

The excavation of a square-ditched barrow and other cropmarks at Boysack Mills, Inverkeilor, Angus

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with contributions by P J Ashmore, M Harman, I A G Shepherd & L Thoms

ABSTRACT

This report describes the excavation in 1977 of a square-ditched barrow, probably dating from the first or second century AD, together with the damaged remains of a second square-ditched barrow, a crescentic feature (possibly the very damaged remains of a ring-ditch or ring-ditch house), and a circular enclosure, possibly of Neolithic date, measuring 18 m in diameter. A burial accompanied by a Beaker was recovered from the quarry shortly after the main excavation. Publication of the project is funded by Historic Scotland.

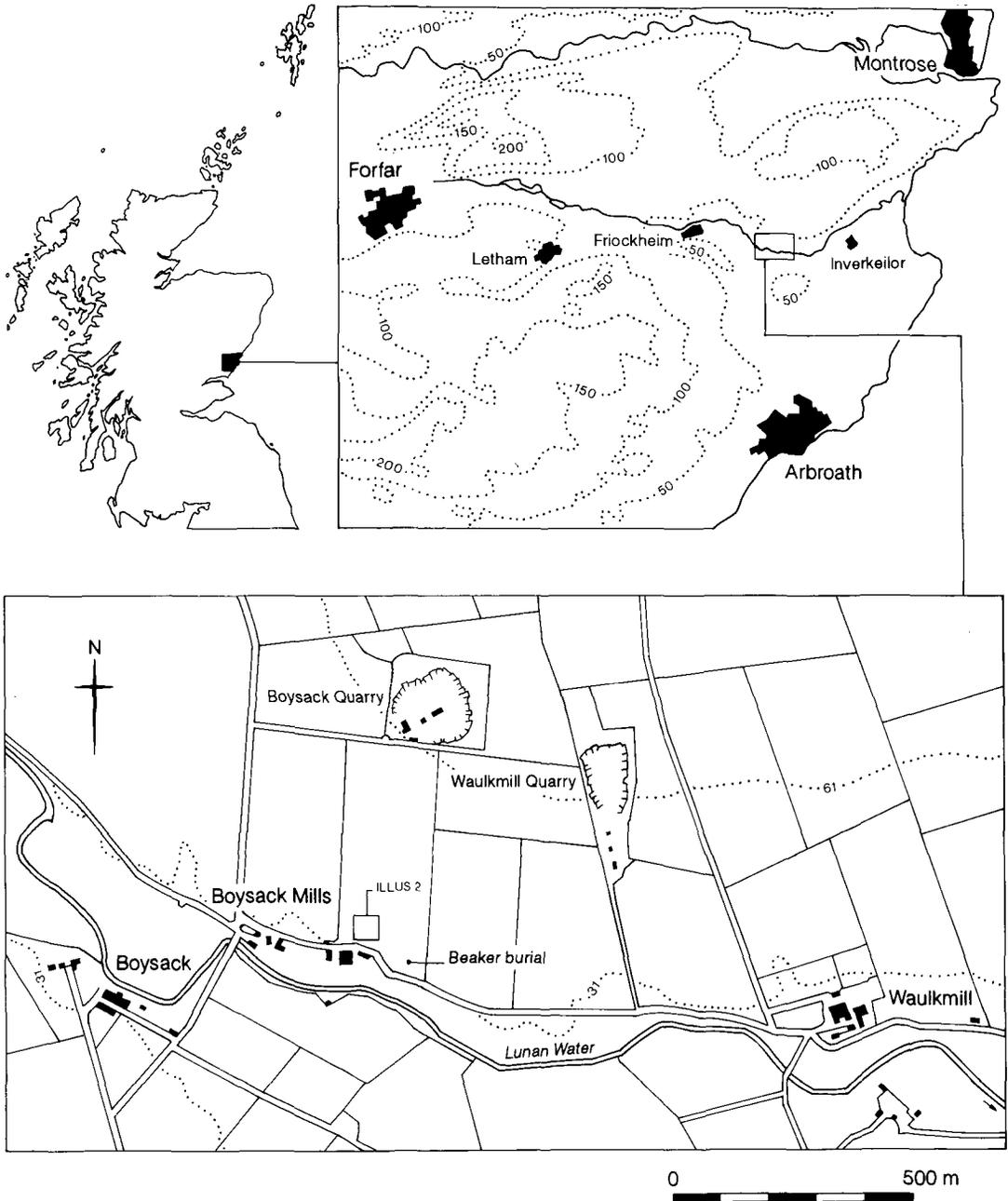
INTRODUCTION

During the exceptionally dry summer of 1976, a number of small square-ditched enclosures, a type of cropmark previously unrecognized in Scotland, were recorded as a result of aerial survey by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS). At Boysack Mills, Inverkeilor, Angus (NGR: NO 6263 4916), two of these square-ditched enclosures were discovered, together with a crescentic feature, a possible small circular enclosure, and a large circular enclosure (illus 1 & 2). In the late spring of 1977, it was observed that the area of these cropmarks had been machine-stripped, as the quarry face of a gravel extraction operation had advanced to the edge of the most distinct of the two square-ditched enclosures and had already cut across the other square-ditched enclosure and the crescentic feature (illus 3). The possible smaller circular enclosure had been destroyed. In view of the rarity and potential interest of the site, an immediate salvage excavation was mounted, funded by the Department of the Environment and with the kind co-operation of Mr Ramsay at Boysack Mills Farm and Tilcon, the quarry operators.

The excavation was executed by means of a series of brief campaigns, as other commitments allowed, between early June and August 1977. The complexity of the major internal pit within the square-ditched enclosure required detailed examination which continued after the main team had left. It was also considered desirable to examine the large circular enclosure in advance of

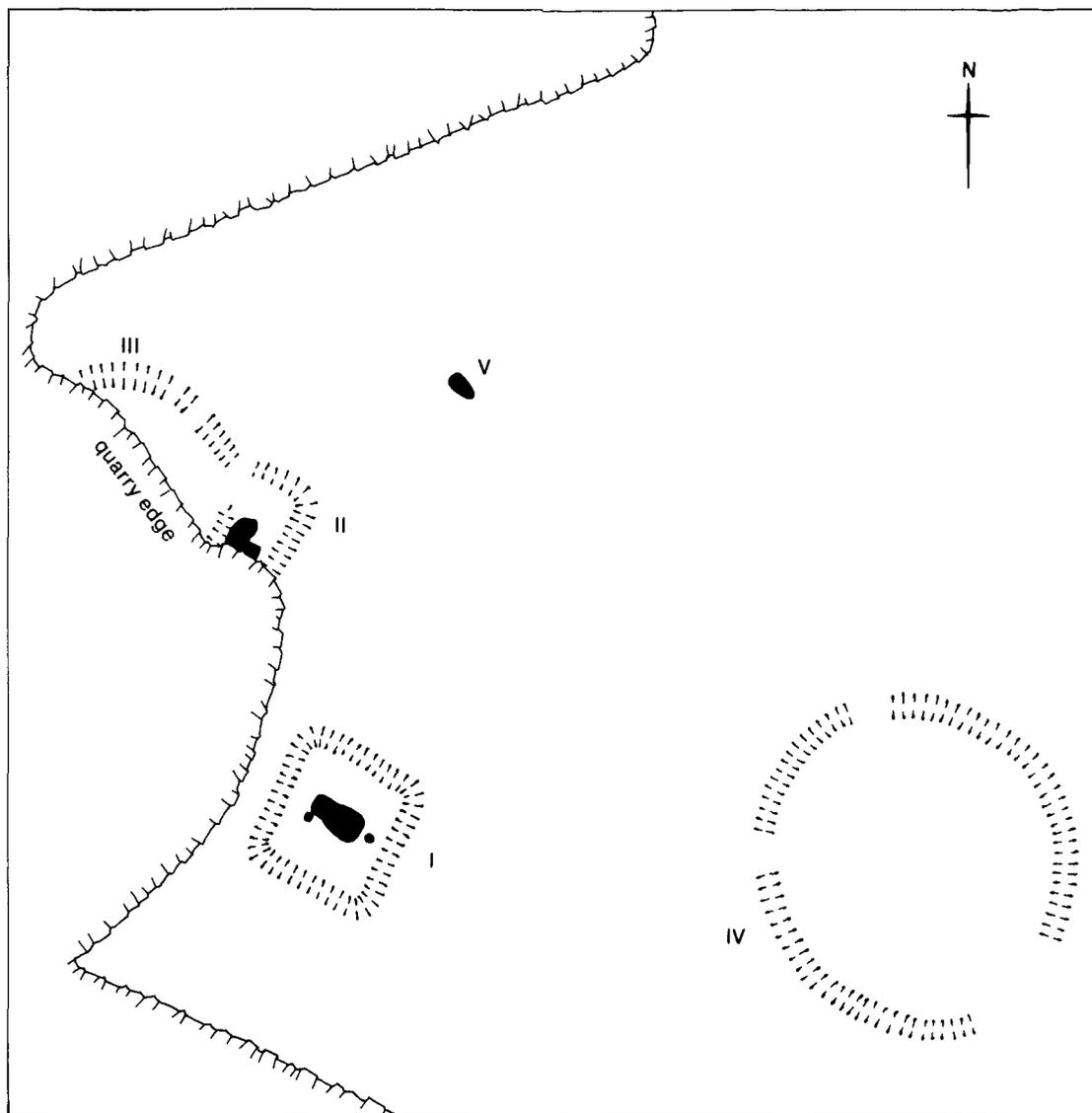
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ILLUS 1 Location map. (Based on the Ordnance Survey map © Crown copyright. RCAHMS Licence GD03127G/006/98)

quarrying and this was completed by Mr George Haggarty (IV, below). In June 1978, as gravel extraction proceeded eastwards, a Beaker burial was discovered approximately 100 m south-east of the square-ditched enclosures; this was examined by Lisbeth Thoms (Appendix 1, below).

