (A.D. 120–150) and type G from the Caistor kilns (D. Atkinson, 'Three Caistor Pottery Kilns', *Journal of Roman Studies*, XXII, 1932, pp. 33–46) dated by Atkinson to A.D. 120–150. This piece came from approximately the same location as J 11.

[1] Cf. also Coldham Clamp Fig. 4, C 18 (*c.* 120/130–*c.* 200) (T. Potter, 'The Roman Pottery from Coldham Clamp', *Proc. C.A.S.* LVII (1965), pp. 12 ff.).

SMALL FINDS

The small finds from these sites are relatively few and mostly undistinguished and stratigraphically unimportant. They are listed here by areas to give an impression of the quantity of material found on sites of this kind. For the Roman period it reveals that in the second century the inhabitants could obtain some manufactured articles, but that these were relatively scarce. No coins were found in any of the areas excavated.

SITE 7088, AREA 1

From the Wall-trench (?) area—no finds except one nail.

From the Hollow (see Figs. 4 and 5):

1. Piece of polished bone, $4\frac{1}{2}$ in. long, tapering to a blunt point. From layer 9, in north–south trench.
2. Large bone needle, $3\frac{1}{2}$ in. long, for netting (?). From layer 4, in north–south trench.
3. Stone sinker or weight, torpedo shaped. In east–west trench, from shelly layer equivalent to layer 3 in published section.
4. Stone weight, circular, pierced. From same layer as no. 3.
5. Small whetstone. From same layer as no. 3.
6. Tanged and barbed flint arrowhead. From the chalk surface at the bottom of the east–west trench. This arrowhead, of Bronze Age type, was the only well-made flint implement found in area 1. A considerable number of very crude implements, flakes and cores, probably Bronze Age, were found scattered over the chalk surface and in the layer immediately above in both trenches.

SITE 7088, AREA 2

1. Flint 'saw'—flint implement $1\frac{3}{4}$ in. long, serrated along half of one edge, probably used for stamped decoration of Beaker pottery. From Pit A 3, from which came a number of flakes and implements similar to those from area 1.
2. Thin bronze pin, Roman, simple moulded finial, point lost, present length $2\frac{1}{4}$ in. From ditch system B, close to findspot of iron shears marked on Fig. 6.
3. Bronze finger ring, Roman, inner diameter $\frac{5}{8}$ in.: bezel an enamelled and gilt roundel, blue centre; hoop flat internally and rounded externally, no shoulder. First or second century? From south-west corner trench, in layer under topsoil.
4. Curved tapering piece of Bronze, Roman, length 3 in., section flat internally and curved externally; perhaps part of a coil or pennanular bracelet. From a depression in the surface east of south end of forked gulley C 2 (see Fig. 6).
5. Bronze tweezers, Roman, length 2 in. From gulley C 2, cf. Fig. 6.
6. Two fragments of fine sheet bronze, Roman. From upper part of fill of road ditch.
7. Iron shears, Roman, seen as a stain on the bottom of ditch system B (see Fig. 6), photographed, but impossible to preserve.
8. Iron object, presumably Roman, in two fragments—knife blade? From the curved ditch B 2 (see Fig. 6).
9. Thirteen Roman nails of varying size, fairly evenly distributed over site.
10. Spindle whorl, Roman, made from base of a small black pot. From upper part of road ditch fill.
11. Two stone sling stones of uncertain date, from layer under topsoil in trench at south-west corner of site.
12. Whetstone of uncertain date. From vicinity of pit of series A 2 near to findspot of iron shears (see Fig. 6).

13. Base of coarse black pot, Roman, with hole drilled through centre, perhaps from a cremation. From fill of broad ditch, series B, at south end of site.

14. Base of coarse black pot, Roman, with hole knocked through centre, perhaps from a cremation. From fill of ditch C.

15. Two fragments of a large millstone, unstratified, presumably Roman (cf. 7188, area *a*, no. 21).

SITE 7188, AREA *a*

1. Bone pin, Roman, from a ditch in trench R/S 1/2.

2. Miniature bronze axe head, Roman. From chalky layer under topsoil in trench M 2. A toy, an amulet or a votive object.

3. Bronze penannular brooch, Roman, diamond section hoop with coiled terminals. From centre of trench Q 13/15, from beneath rammed chalk of ancient track or yard.

4. Rim fragment of dark blue glass, Roman, from chalky layer under topsoil in trench M 2. Perhaps from a pillar-moulded bowl: if so, the deep colour would suggest an early to mid first-century date (D. Charlesworth, 'Roman glass in Northern Britain', *Archaeologia Aeliana*, ser. 4, XXXVII, 1959, p. 38), but the type goes down to Trajan in Britain and to the mid second century in Germany.

5. Four fragments of Roman bottle glass, three blue-green and one yellowish green. From the same layer in trench M 2 as no. 4.

6. Fragment of thin pale green glass of uncertain date. From trench R/S 1/2 from surface of natural chalk.

7. Rim and two other fragments of a large bottle, Roman. Found together with samian in depression in chalk in north-east corner of trench N 1/2.

8. Fragment of green bottle glass, Roman. Unstratified.

9. Fragment of pale green glass, Roman. Unstratified.

10. Blue glass bead, with multicoloured spots, Roman. From topsoil in trench P/Q 1/3.

11. Lip of a Roman green glass bottle, fused and abraded after original breakage. From topsoil in trench N 1/2.

12. Part of an iron plough coulter, Roman. From the ditch fill in the middle part of trench P/Q 1/3.

13. Large iron nail, probably Roman, $5\frac{3}{4}$ in. long. From topsoil in trench PQ/1/3.

14. Five Roman nails widely distributed over site.

15. Spindle whorl, Roman ?, made from a limestone flake. From topsoil in trench P/Q 1/3.

16. Spindle whorl, Roman ?, made from a pebble. Same provenance as no. 15.

17. Whetstone, Roman ?, from fill of ditch at east end of trench Q 13/15.

18. Fragment of shale. From fill of main ditch in trench N 11.

19. 'Ash-tray'—base of pinkish-buff Roman coarse pot with broken edge deliberately smoothed. From baulk between trenches M 2 and N 1/2, unstratified.

