

# Evidence of Bronze Age Salt-Production at Northey, Peterborough

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## ABSTRACT

*Rescue excavations at Northey produced evidence of salt-production in features of Bronze Age date. The finds are discussed with reference to similar finds from nearby Fengate, and the salt-industry is seen in the context of Bronze Age settlement of the Fen-edge.*

## ACKNOWLEDGEMENTS

I am particularly indebted to Mr Francis Pryor and Mr Adrian Challands for their considerable help and encouragement in the publication of this paper. Mr Francis Pryor commented and advised on the pottery and flint, and also read and commented upon the first draft. Mr Benjamin Booth and Dr G Bailey identified the animal bones, Mrs Maisie Taylor identified the charcoal, and Dr I C Freestone (BM Research Laboratory) supplied the report on the fired clay sherds of salt-evaporation vessels. A grant towards the cost of publication was generously given by the Nene Valley Research Committee.

## INTRODUCTION

Northey lies on the western edge of the civil parish of Thorney, and is approximately 1½ miles (4km) east of Peterborough (FIG 1). The site is situated on an outcrop of the Nene First Terrace river gravels, about 2.70–3.40m above the nearest alluvial surface (Horton et al 1974, FIG 12 and 55). The gravel is overlain by .50–1.00m of black fen topsoil and silt, the surface of the site being approximately 2.62m OD. The site was discovered by chance in April 1977 by Adrian Challands, John Hadman and Francis Pryor, while walking through a newly stripped area of gravel quarry. The owners of the site, Amey Roadstone Corporation were approached,

and permission was given for further investigation. The finds and site records will be deposited in Peterborough Museum.

## THE SITE

The site (centred on grid reference TL23659881) was on an area of freshly exposed gravel 30m wide, from which up to one metre of topsoil and 'B' horizon had been stripped. The quarry face ran NW-SE across the site. Extensive cropmarks are known from aerial photographs of Northey, indicating several acres of enclosures and trackways or droveways, and these are plotted on FIG 2. A possible Bronze Age round barrow was reported in 1963 at TL23509890 (pers comm Mr Eric Standen). Regrettably during 1977-9 this area was destroyed during quarrying operations, and further excavation in the immediate vicinity of the site is therefore impossible. The quarry face now lies some 350m to the west of the site excavated in 1977, which has since been backfilled.

## THE EXCAVATIONS (PL 1)

Two ditches were visible on the stripped gravel surface, and these were cleaned, planned and sectioned. The orientation of these features was difficult to ascertain in the circumstances, and FIG 3 shows their position as accurately as could be determined. The ditches ran exactly parallel, were orientated approximately ENE-WSW, and were separated by a strip of clean gravel 4.50m wide.

### DITCH 1

The southern ditch (1) was traced for four metres before it ran into the unstripped area to the SW, its eastern end being a semi-circular buttend. The surface width of this ditch was .80m and

