

Excavation of Neolithic enclosures at Cowie Road, Bannockburn, Stirling, 1984–5

James S Rideout*

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ABSTRACT

Excavations undertaken in 1984 and 1985 on cropmark sites identified as pit and post alignments revealed a bow-ended pit-defined enclosure dated to late fifth to mid fourth millennium cal BC, a post-defined enclosure dated to the mid fourth to early third millennium cal BC, and possible domestic activity. The pits of the enclosure showed up to three phases of use with deposits containing Carinated Bowl-type pottery in the later phases. Medieval or post-medieval rig and furrow overlay the site and a small assemblage of medieval pottery is also described. The project was funded by Historic Scotland.

INTRODUCTION

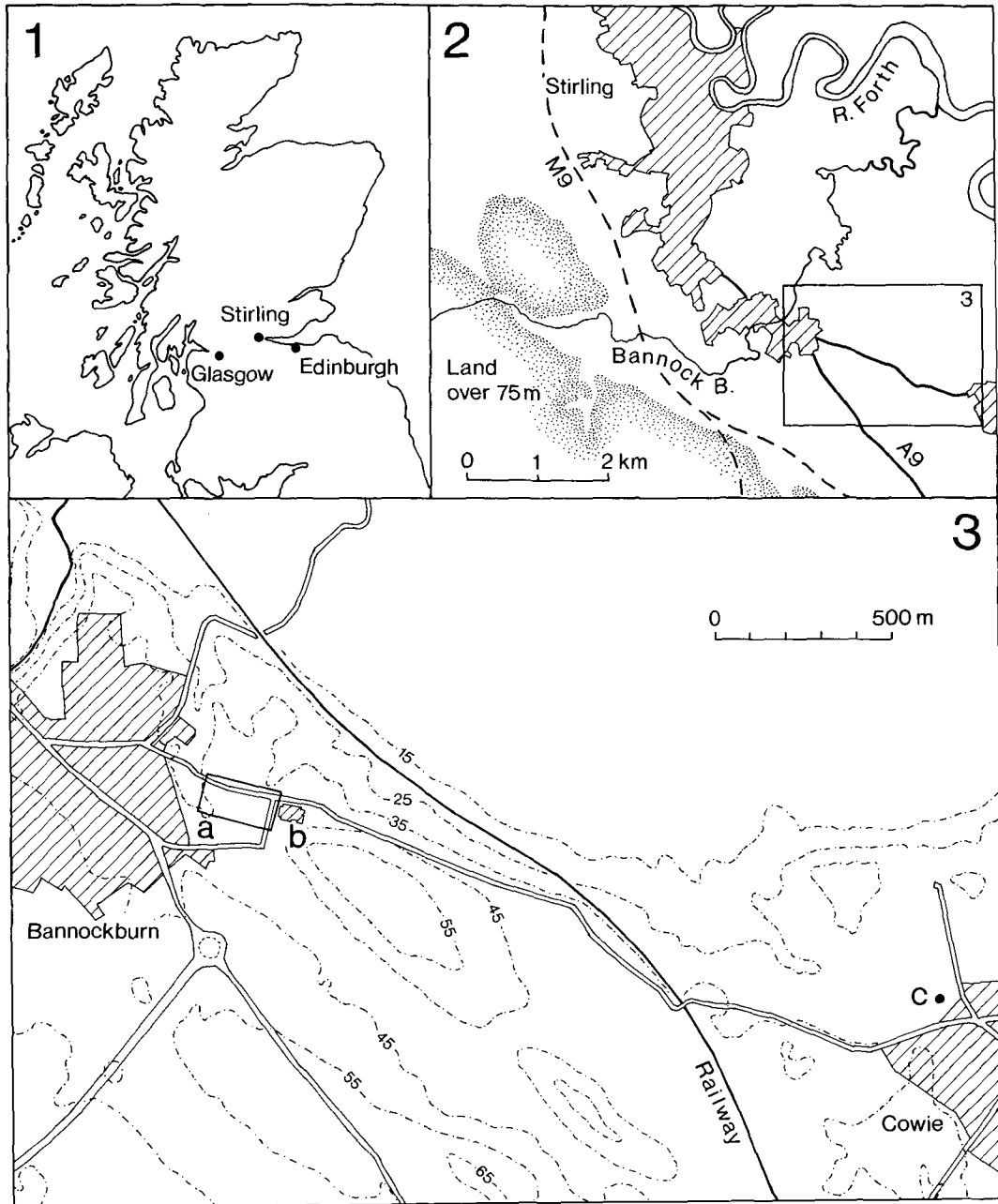
Two seasons of excavation, in 1984 and 1985, were carried out on a pit enclosure and adjacent post enclosure by the then Central Excavation Unit (Historic Buildings and Monuments). The site, immediately to the south of the B9124 Bannockburn to Cowie road (site centred NGR: NS 816 901), was part of a group of cropmark sites threatened by construction of the new Stirling Eastern Distributor Road, and housing (illus 1). The other sites, a promontory fort (centred NGR: NS 816 903) and a palisaded homestead (centred NGR: NS 817 903), are published elsewhere (Rideout 1996).