20. Piece of moulded very hard daub, presumably substitute for plaster. From fill of ditch near middle of trench P/Q 1/3.

21. Fragment of millstone. From fill of ditch in trench P/Q 1/3.

7188, AREA *b* (see Fig. 10)

1. Bone pin, fragmentary, Roman. From the large area of postholes on western side of site, just below peaty topsoil.

2. Bone pin, fragmentary, Roman. From topsoil east of findspot of Beaker.

3. Bronze brooch, Roman, bottom half (pierced catch-plate and thin bow). From the 45° trench in the south-eastern part of the site, beyond eastern end of planking.

4. Bronze brooch, Roman (pin missing). From the 45° trench, south-eastern part of site.

5. Bronze brooch, Roman (pin and half of body). From the 45° trench, from topsoil outside area of planking.

6. Bronze brooch, Roman, 'Langton Down' type (cf. *Camulodunum*, pl. XCIV, 92; *Hod Hill*, I, C 29–32): a basically Claudian type, but with the developments in the mid or later first century. From area marked *A* on Fig. 10.

7. Engraved carnelian from a signet ring, Roman, depicting Abundantia facing right with cornucopia and patera—first or second century (J. M. C. Toynbee). There is a similar stone from Mursa in the Osijek Museum, Yugoslavia. The stone came from the area marked *B* on Fig. 10, unstratified.

8. Fragment of a green bottle, Roman. From the fill of the eastern ditch of the main road at a depth of about 2 ft. 6 in. in the southern section.

8. Iron bead of uncertain date. From topsoil in the trench marked *C* on Fig. 10.

9. Nine iron nails of various sizes Roman (widely distributed over site), including one imbedded in daub from topsoil in the area marked *A* on Fig. 10, suggesting a structure including a nailed timber frame.

10. Fragment of limestone from the large pit marked *D* on Fig. 10.

11. Slingstone (?), from the trench marked *C* on Fig. 10, in topsoil.

12. Two fragments of millstone (?), probably Roman. From area of timber structure (Fig. 11*a*), in topsoil.

13. Fragment of millstone, probably Roman. From fill of west ditch of main road, northern section.

14. Two fragments of millstone, probably Roman, from fill of large pit marked *D* on Fig. 10.

15. Part of a Hertfordshire Puddingstone quern, Roman. From the area marked *E* on Fig. 10, unstratified. A complete upper stone in this material was found somewhere on Grange Farm at an earlier date.

16. Fragment of a Hertfordshire Puddingstone quern (?), probably Roman. From the area marked *F* on Fig. 10, unstratified.

17. Fragment of a Hertfordshire Puddingstone quern, Roman. Unstratified.

18. Part of a whetstone of uncertain date. From the area marked *F* on Fig. 10, in topsoil.

19. Worn whetstone, presumably Roman. From among planking in area marked *F* on Fig. 10.

20. Part of a whetstone of uncertain date. From the area marked *G* on Fig. 10, in topsoil.

21. Quantity of charred grain, not certainly identified but probably spelt. From fill of ditch marked *H* on Fig. 10.

ORGANIC MATERIAL

Molluscs and Plants

B. W. Sparks, D. M. Churchill *and* J. R. Haynes

SITE 7088, AREA I

(i) From the hollow, in layer 3*a* (see Fig. 5)

Molluscs

The shelly sample taken from the excavations in early July, 1962, proved to be extremely rich and contained the following 35 species:

Valvata cristata Müller	293	**Pupilla muscorum* (Linné)	3
Bithynia tentaculata (Linné)	35	**Vallonia costata* (Müller)	17
**Pomatias elegans* (Müller)	3	**Vallonia pulchella* (Müller)	26
**Carychium minimum* Müller	377	**Vallonia excentrica* Sterki	3
Lymnaea truncatula (Müller)	124	**Vallonia* sp.	55
Lymnaea glabra (Müller)	299	**Clausilia bidentata* (Ström)	1
Aplexa hypnorum (Linné)	178	**Helix* (*Cepaea*) sp.	1
Planorbis planorbis (Linné)	42	**Hygromia hispida* (Linné)	65
Planorbis leucostoma Millet	967	**Punctum pygmaeum* (Draparnaud)	23
Planorbis crista (Linné)	129	**Euconulus fulvus* (Müller)	6
Planorbis contortus (Linné)	8	**Retinella radiatula* (Alder)	3
Segmentina nitida (Müller)	29	**Zonitoides nitidus* (Müller)	80
**Succinea putris* (Linné)	8	**Agriolimax* sp.	13
**Succinea pfeifferi* Rossmässler	14	*Sphaerium corneum* (Linné)	1
**Succinea* sp.	86	*Sphaerium lacustre* (Müller)	3
**Cochlicopa lubrica* (Müller)	18	*Pisidium casertanum* (Poli)	228
**Vertigo antivertigo* (Draparnaud)	53	*Pisidium personatum* Malm	210
**Vertigo moulinsiana* (Dupuy)	1	*Pisidium obtusale* (Lamarck)	232
**Vertigo angustior* Jeffreys	5		3,639

The fauna listed above is a mixture of land and fresh-water forms. Of the total number of specimens recorded, 76 % are freshwater and 24 % land. Of the fresh-water total, 80 % are specimens belonging to what might be termed slum species, namely those capable of living in very poor water conditions, i.e. subject to considerable variations in volume, temperature and oxygen content. Of the land species, 90 % are either characteristic of or frequently found in marshes. In fact, the environments required by the slum freshwater species and the marshland species are very similar so that the predominance of these two groups of Mollusca points to little more than a wet marshy patch. Although there are freshwater species which prefer moving water, and land species which prefer drier conditions, both of these are present in such small numbers that they can probably be explained by either accidental introduction or by temporary improvements in the state of the water body concerned. These Mollusca do not of course reveal anything about the date of the deposit.