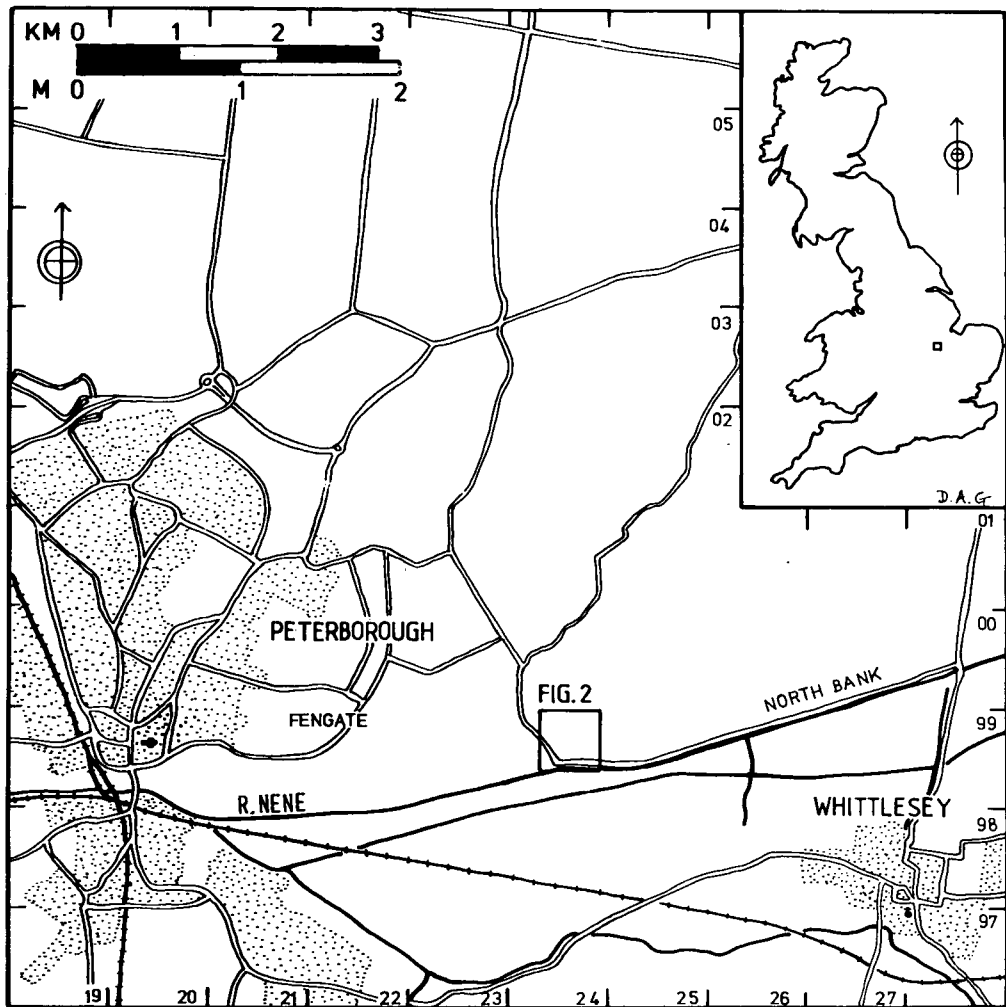


Fig. 1 Northey: site location maps

its depth varied from .34-.38m. Sections were dug in two places (FIG4, Sections 1A, 1B, Section 1A, PL2 ) and then the total length of exposed ditch was excavated.

*Layers (Sections 1A,1B)*

1. Pale grey fine sandy silt, with some small to medium pebbles and charcoal flecks.
2. Medium brown very silty sand.
3. Black, very fine charcoal silt with charcoal lumps, frequent small to medium pebbles, pottery, fired clay, flint and bone.

**DITCH 2**

The northern ditch (2) had a minimum length of 33m, running from the quarry edge to the NE across the cleaned gravel and into the face of the unstripped area. Its surface width was 1.20m and its depth .26m. A two metre length of this ditch was excavated and the western section drawn (FIG4, section 2).

