ASTON ON TRENT 1, DERBYSHIRE – EXCAVATION OF A ROUND BARROW AND PROTECTED CURSUS LAND SURFACE

By ROY LOVEDAY (School of Archaeology & Ancient History, University of Leicester)

with contributions by

ROBERT ALVEY (Formerly Dept of Archaeology, University of Nottingham, University Park, Nottingham NG7 2RD),

CHRISTOPHER BRONK RAMSEY (Oxford Radiocarbon Accelerator Unit Research Laboratory, Dyson Perrins Building, South Parks Road, Oxford. OX1 3QY),

JOHN CARNEY (British Geological Survey, Kingsley Dunham Centre, Keyworth, Nottinghamshire, NG12 5GG),

GORDON COOK (SUERC Radiocarbon Laboratory, Scottish Enterprise Technology Park, Rankine Avenue, East Kilbride, G75 0QF),

LYNDEN COOPER (University of Leicester Archaeological Service, University of Leicester, University Road, Leicester LE1 7RHS),

ALEX GIBSON (Division of Archaeological, Geographical and Environmental Sciences, School of Life Sciences, Richmond Road, Bradford, West Yorkshire BD7 1DP),

JOHN HUNTER (Institute of Archaeology and Antiquity, Arts Building, University of Birmingham, Edgbaston, Birmingham B15 2TT),

JOHN MEADOWS (Leibniz-Labor für Altersbestimmung und Isotopenforschung, Christain-Albrechts-Universität zu Kiel, Max-Eyth-Str 11-14, 24118, Kiel, Germany (formerly English Heritage),

ANGELA MONCKTON (University of Leicester Archaeological Service, University of Leicester, University Road, Leicester LE1 7RHS)

GRAHAM C. MORGAN (University of Leicester Archaeological Service, University of Leicester, University Road, Leicester LE1 7RHS),

FIONA ROE (

ANNE WOODWARD (Institute of Archaeology and Antiquity, Arts Building, University of Birmingham, Edgbaston, Birmingham B15 2TT)

SUMMARY

A partially reported excavation carried out in the 1960s of an upstanding round barrow within the cursus at Aston on Trent, Derbyshire recovered two Beakers with grave goods and an exceptional large cache of grain from an underlying pit containing Carinated Bowl pottery. It also exposed a rare example of a preserved cursus land surface. The surviving material from *the excavation is analysed here and the report completed. Radiocarbon dating points to more than one phase of grain charring activity, the later of which may be broadly contemporary with the cursus. The two leached Beaker burials were either unusually surface-laid or cut into an earlier barrow.*

INTRODUCTION

The double ring ditch, termed Aston 1, lies on the first terrace (Holme Pierrepont) gravels of the River Trent at SK 422292. Adjacent is a smaller ring ditch (Aston 2) and a large U-shaped enclosure. Unusually these and the other monuments at the complex were placed almost exclusively within, rather than around, a cursus (Fig. 1), a monument *c.*100m wide and at least 1700m long (St Joseph 1966; Gibson and Loveday 1989). Even more unusually Aston 1 survives as an earthwork. The round barrow was recorded as 0.51-0.61m high in 1968 and was reportedly at least *c.*0.30m higher forty years earlier when the field was pasture (Reaney 1968,70). As a result of the protection afforded to it by Hanson Aggregates since 1999 it still stands some 0.38m high today (Loveday 2000; 2004). Such barrow survival is a rarity on gravel soils and all but unique within a cursus.

In 1962 Don Reaney, an extra mural student of Jeffrey May of Nottingham University, commenced excavation of the site. His work extended over several seasons. No precise record of its progress survives but it appears to have involved the initial cutting of long sections through the mound and ditches in the north-east quadrant followed by progressive extension of the north-south trench to expose the centre of the site (Fig. 2). This revealed two Beakers, a wrist guard and a barbed and tanged arrowhead on the old land surface, along with pits and apparent gullies cut into the subsoil. One pit (Pit 3) that contained sherds of earlier Neolithic Carinated Bowl also produced a substantial deposit of carbonised cereals (*c.*1000 grains). The findings were reported by Reaney in interim form in *The East Midlands Archaeological Bulletin* 1964 and *Derbyshire Archaeological Journal* 88, 1968. Subsequently a sample of grain was radiocarbon dated: BM 271: 4700 ± 150 BP (Barker *et al.* 1969). However, a detailed and important report on the grain by R. Alvey (1964) remained unpublished and uncertainty continued to surround the nature of the 'circular gullies' reportedly preserved in the cursus interior beneath the barrow (Loveday 2000). Since the site is one of only four surviving protected interior cursus land surfaces and the only one known to definitely cover evidence of Neolithic activity (Loveday 2004); and since the cache of Neolithic grain ranks fourth in size nationally for the 4th millennium cal BC (Jones and Rowley-Conwy 2007, 392-3); it was clear that the fullest possible record of the excavations needed to be published and modern analytical procedures applied to the surviving material. The limitations of the archive must, however, be noted. The fact that neither site note book nor finds register survive makes close provenancing of most of the material impossible. Plans and sections though do record contexts of the critical elements – the Carinated Bowl, Beakers and grain – and the interims (Reaney 1964a and 1968) furnish contextual detail.

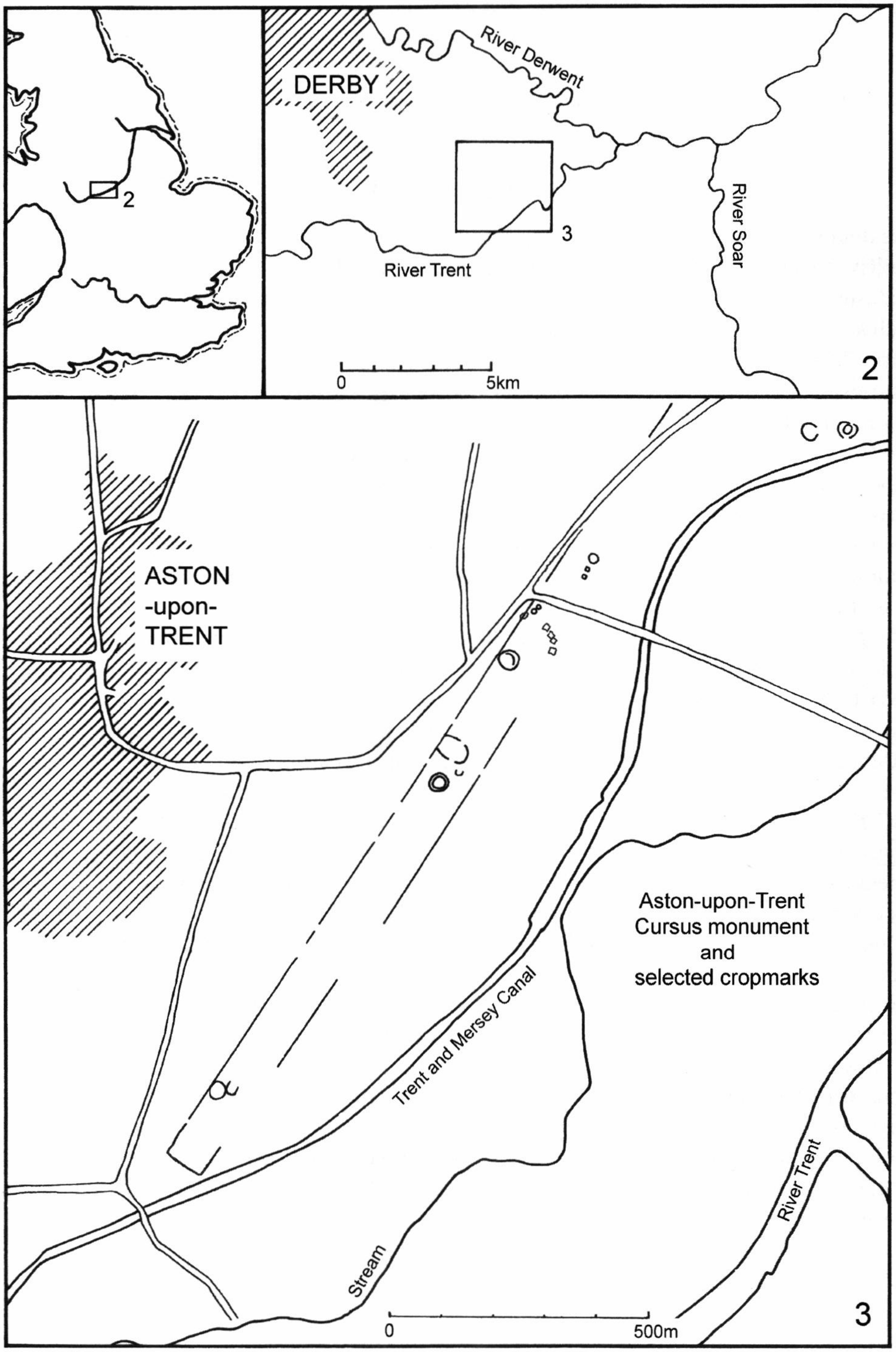

Fig. 1: Location map. Ceremonial and funerary monument cropmarks only.

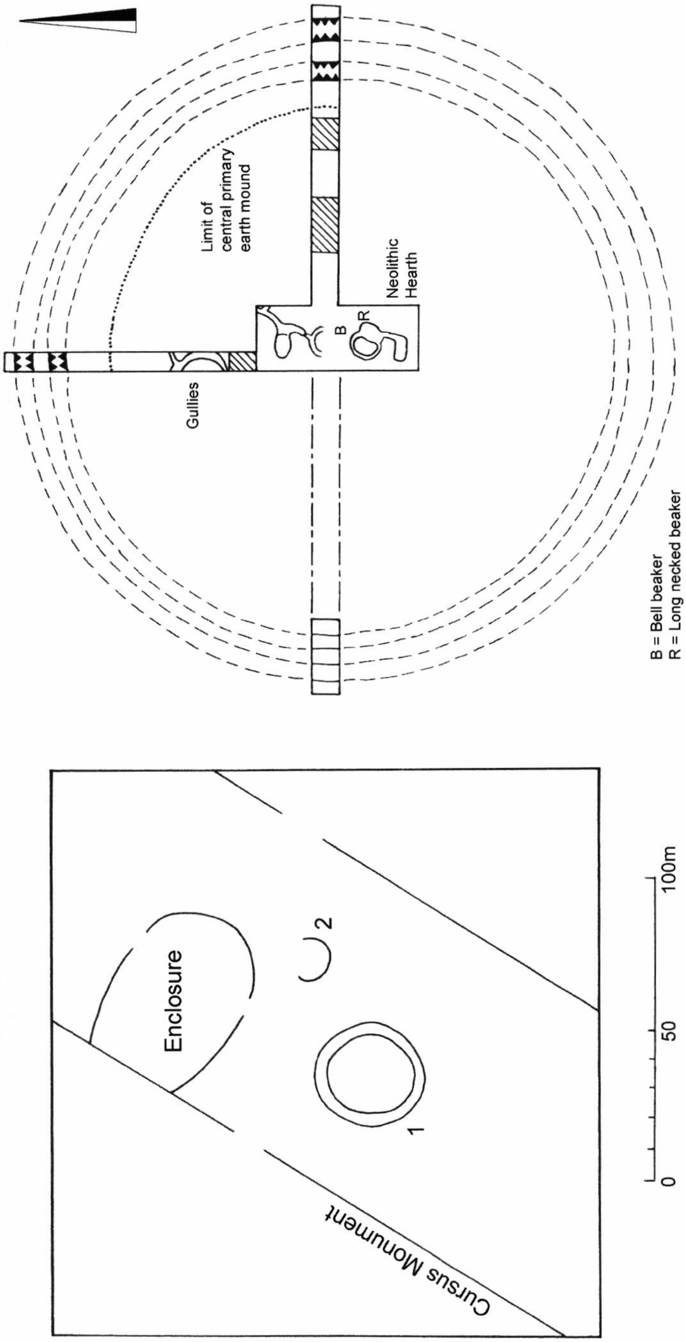

Fig 2: Excavation plan

THE EXCAVATION

By Roy Loveday

The barrow comprised a low circular mound 31m in diameter and some 0.51-0.61m in height. It was encircled by two close-set concentric ditches 31m and 35m in diameter.

Longitudinal section

The north-south trench (Fig. 3) revealed a layer of 'sandy mottled subsoil' about 0.3m in depth immediately beneath the topsoil. It overlay a 'primary mound of dark humus laden soil' some 0.35m in height. This was recorded in more detail as a '...a core of earth with a capping of turf ranging from 1-5 layers, the turfs being placed almost on end in the form of oblique stacking where several layers were evident' (Reaney 1968, 71). The irregular surface of this layer over Pit 3, shown in section B-B′ (Fig. 5), presumably records the latter but the fact that it is absent from section A-A′ some 0.90m away and from the longitudinal section (Fig. 3), could indicate that such stacking was a feature of the covering of Pit 3. It is also recorded that the earth core contained '...a good deal of occupation material, charcoal fragments, pottery fragments (all Neolithic), worked flints and waste flakes, as well as a scatter of hazelnuts fragments' (*ibid.*). The suggestion that the turf and topsoil were scraped from the surrounding area comes from the absence of an observed turf line overlying the natural gravel. This was not simply a failure of recognition within the humic make up of the mound: the centre the mound sat on a thin gravel layer laid directly over undisturbed natural gravels and Pit 3 which contained carbonised grain and sherds of a Carinated Bowl. The old land surface had it seems been truncated and partially covered by this thin layer prior to material being heaped back over it.

The topsoil and turf mound stopped some 3m short of the inner ditch and was thus some 31m in diameter. Overlying this, the sandy, mottled sub soil layer extended into and across the ditches. Its depth and composition recall the 'yellow-brown sub soil' encountered 700m south-west, overlying Aston 4, that contained modern finds and was interpreted as a medieval ploughsoil (Gibson and Loveday 1989, 32). At Aston 1 this layer appears to represent the disturbed and spread upper part of the mound.