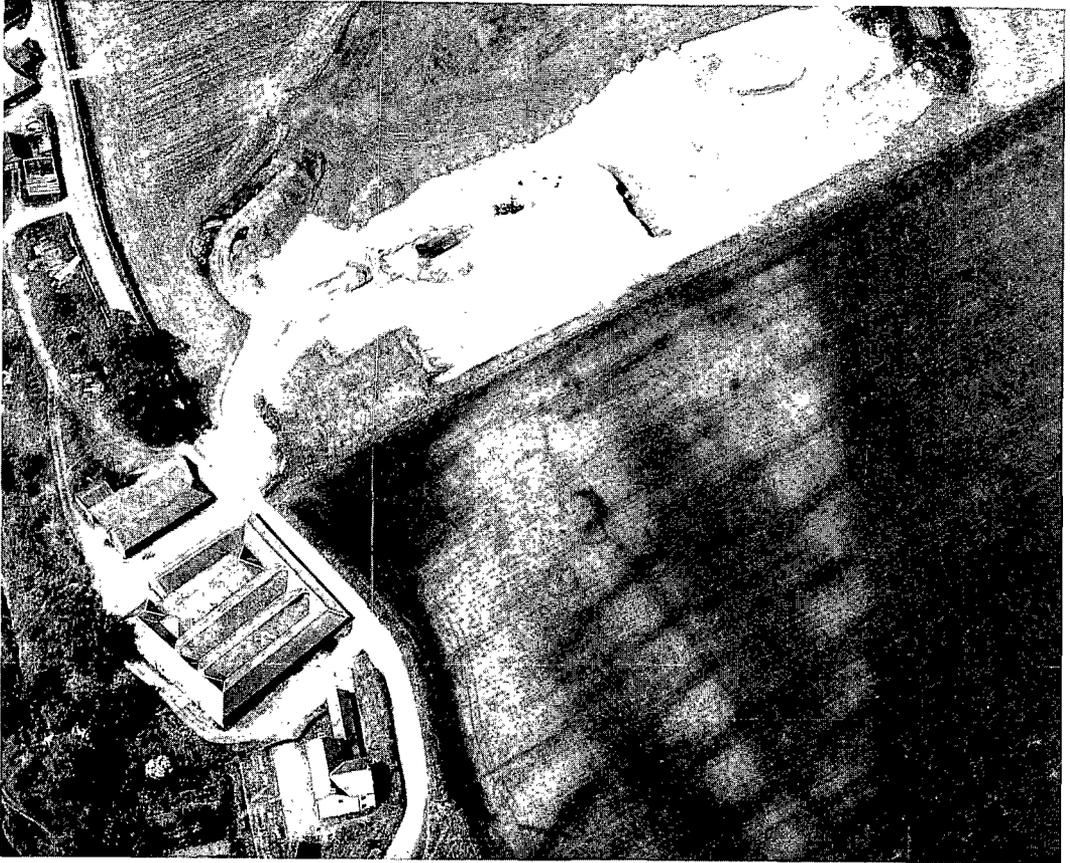


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ILLUS 2 The location of Boysack Mills sites I to V

LOCATION

The site, which has now been destroyed by quarrying, was located c 3 km east of Friockheim and c 3.5 km west of Inverkeilor at NGR: NO 6263 4916 (RCAHMS 1978, no 26). It was situated at c 30 m OD on a broad flat terrace consisting of very free-draining sands and gravel, approximately 100 m north of the Lunan Water east of its confluence with the Gighty Burn (illus 1). The gravel spreads in the immediate environs, more particularly to the west and south of the site, are prolifically marked with cropmarks of archaeological and geomorphological origin. To the north,

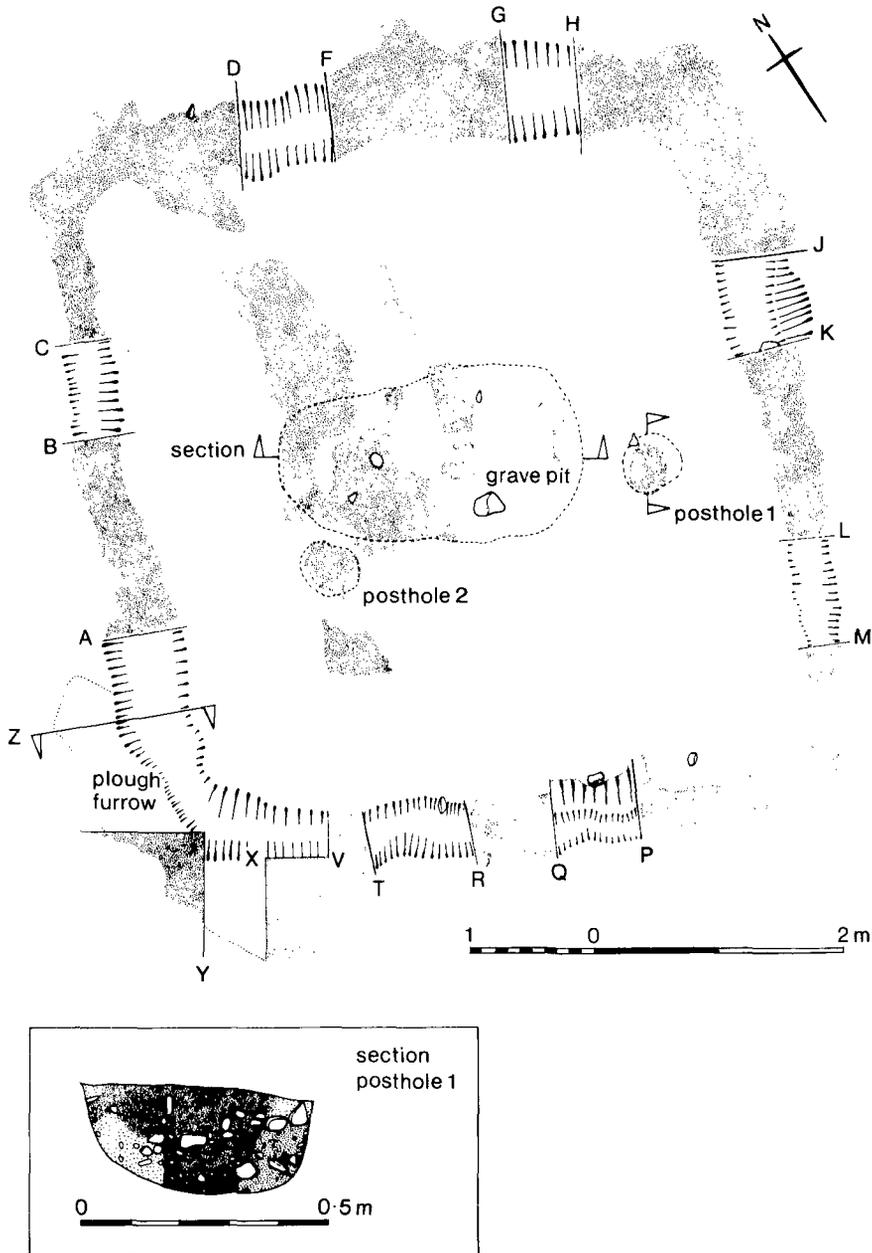


ILLUS 3 Aerial photograph of site under excavation, from east (© Crown copyright: RCAHMS, NMRS AN2817)

the ground rises to a height of over 60 m OD at Compass Hill, which is the site of an extensive whinstone quarry, some 500 m from the features discussed here. An indication of the complexity of cropmarks in the lower Lunan valley is provided in the published illustrations from the Lunan Valley Project (Pollock 1985).

EXCAVATION

The topsoil had been stripped by the quarry operators in preparation for gravel extraction (illus 3). From the exposed section left where this operation had ceased, it was estimated that the overburden of topsoil had been approximately 0.4 m deep, and that about 0.1 m of gravel surface had also been removed. Only the most easterly enclosure (IV) retained an overburden of topsoil, part of which was subsequently removed by hand, and the remainder stripped by machine under archaeological supervision. No vertical stratification survived in this ploughsoil although traces of rig-and-furrow cultivation, visible on the aerial photograph, were detected. In the area which had been machine-stripped, brushing of the gravel surface was sufficient to reveal the sharp contrast between the dark loamy fill of the features and the natural terrace deposit. Although a wide area was examined, no features additional to those apparent on the aerial photograph were



ILLUS 4 Boysack Mills I: square-ditched enclosure

detected, except a shallow pit (V), 1.1 m by 0.81 m and 0.2 m deep (illus 2). The fragmentary square-ditched enclosure (II) and the crescentic ditch (III) overlapped, but the damage sustained by these features from the combined effects of quarrying and stripping prevented clarification of their relationship. Fortunately, the other square-ditched enclosure (I) had remained intact, although, at the time of excavation, it lay adjacent to the quarry edge.

THE SQUARE-DITCHED ENCLOSURE (I)

The feature was defined as a roughly square enclosure measuring 5.6 m east/west, and 6.0 m north/south, marked by an uninterrupted ditch between 0.3 m and 0.9 m in width at its surface (illus 4). On excavation this was demonstrated to survive to between 0.2 m and 0.45 m in depth. The upper fill of the ditch consisted of a loamy deposit, but the lower fill was of redeposited gravel. Iron panning was noted in the bottom and around the sides of the ditch sections. The profile of the ditch varied around its circuit, reflecting differential patterns of weathering and preservation. Signs attributable to weathering were noted in some of the ditch fills; on the south side, the surviving sections had a U-shaped profile, probably as a result of truncation by ploughing or topsoil stripping (illus 5 & 6). The deep cut profiles of sections G and H and the even fill in this sector, suggesting deliberate infilling, may indicate that some form of fence was intended, although no trace of posts, nor of a bank was discovered. Investigation at the south-west corner of the enclosure revealed that the ditch had been truncated by a plough furrow which was part of the ridged cultivation recorded on the aerial photograph and noted in excavation elsewhere on the site.

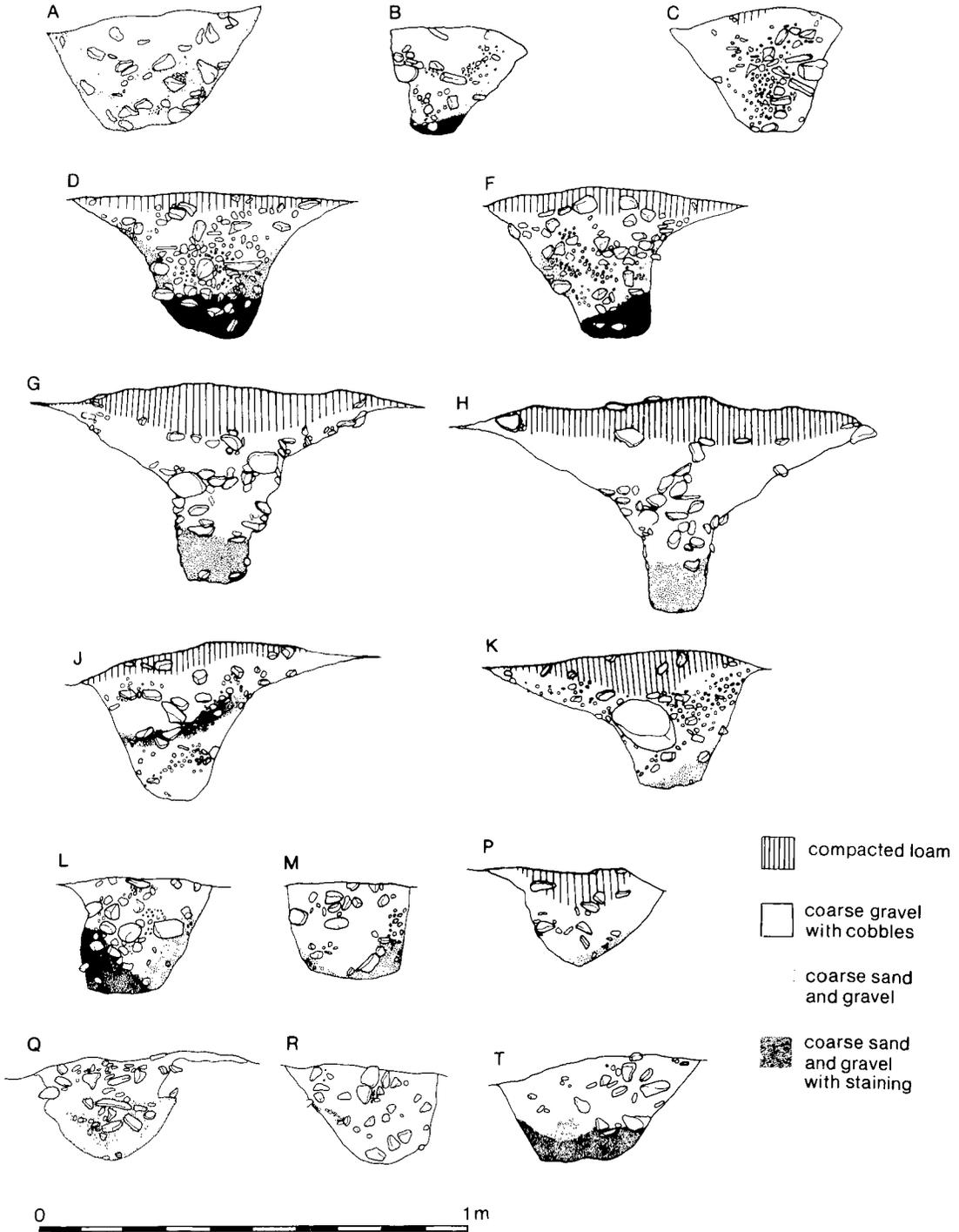
Deposits of loamy soil, remaining to 50 mm in depth, capped some areas of the gravel within the area defined by the ditch in the vicinity of the grave. No other deposit of this kind was noted elsewhere in the area stripped by machine, and it is likely that this represents the remains of a barrow due to disturbance of the old ground surface below the level of the surrounding topsoil. The loam that so clearly defined the grave and the surrounding ditch would have survived as it became incorporated into the top of these features when the fills settled within them. They would therefore be below the topsoil level stripped by machine.