*Layers (Section 2)*

4. Pale grey sandy silt with some small to medium pebbles, charcoal flecks and bone.

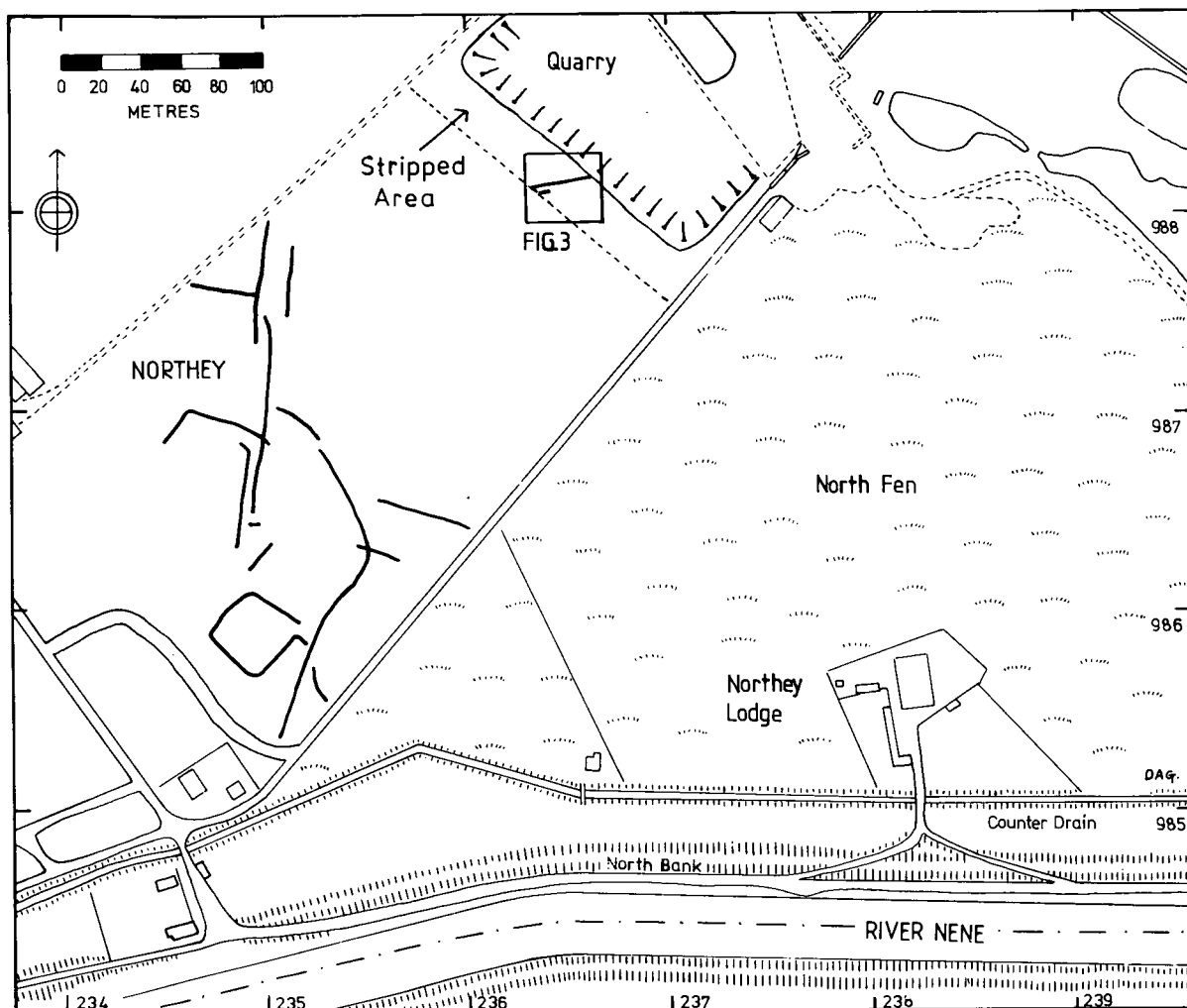


Fig. 2 Northey: location of excavations and cropmarks

## THE FINDS

All the finds from the 1977 excavations are described. The extremely poor quality of the pottery and fired clay fragments should be noted, and in FIGS 5 and 6, the use of stippling is intended to represent the particularly rough and uneven appearance of the fabric. The use of the imprecise term 'briquetage' is deliberately avoided.

## THE POTTERY

### DESCRIPTION

The pottery fabric is of a soft or very soft character, not particularly well-fired, and with moderate ill-sorted shell inclusions. Sherd surfaces appear to have been carefully smoothed. Some sherds are heat-cracked, and where inclusions have dissolved out there are small irregular plate-like voids, giving a pitted or 'corky' appearance. All sherds were consolidated using PVA in

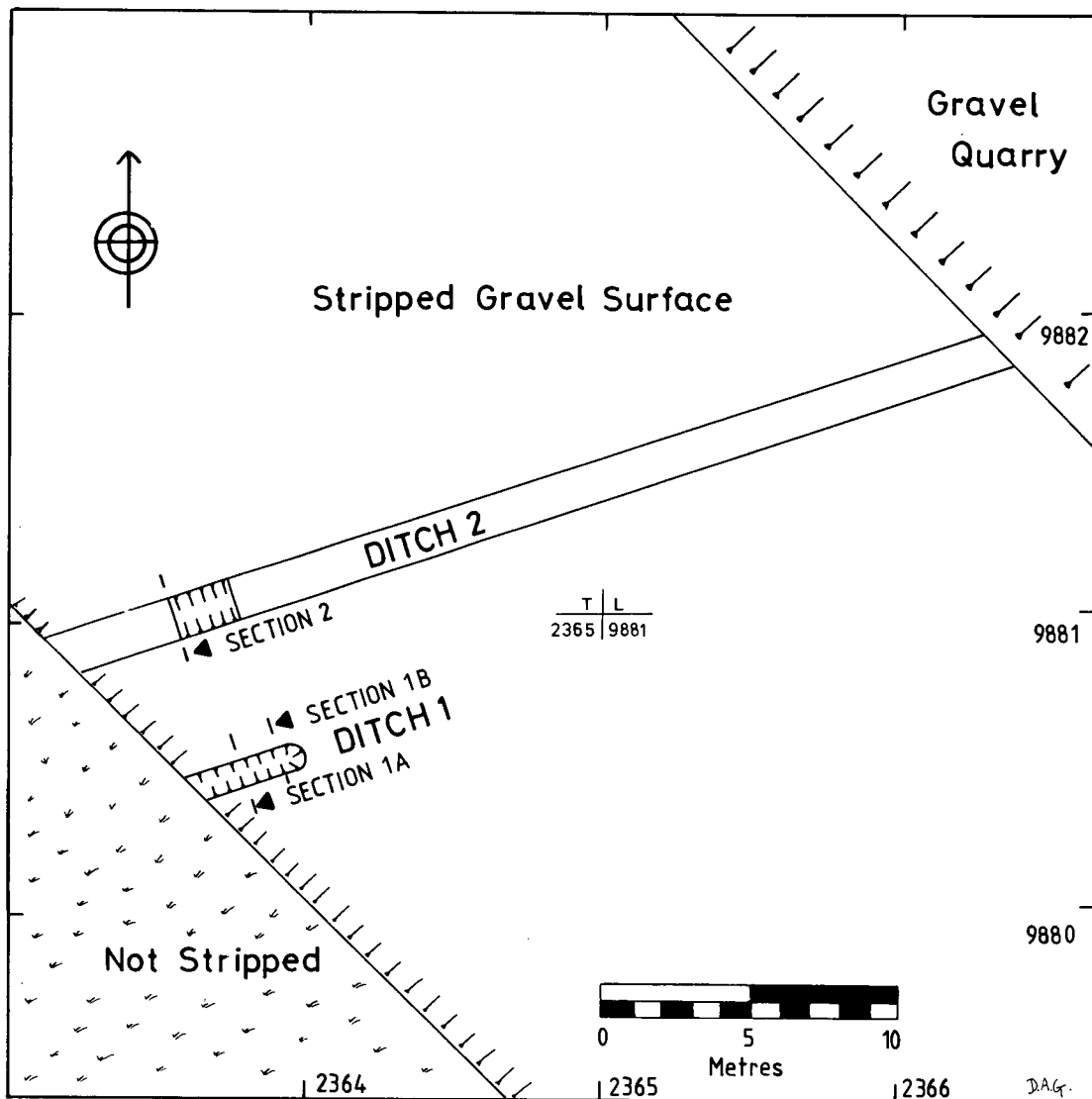


Fig. 3 Northey: plan of excavated features

acetone. Normal colour descriptions for sherd interiors and exteriors are black to various shades of grey or brown (Munsell 10YR 3/2, 4/1, 5/2, 6/2, 6/4, 7/1) and cores, reddish or brownish yellow (7.5YR 6/6, 10YR 6/6). Thirty-three pottery sherds were found, all from Ditch 1, Layer 3, with a total weight of 817gm after consolidation. The body sherds (22) weigh 450gm, the rim sherds (10) 226gm, and the single base