GEOLOGY, GEOMORPHOLOGY, AND SOILS

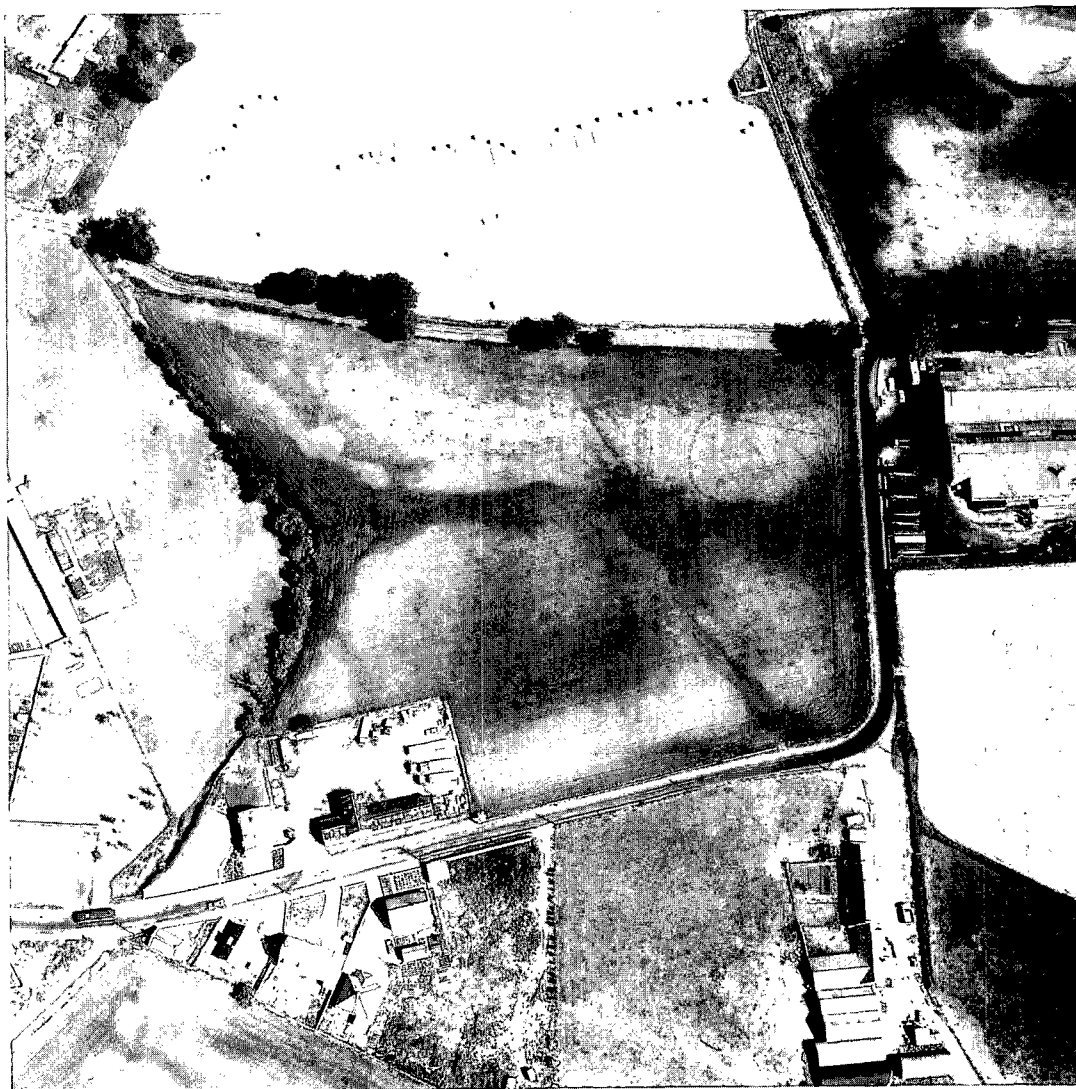
David Jordan

Both sites lie on the first terrace above the Forth valley at an altitude of between 35 m and 38 m OD, also known as the Main Perth Shoreline. The enclosures are mapped (Soil Survey of Scotland 1968) on soils of the Kennet Series, imperfectly drained 'Brown Forest Soils' formed on tills derived from Carboniferous sediments, with partly watersorted upper layers. While both sites lie on the raised beach, their underlying parent material strata show more evidence of braided stream deposition than of littoral reworking. The superficial geology underlying the sites consists of banded silts, sands and gravels with indurated (hardened) upper strata, showing the typical

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ILLUS I Cowie Road, Bannockburn: location maps — on 3, a is illus 3; b is the bus depot; c is the location of the settlement at Chapelfield. Contours in metres. (Based on the Ordnance Survey map © Crown copyright)



ILLUS 2 Cowie Road, Bannockburn: aerial photograph showing the pit enclosure (Enclosure 1) and the post enclosure (Enclosure 2) (Crown copyright: RCAHMS)

structure of glacial outwash deposits. This induration impedes drainage only in the lowest soil horizons and where the strata are of silts and fine sands. Elsewhere soil drainage is good. This, combined with the quartz richness of the particles, has had a particular influence upon the site's formation, inducing light, easily worked soils which tend to acidity.

ARCHAEOLOGICAL BACKGROUND

J S Rideout

Before 1976, the only archaeological site known in the area was the promontory fort, c 250 m NNW of the pit and post enclosures (Enclosure 1 & Enclosure 2 respectively), discovered on

National Survey aerial photographs of 1955 (RCAHMS 1963, 420, no 493). In 1976 and 1977, the area was photographed by the Cambridge University Committee for Aerial Photography; the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) also flew sorties in 1977 (illus 2). In addition to the fort, the photographs showed the two enclosures described here and two palisaded homesteads. In 1981, the fort, one of the homesteads, and the two Neolithic enclosures came under threat of development. A new road (the Stirling Eastern Distributor Road) was to be built over the western side of Homestead 1 and part of Enclosure 1, and the area to the west of the new road was zoned for private housing, threatening the fort, the western end of Enclosure 1 and Enclosure 2.

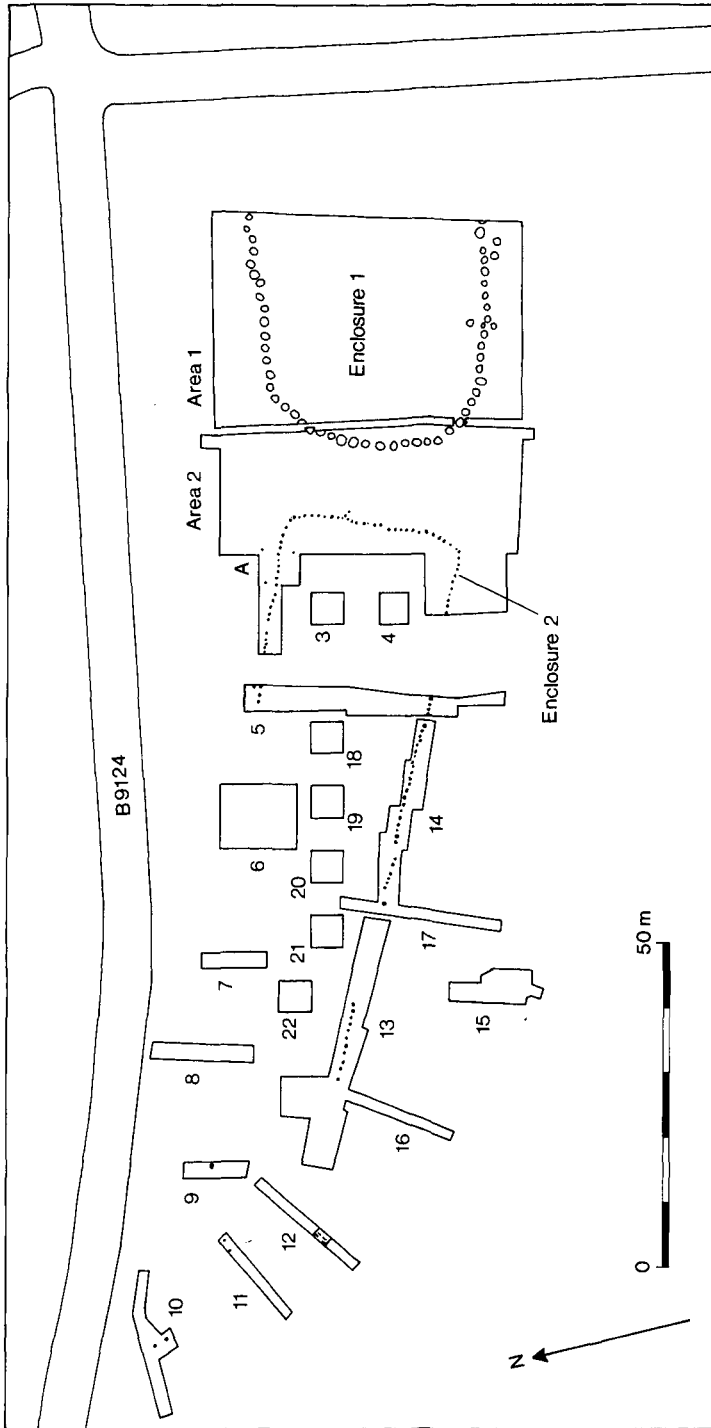
In September to November 1982, the Central Excavation Unit (CEU) carried out a large-scale trial excavation on the fort to the north of the area of cropmarks under the direction of Gordon Barclay. The parts of Enclosure 1 and Homestead 1 on the line of the new road were investigated in October 1984 by Nick Tavener; the remainder of the fort (Rideout 1996) and the enclosures were excavated in April to June 1985 by J S Rideout and Nick Tavener respectively. Since excavation finished, any surviving part of Enclosure 1 in the gap (a maximum of 20 m — see illus 3) between the eastern boundary of the excavated area and the old road beside the bus depot has been removed by an extension of the bus depot car park to the edge of the new road (Lorna Main, pers comm). An interim report had already been produced by Nick Tavener (1987) when, in 1995, J S Rideout was commissioned by Historic Scotland to bring the project to publication.