As first revealed, the grave pit lay in the centre of the enclosure and was orientated roughly east/west, measuring 2.5 m in length by between 1.2 m in width at the west end to 1.45 m at the east end. A post-hole, 0.25 m deep, containing the remains of a substantial post 0.15 m in diameter that had rotted *in situ*, was situated to the east of the grave. A second feature to the south-west may also have contained a post. In spite of wet-sieving the contents, neither feature produced sufficient charcoal for radiocarbon dating and they can be related to the grave only by proximity.

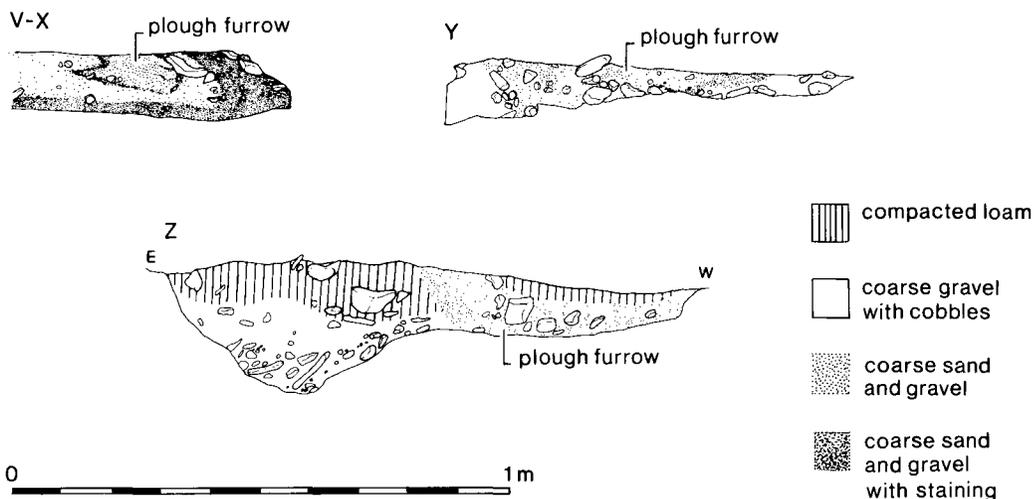
There were no indications of any further post positions so that a roofed structure may be discounted. The post at the south-west end of the grave could have been a grave marker but it is also possible that the posts may have been part of some kind of lifting gear used to manoeuvre the large stones found within the grave.

The grave itself was 1.5 m deep, the sides remaining vertical in the compacted gravel. At the bottom, a body had been laid in a wooden coffin with a lid, the sides and ends of which had collapsed inwards. The wood had entirely disintegrated, leaving only a very thin stain no more than 10 mm in thickness, but the patterning of the wood grain could still be seen intermittently in the stained gravel (illus 7 & 8). No skeletal material remained apart from a small fragment of the skull which had the consistency of clay, and a faint shadow of the skeleton could be defined by stained gravel.

The body appeared to have been extended, laid full length on its back, or possibly with its lower half on its side, in the coffin, with the head to the south-east and at least one leg slightly bent with the knee pointing south. A badly corroded ring-headed iron pin lay in the position where the left shoulder would have been (illus 9). This is a typical projecting ring-headed pin. Clarke (1971, 28–32, fig 4 & Appendix III) has mapped the distribution of the type in Scotland (both bronze and iron examples are known) and has discussed the problem of its date and origin. Few have been recovered from datable contexts, and Close-Brooks (1984, 94) rehearsed the



ILLUS 5 Boysack Mills I: sections of the ditch



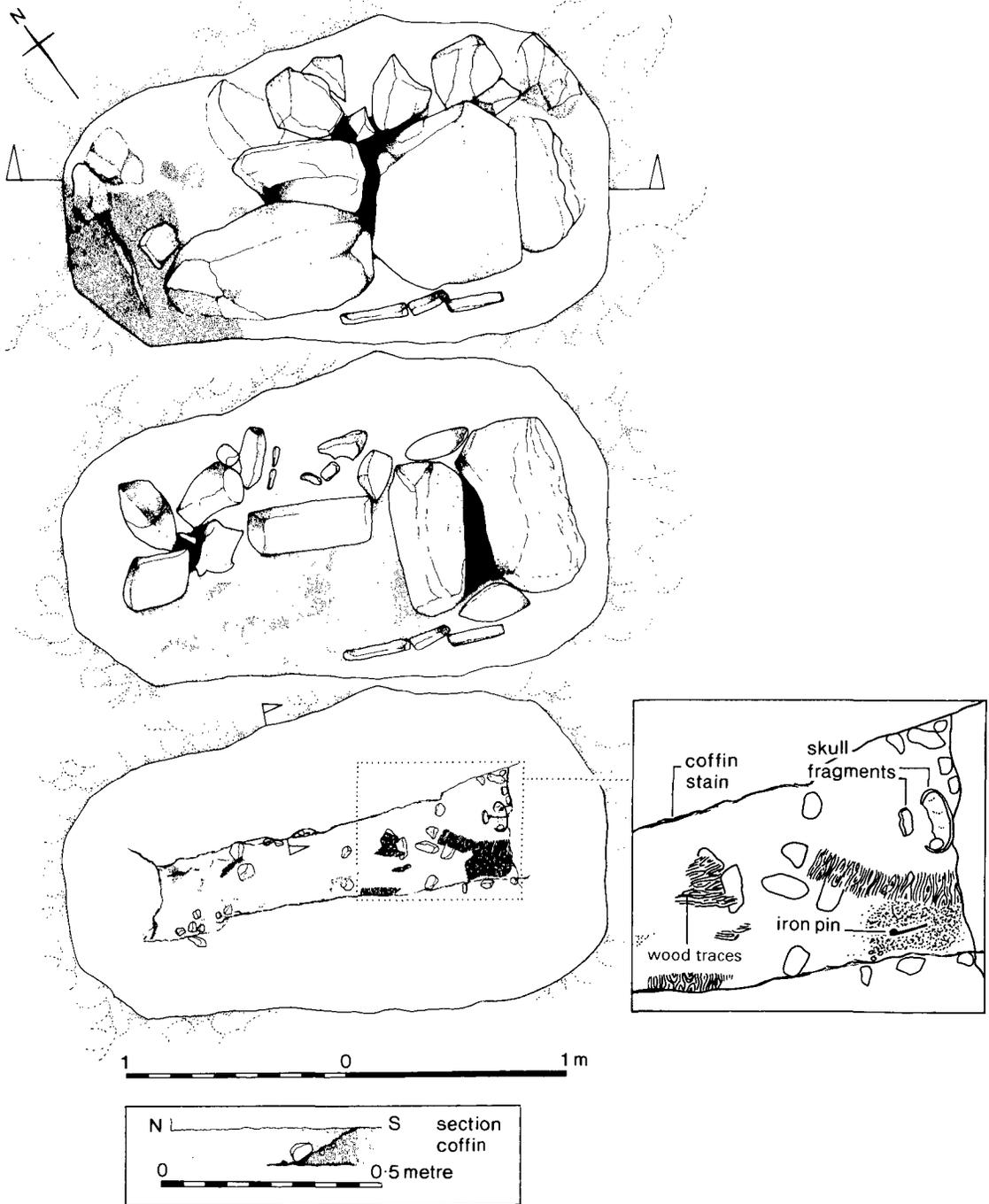
ILLUS 6 Boysack Mills I: sections of the ditch

evidence from Traprain Law (East Lothian) and the Moredun burial (Edinburgh) for preferring a date in the first, second or possibly third century AD. Since then, some further dating evidence has become available: at Crosskirk, Caithness, ring-headed pins are represented by that site's Period Three, radiocarbon dated to the late first millennium BC (Fairhurst 1984, 117 & 165). In contrast, moulds for the type from Gurness, Orkney, have been ascribed to the later second to fourth centuries AD (Close-Brooks 1987, 303). Most recently, reviewing the evidence for dating in the Atlantic Province, Armit (1991, 200) has expressed reservations about the chronological significance of native metalwork in general and projecting ring-headed pins in particular.

The body was probably clothed as there are indistinct, but undoubted traces of fabric preserved by the corrosion on the pin. On the back of the pin, the fabric is in two layers up the shank and on the front there is certainly one layer, and possibly two, both on the shank and over the projecting head. The threads lie slantwise to the pin shank. The cloth appears to have been a plain weave of unfelted threads, about eight per centimetre, but there is insufficient evidence to say whether it was wool or linen.

There was no charcoal in the vicinity of the coffin and insufficient remains of the skull to allow a conventional radiocarbon date. The grave had been backfilled with gravel and, at a depth of approximately 0.8 m, two layers of large stones had been inserted (illus 7 & 10). The smaller of these had been set on edge and the larger boulders, which were removed only with some difficulty, were located in the centre of the grave. The uppermost 0.4 m of the fill was of sand and gravel but also contained turves, clearly visible in section. The natural gravel was very compacted and there were no signs of open weathering so that the vertical edge of the grave had retained its original shape. Iron panning was visible around the sides and base of the grave. Loam had fallen in between the sides of the grave and the gravel fill, to a depth of about 0.2 m, perhaps as the fill and stones settled in the centre, and clearly delimited the grave edge.

