STONEA CAMP, WIMBLINGTON

An Iron Age Fort in the Fens

Cambridgeshire
County Council

STONEA CAMP, WIMBLINGTON
An Iron Age Fort in the Fens
Interim Report

Tim Malim

1992

Archaeology Section
Property Department
Shire Hall Castle Hill
Cambridge CB3 OAP
Tel. (0223) 317312

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View of Stonea Camp during excavations, 1992

CAMBRIDGESHIRE ARCHAEOLOGY

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Stonea Camp is a multi-vallate Iron Age Fort whose outermost defences enclose 24 acres. It is situated on the very edge of a fen island, at 2.0m OD. A complex pattern of earthworks representing defensive banks and ditches were mostly levelled 30 years ago, and the present programme of work has allowed a limited, but informed, reinstatement to be made. Excavations and survey work have shown that previously unknown additional ditches existed, that surprisingly well-preserved organic-rich ditch deposits survive which include worked wood and human bone (carbon-dated to 1st century BC.), and that positioning of the defences clearly followed the micro-topography of the area, taking full advantages of natural contours and other features. In concept and scale Stonea Camp is similar to the hill-forts of southern and western England, whilst unparalleled in Cambridgeshire and largely unlike any forts in the surrounding region. However there is little evidence to suggest much occupation of the site, and instead when viewed in the light of the greater landscape Stonea Camp should be seen as a focal point for the surrounding Iron Age communities, evidence of whose settlement can be found elsewhere in the locality.

INTRODUCTION

"It is almost wholly ancient pasture and no difficulty should arise in respect of preservation. There are so few large earthworks in the Fenlands: and so little is known of the condition of life in early times that the preservation of this camp, for future careful exploration, is much to be desired" wrote Cyril Fox in the 1920s when he scheduled Stonea Camp as an ancient monument. Unfortunately he was proved wrong, because the pressures of post-war agriculture to intensify arable production, vastly encouraged by government grants to rip out hedges and fill in dykes, rapidly found that pockets of pasture like Stonea Camp were unprofitable and needed to be flattened to make ploughing easier. Major Roman earthworks at Stonea Grange, Grandford, and Flaggrass suffered similar fates, local examples of a widespread disaster that struck thousands of rural earthwork sites in much the same way that inner city renewal began extensive destruction of our urban heritage. Champions were found for the latter, and much was learnt about the early development of our cities as a consequence. For remote rural sites there was far less public appeal, and consequently great unrecorded losses.

Destruction of Stonea's earthworks had occurred over the past 30 years as a consequence of an arable farming regime. Measures to stop further damage to the remaining banks in the 1980s had involved erection of 10 concrete posts to define which areas were not to be ploughed. By 1989 only three of these posts remained intact, and the banks showed clear signs of recent plough encroachment.

In 1990 the opportunity to prevent further damage to Stonea Camp (owned by Cambridgeshire County Council) and to assess the state of preservation of archaeological deposits at the site was brought about through publication of an archaeological management plan for the County Farms Estate of Cambridgeshire (Malim, 1990). Funds were made available by Fenland District Council, the County Council and English Heritage to implement a programme of works that involved a return to pasture, limited reinstatement of levelled earthworks, and public access and interpretation. Three seasons of work have followed, and the site is now similar to its appearance in 1960, with earthworks under grazed pasture, 5 information boards erected to explain the site to the public, and various environmental improvements in progress to enhance the wetland setting and to promote better conditions for continued preservation of organic remains. Acceptance of the Camp into the Countryside Commission's Stewardship Scheme provides a steady income for on-going maintenance works at the site.

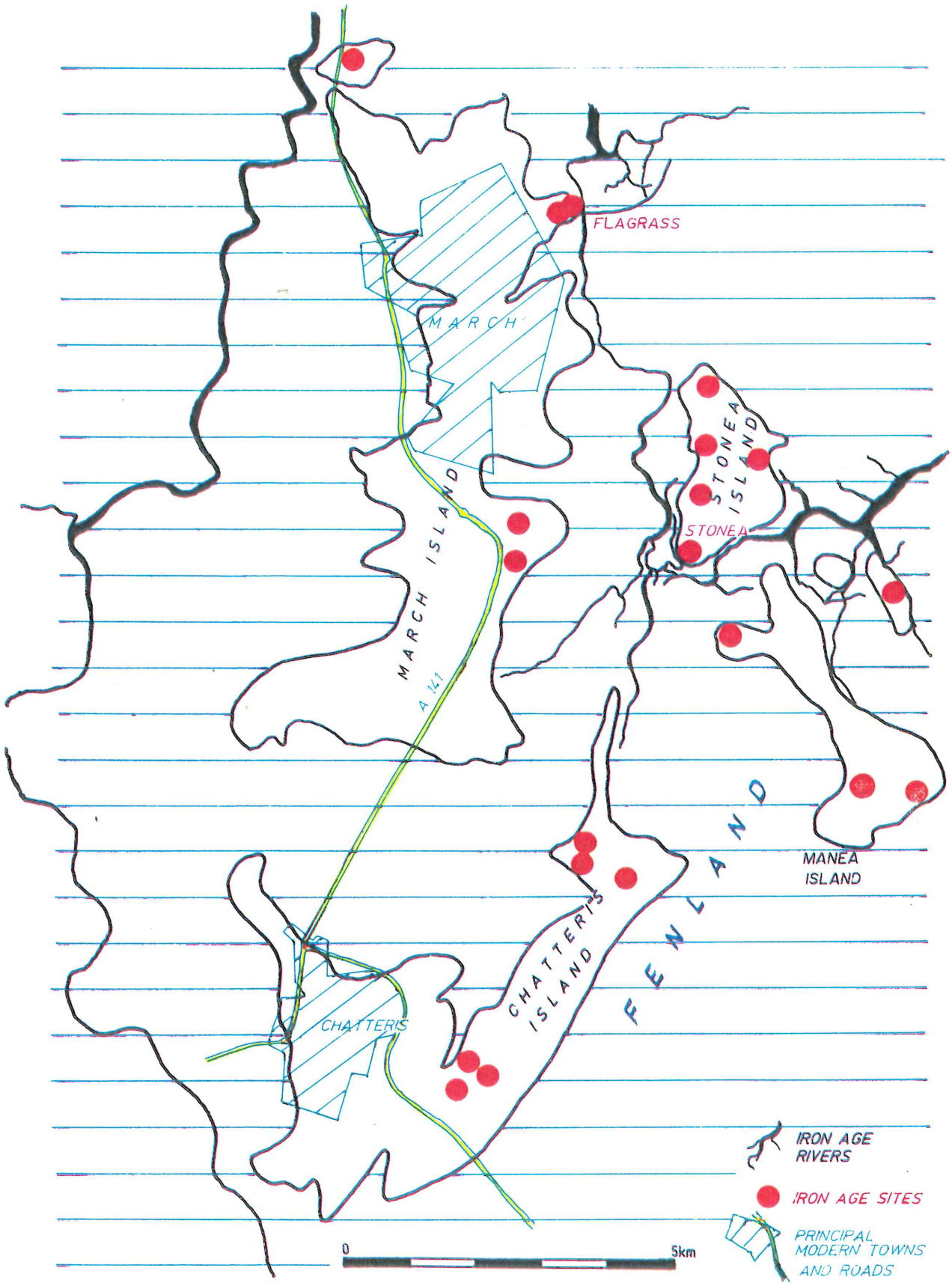


Figure 1 Iron Age location map. Stonea Camp is situated on the south-western edge of Stonea island. (Information kindly supplied by David Hall)

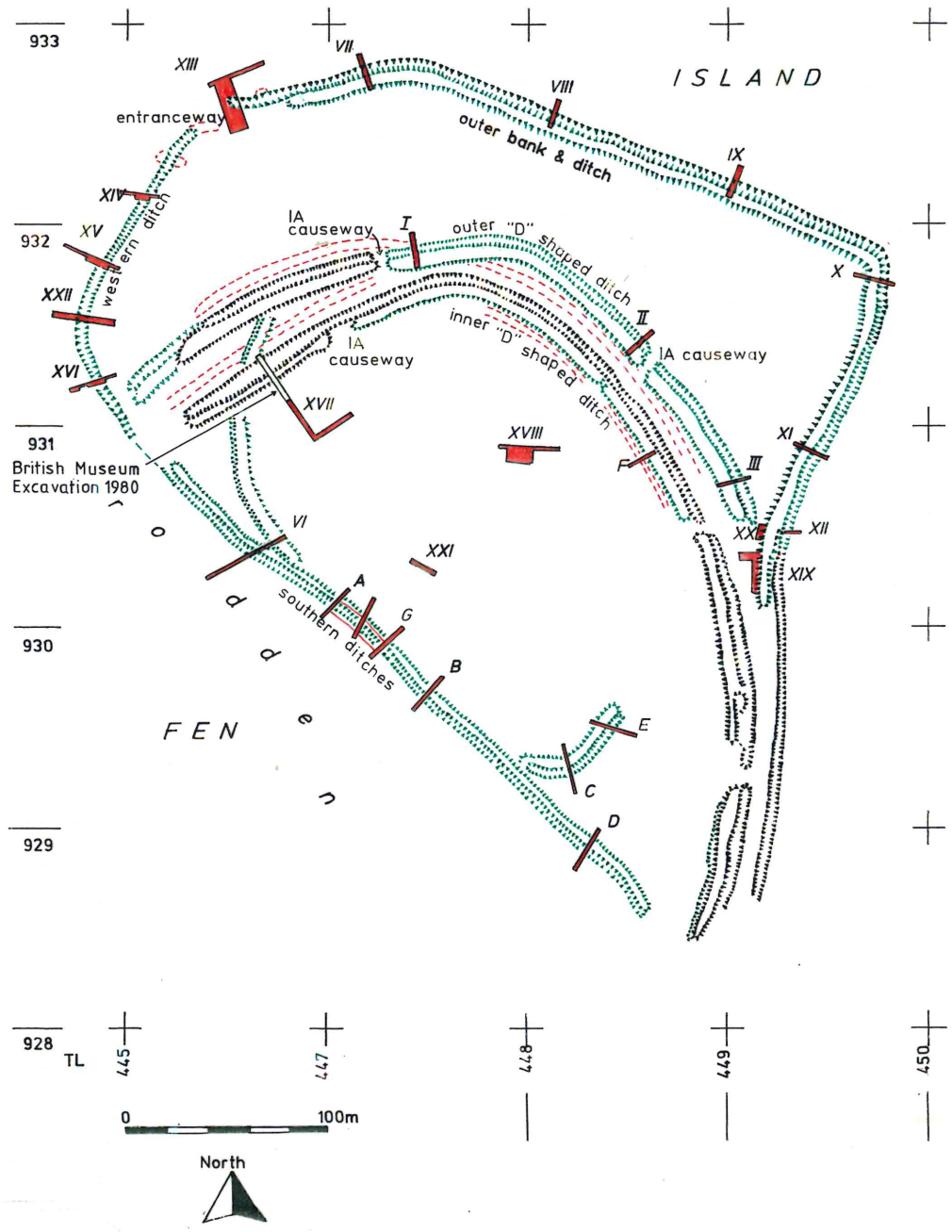


Figure 2 Plan of Stonea Camp showing location of all trenches. Trenches XIX and XX investigated phasing of defences; trenches XVII and XXI investigated pottery concentrations (for occupation remains); trench XVIII investigated the "earthen ring"; all other trenches investigated the defensive ditches. Green hachering represents reinstated sections of bank and ditch. Dashed red lines show where parchmarks and dips in the grass reveal the lines of previously unknown ditches.

ENVIRONMENTAL SETTING

Stonea island (Fig.1) is composed of glacial sands and gravels capping Chalky-Jurassic till (Boulder Clay) which rises to over 5m O.D. at the highest point of the island (Gallois 1988). Much evidence of solifluction activity has been identified which has resulted in lumps of Boulder Clay being brought close to the surface, and seams of sand around the edge of irregular polygons extending to about a metre in depth (Colin Forbes pers. comm.). Above the geological deposits soil cover is approximately 0.4 - 0.5m thick.

Stonea Camp was situated on the south-western promontory of the island. During Iron Age times the adjacent fen was very wet, with an active watercourse running close to the west and south, whilst to the north and east of the Camp higher land would have been valuable for settlement and agriculture. Pollen and macro-fossil evidence from basal ditch deposits suggest a sequence of environmental changes from the time of construction through primary and secondary ditch fills that show a densely wooded island of oak, birch, and blackthorn which changed to grazed pasture after an episode of brackish water flooding.

ARCHAEOLOGICAL BACKGROUND

The gravel outcrop of Stonea was surrounded by inhospitable but productive fens, providing abundant traditional fenland resources (fish, wild fowl and fuels) with relatively easy communications by water transport. Thus Stonea was a favoured area for settlement from early prehistoric times. Tools of Palaeolithic and Mesolithic date have been regularly found, with evidence for more intensive occupation during the Neolithic, when rising sea-levels were restricting land suitable for habitation. Neolithic worked flints are common, a dense pottery scatter was found beneath a Bronze Age barrow and 2 parallel lines leading to the barrow, visible on aerial photographs, have been interpreted as a cursus (Potter 1989). Bronze Age flints, pottery and metal tools have also been found on the island and a burial mound adjacent to the fort, excavated by Tim Potter in 1961 (Potter 1977) contained a primary burial pit of a cremated woman with 17 jet and 11 amber beads, and a secondary cremation urn with a man in his twenties. Several other ring-ditches are visible from air photographs in the immediate vicinity of the Camp.

One of the wettest periods for the fens was in the Iron Age, when numerous watercourses and low-lying marshy ground gave Stonea an excellent defensive position as well as access to rich natural resources. Politically, it lay near the boundary of 3 powerful tribes, the Iceni, the Catuvellauni, and the Coritani (Potter 1989). Archaeological artefacts, such as coin hoards orginating from various different tribal areas, have been found on Stonea island and show that it was an important focus in the late Iron Age, with several phases of fortification enclosing an area of at least 24 acres at the Camp. Reports of human bones discovered during agricultural activities (pers. comm. March Museum) fit in with results from recent work which included the sword slashed skull of a young child (carbon-dated to the late Iron Age and found in the base of a ditch), and the skeleton of an adult male casually 'buried' at the top of a ditch-fill (see below). Unfortunately the earlier finds were hurriedly reinterred and never properly reported, but all these records give evidence for active use of this fort.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Previous archaeological work on Stonea island has been dominated by Tim Potter, with excavation of a Neolithic and Bronze Age site immediately east of the Camp, extensive excavations of a Roman town adjacent to the north, and a trench through one of the Camp's intact bank and ditch defences in 1980 (Jackson 1980; Potter 1977, 1989, and forthcoming). Combined with David Hall's fieldwalking (forthcoming), and aerial photographs of the area, it is possible to interpret much of the past landscape, with nineteen Iron Age settlements so far located within 5 miles of Stonea Camp (Fig.1).

A large-scale magnetometer survey of the interior, at 1m intervals on a 30m grid, was undertaken by Andrew David of the Ancient Monuments Laboratory in 1983 to examine evidence for occupation. Results were largely negative, which may be the result of extensive ploughing-out of features such as hearths andthe unresponsive nature of the subsoil in this area, rather than concrete evidence for lack of occupation. Similarly phosphate sampling by David Gurney in 1981 for the British Museum gave low intensities not indicative of settlement, even in locations with pottery concentrations.

Environmental results from the 1980 British Museum excavation were also not encouraging, with much dessiccation and contamination of deposits. A valid interpretation of Iron Age environment was not possible, although mollusca from beneath bank deposits gave the impression of an open and damp landscape (Potter forthcoming).

RECENT WORK

Management works at Stonea Camp were designed principally to halt further damage to archaeological remains through ploughing, scrub encroachment, drainage, and metal-detecting, and to remove all debris from ditches and pond which had accumulated as a result of farming activities. These were not considered illegal as such tipping is defined as agricultural waste. Demolition in *c.* 1973 of the very unusual 17/18th century brick farmhouse had created dumps of brick and other rubble at various places in the Camp, while one length of ditch was found to be full of burnt grain. Therefore much management work was needed to put to rights so much of this neglect and damage, and a policy of grass management was determined to be the best way to prevent further agricultural damage and to inhibit the illegal activity of metal-detecting. Recent work concentrated on scrub clearance and waste removal to enhance the environment, and it was decided also to improve access so that the site could be open to the public. Information boards and a programme of reinstatement of the earthworks to their pre-ploughing state *c.* 1963 was necessary to explain this important site. The problem of drying-out was tackled by destruction of all existing drains and insertion of a vertical plastic membrane to a depth of 2m immediately downslope of the Camp in an attempt to impede drainage and thus mainatin or raise the water-table. Dip-wells have been inserted to monitor this. Such a programme of major management works could not be conducted in isolation as much background information was required and thus archaeological excavation was necessary to evaluate the condition of preservation of archaeological deposits and to aid in interpretation and reinstatement.

Fieldwalking was conducted before the re-establishment of grass cover over the Camp, in 10m transects with collection points every 10m. Finds were sparse but one area in the west of the interior was identifed as having a distinct concentration of pottery ("Stonea Camp ware" 40 - 60 A.D. Potter, pers.comm.). Finds of worked flints include Neolithic blades, leaf-shaped arrowheads, and Bronze Age tools, but no particular concentrations were defined (see Appendix II). In fact it was noted that more finds were made from random walking over the site than from the controlled programme of fieldwalking.

Geophysical surveying was carried out in an attempt to define the line of the southern ditches. Both magnetometer and resistivity were used unsuccessfully even over wide, deep ditches which were subsequently revealed by hand-excavation. These negative results suggest that the previous use of geophysical surveying within the interior was, in retrospect, an invalid technique with which to search for occupation evidence at Stonea, and thus its results must be discounted.

Soilmarks of levelled banks and ditches were clearly apparent in freshly disced topsoil before the Camp was seeded with grass. Across these soil-marks narrow trenches were laid out for hand-excavation to locate the correct line of the ditches and to examine the fills, ascertaining the extent of modern in-fill and the depth of archaeologically important deposits within them (Fig.2).