EXCAVATION STRATEGY

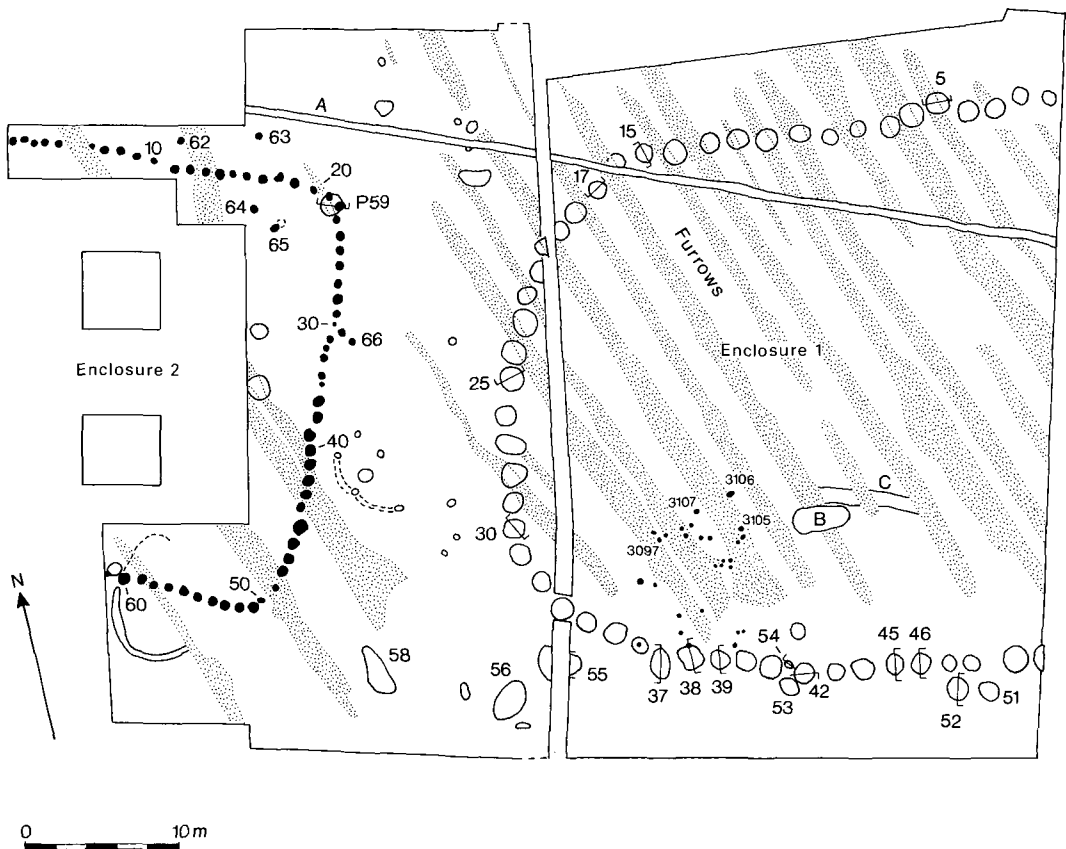
In 1984, permission to excavate was restricted to that part of Enclosure 1 on the line of the new road. The area opened, Area 1 (illus 3), was designed to expose the pits and the area between them. It was subsequently extended to the east when the lines of pits were found to extend beyond the area visible on the aerial photographs. About half of the exposed pits were investigated by half-section or by quadrant.

In 1985, the rest of the site became available for excavation. An irregularly shaped second large trench, Area 2 (illus 3), was opened immediately to the west of Area 1 to expose the western end of Enclosure 1 and the eastern end of Enclosure 2. Twenty further trenches, some overlapping, were opened to investigate the projected line of the sides of Enclosure 2, the interior of the enclosure and the slopes to the south and west (Areas 3–22, illus 3).

The results of the first season suggested that each pit of Enclosure 1 exhibited signs of between one and three phases of activity. The services of a soil scientist were engaged to develop an integrated sampling strategy to attempt to answer the questions posed. In line with current CEU practices, bulk soil samples were taken for flotation and wet-sieving, and smaller 'routine' samples for chemical analysis and other tests. Some were taken from selected contexts, others were randomly chosen. Unfortunately, in subsequent years, some samples have deteriorated and others simply been lost. Thus, in bringing the project to publication, attention has been focused on the material from the bulk soil samples likely to throw light on the date and function of the pits. Lignin tests, originally intended to test a hypothesis that the pits, or some of them, had contained posts, were abandoned for the simple reason that the presence of charcoal in most of the pits would indicate the presence of lignin from unburnt wood (regardless of its origin).



ILLUS 3 Cowie Road, Bannockburn: overall site plan showing the location of the trenches and the recorded pits and post-holes of the two enclosures

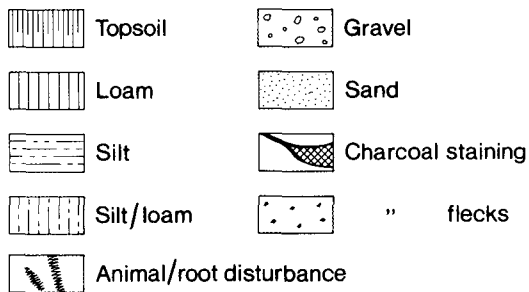
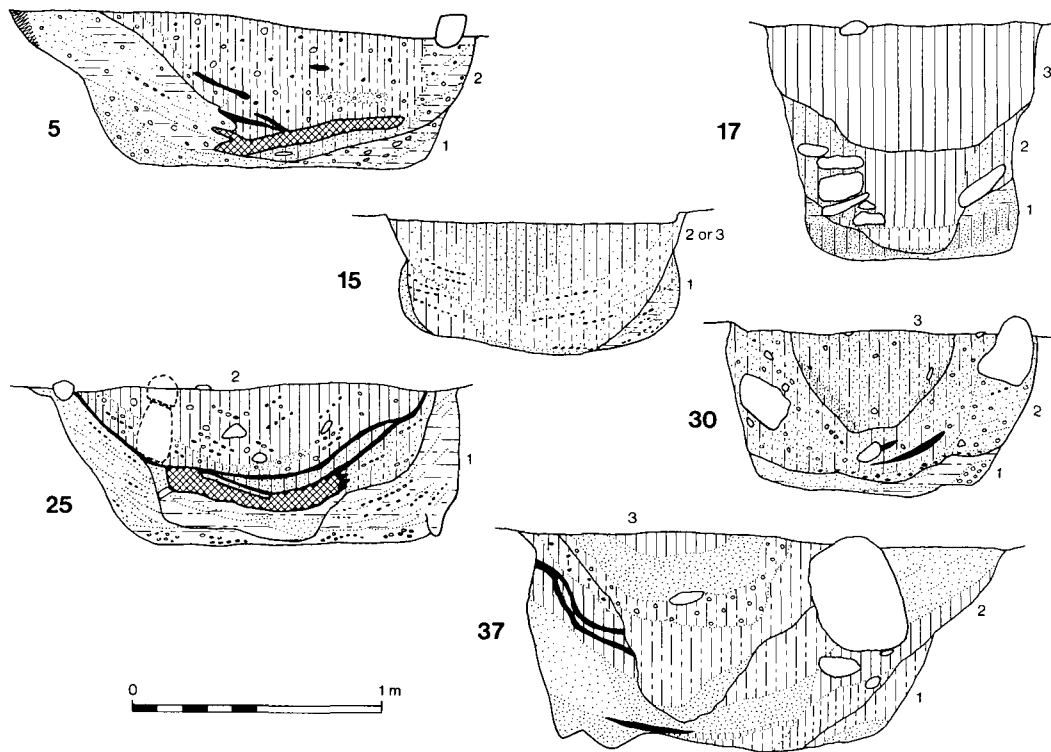


ILLUS 4 Main excavation area — Areas 1 and 2 (and square trenches 3 and 4) showing the terminals of the two enclosures and other features — A is the modern drain; B is the test pit; C is a shallow linear feature. Only selected pits and postholes are numbered

ENCLOSURE 1

The excavated western end of Enclosure 1 consisted of 50 pits in three rough lines forming a U-shape (illus 4). The pits were re-numbered for publication from 1 to 50 in a continuous clockwise sequence (nos 51–8 refer to several pits outlying the main group and possibly unrelated to the enclosure). A full concordance of feature numbers and field records, with stratigraphic matrices, is in the archive of the project records at the National Monuments Record of Scotland.

