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REPORT FOR STAGE 2 EVALUATIONS ON THE LAND EAST OF BLACO HILL, MATTERSEY, FOR TARMAC ROADSTONE LTD

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INTRODUCTION

This report forms the results of the stage 2 evaluations conducted in June and July 1995. The stage 1 evaluations have already been presented (STAGE 1 EVALUATIONS ON THE LAND EAST OF BLACO HILL, MATTERSEY FOR TARMAC ROADSTONE LTD). Since these stages are complementary, the numbering of sections and figures from stage 1 is continued in this report. An assessment of the importance of the archaeological deposits in the proposed development area, and the proposed mitigation measures, are outlined in the report which forms the Environmental Statement (ARCHAEOLOGICAL DEPOSITS ON THE LAND EAST OF BLACO HILL, MATTERSEY, FOR TARMAC ROADSTONE LTD; AN ENVIRONMENTAL STATEMENT). The brief, and the specific targets identified for the stage 2 evaluations, are outlined below.

Brief
After consultation with the County Archaeologist for Nottinghamshire it was agreed that the evaluation design should address three equally important issues:
Objective A) characterise the known archaeological remains (cropmarks, historic landscape)
Objective B) locate any buried archaeology and assess its potential
Objective C) assess the potential for local environmental reconstruction and the contribution to a regional picture.

The first stage addressed the issues identified above in relation to the known archaeology and create a morphological plan of the subsurface topography now masked by peat/alluvium. The second stage used the results from the geomorphological and archaeological mapping of stage 1 to define target areas for further investigation. The objective was to characterise the stratigraphic position and condition of preservation of deposits and test whether archaeological sites are interstratified. The specific targets were discussed and agreed with the County Archaeologist, Mr. M.W. Bishop.

Targets for stage 2 evaluation
Targets 1-4 were described and commented upon in the stage 1 evaluation report.

5. ***Extent and condition of the cropmark features***
   a) Identify the extent of the ancient field boundaries to the east and north of their cropmark manifestations.
   b) Does the condition of the organic deposits within the cropmark features, and therefore their palaeoenvironmental potential, vary significantly to the east and north.
   c) Is there a relationship between the cropmark features of the central block with those to the south of the track.
   d) What is the character and date of the southern cropmarks.
   e) Comment on the integrity of the cropmark plot: are all the features plotted likely to be pre-medieval.
6. ***Condition of the peat***
   a) How does the palaeoenvironmental potential of the deposits vary across the site
   b) Can the rate of attrition of the peat be assessed.

7. ***Character and extent of Romano-British settlement***

a) Evaluate the character, extent and preservation of the deposits represented by the Romano-British pottery scatter

b) How does this scatter relate to the cropmark site to the south and west

8. ***Other archaeological activity***

a) Evaluate the character, extent and preservation of the deposits represented by the burnt stone scatters. How does the burnt stone scatter relate to other deposits, particularly any with palaoenvironmental potential.

b) Evaluate the character of the deposits represented by the scatter of slag.

EVALUATION RESULTS

TARGET 5. EXTENT AND CONDITION OF THE CROPMARK FEATURES

Objective
5a) Identify the extent of the ancient field boundaries to the East and North of their cropmark manifestations.

The northern limit of cropmark VI was established in stage 1 by trenches across its line (stage 1 report Fig. 10); it does not extend beyond cropmark I. Cropmark I was taken as the representative of the west-east cropmarks since it was likely to mirror the extent of cropmarks II-IV, and would provide direct comparative information on the variability of the palaeoenvironmental potential of the ditch fills (objective 5b).

Methodology
The eastern limit of the peat-filled ditch of cropmark I was established in field 7648 by a combination of augering and machine stripping of topsoil across its line, until the ditch terminal was located.

A temporary baseline was laid out in line with the known ditch position, with its zero point at the east end of trench 04 excavated for the stage 1 evaluations. Auger results were confirmed by small machine-stripped trenches across its line at 30, 50m, 60m, 72m, 83m and 90m, but no ditch was recovered at 120m on the field boundary.

Results (Fig. 17)
Trench 29 at 90m along the baseline was extended in all directions to completely reveal the ditch forming a right angle turn to the south.
The peat formed a shallow layer (estimated maximum 0.2m thick) which marked the central hollow of the ditch infill. Dark grey-brown, sandy loam to either side of the peat clearly marked the extent of the ditch. Two small gulleys, interpreted as erosion features, and containing a similar fill to the ditch extending to the north-east. Two recent land-drains were also recognised; one had slag/clinker revealed below its clay capping (see section 8b).

It is clear that the ditch of cropmark I joins a north-south ditch at trench 29. There is no cropmark information for this location. The upper peat infill is very shallow and now dessicated but clearly is a woody peat equivalent to the better preserved deposits located in trench 04 in the stage I evaluations (p.16-17).

Comment
The recovery of linear features well past their known cropmark extent, and extending into the sandy deposits of zone 1 (stage 1 evaluation report Fig. 2b), begs the question why they did not show as cropmarks. The aerial photographs were therefore re-examined. Two photographs clearly show the cropmarks in this field; neither include the eastern part of the field (the Riley collection was visited at the time the cropmark plot was drawn up, and the Trust now holds that collection). Hence, the extension of cropmark I traced by excavation does not appear on the cropmark plot because no photographs are available.

With this in mind, and the evidence from trench 29, it seems likely that cropmarks I and II, and possibly III, extend to, then stop at a north-south ditch, which marks the eastern limit of field-systems at this point (Fig. 16). It is possible that the ditch of cropmark IV did not extend this far, as it has not been traced by excavation east of cropmark IV (see results of trench 23 in section 5c). Cropmark V has not been located by excavation (stage 1 report, p.17, 18).

Objective
5b) Does the condition of the organic deposits within the cropmark features, and therefore their palaeoenvironmental potential, vary significantly.

Methodology
A qualitative assessment is made from the results of the stage 1 and 2 field evaluations.

Results
Five sections were dug across the cropmark ditches, which were also exposed in plan in another five trenches. Most of these ditches had an upper peat infill, which was variably truncated and dessicated.

Cropmark I was investigated most intensively. In trenches 03 and 29, the infilled ditches included organic deposits which were drying out; in trench 04 the organic deposits were thicker, and waterlogged. Trench 04 lay within the alluvial basin of zone 3, trenches 03 and 29 on the sandy zone 1 deposits (stage 1 report, Fig. 2). The palaeoenvironmental assessment showed that the dessicated deposits of trench 04 were biased (stage 1 report, p. 27). Hence these sections across cropmark I showed that its topographic position was a key feature to the survival of organic deposits.

A ditch of a feature (probably represented by a cropmark) was also located in trench 16 within the zone 3 basin; this was also infilled with a series of wet, peaty deposits (stage 1 report, p.10).

The other cropmark ditches (trenches 23 and 31), all contained humic or peaty horizons which were in various stages of drying out. Ditches located outside the known cropmarks, but probably part of the same system (trenches 19 and 20), also had dessicated organic deposits.

In general the dessication, and truncation of the ditch deposits, was most severe within the southern part of the proposed development area. The best preserved deposits lay within the zone 3 alluvial basin.

The fact that the cropmark ditches are cut into this alluvial basin demonstrates a phase of alluvial deposition prior to the laying out of this field-system. Continued alluviation after the field-ditches had infilled is demonstrated by alluvial sediments above cropmark VI in trench 22, and the flood deposits above cropmark I in trench 03.

Comment
The potential for the preservation of palaeoenvironmentally significant deposits within the cropmark features appears to relate directly to the geomorphological topography; the best preserved deposits are in the area identified as an alluvial basin.

The stratigraphic position of the field-ditches with respect to alluvial deposits identifies at least two episodes of alluviation within this part of the valley. The timing, and rate of alluviation has been identified as a key research issue within the context of the Trent Valley which the River Idle feeds as a tributary (*cf.* Knight and Howard 1994).

Objective

5c) Is there a relationship between the cropmark features of the central block with those to the south of the track.

Cropmark VI continues as a faint, patchy, cropmark, south of cropmark IV (Fig. 15). At its southernmost extent, it apparently lines up fairly readily with another NW-SE cropmark of the southern complex south of the lane, but the cropmarks have a large gap and geophysics failed to detect any feature in this gap.

Methodology

The first step was to establish if the faint cropmark of ditch VI in field 4322 represented an identifiable subsoil feature (given the results from trenches across the equally faint cropmark V where no subsoil feature could be identified - see the stage 1 evaluation report p.17). This was established first by attempting to trace the cropmark ditches in a 1.5m wide machine-stripped trench (22: 42x1.5m) to the top of undisturbed deposits, along the field boundary. This trench was extended to clarify the nature of the deposits, and a second trench (23: 12x5m, later extended to the south) was laid out over the judged location of the cropmark intersection.

Results (Fig. 18)

Trench 22

The north-south ditch of cropmark VI was readily apparent, but there was only alluvium and dark stained sand where the ditch of cropmark IV was plotted. The trench was extended within this area, and deepened to clarify the nature of the deposits. This revealed many of the dark stained areas to be the degraded remains of tree boles (one revealed in plan in trench 23 still had well preserved woody deposits at its edges which were interpreted as degraded bark) and a very mixed alluvial deposit at approximately the expected place for the east-west ditch of cropmark IV, though no ditch was located.

Trench 23

The ditch of cropmark VI (0203) was seen clearly running up the west side of the trench and curving slightly to the west in the south-west corner. An extension from its south-west corner revealed an end to the ditch. The ditch clearly turns west and the flat-ended terminus suggests that this is a junction with the east-west ditch of cropmark IV. The fact that the ditch was not present in trench 22 suggests that it is more likely to form a right-angle rather than a T junction.

The ditch (0203) was box-sectioned. It was a shallow U shape, no more than 0.34m deep. It had a patchy, thin covering of alluvium then dessicated peat as its upper fill immediately below the ploughsoil, with the rest of the fill a sandy loam. It was cut into a sandy loam which overlay silty clay.

Trenches 24 and 26

The possible extension of cropmark VI beyond this point was checked with two trenches (26: 50x2m and 24:25x2m) at the southern edges of fields 4322 and 5200. The ploughsoil was strippped by machine to the top of undisturbed deposits, and any subsoil variations of ditch-like character cleaned in plan, recorded by drawing and photography, and box-sectioned. No ditches, nor any other features, were evident in either trench.

Comment

Cropmarks linking the field-systems to the southern block

This work demonstrates that although faint cropmarks are discernible, no subsoil features are now present. The reasons for this in the case of cropmark V were explored in the stage 1 evaluation report (p.18). One possibility is that the cropmark could reflect the last remnants of a ditch extant in 1978 when the aerial photograph was taken, or that the ditch sediments have been totally encapsulated within the ploughsoil. It seems likely that any continuation of the ditches in this area were not as substantial as those to the north.

The only obvious possibility of linking the field-system complex with the cropmarks south of the lane have proved negative. There is no other obvious link between the two cropmark complexes.

The plan of the field-systems

Both ditches of cropmarks IV and VI were located. From the present excavation evidence it might be suggested that neither extended east or south of this point. Re-examination of the aerial photographs show these cropmarks to be tentative. It is unclear whether the break in the west-east cropmark (IV) is the limit of the field-system here or an entrance gap. If the field-plan is a regular block, the fact that cropmark I extends to the east (section 5a) may imply that cropmark IV does too, but this needs further testing.

The relevance of the apparently increased number of tree boles in the area of the expected extension of cropmark IV is unknown.

The markedly different size of the ditch of cropmark VI, compared with that recovered in trenches 03 and 04 (c. 1m deep: stage 1 report Figs 11, 12) of cropmark I, is surprising, particularly since the cropmarks register similarly.

Date of alluviation

There are thin spreads of alluvium in the upper hollow of ditch 0203 in trenches 22 and 23. This is an important result in an archaeological framework where the timing and rate of alluviation within the river valleys is a key research issue (cf. Knight and Howard 1994).

Objective

5d) What is the character and date of the southern cropmarks.

An intersection of cropmarks was investigated to establish their sequence and character. The cropmark most likely to represent the southern extension of cropmark VI was targeted, though that has been proved not to be continuous this far south (see above). The thin line of this cropmark is dissimilar to cropmark VI, and with the other NW-SE trending cropmarks, was thought to possibly represent the boundaries of earlier medieval fields. The eastern extent of the, in places, double and triple-ditched cropmark running from SW to NE cannot be traced because its line runs only slightly oblique to the current trackway. It is not inconceivable that this cropmark represents a pre-Enclosure line of this track.

The cropmark that runs diagonally across the field from NE to centre SW is very narrow and precisely defined; it is probably the line of a Victorian cast iron drainage pipe (information from Alistair Lee).

Methodology

A 11x6.5m trench (31) was located over the cropmark intersection, then the ploughsoil machine-stripped to the top of undisturbed deposits. The exposed surface was cleaned by hand and recorded by drawing and photography. Two of the ditches exposed were box-sectioned to reveal their character and fill sequence.

Results (Fig. 19)

The cropmarks were located clearly, cut into bright orange brown sand. The north-south cropmark is a modern land-drain or irrigation main (0228: like 0032 in trench 03, stage 1 report, Fig. 11). The two northern north-east to south-west ditches were box-sectioned and revealed to be shallow U-shaped features a maximum of 0.3m deep. The southern (0230) had a clayey fill, the northern (0226) a sandy fill. The narrow feature to the south barely survived. No artefacts were recovered.