Positioned transversely across the centre of the grave was a dark deposit containing charcoal from brushwood of several species, including birch, hazel, oak and willow. This was traced in an irregular column from the surface down to the layers of large stones, penetrating amongst and underneath them to a depth of 0.5 m (illus 11 & 12). The deposit varied in shape but measured approximately 0.8 m by 0.3 m. Charcoal was collected from this deposit from



ILLUS 7 Boysack Mills I: plans of grave pit at c 0.5 m below machined surface (top), 1 m below surface (middle) and 1.5 m below surface (bottom)



ILLUS 8 Boysack Mills I: the grave pit, showing the outline of the coffin

underneath the first stone layer at a depth of 0.5 m and produced two dates of 930 ± 105 BP (GU-1301) and 720 ± 90 BP (GU-1514).

Although it is not possible to dismiss the incorporation of this charcoal at the time of construction, a more likely explanation for this deposit is that it marks the position of an upright stone, serving as a grave marker and held in position by the large stones in the grave. The charcoal may have come from a fire, lit to crack the stone prior to its removal, the charcoal trickling down into the hole as the stone was extracted, thereby giving a date of destruction rather than erection. If an upright stone had existed, it is likely to have been removed some time before the fields were rigged. cursory examination of the locality revealed no obvious surviving candidate for a removed stone.

THE SQUARE-DITCHED ENCLOSURE (II) & THE CRESCENTIC FEATURE (III)

A square-ditched enclosure overlapped the crescentic feature (illus 2, 13 & 14). Their point of intersection was badly eroded by the quarry edge and the topsoil stripping. It was also at a point



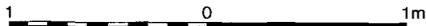
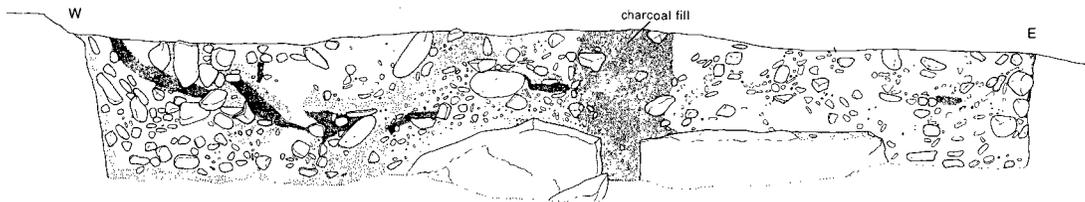
ILLUS 9 X-radiograph of the ring-headed pin. (*Copyright: Trustees of the National Museums of Scotland*)



ILLUS 10 Boysack Mills I: the grave pit under excavation, showing the massive stone fill



ILLUS 11 Boysack Mills I: the upper part of the fill of the grave pit

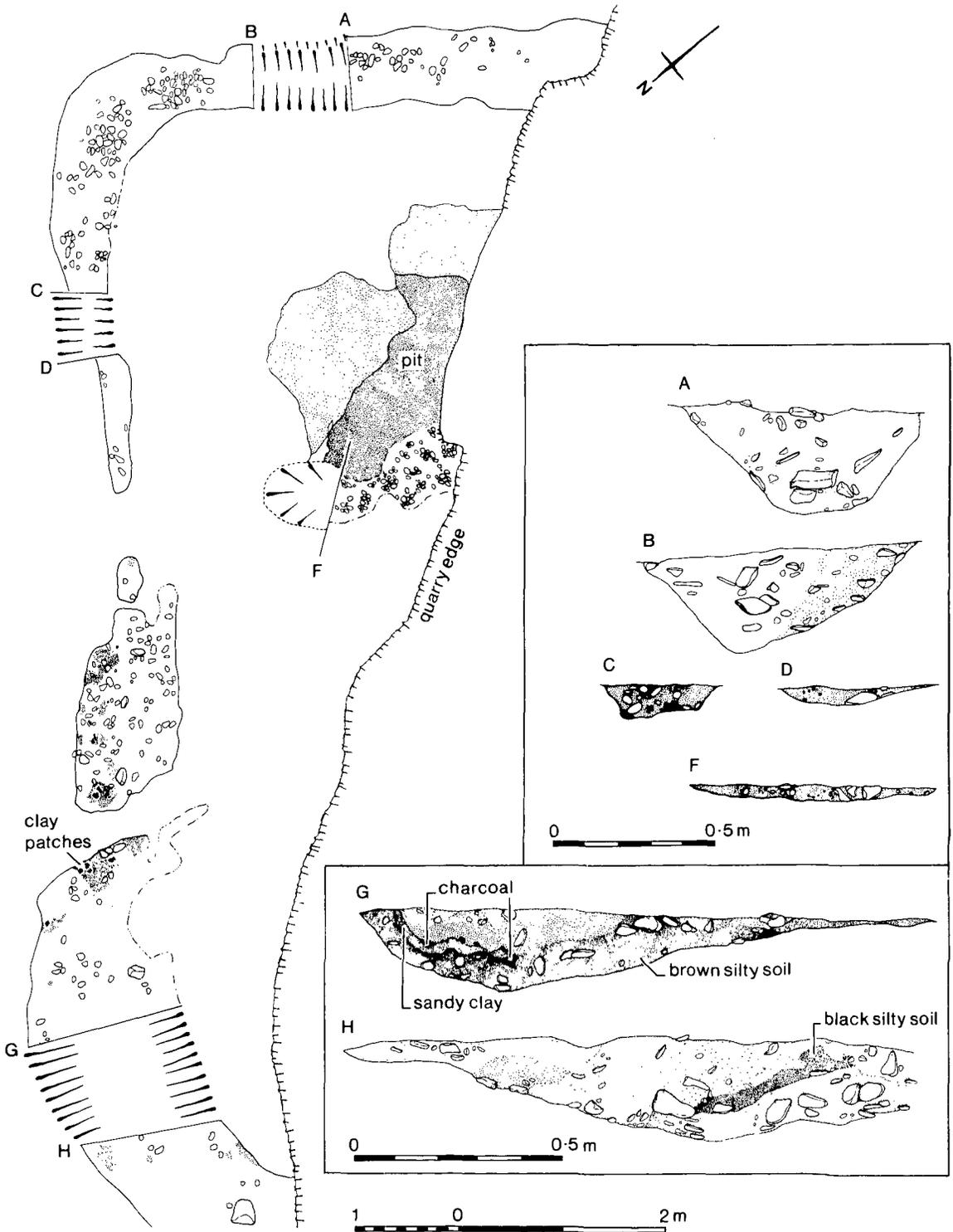


ILLUS 12 Boysack Mills I: cross-section of the upper part of the fill of the grave pit

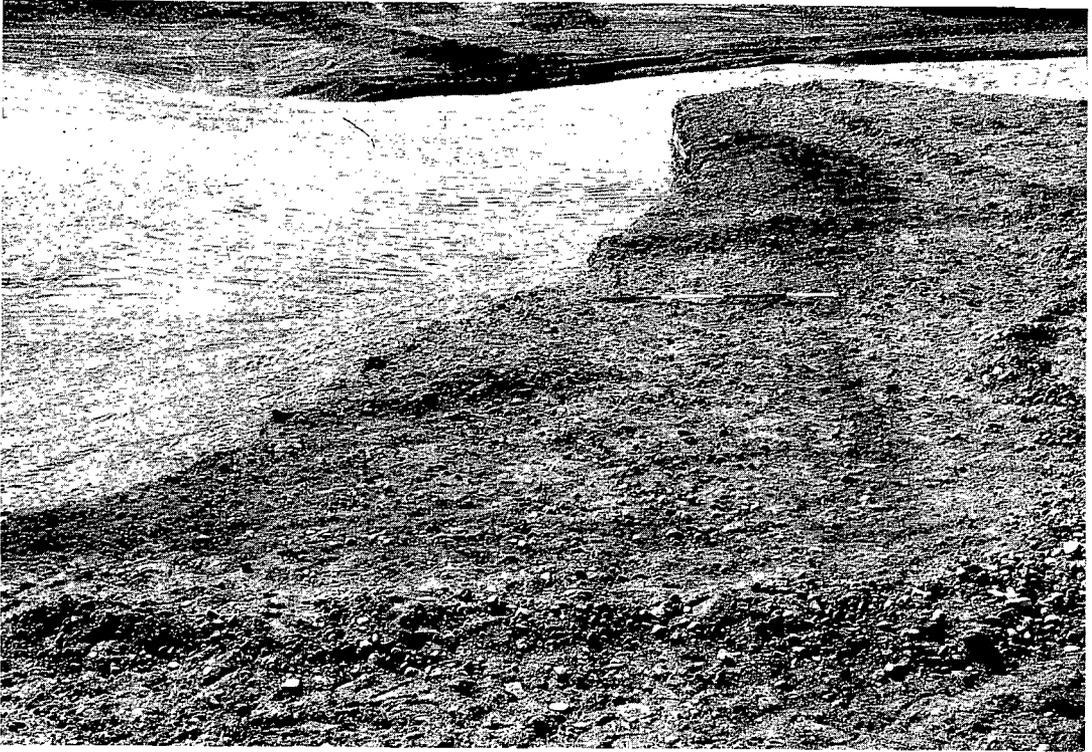
where a furrow of the later ridged cultivation cut across the features. There was less than 0.1 m of deposit left at this junction and no clear stratigraphical relationship could be established between the pre-furrow archaeological features.

The square-ditched enclosure (II)

Three sides of a square enclosure with an apparently continuous ditch were revealed. The north side was at least 4.4 m in length, although it was unclear at the north-west corner where it coincided with the crescentic feature. The remaining two sides were both cut by the quarry edge. The ditch measured up to 0.7 m in width and survived to a maximum depth of 0.45 m. A shallow