The ditches

Three ditches are visible in the longitudinal section (Fig. 3). The central one can, with reasonable confidence, be equated with a ditch visible on aerial photographs running between Aston 1 and Aston 2. The profile of the inner ring ditch reveals it to have been slighter than that of the outer ring, confirming the aerial photographic evidence (Plate 1). Unfortunately this section fails to record the nature of the ditch silts and the other two ditch section drawings in the archive (sections T and Q) are, like the single published drawing (Reaney 1968, fig. 3), highly confusing; they appear to record substantial cutting by the excavators into the natural. The interims record that the primary ditch had silted almost completely when the barrow was enlarged. Since the hypothesised barrow enlargement does not appear to cover the inner ditch it is difficult to see the basis for this statement. All that can be stated with confidence is that the silts of all ditches were characterised by sandy loam largely indistinguishable from the overlying subsoil with little if any runs of gravel, and that relatively slight ditch sizes makes it unlikely that they contributed much to the make up of the mound. The excavator noted a slight

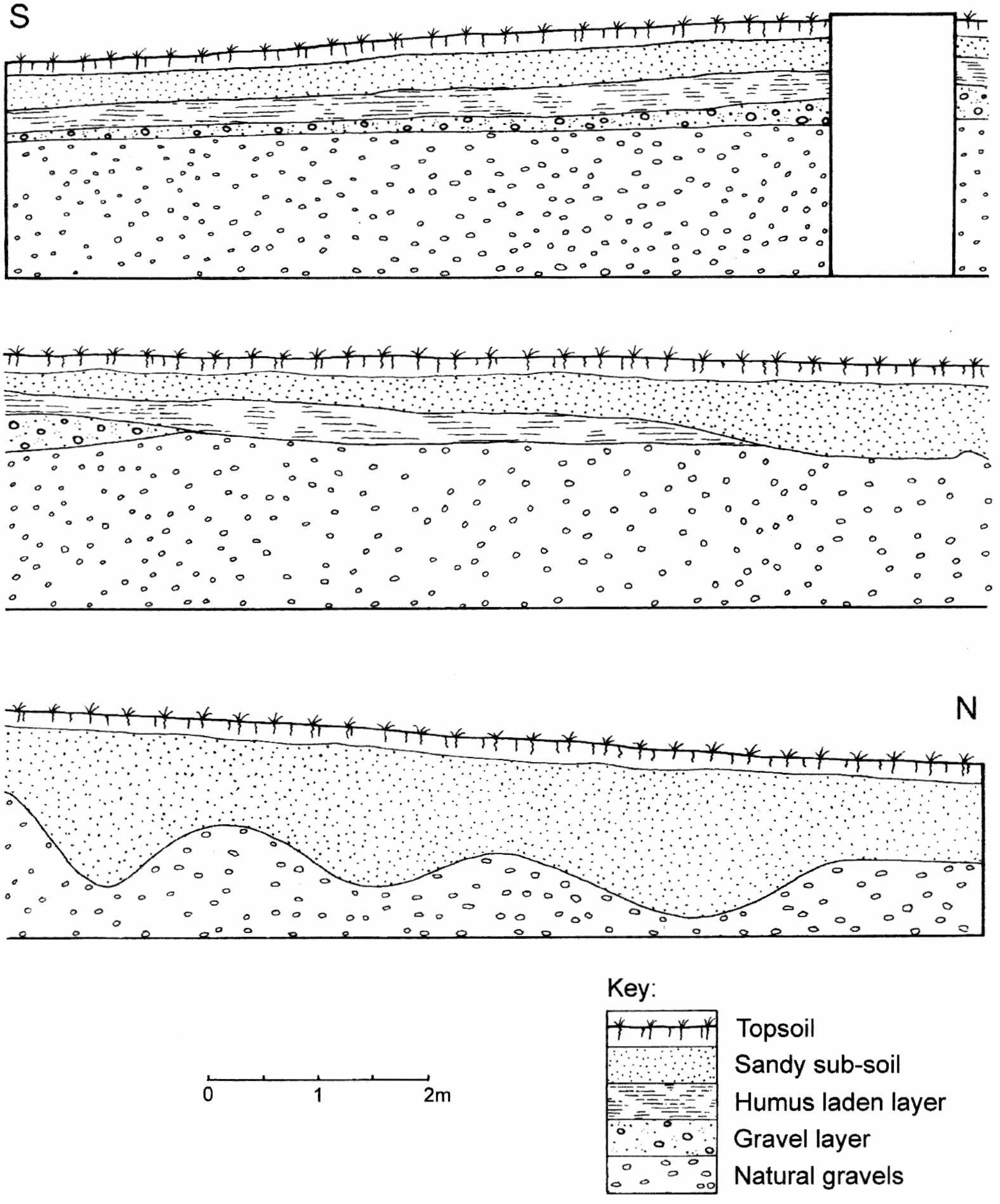

Fig 3: Longitudinal section

displacement of the outer ditch: it was separated from the inner by 2.7m in the north section (Fig. 3) but only 1.8m in the eastern one (*ibid.,* 74).

Central area.

An area 9m x 4m was opened in the centre of the barrow. A number of features were recognised cutting the natural gravels under the mound (Fig. 4).

Gullies

These are recorded as completely or partially circular features 1.5-1.8m in diameter defined by 0.23m deep x 0.23-0.31m wide gullies. They were not restricted to the central area but were also encountered in the longitudinal trench (Fig. 2). Except in the one instance where a stratigraphic relationship was recorded, they were sterile. The completely circular gully was cut by Pit 3 that contained carbonised grain and charcoal and this had spread into the gully 'for a few inches' from the pit edge (*ibid.*, 70). It would thus appear to have been only loosely filled at the time Neolithic occupation took place.

In the absence of published plans, initially it seemed possible that these gullies represented fortuitously preserved drainage gullies set around ephemeral grain storage structures (Loveday 1999a; 2000). Retrieval of the archive plan, however, made it clear that they were either natural or animal-made features. The contorted strata recorded in sections J and A-L (Fig. 4) confirm their likely nature: vertical sided profiles opposed by slope and upcast ridges characterise tree-throw holes (*cf.* Barclay *et al.* 2003, 60-2; Beamish 2009, 138-40). The potentially circular nature of such features is emphasised by feature 177 at Drayton, Oxfordshire (Barclay *et al.* 2003, pl.4.2), which corresponded significantly closely in diameter to the circular gulley cut by Pit 3 at Aston. The crescentic gravel layer deposited on the stripped natural may represent collapse from the roots of a tree fallen from Pit 4, the overlying topsoil having been lifted by the root plate (I am grateful to Matthew Beamish for advice on this question). Tree-throw features were unrecognised 50 years ago when the excavation took place and continue to present problems of interpretation (Green 1996; Barclay *et al.* 2003, 61-2). Rationalisation of the evidence during planning at Aston 1 appears to have created enigmatic gullies.

Natural gravel layers then appear to have been disturbed by one or more episodes of tree collapse/clearance prior to Pit 3 being dug. Charcoal recorded as coming from 'a buried surface in the vicinity of a hearth' (i.e. Pit 3) has been dated to 4330-4060 cal BC (SUERC-24957, 5370±30 BP) and 3960-3710 cal BC (OxA-21061, 5037±31 BP (Meadows *et al.* below).

Pits

Pit 1 is recorded as cut from the present surface of the barrow (Fig. 5). Pit 2 stands in an uncertain relationship to the connecting gulley. Its fill contained '…2 worked flints, 2 small sherds of Neolithic pottery and some crumbs of charcoal' (Reaney 1968, 71). These could represent elements from the old land surface drawn into a tree-throw hole by drag or collapse, or they could have been backfilled into a pit which cut into tree-throw activity.

Pit 3 was roughly circular, 0.9-1.2m in diameter and 0.3m deep. Its base '…showed clear evidence of a fire, both in the baking of the earth and in the colour changes associated with it. Around the upper part of the hearth, mixed with a quantity of charcoal fragments, were found many carbonised grains of corn' (*ibid.*,71). The implication that the grain lay around the pit edge is backed up by the statement in the earlier interim that '…near the top of the hearth, around the sides, were many grains of corn' (Reaney 1964a) and by the section drawing (Fig.

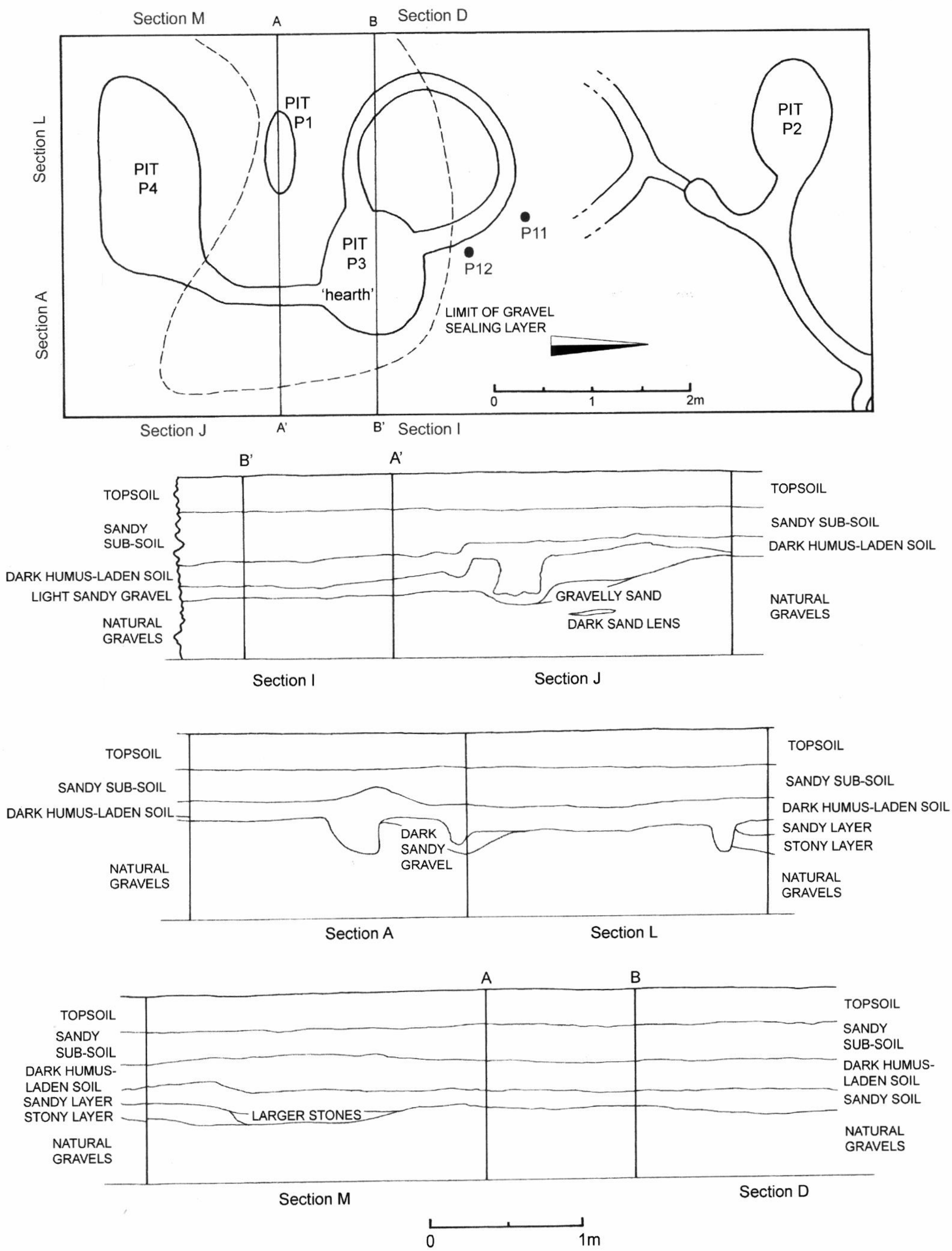

Fig 4: Plan of central area excavation and sections.

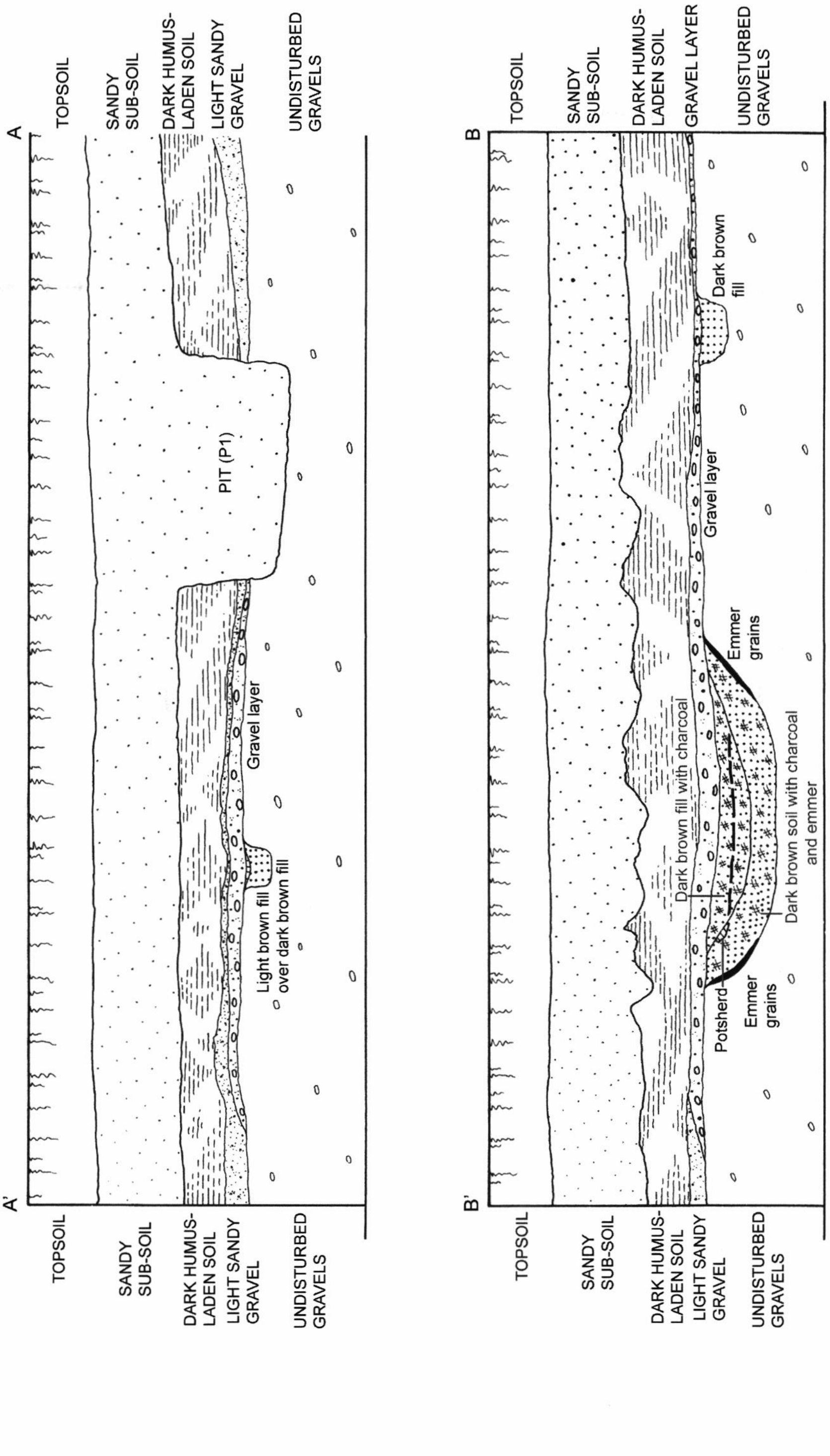

Fig 5: Sections of pit 1 (upper) and pit 3 (lower).

5). Description of the fill accompanying the latter suggests grains were also present in the body of the pit (although not in the same concentration) but were absent from the topmost central fill. This is likely to accurately reflect the disposition of grain within the feature since macroscopic identification in the uppermost levels would have heightened rather than reduced perception at the lower levels. The number of carbonised grains in the pit must, however, have exceeded the 1159 recorded by Robert Alvey in the samples he received, since there is no question of on-site flotation being employed at that date to recover the full complement.

Sherds from a Carinated Bowl (P1) were found 'towards the top of the hearth' and recorded in section B-B' as lying at the interface of two fills (although level descriptions on the section suggest no real distinction). A horizontal line, not inked in on the manuscript section (shown dashed in Fig. 5), may relate to the excavator's uncertainty regarding his conclusion that the pits (unspecified) were flooded or infilled. The 1964 interim records '...a number of other sherds were found in this area including two body sherds showing carination....there was also a scatter of flint blades and flakes, together with some fragments of hazel nuts' (Reaney 1964a). How this relates to Pit 3 is unclear.

Gravel spread

A distinct gravel layer 0.10m thick covered pit 3 and spread in an arc across the central area (Fig. 4). Sections A-A' and B-B' (Fig. 5) show that it lay directly over the undisturbed natural gravels; there was no intervening old land surface. As noted above it is possible that it derives from the upturned root plate of a large old tree whose tree-throw could be represented by pit 4. If so the tree's collapse or casting down must post date both pit 3 and the stripping of the old land surface, whether naturally through lifting on the root plate or deliberately by human agency. Alternatively the gravel was a deliberately laid layer.

Beakers

Just to the north of the gravel spread the excavators found the crushed remains of two Beakers (Fig. 4). Almost central within the ring ditch were the remains of a sinuously profiled vessel (P11), '...it had been crushed and the remaining fragments dispersed over an area 3 feet (0.9m) square...the Beaker was lying on top of or slightly below the ancient surface. There was no evidence of a burial pit of any kind. A few inches below the Beaker was a flat perforated wrist guard of greenish polished stone, and 20in. (0.51m) to the south at the same level was a small tanged and barbed flint arrowhead' (*ibid.,* 73). The earlier interim confirms that the presumptively leached '...body had apparently been placed directly on the surface and the mound raised above it' (Reaney 1964a).

Some 1.2m to the south-east a long-necked Beaker (P12) was recovered. It was crushed but clearly lying on its side. '...some disturbance of the primary was evident but the (leached) body was again placed on the surface – no grave pit or even scrape was found' (*ibid.*). No other grave goods were found.

Aston 2

A single trench parallel with the present track was cut across the levelled cropmark ring ditch termed Aston 2. It determined that the no trace of an earthwork survived and that the site's diameter was 15m. It also established that the ditch deepened by 0.30m to the south of the eastern section but did not appreciably widen (Fig. 6) One sherd of Neolithic pottery was found at the base of the western section and two or three crumbs with two waste flakes and a small blade in the eastern. Charcoal flecks were noted in the lower ditch fill.