Comment

The excavations have demonstrated that these cropmark features are very truncated. They cannot be linked with the Brickwork plan field-systems (sections 5c and 5e). If contemporary, the ditches are too close to define any continuation of the trackway to the north-east. Their date and function remains unknown.

Objective
5e) Comment on the integrity of the cropmark plot: are all the features plotted likely to be pre-medieval.

Methodology
Outline the main structural elements of the central complex. Use the information from 1c and 1d, and from the stage 1 report, Fig. 14, to comment on the probable relationship and nature of the southern block of cropmarks.

Analysis
The cropmarks reflect buried linear features irrespective of their date; it is therefore necessary to analyse their origin and pattern to judge whether they form a number of different elements, or an essentially single landscape.

Cropmarks of recent features
There is some evidence from the proposed quarry area to suggest that not all the cropmarks are contemporary. Those identifiable as relatively recent are marked in Fig. 20 and omitted from the analysis in Fig. 21.

Some of the cropmarks are in positions identifiable as past Enclosure field boundaries (Fig. 20). Some of the cropmarks in field 6174 are very thin and well-defined. One of the approximate NW-SE cropmarks was demonstrated to be a modern drain in trench 31 (0228 in Fig. 19); the parallel cropmarks are likely to be similar features. The straight, thin, cropmark running from NE-SW in the same field probably marks the line of an iron Victorian pipe (information Alistair Lee).

The obvious parallel lines of drains showing as cropmarks in field 3853 were not plotted.

This leaves the majority of cropmark features for further consideration (Fig. 21).

The cropmark pattern
The major elements of the cropmarks are analysed in Fig. 21. The major long elements were identified initially, followed by all those approximately parallel and at right-angles. This analysis has also been conducted for the cropmarks to the south-east and south-west of the proposed quarry area. This clearly identifies major E-W and N-S elements to the cropmark boundaries and an overall coherence in plan characteristic of the Brickwork plan field-systems (Riley 1980).

The cropmarks within, and adjacent to, the proposed quarry area do appear to belong to two slightly differently orientated plans, the north-western set of fields and enclosures being tilted slightly further towards the east (dotted in Fig. 21). However, if cropmark I is judged to extend into this part of this complex, which based on its alignment and position seems reasonably certain, it clearly articulates with both plans. This suggests that this set of cropmarks form a coherent, coeval, system of land allotment and use.

This analysis shows that the cropmarks at the southern end of the proposed quarry area do not form part of this pattern. It has already been demonstrated above that some are of recent features. In addition, it is possible that the NE-SW trending ditches in field 6174 could form a south-western continuation of the track from Horsen Bank, perhaps leading towards Wild Goose Cottage to the south, though they are too close to be contemporary ditches either side of a track.

TARGET 6. CONDITION OF THE PEAT

Objective
6a) How does the palaeoenvironmental potential of the deposits vary across the site?

Methodology
Report the results from the assessment of the deep peat located in field 1237, then assess qualitatively from stage 1 and 2 field evaluations.

Introduction
Hand-augering on a 100m grid (stage 1 evaluation report Fig. 2), followed by selected transects across the area, demonstrated that most of the peat across the northern part of the proposed quarry area was generally thin (*c.* 0.5m) and dessicated. However, these deposits do contain an environmental record which can be partly correlated with that from the peats of the cropmark ditch deposits (Appendix 4), and they are significant in the landscape development e.g. the peat horizons overlying the burnt stone scatters in trench 17 (p. 20). Only one area of deep, wet peat, was recovered adjacent to the present course of the river; this was augered to locate its deepest point, then a small trench dug (32 below) to take samples for assessment and dating (in progress).

The wiggly line of Horsen Bank almost certainly defines a former stream course. It has been used as a track since Enclosure (stage 1 report, p. 33). It now lies at a higher level than the fields to either side, probably due to a combination of deflation of the field surfaces and a build-up of hard-core to provide a dry trackway. Augering to either side of the track did not locate any deeper peat deposits, and augering from the ditches at the side of the track also failed to produce any organic remains. The significance of the deposits below Horsen Bank await demonstration.

The wiggly northern boundary to field 3853 (fig. 16) is also a former stream course, whose line is continued south by a cropmark. This probably represents a small stream, with no indication of any wider deposits of palaeoenvironmental significance along this line.

Results from trench 32
Augering in a east-west direction from Horsen Bank to the modern flood levee in the southern corner of field 1237 indicated up to *c.* 1.25m of moist peat, possibly thickening towards the modern river beneath the flood levee. The recognition of such a thick environmental deposit resulted in the decision to excavate a small machine-dug trench (32) to sample the material for environmental remains and record its stratigraphy. The trench was excavated parallel to the auger transect (east-west) by a JCB back-actor with a 2m wide ditching bucket; its dimensions were approximately 2m long, by 2m wide, by 2m deep.

The north and south facing trench sides revealed significantly different stratigraphies to merit recording both faces; however, environmental sampling was restricted to the north section.

South section
The sequence comprised a dark reddish brown sandy clay loam (topsoil), underlain by a dull orange pebbly sand. Beneath the sand, a brownish black silty peat was present, grading vertically downward into a peaty sandy silt. This sequence rested upon a horizontal piece of wood which was laterally

extensive and appeared to have flat upper and lower surfaces, suggesting that it may have been cut. A fragment of wood joined the large horizontal piece, residing at an angle of *c*. 45 degrees. However, the exact relationship of the two pieces was unclear. A small pocket of peat occurred beneath the wood at the eastern side of the face, although the majority of the wood rested upon greyish brown sandy silt, in-turn lying on brownish grey pebbly sands.

North section
The first two units of the sequence were similar to the opposing face with dark reddish brown sandy clay loam (topsoil), underlain by a dull orange pebbly sand, which was slightly silty. The sand was underlain by a brownish black dried peat cut by a land-drain infilled with slag. The dried peat merged into a dark reddish brown moist peat. This in-turn was underlain by a variably coloured peaty sandy silt, which became progressively more peaty eastward. The peaty sandy silt rested upon the basement sand and gravel. Two columns of material (bulk samples for macroscopic remains and radiocarbon dating) were removed from this section.

Interpretation
The interpretation of the sequence in the south section is of coarse fluvial basal sands probably deposited in the early Holocene being replaced by finer sandy silt. The decrease in grain size is associated with the changing hydrological regime and amelioration of climate into the Holocene. The wood encountered may have been part of a structural timber and is overlain by peats, indicating quiet waterlogged conditions. The peat is overlain by sands suggesting an increase in water energy in the area perhaps caused by a change in proximity of the river or changing hydrological conditions (increased precipitation). The top of the sequence comprised a sandy clay loam which can be interpreted as alluviation by river flooding. Whether this was anthropogenically encouraged (warping) cannot be deduced.

The sequence in the north section is different at the base. Here the basal sandy silt is variable, and in places very peaty. The reason for this may be related to the timber in the opposing section which perhaps acted as a barrier to sedimentation northward of it. Above the sandy silt and at approximately the level at which the timber is no longer present, peat appears to form normally, and the sequence vertically (upward) is similar to the opposing face.

A complex sequence of deposits were encountered in this small trench; further comment must await the results of the palaeoenvironmental assessment which is in progress.

Comment
The peat which blanketed the northern part of the proposed development area is now mostly thin and mixed, with only a few deeper pockets surviving (e.g. trenches 14, 32) which are themselves truncated. The deeper deposits are still waterlogged and contain macro and microfossil fauna which can be interpreted in respect of past activities and landscapes. With the deposits blanketing the archaeological remains (as in trenches 03 and 17), and the archaeological features themselves, this should allow a sequence of landscape development to be built up.

Objective
6b) **Assess the rate of attrition of the peat**

Methodology
The stage 1 results were compared with the mapping for Geological Survey Maps in 1957-9, and with more recent borehole data (1970, 1976 and 1989) available at the British Geological Survey, Keyworth, Nottinghamshire.

Results (Fig. 23)
The British Geological Survey (BGS) holds (in theory) an archive of every excavation record in U.K. site investigations. All the records consulted post-date 1970, with many drilled in 1976 as part of the BGS Mineral Assessments programme (coded m.a.r. in Appendix 5). Only two boreholes were held in archive for the proposed mineral extraction site. Record SK78NW 12 was located on the western edge of the site and recorded no peaty deposits although this was expected since it is within the zone 1 deposits (defined in the stage 1 report fig.2). Record SK78NW 13 is adjacent to the river at the southern end of Horsen Bank and records 2.8m of peaty material. Auger holes, and trench 32, excavated in June 1995 as part of the stage 2 evaluation (section 6a above) recorded a maximum thickness of 1.25m of peat in this area. However, deeper pockets may exist towards the river.

Outside the study area, there is a variable distribution of peats. To the north and adjacent to the river in Mattersey there is 4-5.7m of peat below alluvium and made ground.

To the south of the area, as far as Chain Bridge Lane, both east and west of the river, there is only one borehole with a record of peat (0.7m thick) at Leyfield Farm. Adjacent to Chain Bridge Lane, boreholes for a Severn Trent Pipeline (1989), and Mineral Assessment records, indicate peat to the east of the river up to 1.5m thick but below reconstituted ground, suggesting that it may have been thicker originally.

Field slips from remapping of the East Retford Sheet (1:10,000, SK78NW, 1957-59) in the study area record between 0.5-1.5m of peat in the south of the study area, considerably more than recorded in 1994 (stage 1 evaluations Figs 3, 4; this report Fig. 22). In the north of the study area, there seems to be a more positive picture as similar depths were recorded, however, the peat depths recorded here in 1994 varied from 0.3m (i.e. ploughsoil only) to 0.7m and it is unclear which would provide the best comparison. 1m of peat was recorded east of the River Idle north of Chain Bridge Lane, and up to 1.2m adjacent to Chain Bridge Lane.

Comment
Comparison of the current survey of the peat, with the British Geological Survey mapping records from 1957-9 and 1976, suggests severe deflation of this resource.

TARGET 7. THE CHARACTER AND EXTENT OF THE ROMANO-BRITISH SETTLEMENT

Objectives

7a) Evaluate the character, extent and preservation of the deposits represented by the Romano-British pottery scatter

7b) How does this scatter relate to the cropmark site to the south and west

Introduction

The Romano-British pot scatter in field 4084 lies within an area mapped as zone 3 i.e. peat overlying alluvial silty clays. Hence, it is unsurprising that the cropmarks of the settlement do not extend this far east and north, even if the spread of activity does.

Methodology

The stage 1 evaluations demonstrated that geophysics does not pick up the ditches on this site, so trenches were employed. Three trenches were sited so as to locate any continuing W-E boundaries from the cropmark complex to the west: 19 in field 4084 (30x3m) within the area of the fieldwalking scatter (also sited to cut across the alluvial zone 3 at approximate right-angles); 20 and 21 in field 3853 (60x2m and 40x2m respectively). The ploughsoils were stripped by machine to the top of undisturbed deposits, with the exposed surface cleaned by hand and recorded in plan. Selected features/variations in the subsoil were excavated to elucidate the character of the deposits.

Results

Stratigraphy

The ploughsoil was stripped to reveal the subsoil which consisted of a series of patches of sands, silty to gravelly sands and clay. Two of these clay patches were box-sectioned to determine their nature. One was a thin spread of silty clay overlying hollows within the silty sand subsoil, and was interpreted as alluvium. The other was from an underlying silty clay layer, probably involuted under water saturated conditions, to form a mixed deposit.

Some of the patches of sandy loam were mid-dark grey in colour and filled shallow undulations in the subsoil surface. They resembled the deposits seen in trenches 17 and 18 and interpreted as relict soils (section 8a). They were also noted adjacent to the ditch in trench 20 (see below).

Conditions on site were extremely dry, and any silty or clay deposits rapidly cracked. It was clear that the pattern of surface cracking extended well below the surface, which called into question the reliability of any samples for palaeoenvironmental analysis.

Trench 19 (Fig. 24)

The topsoil stripping revealed archaeological deposits immediately, though the uppermost 0.05m of these were too badly damaged for clear identification of units, so they were removed along with the topsoil. These features included two linear features intersecting at right angles, a narrow linear feature, various silty and stony patches along the edges of the linear features and in the northern part of the trench, and a roughly semi-circular feature cut by the east-west linear feature. One of these darker, stonier, patches (0175) on the western side of the linear feature was probably the source of the pottery sherds disturbed by a ploughmark.

A 1m wide section was excavated across ditch 0191 where it appeared relatively uncomplicated though it clearly cut a feature to the south-west (0174), however in the event, it also abutted a gulley to the north-east (0199).

Ditch 0191 had a wide V-shaped profile. It had an upper peat fill (a woody peat overlying a humic peat - 0167 a&b), overlying a grey brown sandy silt loam (0169), with a series of organic silty clays infilling the base of the ditch. These deposits were badly dried out. These fills contained a number of fire cracked pebbles and animal bones.

The middle sandy fill of ditch 0191 also formed the secondary fill of a narrow U-shaped gulley (0199) that was revealed joining at right-angles from the north-east. Just north of the junction between 0199 and 0191, two sherds of pottery were found in the base of the gulley (0199). A number of large fire-cracked pebbles were also found in its base. It appears that gulley 0199 was excavated after ditch 0191, but before it had completely silted up.

The Romano-British pottery from trench 19
by Ruth Leary

15 sherds were collected from surface cleaning of the trench and two from the section across ditch 0191 and gulley 0199.