ILLUS 13 Boysack Mills II/III



ILLUS 14 Boysack Mills II/III before excavation

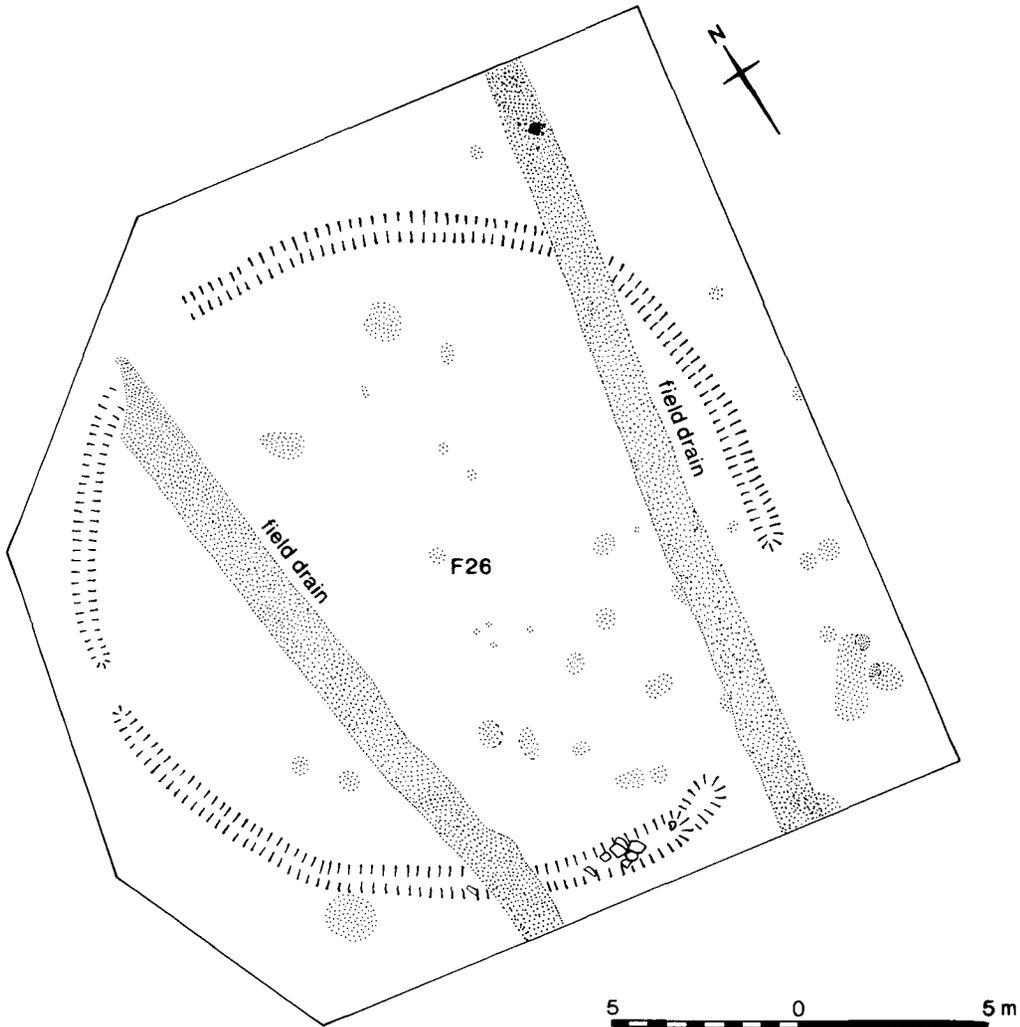
pit within the area defined by the ditch could be seen in section in the quarry face. This was examined but proved to be of amorphous shape and only 0.4 m deep. The full extent of this square-ditched enclosure cannot be defined clearly on the aerial photograph and it may have been seriously damaged by the ridged cultivation prior to quarrying activities. While the shallow pit may have been the remains of a grave, there was no evidence of a burial and no indication that there had ever been a deep grave pit similar to the neighbouring example (I) described above.

A sample of charcoal was taken from the shallow pit and was found to consist of mixed brushwood species, including birch, hazel and willow. A radiocarbon date of 2085 ± 115 BP (GU-1256) was obtained. No artefactual material was recovered.

The crescentic feature (III)

The crescentic feature proved to be a shallow asymmetrical ditch with a steeper profile on the outer edge, rising more gently on the inside of the crescent. It was filled with a dark loamy deposit containing charcoal fragments with patches of yellow clay and measured 2.5 m wide, surviving to a depth of only 0.15 m. On plan, the full extent of the ditch was impossible to determine as it had been seriously eroded by the quarrying activities and no features survived within the area defined by the ditch.

Although extremely degraded, these remains may represent a ring-ditch house, of the kind examined elsewhere in the Lunan catchment at Douglasmuir, where the ditch profiles displayed very similar characteristics (Kendrick 1995), and at Ironshill, Inverkeilor, where one house of



ILLUS 15 Boysack Mills IV

this type was encountered in excavations which also uncovered other later prehistoric structures (Pollock, this vol). Both these sites also produced evidence of four- or six-post settings, not encountered in the excavations at Boysack Mills. Nearer Friockheim, at Hatton Mill Farm, excavations by Tim Neighbour produced a further possible example of the ring-ditch house (CFA 1993, 95–6, fig. 41).

THE CIRCULAR ENCLOSURE (IV)

The circular enclosure measured 18 m in diameter, and was defined by a ditch which survived to between 0.06 m and 0.25 m in depth, and 0.6 m in width (illus 2, 15 & 16). The site had been eroded by plough damage and was cut by 19th-century field drains. The internal features showed no consistent pattern and their fills were mainly indeterminate only one (F26) showing any signs of having held an upright timber.



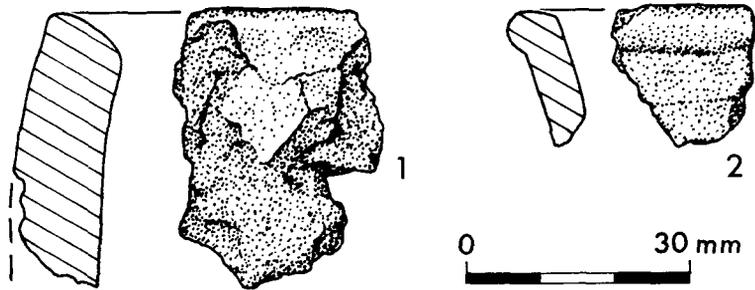
ILLUS 16 Boysack Mills IV under excavation

The enclosure had two entrances, one on the west measuring 1 m in width with narrowing ditch terminals and one on the south-east, 6 m wide, with rounded terminals, one of which had been recut. The ditch appeared to have been constructed in sections, as there were straight stretches around its circuit.

A sample of charcoal was taken from the middle layer of the ditch fill of the enclosure and produced a date of 2470 ± 80 BP (GU-1034). Two rim sherds of Neolithic pottery, eight sherds of indeterminate prehistoric pottery and a flint flake were found in the fill of the ditch. Two other flakes of local orange flint were found in the top of the gravel. It is likely that all of these artefacts should be regarded as redeposited, although, on typological grounds, the enclosure would not be out of place in the Neolithic ring-ditch tradition.

The pottery

- 1 Rim sherd of soft, disintegrating ware, 13 mm thick; the top of the rim is flattened. From a pot with a curved wall; the angle of the rim uncertain. (0.7 m from north butt end of ditch, 0.15 m deep) (illus 17.1).
- 2 Rim sherd of bowl; the rim flattened on top, beaded on the outside; the angle uncertain. Brown fairly fine ware with stone grit, 5 mm thick. (0.8 m from south butt of ditch, 0.15 m deep) (illus 17.2).
- 3 Body sherd of light brown ware sooted inside, 5 mm thick. Possibly from same pot as 2. (0.8 m from south butt of ditch, 0.15 m deep).



ILLUS 17 Boysack Mills IV: the pottery

- 4 Six body sherds of light brown ware with some large stone grits, up to 10 mm thick, not certainly all from the same pot. (0.8 m from south butt of ditch, 0.15 m deep).
- 5 One small body sherd similar to 4 and a degraded fragment (from south ditch).

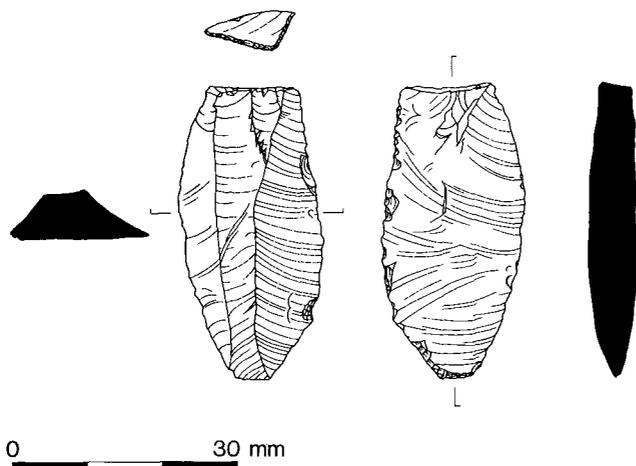
No 1 belongs to the group of pottery generally called 'Flat Rim Wares', which has been discussed by Coles & Taylor (1970), Hedges (1975, 69; with an inventory at Appendix 9, 92–3) and Halliday (1985, 243–5). The term itself is generally acknowledged to be inadequate as these series of coarse wares display a wide range of rim forms, including pointed, round and flat examples. One of the sherds from the earliest Scottish context to bear close scrutiny (Hedges 1975, 69), at Croft Moraig, Perth & Kinross, was found in association with Western Neolithic pottery (Piggott & Simpson 1971, pl 4 & 6), and is similar in shape to that from Boysack. The bulk of the flat rim wares are later in date, however, such as that from the midden in the Culbin Sands, Moray, which produced a single radiocarbon date of (Q-990) 3209 ± 70 BP, securely within the second millennium BC (Coles & Taylor 1970).

The single sherd from Boysack, however, lacks any of the traits employed by Halliday (1985, 245) to subdivide pottery of the second to early first millennium BC found on the eastern mainland of Scotland. There is no direct contextual evidence for the date of this Boysack sherd, and in the present state of knowledge it would seem unwise to go beyond proposing the second millennium BC as perhaps marginally more likely than the preceding or succeeding spans.

No 2 is a rim sherd from a Neolithic bowl of rather smaller size than most, and not burnished. It clearly belongs to the family of Western Neolithic pottery, and is the first such sherd to be found in Angus. Neolithic pottery from Angus is otherwise restricted to the finds from Douglasmuir, approximately 1 km to the southwest, across the Lunan Water (Kendrick 1995; Kinnes 1985; Cowie 1992, Table 20.1). There, three shallow pits, set amongst others attributed to the ring-ditch house settlement, produced earlier ceramics: one produced Beaker sherds, a second undecorated material, and a third fragments of a Neolithic carinated bowl with vertical incised lines.

The Boysack Mills rim may have belonged to a simple hemispherical pot similar to fragments from Tulloch of Assery B, Caithness (Henshall 1972, 310, no 10, 557) or Calf of Eday Long (Henshall 1963, 249, nos 18, 24, 190–1) and Unstan, Orkney (Henshall 1963, 253, no 28, 242). If, on the other hand, the sherd is from an open carinated bowl, parallels for the beading can be found on several sherds from Easterton of Roseisle, Moray, the closest parallels perhaps being two sherds in the National Museum (L. 1960 58, 59).

Nos 3–5 could be of almost any date from Neolithic to pre-Roman Iron age. The whole group may simply be rubbish surviving in the ditch fill. Cowie (1993, 24) has subsequently commented that he would be content to assign a Neolithic date to the whole assemblage.



ILLUS 18 Boysack Mills IV: flint flake

Further finds have subsequently been reported from the Boysack Mills sand and gravel quarry. The year after the excavations described here, a short cist was identified in the quarry face at NGR: NO 628 491 (Thoms — Appendix 1, below). Subsequently, a number of pits were examined in an area prepared for gravel quarrying at NGR: NO 6295 4905; one of these produced a thumb-nail scraper and an unworked flake of flint (Sherriff 1981, 45).

The flint

The illustrated flint (illus 18) is an inner flake, orange in colour, measuring 40 mm by 17 mm by 6 mm. It is damaged along the left edge and its platform has been trimmed.

RADIOCARBON DATES

Patrick J Ashmore

Four radiocarbon dates were obtained from samples from three contexts (Table 1). All calibrations are from CALIB 3.03 (Stuiver & Reimer 1993). Calibrated figures have been rounded to the nearest five years.

All the dates are significantly different from each other except GU-1301 and GU-1514 (illus 19). If all the brushwood used to obtain GU-1301 and GU-1514 is of practically identical true date it is legitimate to take the weighted mean of the two measured dates. The weighted mean is 810 ± 70 BP. This calibrates to between cal AD 1035 and 1299. On the whole, it is most likely that the brushwood from which this date derives was cut or died in the second half of the eleventh, or in the twelfth century or in the thirteenth century AD.