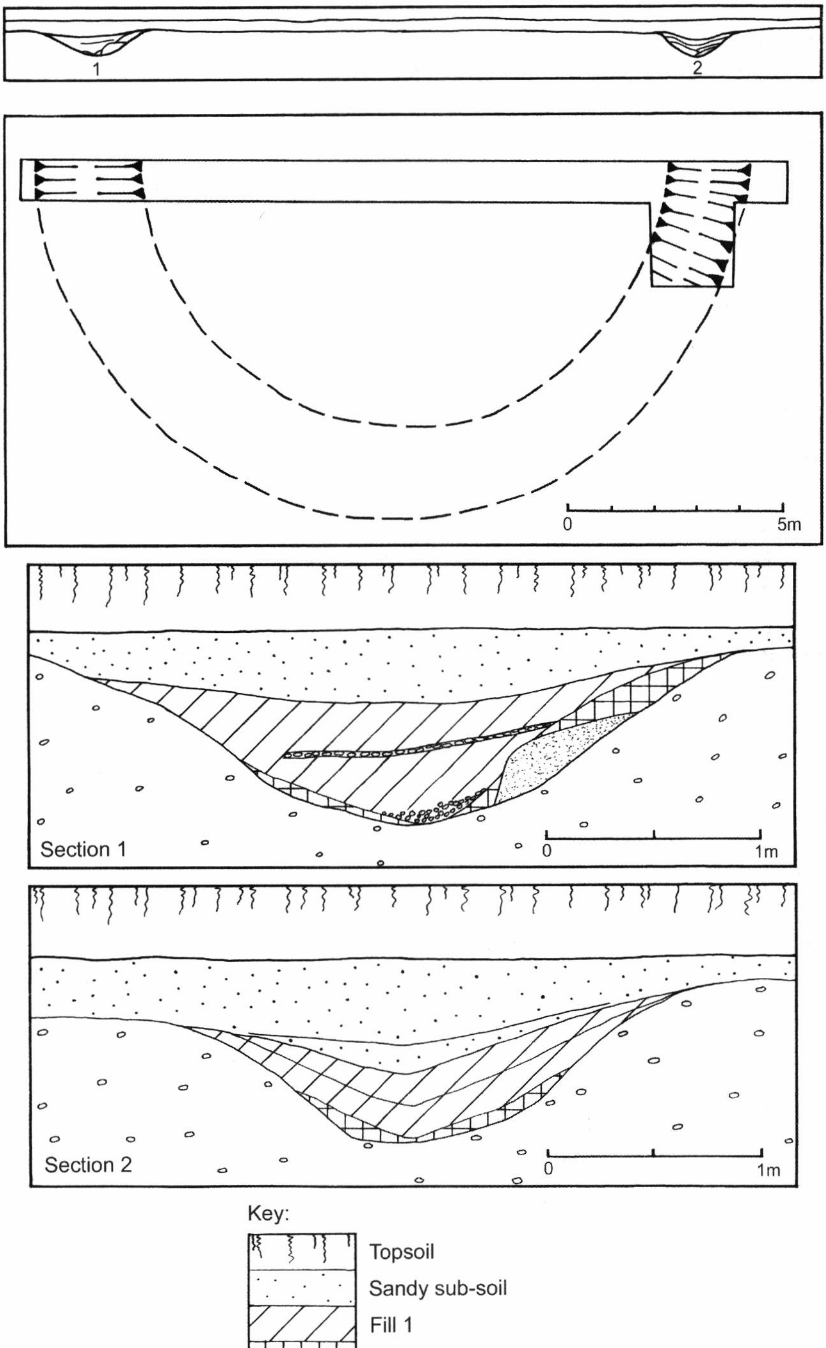
1
2
0
5m
Section 1
0
1m
Section 2
0
1m
Key:
Topsoil
Sandy sub-soil
Fill 1
Fill 2
Natural gravels

Fig. 6: Aston 2

Excavation Archive

Artefacts and material from the excavation of the two sites were deposited at Derby Museum and Art Gallery in 1967 (accession number 1967-810; 1-11). In 1996 the records of the excavation were also deposited at the Museum following the death of the excavator (accession number 1996-266). Included amongst them were two additional small collections of carbonised grain (1996-266/82 and 266/141). The storage history of this material between 1964 and 1996 is unknown, as is its relationship to the samples analysed by B. Alvey.

The cursus ditch was also sectioned during the excavation of Aston 1 and 2. No finds were made and the section drawing has been published elsewhere (Gibson and Loveday 1989, fig. 3.3).

POTTERY

By Alex Gibson

The pottery was all examined macroscopically, in good natural light and with the aid of a x10 hand lens. Seven fabric groups were identified and are described below. A representative sherd from five of these macroscopically identified fabric groups was submitted for thin sectioning and the results of this analysis are described below. Fabric group GS could not be thin sectioned as all sherds had been incorporated into the reconstructed Beaker and fabric G could not be thin sectioned as it occurred in only two small sherds. The pottery was weighed and sorted into sherd groups probably representing individual vessels in an attempt to arrive at a minimum number of vessels and these are described below.

Catalogue of Sherd Groups

The writer prefers the term 'sherd group' to the more usually used 'vessel' when dealing with fragmentary assemblages. The term 'sherd group' acknowledges that the sherds may well come from a single vessel, but in the absence of convincing conjoining sherds, there is always the possibility that these groups may represent more than 1 pot. The number of sherd groups, however, is likely to correspond to the minimum number of vessels present.

Neolithic (Carinated Bowl) (Fig. 7)

P1

Fabric V. Weight 122g. Eleven sherds (some partially reconstructed) plus crumbs from a Carinated Bowl some 320mm in diameter. The rim is rounded and everted leading to a concave neck and a well pronounced carination. The fabric is grey-brown throughout, averages 6mm thick and is heavily pitted. The surfaces have originally been well-smoothed.

P2

Fabric QS. Weight 9g. Two rim sherds from a Carinated Bowl in a hard well-fired and burnished fabric. The outer surfaces are grey and the core has a slightly pinkish colour. The rim is slightly thickened and everted and the fabric averages 7mm thick.

P3

Fabric Q. Weight 95g. Twenty-two sherds including 4 rims from a Carinated Bowl. The fabric is hard and burnished and grey externally varying to grey-brown internally. Three rims have signs of coil breaks. The rim profiles are variable from externally lipped to simple and rounded. The fabric averages 7mm thick. 1967-810/6(w)

P4

Fabric QS. Weight 89g. Sixteen sherds from a Carinated Bowl including 3 rims in a hard, well-fired and burnished fabric which averages 8mm thick. The sherds have a grey-brown outer surface and dark grey inner surface. The fabric is black. Some quartz sand visible in both surfaces.

P5

Fabric Q. Weight 44g. Shoulder sherd from a Carinated Bowl in a hard well fired and burnished fabric with grey surfaces and a black core. Shoulder is very weak and the fabric averages 9mm thick.

P6

Fabric Q. Weight 6g. Rim sherd from a Carinated Bowl with strongly everted rim and slightly flattened top. The surfaces are light grey-brown and the core is black. The fabric averages 7mm thick.

P7

Fabric Q. Weight 32g. Four body sherds in a hard well-fired fabric but with slightly cracked surfaces. The outer surface is light brown, the interior and fabric are grey. Some quartz breaks both surfaces. The fabric averages 9mm thick and the curvature of the largest sherd suggests that it is from low in the vessel's profile.

P8

Fabric QQ. Weight 104g. Thirteen body sherds in a hard fabric with slightly crazed outer surface. The outer surface is light pinkish-brown, The interior is dark grey with the surface colours meeting halfway through the sherds. Quartz inclusions are abundant and break both surfaces. The fabric averages 10mm thick and the curvature of the sherd suggests that it is from low in the vessel's profile.

P9

Fabric Q. Weight 61g. Eleven body sherds including a shoulder sherd in a grey fabric with abraded surfaces. May be abraded sherds from P7. Slightly pitted surfaces.

P10

Fabric G. Weight 5g. Rim sherd in a grey-brown to dark grey-brown fabric and with a diameter in the region of 220mm. The rim is rounded with an internal bevel and slight internal lip at the base of the bevel. Outside there is a slight dimple which may suggest decoration or, given that grog at the base of the concavity has not been pushed in but rather has been scratched and scraped flat, it may represent pre-firing damage or at least ancient damage. The fabric averages 9mm thick.

Beaker (Fig. 8)

P11

Fabric GQS. Beaker in a hard, red-brown fabric with smooth burnished surfaces and a black core. The rim diameter has been in the region of 180mm. The vessel is heavily restored and consolidated and these processes have obscured some decoration. There are a few organic voids on both surfaces. The fabric averages some 7-8mm thick. The decoration is entirely tooth comb-impressed with the short horizontal (ermine) motifs being formed by a short comb of 2-3 teeth. The decoration comprises 4 zones on the surviving part. The profile is sinuous with a rounded bulbous belly. The rim is everted.

The uppermost zone comprises 5 encircling lines.

The second zone in the lower portion of the neck comprises 5 encircling lines, a zone of short

impressions forming an ermine motif (Clarke's motif 6, motif group 1) bordered below by 6 encircling lines.
The third zone, starting at the top of the belly is similar to the 2nd but bordered above and below by 5 and 4 encircling lines respectively.
The fourth surviving zone appears to have been similar, bordered above by 6 encircling lines with traces of motif 6 just above the break.
Three lines of twisted cord impressions decorate the inside of the rim.

P12

Fabric GS. Beaker in a pink-buff fabric with a grey interior and black core. The outer surface is burnished. The rim diameter is in the region of 155mm and the height as restored is 225mm. The vessel is heavily restored towards the base. The decoration has been made with an irregular toothed comb with teeth c.1-2mm long. The rim is rounded and slightly flattened in places and the fabric averages 6-7mm thick. The internal waist angle is slightly angular.
The vessel has a sinuous profile with a slightly inturned rim, convex neck, well defined waist and a bulbous belly.
The decoration is entirely comb-impressed and is divided into 4 broad zones. The neck zone comprises 3 encircling comb lines, a row of Clarke's (1970) motif 27 (motif group 3), 3 encircling lines, a zone of Clarke's motif 32ii (motif group 4), 3 encircling lines, a zone of Clarke's motif 32i (motif group 4), 3 encircling lines, a zone of alternating vertical and oblique lines, not formally recognised by Clarke but probably akin to cross-hatching (motif 4, motif group 1) then 3 further encircling lines.
The second zone starts at the waist and comprises 3 encircling lines, a broad zone of Clarke's motif 27 (motif group 3) bordered above by double and below by triple oblique lines, then 3 encircling lines.
The third zone decorates the lower part of the belly and comprises 3 encircling lines, a broad zone of Clarke's motif 27 (filled chevron – motif group 3) then 3 encircling lines.
There are traces of a further 2 encircling lines after an undecorated band just above the restored portion of the vessel.

Bronze Age (Fig. 7)

P13

Fabric G. Weight 63g. Large base sherd with a pink outer surface. The core is grey. The inner surface is missing.

P14

Fabric Q. Weight 7g. Rim sherd in a light brown fabric with dark grey core. The rim has a concave internal bevel. The outer surface is decorated with an overlapping line of square toothed comb impressions. The fabric averages 9mm thick

Macroscopically Identified Fabrics

G	Fine crushed ?grog. Thin sectioning (Carney below) has identified shadowy fragments of black silty clay and small fragments of weakly foliated meta-siltstone which probably account for the inclusions identified macroscopically as grog.
GQS	Fine crushed grog, some occasional sand grains and sparse angular quartz <5mm across.
GS	Fine crushed grog, some occasional sand grains.
V	Voided. Soft fabric with corky appearance resulting from the leaching out of soluble

inclusions. Pitted surfaces and fabric.

Q Similar to QS but the quartz inclusions, though still sparse, are slightly larger reaching up to 3mm across. They are more angular than in fabric QS.

QS Quartz sand. The quartz inclusions are rounded and rarely over 1mm across.

QQ Like Q but the inclusions are more abundant and reach up to 5mm across.

Discussion

Neolithic

The Neolithic pottery from Aston is small and fragmentary and therefore almost certainly residual. It comprises exclusively Carinated Bowl which represents the earliest ceramic tradition in Britain and Ireland. In the original report, Ian Longworth recognised fragments of some 18 vessels represented by rims and shoulders (Longworth in Reaney 1968). This total may well be correct, however by matching vessels by fabric and finish it has been possible to estimate the *minimum* number of individual vessels as 10. The fabric generally contains quartz opening agents and is fairly uniform in terms of finish and thickness. P10 is an exception and contains grog. Longworth identified an oval impression below the rim on this sherd, interpreted this as decoration and therefore tentatively identified the sherd as 'a local form of the Ebbsfleet style' (Longworth in Reaney 1968, 81). The depression could, however, represent damage sustained in antiquity: within it are two grog fragments whose surfaces appear scratched, concave in line with the depression. If this interpretation is correct, then the sherd would fit well within the rest of the Carinated Bowl assemblage, although grog inclusions are rather unusual for this class of pottery; fabric and bevel could also be applicable to Grooved Ware or Early Bronze Age urns but are not a feature of local Peterborough Ware (P. Beswick *pers. comm.*).

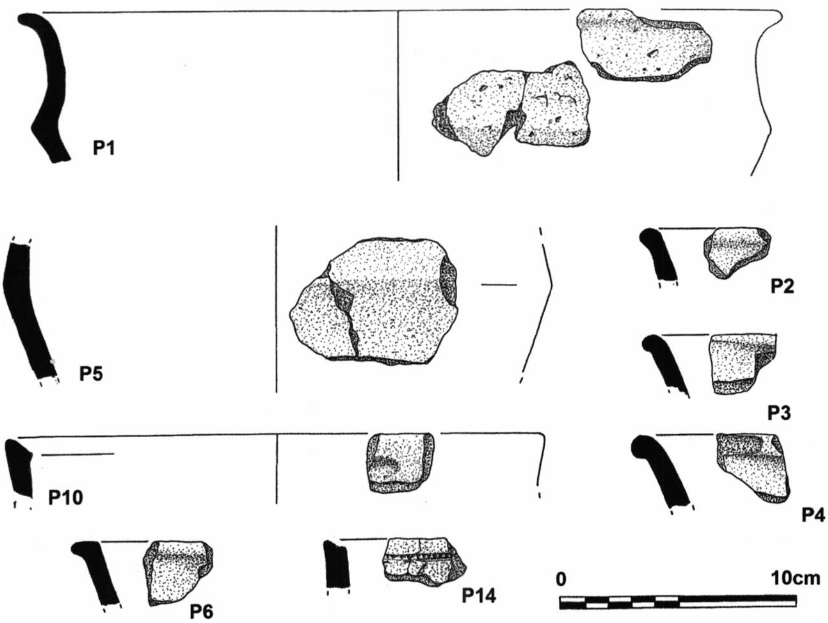

Fig. 7: Neolithic pottery and Bronze Age sherd (P14)

With an estimated rim diameter of 300-340mm, P1 is certainly the largest vessel and most complete. The pitted 'corky' nature of the fabric means that this pot also stands apart from the majority of the assemblage, though it is not unusual in Carinated Bowl assemblages generally and has been recognised in other Derbyshire material such as the 'vesicular' material associated with the structures at Lismore Fields, Buxton (Garton 1986 and *pers. comm.*), Mount Pleasant, Kenslow (Garton and Beswick 1983) and possibly also Holme Dyke, Gonalston (Parker *pers. comm.*).

Carinated Bowl is rare in the Midlands and in his review of the evidence over 20 years ago Vine was only able to list four find-spots (1982, 20-21). 'Grimston Ware' has also been recorded at Attenborough (cited by Manby in Wheeler 1979, 146). The present assemblage from Aston on Trent was at that time by far the largest, with a single stray-find rim sherd from Astonhill, and a further three sherds from the forecourt blocking, the facade and the cairn material of the Green Low chambered cairn. Since then, Carinated Bowl has been found at a number of sites in Derbyshire and the Trent Valley though unfortunately not all of them are yet fully published. Two small find-spots, a single shoulder sherd, for example, also in a quartz-opened fabric, recovered from pre-barrow contexts on the Trent gravels at Lockington, Leicestershire (Hughes 2000, fig. 28:2) and a shoulder sherd from the gravel surface within ring-ditch 4 at Aston-on-Trent (Gibson and Loveday 1989) are interesting in their own right but make little contribution to the advancement of the local study of this style of pottery. The Neolithic pottery from Barrow IV at Swarkeston Lowes, Derbyshire, like the present assemblage, comes from a pre-barrow spread (Greenfield and ApSimon 1960). From the same general horizon as Beaker pottery, it must be regarded as comprising residual evidence of occupation.