The sherd from the base of the gulley (0199) is in a sand and calcite gritted fabric, and is an unabraded, grooved, flanged-rim jar, with a shoulder rebate above a cordon, and surface rilling on the body. It is heavily sooted on the top of the rim flange. It is a Torksey form, dated by Buckland to 135-225 AD; the fabric would point to the earlier part of this date range. The small, heavily abraded sherd from the base of the ditch, is in a similar fabric.

The material from the surface cleaning of the ditch (0169) includes two sherds of classic grey ware with no diagnostic features.

The sherds from feature 0175, and the plough-scrape through it, includes a shell tempered fabric of 1st and early 2nd century type, and a rim of a grey ware dish with a small triangular rim. It is a long-lived form, predominantly of 2nd century type, but surviving into the 4th century AD.

This small collection of pottery could belong with 2nd century activity. It is comparable with forms and fabrics of the material found by fieldwalking in the fields to the west (outside of the proposed quarry area) which, from first inspection, is dated from the 1st-3rd centuries AD.

Trenches 20 & 21 (Fig. 24)
Only one ditch was recovered, in trench 20. A 1m wide section was removed, then it was then boxed to confirm its form and to examine the surface deposits to the west. Its fills were: a badly degraded peat filling a shallow central depression, a sandy silt forming the main upper fill, a silty clay at the base. A thin lens of organic material was preserved down the south side. This sequence mirrors that in ditch 0191 in trench 19, except for the lack of a significant component of organic remains in the basal fills. A slight weathering cone was present at the top of ditch 0190.

Immediately to the west was an area of linear banding. The box-section revealed this as a dark grey brown silty loam, covered across its centre by an orange brown loamy sand, and lying directly on the clay subsoil. This gave the brown: orange: brown banding pattern at the surface. One interpretation of these deposits is that they are a buried soil and upcast from the ditch. In this case, the dark grey brown silty loam would be the relict topsoil, perhaps combined with topsoil upcast, much compressed and leached. The orange brown sandy loam is the remnant of upcast natural sand from the excavation of the ditch. This hypothesis would be best tested by revealing more of the ditch in plan to check whether this pattern continued.

At the south-western end of trench 20 were a number of patches of the grey sandy loam, interpreted above as relict soils. Their character was briefly investigated: one was deeper than 0.15m where a land-drain was removed, another contained a hone stone. These were almost certainly features, but whether intentionally cut, or the remains of biological activity or tree-casts, was not clear.

Comment
Part of the field-system has been revealed in an area where cropmarks were not known. The two ditch features identified are almost certainly of a single phase and have very similar fill characteristics to the known cropmark features already examined (e.g. in trench 03 of the stage 1 evaluations, Fig. 11). The presence of pottery sherds, animal bone and fire-cracked pebbles in the primary fills of the ditch in trench 19 suggests the presence of nearby settlement focus; this does not extend into trench 21. This suggests a separate area of activities from the cropmark enclosures known to the west and south. The possible features recorded at the south-western end of trench 20 could belong with the enclosures to the south, outside of the proposed development area.

There are no aerial photographs which show more than the southern corner of field 4084; hence these ditches were not visible as cropmarks when the photographs were taken (1978, 1979 & 1986). This may partly be because conditions are not so suitable for cropmark development because of the mixed nature of the subsoils, and the depth of the underlying silty clays did not allow a water moisture deficit to develop whilst the crops were ripening. Hence, the field-systems could be much more extensive to the north than the cropmark plot suggests.

TARGET 8. OTHER ARCHAEOLOGICAL ACTIVITY

THE BURNT STONE SCATTERS

Objectives

8a) Evaluate the character, extent and preservation of the deposits represented by the two burnt stone scatters. How does the burnt stone scatter relate to other deposits, particularly any with palaeoenvironmental potential.

Methodology

Both of the stone scatters identified by fieldwalking were evaluated using asymmetrical T shaped trenches (17 and 18: Fig. 16), each totalling 40m x 3m. The intention for each trench was for to cross from high to low density surface scatters and to extend into the most likely areas of deeper riverine sediments.

The ploughsoil from both trenches was removed by JCB using a 1.5m ditching bucket on its back actor, then cleaned by hand and recorded. Further inspection of the character, extent and preservation of the exposed deposits was achieved by the hand-excavation of three test pits and a series of auger transects in or alongside each trench. A minimum of selective excavation was also initiated on two minor features in trench 17 (0121-2), and palaeoenvironmental samples were retrieved from organic deposits in each trench. All artefacts were recorded individually. A contour survey, showing the ground levels around each area excavated was also conducted.

***Results of Trench 17** (Fig. 25)*

Stratigraphy of the deposits

The trench was located near the south-east corner of field 9334 close to the Enclosure hedge-line. The stratigraphic sequence comprised a silty ploughsoil of alluvial character; a thin, patchy peat; sand; a mid-dark grey sandy loam with charcoal and burnt stone; then orange-brown sand.

Immediately below the ploughsoil at the northern and eastern ends of the trench, were remnants of a thin layer of peat (0119) up to 0.15m in depth. Elsewhere in the trench this peat was found to survive only within a few patches and undulations in the subsoil. Samples of this layer were retrieved from test pit 17/02 for palaeoenvironmental analysis and radiocarbon dating.

Below the peat (0119) in the west end of the trench was a pale grey-white stone free sand (0114), that ranged up to 0.10m in depth.

Beneath these layers, and again largely confined to the north and east ends of the trench, were a number of mid-dark grey sandy-loam deposits (0100) which contained varying quantities of charcoal flecks and fragments (up to 10%) in addition to burnt and shattered stones (2%). The quantities of these burnt stones were sufficiently small as to allow their individual plotting from the cleaning and test-pits. With the auger results (34 bore-holes in total), and the test-pits, these deposits were found to be up to 0.2m deep (average 0.1m) and cover an area of approximately 32 x 15m to the field boundary.

Augering to ascertain the limits of the mid-grey sand revealed the presence of peat deposits up to 1.2m in depth to the east of the hedge-line and modern trackway (Fig. 22). These deposits probably indicate a palaeochannel and were sampled in trench 32 (Fig. 22).

Exposed largely in the southern end of the trench was an orange-brown sand with grey mottles. This was confirmed by augering and test-pitting to be the natural sand underlying all the above layers. This varied in depth (0.3-0.6m) and in turn overlay the reddish-brown clay interpreted by previous fieldwork as probably glaciolacustrine in origin (stage 1 report, p.7).

Features
A number of possible features were uncovered; they all contained mid-dark grey sandy fills. One of these features (0122) at the southern end of the trench was half-sectioned; it was shallow (0.05m in depth) and probably represents an undulation in the subsoil. Part of a large feature (0121) was exposed within test-pit 17/02 below the mid-dark grey sandy-loam; a sample for flotation for charred plant remains was retrieved from its surface.

Comment
The siting of the burnt stone scatter, close to a probable palaeochannel, is a classic burnt mound location, but no upstanding mound of burnt material and stone was found to survive. The layer defined by the mid-dark grey sandy-loam containing burnt stones and charred wood fragments (0100) resembles closely those layers encountered under the burnt mound at Waycar Pasture, Girton in 1993 (Garton 1993). It is therefore suggested that this deposit represents the basal layers, and relict soil, beneath the burnt mound activity on this site. The discovery of a large, unabraded, sherd of Romano-British samian pottery on the surface of this relict soil could be interpreted as suggesting that degradation of the mound had occurred as early as the Romano-British period: the radiocarbon date from the overlying peat is awaited with interest. The overlying sand (0114) and peat (0119) indicates that the lands fell into disuse, and became waterlogged, after denudation. The preservation of these layers appears to be best close to the modern hedge-line, and may also continue below the adjacent track which is higher than the fields along most of its line (p.14). Features survive below the relict soil (e.g. 0121). Any relation between these relict soil deposits and the deep peat sampled in trench 32 is unknown.

Results of Trench 18 (Fig. 26)
This burnt stone scatter was located on one of the three ridges (stage 1 report p.29) located along the northern perimeter of field 4726 in its north-west corner close to the hedge-lines. The field surface to the north of the hedge-line was much higher than that in the area evaluated; the plough has cut into the deposits south of the hedge-line. The deposits north and east of the hedge-lines were not investigated.

Stratigraphy of the deposits
The stratigraphic sequence comprised a silty ploughsoil; a thin, patchy peat; one area then had a sand lens; a mid-dark grey sandy loam with charcoal and burnt stone; then orange-brown sand.

The thin layer (0.10m) of peat (0152) immediately below the silty ploughsoil was confined mostly to the northern edge of the trench, close to the hedge-line. Samples of this layer were retrieved for possible palaeoenvironmental analysis.

One lens of sand (0161), similar to that located in trench 17, was present as a thin layer (0.02m) within test-pit 18/03 only.

Mid-dark grey sandy deposits (0145) containing charred plant fragments and burnt stones were found to lie below the topsoil and peat, forming a layer up to 0.20m in depth. These deposits covered almost the entire area in the trench except for the east end. With the auger results (25 bore-holes in total) these deposits were found to cover an area of approximately 31 x 19m. The quantities of charred material (10%) and burnt stone (4%) were marginally greater than in trench 17; again the burnt stone was plotted individually. A sample of this material was taken for flotation.

In the eastern end of the trench yellow and orange sands with grey mottles were exposed. These were verified by augering and test-pitting to range up to 0.50m in depth and underlie the grey sandy deposits. Beneath these layers, at a depth of 0.7-0.8m from the ground surface, was the reddish brown glaciolacustrine clay. A slight variation to this was recorded in the augering to the east of the trench where a grey clay was detected overlying the red-brown clay.

Features

A feature (0162) running north-south and 1-1.5m wide was uncovered in the eastern end of the trench. Lying immediately below the ploughsoil, the feature was cut into the yellow and orange sands (0147), and contained peat. A 1.5m wide section was excavated across this feature. It was a shallow (0.15m), flat bottomed, furrow-like feature, with a number of peat filled plough scrapes at its base which may represent the working of this land when waterlogged. No other features were uncovered in the trench.

Comment

The sequence of deposits closely mirrored those found in trench 17, and again, no upstanding mound of burnt material and stone survived. The similar sequence of deposits may suggest a similar set of processes and timescale for denudation of the mound and re-deposition of the sand, peat and overlying alluvium.

THE SLAG SCATTER

Objective
8b) Evaluate the character of the deposits represented by the scatter of slag.

Methodology
The scatter of slag recorded by fieldwalking was some 20m across in field 7648 (stage 1 report, Fig. 13). Geophysical survey located clearly defined NW-SE drains (Fig. B.2 of Appendix 3 of stage 1 report) which are partly clinker-filled (information Alistair Lee). This was confirmed by the recovery of a drain in trench 29 in the centre of the field (Fig. 17), and in the recovery of slag/clinker from immediately below the ploughsoil in the western part of the auger transect across this field (Fig. 3 of stage 1 report).

Result
It is likely that the slag scatter recorded is either from a dump made prior to filling the drains, or that recent ploughing has truncated a drain scattering slag on the surface. It is therefore unlikely that it represents an ancient metal-working site and no further investigation is proposed.

THE POST-MEDIEVAL LANDSCAPE

8c) The documentary evidence for the historic landscape was considered as part of the stage 1 report; during the fieldwork for the stage 2 evaluation, an earthwork was identified which is considered below.

The field surface along the northern part of field 4726 was lower than the adjacent field to the north, almost forming a lynchet in appearance, but occurring on only very gently sloping land within the floodplain. This hedge-line, and that running east from its northern corner, are marked as a track on the 1773 Enclosure Award. A prominent, wide, bank, some 1.5m high, continues its northern line towards the river (Fig. 16). This bank is on a field boundary in the Enclosure Award, but is not otherwise commented upon. Most of the field boundaries in this area are ditched and hedged, so this bank is unusual. It runs at right-angles to the river, so would not form an obvious flood-bank. The most obvious interpretation is that was a causeway between the river and the Enclosure track (the field north of the present boundary is approximately at the same level as the top of the bank). Another possibility is that it marked some perimeter around Mattersey Priory which lies some 200m to the north-west. However, several fields south of this bank were called Abbey Close at Enclosure which suggests that lands of the Priory were formerly more extensive than any embanked area.

SUMMARY OF RESULTS & CONCLUSIONS

TARGET 5: MAP THE EXTENT AND CONDITION OF THE CROPMARK FEATURES

5a) Identify the extent of the ancient field boundaries to the East and North of their cropmark manifestations. (Fig. 17)

5a.1 The northern limit of cropmark VI was established in stage 1 by trenches across its line; it does not extend beyond cropmark I.

5a.2 Cropmark I was taken as the representative of the west-east cropmarks since it was likely to mirror the extent of cropmarks II-IV: its eastern extent was recovered by augering and trenches. The ditch of cropmark I extended some 90m east past its last known recorded point where it made a right-angle turn to the south (Fig. 17). It therefore seems likely that a north-south ditch bounds the eastern extent of the field-system, and that the ditches of cropmarks II-IV could extend similarly far east.

5a.3 At the southern end of the field-system, the ditch of cropmark VI may end at the junction with cropmark IV.

5a.4 Hence, it is suggested that these field-systems form a regular block of ?eight fields, each side defined by ditched boundaries away from the settlement focus.

5b) Does the condition of the organic deposits within the cropmark features, and therefore their palaeoenvironmental potential, vary significantly to the East and North.