sherd 141gm. The body sherds (not illustrated) vary in thickness from 9-17mm, and the largest measures 70 x 110mm. The degree of curvature on all sherds is slight. A thin deposit, light grey in colour (5Y 7/1) is present on the external surfaces of rims 5, 6, 10, base 14, and ten body sherds. Insufficient analysis of such deposits on salt-making equipment has been undertaken for this to be usefully discussed at the present time.

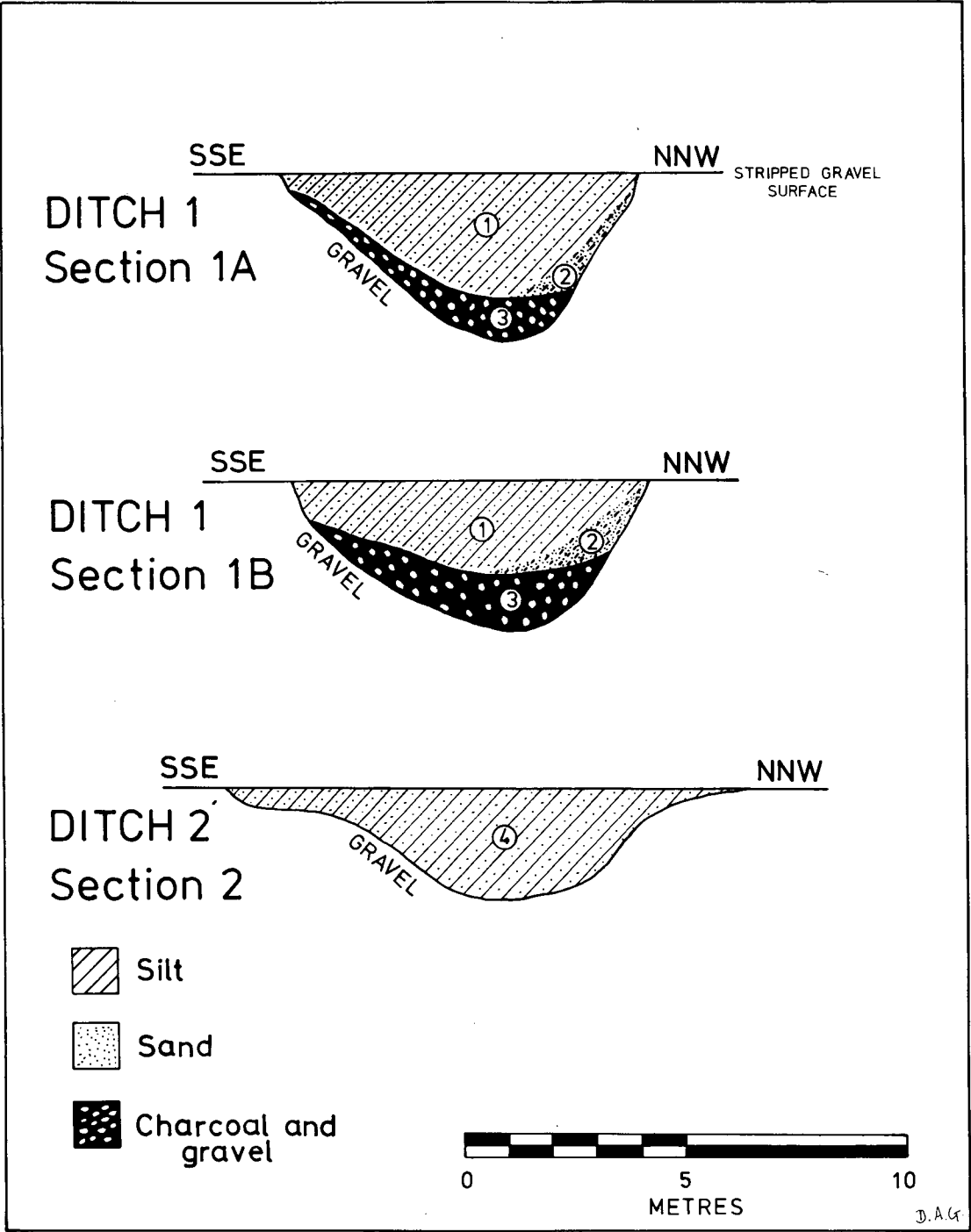
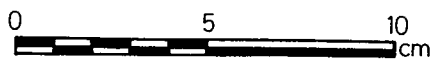
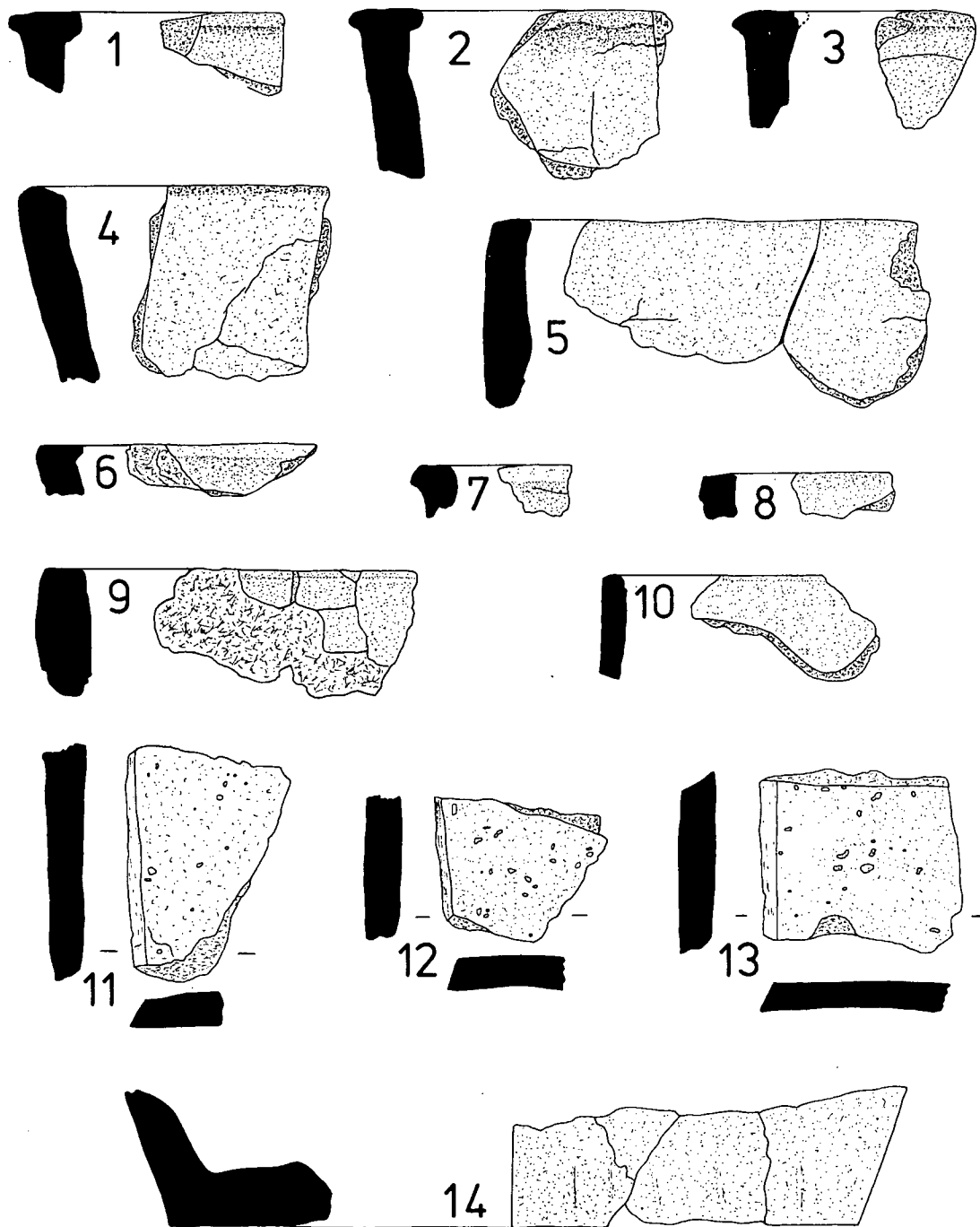