At Willington, Derbyshire, over 20 sherds were discussed by Manby (in Wheeler 1979, 146) and are recorded as coming from pits and postholes within two areas more noted for their Grooved Ware-associated features. The use of quartz opening agents in the fabrics again draw close parallel with the Aston on Trent assemblage as do the upright and outwardly flaring rim forms (Wheeler 1979, fig. 58). Similarly from the more recent excavations at the same site a small early Neolithic element was found, though Peterborough Ware was the predominant ceramic (Beamish, 2009). The fabrics are once again opened with quartz and both open and closed forms of vessel are present (Woodward in Beamish 2009, 88).

An important Carinated Bowl assemblage has been published from the Great Briggs ring-ditch at Holme Pierrepont (Guilbert 2009). The 39 vessels illustrated from this site compare well with the present assemblage in terms of rim forms, degrees of carination, colouration and use of quartz opening agents. The petrological examination of this material by Firman and Williams (in Guilbert 2009, 108-113) has suggested that the material is not local to Holme Pierrepont but rather is derived from further afield, in all probability from the Charnwood Forest area of Leicestershire. This may be important in consideration of Loveday's hypothesis that the cursus monuments of Aston and Potlock may have been pivotal in the distribution of Group XX stone axes from Charnwood Forest to the Peak District (Loveday 2006, 134-5). By contrast, the generally quartz-tempered fabrics from the present site could all be of local origin (Carney below). It is interesting to note that Dr Carney has suggested that some of the crushed quartz opening agents encountered in the Aston material may represent an element of deliberate selection. If this is the case, then this might also possibly be extended to the other quartz-rich fabrics from the East Midlands mentioned above given the apparent similarities in their fabric recipes. The deliberate selection of opening materials, specifically quartz, has already been remarked upon in later ceramic assemblages, particularly Peterborough Ware (Gibson 1995). Occurrence of quartz on Neolithic and Bronze Age ritual sites may suggest that this white rock had a special significance, perhaps even a distinctive mythology, within Neolithic and Bronze Age society. Reaney's recovery of '...a small quartz pebble that had been subjected to intense heat' along with three flint flakes in the central 'burial' pit of Weston 1, a ring ditch some 500m from the south-western terminal of the cursus, supports the idea that quartz was being isolated for particular treatment in the area, albeit at what can be presumed to be a considerably later date (Reaney 1964b; 1968,76). Indeed the deliberate selection of intentionally added inclusions may have had more than a simply utilitarian role throughout Prehistory (Gibson 2002, 31).

Recent and judicious radiocarbon dating of Carinated Bowl is confirming its early appearance at the start of the Neolithic. In her recent review of the evidence from Scotland and Northern England, with the benefit of easily accessible calibration packages and increased scrutiny of the radiocarbon evidence, Sheridan has demonstrated a case for a date range between 4000-3500 cal BC for this material (Sheridan 2007). Carinated Bowl from Coupland, Northumberland, with both everted and upright rim forms similar to Aston, has some of the earliest reliable dates for this ceramic type (e.g. pit 1: 3760-3540 cal BC (OxA-10638: 4880±45 BP); pit 2: 3990-3700 cal BC (OxA-6833: 5060±60 BP); pit 3: 4040-3710 cal BC (OxA-6832: 5090±60 BP)) (Gibson in Passmore and Waddington 2009, 187-9). The date of 3950-3660 cal BC (SUERC-28362) on the hazelnut shell from 1996-266/82 and the dates obtained from the earlier phase of grain deposition at Aston are entirely in keeping with the early dates so far recorded for Carinated Bowl. The dates from Holme Pierrepont, though later than the Coupland dates, nevertheless fall within the general date range for Carinated Bowl overlapping with the appearance of early decorated styles generally associated with the Midlands causewayed enclosures such as Briar Hill, Northamptonshire (Bamford 1985) and Etton, Cambridgeshire (Pryor 1998). The recently discovered causewayed enclosure at Husbands Bosworth, Leicestershire (Clay 1999) remains to be fully published as do finds of early Neolithic pottery from Holme Dyke, Nottinghamshire, Lismore Fields, Derbyshire and Eye Kettleby, Leicestershire (Parker *pers. comm.*). This aside, the Neolithic of the Trent Valley and the East Midlands is at last starting to show itself.

Beaker

Sherds representing 2 Beakers (P11 and P12) were recovered from the 1964 excavations (Fig. 8).

P11 was described as a W/MR Beaker according to Clarke's (1970) scheme and, being associated with a wristguard and a barbed and tanged arrowhead, is assumed to have derived from a leached burial. Certainly the sinuous profile, everted rim and zoned decoration might suggest a W/MR Beaker. However the internal decoration is absent from Clarke's W/MR corpus being more common on European (E) Beakers (e.g. Stogursey, Somerset (Clarke No. 818) and Thickthorn, Dorset (Clarke No. 184)) and All Over Cord (AOC) Beakers (e.g. Ardnamurchan, Argyll (Clarke No. 1527) and Mortlake, Surrey (Clarke No. 980)). These examples also closely match the form of P11 although the latter three have slightly more angular belly profiles. Internal decoration can also be found on a vessel of Clarke's Northern/Mid Rhine (N/MR) group from Dalry in Ayrshire (Clarke No. 1558), but in comb rather than cord, whilst on a Primary Northern/Dutch (N^1/D) from Goodmanham 99 in Yorkshire (Clarke No.1311) a total of 12 internal cord lines are found despite the external decoration being combed.

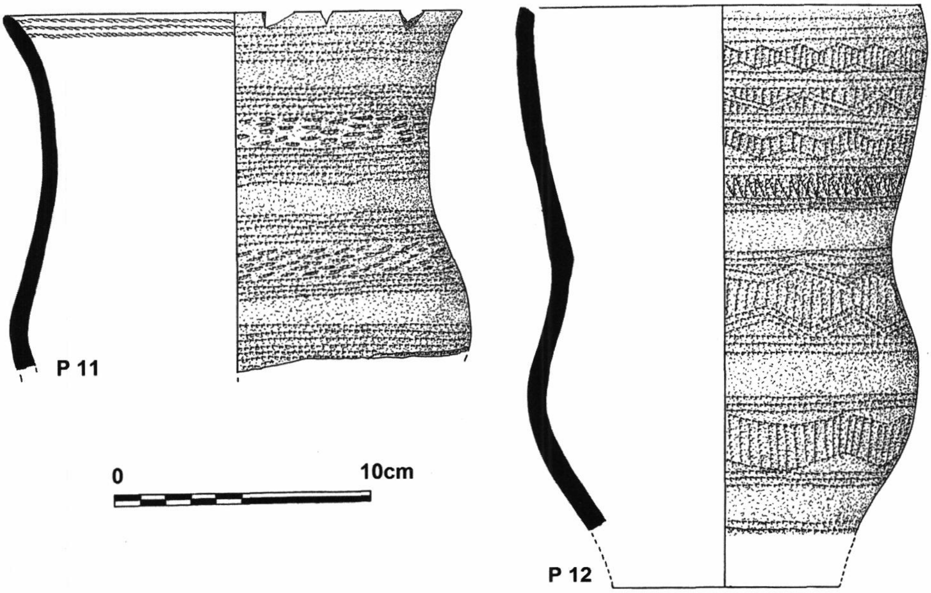

Fig. 8: Beakers

The short-combed ermine motif on the outside of the vessel can be paralleled on a W/MR Beaker from Dorchester XII, Oxfordshire (Clarke No. 735) that was also associated with a wristguard, and on a N/MR Beaker from Poltalloch, Argyll (Clarke No. 1551), though both vessels have slightly taller profiles than the Aston pot. N^1/D vessels from Lunanhead, Angus (Clarke No. 1525) and Kinneff, Kincardine (Clarke No. 1688), and a Developed Southern (S^2) Beaker from Rusden Low in Derbyshire (Clarke No. 145), also employ the ermine motif but within a more complex, zoned decorative scheme. Its repetition, as found on the Aston Beaker, appears rare amongst comb-decorated Beakers. An exception is a Barbed Wire (BW) Beaker from Chagford, Devon (Clarke No. 156) that also parallels the slightly oblique angle of the Aston short impressions. The closest parallels for the decoration (but not necessarily the shape) comprise a Developed Northern Beaker (N^2) from Minning Low, Derbyshire (Clarke No. 140) and a belly sherd from Kenslow, Derbyshire (Vine 1982 No. 354). On the former the ermine motif is repeated in 4 contracted zones, but again is combined with other motifs, while the latter bears two zones of ermine interspersed with horizontal lines and narrow zones of cross-hatching.

Certainly the formal and decorative features suggest that P11 is early in both Clarke's stylistic scheme (Clarke 1970) and the stepped scheme of Lanting and van der Waals (1972) where it equates to step 3 in the 7-stepped sequence. The sinuous profile of the pot, however, would place the vessel in Needham's low-bellied S-profiled group (Needham 2005). These vessels belong to Needham's post-Fission Horizon group, *c.*2250-1950 BC.

P12 is a tall, elegant long-necked Beaker with contracted decorative zones in the neck, waist, belly and at the base, although this lowest zone is represented purely by two encircling combed lines above the restoration. Once again, and indeed as is the case with all Beakers, it is difficult to find an exact parallel for the decorative scheme, rather the decoration comprises well known and frequently used motifs in a unique combination. The use of cross-hatching and filled and reserved chevrons is found on a Developed Northern (N^2) vessel from Garton Slack 161, Yorkshire (Clarke No. 1303) and the neck and belly form is not dissimilar to the Aston vessel. Another vessel from Garton Slack 163 has similarly complex decoration but has a much shorter neck than the present vessel (Clarke No.1306). The chevron-based complex neck decoration incorporating motif 27 is found on N^3 vessels from Felixstowe, Suffolk (Clarke No. 885) and Ardoe, Aberdeen (Clarke No. 1425) indicating the geographic spread of the motif. It is also found on both the neck and belly of N^3 vessels from Hempholme, Yorkshire (Clarke No. 1327) and North Sunderland, Northumberland (Clarke No. 696). A third vessel from Garton Slack (Barrow 75 – Clarke No. 1298) interestingly combines the filled running chevron of P12 and the ermine motif of P11. The shape of this S^1 vessel with its bulbous belly and long, slightly in-turned neck is also similar to Aston P12. This is also the case with the S^3 Rusden Low vessel mentioned above which combines filled running chevron on the neck, ermine motif on the belly and whose neck and rim forms also bear comparison with the present vessel.

In short, P12 combines decorative motifs normally found in Clarke's Northern series whilst the form of the vessel finds more parallels within the Southern Series. In Lanting and van der Waals's (1972) scheme, the vessel would be late, approximating to step 5 or 6. In Needham's (2005) scheme it belongs to the long-lived tradition of long-necked Beakers ranging from 2250-1750 BC, although the decoration suggests that the vessel belongs to the middle part of that period, say 2100-1800 BC. There is therefore, according to current thinking, a considerable overlap in the currency of both types of Beaker found at Aston.

Beaker in the Trent Basin is also becoming increasingly known and indeed Swarkeston IV provides some rare evidence for Beaker structures (Greenfield and ApSimon 1960). Beaker was also found at Willington (Wheeler 1979; Beamish 2009) and the spectacular finds of gold and bronze metalwork with the two fragmentary rusticated Beakers from Lockington (Hughes 2000) have received considerable attention. Beaker pottery was also found in small amounts during the excavations at Aston ring-ditch 4 (Gibson and Loveday 1989) suggesting that its presence at Aston may not necessarily be localised. At all these sites, though fragmentary, the decorative schemes employed suggest that the vessels are comparatively late in the Beaker chronology.

Bronze Age

The thick base with grog opening agents is undecorated but clearly from a large vessel. It is most likely to be from a Collared Urn which type of vessel frequently occurs in grog-opened fabrics.

The internally and concave bevelled rim of P14 with its horizontal impressed line also suggests a vessel in one of the Urn traditions (Fig. 7). A similar rim from Willington was identified as possibly belonging to a Cordoned or Biconical Urn (Woodward in Beamish 2009, 97). The small size of the sherd in question would render further discussion inappropriate as it would reduce it to conjecture, especially as such concave-bevelled rims are also found on bowl and vase Food Vessels in the area.

POTTERY PETROGRAPHY

By John N. Carney

Five samples of pottery sherds were submitted for thin section preparation and petrographical examination at the BGS.

Quantity	Fabric	Weight	Vessel
1 sherd	V	2g	P1
1 sherd	QS	3g	P2
1 sherd	Q	4g	P7
1 sherd	QQ	4g	P8
1 sherd	GQS	3g	Beaker P11

Table 1: Sherds sent for thin sectioning.

Fabric GQS

The clay **matrix** is dark red-brown. **Inclusions**: all are very small, ranging from silt to fine sand in grain size. The dominant type consists of crystal fragments. Quartz fragments are the most abundant; some have strained extinction indicating ultimate derivation from a metamorphic parent rock. Other crystal fragments comprise potassium feldspar (K-feldspar).

Fabric Q

The **matrix** consists of red-brown clay. **Inclusions**: the most abundant are very fine silt to sand grain size, and mostly consist of rounded to highly angular quartz. Features indicate derivation of the quartzose fragments from metamorphic rocks.

Fabric QS

The **matrix** consists of dark to pale red-brown clay. **Inclusions**: the most abundant are of very fine silt to sand grain size consisting of rounded to highly angular fragments of quartz. The narrow, sliver-like shapes of many inclusions suggest that the parent rock possessed a metamorphic foliation.

Fabric QQ

The **matrix** consists of dark to pale red-brown clay. **Inclusions**: the most abundant are of very fine silt to sand grain size. These mainly consist of rounded to highly angular fragments of quartz. There are also fragments of fine-grained, quartz-rich siltstone with sporadic flakes of detrital mica (muscovite).

Fabric V

The **matrix** consists of dark red-brown clay. There are abundant fractures and cavities. Many of the microscopic cavities have lath-like outlines, suggesting that these are sites where mica flakes were originally present. **Inclusions**: these are entirely of silt to fine sand grain size.

The dominant type consists of quartz. A small grain of plagioclase feldspar is also present, suggesting a minor input of igneous material.

Potential local sources of inclusion material

Silicate inclusions in pottery present very fragmentary glimpses of likely parent lithologies. Despite these limitations, however, most of the Aston inclusions suggest an ultimate derivation from quartz-rich, metamorphic rocks. These do not crop out in the English Midlands, with the exception of extremely small areas around Rushton far to the west. However, quartz-rich pebbles are very common in sandstone and conglomerate strata of Triassic and Carboniferous age that crop out locally. Millstone Grit sandstones have small pebbles; they crop out extensively in the Dark Peak area of Derbyshire and are also found in South Derbyshire, around Melbourne, just to the south-west of Aston. Particularly high concentrations of quartz pebbles, some of relatively large (cobble) size dimension, characterise conglomeratic sandstones of Triassic age, notably the Nottingham Castle Sandstone Formation. These strata have extensive local outcrops bordering the Trent valley; for example, around Nottingham and the Foremark Reservoir in South Derbyshire.

Given the location of the pottery site, further sources to be considered are the alluvial gravels and river terrace deposits of the Trent floodplain. Quartz-rich pebbles and cobbles are preferentially concentrated within these deposits, due to their resistance to abrasion and dissolution. Such pebbles are diverse in type. In view of this, the fact that the pottery inclusions mainly consist of meta-quartzite suggests that these types of pebbles were especially selected for use as temper. This could be because of their hardness, or their ability to flake and split easily along foliation planes, or they may have certain features (e.g. colour, coarse banding) that enabled them to be distinguished from the many other types of pebbles.

Potential local sources of the pottery clay

In this region, Mercia Mudstone, Thrussington Till and Alluvial clay and silty clay are ubiquitous and are therefore considered to have the best potential for pottery clay source material.

FLINT

By Lynden Cooper

The preserved collection comprises 18 flints. The raw material was a semi-translucent flint of good quality, a type typical of East Midlands assemblages. However there remains some uncertainty regarding its exact local source: small nodules of the flint can be found in the Trent terraces but its ultimate origin must have been from the Anglian till.