The enclosure was 33 m wide near its western end and 36 m wide beside the eastern baulk. The original length of the enclosure is not known. A length of 35 m was excavated. The gaps between the pits varied from 0.2 m to 1.6 m. If, as noted by the excavator (Tavener 1987, 71), erosion has been greatest on the north side, then some pits here may originally have merged at the original ground surface or been cut into one another (this greater erosion may be borne out by the average depth of pits which, here on the north side, is 0.49 m, but on the west side, 0.60 m and on the south side, 0.72 m). In their final form, the pits ranged in size between 0.9 m and 1.9 m in diameter. The irregular lines of the enclosure give the appearance of having been constructed in short lengths of a few pits at a time.

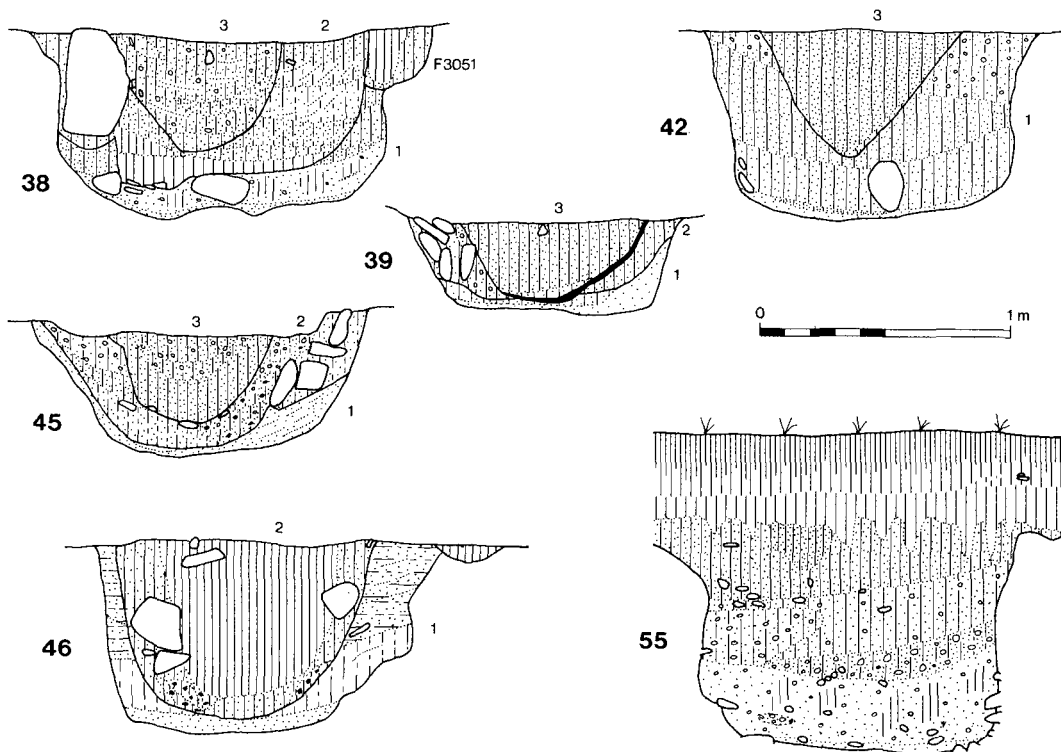


ILLUS 5 Selection of Enclosure 1 pit sections — the positions of the sections are given on illus 4, where the lines at the section ends point to the excavated half. The numbers are prefixed 'P' in the text. Smaller numbers refer to Phases. The pecked stones are part of the stone lining, projected forward.

ILLUS 5a Key to the conventions used in all section drawings — the symbols may be combined

In the absence of most of the tests originally designed to aid understanding of the on-site interpretations, the pits have been assessed using the section drawings, the site photographs and, to a lesser extent, the written site record. In the field, three phases of activity were identified (summarized in Tables 4–7 in Appendix 1, below). Measurements given in the tables are based on the section drawings which, although possibly not accurately reflecting the size of individual pits, illustrate the range of sizes present. Depth is taken from the subsoil surface. A selection of 12 pit sections is shown (illus 5 & 6).

All of the surviving samples from 10 pits were assessed for seed, and other macroplant content. The pits were selected to provide a range of different phase permutations. Few seeds were recovered.



ILLUS 6 Selection of Enclosure 1 pit sections. Pit numbers are prefixed 'P' in the text

PHASE 1

The first phase of activity involved the cutting of roughly circular pits, mostly with steep to vertical sides and level bases. One pit (P15) had apparently been 'undercut' to create a pit narrower near the subsoil surface than towards the base (illus 5). The sides were scarred with spade or pick marks. Later activity has tended to mask the details of Phase 1 and in some no distinct Phase 1 fills survived the Phase 2 activity (indicated by an open square in Table 1). In such cases dimensions are unknown; in other cases dimensions are uncertain. Where there is any uncertainty the figures have been ignored in the following paragraphs but are given with question marks, or less than/greater than symbols in the tables. Those which have survived show that the Phase 1 pits excavated were between 1.11 m and 1.76 m wide and between 0.10 m and 0.95 m deep. The average width was 1.38 m (20 measurements) and the average depth 0.60 m (37 measurements).

Where later activity had not removed the fills of the Phase 1 pits it was apparent that the pits had been allowed to silt up to at least the depth of the subsoil surface (see pit P5, illus 5). The nature and distribution of the surviving fills gave no indication of deliberate backfilling. (As noted above, samples for soil micromorphology deteriorated before analyses could be carried out.)

Few finds were recovered. Two body sherds of Neolithic pottery were recovered from pit P42 (SF309) but were found near the top of the fills and cannot be ascribed to this phase with total confidence. Another body sherd was recovered from the top of unexcavated outlier pit P58

(SF341). A grinding stone (SF348, illus 17) was recovered from the context ascribed to Phase 1 in pit P9, although the stone may actually have come from Phase 2. A pecked stone (SF347, illus 17) and a chert flake (SF346) were recovered from pit P3.

Very little charcoal survived, but a sample from pit P18 produced enough material for a radiocarbon date. The sample (0267), from the bottom of the pit, proved to be large diameter oak; it was not, therefore, used for dating (see Radiocarbon Dating section below).

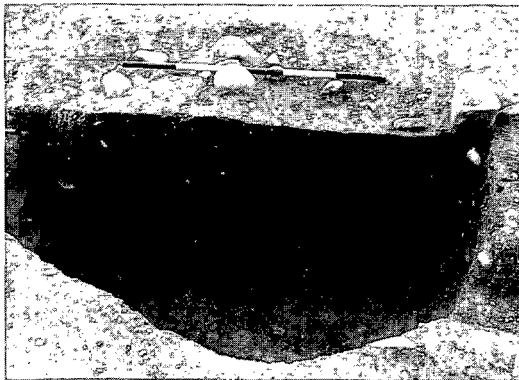
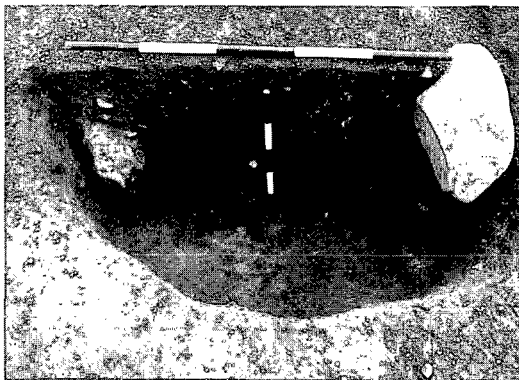
No charred seeds were found in any of the Phase 1 samples included in the macroplant assessment (Holden, below).