(ii) From the hollow, from a depression in the natural chalk surface in the east-west trench.

Molluscs, etc.

**Pomatias elegans* (Müller)	2	**Discus rotundatus* (Müller)	2
**Cochlicopa* sp. indet.	2	**Vitrea contracta* (Westerlund)	1
**Vallonia costata* (Müller)	3	**Oxychilus cellarius* (Müller)	1
**Acanthinula aculeata* (Müller)	1	**Retinella pura* (Alder)	3
**Ena montana* (Draparnaud)	1	**Retinella nitidula* (Draparnaud)	5
**Clausilia bidentata* (Ström)	1	**Zonitoides nitidus* (Müller)	2
**Hygromia hispida* (Linné)	11		

Probably thin woodland or bush with some dry open spaces. This is supported by frequency of *Sambucus nigra* (elderberry) seeds in the deposit. B.W.S.

* Land species are asterisked throughout.

(iii) From the hollow, from the chalky clay sealing the chalk surface and containing flints presumably from the occupation on the chalk (layer B):

Pinus sp. *Prunus spinosa*

D.M.C.

SITE 7188, AREA *a*

From the pit in trench N 14, layer 5, sealing pottery group H (see Fig. 9).

Plant remains

Seeds
- *Lycopus europaeus* L.
- *Urtica dioica* L.
- cf. *Baldellia ramunculoides* (L.) Parl.
- *Juncus bufonius*
- *Juncus* sp.
- Compositae

Leaves
- *Salix* sp. (very abundant and all deposited in a horizontal plane)

The habitat which these species have in common is that of ditches, ponds, marshes and fens. *Urtica* and *Juncus bufonius* are commonly associated with sites of human disturbance, cultivation or arable land. The leaves indicate that the filling of the pit took place under very quiet conditions.

Foraminifera

A large number of foraminifera was found in this sediment and this led to the speculation that the sediment may be of marine origin. The sample contained *Globotruncana*, *Globigerinella*, *Cibicides*, *Gyroidina*, *Gavellinella* and *Marginulina* which are Upper Cretaceous genera. No undoubted Holocene foraminifera were seen. Thus the possibility of a marine origin for these silts is highly unlikely. It seems far more probable that the sediment resulted from the inwash of weathered chalk.

D.M.C. and J.R.H.

SITE 7188, AREA *b* (see Fig. 10)

(i) From the east ditch of the main road (north section through road), from grey chalky silt fill

Molluscs

Valvata cristata Müller
Bithynia tentaculata (Linné)
**Carychium minimum* Müller
Lymnaea peregra (Müller)
Aplexa hypnorum (Linné)
Planorbis carinatus Müller
Planorbis planorbis (Linné)
Planorbis vortex (Linné)
Planorbis leucostoma Millet
**Succinea putris* (Linné)
**Cochlicopa lubrica* (Müller)
**Vallonia costata* (Müller)
**V. pulchella* (Müller)
**Hygromia hispida* (Linné)
**Vitrea contracta* (Westerlund)
**Zonitoides nitidus* (Müller)
Pisidium casertanum (Poli)
Pisidium milium Held
Pisidium nitidum Jenyns

All these are present in very small numbers, usually less than 5, except for *P. leucostoma*, which is by far the most abundant, and *H. hispida* which is fairly common.

This seems to be a deposit of a very small and perhaps rather muddy slow stream, with some marsh adjacent, though this may have been no more than a yard wide strip adjoining the stream. There are no brackish Mollusca whatever.

B.W.S.

Foraminifera

A number of foraminifera were present in the sediment. No undoubted Holocene forms were present in the sediment and all consisted of reworked Upper Cretaceous foraminifera.

No diatoms were found.

D.M.C. and J.R.H.

(ii) From north ditch of southern side-road, from the primary silting of the ditch, sealed by peat

Valvata cristata Müller	1	*Planorbis leucostoma* Millet	6
Bithynia tentaculata (Linné)	8	*Planorbis crista* (Linné)	1
**Carychium minimum* Müller	1	*Planorbis contortus* (Linné)	4
Lymnaea palustris (Müller)	1	**Succinea putris* (Linné)	1
Lymnaea peregra (Müller)	5	**Helix nemoralis* Linné	1
Planorbis planorbis (Linné)	18	*Pisidium obtusale* (Lamarck)	1

This could be the deposit of something like a slow-moving peaty fen drain.

(iii) From the north ditch of the northern side-road, from a sandy level sealed by chalky grey silt.

Planorbis planorbis (Linné)	4	*Planorbis leucostoma* Millet	1

(iv) From the same level as (iii), different sample

Lymnaea stagnalis (Linné)	1	**Hygromia liberta* (Westerlund)	1
**Hygromia hispida* (Linné)	1	*Sphaerium corneum* (Linné)	2

(v) From the same ditch as (iii), but in mud sealed by the sandy silt layer

Planorbis planorbis (Linné) 18

(vi) From the same ditch as (iii), not closely stratified

**Helix* (*Cepaea*) sp. indet. 1

(vii) From the ditch marked *J* on Fig. 10, from grey fill

Planorbarius corneus (Linné)	1	**Helix nemoralis* Linné	1
Planorbis planorbis (Linné)	1		

B.W.S.