ARCHAEOLOGICAL EXCAVATIONS

Trenching Strategy

In late autumn 1990 twelve investigation trenches (Trenches I - XII) were designed for hand-excavation, but after excavating the northern ones time permitted only one trench (Trench VI) to be excavated through the southern defences during that season. Thus trenches IV and V were never dug, but were relocated and amplified by Trenches A - E during spring 1991 (Fig.2).
Trenches I - III were positioned along the outer "D" shaped ditch; Trench VI ran across both southern ditches and on to the roddon (an extinct ancient watercourse); Trenches VII - IX examined the outer northern ditch, and Trenches X - XII examined the eastern side of this outer ditch. Trenches were opened approximately every hundred metres, but not all were fully excavated. Trenches II and VIII were used only to locate the top of the ditch to help with tracing its line between the fully excavated sections of Trenches I, III, VII, and IX. Similarly, on the eastern side, Trench XI was only excavated to the top of the ditch, tracing its line between the fully excavated sections of Trenches X and XII.

In spring 1991 Trenches A, B and G were positioned to examine both southern ditches and the apparent entranceway as seen on early O.S. maps of Stonea Camp (see Fig. 9). An area between Trenches A and G was opened to expose in plan the tops of the southern ditches at the point where they ran together to investigate their phasing and to clarify the question about an entranceway. Trench D sectioned the outer southern ditch, and trenches C and E examined the inner southern ditch after its turn northwards and before it disappeared into an area of 19th century quarrying. Trench F was designed to investigate a previously unknown ditch that was discovered to run just inside of the inner "D" shaped ditch.

In summer 1992 the third season of fieldwork continued trench numbering in Roman numerals carrying on from the final trench excavated in 1990 (Trench XII). Thus trench XIII was an area opened over the eastern side of the main entranceway through the outer defences at the north-west corner of the Camp. Trenches XIV - XVI

investigated the western ditch, and Trench XXII was positioned to trace the line of the ditch between the fully excavated sections at Trenches XV and XVI; Trenches XVII and XXI were located over pottery concentrations, after seven 1m square test-pits had been dug and sieved to see what density of finds there were in the topsoil; Trench XVIII was a 30m long trench across the approximate position of an "earthen ring" as shown on the 1926 O.S. map (Fig. 9), which was subsequently opened in plan to the top of the ring-ditch to get its full dimensions and examine whether it contained interior features; Trenches XIX and XX were located to see whether the outer (eastern) ditch originally turned to meet with the southern inner ditch, thus testing Tim Potter's postulated phasing for the defences (Fig. 8); Trench F1 was relocated over Trench F and enlarged to include bank remnants between the inner "D" shaped ditch and the newly discovered ditch inside of this defence.

The Ditched Defences

Results are presented below in general form. Fuller analysis will be presented in the final publication, whilst the site archives are stored at Cambridgeshire Archaeology's facilities and can be consulted for research purposes.

Northern ditches *(Trenches I, II, III, VII, VIII, IX, F)* *(see Fig. 3)*

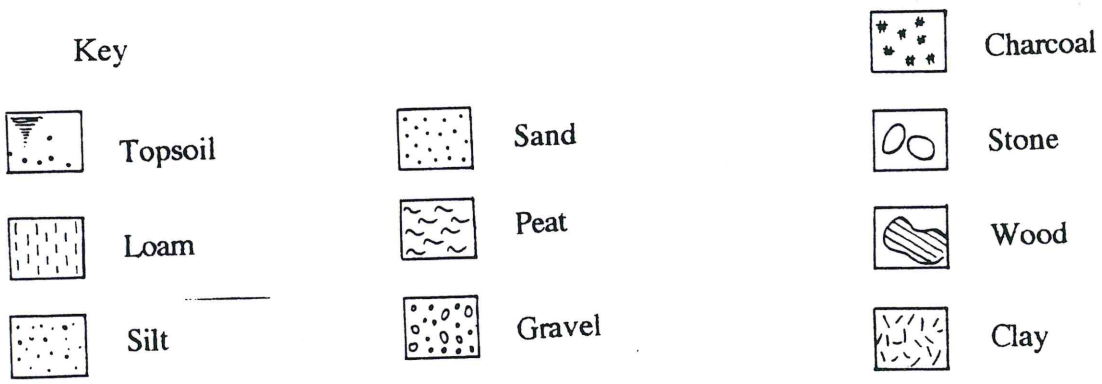
Dimensions: Tr. I: (outer "D") Depth = 1.60m; basal width = 1.4m; top width = 5m
Tr. III: (outer "D") Depth = 1.75m; basal width = 2.8m; top width = 5m
Tr. VII: (outer ditch) Depth = 1.45m; basal width = 2.0m; top width = 4m
Tr. IX: (outer ditch) Depth = 1.45m; basal width = 1.8m; top width = 4.5m
Tr. F: (inside inner "D") Depth = 0.95m; basal width = 1.0m; top width = 2.2m

Description: Trenches I, III, VII, and IX were all fully excavated. Trenches I and III through the outer "D" shaped ditch, and VII and IX through the outer ditch of the Camp. The pattern of their in-filling closely resembled one another. Recent fills were detected by an obvious heavy yellow clay and gravel deposit up to 0.6m thick which was the remains of bull-dozed bank material. Below this there was often a thin turf layer with bricks, plastic bags, bottles and other modern rubbish. Where earlier removal of banks and in-filling had occurred the modern deposits were defined by the amount of 19th and 20th century artefacts found within a dark-brown fine silty loam. Between recent fills and primary deposits there was evidence of a long period of build-up with occasional finds of 16th and 17th century pottery, oak planks, and even a small iron cannon-ball. These deposits ranged from 0.2 - 0.4m in depth. Beneath these later deposits primary fills of fine silty-clay with desiccated organic remains were found, which would appear to date back to the Iron Age.
Immediately south of the Inner "D" shaped ditch another ditch was found (Trench F), and between these were remnants of undisturbed bank material, which were sampled for evidence of buried soils.

Eastern ditch *(Trenches X, XI, XII, XIX, XX)* *(see Fig. 3)*

Dimensions: Tr. X: (outer ditch) Depth = 1.55m; basal width = 1.9m; top width = 5m
Tr. XII: (outer ditch) Depth = 1.15m; basal width = 2.1m; top width = 4.5m

Description: Trenches X and XII were fully excavated through the outer ditch and showed that recent in-fill consisted of 19th and 20th century pottery, iron work, glass, and bricks bedded in a dark earth and ash deposit. Patches of pushed-in bank were found, but modern contamination continued below this level to the base of the ditch.
Trench XIX was opened as an area and showed that the eastern (outer) ditch did not turn to meet with the southern ditches to make an earlier phased smaller enclosure.
Trench XX was a 3 x 2m area excavated to the top of the ditch showing that the outer "D" shaped ditch turned abruptly to meet with the eastern (outer) ditch, terminating against the bank.



Key to section drawings

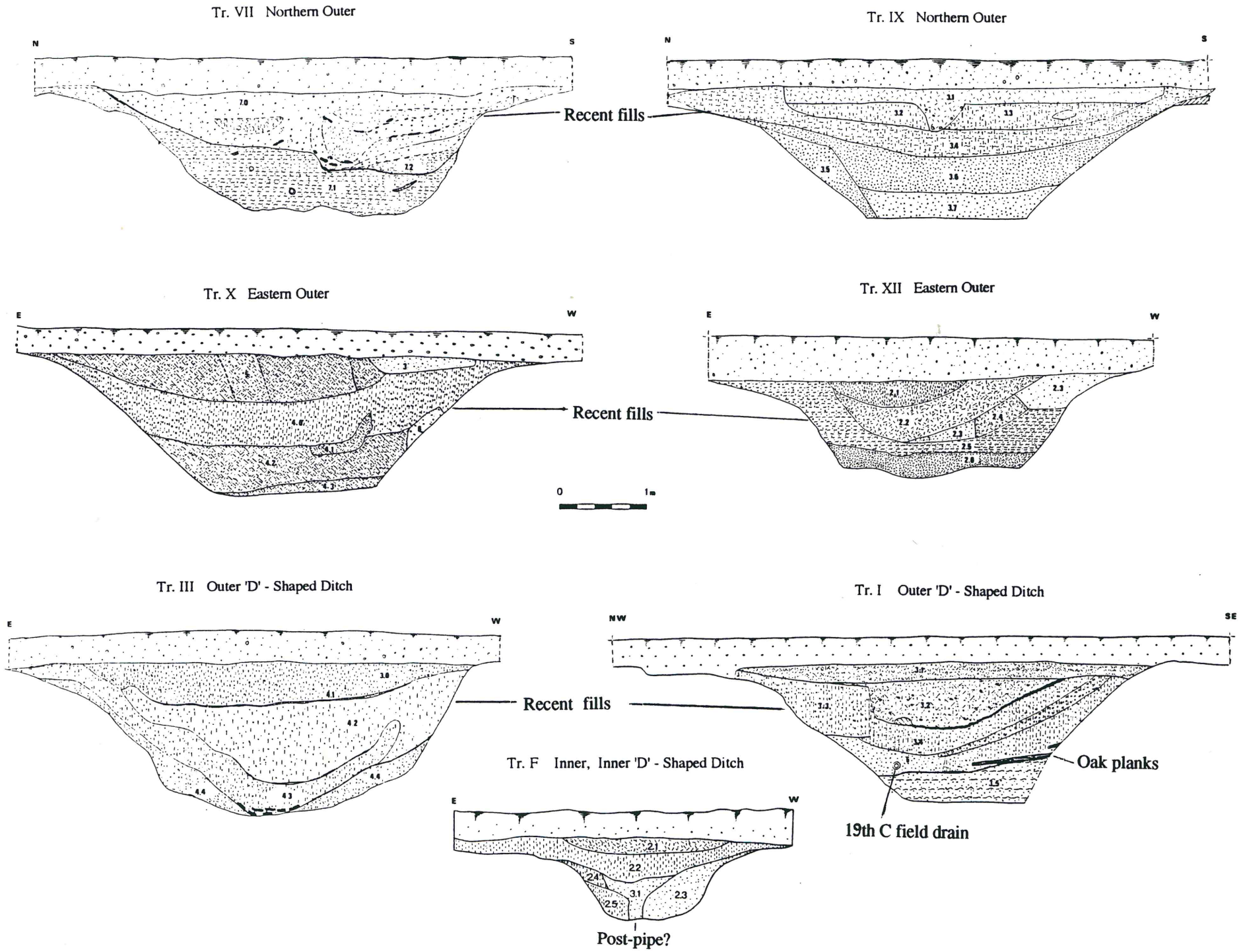


Figure 3a Section drawings of northern and eastern defensive ditches

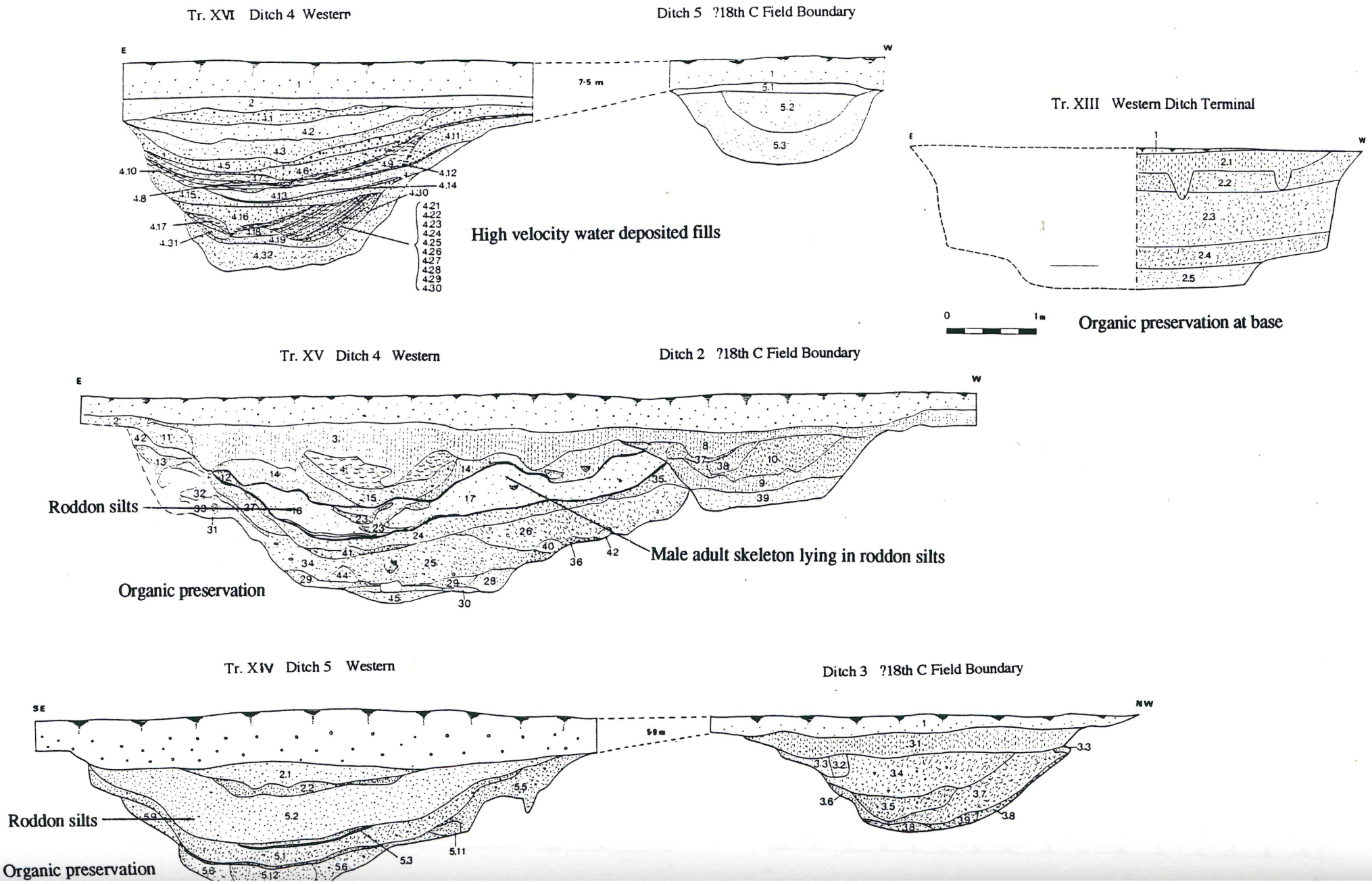


Figure 3b Section drawings of western defensive ditches

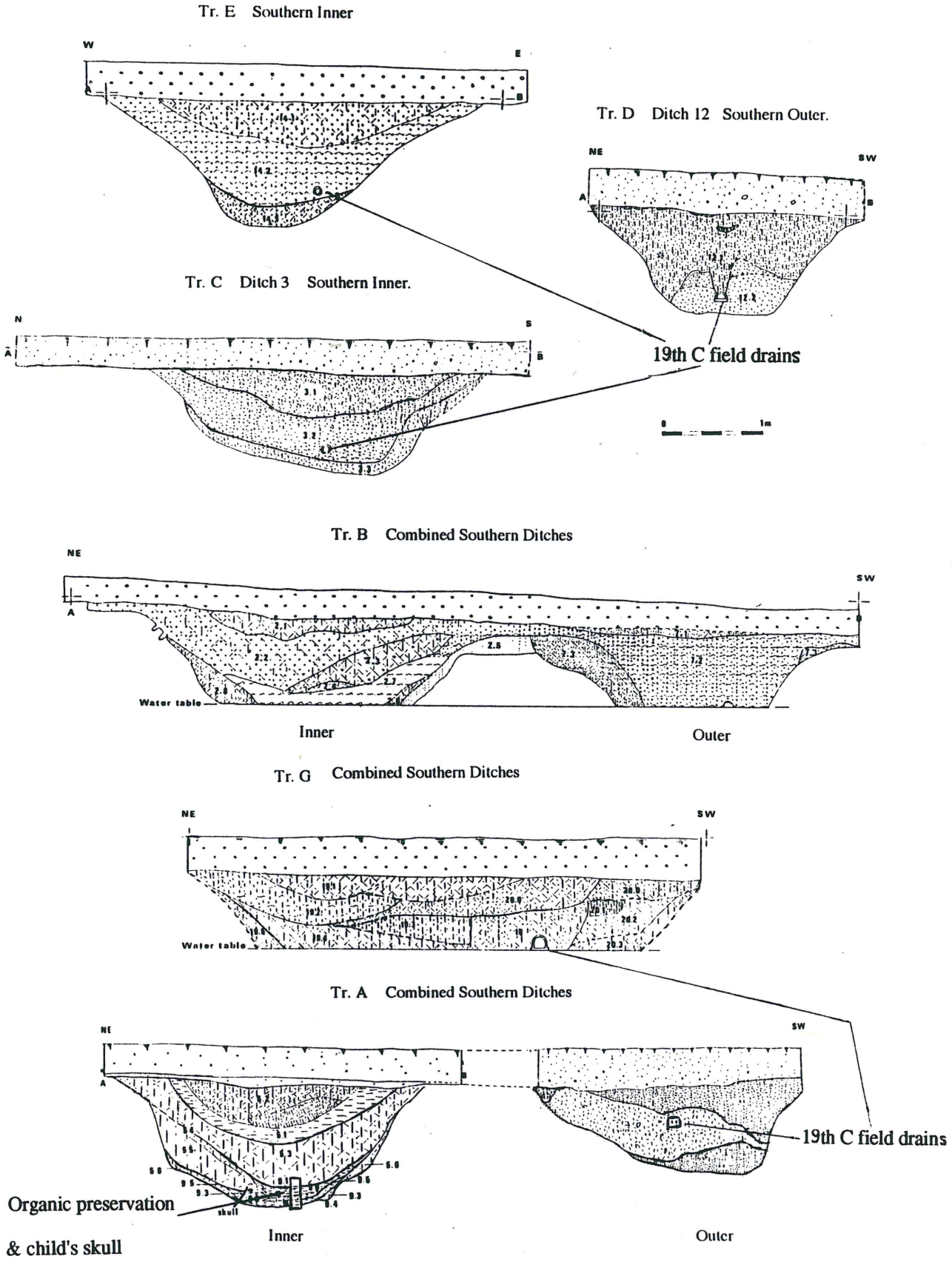


Figure 3c. Section drawings of southern defensive ditches

Western ditch *(Trenches XIII, XIV, XV, XVI, XX)* *(see Fig. 3)*

Dimensions: Tr. XIII: (outer ditch) Depth = 1.50m; basal width = 2.4m; top width = 4.5m
Tr. XIV: (outer ditch) Depth = 1.50m; basal width = 1.3m; top width = 5.5m
Tr. XV: (outer ditch) Depth = 2.00m; basal width = 2.4m; top width = 5m?
Tr. XVI: (outer ditch) Depth = 1.70m; basal width = 1.7m; top width = 4m

Description: Trench XIII was a quarter section excavated from the terminal of the outer ditch at the entranceway. Trenches XIV, XV, and XVI were all fully excavated through the outer ditch on its western (fen) side, and all told a similar story. Deposition within this outer ditch bodering the fen revealed a complex history of early in-fill, including flooding episodes from the adjacent stream. Organic preservation in the lower fills was good and included wood, some of which showed worked surfaces (see Appendix V) which were probably the bases of posts and stakes. Fast flowing water could be detected at the south-western corner of the Camp, where deposits of sand interleaved with organic-rich lenses were found to be filling the western ditches.
Although increased clay content could be seen in the base of the topsoil overburden, and a remnant of bank was found intact (0.2m high), generally it was unclear where the bank material had been spread, and it is possible that it was removed altogether to be used elsewhere during the 1960s. However one remnant of bank was discovered in-situ in Trench XXII, which had been located merely to trace the line of the western ditch between the fully excavated sections of Trenches XV and XVI. This bank material was sampled to see whether a buried soil survived, and to see whether grey lenses of silt in the centre of the bank were remains of a turf-stack (French forthcoming).