Fig. 4 Northey: sections



D.A.G.

Fig. 5 Northey: Bronze Age pottery

FIG5

- 1,2 Rim sherds. Rims thickened internally.
- 3,4 Rim sherds. Interior of rims missing.
- 5 Rim sherd. Rim slightly pinched internally and irregularly thickened. From a vessel with rim diameter of c280mm.
- 6 Rim sherd. Rim pinched and thickened internally.
- 7 Rim sherd. Rim pinched externally.
- 8 Rim sherd. Rim slightly thickened externally.
- 9 Rim sherd. 'Sandwich split' on external surface.
- 10 Rim sherd. 'Sandwich split'. Internal surface missing.
- 11,12,13 Sawn body sherds. These sherds have been sawn through after firing, and faint vertical striations are visible along the sawn edge of each sherd.
- 14 Base angle. From a vessel with a base diameter of 200mm. Immediately above the base angle on the external surface are five very slight evenly spaced vertical ridges (possibly finger impressions).

*Discussion*

The pottery from Northey can most easily be placed in the context of an Early or Middle Bronze Age domestic assemblage, and characteristic features of Iron Age pottery are absent. Both the rim profiles and fabric type find very close parallels in the Bronze Age pottery from Fengate, Peterborough, and the following comparisons are suggested:-

Rim sherds 1,2,3.	Pryor 1980 FIG55, no36 and FIG56, nos38,39,44.
Rim sherds 4-10.	FIG55, nos26,28,30, 33,34.
Sawn sherds 11,12,13.	FIG13, no1.
Base angle 14.	FIG55, no25.