The excavated collection also included three other pieces that were sketched but are now missing (Fig. 9). These comprised an Early Bronze Age barbed and tanged arrowhead (from the same level as, but 0.50m south of, the wristguard and Beaker P11), a Neolithic leaf-shaped arrowhead (from the old land surface or primary barrow), and a Neolithic/Bronze Age scraper (close to the present surface) (Reaney 1968, 71, 73). A second illustrated 'scraper' is in fact not such, but can be described as an atypical discoidal retouched piece. The shallow angle of the retouched edge suggests that it may have functioned as a knife.

Fig. 9: Original drawings (no scale) of a leaf-shaped arrowhead and a barbed and tanged arrowhead (both lost).

The predominant technology seen in the remainder of the collection is that of bladelet manufacture. It comprises five secondary and three tertiary bladelets, a small utilised blade and two pieces with bladelet scars. These are likely to be Mesolithic pieces residual in later features.

BRACER

By John Hunter, Fiona Roe and Anne Woodward

J. Hunter and A. Woodward

The bracer measures 74.5mm (max length) x 38.0mm (midpoint width) x 4.5mm (max thickness). It is made from fine-grained rock which petrographically appears to be an amphibolite with some resemblance to nephrite. The precise source is unknown, but is possibly in the south-west of Britain and the bracer is not local to its findspot. It is coloured greenish grey (5G 7/1) and is fairly translucent in appearance with some mottling and darker green veins. One corner is missing but it was approximately 98% present at the time of deposition, fractures and chips having occurred either in manufacture or in use. The front surface is highly polished; there are also faint traces of manufacturing marks on both the front and rear faces. This is a very finely made piece with four perforations and is seen as slightly worn.

Leverhulme Early Bronze Age Project ID 107 (Woodward *et al.,* in prep.) (Derby Museum and Art Gallery (A235) 810-3-67; Reaney 1968, 68-81 (not illustrated); Vine 1982, 315, no. 167).

F. Roe

The bracer belongs to Atkinson's type B (rectangular, flat sectioned) that Clarke noted are almost exclusively associated with Wessex/Mid Rhine Beakers and exhibit the preferred colours of blue-grey or grey-green (1970, 98).

This bracer is not an isolated occurrence, since others of comparable type are known from the East Midlands and have been included in a recent survey (Woodward *et al*, forthcoming). There is a second find from Derbyshire, a six-holed example that came from plough soil near

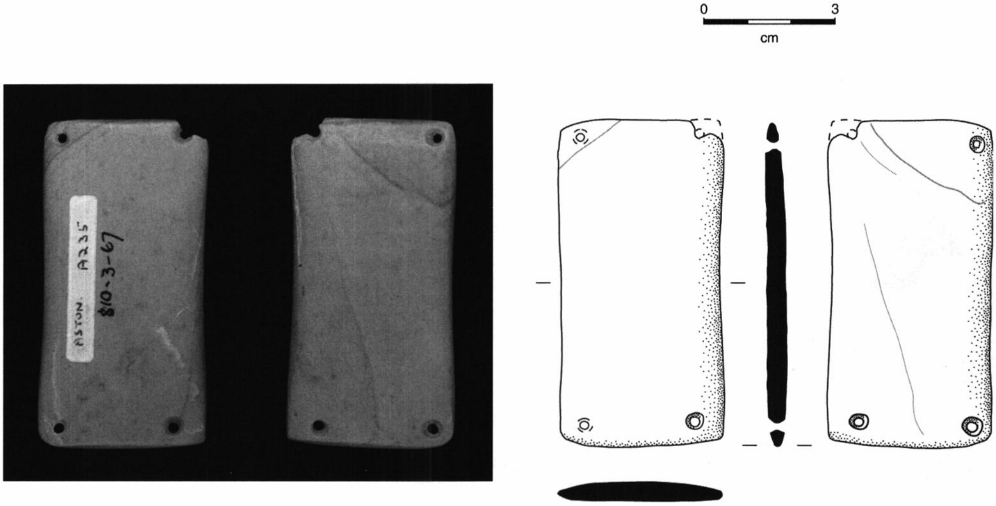

Fig. 10: Bracer (courtesy of John Hunter and Ann Woodward; drawing courtesty of Fiona Roe).

Aleck Low (Hart 1985, 56 and fig. 3,4). The type of stone used to make this bracer has not been determined, but others have been analysed by X-ray fluorescence and shown to be made from the same fine-grained amphibolite as the bracer from Aston (Woodward *et al.,* in prep.). There are to date no records of such bracers from Nottinghamshire and Leicestershire, but there are a couple of two-holed ones from Northamptonshire, from Upper Heyford and Duston (Clough and Cummins 1988, Np 13 and Np 37, 185-6). A closer comparison, morphologically, can be made with a four-holed amphibolite bracer from Calceby, Lincolnshire (May 1976, 91, fig. 52,2). These bracers, other than the one from Aston itself, have all been loose finds. For some comparable bracers from burial contexts one must look southwards , where bracers from Beaker grave groups are of more frequent occurrence, especially in the Wessex area (Woodward *et al.*, in prep.). Two such grave groups, with four-holed bracers of similar proportions and made from the same fine-grained amphibolite, can be quoted; one is from Sewell, Bedfordshire (Clarke 1970, 574, fn 57 and pl. 3), where the Beaker is of Clarke's Wessex/Middle Rhine type and also belongs within Needham's Low Carinated group (Needham 2005, 215 and fig. 5, 7), while the other is from Pyecombe, Sussex (Butler 1991, 8 and fig. 6, 2), where the Beaker has been assigned to Needham's Tall Mid Carinated group (2005, 215 and fig. 6, 6). These varieties of Beaker fit well with Needham's assessment of the Aston Beaker as either a Low or Mid Carinated variety (*pers. comm.*). It can be seen from this brief review that the bracer found at Aston belongs within a group of flat bracers that may have two, four or six holes, all of which are made from the same variety of stone and some of which have Beaker associations that put them within the primary package in the Needham scheme (2005).

CHARRED PLANT REMAINS

By Angela Monckton and Robert Alvey

Introduction

Excavations were carried out at Aston-on-Trent by D. Reaney in the 1960s (Reaney 1968). No details of the cereal remains were published but some cereal samples from the site were identified in 1964 by Bob Alvey and the information from the archive report is described and tabulated below. However, it is uncertain which sample, or even if any of these samples, was dated by BM-271 (Barker *et al.* 1969) because the details have been lost.

Recent re-examination of the archive has failed to identify Alvey's original samples although some charcoal samples survived from the excavation: Accession 1967-810. The archive also contained two additional samples containing carbonized grain that were donated later to Derby Museum by the family of the excavator: Accession 1996-266/82 and 1996-266/141. They lack context information but scrutiny of the records of other sites excavated by D. Reaney reveal no other sources of either carbonised grain or Neolithic material. They are likely therefore to represent some part of the residue of the samples examined by Alvey. They are described separately below.

Original analysis Robert C. Alvey

Nine samples were recorded in the archive report (Alvey 1964). The carbonized plant remains were identified and counted. A selection of cereal grains from each sample was measured and their length, width and thickness recorded. The results are summarised below (Table 2). Chaff fragments were also identified and some measured. Four grains from the first and second samples were illustrated to show their shape in longitudinal and transverse profiles; two spikelet forks from sample 2 were also illustrated in the archive. The wheat grains and chaff (spikelets) were identified as emmer (*Triticum dicoccum*) with two possible barley grains (*Hordeum* sp.) in one sample, and fragments of hazel nutshell (*Corylus avellana*) in four of the samples. Numbers of broken grains were estimated (Table 2).

The first sample was described as '...from the Neolithic levels below a Bronze Age barrow. It was sealed from the above Bronze Age levels by 4 - 6 inches (10-15cm) of gravel, and 3 ft 8 inches (*c*.1.12 m.) below the present ground surface. The sample is taken from a hearth-like structure'. Sample 2 appears to be from the same feature. As the interim report (Reaney 1968) records grain deriving solely from the single hearth identified during the excavation, and a few inches of the abutting gully, it seems reasonable to conclude that samples 5 and 6 were taken from the former and 3 and 4 from the latter. Unfortunately the imprecision of the feature descriptions makes this uncertain.

Other samples 10.11.64 page 7 of Archive Report

A7: Sieved from hearth, only very fine charcoal fragments.

A8: Pit SE corner, ref. G7, fine charcoal.

A9: Dark Area, new box depth 1 ft 8 inches, one hazel nut shell fragment and pieces of charcoal.

Additional analysis Angela Monckton

The grains illustrated all have triangular transverse profiles, flat ventral profiles, and mainly

Alvey's samples:	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**
Date examined:	3.10.64	-	10.11.64	22.11.64	10.11.64	-
Page in archive report:	p.1-2	p.3-4	p.5	p.6	p.7	p.8
	Hearth-like structure Neo level	Sample 2	Lower gully or ditch fill	Central ditch fill Neolithic level	Hearth vicinity of ditch, N side	Hearth
Emmer grains	81	549	114	80	105	*c*.230*
Emmer spikelet bases (chaff)	-	4	-	-	-	22
Barley grains	-	-	2 ?	-	-	-
Hazel nutshell frags.	13	12	-	18	-	41
Alder section	-	-	-	1	-	-
Charcoal fragments	-	(67)	++	++	++	-
Charred twig fragments	-	-	-	-	(2)	-
Average dimensions						
Grain length (mm)	5.73	5.87	5.79	5.51	5.30	5.56
Grain width (mm)	3.01	3.16	3.04	2.96	2.85	2.85
Grain thickness (mm)	2.71	2.86	2.77	2.54	2.62	2.51
Number measured	(25)	(25)	(20)	(20)	(15)	(25)

Table 2: Archive report summary of results (Alvey 1964).

Key: + = present, ++ = abundant. * = approx number of grains because crushed and broken humped dorsal shape, consistent with identification as emmer (*Triticum dicoccum*). The dimensions recorded fall within the size range for emmer, and the ratio length/height was calculated and found also to be consistent with this species (Jacomet 2006). The two 'spikelets' illustrated from sample A2 are whole spikelet forks; all the chaff is referred to as spikelets in the report. Those measured here are of small dimensions and appear to be of emmer.

Sample volume is not recorded. Bob Alvey remembers that one was in a small packet (R. C. Alvey *pers. comm.* 26.3.2004). These are likely to have been taken as spot samples when charred grains were seen. Hence, these samples probably represent a high concentration of remains at places in the soil. The usual method at the time was to wash or dry sieve samples on a very fine mesh so small fragments would be retained. Sample A7 is described as 'sieved from hearth' so any small chaff fragments or seeds would have been retained. The sample sent for radiocarbon dating (BM-271) was from '...some 400 grains provisionally identified as emmer from the immediate vicinity of the hearth, mainly from the upper part of the pit'. (Reaney 1968, 77).

Analysis of samples from the archive

Samples remaining in the archive at Derby Museum consisted of nine small samples from Accession 1967-810 of soil, charcoal, hazelnut shell and one labelled '...fine material from hearth'. The latter, 1967-810/8a, contained a few fragments of chaff and fragments of wheat grains, possibly emmer, and a few charred seeds of grasses and sedges. Charcoal was identified (Morgan below) but fragments of wheat grain from this sample failed to produce a radiocarbon date (Meadows *et al.* below).

Two additional samples labelled carbonised grain (Derby Museum 1996-266/82 and 141) were sorted using a stereo microscope x10-x30 magnification and the charred plant remains identified and counted. The samples were small and resembled flots or small samples washed on a fine sieve; small charred fragments were present. The post excavation integrity of these samples prior to accessioning by Derby Museum is unknown.

Identification of the cereals was carried out by comparison with modern reference material. The grains were mainly large in size and well developed prime grains, which were consistent with emmer, having triangular transverse profiles and dorsal ridges where the grain was held by the chaff. The size and the proportions of length/height of the measured grains fell into the published ranges (Jacomet 2006), and they also compared well with the grain recorded by Alvey (1964) (Table 2). The spikelet forks had the typical form and scar of attachment of emmer. A few damaged fragments could not be identified further so were classed as glume wheat. There were many broken grains so the numbers were estimated by pairing longitudinal fragments and counting the embryo end of the rest. The grain in sample 141 was generally larger in size than sample 82. Sample 141 compared with Alvey's samples in having little chaff, while sample 82 had the most chaff. Both these samples contained hazel nutshell (Table 3), and oak charcoal. Selected grains were submitted for radiocarbon dating (Meadows *et al.* below) that supported the attribution of the assemblage to the early-mid fourth millennium cal BC.

Discussion

Alvey's samples A1-A6 are all described as being from the Neolithic levels and all contain high numbers of grains, mostly very high for the period. Chaff is present in only two of the samples and although a rare find in Neolithic samples in the region, it is in small numbers

Accession 1996-266	**82**	**141**	
Date examined:	2009	2009	
Sample volume	30mls	22mls	
Emmer grains	52	55	*Triticum dicoccum* Schubl.
cf. Emmer grains	62	157	*Triticum cf. dicoccum*
Cereal grains	17	132	Cereal indeterminate
Emmer spikelet forks	25	2	*Triticum dicoccum* Schubl.
Glume bases	19	3	*Triticum dicoccum* Schubl.
Wheat glume bases	3	-	*Triticum* sp. chaff
Hazel nutshell frags.	119	74	*Corylus avellana* L.
Charcoal fragments	++	+	Charcoal, oak
Average dimensions (mm)			
Grain length	5.47	6.32	Grain length (mm)
Grain width	2.82	3.43	Grain width (mm)
Grain thickness = height	2.65	2.78	Grain height (mm)
Number measured	25	6	Number measured

Table 3: Charred cereals from archive samples.

relative to the grain. It is known that the glume wheats require extra processing after threshing which breaks the ears into spikelets. This can be done by parching and pounding the spikelets to free the grain from the chaff (Hillman 1981) although it may have been carried out without exposure to fire in the Neolithic (Nesbitt and Samuel 1996) with small batches being processed as required. Whilst chaff burns away more easily than grains (Boardman and Jones 1990), there is so little in these samples that they appear to represent cleaned grain. Hazel nutshell fragments present in four of the samples probably represent food waste, although a role as kindling cannot be excluded (Jones and Rowley-Conwy 2007, 400). Food waste and grains burnt accidentally during food preparation seem to be indicated.

Cereal grains are found on many Neolithic sites, although mainly in small numbers; they are a usual part of the Neolithic economy (Moffett *et al.* 1989). Hazel nutshell fragments usually outnumber grains since, unlike cereals, they represent waste for disposal (Robinson 2000). Finds from other pits in the region, mainly of Later Neolithic date, include cereal grains in small numbers with more hazel nutshell fragments and some other wild fruits such as crab apples (e.g. Castle Donington: Monckton 2004, 2006). The samples here differ in the cereal grains outnumbering other remains. Numbers are exceptional (*cf.* Moffett *et al.* 1989; Monckton 2004, 2006); only Lismore Fields, Buxton produced grain in higher figures. On that site charred emmer was found in contexts associated with Earlier Neolithic houses and interim information suggests it mostly comprised waste from food preparation as on Iron Age sites (Jones and Rowley-Conwy 2007). Most of the Aston 1 samples consist of cleaned grain and show that emmer was being prepared for food at the site in the Early Neolithic period. As at Lismore Fields, cultivation of the crops in the locality implies permanency of occupation by at least a segment of the population.

During the cursus phase cereals may also have been brought in from nearby, but more dating evidence is needed from the monument before any material from this site can be confidently associated with it..

CHARCOAL

By G. C. Morgan

1967-810	6 (c)	oak	fragments
		pottery	fragments
	9 (a)	oak	fragments (67)
	9 (b)	oak	fragments
	9 (c)	oak	fragments
		poplar or willow	fragments
	9 (d)	oak	fragments
		bituminous coal	
	9 (e)	oak	fragments
1996-266	82	oak	fragments
	141	oak	fragments

Table 4: Charcoal samples.

This collection was mainly Oak, *Quercus* spec., with a single find of Poplar or Willow; *Populus* spec or *Salix* spec. There were possible fragments of fired clay and coal / par-burnt coal in several samples.

RADIOCARBON DATING

By J. Meadows, C. Bronk Ramsey, and G. Cook

Radiocarbon dating was used to address three issues:

- to confirm the date of the carbonised emmer found in and around Pit 3, previously based on the measurement of a bulk sample submitted by Reaney to the British Museum laboratory (BM-271, 4700 ±150BP, 3790–3020 cal BC, 95% confidence), by dating a number of individual grains
- to attribute this important archaeobotanical assemblage to a narrower date range within the Early Neolithic
- to thereby provide a more precise date for the use of Pit 3, and a more precise *terminus ante quem* for the sherds of Carinated Bowl(s) found in its fill (Gibson above).