5b.1 Wherever the cropmark ditches of the field-system have been excavated they have a layer of peat as their uppermost fill. However, the amount of truncation of the ditch deposits, and the degree of dessication of the organic deposits varies widely. The best preserved deposits were located in the ditch of cropmark I as it crossed the alluvium filled basin of zone 3. A pollen sequence from the re-cycled mid-Holocene soil, through the primary silting of the ditch indicating both pasture and arable lands within the vicinity, to the abandonment of the ditches during rising water levels, could be documented. The deposits to either side of this basin, on the sandy zone 1 deposits, were dessicated biasing the composition of the pollen assemblages.

5b.2 The ditches of cropmark I cut the alluvial deposits of the zone 3 basin, so some of these alluvial deposits are pre-Roman in date. There are also thin spreads of alluvium in the upper hollow of the ditch of cropmark VI, suggesting that alluviation continued beyond the Romano-British period. This is an important result in an archaeological framework where the timing and rate of alluviation within the river valleys is a key research issue (*cf*. Knight and Howard 1994).

5c) Is there a relationship between the cropmark features of the central block with those to the south of the track.

5c.1 Two trenches were sited to locate any extension of cropmark VI south of cropmark IV. Neither showed any trace of a ditch. Therefore, the only obvious possibility of linking the two cropmark complexes proved negative. On excavation of the possible continuation of cropmark VI to the south of the track, it was demonstrated that this was a modern field drain/irrigation main.

5c.2 The analysis of the cropmarks (section 5e) suggests that the cropmarks south of the track are on a different alignment.

5d) What is the character and date of the southern cropmarks.

5d.1 These cropmarks cannot be linked with the Brickwork Plan field-systems (sections 5c and 5e). The ditches in trench 31 are aligned with the trackway to the north-east, but they are too close to each other to be contemporary trackside ditches. Their date and function remains unknown.

5e) Comment on the integrity of the cropmark plot: are all the features plotted likely to be pre-medieval.

5e.1 The cropmarks reflect buried linear features irrespective of their date; their pattern was therefore analysed. The cropmarks caused by recent features were discounted, then the major elements were identified as forming a coherent plan characteristic of the Brickwork Plan field-systems (Riley 1980). The cropmarks at the southern end of the proposed quarry area do not form part of this pattern.

TARGET 6: ASSESS THE CONDITION OF THE PEAT

6a) How does the palaeoenvironmental potential of the deposits vary across the site?

6a.1 Hand-augering on a 100m grid (stage 1 report Fig. 2), followed by selected transects across the area, demonstrated that most of the peat across the northern part of the proposed quarry area was generally thin (c. 0.5m) and dessicated. However, these deposits do contain an environmental record which can be partly correlated with that from the peats of the cropmark ditch deposits, and which are significant in the landscape development e.g. the peat horizons overlying the burnt stone scatter sites (Figs 25, 26). Only one area of deep, wet peat, was recovered adjacent to the present course of the river (Fig. 22); assessment and dating are in progress.

6b) Can the rate of attrition of the peat be assessed.

6b.1 Comparison of the current survey of the peat, with the British Geological Survey mapping records from 1957-9 and 1976, suggests severe deflation of this resource.

TARGET 7: ASSESS THE CHARACTER AND EXTENT OF ROMANO-BRITISH SETTLEMENT

7a) Evaluate the character, extent and preservation of the deposits represented by the Romano-British pottery scatter

7a.1 Ditches and other features were located in trenches north-east of the known cropmark complex (Fig. 24). Two ditches were sectioned. Neither were as substantial as those ditches of cropmark I, and the weathering cone at the top of the ditches did not survive which suggests the deposits were truncated. However, if the interpretation of the possible upcast and buried soil deposits located adjacent to the ditch in trench 20 is correct, this suggests a lesser degree of truncation than in most of the other areas tested by excavation.

7a.2 The sequence of infill of the ditches; humic silts, sandy silts, then peat below a silty topsoil, mirrors the infilling of the ditches of cropmark I, however, these deposits are dessicated.

7b) How does this scatter relate to the cropmark site to the south and west

7b.1 The recovery of reasonable quantities of pottery from cleaning and minimal excavation of the features, and the variety of feature types recovered, suggests some focus of activity in trench 19. This scatter did not extend into trench 21, suggesting that this was a separate area of activities from the cropmark enclosures known to the south.

7b.2 If the extent of the fieldwalking scatter is assumed to be representative of the sub-ploughsoil deposits, then this pottery-using activity does not continue to the north-west into the area adjacent to those enclosures. This is particularly true of the Brickwork Plan field-systems where the recovery of pottery scatters away from enclosure complexes, assumed to represent settlement foci, is rare. This settlement activity has a similar range of pottery to that from fieldwalking the enclosure clusters to the west (English Heritage project information).

7b.3 The plan of the ditches, and their orientation, suggests that they are similarly aligned with the rest of the cropmark plot, and hence, that they belong to the same system of land allotment. This suggests the extension of the landscape defined by cropmarks into the proposed quarry area.

TARGET 8: ASSESS THE OTHER ARCHAEOLOGICAL ACTIVITY

8a) Evaluate the character, extent and preservation of the deposits represented by the burnt stone scatters. How does the burnt stone scatter relate to other deposits, particularly any with palaoenvironmental potential.

8a.1 Two of the burnt stone scatters recovered by fieldwalking were evaluated by excavation; they lay on the edges of the proposed quarry area. Both revealed a similar stratigraphic sequence. The soil beneath the mound was preserved, though any mound had been denuded prior to sand, and then peat, being deposited, before the present silty alluvium capping was ploughed. The peat has been sampled for palaeoenvironmental analysis and dating. The soil beneath the mound, and probably features, survive in both cases adjacent to the hedge-line.

8a.2 There are no demonstrated instances of the interleaving of burnt mound material with deposits of palaeoenvironmental potential (peat) within the proposed quarry area.

8b) Evaluate the character of the deposits represented by the scatter of slag.

8b.1 The field has a series of recent land-drains filled with slag/clinker. Hence, it is likely that the slag scatter recorded is either from a dump made prior to filling the drains, or that recent ploughing has truncated a drain scattering slag on the surface. It is therefore unlikely that the scatter represents an ancient metal-working site, so no further investigation was conducted.

8c) The post-medieval landscape

8c.1 A large bank linking an Enclosure trackway to the river was recognised (Fig. 16). The most obvious interpretation is that it was a causeway to the river, though its proximity to Mattersey Priory, and the fact that banks are unusual field boundaries in this area, means that other functions, for example part of a boundary to the Priory, should also be considered.

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PROJECT TEAM

The project was designed by Daryl Garton with advice from Mike Bishop, the County Archaeologist for Nottinghamshire, with helpful comments on site from Ursilla Spence. Lee Elliott supervised the excavation of the burnt stone scatter sites (trenches 17-18) and Tony Morris supervised all the other trenches (19-31) and was assisted by Paul Caldwell, Jen Eccles, Doug Gilbert, Audrey Karagounis, Alison Kennett, Chris Scurfield and Mark Southgate. The surveying, geomorphological investigations (including trench 32) and assessment of the condition and rate of attrition of the peat, was conducted by Dr. Andy Howard. The biological assessments were conducted by Dr. Chris Hunt, University of Huddersfield. The Romano-British pottery was assessed by Ruth Leary. The illustrations for this report were drafted by Jane Goddard and Caroline Bevan.

Daryl Garton, Lee Elliott, Andy Howard, Chris Hunt and Tony Morris for T&PAT
August 1995

APPENDIX 4: PALAEOENVIRONMENTAL ASSESSMENT OF SAMPLES FROM TRENCHES 14 AND 16
by C.O. Hunt

INTRODUCTION
This report describes the environmental content and significance of five samples from trenches 14 and 16 described in the stage 1 report taken by Dr A. Howard.

METHODS
The monoliths provided by Dr Howard were subsampled, with 1 cc subsamples for palynological analysis and 1 kg subsamples for macrofossil analysis. The lithology of the samples is indicated in Table 1.

Table 1: Lithology of samples from Blaco Hill (depths from top of monoliths)

Trench	Depth (m)	Sample	Lithology
TBH 16	0.05	A	Dark brown very organic silt
	0.35	B	Dark brown very organic silt
	0.70	C	Very dark brown very organic silt
TBH 14	0.40	E	Mid brown sandy organic silt
	0.60	D	Dark brown silty peat

The palynology samples were boiled in 5% potassium hydroxide solution to dissolve humic substances, sieved through 100 micron nylon mesh to remove large particles and on 10 micron nylon boulting cloth to remove fines and solutes. Mineral grains were removed by swirling (gravity separation). The organic concentrate was stained with fuchsin. Pollen was counted in a water mount under 400x magnification, with UV fluorescence used to indicate recycling. 200 or more grains were counted for each sample except sample D, where only 105 grains could be counted. The macrofossil samples were disaggregated in 5% hydrogen peroxide and sieved wet on a 0.5 mm stainless steel sieve and all seeds and beetle fragments were counted wet under a binocular microscope with x20 magnification. Presence and approximate abundance of other organic matter, such as wood, roots and leaves, was noted. No molluscs or bones were noted.

RESULTS

Palynology
The pollen counts are shown in Table 2, the algal microfossil counts in Table 3 and the plant macrofossil counts in Table 4.

Table 2: Palynology of samples from trenches 16 and 14

SAMPLE	C	B	A	D	E
Betula	2.2	1.4	2.0		1.3
Pinus	0.9	0.5		5.7	
Quercus	4.3		2.9	1.0	0.9
Ulmus	1.7				
Tilia	2.2			1.9	
Fraxinus			0.5		
Fagus			0.5	1.0	
Alnus	49.6	12.2	18.2	6.6	6.7
Corylus	6.5	3.1	6.2	7.6	2.2
Salix			0.5		
Juniperus			0.5		
Hedera			0.5		
Rosaceae			0.5		0.4
Ericales			1.0	1.0	
Gramineae	4.3	18.0	18.7	16.2	22.2
Cereal	0.4	1.8	0.5	1.9	0.4
Compositae (Liguliflorae)	0.9	1.4	0.5		0.9
Rumex			1.0	1.0	
Anthemis type		0.9	0.5		
Spergula type			0.5		0.4
Artemisia		0.4	0.5		
Chenopodiaceae			0.5		0.4
Cirsium type		0.5			
Caryophyllaceae		0.5			
Plantago	1.3			1.0	1.3
Umbelliferae					0.9
Cyperaceae	7.3	34.2	32.5	21.9	53.3
Typha		0.5			0.9
Ranunculus	0.4				0.4
Mentha	0.4				
Myriophyllum	0.4	0.9	2.00		0.9
Filicales	7.8	13.5	4.8	21.9	1.7
Pteridium	3.9	9.9	2.9	9.5	4.4
Polypodium	0.9			1.0	
Sphagnum	0.4		1.0	1.0	

Pollen in the samples from trench 16 was generally poorly preserved and showed signs of corrosion. Pollen in the samples from trench 14 was generally well-preserved. The *Tilia*, *Pinus*, *Ulmus*, *Polypodium*, Filicales and *Pteridium* spores in all samples showed signs of corrosion, being significantly thin and degraded. Under fluorescence microscopy they showed a dull yellow, rather than the bright yellow which was shown by the other taxa. It can therefore be concluded that these taxa are recycled, probably from an older Holocene forest soil. They are therefore not commented upon in the discussion below concerning the ecology of the site.

The composition of the samples is rather variable. *Alnus*, *Corylus*, Gramineae and Cyperaceae are important in all samples, but *Alnus* dominates sample C, and Cyperaceae with lesser Gramineae dominate the others. All samples have small quantities of tree pollen, pollen of herbaceous plants and cereal pollen. All except sample D contain pollen of wetland and aquatic plants.

Algal microfossils

All samples contain spores of benthic algae (including some or all of the zygnemataceous taxa *Spirogyra*, *Zygnema*, *Meugotia*). All except C contain planktonic forms (Type 114, *Sigmopollis*, *Cosmarium*, *Saeptodinium*, *Pediastrum* and cf. *Michrystridium*).

Table 3: Algal microfossils from trenches 16 and 14

	C	B	A	D	E
Spirogyra	0.4	1.4	2.0		
Meugotia	0.9	0.9	0.5	1.0	2.7
Zygnema			0.5		
Type 114			0.5		
Sigmopollis		5.0	1.4	1.9	0.9
Cosmarium			0.5		
Saeptodinium			2.4		0.4
Pediastrum		0.9			
cf. *Michrystridium*		0.9			

Macrofossils

The plant macrofossil assemblages are also rather variable. A and E contain numerous waterlogged seeds, mostly of herbaceous taxa. Both samples from trench 14 contain beetle fragments in a moderate state of preservation: all those from trench 16 contain wood. There is a fragment of a charred grain and a waterlogged grain of ? *Hordeum* in sample A., a *Ribes* pip in sample B and numerous sedge nutlets and some *Potamogeton* stones in sample D.