Southern ditches *(Trenches VI, A, B, C, D, E, G)* *(see Fig. 3)*

Dimensions: Tr. VI: (outer ditch) Depth = 0.90m; basal width = 1.1m; top width = 3.1m
(inner ditch) Depth = 1.20m; basal width = 1m; top width = 3m
Tr. A: (outer ditch) Depth = 1m; basal width = 1.3m; top width = 2.7m
(inner ditch) Depth = 1.30m; basal width = 1m; top width = 2.8m
Tr. B: (outer ditch) Water-table at 1.1m from surface; top width = 2.7m
(inner ditch) Water-table at 1.1m from surface; top width = 3m
Tr. C: (inner ditch) Depth = 1m; basal width = 1.8m; top width = 3.3m
Tr. D: (outer ditch) Depth = 1.05m; basal width = 0.9m; top width = 2.6m
Tr. E: (inner ditch) Depth = 1.20m; basal width = 0.9m; top width = 3.7m

Description: All the above ditches displayed very similar depositional histories, and in-fill on this south side showed little evidence of a levelled bank, with the highest levels containing 19th and 20th century rubbish. Fills were largely desiccated peat deposits at higher levels, with well-preserved organic remains in a silty-clay layer near the base (see Appendices III and IV). Flooding episodes separated the organic-rich Iron Age primary fills from later deposits, and it was from these southern ditches that the environmental sequence has been reconstructed by Patricia Wiltshire (pollen) and Peter Murphy (macro-fossils).

Figure 4 Western outer ditch (Trench XV from west); the yellow band in the middle is roddon derived silts, in which a male skeleton had been laid. Beneath them organic remains were preserved in primary silty-clay fills

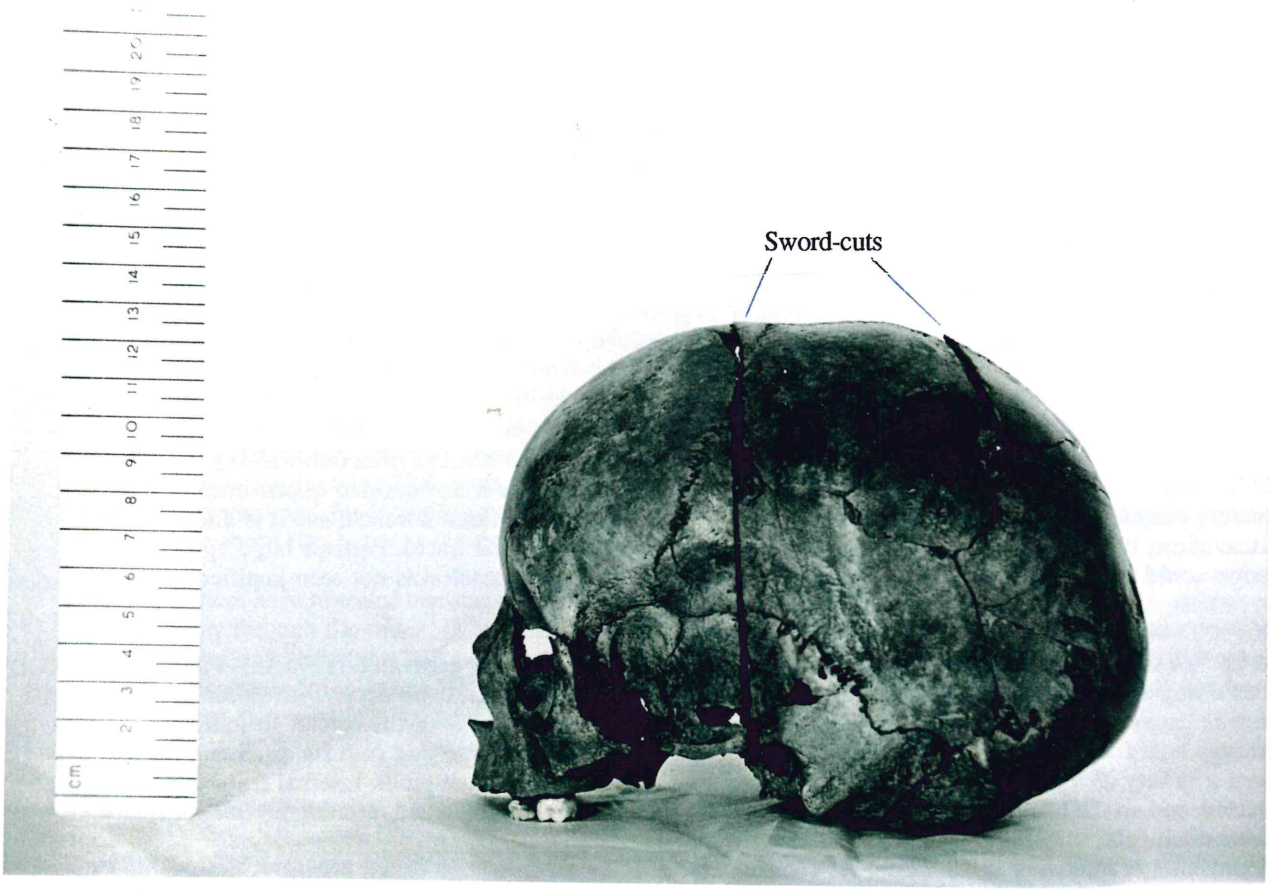


Figure 5 Photographs of skeletons found by excavation; a) child's skull from Southern ditch Trench A
b) skeleton recovered from outer ditch Trench XV which had sunk into roddon silts filling the ditch

Human remains *(See Appendix I)*

A 4 year old child's skull with two sword cuts and associated human bones of an adult and younger child were found within the primary fills of the inner southern ditch (Trench A; see figs. 3c & 5). Carbon dating has given a date of 2070 +/- 65 B.P. (OxA 3620), i.e. approximately ranged between 185-55 BC. These bones were sealed beneath brackish water deposits. Further human remains were found in two of the western ditch sections, a single adult long bone from Trench XVI and a complete male adult skeleton from Trench XV. He was 25-35 years old, healthy, 1.78m tall, and was found within the silty-sands deposited during flooding, but no grave-cut could be seen. Therefore its seems that the body was lowered into a wet ditch, into the fills of which it sank. No grave-goods or other artefacts have been found with any of the bones.
In comparison to human remains it is worth noting the very few animal bones recovered during excavation, especially from primary fills. There would be no reason on grounds of differential preservation for this absence, therefore it is clear that the Camp does not have a typical domestic Iron Age assemblage of bone.

Occupation

Test-pits and trenches were excavated over two areas defined by pottery concentrations from fieldwalking in 1980 and 1990. Very few artefacts were found in the topsoil, and sub-soil features were confined to pan-busting and 19th century drainage. Trench XVII was a continuation of the 1980 British Museum trench, and it is clear from both excavations that whatever occupation occurred has left very insubstantial traces. Perhaps large open-area excavation could find evidence of fairly temporary structures, but this approach was not seen justified in the present campaign of work.

One of the "earthen-ring"s shown on the 1926 O.S. map of Stonea Camp was excavated (Trench XVIII) and produced a ring-ditch of 10m diameter (Fig. 6), with ditches up to 1m wide and 0.4m deep. Two-thirds of this feature was excavated in plan revealing all but its northern part, and no break in the circuit to indicate an entranceway was found in the opened area. Only three 1m long segments were dug into its ditch and these displayed a variety of V to U-shapes, with fills that included packing around post-pipes. Internal features were not detected, and artefacts were limited to worked flints, most from the overburden and cleaning layers, but also some from ditch-fills.
The dimensions of this ring-ditch would fit comfortably those of an Iron Age round-house. Although no structural details were found on the interior perhaps the timber supports rose only from the surrounding ditch, or that within it they rested on stones, rather than being sunk into post-holes. Lack of finds can be attributed to cleaning-out activities, and this ring-ditch must constitute the best evidence we have so far for settlement at Stonea. However from such limited excavation this evidence is far from conclusive, and in the context of adjacent ring-ditches and burial monuments the evidence also suggests that we have neither a round-house nor barrow, but that the ring-ditch forms part of some palisaded ritual monument such as the "wossit" excavated at Street House, Loftus, Cleveland (Vyner, 1988), probably of Late Neolithic-Bronze Age date.

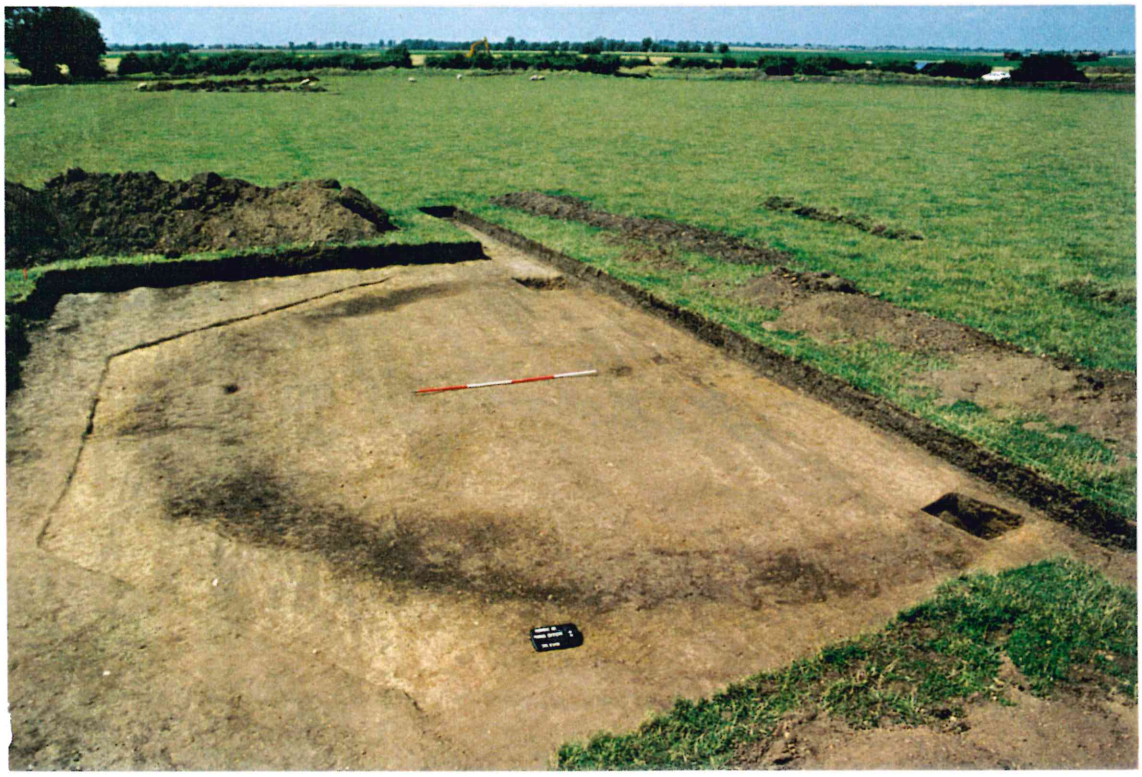


Figure 6. Ring-ditch in Trench XVIII during excavation.

Entranceways

The eastern side of the only known entranceway through the outer ditch and bank was opened as Trench XIII. A single quadrant was excavated in the ditch terminal, and organic remains including worked wood were found in the clayey primary fills. Desiccated peats formed the upper levels of in-fill. Although much evidence of solifluction was observed, no archaeological features such as post-pits for gate structures were seen. In fact the area seemed to be disappointingly uncomplex! Further open-area excavation across the full width of the entrance and immediately behind it would be desirable at a later date. A deposit behind the ditch, with animal bone and orange-clay flecking in it, may be residual bank material.
In the southern defences a possible entranceway shows on the 1880s and 1926 O.S. maps. However, during excavation it was found that the ditch line was continuous, with inner and outer ditches combining to make a single defence (Fig. 9). From air photographic evidence (Derek Edwards 1990) it can be seen that the inner bank survives along its entire length, with two ditches outside of it. Bank material along the outer ditch stops where the two ditches run together. Thus it would suggest that the inner ditch post-dates the outer (Fig. 9). This would appear to contradict the double banks that show on early O.S. maps, but I think these may be a product of poor hachering as there would not have been sufficent room remaining between the banks for the inner ditch. We should perhaps interpret the O.S. map as having ditches rather than banks on the south side. The apparent "entrance" represented by incurving outer bank (or ditch) was found in the excavation of this area to be a peninsula of natural clay between the merging of outer and inner ditches.

Internal defences have revealed one staggered entrance through the "Double-D" ditches, and one other genuine Iron Age causeway through the outer "D" defence (Fig. 2). Derek Edwards' air photograph shows the causeways as cropmarks through the outer "D" shaped ditch, but until excavation showed them, and also one of the two existing ones through the inner "D", to have high natural subsoil between ditch terminals it had not been recognised that they were original Iron Age features.

Topographic survey

During the 1992 season a full contour survey was carried out by Jamie Quatermaine of Lancaster University Archaeology Unit. Computer graphics has allowed a dramatic visual representation of Stonea Camp's fen-edge location to be plotted (Fig. 7), and has provided very useful information for water management on the site. Further analysis of this data is being undertaken at present.

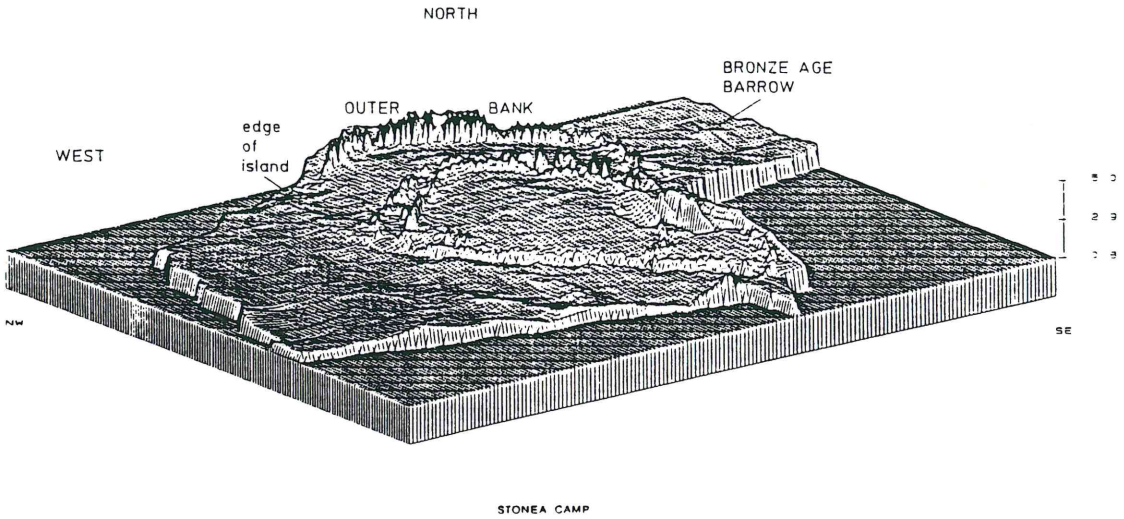


Figure 7. Survey of Stonea Camp looking from south-west. The grid pattern of the contours shows the general rise of the island out of the fen and that the southern and western defences have been positioned on the very edge of the island.

Phasing

Potter (1989) suggests three main phases of development for Stonea Camp (Fig.8), based upon study of O.S. plans of earthworks and air photographs. From our excavations and detailed contour survey it has been possible to identify at least three further ditches, which have been totally in-filled (Fig. 2). Dating for these is unknown, but certainly two would seem to pre-date the Double-"D" shaped ditches. Two trenches (XIX and XX) were positioned at the junction of the outer defence and the outer D-shaped ditch to investigate the relationship of these ditches and to test the phasing proposed by Tim Potter. No evidence of the postulated second phase enclosure ditch was found, indeed excavations clearly showed the outer "D" ditch suddenly curving outwards to meet with the outer bank and ditch. Much work remains to be completed on these aspects of the Camp.