A HUMAN SKELETON FROM SITE 7188, AREA *b*

C. B. Denston

Duckworth Laboratory of Physical Anthropology, Faculty of Archaeology and Anthropology, University of Cambridge

Sex: Male
Age: Approx. 35–40 years.
Stature: Approx. 5 ft. 6 in.

The cranium is less robust than one would expect of a fully adult male individual, but the mandible is clearly male in character, as also are the post-cranial bones. On the frontal bone of the cranium, above and to the right of the supra-orbital torus, is a small depressed area which suggests a healed fracture. Also on the frontal bone in the centre, is a slightly raised area with osteoporosis, which extends to the parietal eminences, the osteoporosis possibly caused by inflammation due to the fracture. The portion of the maxilla which would have contained the second and third molars is not preserved, but from what is present it can be seen that both left and the second right premolars, and the first right molar were lost ante-mortem, the alveoli having resorbed. The two right incisors have been lost post-mortem, leaving, *in situ*, two left incisors, both canines, a first right premolar, and a first left molar. From the mandible, it seems likely that the second left molar was lost ante-mortem and the crown of the first left molar also lost ante-mortem, with a diseased root of this tooth left *in situ*. The left lateral incisor has been lost post-mortem and with the exception of both third molars which an examination of the relevant areas of the mandible suggests these teeth never formed, the rest of the teeth remain *in situ*. All the teeth of the maxilla display a medium degree of attrition, while those of the mandible, except the two right molars, display a medium degree. The two molars display only a slight degree of attrition and it is feasible to suggest (though the equivalent portion of maxilla is not preserved) that the upper right molars were lost rather early in life, and so precluded a lot of wear on the lower. There is evidence that the first right molar was lost ante-mortem. The buccal and lingual areas of the crown of these two lower molars extend downwards towards the alveolar border of the mandible more than is found normally. A single carious cavity, in each case, can be seen on the mesial crown surface of the upper first right premolar, and on the distal crown area of the lower first right molar: recession of the alveolar borders of the maxilla and mandible indicate a slight to medium degree of periodontal disease, while it is possible that abscesses were present in the apices of the sockets holding the first and second left molars of the mandible. Some of the teeth display a slight degree of enamel hypoplasia. Other non-metrical features recorded on the skull are two small wormian bones in the lambdoid suture, a right parietal notch bone, a slight mandibular torus, and the bilateral occurrence of stellate pterion, which is very uncommon.

The upper teeth, and tooth sockets in the case of missing teeth starting from the first right premolar and proceeding mesially along the front of the maxilla to the left canine, are overcrowded and deviate from the normal positions, some to a greater degree than others. The lower teeth are normal, though the right canine is rather crowded, and rotated slightly in a buccal and distal direction.

Some of the postcranial remains are rather fragmentary, but maximum length measurements could be recorded for some of the long bones, so enabling an approximate stature of the individual to be calculated. Both femora are platymeric (i.e. show marked antero-posterior flattening of the upper portion of the shaft below the trochanters). The right tibia is platycnemic and the left mesocnemic (i.e. marked side to side flattening of the shaft), the former being more pro-

nounced than the latter. The tibia are also bowed antero-posteriorly. A slight to medium degree of osteo-arthritis can be observed on vertebrae from the various regions of the vertebral column, the lumbar region being the most affected. The right innominate bone is also affected at the auricular area, and so to a lesser extent is the left innominate bone. There is the possibility that the right innominate bone and sacrum were ankylosed, but the sacrum is nearly non-existent, so one cannot be dogmatic about this. On the anterior surface of the right patella is a raised roughened ossified area, extending a little beyond the superior and inferior borders, the possible cause of this being a chronic strain put on the quadriceps muscle for one reason or other. (The customary biometric measurements have been taken on the skull and long bones, and are recorded in the Duckworth Laboratory.)

REPORT ON THE ANIMAL BONES FROM HOCKWOLD

C. L. Cram

Introduction: the aims of the Report

This report is based on the animal bones excavated at Hockwold in 1961 and 1962. The 1961 assemblage consisted of the more complete bones excavated, all coming from the Roman period. In 1962 a larger collection was made; all the bones found during excavation were kept for examination and they came from the following periods: Late Neolithic, Early Bronze Age, Bronze Age to Iron Age, Iron Age and Roman (mid second century A.D., second century, and late second century).

The bones were studied to compare the information obtained for each period about the species present, their numerical proportions and how they reflect the environment, the ages at death of animals, the measurements of bones and sizes of animals, the amounts of meat available from cattle, and the distribution of bones over the site.

Jewell's measurements of cattle bones from Britain[1][1] have shown a decrease in the size of cattle from the Neolithic to the Iron Age, and Roman cattle from Corbridge ranged between the sizes of Neolithic and Iron Age cattle. The Hockwold cattle bones were examined to see if they supported Jewell's conclusions.