Table 4: Plant and other macrofossils from trenches 16 and 14

	C	B	A	D	E
Wood		x	xx		
Corylus/Betula/Alnus twig	xx	x			
Gramineae (l/s)	x		x	x	
Gramineae seeds			1		2
? *Hordeum* (g)			1		
Charred cereal indet. (g)			1		
Chenopodiaceae (a)			15		19
Polygonaceae (a)			3		2
Rumex (a)					
Stellaria/Arenaria (a)			5		
'anchor' seeds ?*Rumex* (a)			26		28
Caryophyllaceae (a)			3		
Ribes (a)		1			
Cyperaceae (n)			1	12	3
Potamogeton (n)				2	
Musci (c)					1
Musci (s/l)				xx	x
Indet. seeds				3	
Beetles				3	1
Indet stem fragments	xxx			xxx	

INTERPRETATION

The considerable similarities between the macrofossil and pollen assemblages in sample A and sample E is perhaps consistent with these samples, near the top of the peat unit, being approximately contemporary. Samples B and D have some elements of similarity, but sample C is rather different and most probably somewhat earlier.

Both sets of samples clearly originated in a largely cleared agricultural landscape with soil erosion nearby contributing a stream of recycled pollen and spores, especially at the base of both sequences. Agricultural activity is indicated by the presence of cereal pollen and pollen of herbaceous taxa in all samples. *Spergula* and the Chenopodiaceae are usually associated with arable crops, while Gramineae, together with *Plantago*, *Artemisia* and *Rumex* are typical of pasture. A nearby mixed agricultural economy is thus probable for all samples.

Alder (*Alnus*) was clearly important locally when the ditch in trench 16 was first recut (sample C), and it remained a reasonably important component of the landscape throughout, most probably as a waterside tree. Hazel and perhaps birch may have been present as second growth somewhere nearby, and there is a suggestion of the beginnings of regeneration of second growth taxa (*Fraxinus*, *Fagus*, *Juniperus*) in sample A. The samples all clearly accumulated in wet places: there are high counts for sedge pollen and pollen of other wetland taxa and benthic algae are present in most samples. It is clear from the presence of planktonic algae and the presence of either the pollen of *Myriophyllum* or *Potamogeton* stones that standing water probably 0.5-1.0m deep was locally present for a significant part of the year. Since flood water could have introduced these to the site it cannot be claimed that they were growing at the excavated site, but this clearly remains a strong possibility.

Conclusion

1. The upper part of the ditch fill in trench 16 and the 'blanket peat' in trench 14 are probably contemporary, the base of the ditch fill being older.

2. The ditch fill and blanket peat accumulated in a predominantly agricultural landscape with a mixed economy.

3. The sites were locally wet and most probably were covered with at least seasonal standing water 0.5-1.0 m deep.

4. It would thus appear that the ditch in trench 16 was recut as a response to locally rising water levels but was unsuccessful in that aim. Agriculture was forced to retreat upslope but continued largely unchanged during the deposition of these sequences.

APPENDIX 5: BOREHOLE RECORDS HELD AT THE BRITISH GEOLOGICAL SURVEY, KEYWORTH

SK78NW 7 (SK703 874) (1970) NO S.H.
Topsoil
Sand
Sand and Gravel
Red Clay
SSG

SK78NW 10 (SK7030 8979) (1976 m.a.r.) +6.9M O.D.
Mattersey Priory

Black soil on Silty Peat	5.7m
1st Terrace Gravel	2.1m
SSG	

SK78NW 12 (SK7041 8838) (1976 m.a.r.) +6.5m O.D.

Brown sandy soil	0.7m
Soft brown-green alluvial clays	2.1m
1st Terrace Gravel	1.5m
SSG	

SK78NW 13 (SK7111 8827) (1976 m.a.r.) +6.2m O.D.

Black Peat	2.8m
1st Terrace Gravel	1.3m
SSG	

SK78NW 14 (SK7193 8833) (1976 m.a.r.) +12.3m O.D.

Brown Peaty Soil	0.7m
Glacial Sand and Gravel	1.6m
MMG	

SK78NW 15 (SK7067 8710) (1976 m.a.r.) +7.0m O.D.

Clayey Pebbly Sand Alluvium	1.0m
1st Terrace Gravel	1.8m
SSG	

SK78NW 16 (SK7215 8747) (1976 m.a.r.) +7.6m O.D.

Soil	0.3m
Brown Clay Alluvium	0.6m
Clayey Sand	2.0m
MMG	

SK78NW 17 (SK7331 8702) (1976 m.a.r.) +10.1m O.D.

Brown Clay Alluvium	3.4m
MMG	

SK78NW 18 (SK7127 8651) (1976 m.a.r.) +7.1m O.D.

Hard Stony Clay Alluvium	1.0m
1st Terrace Gravel	1.6m
SSG	

SK78NW 19 (SK7266 8674) (1976 m.a.r.) +8.0m O.D.

Brown Soil	0.8m
Brown Clay Alluvium	0.6m
MMG	

SK78NW 20 (SK7103 8573) (1976 m.a.r.) +8.0m O.D.

Brown Stony Soil	0.1m
1st Terrace Gravel	1.9m
SSG	

SK78NW 21 (SK7175 8560) (1976 m.a.r.) +7.2m O.D.

Silty Peat	0.7m
1st Terrace Gravel	0.3m
MMG	

SK78NW 29 (SK7142 8575) (1989) No S.H.

Made Ground	2.1m
Peat	0.7m
1st Terrace Gravel	2.2m
SSG	

SK78NW 33 (SK7213 8539) (1989) +7.4m O.D.

Made Ground	1.0m
Peat	0.25m
Peaty Clay	1.25m
1st Terrace Gravel	0.9m

SK78NW 34 (SK7199 8545) (1989) +7.25m O.D.

Made Ground	0.8m
Peat	1.1m
Silty Clay	1.0m

SK78NW 35 (SK7156 8563) (1989) +7.50m O.D.

Peaty Made Ground	0.2m
Peaty Silty Clay	0.3m
Brown Silty Clay	0.5m
1st Terrace Gravel	2.0m

SK68NE 50 (SK6868 8972) (1986) +5.35m O.D.

Topsoil	0.4m
Black Loamy Soil	1.6m
Peat	2.5m
Peat with Pebbles	1.5m
SSG	

SK68NE 51 (SK6907 8948) (1986) +6.51m O.D.

Made Ground	1.0m
Brown Pebbly Sand	1.5m
Brown Peat	1.5m
Wet Brown Peat	3.0m
SSG	

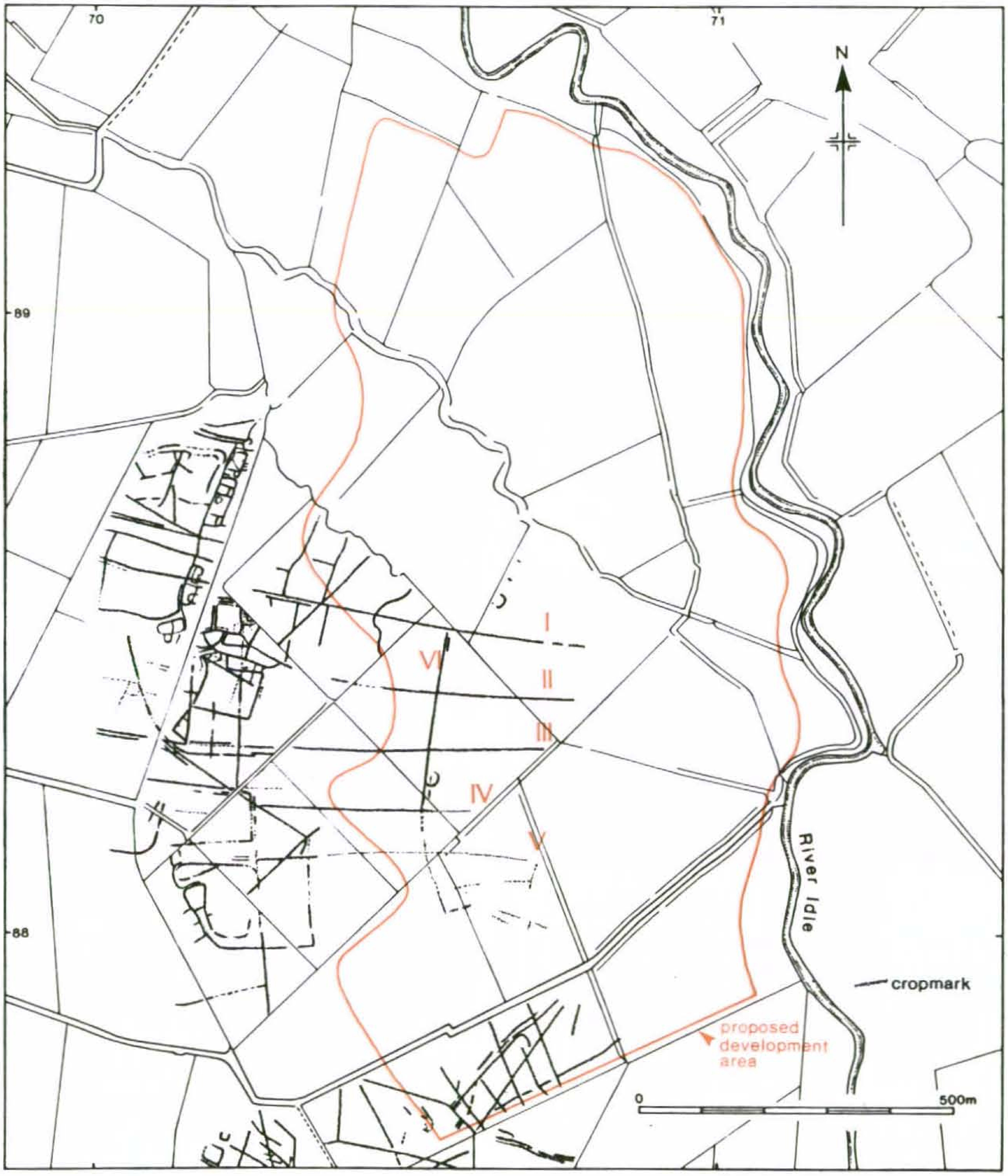

Fig. 15 Plan of the proposed extraction area showing the cropmarks (major elements of the field-systems numbered). Scale 1:10,000.

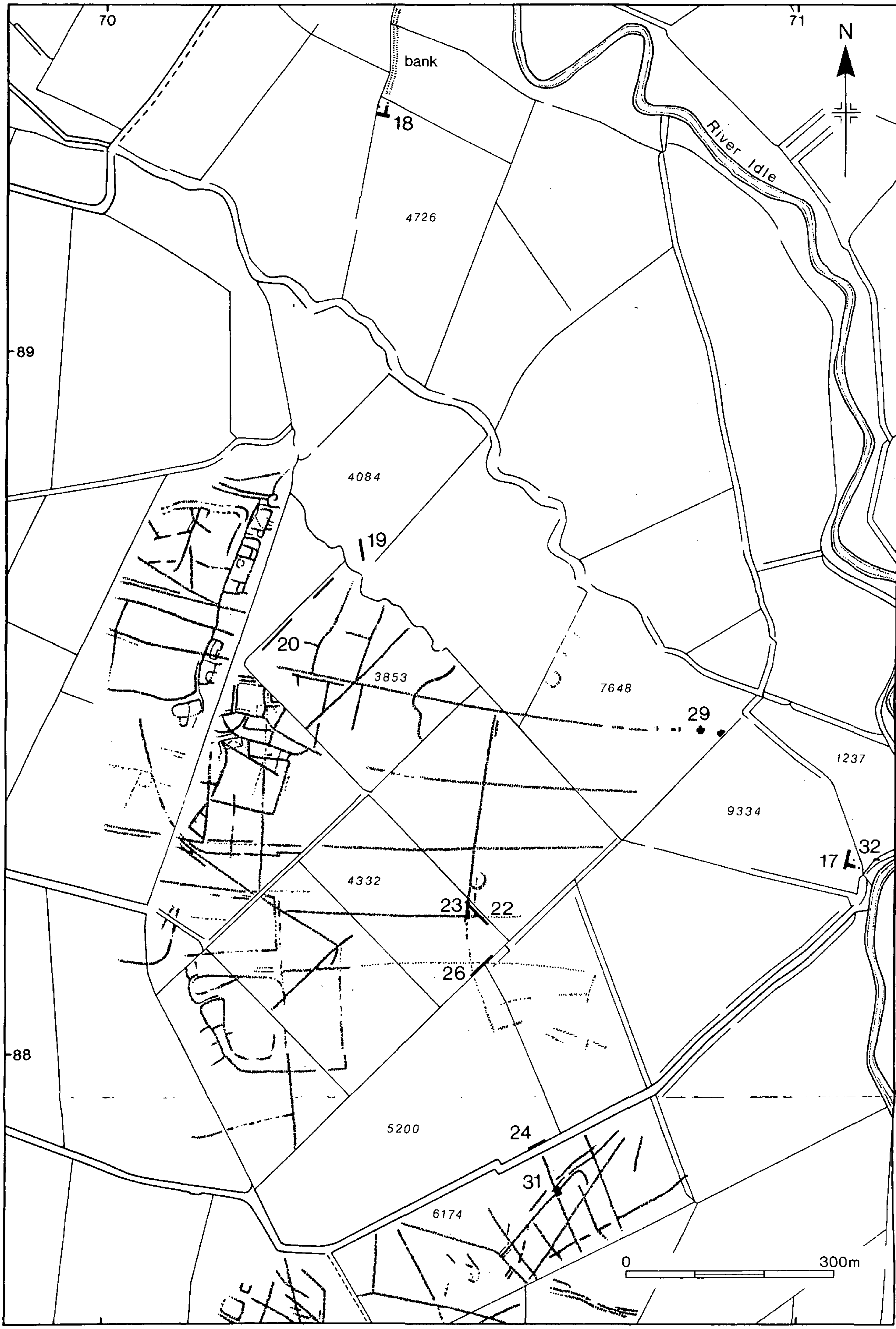

Fig. 16 Plan of the excavation areas (trench numbers are two figures, OS field numbers are four figures). The bank just outside the proposed development area is also shown. Scale 1:5,000.