PHASE 2

In the majority of pits P1 to P50, much of the Phase 1 silting was removed and a stone lining was inserted, occasionally off-centre. Usually steep-sided and flat bottomed, the recuts of the pits were between 0.90 m and 1.95 m wide and between 0.27 m and 0.91 m deep. The average dimensions are 1.29 m wide (30 measurements) and 0.59 m deep (34 measurements). That this phase was a deliberate re-cut of the pits is most clearly illustrated by pit P38, where the Phase 1 pit, backfilled to the level of the subsoil surface, was cut by a small negative feature (F3051) which was, in turn, cut by Phase 2 (illus 6). The stone lining often appeared near the subsoil surface as a rough ring or sub-rectangle of stones (see pit P45, illus 7 & pit P18, illus 8) and in section as little more than a stone tumble or a few stones (pit P30, illus 9). The best constructed, or best surviving, lining was near vertical with more than one course (illus 7). In some cases the lining survived only in part of the pit and below the level of the subsoil surface. Clean till or sand usually formed the matrix for the stones, occasionally forming a layer between the stones and the surviving Phase 1 fills. In many cases, the lining was roughly square or sub-rectangular in plan. Some pits with Phase 2 fills present showed no evidence of stone lining, but since a number were not fully excavated, these linings may not all have been detected (see pit P15, illus 10 for a stone-free section).

Other activity associated with this phase resulted in evidence of burning which in some cases produced large quantities of charcoal or charcoal-stained soil (see illus 5 & 6; pit P5, illus 11). In one pit (P6), the surviving carbonized wood had the appearance of collapsed plank-built lining. Most of the burning appeared to have been *in situ* but there was little evidence of scorching on the stones or surrounding soil. The charcoal-bearing soil usually overlay a light grey silty loam which was also found in pits with little or no charcoal. The excavator suggested that the layer could be interpreted as the product of wood ash (Tavener 1987, 72). In some cases, there appeared to be more than one event involving burning. Upper and lower layers of charcoal-bearing soil in pit P25 produced samples for identification and radiocarbon assay. The lower sample (0805) was large and exclusively of oak. The upper sample (0809) contained mostly oak with pine, hazel and alder in small quantities. The hazel charcoal was submitted for AMS dating and returned a result of 3778–3384 cal BC (AA-20412). Similarly, sample 0823, exclusively oak from the bottom of Phase 2 in pit P6, was sub-sampled to provide three AMS dates with a mean range of 4034–3816 cal BC.

Following the burning activity, the pits filled with topsoil-like soils, again apparently to the level of, or nearly to the level of, the subsoil surface. Finds included body sherds of Neolithic pottery from several pits (Table 6). Pit P25 produced a chert flake (SF353), an inner chunk of chert (SF354) and a chert blade (SF361). A pitchstone blade (SF351) was recovered from pit P34, and a chert flake was found in pit P48 (SF317). Single charred grains of *Triticum* (wheat) were found in samples from pits P11, P23 and P25. Other charred plant remains included a single



ILLUS 7 Pit P45 showing ring of Phase 2 stones near the subsoil surface in the unexcavated half and courses of stone in the excavated half (top left)

ILLUS 8 Pit P18 showing Phase 2 packing, some as tumble (top right)

ILLUS 9 Pit P30 — a burnt deposit is on the bottom of the pit (vertical scale is 50 cm) (middle left)

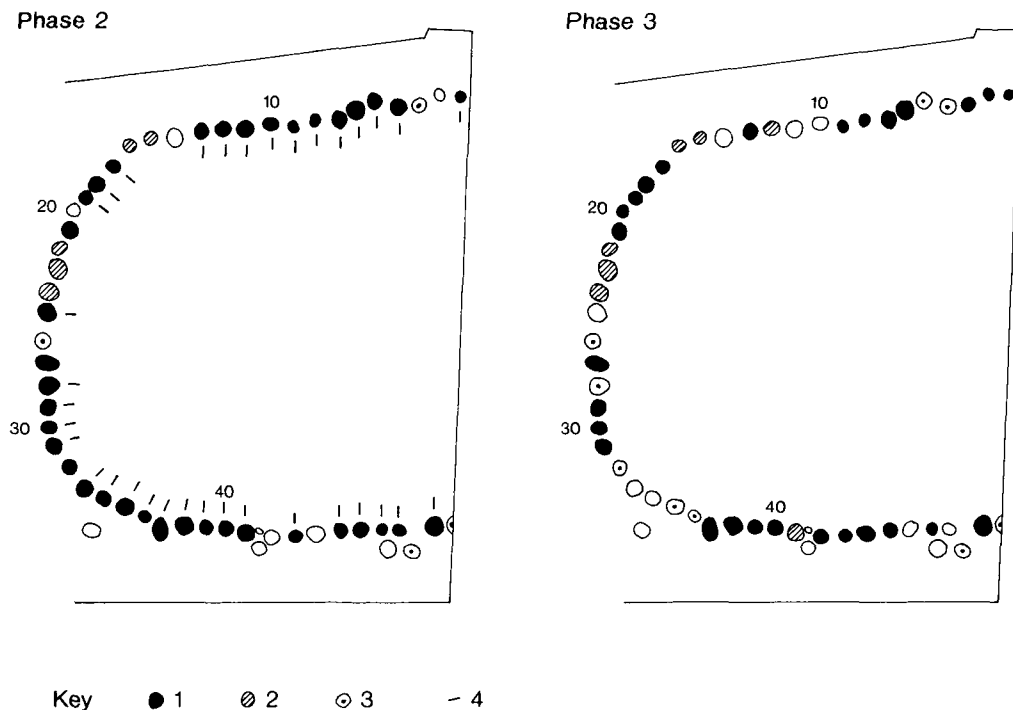
ILLUS 10 Pit P15 showing stone-free Phase 2 (middle right)

ILLUS 11 Pit P5 — a charcoal-rich layer is visible as a narrow band near the bottom of the section (bottom)

charred seed of *Ranunculus flammula* (Lesser spearwort) from pit P1, single seeds of *Ranunculus flammula* and *Galium aparine* (Cleavers) from pit P48, and two seeds of *Galium aparine* and a small grass seed from pit P6.

PHASE 3

The Phase 3 features could be the product either of activity in or around the Phase 2 pits before they were fully backfilled or of activity in later, shallower recuts of the pits (see P17, P30 & P37 in



ILLUS 12 Enclosure 1: diagram showing distribution of the phases — 1 = present, 2 = probably present, 3 = presence uncertain or unknown, 4 = presence of stone lining known

illus 5; P38, P39, P42 & P45 in illus 6). In profile, they ranged from deep and steep-sided to shallow and bowl-shaped, 0.33 m to 1.45 m wide and 0.12 m to 0.76 m deep. On average they were 0.81 m wide (22 measurements) and 0.44 m deep (26 measurements). In many cases, this phase is defined by a deposit of charcoal or charcoal-bearing soil below topsoil-like material. Since some of the Phase 3 features show in section as being deep, steep-sided, and with clear boundaries, it is possible that some, if not all, were deliberate recuts. Some, however, may have been little more than the final Phase 2 fills.