Sixteen new short-lived samples were submitted for radiocarbon dating, but only seven of these could be dated. The results (Table 5) support the attribution of the charred grain, and by implication the pit and the pottery assemblage, to the early-mid fourth millennium cal BC, but also indicate that the sequence of deposits within the Early Neolithic occupation may have been more complex than was apparent when the site was excavated.

BM-271 (Barker *et al.* 1969, 288) was a bulk sample of emmer grain lining the upper part of a small pit, submitted to the British Museum laboratory shortly after the excavation. It was dated by Gas Proportional Counting, as described by Barker and Mackey (1968). At this time, rather than measuring $\delta^{13}C$ for each sample to account for fractionation (Stuiver and Polach 1977), the laboratory increased the reported error in the radiocarbon age by ±80. Considering the measured $\delta^{13}C$ values for the new emmer samples (Table 5), this increase (equivalent to assuming a $\delta^{13}C$ value of -25 ±5‰) is probably excessive.

The new samples were dated by Accelerator Mass Spectrometry (AMS) at the Oxford Radiocarbon Accelerator Unit at Oxford University, following methods given by Bronk Ramsey *et al.* (2002; 2004), and at the Scottish Universities Environmental Research Centre in East Kilbride (relevant procedures are described by Vandenputte *et al.* (1996), Slota *et al.* (1987), and Xu *et al.* (2004)). Internal quality assurance procedures and international inter-comparisons (Scott 2003) indicate no laboratory offsets, and validate the measurement precision given.

Laboratory code	Sample	Identification	$\delta^{13}C$ (‰)	Radiocarbon age (BP)	Calibrated date (95% confidence)
OxA-21061	1967-810/9d-#1	*Quercus* sp. roundwood charcoal	-25.7	5037 ±31	3960–3710 cal BC
SUERC-24957	1967-810/9d-#2	*cf. Betula* sp. charcoal	-24.7	5370 ±30	4330–4060 cal BC
GU-19375	1967-810/8a-#1	*cf.* emmer (fragment)	-	failed	-
P25455	1967-810/8a-#2	*cf.* emmer (fragment)	-	failed	-
P25685	1996-266/82A	emmer grain (whole)	-	failed	-
SUERC-25943	1996-266/82B	emmer grain (whole)	*	4770 ±50	3650–3370 cal BC
P25931	1996-266/141C	emmer grain (whole)	-	failed	-
P25932	1996-266/141D	emmer grain (whole)	-	failed	-
GU-20720	1996-266/82G	emmer grain (whole)	-	failed	-
GU-20721	1996-266/82H	emmer grain (whole)	-	failed	-
GU-20722	1996-266/82J	emmer grain (whole)	-	failed	-
P26808	1996-266/141K	emmer grain (whole)	-	failed	-
OxA-22081	1996-266/141L	emmer grain (whole)	-22.9	5024 ±35	3950–3700 cal BC
SUERC-28362	1996-266/82 hazel	hazelnut shell (fragment)	-26.8	4995 ±40	3950–3660 cal BC
SUERC-28361	1996-266/82Y	emmer grains (bulk)	-24.8	4990 ±40	3940–3660 cal BC
SUERC-28360	1996-266/82X	emmer grains (bulk)	-24.6	4835 ±40	3700–3520 cal BC

Table 5: Radiocarbon dating results.

* this sample produced insufficient material for a separate mass spectrometer measurement of $\delta^{13}C$, so the radiocarbon age was corrected for fractionation using the AMS measurement of $\delta^{13}C$.

The results are conventional radiocarbon ages (Stuiver and Polach 1977), which have been corrected for fractionation using measured $\delta^{13}C$ values (except for SUERC-25943, for which a value of -23‰ was assumed). They are quoted according to the format known as the Trondheim convention (Stuiver and Kra 1986). The calibrated date ranges have been calculated by the maximum intercept method (Stuiver and Reimer 1986), using the program OxCal v4.1 (Bronk Ramsey 1995; 1998; 2001; 2009) and the IntCal09 data set (Reimer *et al.* 2009), and are quoted in the form recommended by Mook (1986), rounded outwards to decadal endpoints.

Figure 11 shows the calibration of the radiocarbon results by the probability method (Stuiver and Reimer 1993), again using OxCal 4.1 and the IntCal09 calibration data. For comparison, a single date from the Aston-on-Trent cursus is also shown (Beta-100928, 4780 ±70BP, 3700–3370 cal BC). This sample was a waterlogged twig from the basal fill of the cursus ditch, which should date to around the time of the monument's construction (Elliott and Garton 1995).

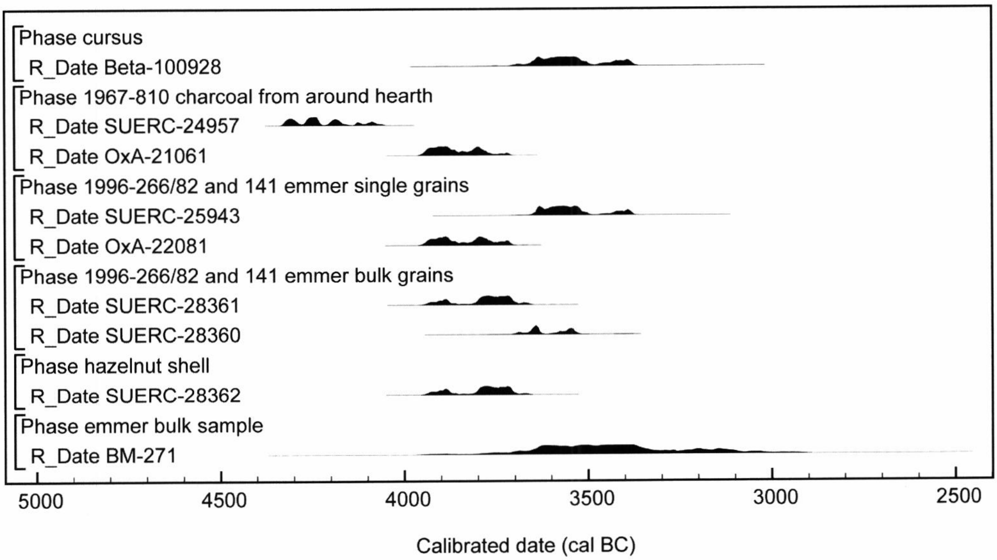

Fig. 11: Calibration of the Aston-on-Trent radiocarbon results by the probability method (Stuiver and Reimer 1993).

Two emmer grain fragments and seven other whole grains, which were submitted for AMS dating as single-entity samples (Ashmore 1999), failed to date, for reasons that are not wholly understood. The whole grains were typical in size and appearance of carbonised emmer grains, and normally such grains contain sufficient carbon for AMS dating. Both laboratories obtained unusually low carbon yields, however. This could indicate that the grains were charred at a relatively low temperature, which did not completely carbonise the interior of the grains and thus may not have prevented partial humification during burial. It is also possible that the grains have lost carbon through partial oxidation since they were excavated, particularly if they were not fully carbonised at deposition.

Dana Challinor specifically looked at 1967-810/9d for charcoal from short-lived species that would be suitable for radiocarbon dating. Two short-lived charcoal fragments were submitted with the first grain samples (GU-19375 and P25455), to confirm the supposition that a single burning episode could account for all the charred material recovered by Reaney. The two charcoal fragments are not of the same date (SUERC-24597 and OxA-21061: T'=59.1, T'(5%)=3.8, , ν=1; Ward and Wilson (1978)), and each was also clearly older than the single emmer grain dated in the first round of sample submission (SUERC-25943, a replacement for the failed GU-19375). The latter gave a result that was statistically consistent with the original bulk grain date, however (SUERC-25943 and BM-271; T'=0.2, T'(5%)=3.8, ν=1; Ward and Wilson (1978)), and it therefore appeared feasible that all the charcoal was residual and all the emmer was derived from a single event in the mid fourth millennium cal BC.

Five more grains were then submitted as single-entity samples (P25931–2, GU-20720–2), all of which failed, but one of their replacements (OxA-22081) was dated, and the result is inconsistent with that obtained on a single grain in the first round (SUERC-25943 and OxA-22081; T'=17.1, T'(5%)=3.8, ν=1), suggesting that more than one episode of grain deposition was represented. Replacements were then selected for GU-20720–2, consisting of two bulked emmer grain samples (of five grains each), and one hazelnut shell fragment. All three were successfully dated.

Although the excavation report implies that most of the carbonised emmer was found in a thin layer around the edge of the hearth (Pit 3), it is clear that the grain cannot all be of the same date (all five emmer results; T'=27.4, T'(5%)=9.5, ν=4). Even the two bulk emmer samples from 1996-266/82 produced radiocarbon results that are significantly different (SUERC-28360 and SUERC-28361; T'=7.5, T'(5%)=3.8, ν=1), whereas each of the bulk emmer samples could be of the same date as one of the single grains (SUERC-28360 and SUERC-25943; T'=1.0, T'(5%)=3.8, ν=1; SUERC-28361 and OxA-22081; T'=0.4, T'(5%)=3.8, ν=1). This indicates that the grain assemblage (and the archaeobotanical sample 1996-266/82) includes material of at least two different dates.

The hazelnut shell, submitted to obtain a second date on a short-lived single-entity sample from 1996-266/82, cannot be of the same date as the single grain from this sample (SUERC-28362 and SUERC-25943; T'=12.3, T'(5%)=3.8, ν=1), but could be contemporary with any or all of OxA-21061, OxA-22081, and SUERC-28361 (T'=1.2, T'(5%)=7.8, ν=3), although there is no reason to assume that it is.

Given the unknown taphonomy of this material (as well as the significantly earlier charcoal fragment dated by SUERC-24957), and the fact that three of the radiocarbon results (BM-271, SUERC-28360, and SUERC-28361) are on bulked samples, which may easily (in the light of these results) include grains of different dates, it is difficult to construct a satisfactory Bayesian model of the radiocarbon results, and this situation would not be remedied by dating more bulk samples.

We must assume that BM-271 was made up of grains from the concentration visible to the excavators around the edge of Pit 3 (Barker *et al.* 1969; Reaney 1964a; 1968), and that this grain was freshly deposited just before the hearth was abandoned. BM-271 should therefore provide a reliable date for the abandonment of the hearth and its infilling with residual material, including potsherds and grain, charcoal and hazelnut shells. We do not know precisely where in the pit Alvey's archaeobotanical samples came from, but at least some of the grain must be from the same concentration (as no other concentrations of grain were reported). It is plausible, therefore, that the single grain dated by SUERC-25943 is of the same calendar date as BM-271, and that its calibration (3660–3490 cal BC, 79.1% probability) provides a more useful estimate of the date of the hearth than the calibration of BM-271.

Most or all of the grains included in the bulk sample SUERC-28360 may be of similar date, but carbonised emmer was also deposited at Aston at least a century earlier (OxA-22081, SUERC-28361). How these grains, together with hazelnut shells and charcoal, were preserved and subsequently incorporated into the fill of Pit 3 is a matter for speculation (Discussion below), and it is not clear how the dates of these residual archaeobotanical remains are related to the dates of the early Neolithic potsherds. It would appear, however, that the sherds in the pit fills must predate SUERC-25943.

DISCUSSION

The earliest activity on site is witnessed by flint bladelets of almost certain Mesolithic date (Cooper above). They represented the predominant element of flint work contained within the stripped topsoil/turf of the mound. That their current survival in the archive is not simply a consequence of more attractive pieces being removed prior to deposition at Derby City Museum is confirmed by Reaney's report (1968, 71) where only a leaf-shaped arrowhead and some waste flakes and cores (lost) were additionally recorded; a scraper was a surface find. The early date (5370± 30 BP; 4330-4060 cal BC: SUERC-24957) for *Betula* (birch) charcoal from 'the vicinity of the hearth' may record this activity. Treethrow holes on the Irthlingborough island, Northamptonshire, present a closely similar picture to that revealed by the gullies under Aston 1 (Harding and Healey 2007, 51-3) and have been dated to *c.*5300-3330 cal BC. Charcoal did not survive well on that site but almost all the features contained evidence of burnt clayey soil. There is no direct evidence for Mesolithic involvement with treethrow activity at Aston however.

A further determination from a sample labelled 'vicinity of the hearth' returned a date of 5037±31 BP; 3960-3710 cal BC (OxA-21061) on *Quercus* sp. (roundwood). This is indistinquishable from SUERC-28362 (hazelnut) and OxA-22081 (single emmer grain) and potentially contemporary with the Carinated Bowl sherds found in, and around, Pit 3. Their small, fragmentary and in some cases abraded nature suggests exposure on the surface, probably within a midden at a habitation locale (Gibson above). Tree clearance is to be expected in association with such activity but may have been neither extensive nor prolonged. At Willington, 2km upstream, abraded Early to Middle Neolithic pottery incorporated in threethrow holes preserved beneath alluvium pointed to regeneration prior to more extensive clearance in the third millennium (Beamish 2009, 141), while at adjacent Shardlow beside the Trent the presence of pollen of *Quercus* and *Tilia* post 1500 cal BC points to the continued existence of some wildwood (Greig in Beamish 2009, 134). Charcoals from Aston 4, just 700m away, where tree throw evidence was again encountered, were dominated by oak (Morgan in Gibson and Loveday 1989, 48-9) as are those from Aston 1 (Morgan above). The fact that Pit 3 cut the circular gully now interpreted as a tree-throw hole and that the arc of gravel covering it may represent collapse from a large tree root plate that lifted the topsoil (Beamish *pers. comm.*) suggests trees were present until at least the filling of the pit. This would accord with Greig's conclusion that the Trent Valley seems to have had more remaining woods at the end of the Neolithic than the Thames and Warwickshire Avon Valleys (2009, 134). However, the fact that the later dates for grain from Pit 3 correspond with the single date for the cursus places a question mark over this, since these huge linear monuments are reasonably regarded as possessing open interiors. Its precisely straight layout (Fig. 1) additionally suggests clear sighting lines. A number of possibilities exist: that the gravel spread was part of a deliberate feature rather than a product of tree throw from Pit 4; that individual large trees were venerated and left in place within cursus confines (*cf.* Buckley *et al.* 2001, 153); or that the impression of contemporaneity of pit deposit and monument is illusory.

The presence of a very substantial quantity of carbonised grain in Pit 3 along with sherds of a Carinated Bowl would seem to point to significant arable activity in the vicinity. Since, however, it appears to have been cleaned grain (Alvey and Monckton above) it may have been brought in, and since the main deposit around the pit edge probably belongs in the later of the two dating horizons (Meadows *et al.* above), too much should not be made of this. A small number of residual grains may alone have been associated with the earliest Neolithic activity on the site.

Comparable protected occupation evidence associated with Carinated Bowl pottery was recorded beneath Barrow IV Swarkestone (Greenfield and ApSimon 1960), 6km upstream, while a single Carinated Bowl sherd from the interior of the Aston 4 ring ditch (Gibson and Loveday 1989, 42) points to the former protection of comparable evidence there; the suggestion previously put forward (*ibid.*, 44) that this ring ditch which predated the cursus may have been constructed by users of Carinated Bowl pottery must now be revised. Taken together these islands of protection may indicate that Early Neolithic activity was more widespread than generally assumed and marked by tree-throw activity. Alternatively later round barrow builders may have deliberately selected locales that had achieved enduring significance, perhaps as a consequence of cyclical long fallow agriculture, or perhaps for additional less rational reasons.

The role and place of Pit 3

Pit 3 is an unremarkable pit of typical Neolithic form (*cf.* Garrow 2006). What renders it remarkable is the very large quantity of carbonised grain it contained (Alvey and Monckton above) and the disposition of that material. This raises a number of questions with regard to its preservation, context and purpose.