The comparative material quoted from Fengate comes from features securely dated to the second millenium bc on the Padholme Road and Newark Road subsites. A sherd, partially sawn through then snapped apart is associated with C14 dates of 1280 ± 70bc (UB-676) and 935 ± 135bc (UB-677). The latter date probably represents a *terminus ante quem* for the last recut of Ditch 1,

which also contained fired clay fragments, possibly from salt-making equipment. The occurrence of sawn sherds on saltern sites is well documented, with the clearest evidence coming from Gaulter Gap in Dorset (mid-2nd century BC), where the finds suggest that some cylindrical jars were cut in half and fired in two pieces, while others were partially sawn through and snapped apart after firing, as with the Fengate sherd. The former instance argues against the use of these vessels for the production of hardened salt-cakes (Farrar 1975,19), but this cannot be dismissed as a possible function for the Northey pottery vessels.

THE FIRED CLAY

*Description*

Eighty-three pieces of fired clay were found in Ditch 1, Layer 3, and two types of artefact can be distinguished:-

1. Pedestals with circular stems and splayed ends.
2. Fragments of large, steep-sided and flat-based circular vessels.

The fabric is of a very soft and friable character, poorly-fired and with moderate ill-sorted shell inclusions. The surfaces of most fragments are very badly heat-cracked, there is a tendency for sherds to 'sandwich split', and pitted surfaces occur where inclusions have dissolved out. All fired clay fragments were consolidated using PVA in acetone. Normal colour descriptions for interiors and exteriors are dark grey or dark reddish-brown (10YR 4/1, 5YR 3/2), and for cores, yellowish or reddish-brown (10YR 5/6, 5YR 4/3). The total weight of fired clay after consolidation is 1542gm. The base sherds (6) weigh 151gm, the pedestal fragments (3) 393gm, and the 73 body sherds (not illustrated) 988gm. The body sherds vary in thickness from 10-19mm, the largest measures c 80 x 110mm, and the degree of curvature on all sherds is slight. The light grey deposit found on the pottery sherds (described above) is also present on pedestal 17/18, and on the external surfaces of 15 body sherds.

FIG6

- 15 Pedestal fragment (probably top half). Stem diameter 45mm.