A rim sherd of a Neolithic carinated vessel (SF322, illus 16) was recovered from pit P17. Pit P43 produced another rim sherd (SF334, illus 16) as well as two body sherds (SF335 & SF336). Other body sherds were found in pit P40 (SF314) and pit P44 (SF323). A retouched mudstone flake (SF329) was found in pit P18. Pit P35 produced a flint flake (SF324), pit P37 produced a pitchstone flake (SF308), pit P39 and pit P42 produced chert flakes (SF307 & SF310, respectively).

Single charred seeds of *Galium aparine* (cleavers) and *Vicia/Lathyrus* (vetch/pea) were found in a Phase 3 sample from pit P6.

Three samples were selected for identification and radiocarbon assay, but after sample processing, none was considered suitable, due to sample size or problems associated with long-grown or especially old timber.

MISCELLANEOUS FEATURES

Pits P51 to P58 are included in Tables 4–7, although most appear to have no relationship with the enclosure. As mentioned above, only two are of similar form to the enclosure pits (see pit P55,

illus 6). Pit P57 cannot now be located but may be what appears to be a continuation of P55 to the west of the baulk between Area 1 and Area 2. In addition to the pits, there are a number of small negative features forming a group inside the enclosure (illus 4). No pattern can be seen in their distribution. One (F3051) cuts Phase 1 of pit P38; another (F3049) cuts pit P36. Most of the features are small and shallow, from 0.1 m to 0.58 m in diameter and up to 0.2 m deep. A chert flake (SF318) was recovered from F3106, a flint flake (SF319) from F3105, two chert blades (SF320 & SF321) from F3097, a chert flake (SF331) from F3107 and a chert chunk (SF356) from F3237. One feature, to the north of pit P42, is also shallow (0.15 m deep) but is 1.1 m in diameter. A shallow linear feature of indeterminate length, to the east of the small negative features, was cut by the later agricultural furrows (C in illus 4). A possible pit (F3122), only partly investigated, was cut by Pit P52. It produced a quartzite core or flaked chunk (SF328).

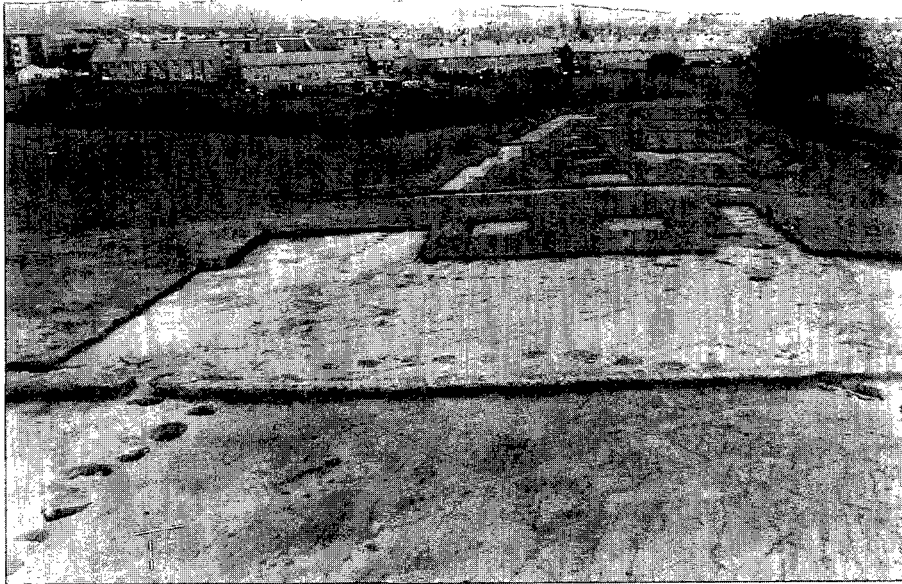
ENCLOSURE 2

A gap of 11 m at its narrowest separated Enclosure 1 from Enclosure 2. Enclosure 2 appears to have been roughly rectangular and was defined by post-holes. It measured 27.5 m wide at its widest known point, near the eastern end, and 25.5 m wide between the north side in Area 5 and the south side (east end) in Area 14 (illus 3). The eastern end of the enclosure survived best. Not all of the trenches revealed surviving post-holes and it appears that erosion has removed much of the middle sections and all of a putative western end. Post-holes in Areas 5, 13 and 14 were not excavated and appear on plan in illus 3 only. Although not recorded on any field drawing, two possible post-holes are visible as differential drying marks on photographs in the northern part of Area 6 and two or three marks between the line of post-holes in the central part of Area 13 and the eastern end of the trench. The position of the marks suggest that they may have been part of the sides of the enclosure. The possible post-hole near the north-west corner of Area 6 would make the northern side a known length of c 50 m, while the surviving length of the southern side is 89 m. The south side is aligned WNW/ESE (c 64° west of True North). What survives of the north side is not exactly parallel to the southern side being c 68° 30' west of True North (illus 3 & 13).

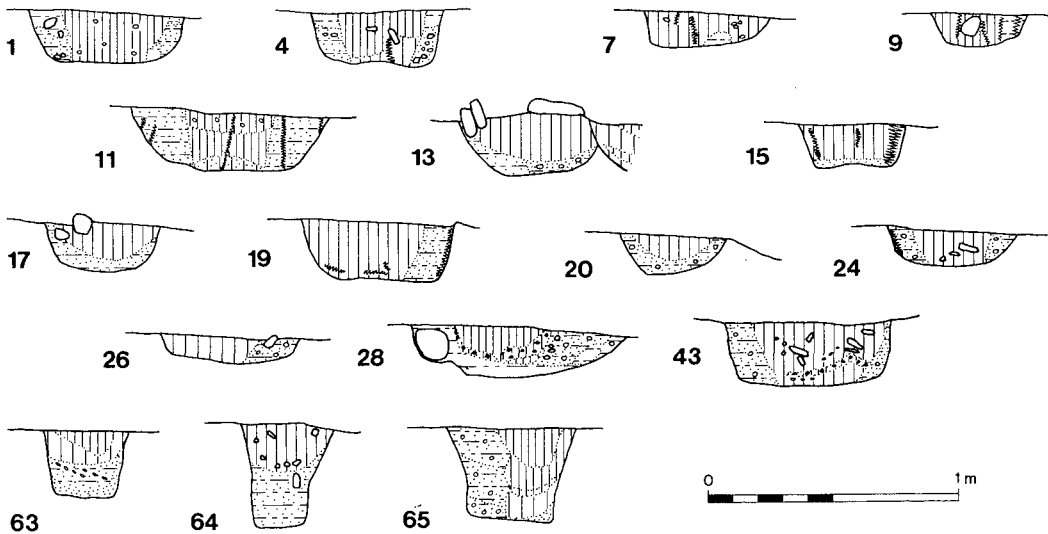
The irregular boundary of Enclosure 2 gives the appearance of having been constructed in short, slightly curved rows of between six and eight post-holes. Except for a short stretch of smaller post-holes near the middle of the east side, the lengths are convex to the inside of the enclosure. The gaps between the post-holes in Area 2 ranged between 0.1 m and 1 m, with the average being 0.45 m (59 measurements — original measurements to nearest 0.05 m). The gaps on the south side were generally wider (average 0.42 m : 10 measurements) than on the north and east sides, which averaged 0.52 m (19 measurements) and 0.49 m (28 measurements) respectively.

The field records include section drawings from 22 of the post-holes in Area 2. Measurements based on these drawings show that the post-holes were between 0.33 m and 0.85 m wide and between 0.11 m and 0.38 m deep. On average they were 0.57 m wide and 0.21 m deep (22 measurements). Most of the post-holes contained evidence of post-pipes in a packing of redeposited subsoil. A few packing stones were recorded. Where measurable, the post-pipes are between 0.30 m and 0.50 m wide, with most of them around 0.35 m wide.