My own phasing would suggest a slightly different sequence based on our excavation results and on more recent air photographic evidence (Figs. 8 & 9). Phase I would involve the complete outer circuit including entranceway. Phase II would be the initial "D" shaped ditch creating an internal division within the Camp (this ditch is now apparent only as a parch mark and depression). Phase III would be a replacement of the southern ditch and the phase II ditch by a sub-rectangular enclosure. Phase IV would involve construction of the existing double "D" shaped ditches, through which a staggered entranceway occurs towards the western end. One other causeway exists through the outer "D" shaped ditch, two-thirds of the way along to the eastern end (These are visible on Derek Edwards' air photograph, Fig. 9). Evidence for a causeway through the inner "D" only occurs at one spot, staggered slightly to the west of the middle one of the outer "D" entrances. The outer causeway here seems to continue a postulated causeway in the phase II ditch where there is a break in the parch-mark and depression. Further ditches, on the interior of the inner "D" and immediately outside part of the western end of the outer "D" are difficult to place but presumably follow the line of those ditches laid out in phase IV, and are therefore contemporary or later.
Evidence for the above phasing rests on the physical relationships of the filled-in phase II ditch to the extant phase III and IV ditches, which clearly cut the earlier one. Phase III is similarly cut by phase IV inner "D", and the argument for phase III southern inner ditch replacing the southern outer ditch is from Derek Edwards' 1990 air photograph (Fig. 9) which shows evidence of a bank and ditch on the inner enclosure which interrupts the bank, but not the line of the ditch, of the outer (and thus earlier) defence. Phase IV outer "D" shaped ditch was seen in excavation to terminate before the outer defence at both ends; at the western end a short gap is left between the ditch of the "D" and the outer ditch, presumably indicating where the outer bank used to stand; at the eastern end this occurs again, but also the "D" shaped ditch turns very abruptly and deliberately to meet with the outer defence.

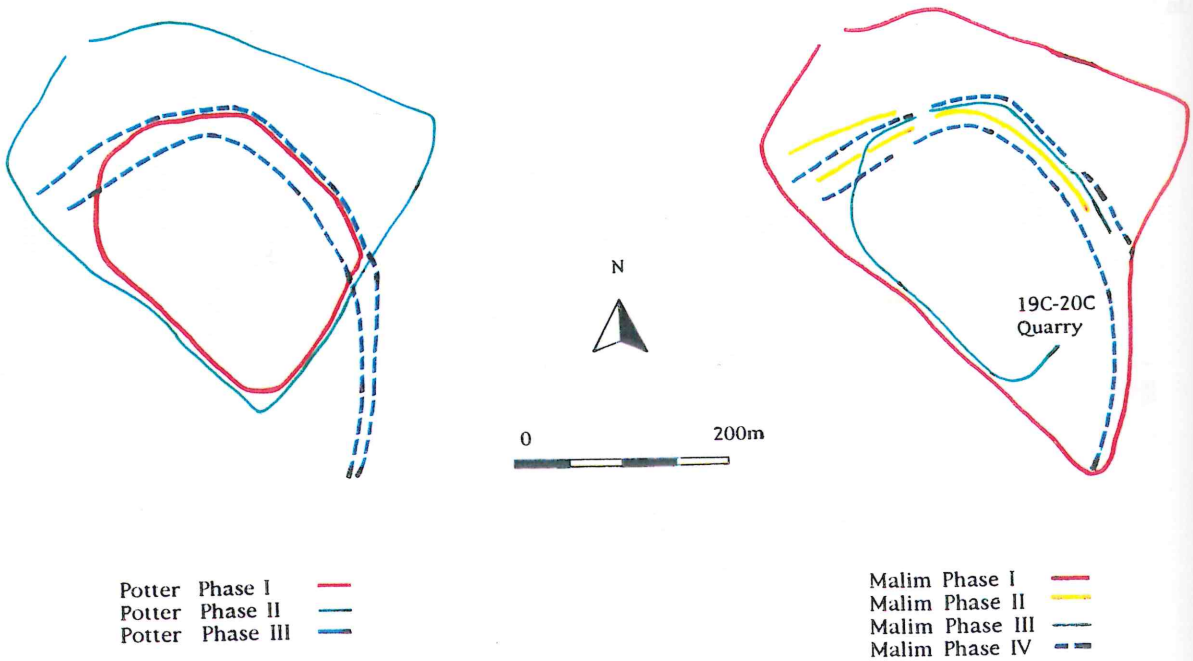


Figure 8. Phasing of Stonea Camp: a) Potter 1989; b) after present work

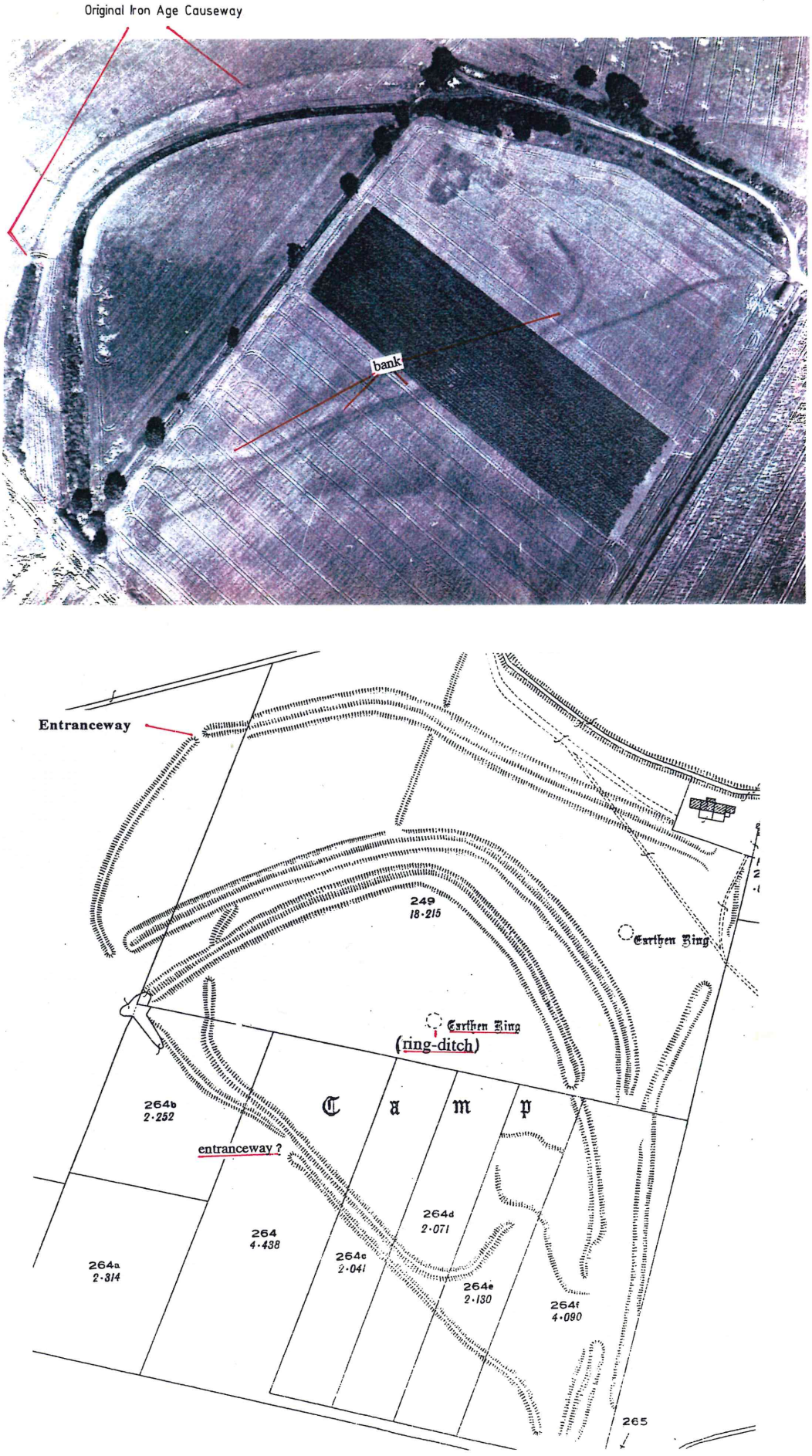


Figure 9 Aerial photograph of Stonea Camp in 1990 and 1926 O.S. map
(Copyright Norfolk Museums Service; photograph by Derek Edwards)

Figure 10 Aerial photograph of Stonea island
(Cambridge University Collection: copyright reserved)

CONCLUSIONS

Nineteen trenches were fully excavated, revealing that the deepest ditches were as much as 1.8m (Fig. 3) deep. On the north side the ditches were cut into firm sands and gravels and have a steep sided, flat-based profile. On the western side they are similar but cut into Boulder Clay, whilst southern ditches have more rounded profiles and are up to 1.3m deep. Width of ditches varies from over 5m to 2.5m at the top, with basal widths from 2.8 - 1m. The apparent dichotomy between northern and southern defences may be due to the immediate topography, with southern ditches not needing to be as substantial as those on the north, as the fen would form a difficult barrier in the south which would therefore require lighter defences than the northern landward side. However, ditch profiles on the western side show a similarity in scale to northern ones, in spite of also having the fen immediately adjacent. It therefore seems likely that the southern ditches were originally dug through land that had accumulated some peat growth, and thus would have been larger than they now appear.

There is no doubt that the location of the fort was carefully selected at the very edge of Stonea island to take full defensive advantage of the fens and adjacent roddon. A detailed contour survey has shown that the southern and western defences were built at the exact point that the island rises out of the fen (Fig. 7), and the proximity of a watercourse (roddon) ensured that these ditches remained water-filled. A complete lack of evidence for cereal growing from environmental samples shows that when the camp was first constructed and used this area was one not used for arable agriculture. Wood samples of good quality worked oak suggest the possibility of a timber revetment and presence of well-managed woodland, and both pollen and plant remains point to a densely wooded island landscape when the Camp was constructed.

Lack of any structural evidence to support a case for more than transitory occupation has been demonstrated, and is supported by geophysical results, very small quantities of pottery (and this very late in date), and very low numbers of animal bone. An enigmatic ring-ditch may indicate the position of a house, but excavated evidence so far has failed to date it or confirm its function.

Amongst the bone assemblage the preponderance of human remains is significant, and in the context set out above either points to deliberate killing and hacking of a ritual nature, or (more probably) to evidence of battles at Stonea, as the bones do not all date to the same phase. There is little doubt that the defences took a great deal of labour to construct over a long period of time, and must surely represent the product of a powerful authority. Deliberate slighting of the bank has been suggested by Potter and Jackson (1982), and Peter Murphy (pers. comm.) suggests that the brackish water inundation of southern and western ditches could be the result of deliberate breaching of the adjacent roddon in an attempt to flood the Camp and therefore destroy its defensive capability. Potter (1981) reiterates Frere's suggestion of a connection between Tacitus' account of a battle during the Icenian revolt of 47 AD (when legionaries had to storm a "rustic earthwork" set amidst woodland) and the defended position of Stonea Camp. There seems to be distinct possibility that this event records a battle at Stonea, a theory which our recent excavations at the Camp helps to support.

Discussion

Stonea is virtually unique amongst the Iron Age forts of East Anglia in design and scale (see Table 1). To the west and south fen-edge forts such as Borough Fen and Belsars Hill, or the forts in the Cambridge hinterland (Arbury, War Ditches, Wandlebury) are almost circular or sub-circular and seldom multi-vallate, which corresponds to the majority of forts along the Norfolk fen-edge (Davies, 1991), and indeed with those forts (and large"defended enclosures") identified around the fen-edge in Lincolnshire (see Figs. 13 & 14). Only Thetford appears comparable to Stonea in the design of its double "D"-shaped ditches curving around the north of the site whilst using the river on the south-side as a natural defence. In size within East Anglia only Essex has forts of comparable or larger area to Stonea or Thetford (Table 1). Thus we should regard Stonea not merely as a fort, but as a special focal point at the very turbulent boundary between powerful Iron Age neighbours, and (probably) that Stonea forms the most tangible remains we have surviving of Icenian expansion into the fens during the first century BC.

Potential for further work

Stonea Camp is a complex site whose full periods of construction and duration of use are as yet poorly understood. To increase our knowledge of the site further I suggest the following strategy:

i) Further excavation to answer specific questions as to the phasing of the defences. This could be completed with small-scale trenching between existing, and across still in-filled, ditches.

ii) Further excavation to establish presence or absence of palisade or major timber defensive structures. Open-area excavation along and behind existing bank and ditch defences would be necessary.

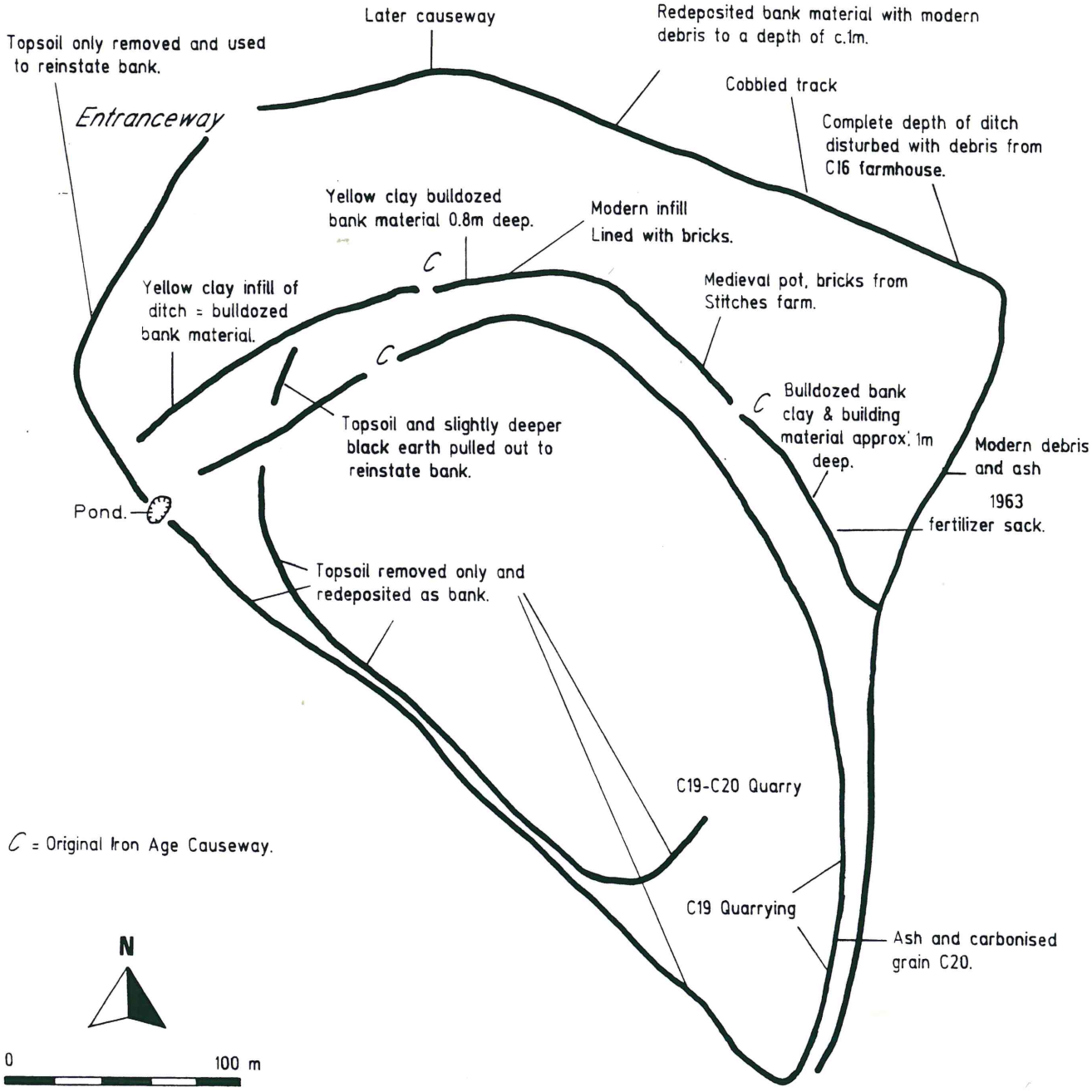
iii) Properly resourced open-area excavations at the entranceway and over areas of possible occupation may reveal more information than could be gained from the rapid, low-key evaluation excavations carried out over the past three years. It is known, for example, that pits exist at various locations, and these may well date back to Iron Age times.

iv) A thorough study of comparable sites in the region to assess Stonea in group association.

v) Further fieldwork remains to be undertaken on Stonea island itself to tie the Camp into its immediate surroundings and contemporary environment, and to establish the location of related Iron Age settlement.

Bronze Age barrow

Figure 11 The changing face of Stonea. Four aerial views showing destruction of earthworks caused by agriculture. Left: pre 1960; right: post 1970 (defences and roddons show as soil-marks). *(Cambridge University Collection: copyright reserved) & Crown Copyright Reserved*



STONEA CAMP : Observations

Figure 12 Plan of Stonea Camp with notes on reinstatement works

Table 1:
GAZETTEER OF "IRON AGE" FORTS AROUND THE CAMBRIDGESHIRE REGION

(Principal sources: Beds SMR; Chowne 1986; Davies 1992; Fox 1923; Hertfordshire SMR; May 1976; Morris 1978)

NAME	NUMBER OF DEFENCES	RELIEF	FORM	AREA ENCLOSED	REFERENCES
Bedfordshire					
Aldbury(1)	univallate	upland	oval	2.6 ha approx.	Beds SMR
Caesar's Camp(2)	univallate	upland	irregular	> 2.83 ha	Beds SMR
Galley Hill 3)	univallate	upland	sub-rectangular	1 ha	Beds SMR
?Kilbury?(4)	univallate	upland			Beds SMR
Maiden Bower(5)	univallate	lowland	circular	4 ha	Beds SMR
Manor Farm, Bolnhurst(6)	univallate	lowland	irregular	5 ha	Beds SMR
Mowsbury Hill(7)	univallate	lowland	sub-rectangular	2.25 ha	Beds SMR
Sandy Lodge(8)	univallate	upland	irregular	0.7 ha approx.	Beds SMR
Sharpenhoe Clappers(9)	univallate	upland	sub-rectangular	3.5 ha approx.	Beds SMR
Waulud's Bank(10)	univallate	upland	circular	8 ha approx.	Beds SMR
Craddocks Camp(11) (hilltop enclosure)		upland	sub-rectangular?	18 ha ? approx.	Beds SMR
Cambridgeshire					
Arbury(12)	univallate	lowland	circular	5 ha	O.S. map
Belsars Hill(13)	univallate	lowland	circular	3 ha	O.S. map
Borough Fen(14)	bivallate	lowland	circular	3.83 ha	Hall 1987
Sawston(15)	bivallate	lowland	oval?	4 ha ? approx.	Cambs SMR
Stonea Camp(16)	multivallate	lowland	triangular	9.61 ha	Present work
Wandlebury(17)	multivallate	upland	circular	5 ha	Fox 1923
War Ditches(18)	univallate	lowland	circular	1.82 ha	Fox 1923
Essex					
Ambresbury Banks(19)	univallate	upland	sub-rectangular	5 ha	Morris 1978
Asheldham Camp(20)	univallate	lowland	sub-rectangular	5 ha	Morris 1978
Chipping Hill Earthwork(21)	bivallate	lowland	sub-rectangular	3.8 ha	Morris 1978
Danbury Camp(22)	univallate	upland	oval	2.4 ha	Morris 1978
Grove Field Camp(23)	univallate	lowland	circular	3 ha approx.	Morris 1978
Grimsditch Wood(24)	univallate	lowland	polygonal (Fox)		Morris 1978
Langdon Hills(25)		?			Morris 1978
Loughton Camp(26)	univallate	lowland	sub-rectangular	2.6 ha	Morris 1978
Mucking(27)	bivallate	lowland	circular	0.75 ha	Morris 1978
Paille or Repell Ditches(28)	univallate?	upland	rectangular	8.58 ha	Fox 1923
Pitchbury Ramparts(29)	bivallate	upland	oval	2.5 ha	Morris 1978
Ring Hill Camp(30)	univallate	lowland	oval	6.7 ha	Morris 1978
Shoebury Camp(31)	univallate	lowland			Morris 1978
Uphall Camp(32)	univallate	lowland	sub-rectangular	19.4 ha	Morris 1978
Wallbury Camp(33)	bivallate	lowland	oval	12.4 ha	Morris 1978
Weald Park Camp(34)	univallate	lowland	sub-rectangular	2.8 ha	Morris 1978

(N.B. Galley Hill and Waulud's Bank may have been originally bivallate)

(N.B. A further group of forts are suggested by Crawford 1936 situated between Ashwell Street and the Icknield Way. These include:
Burlow Hill
Hoys Farm
Limlow Hill
Northfield Farm
Fox 1923 suggests that the Round Moats at Fowlmere may also be of Iron Age date while Evans also sees Coveney Wardy Hill as a defensive settlement of this period.)