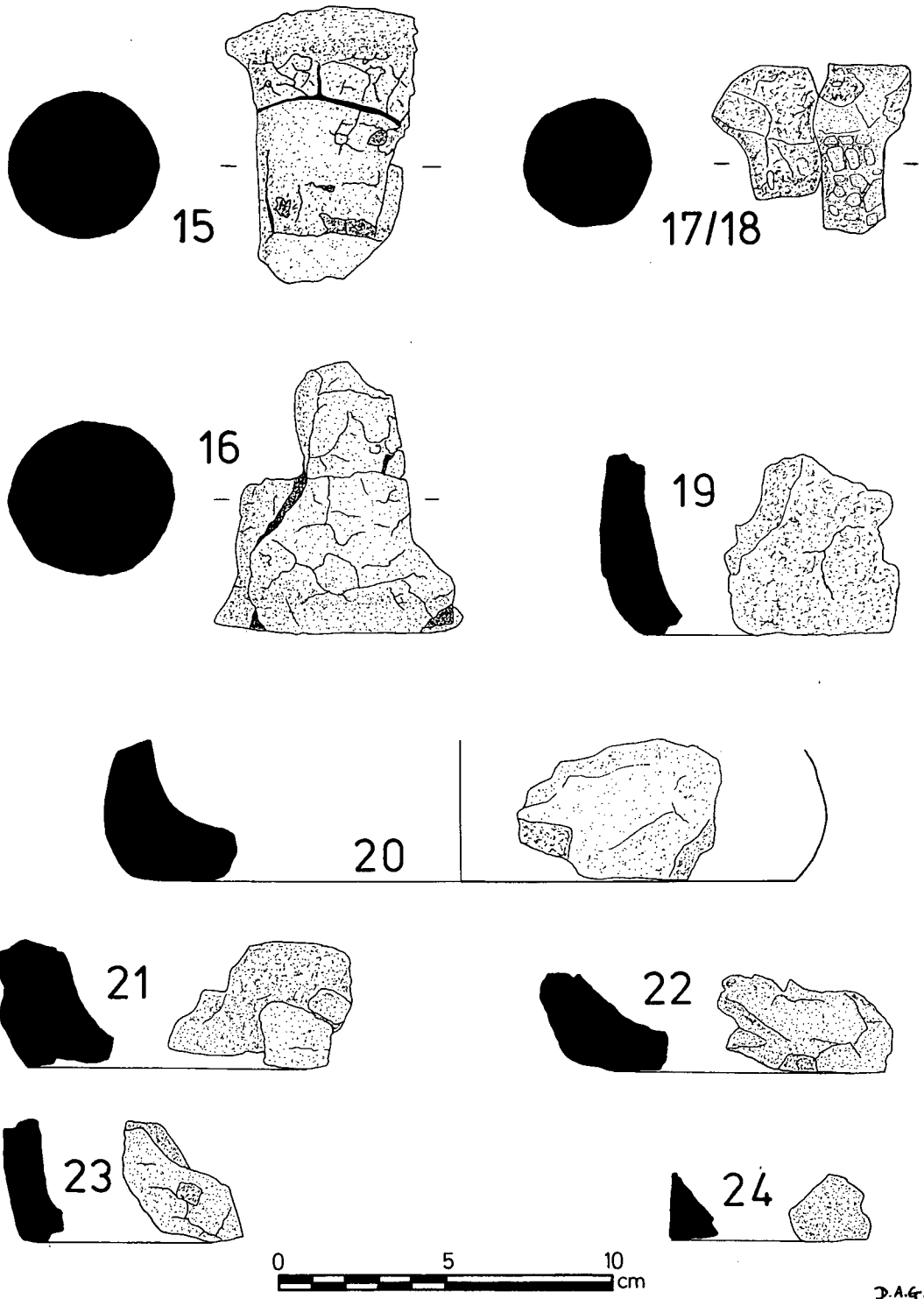


Fig. 6 Northey: fired clay salt-making equipment



- 16 Pedestal fragment (probably bottom half).  
Stem diameter 48mm.
- 17/18 Pedestal fragment (probably top half).  
Stem diameter 37mm (found as two fragments and subsequently joined).
- 19 Base angle.
- 20 Base angle. From a vessel with a base diameter of 200mm.
- 21,22,
- 23 Base angle sherds.
- 24 Base angle. Interior half of sherd missing.

### Discussion

The pedestal fragments are the clearest indication that this material is associated with salt-production, as similar pedestals with splayed ends are well known from Late Iron Age and Romano-British salterns in Lincolnshire and Essex, where they appear to have been used to support brine evaporation vessels in surface-built hearths. The earliest pedestals are found in the Halle/Saale area of Central Germany, where associated directly with pottery of the Únetice culture group, they are clearly of Early Bronze Age date (Matthias 1976). In Britain, cupped, spatulate-ended and splayed flat-ended pedestals have been found with other fired clay salt-making equipment, in ditches of the Later Bronze Age 'South Rings' at Mucking (Jones 1977), and also at the nearby 'North Ring' in features of the same date (pers comm Mr D Bond). Salt production in the Central European Bronze Age is discussed by Coles and Harding (1979, 61-63).

The base angle and body sherds appear to come from a number of large circular vessels, with steep-sided walls and flat bases. No rim sherds were found. It is suggested that these vessels might have had a base diameter of at least 200mm, and a height of perhaps 100mm, being not dissimilar in form to vessels found on a Roman 'Red Hill' on Canvey Island, Essex (Rodwell 1966, FIG8, no34). It seems unlikely that this type of vessel would have been used for the initial evaporation of salt-water into a thick brine, for which shallow troughs or pans, with a large surface area would be more suitable. Perhaps the Northey vessels were used in the later stages of the evaporation process, that is, the crystallization of salt from the thickened brine and the production of hard salt-cakes. This would

account for the very badly fire-cracked surfaces of both vessel sherds and pedestals. The tendency of sherds to 'sandwich split' is unlikely to have been caused by the crystallization of compounds in the brine (pers comm Dr P Craddock, BM Research Laboratory) as suggested by Kondo (1975). Samples of the Northey vessel fragments have been examined by Dr I C Freestone (BM Research Laboratory), and his report appears below as an appendix.

Comparative material for the Northey salt-making equipment can again be found on the Fengate Padholme Road Subsite, where Ditch 1 (associated with C14 dates UB-676 and UB-677) produced six pedestal fragments resembling those from Northey. From the same ditch came a small shell-gritted bowl (Pryor 1980, FIG13.2) which finds parallels at Halle (Riehm 1962, FIG33) and in Lincolnshire (Baker 1960, FIG1), and which may have been used for the production of hard salt-cakes.

### THE FLINT

One piece of flint (not illustrated) was found in Ditch 1, Layer 3, and this has been identified by Mr Francis Pryor as a blade utilised on both edges, and broken at the distal end.

### THE CHARCOAL

A charcoal sample (50gm) was taken from Ditch 1, Layer 3. Mrs Maisie Taylor kindly supplied the following identifications:-

*Salix* spp/*Populus Nigra* (Willow/Poplar) 80% by weight  
*Corylus Avellana*/  
*Alnus Glutinosa* (Hazel/Alder) 20% by weight

These are all Fen species, and would probably have been present along the Fen-edge in the Bronze Age.