TABLE 1. *The number of bones from different animals*

	NEOLITHIC	BRONZE AGE	BRONZE/ IRON AGE	IRON AGE	ROMAN			
					Mid second century	Second century	Late second century	%
Cattle	39	85	7	15	8	115	9	41
Horse	—	—	2	1	1	36	2	12
Red deer	4	1	—	1	—	2	—	0·6
Pig	5	19	3	—	—	10	5	3
Sheep/goat	4	6	4	3	3	112	5	40
Dog	2	2	—	—	—	5	—	1·5

The animals present

The numbers of bones from different animals at the various periods are shown in Table 1, together with the percentages of animals from all Roman deposits. Not included in the table are

[1] The figures in square brackets in this section refer to the authorities cited at the end.

specimens from the following periods: Neolithic: roe deer(3), fish tooth(1); Bronze Age: roe deer(1), human tibia shaft(1); Iron Age: bird(1); Roman second century: fish tooth(1) 0·3 %, bird(4) 1·2 % and many oyster shells. None of the bird bones was from domestic fowl.

A crushed and broken horn core was found from the Neolithic which was 720+ mm. long, measured along its outer curvature, the size suggesting the wild *Bos primigenius*. The same measurement taken on *Bos primigenius* horn cores from Blair Atholl and Kirkcudbright[2] gave lengths of 724 and 540 mm. However, the bones from all periods were below *Bos primigenius* size and so came from domestic cattle, except for the unfused distal end of a radius from the Neolithic which was 189 mm. broad. On a modern shorthorn cow the same bone measured 78·5 mm.

There were three sheep horn cores—no goat—from the Roman sheep/goat category suggesting that the flocks were mainly or entirely sheep.

Discussion

If we look at changes in the numbers of animals during the occupation of the site we can see that cattle are always the most numerous species. The horse is first found between the Bronze and Iron Ages and is the third most frequent animal in Roman times. Sheep/goat are not common before Roman times, then become almost as numerous as cattle. The pig on the other hand becomes less frequent in the Roman period and is missing from the small collection of Iron Age bones. Wild animals are most numerous in the Neolithic but some red deer is found in the Roman period.

In the Neolithic there appears to have been some forest nearby where deer and aurochs were hunted and pigs herded but there would also be open meadows for the cattle to graze. In the Bronze Age there are more cattle, fewer deer, and so perhaps less forest. By Roman times pig and deer are almost absent and the site would be set in farming land where cattle and sheep grazed and crops were grown.

The decrease in pig and increase in sheep has been shown to be a European phenomenon and related to the clearing of forest by prehistoric farmers[3].

TABLE 2. *Cattle*

Ages (in months) at death

(a) From fusion of epiphyses					(b) From eruption and wear of teeth			
Months	NEOLITHIC	BRONZE AGE	IRON AGE	ROMAN	Months	NEOLITHIC	BRONZE AGE	ROMAN
					3–5	—	—	1
7+	1	3	2	—	6–14	1	4	5
12+	4	8	1	6	9+	4	1	6
18−	—	1	—	1	18−	—	—	1
24+	2	9	1	2	18–23	—	1	—
27+	—	1	—	2	21+	1	—	1
30−	—	1	—	4	30−	—	—	1
36−	—	—	—	3	30–35	—	2	3
36+	—	1	—	—	33+	2	4	13
42−	—	—	1	—	42−	1	—	5
42+	—	—	—	4	42–47	—	1	—
48−	3	1	1	3	45+	1	—	4
					48–65	2	1	3
					51+	2	5	5

Ages at death

All horse, dog and pig remains which gave an indication of age at death were from mature animals, except for an immature pig's mandible each from the Neolithic and Roman periods. The ages at death of cattle and sheep/goat are shown in Tables 2 and 3; they are based upon the fusion of epiphyses of bones and the eruption and wear of teeth as given by Silver[4]. Chauveau's dates are taken for cattle (Silver, p. 262) and semi-wild hill sheep for sheep/goat (Silver, p. 263). Not included in the tables are specimens of the following (ages in months): Neolithic: sheep/goat: bones, 36 + months (1 example); teeth, 9+ (1). Bronze Age: sheep/goat: bones, 24−(1), 42− (1); teeth, 39+ (1). Bronze/Iron Age: sheep/goat: teeth, 9+ (1), 40− (1); cattle: bones, 7+ (1), 12+ (2); teeth, 33+ (1), 51+ (1).

TABLE 3. *Sheep/Goat*

Ages (in months) at death

(*a*) From fusion of epiphyses		(*b*) From eruption and wear of teeth	
Months	ROMAN	Months	ROMAN
6+	1	6–11	3
18+	4	9+	8
20+	1	18–23	4
24−	2	21+	6
28−	2	30−	5
36−	1	33+	2
36+	5	40−	5
		39+	12
		43+	2
		36–53	3

Discussion

Almost all the Neolithic cattle bones come from mature animals of over 4 years of age. Bronze Age cattle were killed over the first 4 years and beyond. There is no evidence for cattle having been killed before 4 years of age between the Bronze and Iron Ages. Iron Age cattle appear to have lived over one year. In the Roman period there are 20 teeth of sheep/goat which died before 53 months of age; of these 20, 3 are aged at 6–11 months, 4 at 18–23 and 3 at 36–53. Fourteen specimens come from animals of over 39 months and another 16 might do so. Nineteen teeth of cattle come from animals which died before 65 months; of these, 1 was aged at 3–5 months, 5 at 6–14, 3 at 30–35 and 3 at 48–65. Five specimens come from animals which definitely died after 51 months and a further 24 might have been over this age (see Table 2).

As has been found elsewhere[5] there is no evidence in any period for killing off livestock in autumn because of lack of sufficient winter fodder.

Measurements

Measurements of cattle, horse and sheep/goat bones from Hockwold are given in Table 4 together with measurements from a modern shorthorn cow.