Hertfordshire

Arbury Banks(35)	bivallate	lowland	oval	5.4 ha	Herts SMR
Ravensburgh Castle(36)	bivallate?	upland		6.5 ha	Herts SMR
Wilbury Hill(37)	univallate	lowland		7.2 ha	Herts SMR
Gatesbury Wood(38)	univallate	lowland	sub-rectangular	2.8 ha	Herts SMR
Westfield Farm Earthworks(39)	univallate	?			Herts SMR

Lincolnshire

Burgh (Borough) Banks(40)	univallate	lowland	circular?	3.3 ha approx.	Chowne 1986
Careby Camp(41)	bivallate	?	oval	4 ha approx.	Chowne 1986
Honington Camp(42)	multivallate	lowland	rectangular	0.58 ha	May 1976
Round Hills(43)	univallate	lowland	circular	1.0 ha	May 1976
Tattershall Thorpe(44)	bivallate	lowland	sub-rectangular	1.8 ha approx.	Chowne 1986

Norfolk

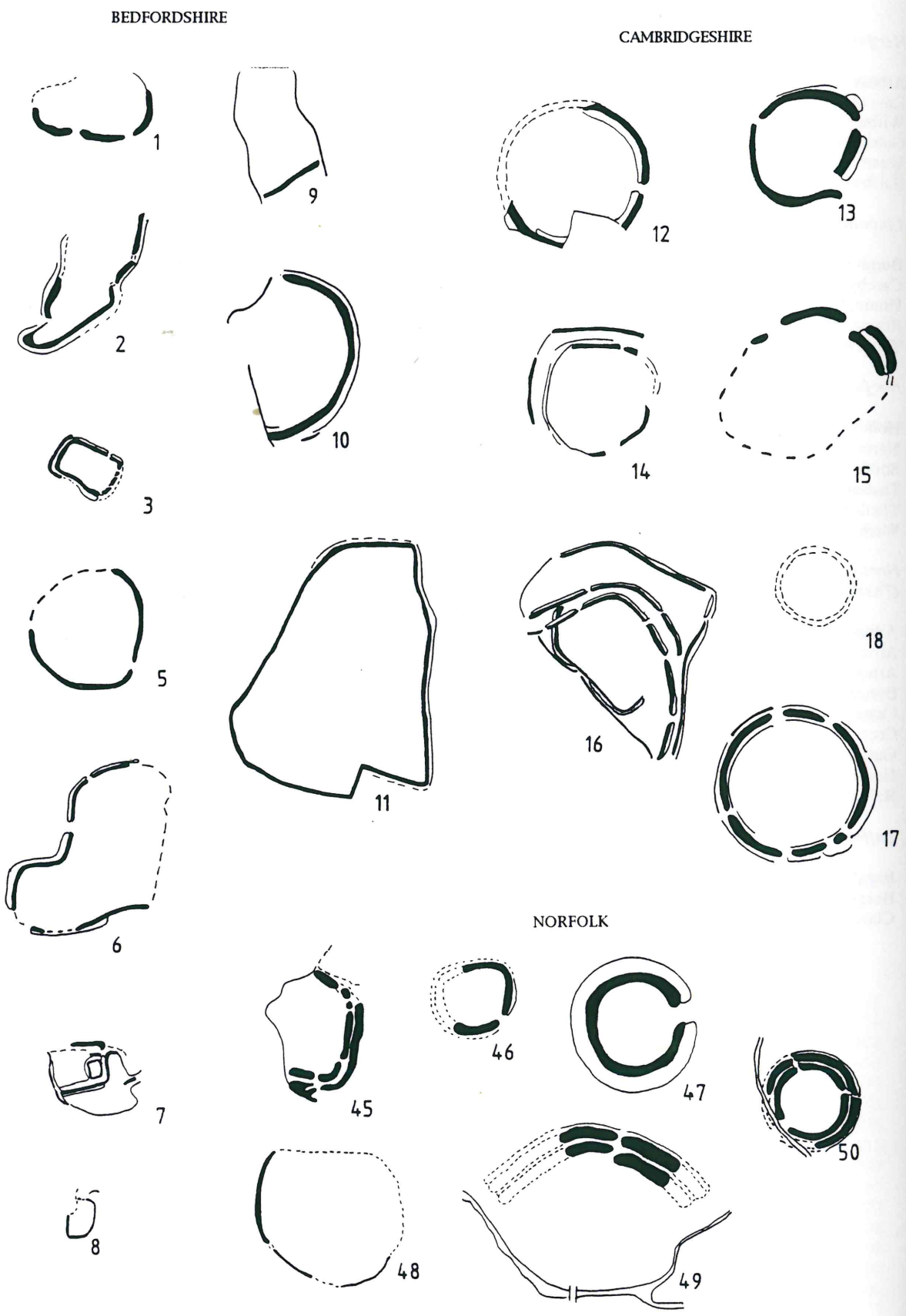
Holkham(45)	bivallate	lowland	sub-rectangular	>2 ha (erosion)	Davies 1992
Narborough(46)	univallate	lowland	oval?	1.56 ha	Davies 1992
South Creake(47)	univallate	lowland	circular	3.5 ha	Davies 1992
Tasborough(48)	univallate	lowland	oval?	6.2 ha	Davies 1992
Thetford Castle(49)	bivallate	lowland	triangular	8 ha approx.	Davies 1992
Warham Camp(50)	bivallate	lowland	circular	1.5 ha	Davies 1992

Northamptonshire
(These Hillforts are not included in the Maps or Diagrams as they are outside the area of investigation)

Arbury Camp	univallate	upland	circular	3.0 ha	RCHM 1982
Arbury Hill	univallate	upland	sub-rectangular	?	RCHM 1982
Arbury/Thenford	univallate	lowland	sub-circular	1.68 ha	RCHM 1982
Borough Hill	multivallate	upland	sub-rectangular	54 ha	RCHM 1982
Castel Dykes	univallate	?	sub-rectangular	3.3 ha	RCHM 1982
Crow Hill	univallate	?	sub-rectangular	?	RCHM 1982
Gulisborough	univallate	?	rectangular	? (large)	RCHM 1982
Hunsbury	univallate	?	circular	1.6 ha	RCHM 1982
Rainsborough	bivallate	upland	oval	2,26 ha	RCHM 1982

Suffolk

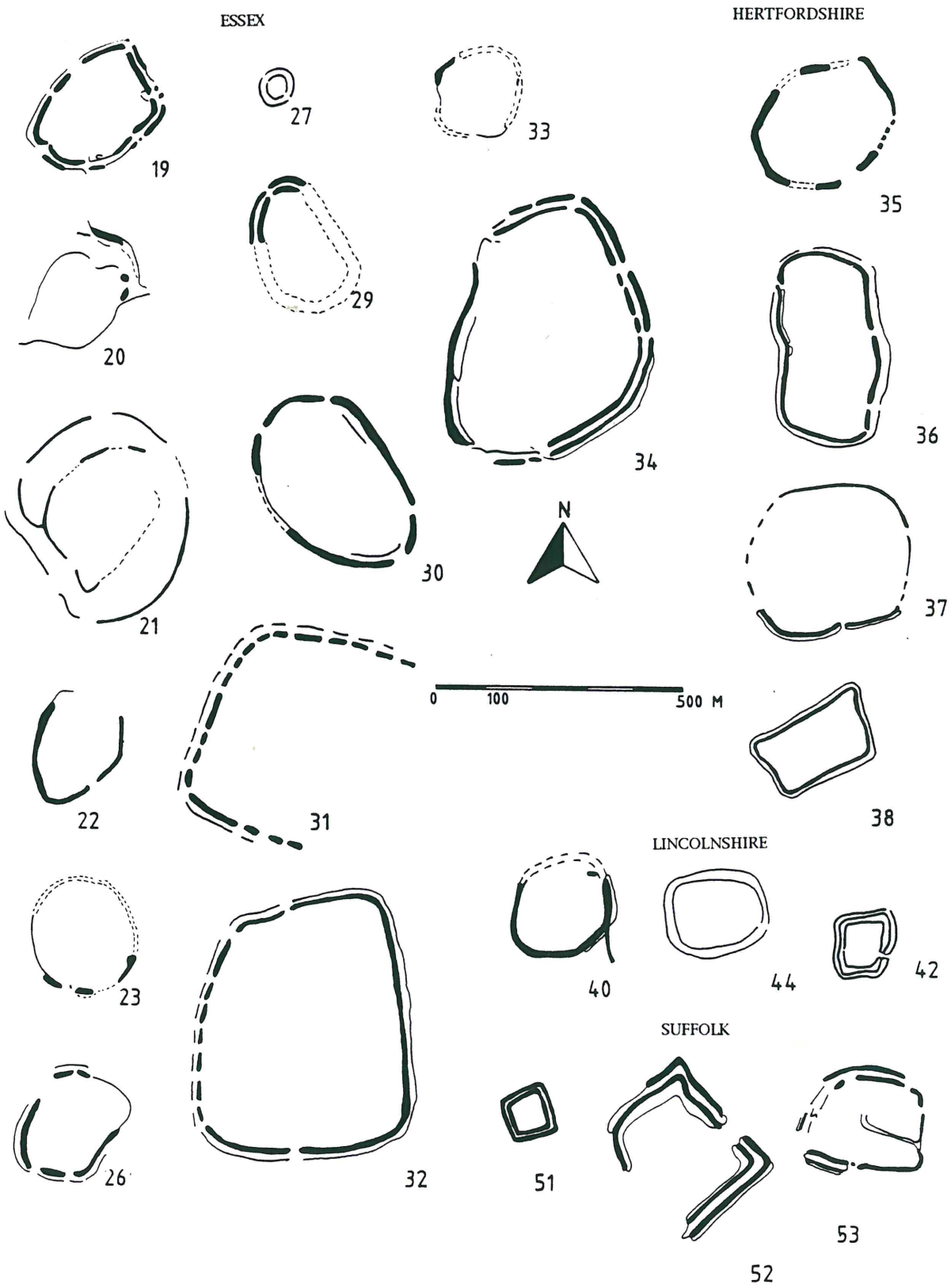
Barnham(51)	bivallate	lowland	sub-rectangular	1.0 ha	Martin 1988
Burgh(52)	bivallate	lowland	sub-rectangular	7.0 ha	Martin 1988
Clare(53)	bivallate	lowland	sub-rectangular	5.25 ha	Martin 1988



Hillfort Index

1. Aldbury
2. Caesars Camp
3. Galley Hill
4. Kilbury(N/A)
5. Maiden Bower
6. Manor Farm
7. Mowsbury Hill
8. Sandy Lodge
9. Sharpenhoe Clappers
10. Waulud's Bank
11. Craddocks Camp
12. Arbury (Cambs)
13. Belsars Hill
14. Borough Fen
15. Sawston
16. Stonea Camp
17. Wandlebury
18. War Ditches
19. Ambresbury Banks
20. Asheldam Camp
21. Chipping Hill
22. Danbury Camp
23. Grove Field Camp
24. Grimsditch(N/A)
25. Langdon(N/A)
26. Loughton Camp
27. Mucking

FIGURE 13 - Comparative diagram of the Hillforts around Cambridgeshire



28. Paille (N/A)
29. Pitchbury
30. Ring Hill Camp
31. Shoebury Camp
32. Uphall Camp
33. Wallbury Camp
34. Weald Park Camp
35. Arbury (Herts)
36. Ravensburgh
37. Wilbury Hill
38. Gatesbury Wood
39. Westfied(N/A)
40. Burgh Banks
41. Careby(N/A)
42. Honington Camp
43. Rounds Hill(N/A)
44. Tattershall
45. Holkham
46. Narborough
47. South Creake
48. Tasborough
49. Thetford Castle
50. Warham Camp
51. Barnham
52. Burgh
53. Clare

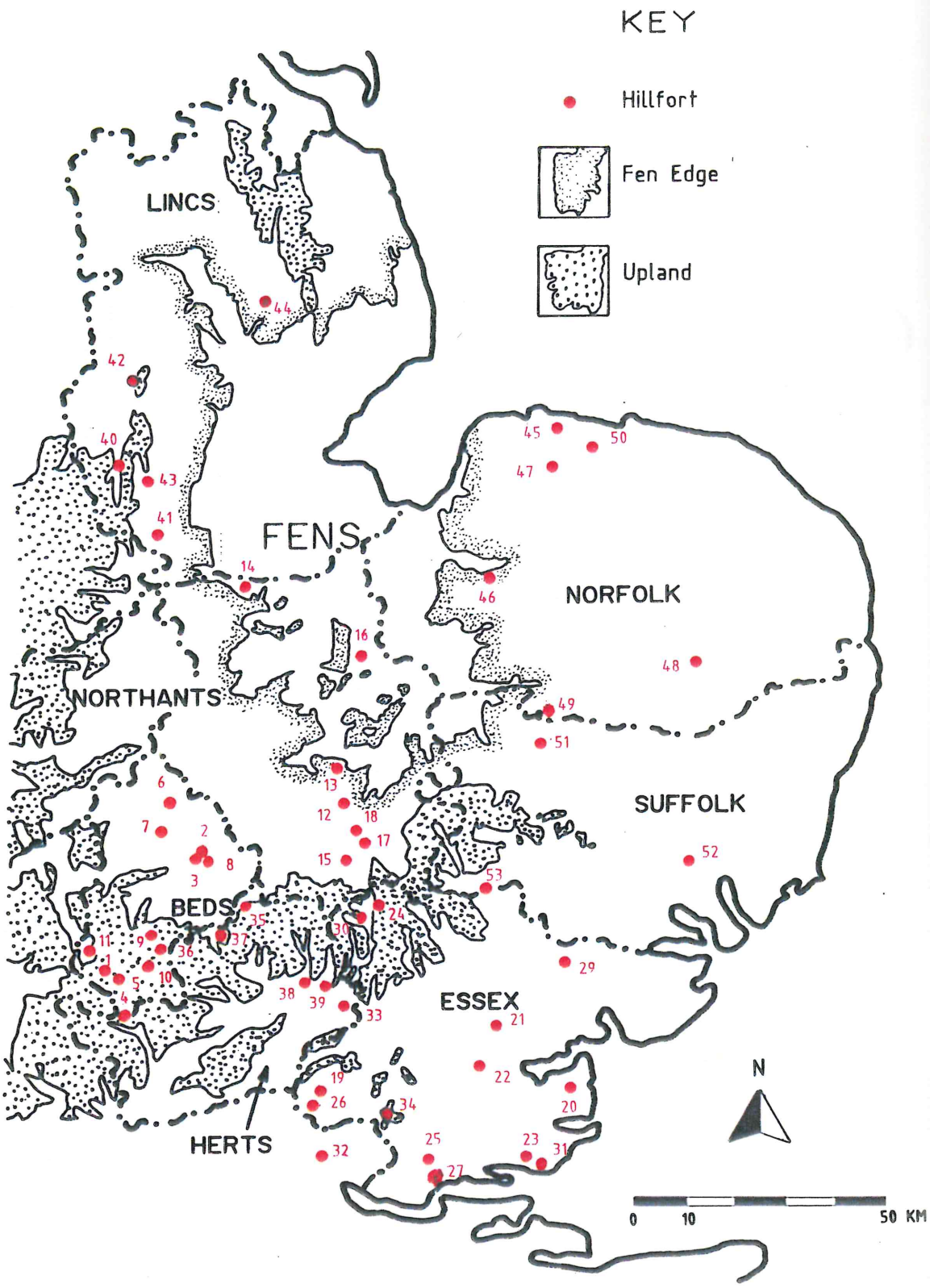


Figure 14 Distribution of hillforts around the Cambridgeshire region

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APPENDICES

I HUMAN BONE

II LITHICS

III POLLEN

IV BOTANICAL

V WOOD

VI GEOPHYSICS

Appendix I Human Bone Report Corinne Duhig

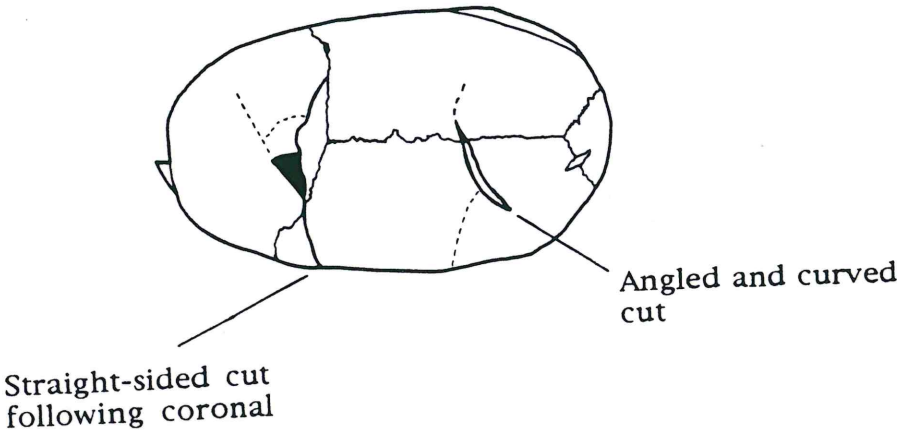
The fragmentary, incomplete and intermingled remains of three individuals were recovered from the base of a single ditch in 1991, whilst during excavations in 1992 the almost complete skeleton of a mature individual was found, as well as a single human radius from another ditch-fill.