Post-holes PH62 to PH65 which lie inside and outside the enclosure near its north-east corner are not necessarily of the same date as the enclosure. Three examples shown in illus 14 for comparison (PH63, PH64, PH65) are deeper and different in character to the enclosure post-holes.



ILLUS 13 Enclosure 2 from the ESE pre-excitation; Enclosure 1 is in the foreground



ILLUS 14 Selection of Enclosure 2 post-hole sections. The numbers are prefixed 'PH' in the text

Few finds were recovered. Neolithic pottery was found in PH19 (body sherd SF357), PH22 (body sherds SF363) and PH57 (rim or carinated sherd SF358). A chert chip (GR3441) was found in PH13, a chert flake (SF369) in PH21, a flint chip (GR3466) in PH47 and a chert chip (SF359) from PH57. A burnt flint chip (GR3483) was also found in outlier post-hole PH65.

Flotation samples from eight of the post-holes were included in the macroplant assessment (odd numbers between PH45 to PH59 inclusive). One seed of *Hordeum* (barley) was found in PH45, one indeterminate cereal seed in PH51 and two seeds of *Hordeum sativum* in PH57.

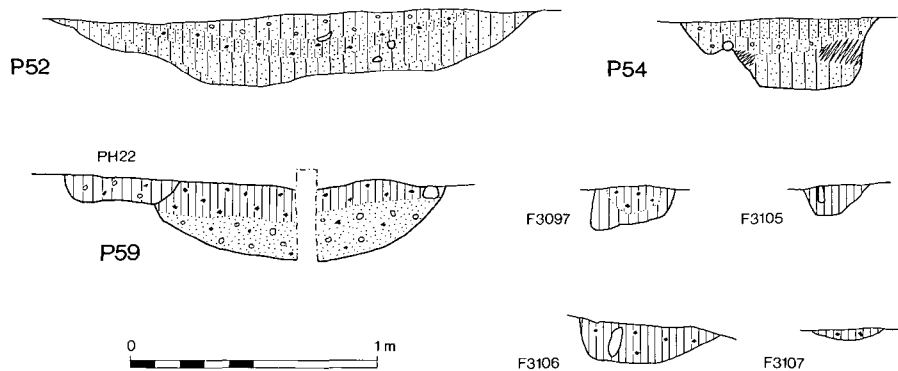
MISCELLANEOUS FEATURES

Fire pit (F59)

Two of the post-holes (PH21 & PH22) in the north-east corner of Enclosure 2 cut a shallow pit (P59) described in the site record as a 'fire pit'. The pit, 1.20 m in diameter and 0.34 m deep, had a lower sandy fill containing charcoal and an upper charcoal-stained fill (illus 15). The upper fill also contained a few fragments of burnt bone; these could not be identified.

Neolithic pottery was recovered from the upper fill (body sherds SF339, SF368, SF370, SF371, SF379b&c; carinated sherds SF364, SF379a; rim sherds SF365, SF366, illus 16). The same context produced two burnt cobbles (SF340), chert flakes (SF367, SF373, SF374) and a chert core (SF372). One of the post-holes in Area 5 produced a chert flake (SF343).

Three samples of carbonized material produced hazel charcoal, hazel-nut shells and pine charcoal. The hazel nut shells (sample 0827) produced an AMS date of 5621–5248 cal BC AA-20413. The largest charcoal sample (0821, exclusively oak) from PH43 was sub-sampled for two AMS dates and produced a mean of 3369–3041 cal BC.



ILLUS 15 Miscellaneous negative features — sections (Pit P55 is on illus 5b for comparison)

Other features

In addition to 'fire pit' P59 (above) and two post-holes in Area 11, possibly medieval, a number of other negative features was noted in the vicinity of Enclosure 2. Most were simply recorded on plan and were left unexcavated. The majority were in, or near, the gap between Enclosures 1 and 2. No pattern can be discerned in their distribution. Some, like a curvilinear band of iron-stained soil linking small negative features near the end of Enclosure 2, may be natural features. Inside Enclosure 2 are two unnumbered, unexcavated possible pits.

Small negative features were also noted in Areas 9 and 10. In Area 12, a shallow ditch or channel produced a fragment of a jet ring (SF338). It was not clear whether the feature was natural or man-made.

AREA 15: INFILLED STREAM CHANNEL

Area 15 was a trench designed to investigate the deeper stratigraphy to the west and south-west of the ridge on which the enclosures stood (illus 3). Although samples were taken from the sections in the trench, many have deteriorated and others, like the burnt bone, have been mislaid. Samples of charcoal were either inadequate for standard radiocarbon assay or were mislaid prior to the more recent post-excavation analyses. Finds which were recovered were not well linked to contexts. The records suggest, however, that some of the finds recovered came from a midden-like deposit described below. The finds consisted of a perforated shale disc (SF350) probably from the modern topsoil, a flint flake (SF362) and lumps of slag (SF352) from the midden. The presence of the slag suggests that the midden is later than the Neolithic enclosures described above.

THE PALAEOCHANNEL

David Jordan

Area 15 cut through an infilled stream channel which once drained the site. This channel is of a steep V-shape with a shelf towards the top, on which some evidence of archaeological activity was found. The profile descends from the modern Ap through accumulated Ap derived soil, eroded from the hillside above. It descends through a thick pan associated with a bone- and charcoal-rich clay layer and through layers of decreasingly coarse clays and peats until it reaches sand and then large boulders. The profile is 2.7 m deep.

The upper redeposited soils are undifferentiated and significantly mixed by worms and roots. The pan which underlies them is diffuse and, although stained by iron oxyhydroxides, appears to be closely associated with the material of the bone and charcoal-rich layer which it underlies.

The bone- and charcoal-rich layer appears to represent a stable surface on which waste had been dumped. The bone appears to have been preserved by the greater moisture of the soils found in the stream channel. The presence of this material here suggests that the stream channel was being used as a dump for refuse but that the stream was not of sufficient strength to remove all the material thrown into it. It was not clear whether or not the bone had been redeposited from upstream. It showed no orientation or sorting, but the matrix in which it was found had a high clay element and might have been brought down by the stream. The presence of artefacts of greater mass found with the bone, however, suggests that it formed part of an *in situ* midden.

A fine, gravelly, sandy clay containing abundant charcoal and fragments of plant matter was found beneath the bone-rich layer. Below this the layers were, from top to bottom, a similar sandy clay lacking fine gravel, a peaty clay with sandy lenses, a peaty clay, a clayey peat with sandy lenses, a clay with abundant charcoal and plant matter and finally a sand. This exposure on its own is insufficient to establish the changes in stream regime with any certainty but in the absence of supporting sequences a few conclusions may be drawn. The channel itself is a relic from a period when sufficient water was available to cut down so deeply. It post-dates the outwash sands and gravels through which it is cut and, since the stream which occupied it was working to the reduced post-glacial base level, must post-date the main post-glacial isostatic adjustment, at least in its final phases of formation. The catchment of its stream, however, is small and, in the absence of any evidence of stream diversion or capture, the conclusion must be that the channel was cut during a period when abundant water was available for erosion within its present

catchment and/or when outwash materials were easily eroded. The stream down-cutting was possibly the result of intermittent heavy stream-flow before vegetation cover was established.