DISCUSSION

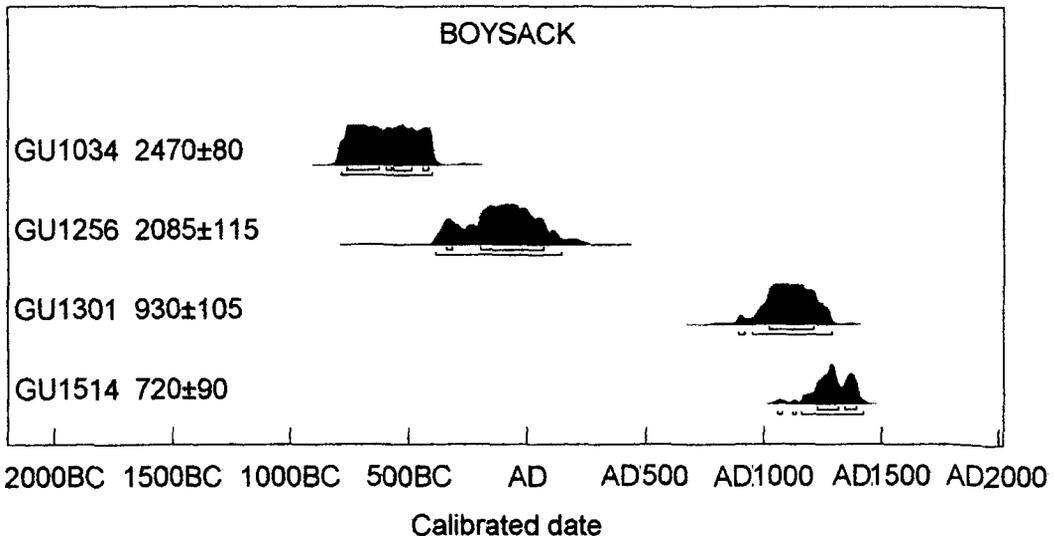
SQUARE-DITCHED BARROWS IN SCOTLAND

Square-ditched 'barrows' were first recognized as cropmarks in Scotland by Gordon Maxwell in 1976 in Angus (eg RCAHMS 1978). Since then, many examples have been added to the catalogue, but still little is known of their origin and function.

TABLE 1
Radiocarbon dates

Laboratory Code	Context	Yrs BP	Calibrated date, two sigma, (95.4% probability)
GU-1034	Circular enclosure: unidentified charcoal from middle layer of ditch; note the Neolithic and later prehistoric artefacts in the ditch imply the possibility of old, or mixed old and contemporary, charcoal, while the lack of identification of the species and morphology of the carbonized wood allows the possibility that the wood came from the heart of an old tree. This date can be used only to show it is likely that the middle layers of the ditch filled up some time after 785 cal BC.	2470 ± 80	785–400 BC
GU-1256	Square enclosure II: mixed species brushwood, including birch, hazel and willow from shallow pit. Since there is no obvious reason why the brushwood should have been incorporated purposefully in the shallow pit, it should be treated as material incorporated accidentally which may be older than digging of the pit. This date can be used only to show it is likely that the pit was dug some time after 390 cal BC.	2085 ± 115	390 BC–AD 135
GU-1301	Square enclosure 1: mixed brushwood species including birch, hazel, willow and oak in dark deposit in top of grave. Same context as GU-1514. This may date the removal of a stone rather than its erection.	930 ± 105	AD 900–1285
GU-1514	Square enclosure 1: mixed species brushwood including birch, hazel, willow and oak in dark deposit in top of grave. Same context as GU-1301. Again, this may date the removal of a stone rather than its erection.	720 ± 90	AD 1070–1420

M. Stuiver, A. Long and R.S. Kra eds. 1993 Radiocarbon 35(1); OxCal v2.0 cub r.4 sd:12 prob[chron]



ILLUS 19 Probability plots for the Boysack Mills dates

Cropmark examples in Scotland now extend from Inverness-shire to Fife and Kinross: a first distribution map was published in 1983 (Maxwell 1983, fig 25). Examples are clustered on free-draining sands and gravels, and are frequently to be found on river terraces. A northern distribution extends from Inverness-shire east along the coastal lowlands to the south of the Moray Firth (eg Shepherd 1993, fig 4.2) as far as Hills of Boyndlie near Banff, close to the lower river Deveron (Ralston & Inglis 1984, 18). To the south, the river valleys debouching into the North Sea seem to be devoid of clear instances, until those in Angus are reached, where there is a significant concentration.

The cropmarks are most easily recognized when they lie in groups and most occur alongside round barrows, ring-ditches, circular enclosures and pits. In some of the groups, the square ditches appear to be touching or conjoined in a 'frogspawn'-like arrangement as at Inverighty Cottage, Angus, less than 1 km north-west of Boysack Mills. Most display evidence of a central grave pit and this is frequently orientated east/west. In some cases the distinction between round and square barrows can be deceptive as the ditches appear to be bowed.

Square ditches surrounding burials are also known from upstanding remains in Scotland such as those in Inverness-shire at Garbeg (NGR: NH 511 322) and Whitebridge (NGR: NH 492 171) where the ditches surround low central cairns and earth mounds, and have external banks (Stevenson 1984). Excavations at Garbeg (Wedderburn & Grime 1984) demonstrated that the cairns covered extended burials in grave pits with crude stone linings, though none was similar to the deep burial at Boysack Mills. A Pictish symbol stone was found in an adjacent round cairn. These excavations prompted Joanna Close-Brooks (1984) to suggest similarities with 'platform cairns' of Dark Age date, some of which have Pictish associations. The cropmark examples display enough similarity with the upstanding remains to suppose that the central graves, including that at Boysack Mills, where the evidence is suggestive but inconclusive, may also have been covered by a low cairn or barrow, or by a small central mound.

At Boysack Mills, the square-plan ditch was continuous. Many cropmark examples are of this kind, but there is also a significant number in which causeways cut across the ditches. In such cases, the causeway may cut across one side of the ditch giving the appearance of an entrance, but they also occur across one or more corners of the square-ditch giving a particularly diagnostic characteristic to the sites. This phenomenon is most commonly observed in the northern examples, but it is also known in Angus and Fife (Murray 1991). The causeways may cut one, two, three or all four corners. Large stones were found strategically placed in the causewayed corners in the excavation of the cairns at Garbeg (Wedderburn & Grime 1984) and attention has been drawn to stone posts placed at the corners of some of the platform cairns, as at Ackergill, Caithness (Close-Brooks 1984).

Square-ditched barrows are commonly 4–6 m in dimension, and Boysack Mills falls comfortably within this range, although a few are up to 14 m across. A few still larger enclosures are known which may be related to this series of monuments, including Kinchyle, Nairn (Maxwell 1983, fig 28), a possible site at Inverighty Cottage, Angus (NGR: NO 620 495) and the enclosure at Melville Home Farm, Fife (NGR: NO 292 132), some 20 m in diameter with causewayed corners. At this last site, part of what may be a circular enclosure is also visible on aerial photographs, adjacent to a standing stone bearing a figure of a Pictish warrior complete with rectangular shield and spear (Murray 1991, 38).

Of all the sites discovered by aerial photography only two have been excavated: Boysack Mills and an example at Balneaves Cottages, Angus (NGR: NO 605 497). Here, a ring-ditch, showing as a cropmark in the same field, produced a Bronze Age cremation cemetery, but no

trace was found of the square-ditched barrow which had either been completely destroyed by the plough or had been a freak cropmark (Russell-White *et al* 1992).

The dating evidence from the burial at Boysack Mills I is to some extent unsatisfactory. The radiocarbon dates cannot be used to date the burial itself, as they are equally likely to relate to a later disturbance whether or not the hypothesis of a stone grave marker is correct. Dating, therefore, rests with the projecting ring-headed pin which places the burial most likely in the first or second century AD. This interpretation clearly poses problems for attempts to identify a unitary funerary tradition by assimilating the cropmark evidence for square-ditched graves with that from excavations at Garbeg and platform cairns elsewhere (Maxwell 1987; Ashmore 1980). The concentrated distribution of these series within Scotland north of the Forth/Clyde isthmus, and their substantial coincidence with distributions of place-names and symbol stones predominantly in eastern sectors of the country, has fuelled the proposition that these graves are Pictish. If the proposed date for the pin is accepted, however, the inhumation at Boysack Mills I would have taken place before the historical emergence of the Picts. Without further evidence, therefore, it is difficult to be conclusive about the relationship of Boysack Mills to other cropmark examples, particularly the series with causewayed ditches, and also difficult to confirm the tenuous relationship with the upstanding examples. No other example of a grave pit exhibiting the features discovered at Boysack Mills I has been found in Scotland, either unenclosed or within a square-ditched enclosure.

Although the inclusion of stone (other than those edging long cists) is recorded in a number of instances in first millennium AD graves in Scotland (for example, those investigated by Wedderburn & Grime 1984), there seems to be no close parallel for the arrangement encountered at Boysack Mills I. Recently, however, the examination of a substantial pit at Longforgan, near Dundee, as part of a rescue programme in advance of the Perth-Dundee trunk road, revealed a number of substantial stone slabs, seemingly disturbed, in the upper fill (CFA 1994). This grave-like pit, which lay in arable land adjacent to an area which has produced fragments of Pictish stones, is undated and lacks any surviving indication of either a burial or a surrounding square ditch; conceivably representing a robbed, stone-lined grave, it may nonetheless bear some relation to that from Boysack Mills I.

There is similarly little parallel for Boysack Mills II in Scotland. Given the incompleteness of this site, the absence of a grave may be accounted for in a number of ways. The Yorkshire series, for example, include square barrows with either very shallow graves or none at all. Eradication through subsequent agricultural activity may be a sufficient explanation, but it is equally possible that the square form was also used for other functions. Some examples of small square enclosure on the European mainland seem to have surrounded small post-built structures: the cemetery at Fin d'Ecurey (Marne, France) provides a well-known example (Piggott 1968, fig 12). In the case of a series of small rectilinear enclosures lacking burials, on the margin of the late Iron Age cremation cemetery at Westhampnett, Sussex, Fitzpatrick (1992, 11) has posited that these may have been 'areas where the spirits of the dead were released and where the living went to mourn'.

SQUARE-DITCHED BARROWS OUTSIDE SCOTLAND

Square-ditched enclosures surrounding burials are better known outside Scotland. Geographically, the closest are those of the extensive series from Humberside and Yorkshire east of the river Ouse (Stead 1979, fig 9). These were initially set into their wider context as square barrows by Stead (1961) and have subsequently been the subject of extensive excavations, most recently

considered by the same author (1991). The principal *floruit* of inhumation under square barrows in this area seems to have been in the second century BC, with initial burials attributable to a phase broadly contemporary with La Tène B on the European mainland and perhaps lying in the fourth century BC. Stead's main burial series, Type A (1991, 179–84) — characterized by crouched or contracted skeletons in north/south graves predominantly with the skull at the north end, facing east — seems to have terminated a century or more before the Roman Conquest.