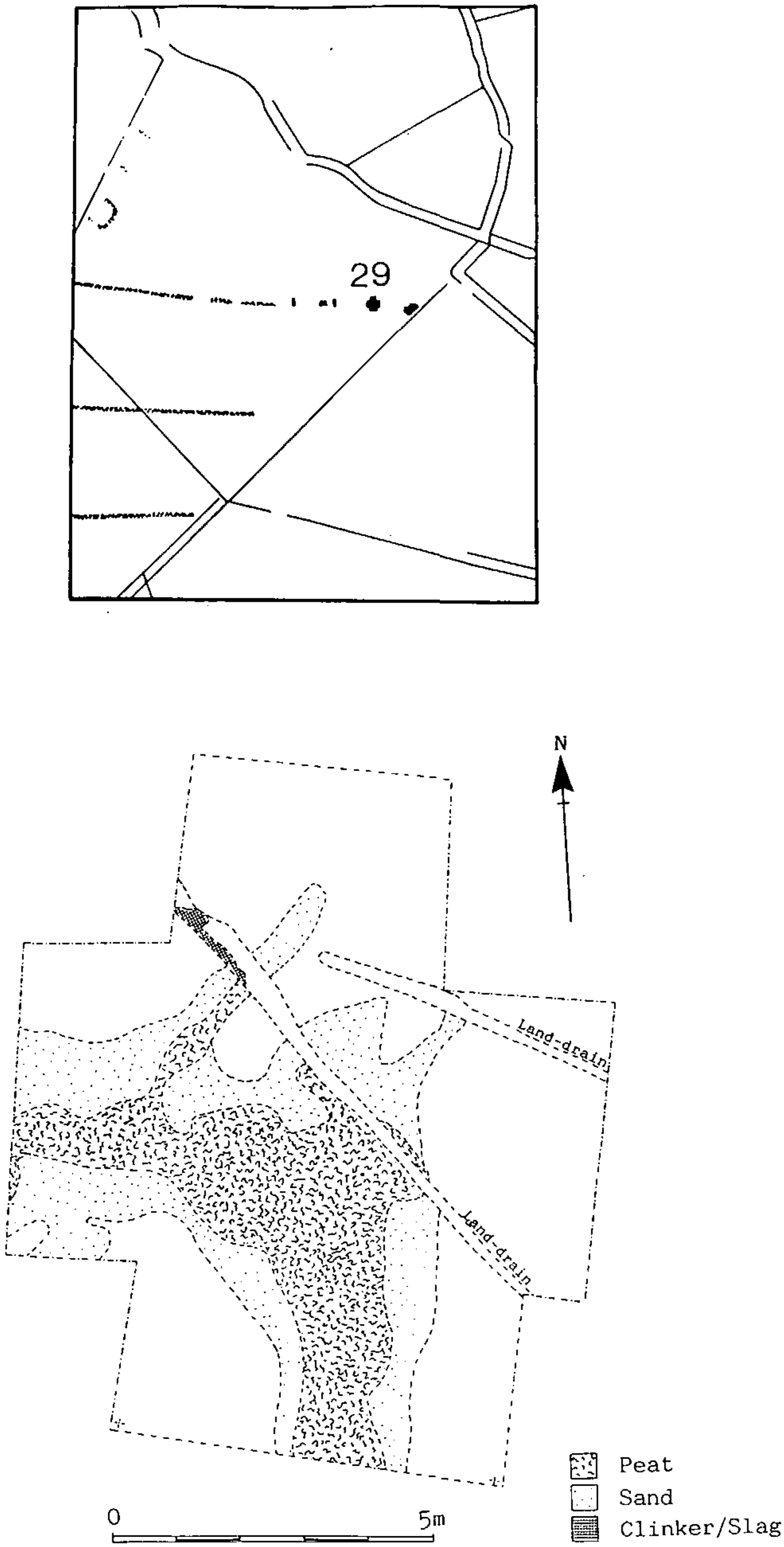

Fig. 17 Excavations tracing the ditch of cropmark I, with a plan showing the ditch turning to the south. Scales: plan at 1:100, inset at 1:5000.

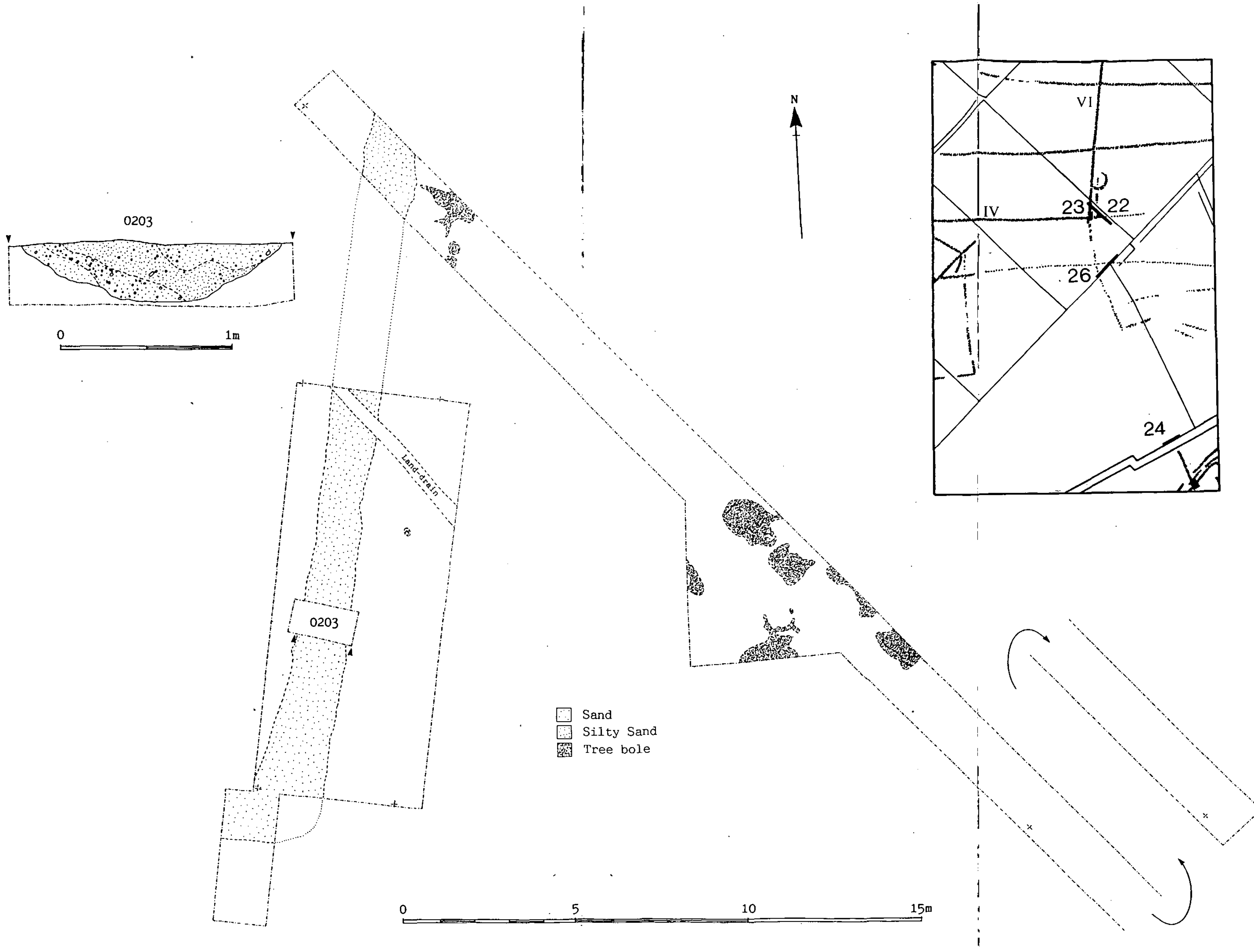

Fig. 18 Excavations at the junction of cropmarks IV and VI. Scales: sections at 1:20, plan at 1:100, inset at 1:5,000.

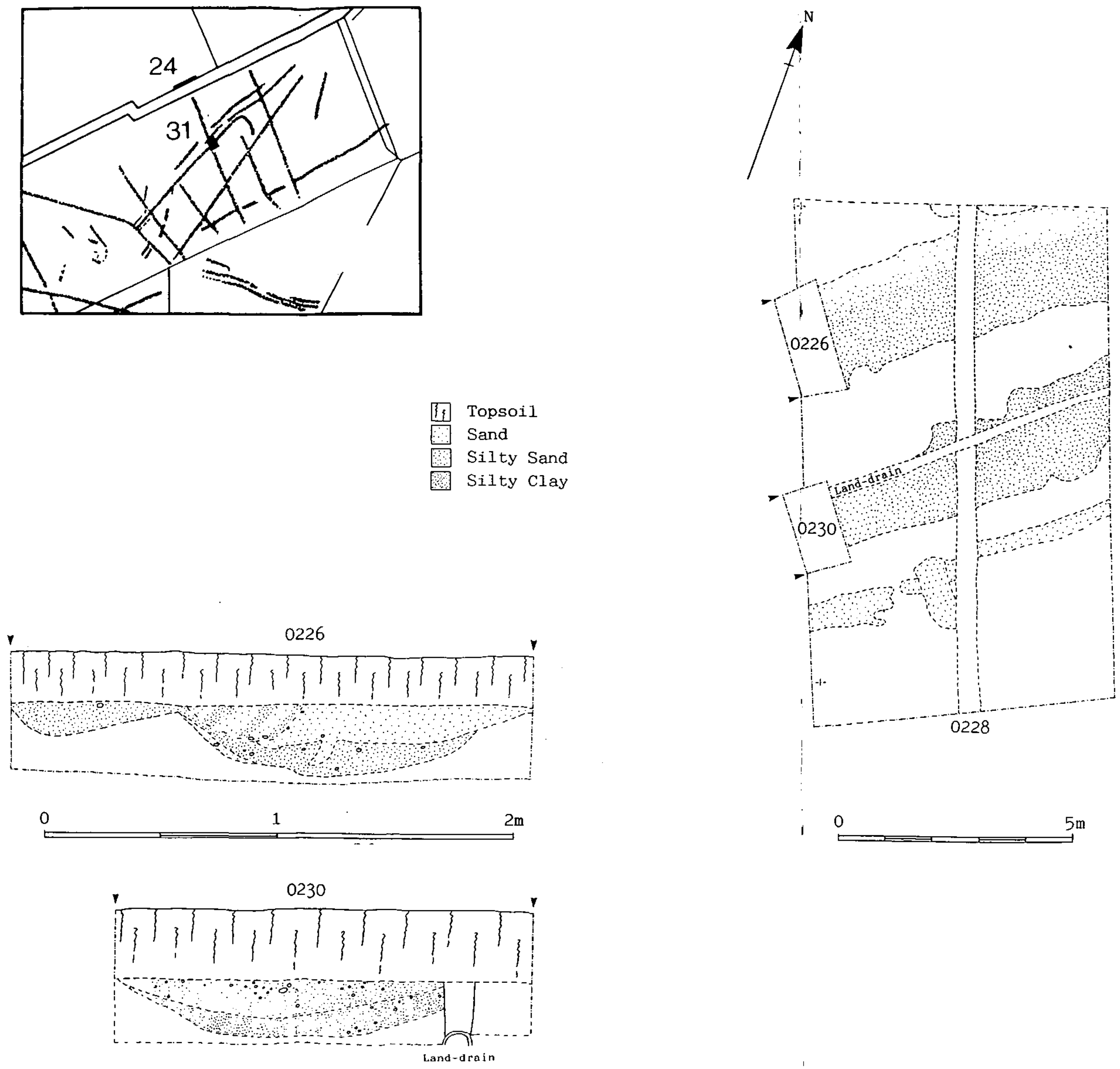

Fig. 19 Excavation of a cropmark intersection on the southern cropmarks.
Scales: sections at 1:20, plan at 1:100, inset at 1:5,000.