Skeleton 1

Most of the material comes from the skeleton of a child of four years of age, represented by a skull without mandible, an almost comlete right arm, a left humerus, portions of the upper neck and shoulder girdle, and a left femur with the associated portions of the innominate bone. A few hand bones are also preserved, but there are no fragments from the right leg, left lower leg, or feet. The child's age can be determined closely, because of the condition of the dentition and the state of fusion of some of the skull bones.

When reconstructed, the skull ----- lacking only the delicate lachrymal bones and the auditory ossicles ----- is seen to be traversed by two cuts, both apparently made by a very sharp, edged weapon or implement which had sliced cleanly through all three layers of the bone, with only minimal cracking. The first cut lies in the coronal plane (at right angles to the long axis of the skull), close to the coronal suture: beginning of the left zygomatic arch, it runs vertically through the left temporal and lower portion of the left parietal, across the suture on to the posterior portion of the frontal bone, and then ends in a broken area on the right coronal suture, 5cm from the midline. In part, the traumatic lesion is interfered with by the interdigitations of the suture itself. Throughout its length, the cut is perpendicular to the skull surface, showing it to have been caused by a blow at the same angle to the surface, probably delivered from the left side where the cut is cleanest. The second lesion is at the mid-point between bregma and lambda (midway down the left parietal), and extends 0.75cm across the sagittal suture to the right parietal. Unlike the previous cut, this is not perpendicular to the skull surface, but is angled at approximately 45 degrees to the surface, sloping from front to back as would be the case if a blow had been delivered from the front. There is cracking at both ends of the cut, and in the central portion the inner table has flaked away, but the angle of penetration would have been too close to the vertical to remove a roundel of bone (as can be seen in many cases of sword cuts such as those from Maiden Castle).

Under magnification, the edge of the second lesion shows striations such as have been experimentally produced on bone by sword cuts, and further examination using the scanning electron microscope will be carried out to test the supposition that a sword had been used in this case. If delivered in life, these wounds would have caused death almost instantaneously, but the injuries may have been inflicted soon after death from another cause, while the bone was still "green" and resilient. A small broken area in the left illium may also be caused by weapon injury, but the eroded condition of this bone prevents further study. The child has slight evidence for anaemia, in the condition of *cribra orbitalia* in both orbits, but no other signs of pathology.



Skeleton 2

Portions of the left ulna and radius, three ribs and a few hand bones are all that survive of this individual. The bones are of adult size, and robust, with slight lipping of the elbow joint showing the results of muscular exertion.

Skeleton 3

A few bones of a young child, are preserved: left radius, right radius and ulna, one hand bone and a fragment of clavicle. The size of the bones suggests that this child was at least a year younger than the first individual.

Skeleton 4

This is an almost complete (95%) skeleton, which was examined using the general methods given in Bass (1987) and Ubelaker (1989). The condition of the bones is good, but they are somewhat leached, and therefore delicate areas such as the facial skeleton are crushed and impossible to reconstruct: fortunately, the upper dentition is mostly present, although the maxilla is lost. There is much iron staining.

All features which are used for sex assessment, on the skull, pelvis and long bones, indicate that this is a male individual. The teeth have a degree of wear which corresponds to Brothwell's (1972) second stage, representing an age range of 25 - 35 years. This is similar to the age range given by the condition of the pubic symphysis: 23 - 29 years (McKern & Stewart 1957). The long bones could be measured, and, using the regression formulae of Trotter and Gleser (1952), stature is estimated at 178cm, approximately 5'10".

Two marked bands of hypoplastic enamel on all four canine teeth indicate an episode of developmental disturbance inearly childhood, at about the age of 3 to 4 years, representing a period of severe malnutrition or febrile illness (Hillson 1986). No other teeth show any signs of enamel disorder, but this is unsurprising: the posterior dentition generally shows less hypoplasia (because of tooth conformation) and the incisors will have completed their crown development before the first episode of disturbance.

The skeleton is otherwise that of a healthy individual, showing strongly developed muscular markings on the forearm. The many Wormian (supernumerary) bones in the sagittal and lambdoid sutures of the skull are of no clinical significance.

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Appendix II Flint Report Twigs Way

During Phase 1 of the Cambridge County Council Archaeology Section *Stonea Camp Excavation and Management Programme (1990)*, several lithic artefacts were recovered from the present ground surface as 'stray finds'. This recovery led to the initiation of a programme of systematic fieldwalking .The resultant lithic material from this fieldwalking was subsequently examined alongside the material collected as 'stray finds' and the pieces encountered during actual excavation. This report presents the results of the study and analysis of these artefacts which totalled109 pieces and date to the periods early Neolithic through to Early Bronze Age.

Introduction

109 lithic artefacts were recovered during Phase 1 of the Stonea Camp management plan. Of these the majority (72%) were recovered by a planned programme of fieldwalking, 26% as 'stray finds' from the present ground surface (but with locations recorded), and the remaining 2% from excavation trenches. As the entire assemblage was so small, and each find could be located to within 10m or less, it was decided to study and analyse the three 'groups' as one, particularly as the two largest groups were both recovered from within the present ploughsoil.

Fieldwalking was carried out over a series of three weekends by a small group (2 - 4) of professional archaeologists. The ground had been recently harrowed, although seeded grass was starting to come up, and visibility was generally good. The area was walked at 10m transect intervals in 10m sweeps and an area of approximately 230mx300m was covered in this way concentrating on the area to the north of Stonea Camp (see area outlined on Fig. 1).

Stray finds which had been previously recovered by a member of the archaeology team were also given co-ordinates (being given small finds numbers at the same time) and were therefore easy to subsequently incorporate into the analysis (Fig. 2).

Finds recovered during excavation are included within the typological analysis but not recorded on the spatial distribution plans as they were from below present-day ground surface. There are only 2 artefacts in this category.

The artefacts were first studied in terms of technology and typology to assess the possible periods represented and whether there were any indications of 'discrete' artefact populations present .This was then followed by spatial analyses to ascertain whether any patterning of types was evident over the landscape.

Raw material

The flint has not been subject to professional geological examination, but the impression gained by the author is generally that of a fairly low quality flint probably originating from gravels. This suggestion is based on the generally small size of flakes (Fig 3); the high frequency of cortical and sub-cortical flakes (58 %) (see Fig. 6); and the size and type of the core pieces (SF 43, 69, 105 and 108).

The above figures are based entirely on the flake assemblage as it was noted from an early stage that there appears to be some difference between the flake and blade assemblages. In particular, the percentage of cortical and sub-cortical pieces amongst the blade and bladelet assemblage is much smaller (23 %) and for some reason the level of patination is much higher (blade patination frequency 82 %; flake patination frequency 16 %). (See Fig. 6). Unfortunately as the actual physical processes causing patination are not fully understood it is impossible to say what this latter figure actually means and in particular, whether it is in any way temporally related.

Additionally some of the artefacts appear to have been made on split pebbles (eg. SF 14 see illus; and SF 6; both scrapers) .

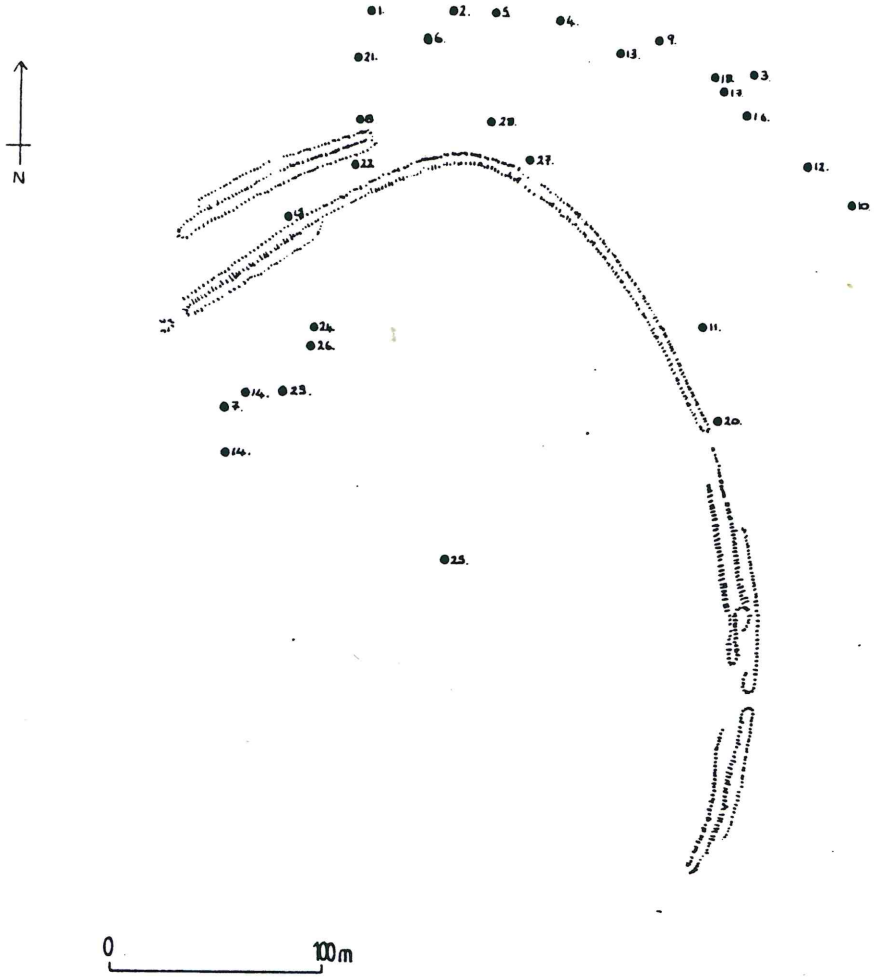
However, a few of the blades and some finer flakes suggest the presence of a finer grained less frost affected flint on the site - presumably brought in from a different source to the gravel flint.

The majority of the flakes and cores show hard hammer flaking with pronounced bulbs and some shattering at the platform but again some blades appear to have been made using a soft hammer and presumably much of the retouch was carried out with some form of bone or antler implement.

KEY

——— outline of area fieldwalked

● single lithic artefact



Typology

A full typological list appears in Appendix 1.

A short breakdown is produced below;

Table 2. Artefact Types

Type	number
leaf arrowheads	2
scrapers	11
cores	4
other retouched pieces	4
blades/bladelets	17
flakes	67
other (fired lumps)	4
TOTAL	109

In discussion of the typology the terminology adopted by Healy 1988 (p30 - 60) is followed.

Arrowheads

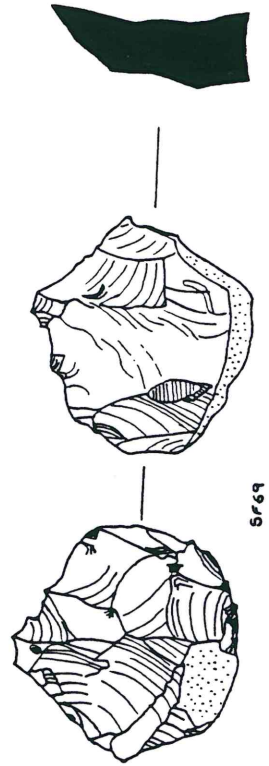
Only two arrowheads were found, both of the type described as 'leaf shaped' and indicative of the early neolithic. One (SF21) was heavily patinated and so flaking is difficult to see, but does not appear to be flaked over the entirety of both surfaces. The other ((SF 5, see illus) is pressure flaked over the entirety of both surfaces and in extremely good condition.

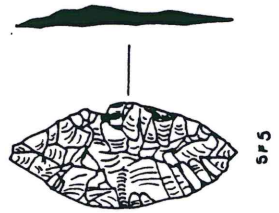
Scrapers

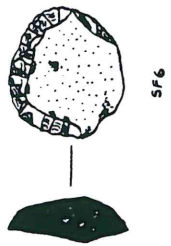
There are 3 main types of scraper present in the collection;

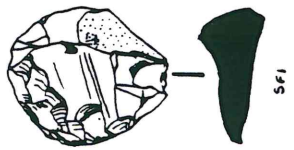
1. Side scrapers. There are three of these present, all of them are fairly rough and made of irregular , thick flakes, one of which may have been a core fragment. All of them are on sub-cortical pieces.

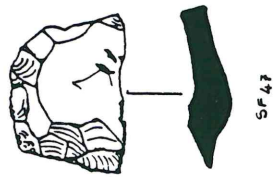
2. Side and end scrapers. There are two of these again on fairly thick flakes, but with slightly finer retouch.











3. Horseshoe scrapers. These form the majority of the scrapers present with four typical examples and two other, rather smaller examples which bear close affinities in fact to the mesolithic 'thumbnail type' (a type which also appears in the 'Beaker period') (SF 6 and 14) but these may be largely a result of their being made on what appear to be a split pebble (see illus.).
Of the more typical examples one rather interestingly appears to have been snapped **after** its manufacture as a scraper (SF 12), and this may be true of a second (SF 47; see illus) although the shape of the flake is rather odd.

With the possible exception mentioned above, these scrapers typologically extend from the early neolothic to early Bronze Age.

Cores

Four cores or core fragments were recovered all of which tend to confirm the comments made above about the type of raw material available.

Table 3. Cores

SF no	Weight	Max. dimens.	Comments.
43	44g	50mm	Keeled core. Almost exhausted
69	44g	50mm	Keeled core. See illus.
105	17g	40mm	Core frag. Multi platform
108	18g	33mm	Keeled core. Exhausted.

Each of the cores still retained some cortex despite at least two of them being exhausted.

The cores show clear signs of flake removals by hard hammer and much scarring of the platform areas, flake hinging is also apparent. These features were also noted on the flakes themselves and suggest that the cores and the flakes are all part of one population. The general shape and size of the flake scars on the cores also agrees well with the sizes of the flakes themselves.

These type of multi-platform and keeled cores belong typologically to the Late neolithic/ Early Bronze Age period (see discussion in Healy 1988, 46 -47).

Other Retouched pieces
These form no coherent group and will be examined individually;

SF 10. (See illus.)
This is an extremely fine blade, unsnapped, with retouch on the distal dorsal (right hand side) which could possibly be described as a 'knife' but the retouch is rather uneven. There appears to be no use wear or edge damage on the opposing side.

SF 32.
A small sub-cortical, rather shiny flake (possibly thermal) with uneven retouch along the distal edge forming a small notch.

SF39
A small cortical flake with extremely fine retouch along the distal and one mesial edge. The flake is snapped lengthways (ie. running proximal to distal) - which appears to have occurred prior to the retouch.

SF 62.
An extremely interesting piece which appears to be part of a blade core having approximately the morphology of a plunging blade but rather too chunky. There are signs of previous blade removals running down the dorsal, but any platform preparation has been obscured by later retouch on the proximal to make a very small scraper. This later retouch shows clearly as the rest of the artefact is slightly patinated. Retouch has also taken place on the distal end creating a fairly steep edge angle. The flint is finer than other cores and core fragments in the assemblage and there is no cortex remaining. Length is 49mm. This piece is not included in Table 3.

Flakes

As discussed above (under *raw material* and *cores*) the flakes appear to form a largely homogeneous group. They are typified by a high percentage of cortical and sub-cortical flakes (83 %); fairly small sizes (mostly less than 45mm in length and 30mm in width) (see figs 3 and 4) ;and also with a perceived concentration of hinge fractures, crushed platforms, and other flaking abnormalities probably caused by a combination of poor quality flint and the use of a hard hammer on such small cores. The few exceptions to this appear to be of a type described as 'thinning flakes' and are on a different kind of material suggesting the presence at some period of flaked axes in another type of material though these appear in a very small quantity not suggestive of on-site manufacture.

Fig. 3 Length of Flakes

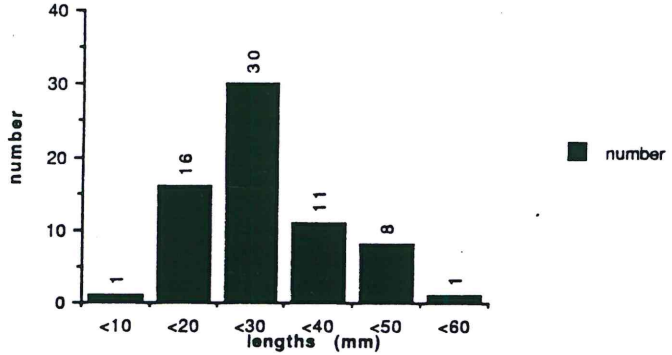
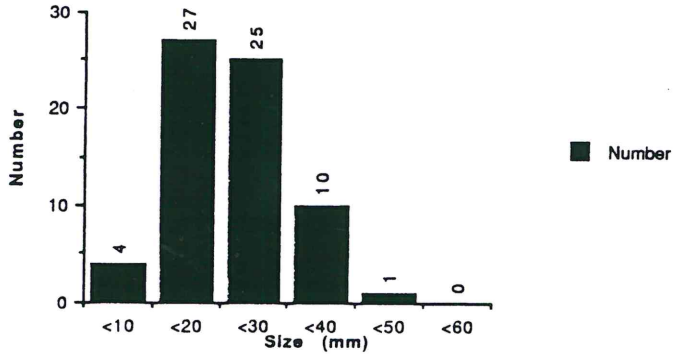


Fig. 4 Width of flakes



Blades

Blades and bladelets exhibit very different characteristics to those of the flakes in this assemblage. In the preliminary examination it was noted that the blades and bladelets were (as would be expected) usually soft hammer manufactured and appeared to have fewer flaking anomalies than the flakes (ie. fewer hinge fractures etc) , there was also a fairly high incidence (unquantified) of platform preparation.
Another characteristic of the blades and bladelets was the high percentage of snapped pieces as compared to the flakes (although this may have been a product of the morphology making damage more likely - although plough damage over the whole assemblage appeared rare).