Discussion

Cattle. The measurements of the distal end of the humerus of cattle at Hockwold decrease from the Neolithic to the Iron Age, then rise in the Roman period to be between the Iron and Bronze Age sizes. Bronze Age tibia and astragalus measurements are as large as those of the

TABLE 4. *Measurements of cattle, horse and sheep/goat bones in mm.*

	CATTLE					*SHEEP/ GOAT*	*HORSE*		*SHORT-HORN COW*
	NEO-LITHIC	BRONZE AGE	BRONZE/ IRON AGE	IRON AGE	ROMAN	ROMAN	IRON AGE	ROMAN	MODERN
Scapula, minimum neck width	—	41–45	—	—	—	—	—	—	57
Humerus, breadth distal end	101–114·5	90–91	—	62	62–64·5	—	—	—	88
Radius									
Breadth proximal end	—	83–86	72	—	67	—	—	—	83
Breadth distal end	—	—	—	—	—	24·5–26	—	—	78·5
Metacarpal									
Length	—	186	—	195	—	120·5	212	188	280
Minimum breadth	—	29	—	31	—	11	32	27	33
Breadth proximal end	—	—	—	56	—	20	46	41·5	60
Breadth distal end	—	48–55	—	50·5	53	23	45	41·5	60
Femur									
Length	—	—	—	—	—	167	—	—	—
Minimum breadth	—	—	—	—	—	14	—	—	—
Breadth proximal end	—	—	—	—	—	38	—	—	—
Breadth distal end	—	—	—	—	—	34	—	74	—
Tibia, breadth distal end	60–63	60–63	—	—	56	20·5–26	—	60	63
Astragalus									
Length	66–68	65·5–68·5	—	59	54	—	—	50–61	71
Breadth	45·5–48	45–45·5	—	42	43	—	—	53–54	48·5
Metatarsal									
Length	—	229	—	—	—	130	—	251	231
Minimum breadth	—	25	—	—	—	12·5	—	29	29
Breadth proximal end	—	46	—	—	—	19	—	45	52·5
Breadth distal end	—	52	—	—	47–50	23	—	46	60
Proximal phalanx									
Length	—	63	—	52–55	58–61	31–38	—	74–78	61·5–65
Breadth	—	30	—	25–27	26–27	10–12	—	46–50	30–32
Medial phalanx									
Length	—	—	—	35–36	36–39	18	—	—	44–45
Breadth	—	—	—	24–26	23–29·5	10–11	—	—	28–30
Distal phalanx									
Length	—	—	—	—	—	26	—	—	—
Height	—	—	—	—	32	—	—	—	31–33

Neolithic. Iron Age measurements at Hockwold are mainly below those of the Bronze Age—for instance the astragalus and proximal phalanx—but the Iron Age metacarpal is the longer. Roman cattle bones reach the size of the Bronze Age in the distal end of the metacarpal but do not overlap with the Neolithic. Some measurements are smaller than those of the Iron Age, for instance the length of the astragalus, but most lie between Iron and Bronze Age sizes. The measurements of cattle bones from Hockwold are in line with Jewell's conclusions except that the Hockwold Roman cow does not reach the size of the Neolithic.

Horse. The Iron Age metacarpal is larger than the Roman, and the Iron Age horse may have been the larger.

Weights of meat

The weights of meat available from cattle at the different periods in the occupation of the site can be calculated by adding the measurements of bones from (*a*) one period at Hockwold, and (*b*) a shorthorn cow of known weight 1184 lb., using measurements common to both in Table 6, and taking the average of a range; then dividing (*a*) by (*b*) and, to find the total weight of one animal from a period at Hockwold, multiplying by the known weight of the shorthorn. This figure is halved to find the weight of edible meat which, in modern cattle, is about half the total weight. The results are:

Neolithic: $(472 \div 349 \times 1184) \div 2 = 800$ lb.
Bronze Age: $(1102{\cdot}5 \div 1250 \times 1184) \div 2 = 522$ lb.
Iron Age: $(635{\cdot}5 \div 808 \times 1184) \div 2 = 466$ lb.
Roman: $(566 \div 673 \times 1184) \div 2 = 498$ lb.

The amount of meat available from cattle, sheep and pigs in the Roman period can be estimated by multiplying the known weight of the animal by its percentage as shown in Table 1. The results, taking cattle as providing 498 lb. of edible meat, sheep 60 lb. and pig 100 lb., are, cattle 20,414 lb., sheep 2400 lb. and pig 300 lb. Cattle would then give 88·4 % of the total meat supply, sheep 10·3 % and pig only 1·3 %. This assumes that there is a direct correlation between bone size and body weight. The sizes of bones will obviously not reflect the weight of the animal accurately, but these figures are thought to have some value.

The horse may have been used for meat, as is discussed under the distribution of bones.

Although sheep do not supply any large proportion of meat compared to cattle, they increase in the Roman period. This may be because the Romans were using sheep to supply something other than meat, perhaps wool.

The distribution of bones

No concentration of types of bone or species of animal was found in the Roman ditches and habitation areas. Most of the bones came from ditches; on site 7188, area *a*, the deep V-shaped ditch in trenches N 11 and Q 13 had many bones in it and a high proportion of teeth and skull fragments. A *Bos* skull was found at the bottom of the road ditch on site 7188 with parts missing from the front and back. The Roman horse, the third most numerous animal, is represented by the same types of bone as the cattle, sheep and pig which are presumed to be food animals, and the horse bones are mixed up with the bones of these animals and scattered uniformly over the site. These horse bones, then, may have come from animals which were killed for food.

In the Iron Age pit in trench Q 15 were found a number of cattle bones (a humerus fragment, 2 pelves, one with 8 articulated vertebrae, a calcaneum, 2 metapodials and 7 phalanges), and some sheep or goat bones (2 teeth and a scapula). There were also pieces of pelvis, vertebra, rib, long bone and skull which came from animals the size of a cow.