The importance of the barrow mound in protecting the evidence must not be underestimated. The pit was only 0.30m deep and the carbonised grain was concentrated around its upper edge (Fig. 5). Had the site been subject to ploughing, as is the case with virtually all Neolithic pit sites, the crucial evidence would undoubtedly have been destroyed; just 700m away the excavation of the ring ditch Aston 4 revealed the modern and underlying medieval plough soil to extend 0.60m below the present field surface (Gibson and Loveday 1989, 32). As it is the feature must have been truncated by the process of deturfing in advance of barrow construction, whether deliberately or as a by product of a tree throw event. The depth of removed soil is unknown but may not have been great: beneath the long mound at West Cotton, Northamptonshire the apparently unstripped soil was recorded as 0.05-0.10m deep (Harding and Healy 2007, fig. 3.12); beneath the Redlands Farm long barrow, Northamptonshire as 0.20m (*ibid.*, fig. 3.27); beneath the cursus bank at Drayton, Oxfordshire, as 0.08m (Robinson in Barclay *et al.* 2003, 164); and in patches beneath alluvium at Willington, Derbyshire, up to 0.20m (Beamish 2009, 35). In the latter two cases any significant compression factor can be excluded. Removal of some 0.10-0.20m at Aston seems probable and means that the uppermost form of Pit 3 is unknown.

Before addressing questions of context and purpose, the nature of the fortuitously preserved evidence must be critically examined. This was a small scale excavation undertaken over forty years ago by enthusiasts lacking the aid of soil scientists and on-site flotation techniques. It was fortunate that in Robert Alvey they gained the services of a very thorough analyst but he did not take the samples on-site, they were handed to him. Nonetheless, from the limited archive available it is possible to reach reasonably secure conclusions regarding the critical questions. First, was this a fire-pit or was the carbonised material a coincidental component of its fill? The excavator clearly referenced 'baking and colour changes' at the bottom of the hearth that supported his contention. The latter could have resulted from iron panning (*cf.* Lockington: Limbrey in Hughes 2000, 87) but this was not recorded elsewhere on the buried land surface. Additionally Reaney was familiar with iron pan having recorded it at a ring ditch at Weston on Trent (1964b). This does not of course preclude the possibility that the pit's contents largely represent redeposited midden material, deliberately or fortuitously employed. The second question therefore relates to the carbonised grain – does its represent the residue of *in situ* burning? Its concentration around the pit edge where it could be macroscopically identified could not have resulted from random infilling. Reference in the layer descriptions (Fig. 5) to emmer grains elsewhere in the primary fill of the pit indicate that it was originally more widespread but no further concentrations, or indeed sources, were recorded beyond the spread 'for a few inches' into one of the 'gullies' from the pit edge. Experience gained by the excavators in recognising the material at the top of the pit would heighten rather than reduce their perception, so it may safely be concluded that the recorded pattern was real, although partially recorded by modern excavation standards. It is possible that the pattern resulted from pit digging through an earlier long-lived midden that contained carbonised grain but on balance it seems reasonable to link the evidence of burning on the pit base with the presence of the carbonised grain around its upper-middle edge. A specific event appears to be evidenced, albeit with final infilling possibly incorporating earlier material. What might the nature of that event have been?

The context of the pit – adjacent to a U-shaped enclosure and virtually central within a cursus - strongly suggests a ritual element, and the size of the cache further encourages the idea. Yet concentration of the carbonised material around the upper edge of the pit is indicative of slumping or residue rather than deliberate deposition. In that situation a central heap of placed items would be predicted (*cf.* Down Farm: Barrett *et al.* 1991, fig. 3.10). An explanation may lie in the lower temperatures achieved around the periphery of a fire. Thus grain placed at the centre would have been totally consumed. This would be consistent with the recording of burning at the base of the pit and with charcoal in the dark brown fill. But such burning activity could more readily have been achieved with a surface fire. Ritualised deposition of cleaned grain, followed by subsequent sacrifice of the deposit through burning, perhaps renders the pit more plausible. Given the probability, based on monument plans, that cursuses derived from houses (Loveday 1999b, 58; 2000; 2004, 10; 2006, 124-30; Thomas 2006), antecedents could lie in the pits placed axially within some of the latter that were subject to special deposits or complex processes (e.g. Claish, Stirling F19; Warren Field, Crathes, Aberdeenshire F30 and 50; Barclay *et al.* 2002; Murray *et al.* 2009). If replication of such practices within cursuses involved pits of similar depth to Pit 3 – and it should be noted that little extra depth would preclude burning - obliteration by agricultural erosion would be certain. Dating, however, presents a difficulty for this interpretation. While two of the grain dates (SUERC-25943 and 28360) broadly correspond with the only date available for the cursus (Beta-100928) (Elliott and Garton 1995; Knight *pers. comm.*), two others, along with the charcoal and hazelnuts dates, fall several centuries earlier and in advance of cursus construction in southern Britain (Barclay and Bayliss 1999).

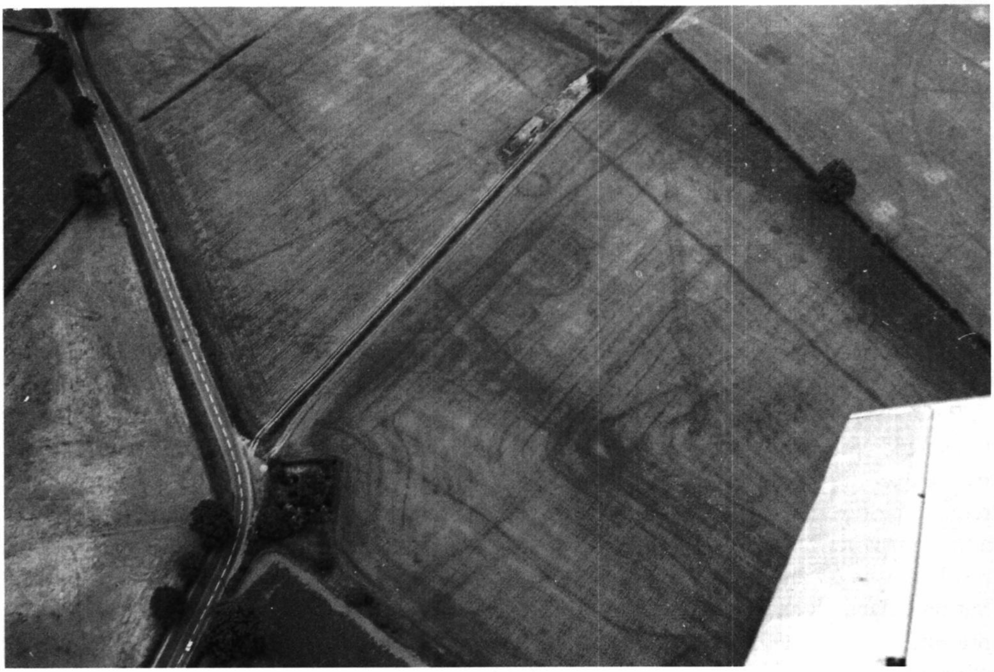

Plate 1: Aerial photograph of Aston 1 and 2, with the U-shaped enclosure, cursus and field system ditches (NMR SK 4229-7).

The adjacent U-shaped enclosure could have furnished a focus for the earlier grain charring events but there are no parallels for the 45m separation. Additionally the large trapeziform plan of the cropmark site lacks obvious parallels beyond the open enclosure at Weasenham Lyngs (Peterson and Healy 1986; Loveday 1985); the fact that the Aston site is bisected by an Iron Age/Romano British field system ditch in contrast to the tangential incorporation of neighbouring ring ditches, suggests it too was an open site (Plate 1). Close association of both enclosures with round barrows hints at a Middle, rather than Early, Neolithic date and apparent abutment of the Aston enclosure against the side of the cursus supports this idea. For later grain carbonisation activity within Pit 3 the lack of decorated bowl pottery, beyond possibly P10 (Gibson above), might seem to support notions of a ritually clean horizon but Gibson notes the long lived nature of the Carinated Bowl tradition. Carbonised grain was a component of a charcoal rich layer found at the base of the south ditch of the Potlock cursus, 9.5 km to the west, but the quantity was very small compared to the high representation of wild plant remains (Guilbert 1996; Monckton and Moffett 1996). Only if we hypothesise that cereal charring at Aston 1 marked ritual activity that recurred across time (in the earlier case apparently unassociated with pit digging) and that the cursus commemorated this (*cf.* the axial pit containing human bone at Dorchester on Thames dated several centuries earlier than the enclosing monument; Whittle *et al.* 1992, 153) can we construct a narrative linking the events recorded in Pit 3 with the cursus. This is hazardous when knowledge of the frequency of such pits and activity beyond the confines of Aston 1 are denied us by erosion, and while the monument remains dated simply by Beta-100928.

The quantity and principal location of the grain around the pit edge fails to equate with the idea of random pit filling with scooped up occupation earth/midden material (Garrow 2007), but the possibility that it was a functional residue must be considered. Peripheral combustion of grain that had been accidentally spread into a cooking pit during querning and food preparation is possible (Alvey and Monckton above) but it is difficult to see why this should have occurred around the circumference of the pit rather than in a specific area. Sterilisation to prevent infestation has been advanced as an explanation for charred cereal deposits within used storage pits of Iron Age date (Monk and Fasham 1980), but rich deposits are primarily a feature of basal layers. The profile of the Aston pit is gentler but still sufficiently steep to predict the running of residual grain to the pit bottom. It is conceivable that it became trapped during pit filling behind an organic liner, either of hide or of the coiled-straw type suggested by Clark from his findings at Hurst Fen (1960, 211). Removal of the basket/bag liner and contents might leave the trapped grain pressed into the pit side. Subsequent burning - either as sterilisation prior to reuse or as a ritualised act of closure followed by infilling - might then explain the pattern. Alternatively all the grain may have been roasted prior to deposition in the pit for reasons of enhanced storage potential or taste (*cf.* Milles 1987,124 regarding cleaned grain on the floor of Scord of Brouster 3). The possibility that the grains were not fully carbonised at the time of deposition (Meadows *et al.* above) may support this idea. However, use of a pit *c.*0.35m deep with a flaring top for storage on low river terrace gravels must be doubted unless some form of organic cover was used, conceivably akin to the above ground straw storage structures recorded in the recent past in Ireland and the Northern Isles (Lucas 1956; Fenton 1978) and discussed in terms of the Neolithic elsewhere (Loveday 1999a). Lack of evidence, noted by Alvey, for sprouting - a feature he recorded at Empingham and an indication of pit storage amongst peripheral grain (Alvey and Monckton 2000) – further weakens the case.

The grain's position on the pit side is equally consistent with slumping from above and total destruction of that at the centre by fire. The only reason for grain to have been suspended over a fire seems likely to have been for drying/parching, an explanation often favoured for such pits in the past (e.g. Liddell 1931; Helbaek 1957; Houlder 1963). The relative absence of spikelets and chaff fragments amongst the grain (Alvey and Monckton above) appears to preclude a role in initial grain processing but Hillman notes (1981, 140) the potential for carbonisation through roasting to make grain palatable, and to this might be added further drying to aid storage or increase milling potential. This could have been achieved by spreading a skin, weighted or staked at its edges, over the fire-pit. Even with a slow burning fire such an exercise would have been fraught with danger, particularly if the pit were originally only some 0.35m or so deep; in the Northern Isles in the last century kilns of similar internal diameter (*c.*1.5m) had drying floors set some 0.9m above slow burning peat fires yet the risk of fire was counted considerable (Fenton 1978, 376-9). Greater height could though have been obtained simply by constructing a cylindrical superstructure (most simply and safely of turf) around the pit's circumference, across which a woven withy 'drying plate' could be set (Loveday and Beamish 2012). This, in combination with the pit, would have had the distinct advantage of slowing combustion through the restriction of oxygen and would thus have furnished the anaerobic conditions necessary for carbonisation when accidental collapse occurred (Reynolds 1981, 119). Such a structure would also have inhibited weathering of the pit sides and have furnished a mechanism for the inclusion of the weathered Carinated Bowl sherds found in its fill: turf cut from a site of repeated occupation is likely to have contained earlier material in its makeup that would enter the pit on the levelling/collapse of the turf structure. The central dip in the pit fill may be explicable as a hollow left after such collapse or conceivably represent a secondary feature cut into the fill.

Radiocarbon dates perhaps most readily support this explanation. Such activity is likely to have taken place outside but in close proximity to houses (*cf.* Balleygally, Simpson 1996) so it is significant that finds of carbonised cereal of comparable size and date derive from house sites (Lismore Fields, Derbyshire and Balbridie, Aberdeenshire) or apparent domestic contexts (Stepleton enclosure F39, Hambledon Hill, Dorset and Stumble 28A, Essex) (Jones and Rowley-Conwy 2007, tab 23.1). Chance preservation of Pit 3 may then have furnished rare evidence of a parching/processing event that adds support to the case that cereals were of greater significance to the Neolithic economy than recent models have allowed (*ibid.).* Should the alternative pit storage or ritual destruction explanations be favoured instead for the evidence from Pit 3 the implications would be even greater, since both necessarily presuppose a pit filled with many thousands of grains.

Beakers

The Beakers and accoutrements present a problem: they were placed approximately at the centre of the ring ditch and so might reasonably be held to represent grave goods but evidence of neither bones nor burial pits were recovered. The first of these difficulties is likely to relate to the acidic nature of the gravels (5.7-5.9 pH: Reaney 1968, 69) that have a regional impact on bone preservation (Greenfield and ApSimon 1960, 6; Knight and Howard 2004, 54). The second is less easily resolved. The excavator's comment that the Beakers lay on the old land surface and that '...no pit grave pit or even scrape was found' (Reaney 1964a) leaves no doubt that any leached bodies were surface-laid. Reference to the wristguard and arrowhead lying 'a few inches below' the level of P11 (Reaney 1968, 73) is not sufficient to suggest significant soil disturbance. There can be no question on this site of agricultural erosion leaving only the unrecognised bases of burial pits, yet surface-laid Beaker burials are extremely rare. Clarke (1970, 257) notes the often shallow nature of grave-pits but records no case lacking them altogether. Examples of surface-laid burials are known from the Peak (3 certain and 1 possible from a count of 22 inhumations: Barnatt 1996a, app 1.2) where they are likely to reflect the local difficulty of cutting into bedrock close to the surface. Extension of the practice to the river valley is possible, conceivably in conjunction with organic counterparts to the Peak tradition of surface cists, four of which were associated with Beakers (*ibid.*). A number of excavated ring ditches in the Trent Valley lacking evidence of burial function could record the practice but heavy plough erosion furnishes a more plausible explanation (Knight and Howard 2004, 60).

Two other possibilities present themselves: that the burials at Aston 1 had been dug through an earlier mound or that the artefacts - with or without bodies - were placed within an initially open ring ditch. Reaney (1968) records no pit above Beaker P11 but does note 'some disturbance of the primary mound' above P12. This could represent redeposited filling of a grave pit cut through an earlier turf/topsoil mound; Pit 1 that was cut through the later sandy subsoil possessed an obvious contrasting fill and was recorded. If a grave shaft cut for a burial with P11 was reopened to receive that with P12 this might explain the broken and scattered condition of P11. P12 lay just over a metre from the P11 spread (Fig. 4) and thus within the space likely to have been needed for an inhumation. Within a broadly comparable double ring ditch, barrow 5 at West Cotton, Northamptonshire, a crushed and slightly dispersed W/MR Beaker and five scattered barbed and tanged arrowheads had been disturbed by a subsequent burial within a grave pit measuring some 2 x1.5m (Harding and Healy 2007, 141 and 229). Reuse of Beaker graves is an increasingly recognised phenomenon (Gibson 2007) but in the case of Aston 1 to additionally explain the apparently surface-laid nature of P11 in these terms would require us to view the mound as a pre-existing structure of Neolithic or Beaker impact horizon date.

It has been demonstrated that a mound of Neolithic date stood within Aston 4, a ring ditch 700m away, since the cursus curves around it cutting away its filled ditch but respecting its interior (Gibson and Loveday 1989). And the practice of inserting a Beaker secondary burial into such a barrow would not be unparalleled: the middle Neolithic mound of Liffs Low in the White Peak had been reused for this purpose (Barnatt 1996b), as had Minninglow (Barnatt 1996a, app 1.2). With so little of the central area at Aston exposed during the excavation, the existence of an earlier burial, either set eccentrically or lying below the Beakers, cannot be excluded; Knight and Howard record the difficulty of recognising Neolithic pits on the Trent gravels (2004, 67). Concentric double rings are not uncommon but those with ditches set close together around the periphery are, and suggest single plan or refurbishment rather than sequential enlargement. A site of this type, and of comparable size to Aston 1, can be found at Linch Hill Corner, Stanton Harcourt (site XXI,1), Oxfordshire, 500m from the Devil's Quoits henge (Barclay *et al.* 1995, fig. 39). The central inhumation there was accompanied by a jet slider and an edge-polished knife, typical southern series Middle Neolithic grave goods (Loveday and Barclay 2010, tab 6.1) and, as may have been the case at Aston, a secondary Beaker burial had been added. Unusually this N/MR Beaker burial was placed between the two ditches, and delimited by its own miniature ring ditch which cut the earlier ditch silts (Grimes 1960, 154-64). This presupposes a former berm between barrow and ditches as may have been the case at Aston (Fig. 3). A broadly similar history could be hypothesized for both sites with differences in the placement of the secondary burials conceivably related to the real or perceived local ancestral connections of the Beaker users.