In Fig. 5 The lengths have been taken as those measurements now available so allowance should be made for the inclusion of snapped blades.

Fig. 5 Lengths of Blades and Bladelets

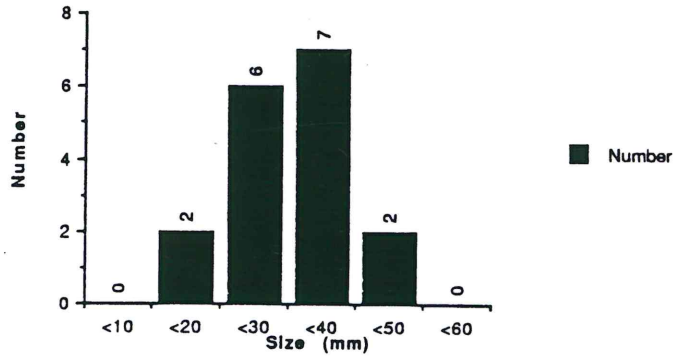
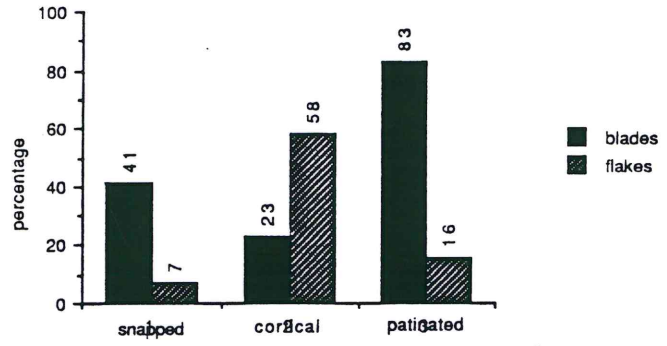


Fig. 6 Comparison Flakes and Blades



Following examination of the typology and technological attributes of the blades I would propose that they probably date to a slightly earlier period than the main bulk of the flakes and certainly utilise a different flint material and technology.

The spatial distribution of the blades was then looked at to see if they formed a discrete spatial distribution (Fig. 7) but this does not appear to be the case.

Distribution

The distribution of the studied assemblage across the area of the Stonea Camp was examined both generally (Figs 1 and 2) and with reference to specific types (Figs 7, 8 and 9). It was initially hoped that either a pattern for the assemblage in general or perhaps, with reference to periods and/or types would appear - however it would appear that the artefacts were scattered almost randomly over the area walked. Concentrations in general were so low that it would be difficult to detect any pattern.

The only distribution that appears interesting is that of the burnt material, which if overlaid onto the plan of all artefacts collected by fieldwalking (Figs. 8 and 2) might suggest a concentration of actual on-site activity within Stonea Camp to the North East.

Conclusions and Recommendations

With such a small assemblage it is difficult to make any generalised conclusions regarding activity within the area of Stonea Camp , other than perhaps the obvious one that activity levels would either appear to be very low or still laying below the present day ground surface (it is however interesting to note that during the excavation of the trenches to establish the ditch morphology only two lithic artefacts were recovered).

The artefacts that were recovered by fieldwalking and random collection belong typologically to the period extending from the Early Neolithic to the Early Bronze Age and this might be extended back to the mesolithic if the blade and bladelet element can be seen as distinct - although there appears to be no spatial distinction between them.

In general there is no apparent spatial patterning either in terms of artefact concentration in general or by artefact type, although a concentration of burnt material within the Camp itself (along with a very slight concentration of activity generally) may relate to actual on-site activity.

This area is now to be grassed as part of a long-term management programme for Stonea Camp and will no longer be suitable for fieldwalking , however, it is recommended that further fieldwalking take place as areas still under arable cultivation become available , in particular within the southern half of the Camp and beyond to the North.

TWIGS WAY

4.1.1991

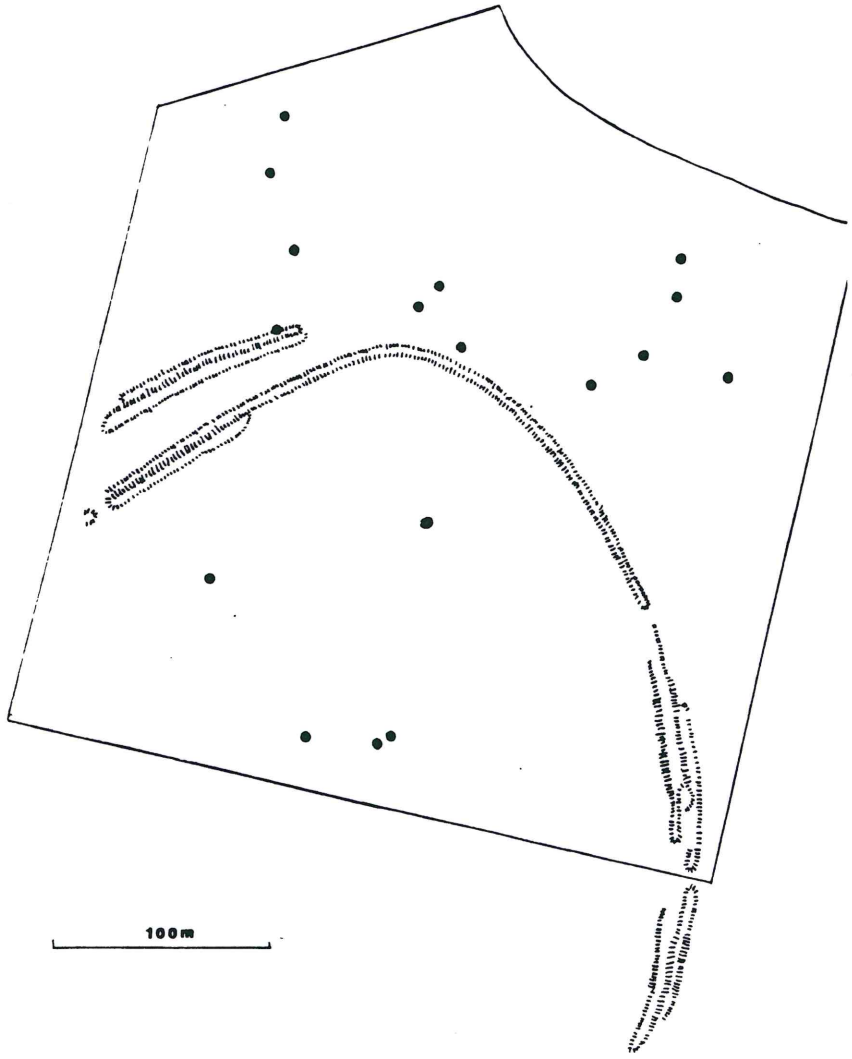


Figure 7 Distribution of Blades

Figure 8 Distribution of Artefact Types

Figure 9 Distribution of Burnt Material

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Peterson, F and Healy, F. 1986. The excavation of two round barrows and a ditched enclosure on Weasenham Lyngs, 1972. In. Lawson, A. 1986 Barrow Excavations in Norfolk 1950 - 1982. EAA Report 29. NAU

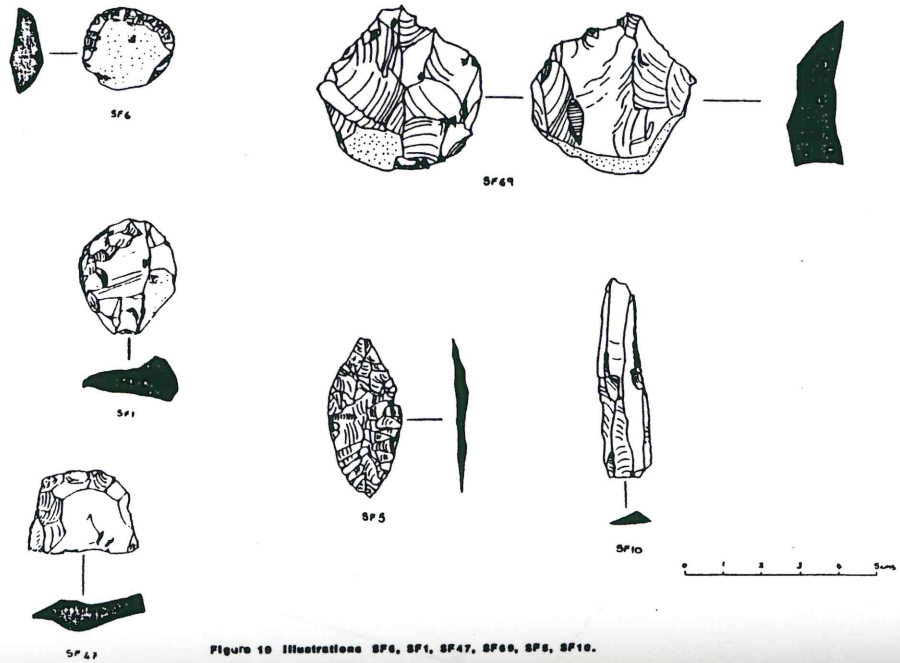


Figure 10 Illustrations SF6, SF1, SF47, SF69, SF5, SF10.

Appendix 1. Artefact Typology

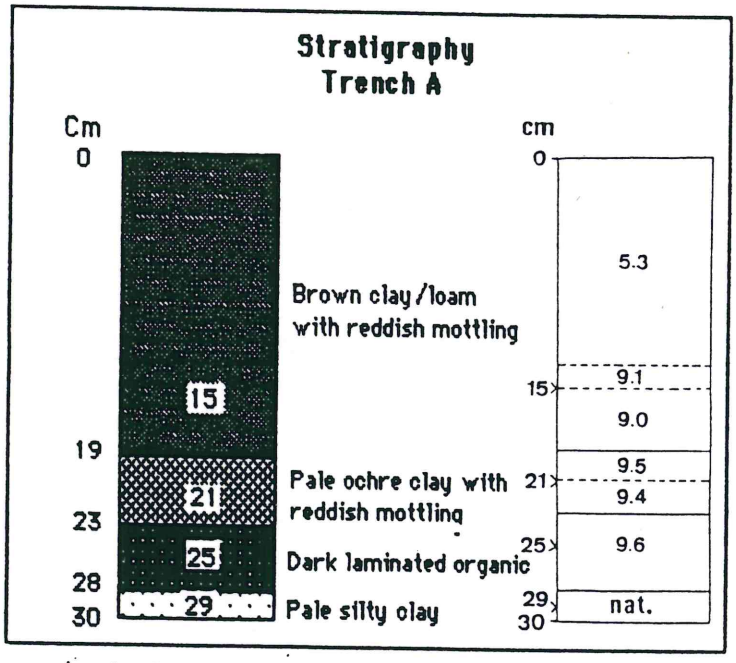
Small Find no.	Description
1.*	Side and end scraper
2.	Flake
3.	Blade
4.	Flake sub-cortical
5.*	Leaf shaped arrowhead
6.*	possible Thumbnail scraper
7.	Flake
8.	Flake sub-cortical
9.	Flake sub-cortical
10.*	Blade/knife (retouched)
11	Flake cortical
12.	Horseshoe scraper
13.	Flake sub-cortical
14.	possible Thumbnail scraper
15.	Horseshoe scraper
16.	Flake sub-cortical
17.	Flake thinning
18.	Flake cortical
19.	Flake cortical
20.	Flake sub-cortical
21.	Leaf shaped arrowhead
22.	Flake sub cortical (thermal?)
23.	Blade (mesial and distal)
24.	Flake cortical (prox. and mesial.)
25.	Blade (mesial and distal)
26.	Flake sub cortical
27.	Blade
28.	Bladelet (distal and mesial)
29.	Flake cortical
30.	Flake sub-cortical
31.	Flake
32.	Flake /notched piece (with retouch)
33.	Flake
34.	Flake
35.	Flake
36.	Bladelet
37.	Flake
38.	debitage ?
39.	Flake (distal) with retouch (?)
40.	Bladelet (proximal and mesial)
41.	Flake thinning (cortical platform)
42.	Side and end scraper
43.	Core - keeled
44.	Flake cortical
45.	Flake frag. sub-cortical
46.	Flake
47.	Horseshoe scraper
48.	Flake cortical
49.	Flake sub-cortical
50.	Flake subcortical (thermal?)
51.	Flake sub-cortical
52.	Flake (edge damage)
53.	Flake sub-cortical
54.	Bladelet
55.	Side and end scraper
56.	Flake sub-cortical
57.	Bladelet
58.	Flake sub-cortical
59.	Flake thinning
60.	Flake
61.	Bladelet (proximal and mesial)
62.	Core frag (?) retouched.
63.	Flake
64.	Flake sub-cortical
65.	debitage (cortical)
66.	Flake
67.	Flake (thermal?)
68.	Flake
69.*	Core - keeled
70.	Flake
71.	Bladelet frag.
72.	Flake
73.	Flake cortical
74.	Bladelet
75.	Flake
76.	Flake
77.	Flake
78.	debitage
79.	Flake sub-cortical
80.	Flake cortical
81.	Burnt debitage
82.	Flake (proximal)
83.	Flake sub-cortical
84.	Horseshoe scraper (on core frag.)
85.	Flake (edge damage)
86.	Flake sub-cortical
87.	Flake
88.	Flake sub-cortical
89.	Flake sub cortical (distal)
90.	Flake sub-cortical
91.	Flake
92.	Flake sub-cortical
93.	Flake (proximal and mesial)
94.	Flake (frag.)
95.	Bladelet
96.	Flake
97.	Burnt debitage
98.	Burnt debitage
99.	Flake (proximal)
100.	Flake
101.	Side and end scraper
102.	Flake sub-cortical
103.	Side scraper
104.	Bladelet (proximal and mesial)
105.	Core frag.
106.	Blade
107.	Flake thinning
108.	Core - keeled
109.	Flake sub-cortical

* Illustrated piece

An assessment of Sediments for Pollen Analysis (Trench A - Ditch 5)

Introduction

The site was visited in April 1991 and a 30 cm monolith of sediments obtained from the base of the ditch close to where human remains had been found. In the laboratory, four distinct layers of sediments were noted and these are shown in the following diagram.



Samples of sediment (at depths of 15, 21, 25 and 29 cm respectively) were treated by standard techniques (Dimbleby 1985) and assessed for pollen content, state of microfossil preservation, and pollen assemblage. There was no attempt to count palynomorphs but particular abundance of certain taxa was noted. Pollen preparations were scanned and every pollen/spore taxon occurring in ten traverses per slide were noted. The presence of microscopic charcoal, spherules, fungal remains, and intenstinal parasite eggs were also recorded. Results are shown in the accompanying table.

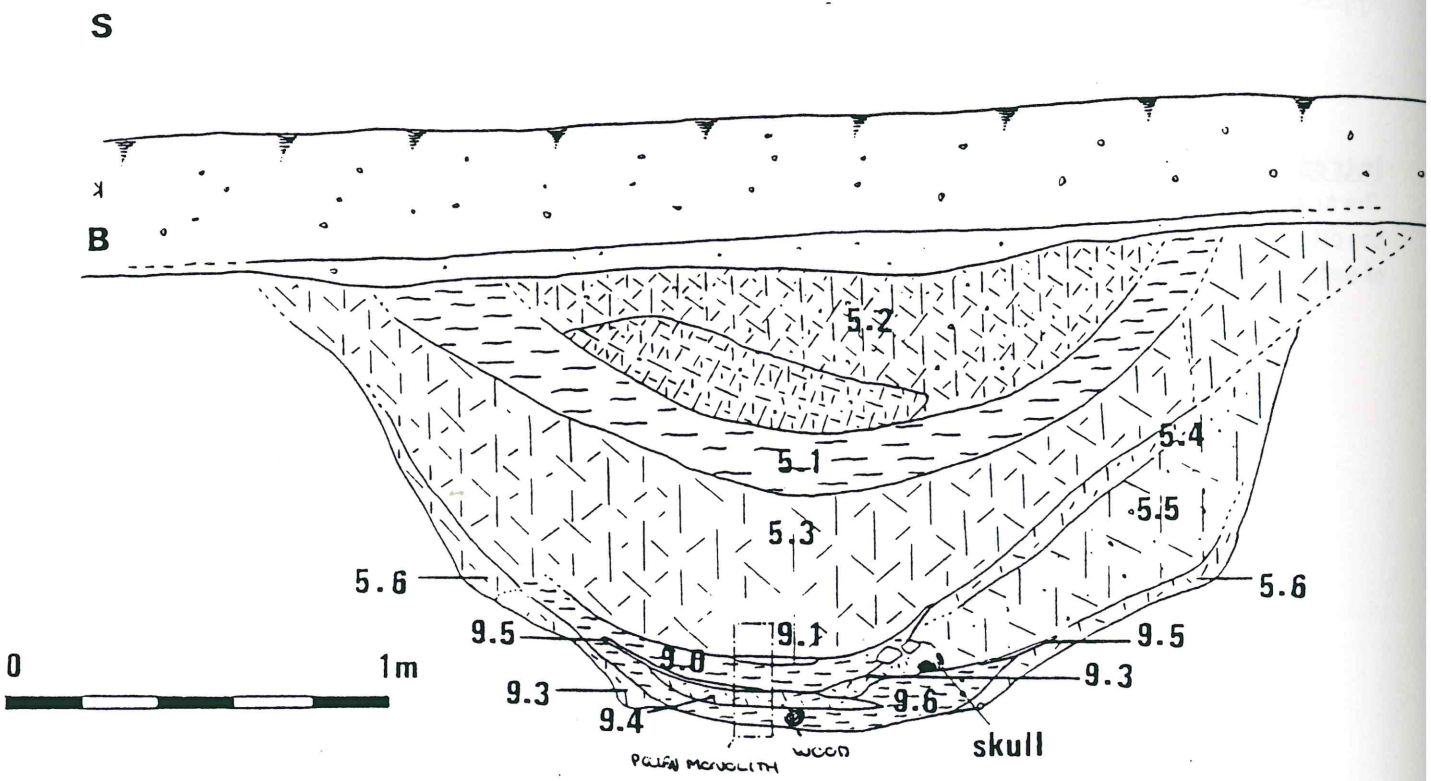
Discussion of Results

Only the sample at 15 cm, from the upper brown/clay loam, contained abundant pollen. Palynomorphs were sparse in all other layers and exceedingly corroded and thinned at 21 cm and 29 cm (in the pale ochre clay and basal pale silty clay respectively). In fact, it is doubtful whether meaningful pollen counts can be obtained from the pale ochre clay.