In pit III (Beaker), on site 7088, area 1, were found the articulated metapodials and phalanges of the four legs of a young sheep or goat.

Summary

Animal bones were found at Hockwold from the Neolithic, Bronze and Iron Ages and second century A.D. Roman. Cattle were the most numerous animals in all periods; there was a decrease in the size and so in all probability in the amount of meat available from one animal from the Neolithic to the Iron Age. Roman cattle probably gave more meat than those of the Iron Age, less than the Bronze Age, and ranged in size between cattle from these periods, not reaching Neolithic sizes. Sheep or goats were almost as numerous as cattle in Roman times although giving only about 10% of all edible meat (they may have been used for wool); in previous periods they were less numerous. Pigs became less frequent in Roman times than they had been in the Neolithic and Bronze Ages. Wild animals, deer and aurochs, were most common in the Neolithic, perhaps because there was more forest near the site, but some red deer is found in Roman times. The horse first occurs between the Bronze and Iron Ages. In Roman times it was the third most numerous animal and may have been used for food, because its bones are in the same condition as those of the known food animals. No domestic fowl was found. There is no evidence for the autumn killing of any species in any period.

Acknowledgements

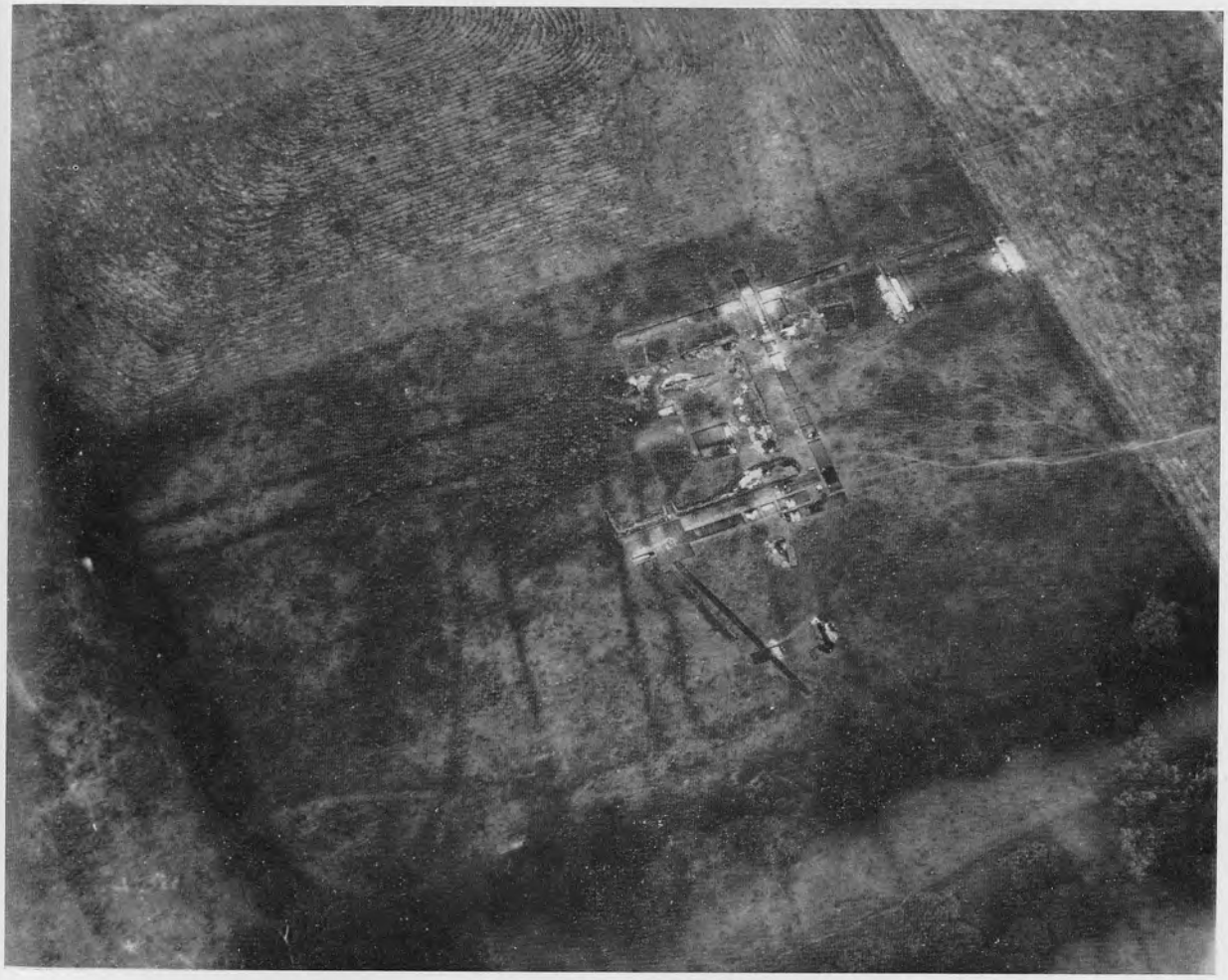
I am indebted to Mr E. S. Higgs for providing many ideas for this report and to the Museum of Archaeology and Ethnology, Cambridge, for the use of comparative osteological material.