On the other hand the slighter and rather irregular nature of the inner ditch revealed by aerial photographs (Plate 1) could point to an initial open enclosure, within which the Beakers were placed deposits (*cf.* Balbirnie stone circle, Fife: Ritchie 1975; Henge B, Llandegai, Gwynedd : Lynch and Musson 2004), although it must be borne in mind that this morphology is also a characteristic of Neolithic round mounds (Kinnes 1979). The rich, almost superficial, deposit with Beakers at Lockington, just across the river (Hughes 20000), gives credence to the idea. Against it though must be set the peripheral position of the latter in contrast to Aston and the presence of a wristguard and a barbed and tanged arrowhead with P11. This leaves little doubt that we are dealing with a burial. Whilst Beakers may be placed in earlier open sites (e.g. Catholme 'sun burst' site: Buteux and Chapman 2009, 68-73), they are a notable rarity and invariably found within a pit (e.g. Fargo Plantation: Stone 1938). That from an irregular triple ring ditch sited close to the presumed northern terminal of the Aston cursus (Fig. 1) came from a pit cut by the innermost ring ditch (Garton *et al.* 1994). This site bears a close morphological resemblance to Dorchester on Thames XI, Oxfordshire, barrow

1 Irthlingborough, and barrow 6 West Cotton, Northamptonshire (Atkinson *et al.* 1951; Harding and Healy 2007) which suggests it was a multiphase barrow rather than an enduring open enclosure (Bradley and Chambers 1988; Loveday 1999b). On balance it seems most plausible that P11 was either added to a pre-existing mound of presumptive Neolithic date or was a surface-laid burial extending a tradition from the Peak, and that P12 was cut through the mound and disturbed it.

Beaker P11 and its accoutrements were undoubtedly prestige items. The Beaker itself, despite the distinction of internal decoration (Gibson above), recalls the Wessex/Mid Rhine example from site XII at Dorchester upon Thames that was also accompanied by a bracer, although this was made of different material, Langdale stone, and is of a different shape (Roe *pers. comm.* and Woodward *et al.* 2011.). The fact that Clarke (1970, 261) records bracers of the flat, rectangular form found at Aston (Atkinson type B) almost exclusively accompanying his W/MR group gives support to the feeling that P11 has the 'flavour' of Dorchester XII, although reassessment suggests the situation may have been more complicated (Needham *pers. comm.* and 2012, 12-16,.). Gibson's observation that internal twisted cord decoration is an early trait, characterising Beakers of All-Over-Corded and European type, additionally favours the idea that deposition of P11 records relatively early Beaker adoption of a pre-existing ritual site. The W/MR Beaker burial at Dorchester lay at the northern entrance to the Big Rings henge and adjacent to the cursus (Whittle *et al.* 1992), and others amongst the thin scattering away from the Wessex 'heartland' reveal a ceremonial site bias (examples at Stanton Harcourt and Little Rollright, Oxfordshire, Sutton Courtenay, Berkshire, Kempston, Bedfordshire, and Barnack, Cambridgeshire: Clarke 1970, 532-3; Donaldson *et al.* 1977). The local sourcing of P11 potting fabric, however, excludes notions of incomers, at least bearing pots. Rather emulation seems indicated perhaps driven by the motor of pilgrimage. That same agency and process might also explain the extremely unusual placing of a round barrow of possible Neolithic date near the centre of a cursus. Exactly the same pattern is evident at Maxey, Cambridgeshire, a site of major regional importance (Pryor *et al.* 1985). On the other hand the fact that Gibson notes the two closest parallels for the decoration of P11 come from the Peak District, an area where Beaker surface-laid inhumations have been recorded, could indicate the Beaker burial was a primary feature of the barrow, as at Dorchester XII.

P12 was, like P11, crushed but appears not to have been dispersed. It may conceivably, therefore, have accompanied a burial that disturbed P11. It seems likely, as Reaney suggested, that the barrow was extended to receive this burial, but the make up of the extended mound is uncertain since the uppermost layers of the barrow appear to represent a plough soil of historic date. Sherds of collared urn from an unspecified ditch location furnish a further possible explanation for enlargement, assuming eccentric or high level interment. The distance between the two ditches (1.8 – 2.7m: Reaney 1968, 74) is little more than might be expected to redefine a spread mound.

Aston 2

With a diameter of 15m Aston 2 belongs amongst a group of small ring ditches intimately associated with cursuses. One such lies just over 360m away across the north-west cursus ditch, while others in similar positions can be found at Maxey, Cambridgeshire, Charlecote, Warwickshire, Drayton North, and Dorchester upon Thames Oxfordshire (Loveday 1985; G. Hey *pers. comm.*). At Maxey adjacent examples lying across the henge and northern cursus ditch respectively are opposed by almost identically sized pit circles placed across, and beside, the southern cursus ditch (Simpson 1985, fig. 168). These sites are of similar dimensional range (6 -15m) to single circuit hengiform monuments elsewhere (Kinnes 1979). Aston 2 may then belong in this group: the excavator considered finds from the ditch to be comparable to those derived from the redeposited turf and old land surface under Aston on Trent 1, but this may simply reflect derivation from an earlier extensive occupation surface. It should be recalled that the apparent gap in the circuit of Aston 2 is a product of cropmark repression at the field edge adjacent to a track (Plate 1) and that small round mounds also characterise early Beaker burials (Clarke 1970, 258). A recently excavated example placed across the cursus ditch at Dorchester upon Thames contained a Beaker burial (G. Hey *pers. comm.*) Grave goods accompanying a surface-laid burial within this small ring ditch would certainly have been scattered by ploughing.

Local and regional context

The placing of Aston 1 and 2, and virtually all the other ring ditches at the complex, within the cursus confines is unparalleled and must indicate continuing respect, although why this should have been inclusive, rather than almost entirely exclusive, as elsewhere, is unclear (Loveday 2006, 29-32). Explanation for continued interest may lie in the location of the complex: close to the Derwent –Trent confluence, in an area that would historically become the location for an important crossing of the only major river encountered on a journey north from the Thames (Ripper and Cooper 2009). That crossings were also made in this zone in the Neolithic is confirmed by the source of Group XX axes in Charnwood Forest, 13 km south of Aston on Trent, and their greatest concentration on the opposing side of the Trent in the White Peak (Fig. 12). Logic suggests they (or the parent rock) were moved across the intervening river in precisely the zone marked out by monuments: the Aston and Potlock cursuses, the Round Hill henge with its large central round barrow and the rare nucleated barrow cemetery at Swarkestone. Although the local sourcing of potting fabrics (Carney above) gives no support to the idea of an associated Peak-Trent transhumance corridor (Loveday 2004) discovery of wooden linear structures, appearing to form components of a causeway running out across the floodplain at Aston and dating to the 16th – 14th centuries cal BC, adds detail to the notion of an early established crossing zone (Garton *et al.* 2001; Knight and Howard 2004, 58).

The presence of the Lockington deposit on the opposing side of the river to Aston may not be insignificant in this context, combining as it does emphatically northern armlets and an equally emphatic southern Breton dagger, related to the Amorico-British series (Needham in Hughes 2000, 23-43). The Trent represents something of permeable boundary in the Early Bronze Age between northern jet fashion artefacts and southern amber ones (Shepherd 2009 app.; Beck and Shennan 1991); Grindlow, Over Haddon, in the Peak District overlooking a tributary of the Derwent produced one of the largest collections of jet buttons in the country (Bateman 1861, 46-8; Shepherd 2009, corpus no. 13a-z). It seems possible then that more than just Group XX axes passed across the river at or near Aston on Trent and that the attendant interaction may have been instrumental in retention of the complex's significance. Inclusion of virtually all accompanying ring ditches within its confines implies longevity of respect reminiscent of the placing of a hengiform, a post circle and ring ditches along the axis of the Dorchester on Thames cursus (Whittle *et al.* 1992, 197-8; Loveday 1999, 51-2). It is surely also significant that the Aston on Trent and Potlock cursuses were of hugely greater size than both the possible examples upstream around the Tame-Trent confluence (Buteux and Chapman 2009, 64-8) and those in the Warwickshire Avon Valley (Webster and Hobley 1964;

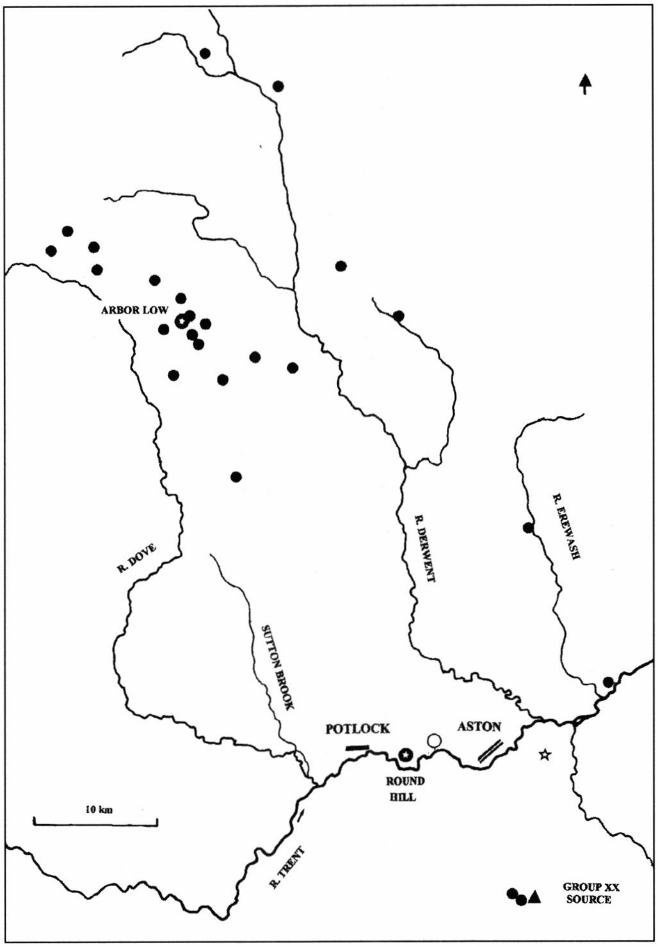

Fig. 12: Group XX axe distribution from Charnwood Forest to the Peak District. (Triangle – Group XX source; black dots- Group XX axes; star in circle – henge; parallel lines – cursuses; circle –Swarkestone nucleated round barrow cemetery; outline star – Lockington deposit).

Loveday 1985; 1989). Only the cursuses at the Maxey – Etton ritual complex, Cambridgeshire, bear comparison, but cropmarks there make it clear that this was a composite site with no individual construction exceeding 1000m (Loveday 2006, 31-2). This contrasts with the remarkably straight and even course of the Aston on Trent cursus over 1500m to Aston 4, the ring ditch incorporated in its ditch line (Gibson and Loveday 1989; Loveday 2006, 118-9). It may also be noteworthy that no other major cursus sites are known currently in the 1500km separating Aston on Trent from the Thornborough, North Yorkshire and Rudston, East Yorkshire, complexes.

The existence of apparent Iron Age square enclosures within the cursus confines some 300m north-east of Aston 1 (May 1970) adds a further dimension to the longevity of the site. These are unusual away from eastern Yorkshire where they concentrate around the Rudston cursus complex (Stoertz 1997). Small clusters occur at North Muskham and Gonaldston in

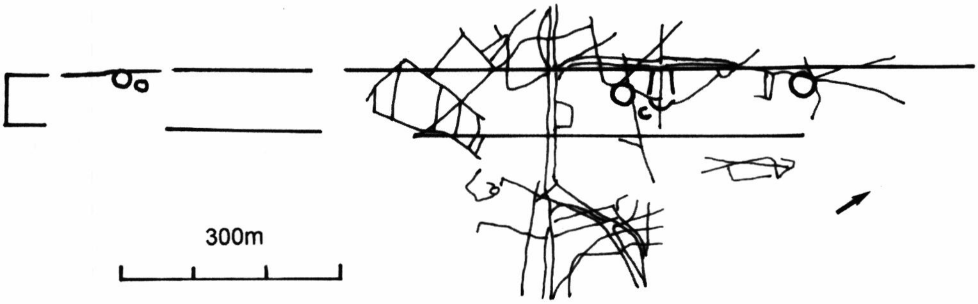

Fig. 13: Later field and trackway ditches in the area of Aston 1.

the Trent Valley (Knight and Howard 2004, 98-9) and others notably beside the Maxey cursus (Simpson 1985, fig 168).

The barrow of Aston 1 probably survived being enmeshed in an extensive Iron Age/ Romano-British field system through its employment as a corner marker: field ditches intersect its northern and western arcs. That was also true of ring ditch Aston 3 to the north (Fig. 13), although only Aston 1 survived to the present day as a mound. An immediate explanation for this lies in the name of the field in which it is situated - 'Nether Park' (Derbyshire Records Office: D779B/E 118). Inclusion in the lands of Aston Hall Park (1735-1924), and before that, perhaps, in the pastureland of the medieval village, favoured preservation but the pattern of trackways associated with the Iron Age/Romano-British field system additionally suggests part of the cursus survived at this point and was respected.

The fact that the principal trackway crosses the cursus site at a near right angle could be coincidental but that is unlikely to be the case with the trackway that appears to branch from it and follow, for some 250m, the cursus ditch line adjoining Aston 1 and the U-shaped enclosure. It is inconceivable that the cursus ditch was still a visible feature more than 3000 years after it had been dug: quite apart from its relatively shallow nature – *c.* 1.3m deep where sectioned by Reaney (Gibson and Loveday 1989, fig 3.3) - Beaker pottery was recovered from its topmost fill (*ibid.*, 42). That is equally true of any bank. An explanation probably lies, as suggested for Drayton North, Oxfordshire, in the presence of a relict length of hedge arising from partial colonisation of cursus fence lines (Loveday 2006, 40-3). Charred plant remains that included hazel, raspberry/blackberry and sloe recovered close to the base of the Potlock cursus could record the presence of a hedge at an early stage in the history of that site (Guilbert 1996; Monckton 1996 and *pers. comm.*). Opportunistic adoption of an existing feature rather than enduring respect for a vanished monument seems likely then, but may have been equally effective in ensuring the preservation of Aston 1 into the historic period.

CONCLUSIONS

The excavation of Aston 1 had many shortcomings but it placed on record evidence that would otherwise have been lost to agricultural erosion within a few years. That relating to Pit 3 is particularly valuable, recording as it does an apparent grain processing event/accident.

This was expected to correlate with the Carinated Bowl sherds in the pit fill but radiocarbon dating demonstrated unexpected complexity. Rather it seems likely that the 'event' took place at a habitation locale that had been associated with Carinated Bowl at least a century earlier. The nature of the activity recorded by the carbonised grain around the pit's circumference was still probably domestic but a ritualised element associated with the adjacent U-shaped enclosure or the cursus cannot be ruled out: the later grain dates and that from wood in the cursus ditch (*c.*3700-3400 cal BC) are comparable. Whether domestic accident or ritual sacrifice, the exceptional size of the preserved residue points to a relative abundance of grain in the earlier Neolithic.

Again by virtue of the protection afforded by the surviving earthwork, the excavation recovered evidence of either an unexpected Beaker rite of surface-laid burial or the presence of a hitherto unsuspected Middle Neolithic round barrow.

The good offices and generosity of Hanson Aggregates have ensured the preservation of the remaining mound and hopefully preservation of uninvestigated areas of the cursus land surface. The possibility that the gravel spread represents an area where the topsoil was raised by a rotating root plate holds out the hope that an *in situ* cursus land surface may be recognised beyond it in future investigation. Limited intervention to test the degree of deposit survival and to retrieve environmental samples and further dating material could be achieved through the reopening of Reaney's longitudinal trench. More extensive investigation must await future developments since Aston 1 covers a window into a very rare feature indeed – a protected cursus interior.

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