Microscopic charcoal was found in every sample, and fungal remains were most abundant at 25 cm and 29 cm. Black spherules were found at 29 cm and a single trichurid egg at 15 cm.

The presence of spherules and *Typha angustifolia* (reedmace) pollen in the basal sample indicates a very high water table locally and also that the water might have been brackish. This species of *Typha* tends to dominate where standing water exceeds 15 cm and it is tolerant of salinity (Grace & Wetzel 1981). Indeed, the base of the ditch must have held a sufficient depth of standing water to allow the reducing conditions necessary for spherule formation (Wiltshire forthcoming). The pollen was sparse in the basal layer but the limited pollen assemblage does indicate that woodland [containing *Alnus* (alder), *Betula* (birch *Prunus* (c.f. sloe) and *Quercus* (oak)] with open, grassy areas prevailed in the environs of the ditch.

Although the pollen was sparse in the dark laminated layer (25 cm), it was in a reasonable state of preservation. Again there appears to have been standing water in the ditch, as is evidenced by the presence of *Lemna* (duckweed) and reedmace pollen. The finding of Cyperaceae (sedges) and *Filipendula* (meadowsweet) further attests to wet soils locally.



STONEA CAMP (WMS 91)
TRENCH A, DITCH 5
FILL MATRIX

PROVISIONAL INTERPRETATION

topsoil — MODERN PLOUGHSOIL
5.2 — BANK MATERIAL PUSHED INTO DITCH c 196
5.1 — PEATY LOAM FROM PRE 1960s PASTURE.
5.3 — GREY/RED MOTTLED CLAY POST-ROMAN FLOODING
9.1 } STANDING WATER + VEGETATION
9.0 }
5.4 — TOPSOIL TIP LINE ?
5.5 — DELIBERATE BACKFILLING TO COVER BURIALS / NATURAL SLU
BURIAL NOS. [10] — [13] — MUTILATED INHUMATIONS (THROWN INTO WET DITCH)
C14 dated to 2070 ± 65 BP
9.5 — ? — 9.3 }
9.4 } STANDING WATER & VEGETATION
9.6 } IN BASE OF DITCH SOON AFTER DITCH IS CUT.
5.6 — PRIMARY FILL
15.0 — DITCH CUT
nat.

There were areas of weedy grassland and waste ground in the vicinity as is shown by the reasonably rich herbaceous taxa and the find of *Artemisia* (wormwood) pollen. However, there is little doubt that the site itself was overwhelmingly dominated by *Quercus* (oak) woodland. Indeed, the presence of *Hedera* (ivy) pollen indicates that tall supports (probably tree trunks) were available very closeby since this entomophilous plant produces very little pollen and will flower only on upright stems in relatively unshaded conditions (Grime et al 1988). This means that either the woodland canopy was rather open, or that the woodland edge was very close to the ditch. The density of trees away from the immediate site is a matter for conjecture. From a single sampling point it is impossible to differentiate between a widespread open woodland canopy and a clearing within a dense stand.

The nature of the pale ochre clay must await soil analysis. It is possible that the layer represents a period of flooding from the nearby roddon but, if so, there was no evidence of aquatic or halophytic taxa as might be expected in such a sediment. The pollen was in such poor condition that quantitative analysis of this layer is questionable. However, if the layer has stratigraphic integrity then the pollen spectra indicate that although oak was still represented, there was increasing species richness in the surrounding woodland. This could mean that the local canopy had become open enough to allow extra-local or regional pollen to enter the site.

The uppermost brown clay/loam contained pollen in reasonable quantity and good state of preservation. The pollen spectra suggest a very different landscape from the one represented by the laminated, organic layer (sample 25 cm). Areas of weedy, probably grazed, grassland were present, but the landscape was characterised by mixed (probably open and patchy) woodland and scrub. The immediate site was certainly occupied by man and/or stock animals since the presence of *Plantago major* indicates local trampling, and the find of a trichurid egg could mean the dumping of human cess, or the deposition of animal dung, within the ditch.

This greater heterogeneity in vegetation is also seen in the pale ochre clay sample (21 cm) but the poor state of the pollen in that layer makes it difficult to form a definite conclusions. Nevertheless, it is obvious from the results that the terrain represented by the upper layer was very different from that prevailing earlier.

The lithology certainly seems to reflect distinct phases in the site's vegetation history and these are probably related to local land use. It is interesting that no cereal pollen was found and, indeed, if the site were a focus for husbandry, then a pastoral economy is indicated. However, further analysis might modify this view.

It has been suggested (Murphy pers. comm.) that the site might have a ritualistic function rather than one of settlement since it was dominated by oak woodland early in its history and, as yet, there is so little indication arable activity.

Proposal for Further Work

It might be prudent to confine more detailed analyses to the uppermost layer (brown clay/loam) and the laminated organic layer. However, spot samples should be taken within the pale ochre clay to determine whether or not it is an homogenous layer.

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Patricia E.J. Wiltshire
22nd May 1992

Depth (cm)	15	21	25	29
Trees/Shrubs/Climbers				
Alnus	+	+	+	+
Betula	+	+		+
Corylus	+	+		
Fraxinus	+			
Hedera			+	
Pinus	+	+		
Prunus				+
Quercus	+	+	++	+
Rosaceae undiff.	+			
Salix	+			
Herbs				
Anthemis type	+			
Artemisia			+	
Aster type	+			
Campanula type			+	
Chenopodiaceae	+			
Cirsium	+			
Cruciferae	+	+		+
Cyperaceae	+		+	
Filipendula			+	
Geum		+		
Gramineae	+	+	+	+
Lactuceae	+			
Plantago lanceolata	+	+	+	
Plantago major	+			
Potentilla type		+		
Poterium			+	
Ranunculus				+
Sinapis type			+	
Trifolium type			+	
Umbelliferae	+			
Spore Producers				
Filicales	+		+	
Pteridium	+	+		
Aquatics				
Lemna			+	
Typha angustifolia			+	+
Trichuris	+			
Spherules				+
Microscopic Charcoal	+	+	+	+
Fungi			+	+
State of Pollen	R	S/CC	S	S/CC

R = Reasonable
S = Sparse
CC = Badly corroded

TRENCH A

Stonea Camp (WIMSC 91) : Preliminary assessment of ditch fills

Organic layers at the base of Trench A, associated with human skeletal remains, were sampled. Small subsamples of four layers have been examined initially, to assess their contents : 9.0 ('organic ditch lining', north slope), 9.1 (north-west half of 'organic ditch lining' with white substance), 9.5 and 9.6 ('organic mat').

The samples all had a matrix of dark greyish-brown organic clay loam, laminated and highly compacted, with reddish brown to brown mottling and brown amorphous organic inclusions. 9.0-9.5 were only slightly moist and difficult to re-hydrate for disaggregation. 9.6 was moister with abundant small wood fragments. Intrusive fibrous roots were visible in 9.0. All four samples, particularly 9.1, contained inclusions and laminations of white powder.

Aqueous suspensions of this powder were examined by transmitted light at high power, to see whether the field interpretation of this material as ash could be confirmed from the presence of phytoliths or other plant silica. In fact the material proved to consist of non-siliceous elongate and fibrous small crystals, thought to be gypsum. MacFadyen (1970) suggests that gypsum formation in fenland clays results from oxidation of pyrite to give sulphur acids which then react with calcium carbonate. In ditch fills of this type freshwater mollusc shells could have formed the main $CaCO_3$ source : there were, in fact, a few shells surviving in 9.5.

The sub-samples were then disaggregated, so far as possible, wet-sieved over a 0.5mm mesh and the material scanned at low power under a binocular microscope.

Macrofossils present included the following:

9.6 The sample contained abundant twigs and wood fragments, including one abraded probable wood-chip. Other remains of trees and shrubs included buds, budscales, leaves and immature cupules of Quercus sp. (oak), fruitstones and seeds of Rubus fruticosus, Sambucus nigra and Solanum dulcamara. Macrofossils of weed plants (Chenopodium album, Rumex sp, Cirsium sp), wetland plants (Lycopus europaeus, Carex sp.) and grasses were also present, together with beetle remains and cladoceran ephippia.

9.5 This sample produced less wood but otherwise a similar range of plant and arthropod macrofossils. Additionally it included more fruit/seeds of aquatic plants (mainly Lemna but also Ranunculus sceleratus, Oenanthe aquatica and Potamogeton sp.) with Eupatorium cannabinum. Mollusc shells, particularly Anisus leucostoma, were present.

9.1 The assemblage broadly resembled that from 9.5, though Potamogeton and R.sceleratus were more common and Lemna apparently absent. Rubus and Solanum remained abundant. There were also scraps of mosses and a single foraminifer was noted, but no molluscs. A few intrusive fibrous roots.

9.0 This again produced a basically aquatic assemblage of plant macrofossils with Rubus and Solanum. No molluscs, insects rare and poorly preserved. Some intrusive roots.

Conclusions

From this rapid preliminary assessment it is quite clear that, despite the largely de-watered state of the deposits in this trench, they do include reasonably well preserved macrofossils (somewhat shrivelled, slightly degraded but still identifiable), in contrast to deposits examined in other trenches by Blackham et al (1982) and P.M. Preservation here seems to have resulted from the highly organic, very compacted nature of the deposits and the fine texture of the matrix so that oxygen has largely been excluded even though they are not fully waterlogged. This happy state of affairs is unlikely to last much longer because modern root penetration with consequent aeration is underway. Consequently full analysis of all samples available should be undertaken, for if drainage conditions remain the same as they are now at the site the organic deposits have a definitely finite life and it is unlikely that they will be available for future investigators.

Ecological conclusions must await full analysis. Provisionally, however, it seems clear that these are all detrital deposits, not intentionally emplaced. The abundance of macrofossils from trees and shrubs indicates that the immediate vicinity was overgrown (? and therefore that the defences were not functional) when these deposits formed. The ditch was more or less wet throughout, apparently wetter when 9.0-9.5 formed than when 9.6 was deposited. The single foraminifer from 9.1 is intriguing : it must relate in some way to a tidal environment but the Terrington Beds (Iron Age intertidal deposits) do not extend this far south (Hall 1987, 40). Could we have evidence here for a tidal surge up the nearby roddon channel, and flooding of adjacent areas? Obviously the samples need to be scrutinised carefully for more evidence of marine/estuarine micro-and macro-fossils.

Blackham, A.M., Gilbertson, D.G. and Van der Veen, M. (1982) 'Palaeoecological Studies'. Unpublished typescript

Hall, D. (1987) The Fenland Project, No.2 : Fenland Landscapes and Settlement between Peterborough and March. East Anglian Archaeology 35

MacFadyen, W.A. (1970) Foraminifera from Roddon Silts at Welney Washes, Norfolk, in Salway, P. et al. The Fenland in Roman Times RGS Res.Ser.No.5. London.

Peter Murphy
15th May 1991

Richard Darrah

Summary
Oak is the predominant species present, some of which could be suitable for dendrochronological dating, but hazel and ash have also been found. Dessiccation was found to be advanced in most samples, but both heart-wood and sap-wood could be found surviving on some samples. Examples of both fast-growing and slow-growing trees (of up to 40 cms wide) were found.
Cuts showed repointing facets of possible piles or stakes. A small piece of coppiced (?) hazel had repeated tool signatures on it.

Wimblington Stonea Camp Timbers 1992, WIMSC 92 Report by Richard Darrah

Other than the small roundwood sample <6>(hazel), which was well preserved, the remaining timbers had almost all lost their surfaces through decay. On a number of pieces there was also severe shrinkage causing alteration of the shape of the timber. This was all recent and suggests that the area is quickly drying out for the first time in 2000 years. If it is believed that the site may contain more waterlogged wood which still survives in better condition then every effort should be made to keep the site wet.

As a result of the loss of surfaces, and the alteration of shape through shinkage, samples may be described as of poor quality, as even the original cross section has to be estimated. However it was possible to identify three distinct woodland resources present.

i) Restricted growth of oak and ash - unmanaged woodland?
Trenches XIII (samples <1> and <2> from context 2.5; basal ditch-fill) and XV (sample <9> from context 25; primary ditch-fill). The first two samples were roundwood, identified by Peter Murphy as being ash, whilst the latter was definitely oak. All these samples came from distinctly slow grown trees, with annual ring widths of less than 1mm.
This suggests that these timbers came from unmanaged and dense woodland, or other conditions which restrict growth. Even where surfaces survived there were no cut marks on any of these timbers, and so they may be purely natural debris collecting in the ditch. If this were the case it may suggest that the ditch was associated with a piece of dense woodland.

ii) Coppiced hazel? - managed woodland.
Pointed rod Trench XVI (sample <6> from context 4.32; basal ditch-fill) was typical of the rods which come from coppicing. Peter Murphy identified this sample as hazel. Although one rod does not make a coppice woodland, it would be unlikley that this rod could grow at 2mm annual ring width in the dense woodland which produced the much slower grown timbers mentioned in section (i).
This piece displays three facets with evidence of a repeated tool signature on it, and has been interpreted by the excavators as a hazel stake.

iii) Fast growth of straight-grained oak - managed woodland?
The third group of timbers Trenches XIII (samples <3> and <4> from context 2.5; basal ditch-fill), and XV (sample <5> from context 25; primary ditch-fill) were radially cleft pieces of straight-grained oak with annual ring widths of more than 2mm, and from their sections it was clear that the trunks had been split into eighths.
Although these timbers had altered their shape through decay it was my impression from the growth pattern that two of these timbers <3> + <4> were from different trees with similar annual ring widths of between 2mm and 3mm, relatively young trees, being less than 70 years old at felling. **If this is the case then these timbers are of the size and quality which would be produced by woodland management.** Their similar **pointed ends** (a single facet on one side) and the quantity of sapwood present, suggests that these timbers were in their primary postitions. The fact that this high quality straight grained timber may have been used as piles or stakes for a ditch revetment suggests that the work was undertaken by someone with access to top quality and presumably valuable timber. It may just be possible to get good dendrochronological dates from the presence of a number of sapwood rings.

However, it should be noted that the problem remains that such small samples as these can only hint at woodland management, as any growth rates that can be obtained by management may also occur quite naturally.

A Note on the Geophysical Survey at Stonea Camp, Cambridgeshire.

The report of the survey at this site is in the form of short note. The aim of the survey was to locate elements of the southern defences.

Initially, it was intended that the ditches would be 'scanned' out using a fluxgate gradiometer. However, once on site it was apparent that the buried features gave no easily identifiable response i.e. the 'anomalies' were at the limit of the instrument's detection.

It was then decided that a number of resistance grids would be surveyed in detail, along the edge of one of the trenches under excavation. The approximate position of the grids can be seen in Figure 1. Both of the ditches were clearly evident in the trench.

The results from the resistance survey can be seen in Figure 2. Although there are a number of linear anomalies they do not correlate with the evidence from the O.S. map of 1926, nor the excavated trench.

It is likely that these changes represent small changes in moisture content due to the sandy matrix.

As the results proved to be impossible to interpret archaeologically, even in an areal survey, there was little sense in extending the grid.

It must be stressed that failure of both techniques is most unusual, although other instances on sand/gravel subsoils are not unknown.

Dr C F Gaffney
Geophysical Surveys of Bradford

28th March 1991

Stonea Camp

Approximate Grid Location

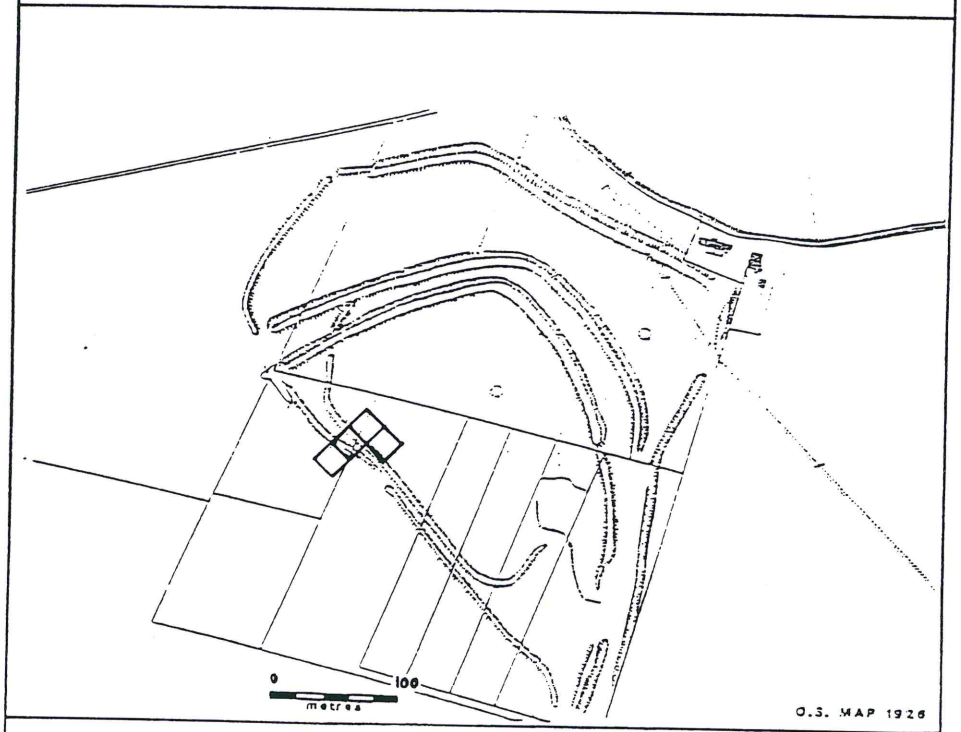

Figure 1

Stonea Camp

Figure 2