### THE ANIMAL BONES

Animal bones were found in Ditch 1, Layer 3, and in Ditch 2, Layer 4. Mr Benjamin Booth and Dr G Bailey kindly supplied the following identifications:-

#### Ditch 1, Layer 3

Cattle	radius (mature)	complete
	skull (orbit) (mature)	1 fragment
	skull (maxilla)	1 fragment
	second phalange (mature)	complete
Sheep/Goat	ribs	29 fragments
	metatarsal (immature)	2 fragments
Unidentifiable	radius	1 fragment
	longbone	1 fragment

### Ditch 2, Layer 4

Cattle	metatarsal (proximal end)	1 fragment
	tibia (proximal end) (mature)	1 fragment
	carpal (mature)	complete
	pelvis	6 fragments
Unidentifiable		14 fragments

## DISCUSSION

While detailed dating evidence for the extensive cropmarks in the Northey area cannot now be obtained, the excavations of 1977 would suggest that at least part of the ditch systems (see FIG2) might date to the Bronze Age. The excavations, although limited, produced finds of Bronze Age date from the primary fill (Layer 3) of Ditch 1, and these are comparable with the finds from the extensive excavations at Fengate. Layer 3, Ditch 1, was remarkable for the amounts of pottery and fired clay which were found in the short length (4m) of excavated ditch. The density of this material suggests that the ditch acted as a dump for industrial debris, and the large quantity of charcoal can perhaps be interpreted as the cleaning-out of a nearby hearth or hearths used in the evaporation process. A radiocarbon date for the charcoal is forthcoming.

The apparent layout of enclosures and trackways or droveways at Northey is also very similar in appearance to the regularly laid-out enclosures at Fengate (Pryor 1978), a system part of which seems to have had its origins in the Late Neolithic, and which was extended and modified during the Bronze Age, continuing in use until c1000bc. The Bronze Age ditch-systems consisted of a series of enclosures and paired ditches. The two parallel ditches excavated at Northey were 4.50m apart, and similarly spaced ditches can be seen on the aerial photographs of the site (see FIG2). At Fengate, the pattern of enclosures and ditches is entirely consistent with livestock management, and this is fully discussed by Pryor (1980, chapter 5). At Northey, a similar complex of enclosures and droveways with small peripheral non-nucleated settlements may perhaps be suggested. The finds and sections across the two ditches would imply that the settlement from which the pottery and salt-making equipment derives was to the south of Ditch 1. The Northey ditch systems are clearly far more extensive than is indicated by cropmarks, as a recent examination of the present quarry face, some 350m west of the

1977 excavations revealed at least six ditches appearing to run NW-SE. These features have presumably been obscured as cropmarks by later alluvial deposits and peat formation.

The finds from both Northey and Fengate indicate the presence of a salt-production industry along the Fen-edge in the Bronze Age. Salt-water would have been easily available from tidal inlets running close to the Fen-edge settlements, and today, the Nene is still tidal as far inland as Dog-in-a-Doublet sluice, only 2½ miles (4km) east of Northey. The Fen-edge in the Bronze Age was probably along the line of the Om OD contour, which lies about 2km east of the site (D Hall, forthcoming). As no *in situ* evidence of salt-production has been found, the presence of salt-making equipment is open to a number of interpretations. It is not impossible that the initial evaporation of brine might have taken place at Northey or Fengate, or if this took place further out in the Fens, that these were salt drying sites. A third possibility is that these Fen-edge settlements included the manufacture of salt-making equipment for use elsewhere.

One fact is becoming increasingly clear as more excavation takes place, and that is that in the Bronze Age, there was large-scale settlement along the Fen-edge, exploiting the light gravel soils and using flood-free areas for winter grazing. In summer months the rich peat-fen could be used for pasture, and this would probably have included large areas of land between Peterborough and Whittlesey (Pryor 1980). The production of salt would be a regular part of the agricultural cycle, most probably between the months of May and September, when conditions for salt-production are at the optimum (Bradley 1975, 22). The Fens would also be a source of fuels for the evaporation process, particularly wood and peat. Salt production can be seen as one more economic activity in an area that is showing large-scale settlement and land-management along the Fen-edge in the second millennium BC.

## APPENDIX

Report on the examination of 'briquetage'  
from Northey, Peterborough

British Museum Research Laboratory, RL File no4444  
by Dr I C Freestone

Several sherds were examined macroscopically and thin sections were prepared of two sherds for examination with the polarizing microscope.

## DESCRIPTION

The sherds are composed of a friable, yellow-brown material. While the interiors of the sherds are soft and poorly fired, the surfaces are harder, show a slight sheen, and are darker in colour, suggesting that they have been heated. Fragments of the surface material are magnetic. The surface layers, in some cases on both sides of the sherd, show well-developed polygonal cracking, the polygons being of the order of 10mm diameter, and the cracks penetrating 1-2mm into the sherd from the surface.

Under the microscope, the fabric is seen to consist of a dark red-brown (iron-rich) material, which is near-isotropic between crossed nicols. It appears to consist predominantly of iron oxides, with relatively minor birefringent clay minerals and very little quartz. This rather poor quality clay has been tempered with abundant fragments of fossil shell (as calcite, CaCO<sub>3</sub>), up to about 2mm maximum dimension.

## COMMENT ON SALT-MANUFACTURE HYPOTHESIS

No evidence was observed for salt-manufacture in the examination. The polygonal cracking is likely to have been caused by shrinkage of the exterior of a wet clay vessel, relative to the interior, due to a relatively short, but fairly high temperature firing. For example, very similar cracking develops on mud flats when the upper surfaces are dried due to exposure to the sun. The cracks are unlikely to have developed due to the action of brine penetrating a briquetage container because they occur on both sides of the sherds but do not extend through the centre.

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## Evidence of Bronze Age Salt-Production at Northey, Peterborough



*Plate 1* Northey: excavation in progress.



*Plate 2* Northey: section 1A.