References

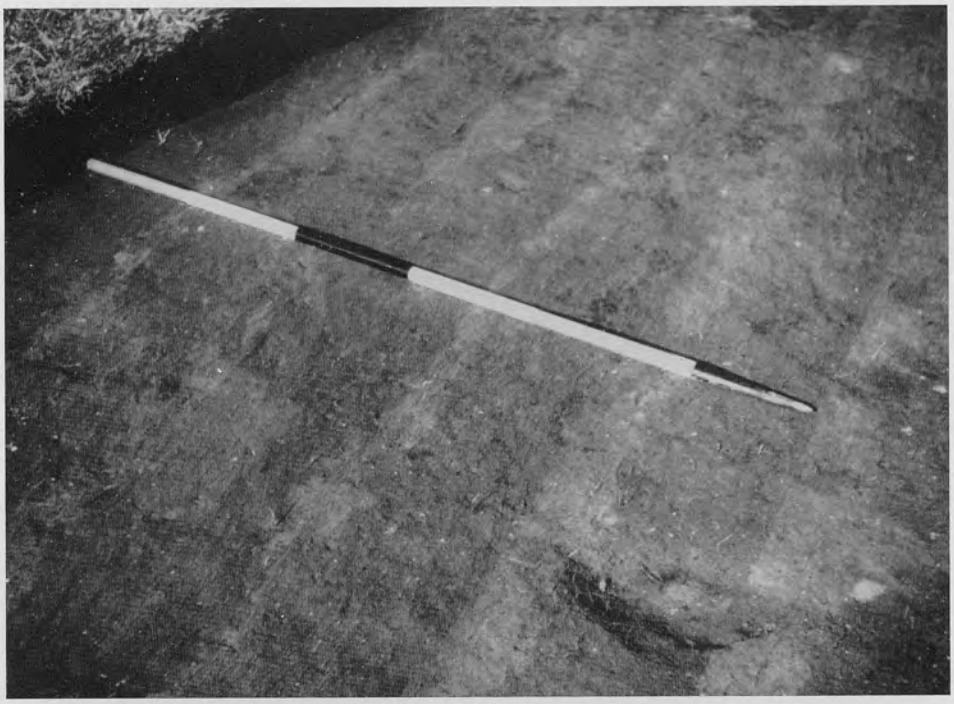
[1] P. Jewell in 'Man and Cattle Symposium', A. E. Mourant and F. E. Zeuner (eds.), *Royal Anthropological Institute Occasional Papers*, XVIII, pp. 80–90.
[2] F. C. Fraser and J. E. King in J. G. D. Clark, *Excavations at Star Carr*, p. 89. Cambridge University Press, 1954.
[3] J. G. D. Clark, *Antiquity* (1947), pp. 122–136.
[4] I. A. Silver in *Science in Archaeology*, D. Brothwell and E. S. Higgs (eds.), pp. 250–68. Thames and Hudson, 1963.
[5] E. S. Higgs and J. P. White, *Antiquity* (1963), pp. 282–9.

Hockwold: vertical air photograph, taken during the 1947 floods. (Royal Air Force photograph, Crown Copyright reserved.)
K indicates trial excavations by Colonel Kelly. For other symbols, see text.

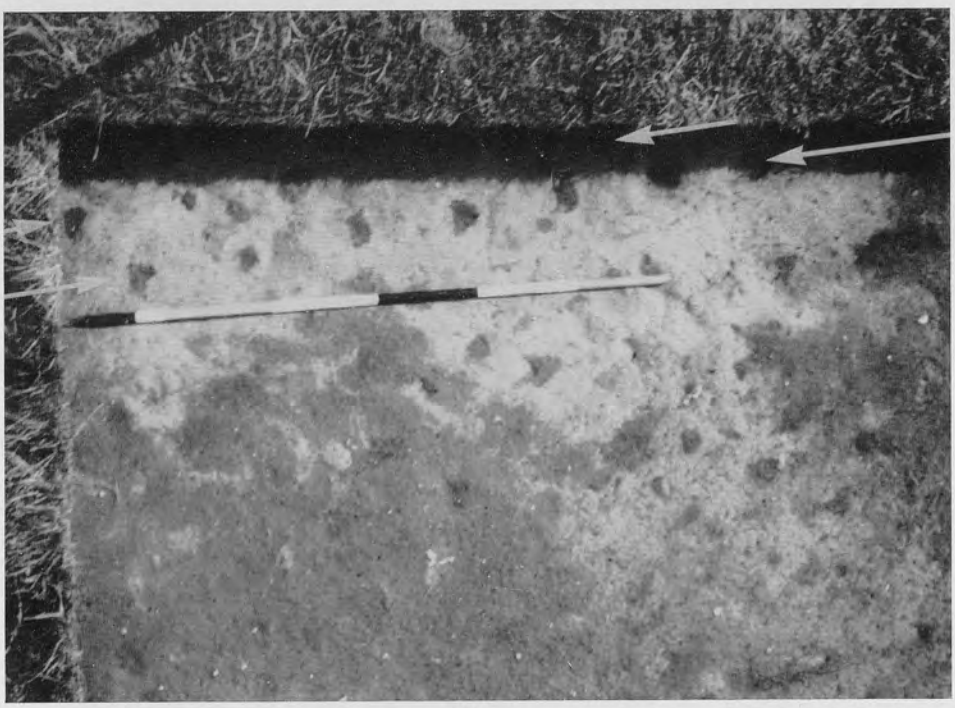
Hockwold, site 7188, area *b*, from the north, before excavation. (Copyright, Cambridge University Committee for Aerial Photography.)



Hockwold, site 7188, area *b*, from the east, during excavation. (Copyright, Cambridge University Committee for Aerial Photography.)



(*a*)



(*b*)

Hockwold, site 7188, area *b*. (*a*) Soil marks, probably representing planking. (*b*) Traces of rows of post-holes (clearest above the ranging-pole), after removal of 'planking'.