A later series, Type B, is marked amongst other traits by the great rarity of brooches amongst the grave goods, and shares with the Boysack example a broadly east/west orientation, as well as flexed or extended inhumation. Type B graves also include a number of iron swords, some of which had straight scabbard mouths, perhaps indicating the continuation of this type into the first century AD. Burials of Type B are known primarily from the Makepiece cemetery at Rudston (Stead 1991), where they include all examples (with one exception: R 159) greater than 1 m in depth. The maximum attained is 1.3 m for an extended inhumation lying in a somewhat unusual position and accompanied by a sword (R 182), a depth broadly comparable with the 1.5 m encountered at Boysack Mills I. In 12 instances, ditch dimensions for Type B burials at Rudston are securely known: these include two circular examples, both 3.6 m in diameter, the remainder being rectilinear and varying in size from 4.2 m by 3.2 m (R 107) to 7.4 m square (R 169), with a number of examples (R41, R159, R163 & R173) lying fairly close to the dimensions of Boysack Mills I. Evidence for wooden coffins (equally lacking nails or other metal fittings) was also recovered in some of these burials, but they offer no parallels for the inclusion of the boulders encountered at Boysack Mills I. In the Yorkshire examples, grave fillings seem to be entirely dominated by immediately available materials, consisting of earth and chalk gravels.

Excavations in Wales at Tanderrwen, Denbigh (Brassil *et al* 1991) revealed square-ditched barrows alongside unenclosed long graves aligned east/west and radiocarbon-dated to the sixth to eighth centuries AD. South of the site a large enclosure, 23 m in diameter with causeways in the middle of each side, may also have held a central burial. This enclosure was strategically placed round a Bronze Age round barrow (Brassil *et al* 1991, 46–97).

Stead (1979, 29–35; fig 10) reviewed the distributional and chronological evidence for Iron Age square or rectangular barrows within Britain and on the European mainland. Within southern Britain, separate from the East Yorkshire series, are some immediately pre-Roman examples. These almost all surrounded cremations, as at Baldock, Hertfordshire (Stead & Rigby 1986, 60–1); both there and at Owslebury, Hampshire, they were closely related to contemporary settlements.

EXAMPLES FROM THE EUROPEAN MAINLAND

Across the English Channel, known instances from Champagne-Ardenne have been increasing in number: early examples date to La Tène I and the series continued into early Gallo-Roman times. Cremations are recorded in association with square enclosures from La Tène C and dominate during La Tène D. These square enclosures display very considerable variety in terms of their spatial organization, development through time, and associations with post-built structures (Flouest & Stead 1981; Lambot 1993, esp. fig 2). Stead (1979, 32) was also able to indicate that square enclosures were features of Second Iron Age cemeteries elsewhere in northern and east-central France. The upsurge of aerial reconnaissance and rescue excavation in that country demonstrates that such features are more widespread than when Stead compiled his account, extending in particular to the west of the Seine (Pion & Guichard 1993 provide a summary inventory). Immediately outside the oppidum on Mont Beuvray, Burgundy, an

extensive series of small square barrows straddles a network of tracks approaching the site (Flouest 1994).

Roymans (1990) has reviewed the evidence for northern Gaul, pointing out that in some cemeteries, notably the huge example at Wederath-Belginum (Kreis Bernkastel) near Trier, the introduction of rectangular enclosures around groups of cremations (*Grabgärten*: eg Haffner 1980, Abb 2) was a feature of Augustan times. Previously, very few graves in this cemetery had been surrounded by rectilinear ditches: grave goods suggest these latter were of prominent persons. The appearance of rectilinear *Grabgärten* in the funerary record of the Neuwied Basin and lower Moselle also may not precede the Roman period. In contrast, in the southern Netherlands and the German lower Rhine area, square enclosures enclosing graves first appear in developed phases of the *Niederrheinische Grabhügelkultur*, broadly contemporary with Hallstatt D/La Tène A and hence c 500 BC; the burial rite in use here was cremations. Roymans (1990, 235) remarks that the tradition of digging rectangular ditches round graves is found again in this area in some native cemeteries of the Roman period.

CONCLUSION

The Boysack Mills I square-ditched grave shares some traits with the Yorkshire series, with Iron Age examples on the European mainland and with later British examples. There is no case, however, from the diversity of grave forms and rites represented, to argue for direct influence to eastern Scotland, the more so since the sole artefact recovered, the ring-headed pin, is essentially a north British type.

What is more apparent is that a square ditch surrounding a barrow covering a burial is a style of funerary monument that extends over a number of centuries and has a wide European distribution. This burial form often appears with others such as round barrows or circular enclosures, perhaps representing mixed burial traditions or continuity of sanctified ground. Thus, it is clearly not, in itself, as diagnostic of period or culture as once thought. Boysack Mills remains, for the present, unique.

APPENDIX 1: THE BEAKER BURIAL

Lisbeth M Thoms

with contributions by I A G Shepherd & M Harman

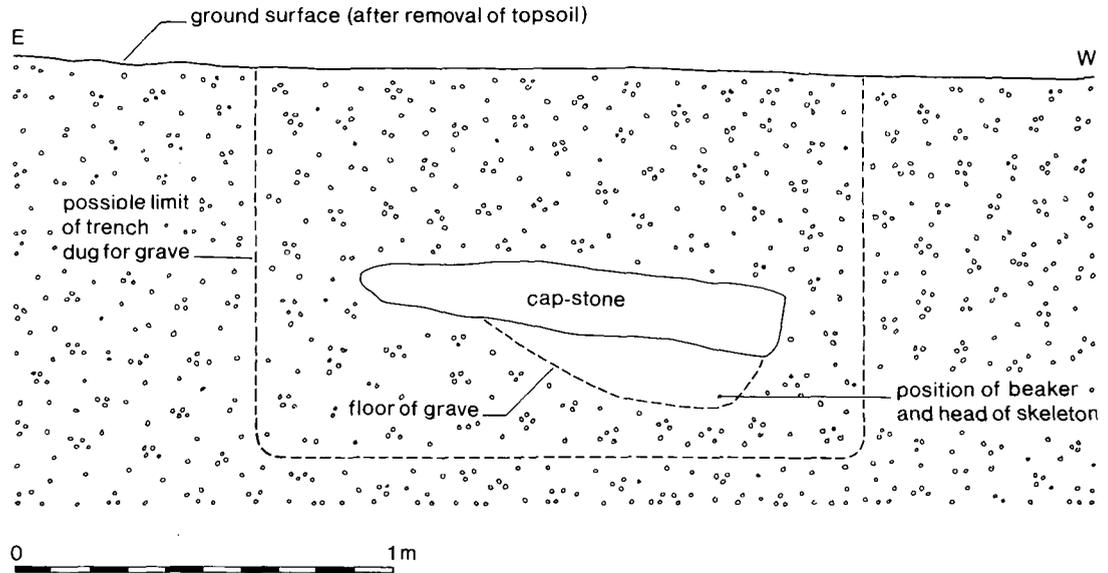
INTRODUCTION

A Beaker burial was discovered in the course of gravel quarrying in June 1978 and was reported to Dundee Art Galleries & Museums. The burial lay on a ridge at a height of approximately 30 m OD above the north bank of the Lunan Water at Boysack Mills (NGR: NO 6275 4908), approximately 100 m south-east of the square-ditched enclosures and other features excavated in 1977 (illus 1).

The burial had been exposed, in section, high in the quarry face by a quarry operator who had removed a Beaker from the grave for safety. The author was held aloft in the bucket of the JCB to make a brief examination of the exposed features and to remove the skeletal material.

THE BURIAL

The fairly well-preserved skeleton of an adult female lay in a crouched position on its right side facing south with head to the west. The Beaker was found positioned behind the head of the skeleton. The skeleton lay in



ILLUS 20 Cross-section of the beaker-accompanied burial

a shallow concave hollow dug in the gravel and covered by a stone 1.1 m long and 0.17 m thick (illus 20). The large slab seen in the section could have been a cist capstone but there was no trace of any side slabs in the quarry face nor could a slab be felt at the back of the cavity. The possible sides of a grave pit were observed but limits were hard to define with certainty because of infilling with the same loose gravel into which the grave had been dug. Unfortunately, due to the circumstances of discovery and recording, it was impossible to be certain about the form of the burial (ie cist or simple pit).

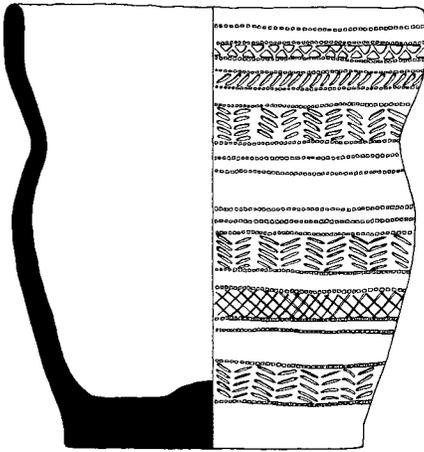
THE BEAKER

Ian A G Shepherd

The example recovered from the disturbed burial is a complete, well-fired, Beaker, very regularly made, standing soundly on a flat, slightly footed base (illus 21). Five vertical cracks and a small corroded patch on the neck are visible, but otherwise the pot is in excellent condition. The Beaker appears almost squat, rising as it does from a solid base and curving out to a broad belly at the mid point; the waist is pronounced and the neck distinctly cup-shaped. The rim is almost squared-off. The pot is 120 mm tall and 110 mm in diameter at the belly; the rim is 5 mm thick. There is an *omphalos* or central raised boss on the inside surface of the base.

The hard fabric has a grey core with occasional medium to large quartzitic grits showing through the exterior slip and the light brown internal surface. The outside surface is covered with a pinky-red slip which in small patches is buff; the undecorated zones have been lightly burnished.

The pot has been decorated in three broad zones (on the neck, belly, and just above the foot) using a toothcomb with irregular rectangular teeth, combined with a small, smooth-ended, very slightly curved spatula. The decorative scheme is closest to Clarke's Style c (1970, 12–13) and the motifs are drawn from his Motif Groups 2 (Primary Northern British/Dutch: nos 12 & 14) and 3 (Late Northern British: no 20) (1970, 425–6). The use of simple horizontal lines of toothcomb to fringe the zones and, in the case of the two pairs of additional lines just below the waist, to begin to bridge them, are characteristic of Clarke's Late Northern (N3) Group (1970, 176–7) and of Step 5 of the scheme of Lanting & Van der Waals (1972), as extended to north-east Scotland by Shepherd (1986).



ILLUS 21 The Beaker (Scale 2:1)

Close parallels for the combination of shape and zonation of decoration on this Boysack Beaker can be found in the N3/Step 5 Beakers from Lochend, Inverness (Clarke 1970, no 1667, fig 579), Upper Boyndlie, Aberdeenshire (*ibid*, no 1504, fig 622) and Fallaws, Angus (Coutts 1971, no 73). However, the fusion of zones is more complete on the two last Beakers than on the Boysack example, which retains some separation of the individual horizontal motifs, a typical archaizing feature of later Beakers (Clarke 1970, 23).