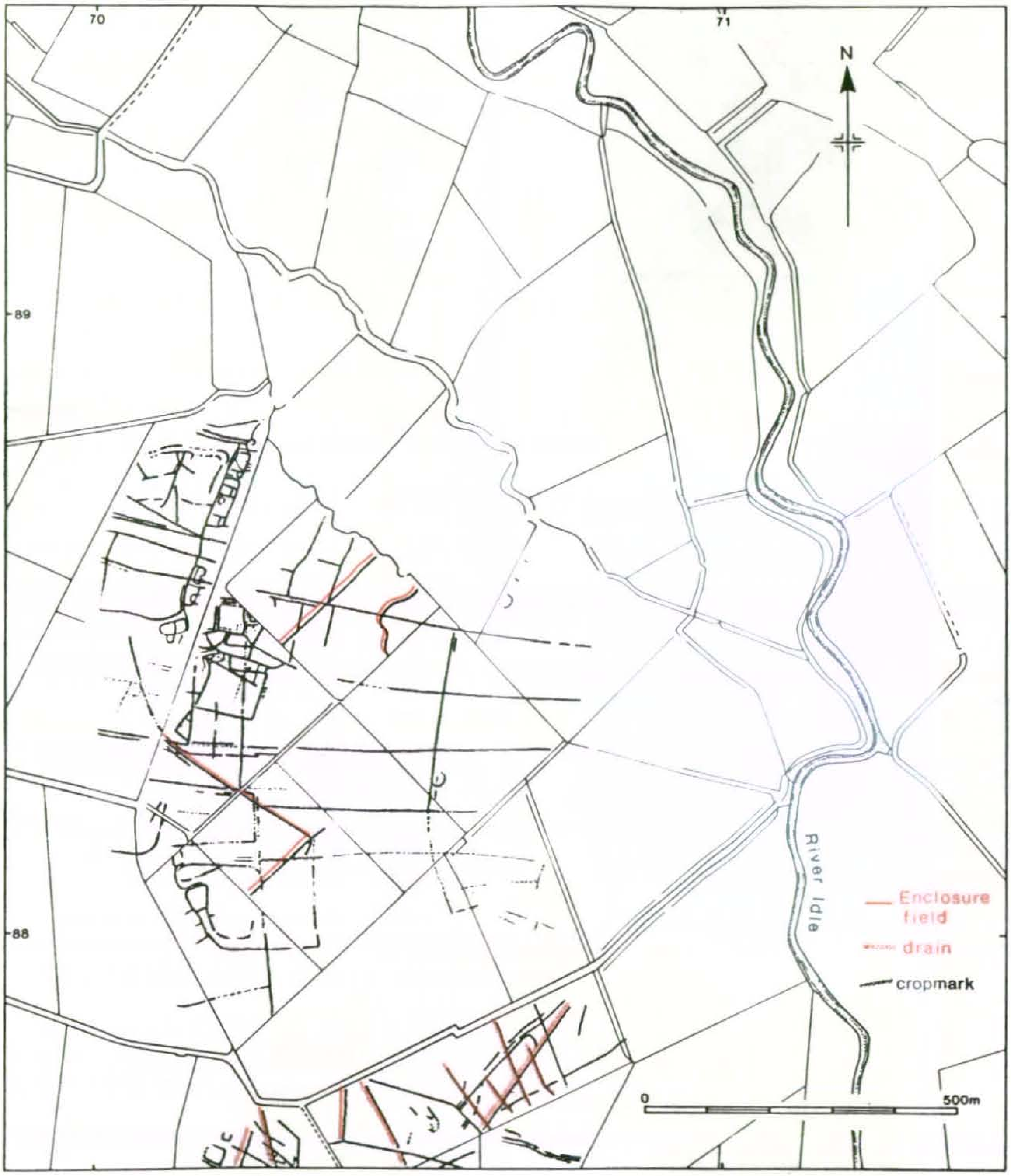

Fig. 20 Analysis of the cropmark pattern: the overlay shows the non-ancient cropmarks of identifiable Enclosure fields and recent drains.

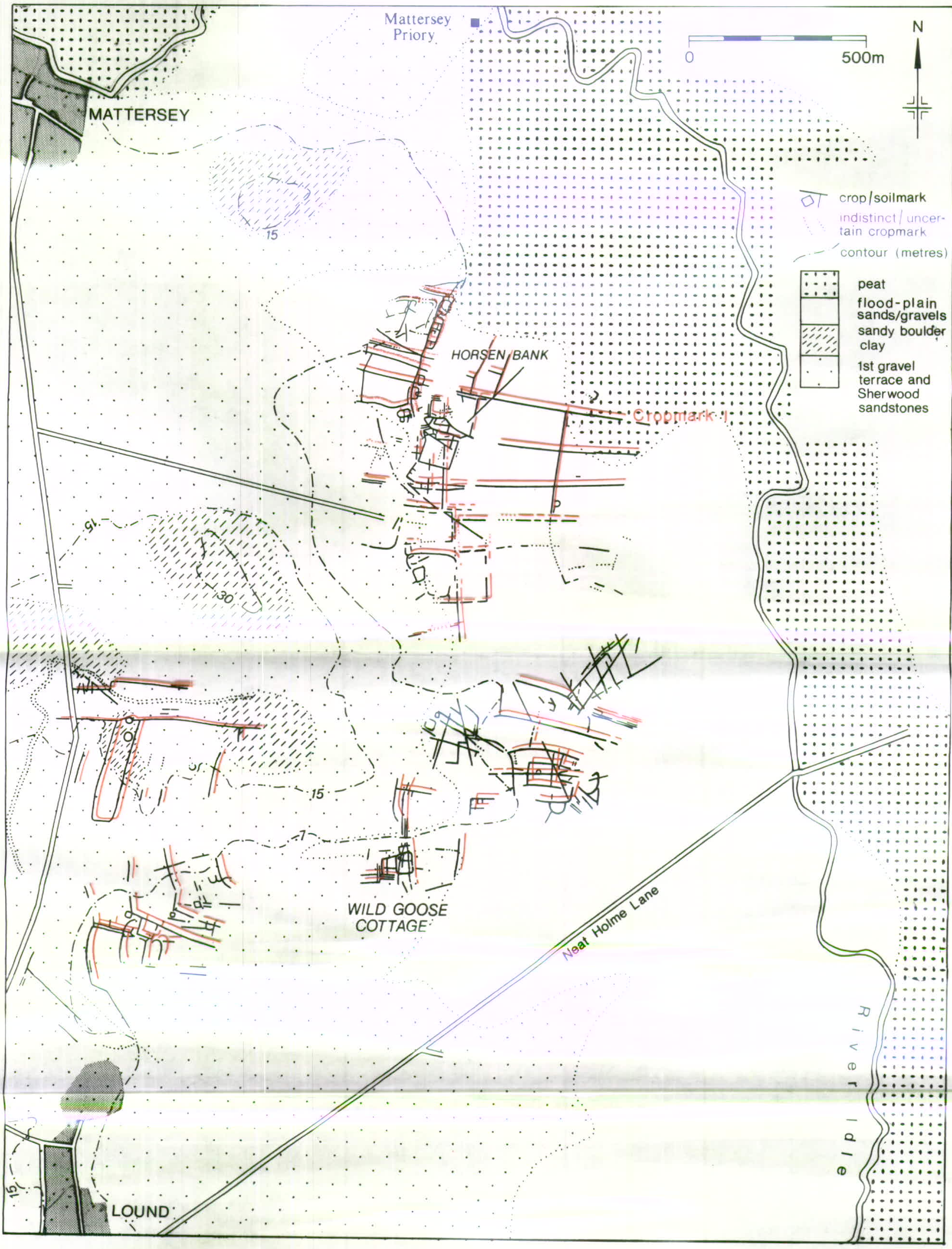

Fig. 21 Analysis of the cropmark pattern: the overlay shows the major elements of the cropmarks which belong with the Brickwork plan field-systems.

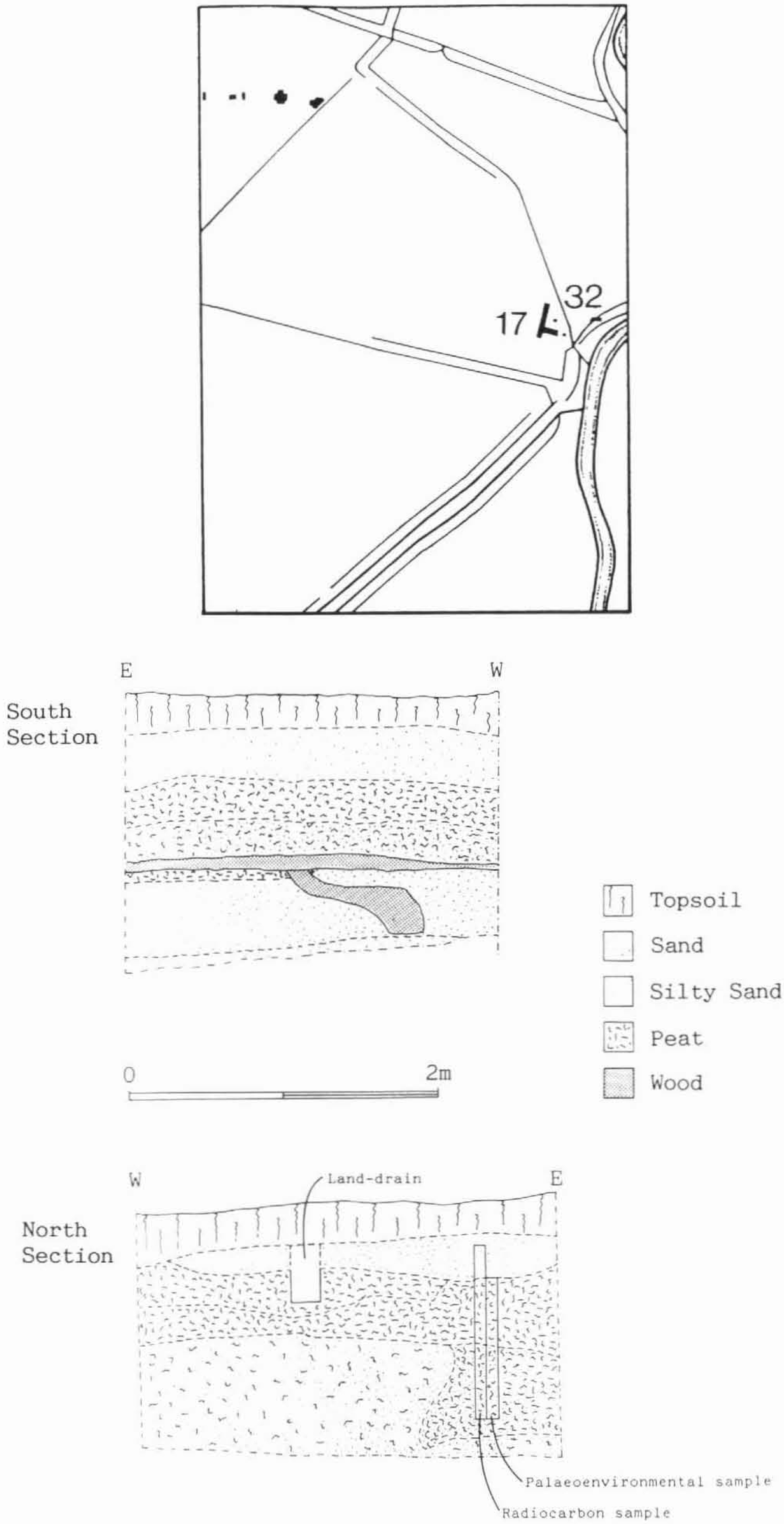

Fig. 22 Sections through the deep peat sampled in trench 32. Scales: sections at 1:40, inset at 1:5,000.

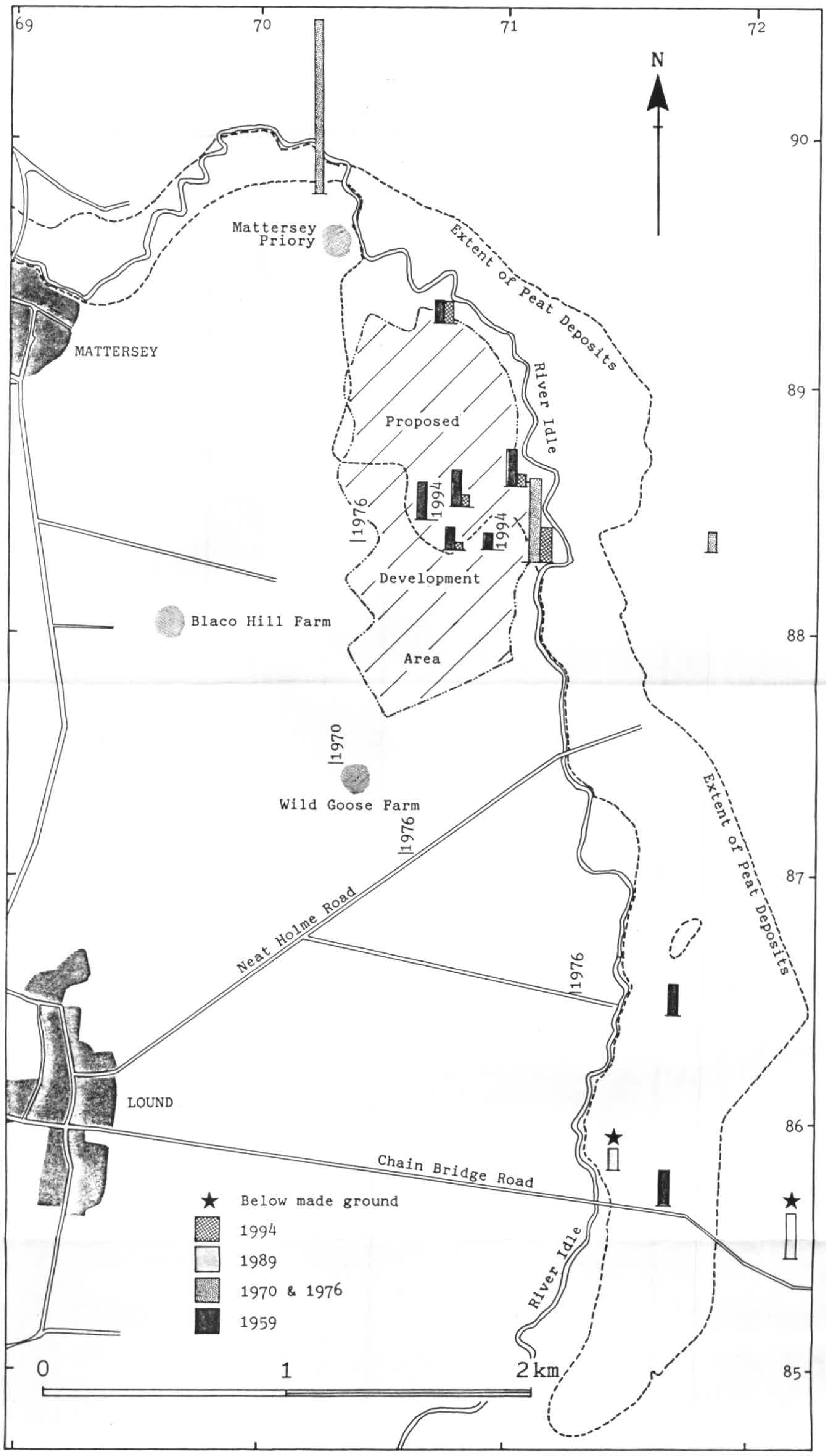

Fig. 23 The depths of peat recorded in the Idle Valley: the 1959, 1976, and 1989 records held at the British Geological Survey (BGS) compared with those recorded for the stage 1 evaluation report. In boreholes where peat was not recovered, the date of the record is indicated.