The absence of conclusive evidence of a cist suggests that the Boysack Beaker was deposited in a simple earth-dug grave of a type occasionally found within a ring-ditch, such as at the very early Beaker burial at Newmill, Perth & Kinross (Watkins & Shepherd 1980) or with a Beaker at Park Quarry, Aberdeenshire (Kirk 1994). Finally, the association with a female inhumation which is arranged in the classic manner for a Beaker female (ie on right, pointing west and facing south) should be noted. It has recently been suggested that the differentiation between Steps 4 and 5 may have been on the basis of the sex of the individual to be interred, rather than on specific stylistic grounds (Shepherd 1989, 80), Step 5 Beakers perhaps being exclusively for female burials.

THE SKELETAL REMAINS

Mary Harman

The skeleton is largely complete. Of the skull, only the left malar, the right temporal, and parts of the occipital remain. Four thoracic vertebrae, both ulnae, and most of the hand and foot bones are missing. Most of the bones are in good condition, though the few skull bones, the upper cervical vertebrae, some ribs and the right arm are poorly preserved.

A small mastoid process, and the relevant features of the pelvic girdle indicate that this skeleton is that of a woman, and the wear on the molars suggests an age of between 25 and 30 years, which is consistent with very slight evidence of osteo-arthritis on the last two lumbar vertebrae. The height, calculated from the maximum length of the long bones, including a femoral length based on an amalgamation of the incomplete left and right femora, is 1.682 m (5 ft 6 in), using Trotter & Gleser's formula (in Brothwell 1965, 102). Dental health was good; all the teeth in the mandible survive though the third molars probably have not developed, or else are retained within the bone. Nine loose upper teeth were collected. None of the teeth shows caries, and there is no sign of abscessing in the mandible.

ARCHIVE & ARTEFACTS LOCATION

The project archive was deposited with the National Monuments Record of Scotland (RCAHMS) soon after completion of the work and has been available for public use for a number of years. The ring-headed pin from Boysack Mills I, the flint and pottery from Boysack Mills IV, and the Beaker [Accession number 1980–272(1)] and skeletal material [Accession number 1980–272(2)] are in Dundee Art Galleries & Museums.

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REFERENCES

- Armit, I 1991 'The Atlantic Scottish Iron Age: five levels of chronology', *Proc Soc Antiq Scot*, 121 (1991), 181–214.
- Ashmore, P J 1980 'Low cairns, long cists and symbol stones', *Proc Soc Antiq Scot* 110 (1978–80), 346–55.
- Brassil, K S, Owen, W G & Britnell, W J 1991 'Prehistoric and Early Medieval Cemeteries at Tandderwen, near Denbigh, Clwyd', *Archaeol J*, 148 (1991), 46–97.
- Brothwell, D R 1965 *Digging up Bones*. London.
- CFA 1993 Centre for Field Archaeology 'Hatton Mill Farm, Kinnell parish', *Discovery Excav Scot* 1993, 95–6.
- CFA 1994 Centre for Field Archaeology 'A90 Longforgan Interchange', *Discovery Excav Scot* 1994, 84–5.

- Clarke, D L 1970 *Beaker Pottery of Great Britain and Ireland*. Cambridge.
- Clarke, D V 1971 'Small finds in the Atlantic Province: problems of approach', *Scott Archaeol Forum*, 3 (1971), 22–54.
- Cliquet, D, Remy-Watte, Monique, Guichard, V & Vaginay, M (eds) 1993 *Les Celtes en Normandie. Les rites funéraires en Gaule (IIIème–Ier siècle avant J-C)*. Rennes: Rev archéol de l'Ouest Suppl Ser, 6. (= Actes XIV Assoc Franç et Age Fer (Evreux, 1990)).
- Close-Brooks, J 1984 'Pictish and other burials', in Friell, J G P & Watson, W G (eds), 87–111.
- Close-Brooks, J 1987 'The clay moulds', in Hedges, J W, 303–4.
- Coles J M & Taylor J J 1970 'Excavation of a Midden in the Culbin Sands, Morayshire', *Proc Soc Antiq Scot*, 102 (1969–70), 87–100.
- Coutts, H 1971 *Tayside Before History*. Dundee.
- Cowie, T G 1992 'Neolithic pottery from Barbush quarry, Dunblane, Perthshire, with notes on the earlier Neolithic pottery of eastern and central Scotland', in Sharples, N & Sheridan, A (eds), *Vessels for the Ancestors*, 272–85.
- Cowie, T G 1993 'A survey of the Neolithic pottery of eastern and central Scotland', *Proc Soc Antiq Scot*, 123 (1993), 13–41.
- Fairhurst, H 1984 *Excavations at Crosskirk Broch, Caithness*. Edinburgh. (= Soc Antiq Scot Monogr Ser, 3).
- Fitzpatrick, A P 1992 *Westhampnett from the Ice Age to the Romans*. Salisbury.
- Flouest, J-L 1994 'La nécropole de "la Croix de Rebout"', in *Centre Européen d'Archéologie du mont Beuvray: Activités 1993, Prévisions 1994*, 13–20.
- Flouest, J-L & Stead, I M 1981 *Iron age cemeteries in Champagne. The third interim report on the excavations carried out between 1971 and 1978*. London. (= Brit Mus Occas Pap, 6)
- Friell, J G P & Watson, W G (eds) 1984 *Pictish Studies. Settlement, burial and art in Dark Age northern Britain*, Oxford. (= BAR Brit Ser, 125).
- Haffner, A 1980 'Neue Ausgrabungen im keltisch-römischen Gräberfeld von Wederath-Belginum', *Funde und Ausgrabungen im Bezirk Trier*, 12 (1980), 16–45.
- Halliday, S 1985 'Unenclosed upland settlement in the East and South-East of Scotland', in Spratt, D & Burgess, C (eds) *Upland Settlement in Britain. The Second Millennium BC and After*, Oxford, 231–51. (= BAR Brit Ser, 143).
- Hedges, J W 1975 'Excavation of two Orcadian burnt mounds at Liddle and Beauquoy', *Proc Soc Antiq Scot*, 106 (1974–5), 39–98.
- Hedges, J W 1987 *Bu, Gurness and the Brochs of Orkney: II Gurness*. Oxford. (= BAR Brit Ser, 164).
- Henshall A S 1963 *The Chambered Tombs of Scotland*, vol 1. Edinburgh.
- Henshall A S 1972 *The Chambered Tombs of Scotland*, vol 2. Edinburgh.
- Kendrick, J 1982 'Ironhill, Inverkeilor parish', *Discovery Excav Scot* 1982, 30.
- Kendrick, J 1995 'Excavation of a Neolithic structure and an Iron Age settlement at Douglasmuir, Angus', *Proc Soc Antiq Scot*, 125 (1995), 29–67.
- Kinnes, I A 1985 'Circumstance not context: the Neolithic of Scotland as seen from outside', *Proc Soc Antiq Scot*, 115 (1985), 15–57.
- Kirk (no initial given) 1994 'Park Quarry', *Discovery Excav Scot* 1994, 27.
- Lambot, B 1993 'Nécropoles, sanctuaires et rites funéraires en Champagne à la Tène finale,' in Cliquet *et al*, 211–24.
- Lanting, J N & Van der Waals, J D 1972 'British beakers as seen from the continent: a review article', *Helinium*, 12 (1972), 20–46.
- Maxwell, G S 1983 'Recent aerial survey in Scotland', in Maxwell, G S (ed) *The Impact of Aerial Reconnaissance on Archaeology*, London, 27–40. (= Counc Brit Archaeol Res Rep, 49).
- Maxwell, G S 1987 'Settlement in Southern Pictland' in Small, A (ed.) *The Picts: a New Look at an Old Problem*. 31–4.
- Murray, D M 1991 'Square-ditched Barrows and Enclosures', in Murray, D M (ed) *Forays into Fife: essays presented to J Davidson on the occasion of his retiral (1991)*, 35–41. (Privately circulated paper.)

- Piggott, S 1968 *The Druids*. London. (= Ancient Peoples and Places, 63)
- Piggott S & Simpson DDA 1971 'Excavation of a Stone Circle at Croft Moraig, Perthshire, Scotland', *Proc Prehist Soc*, 37 (1971), 1–15.
- Pion, P & Guichard, V 1993 'Tombe et nécroples en France et au Luxembourg entre le III^e et le I^{er} siècles avant J-C. Essai d'inventaire', in Cliquet *et al*, 175–200.
- Pollock, D 1983 'Ironshill, Inverkeilor parish', *Discovery Excav Scot* 1983, 34.
- Pollock, D 1985 'The Lunan Valley Project: medieval rural settlement in Angus', *Proc Soc Antiq Scot*, 115 (1985), 357–99.
- RCAHMS 1978 Royal Commission on the Ancient and Historical Monuments of Scotland *The Archaeological Sites and Monuments of Lunan Valley, Montrose Basin, Angus District, Tayside Region*. Edinburgh.
- Ralston, I & Inglis, J 1984 *Foul Hordes: the Picts in the North-East and their Background*. Aberdeen.
- Roymans, N 1990 *Tribal Societies in Northern Gaul: an anthropological perspective*. Amsterdam. (= Cingula, 12).
- Russell-White, C J, Lowe, C E & McCullagh, R P J 1992 'Excavations at three Early Bronze Age burial monuments in Scotland', *Proc Prehist Soc*, 58 (1992), 285–324.
- Shepherd, A N 1989 'A note on the orientation of beaker burials in north-east Scotland', in Greig, M K, Greig C, Shepherd, A N & Shepherd, I A G 1989 'A beaker cist at Chapelden, Tore of Troup, Aberdour, Banff and Buchan . . .', *Proc Soc Antiq Scot*, 119 (1989), 73–81.
- Shepherd, I A G 1986 *Powerful Pots: Beakers in North-East Prehistory*. Aberdeen.
- Shepherd, I A G 1993 'The Picts in Moray', in Sellar, W D H (ed) *Moray: Province and People*, Edinburgh, 75–90.
- Sherriff, J R 1981 'Boysack Mills, Inverkeilor parish', *Discovery Excav Scot* 1981, 45.
- Stead, I M 1961 'A distinctive form of La Tène barrow in eastern Yorkshire and on the continent', *Antiq J*, 41 (1961), 44–62.
- Stead, I M 1979 *The Arras Culture*. York.
- Stead, I M 1991 *Iron Age cemeteries in East Yorkshire. Excavations at Burton-Fleming, Rudston, Garton-on-the-Wolds and Kirkburn*. London. (= Engl Heritage Archaeol Rep, 22).
- Stead, I M & Rigby, V 1986 *Baldock: the excavation of a Roman and pre-Roman settlement 1968–72*. London. (= Britannia Monogr Ser, 7).
- Stevenson, J B 1984 'Garbeg and Whitebridge: two square-barrow cemeteries in Inverness-shire', in Friell, J G P & Watson, W G (eds), 145–50.
- Stuiver, M & Reimer, P J 1993 *Radiocarbon*, 35 (1993), 215–30.
- Watkins, T F & Shepherd, I A G 1980 'A beaker burial at Newmill, near Bankfoot, Perthshire', *Proc Soc Antiq Scot*, 110 (1978–80), 32–44.
- Wedderburn, L M M & Grime, D M 1984 'The cairn cemetery at Garbeg, Drumnadrochit', in Friell, J G P & Watson, W G (eds) 151–67.

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