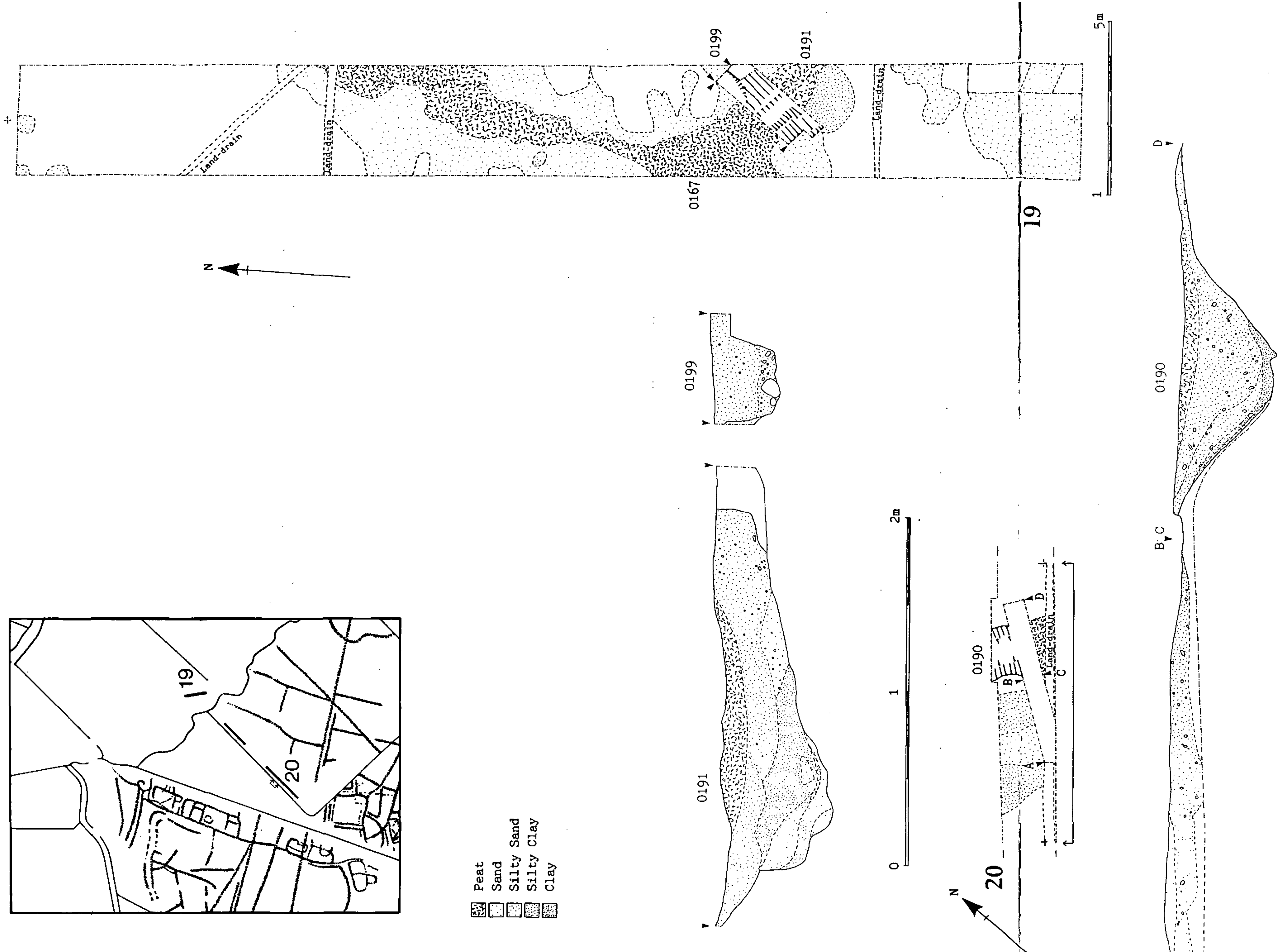

Fig. 24 The excavations in the area of the Romano-British pottery scatter (trench 19), and tracing any continuation of the cropmark field-boundaries (trenches 20, 21). Scales: sections at 1:20, plans at 1:100, inset at 1:5,000.

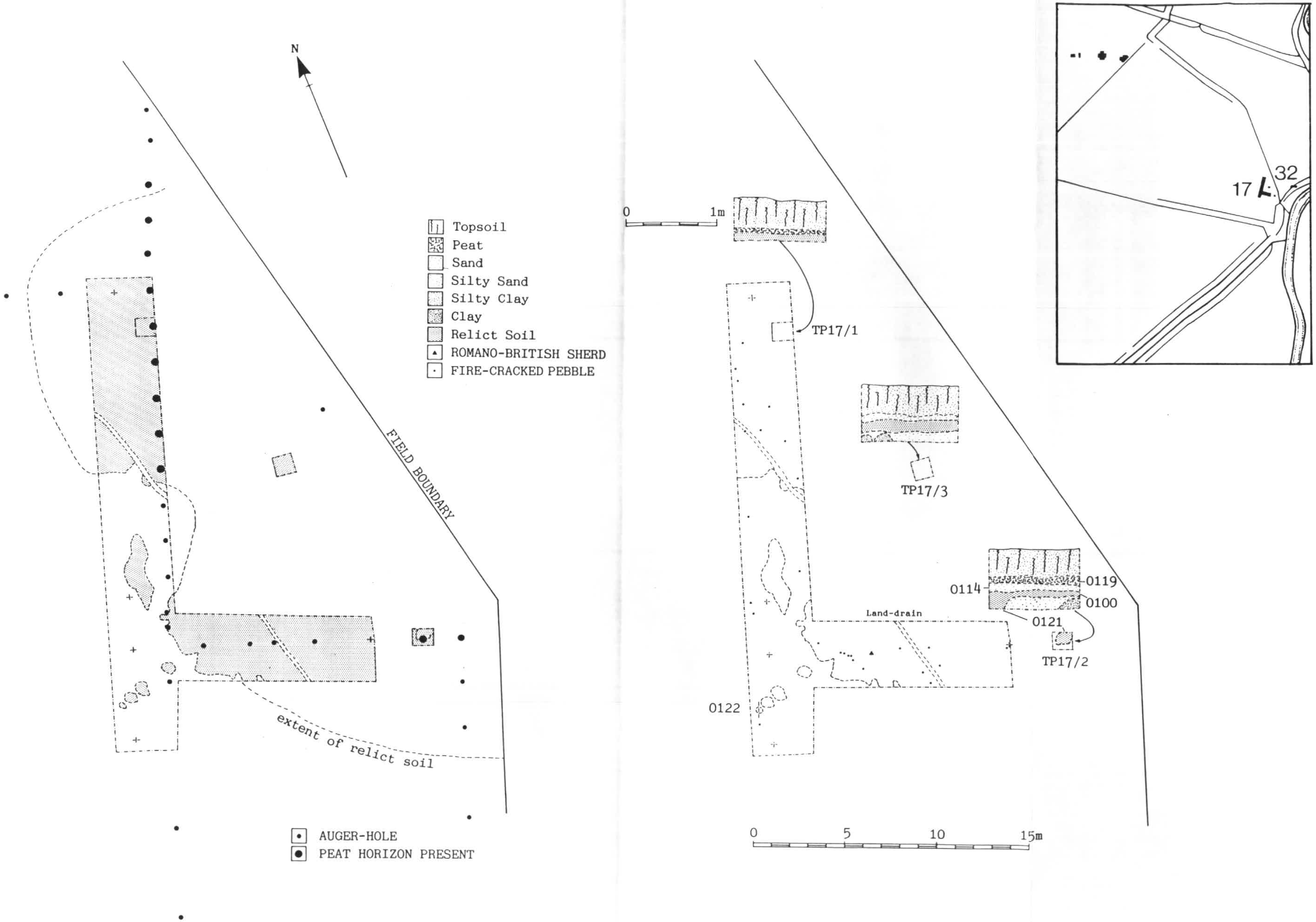

Fig. 25 The excavations in the area of the burnt stone scatter (trench 17) showing the extent of the preserved deposits and the burnt stone and artefact scatter. Scales: sections at 1:40, plans at 1:200, inset at 1:5000.

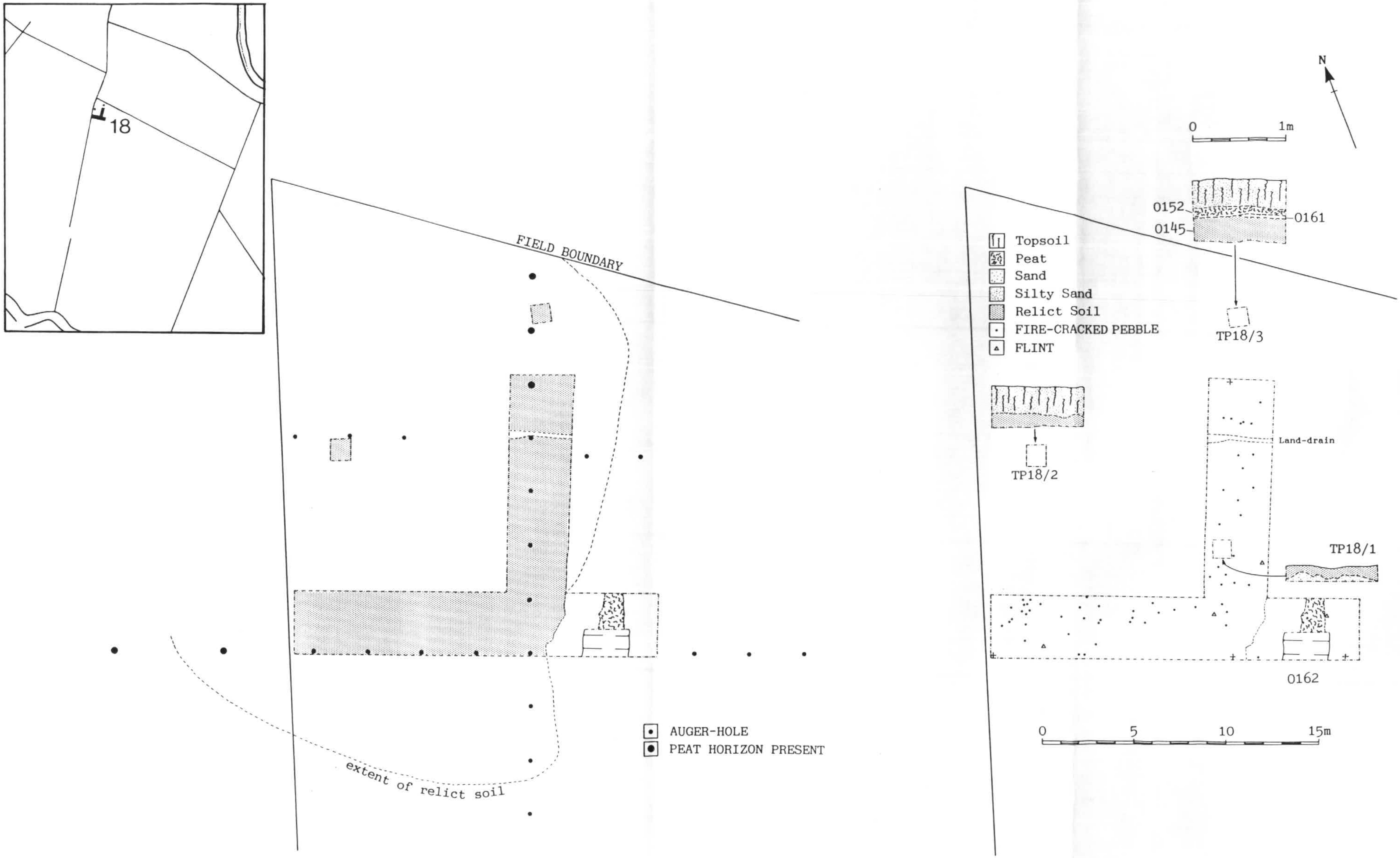

Fig. 26 The excavations in the area of the burnt stone scatter (trench 18) showing the extent of the preserved deposits and the burnt stone and artefact scatter. Scales: sections at 1:40, plans at 1:200, inset at 1:5000.

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