Whatever the cause, net erosion appears to have halted at the underlying till, at a depth of 2.7 m below the ground surface as it is now. Sand and gravel accumulation followed, although these may have had a very local source, with the finer particles being removed from the till. As stream flow slowed, clay deposition and then peat growth set in as vegetation presumably became established on the ground surface and in the channel itself. Stream flow continued, at least intermittently, as well-sorted sandy lenses in the peat testify. It remained subdued, however, despite which the stream remained of sufficient force to remove such eroded soil as was added to it. Given the peat growth found in the channel, this implies that eroded soil supply was minimal and, therefore, that the ground surface was largely undisturbed. Above this, however, is evidence of an unsorted onset of significant erosion and, therefore of soil disturbance due to clearance and cultivation. It is above about 0.1 m of this material that we find the surface on which bone and charcoal was spread, our only direct evidence of human involvement in the formation of the stream sediments.

Charcoal is found in the peats and clays below the point where unsorted soil material begins. This suggests earlier human activity than that associated with the suggested increase in soil erosion rate. Natural fires, however, could be the cause. The picture which emerges is of a stream channel, formed in the early postglacial, draining the Mesolithic land surface on which a small amount of non soil disruptive human activity took place. More intensive human activity led to erosion of soil from the hillside around, possibly when the earliest clearance and agriculture was practised. Nearby habitation or some other intensive human activity resulted in the deposition of midden in the stream bed, now largely filled with sediment. Finally, intensive and prolonged cultivation induced long-term soil instability and A horizon material was deposited in the former stream channel until it merely formed the lowest point in the smooth valley profile.

SPECIALISTS' REPORTS

NEOLITHIC POTTERY

Trevor Cowie

Only a very limited amount of pottery was recovered, comprising 29 sherds with a total weight of 333 g. Most of the sherds were recovered from two discrete areas of the site: 12 (41% by pieces, 32% by weight) were recovered from the sequence of pits P40–P47 along the southern arm of Enclosure 1, while 11 sherds (38% by pieces but 54% by weight) were retrieved from fire pit P59 or post-holes either dug into it (PH22) or in its immediate vicinity (PH19). The contexts of the pottery and their possible significance are discussed further below.

The pottery

In view of the featureless nature of most of the pieces, only a few sherds merit individual attention. These were recently catalogued and illustrated in the writer's review of the Neolithic pottery from eastern and central Scotland (Cowie 1993, 35–6, illus 6); for ease of reference, they are described again here but with little in the way of additional comment. A full catalogue has been deposited with the archive of the project records in the National Monuments Record of Scotland (RCAHMS).

Only four definite rim sherds are present. Despite its incompleteness, there can be little doubt that SF322, from pit P17, represents a portion of a fine carinated bowl. SF365 and SF366 also appear to derive from open, most probably carinated or shouldered bowls with flaring rims. The presence of such vessels is indicated by SF379 (possibly from the same vessel as SF365) and by the single sherd SF364. SF334 is a rim sherd from a vessel of uncertain form, probably an unshouldered pot with upright rim. The remainder of the assemblage comprises relatively featureless body sherds. A number of sherds, noted in the catalogue, have markedly curved profile in keeping with their identification as plain bowl sherds but otherwise they throw no light on the vessel forms.

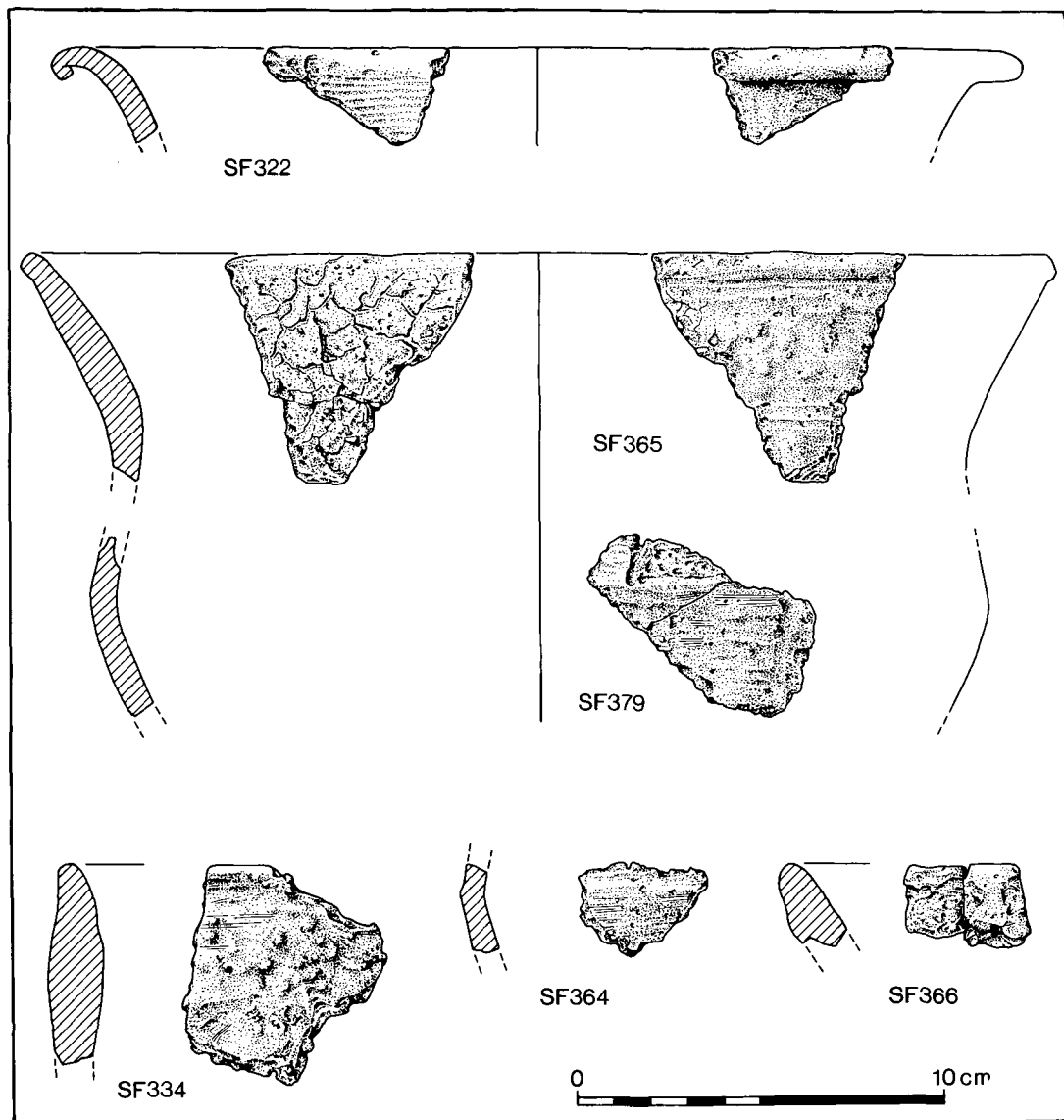
There is some variety in the range of fabrics: most of the pottery is of good quality with a hard compact matrix, while the most distinctive sherds have stone inclusions consisting either of speckled igneous rock with black and white minerals, angular quartz inclusions or a pronounced micaceous component. Several sherds have well-smoothed or semi-burnished surfaces. Some show traces of tooling. With one exception, the range of fabrics is entirely in keeping with an Early/Middle Neolithic date. The exception is a body sherd of coarser ware from the 'fire pit' (P59) distinguished by the presence of rounded stone inclusions (probably in the primary clay body); while atypical, there seems no reason to doubt its association with the rest of the material.

Deposition

As noted above, a sizeable proportion of the pottery was recovered from pits on the southern arm of Enclosure 1, running in sequence from P40 to P47. In terms of the proposed phasing of the pits, the pottery is principally associated with Phase 2 or Phase 3 fills. Only one pit (P42), produced sherds assigned to a Phase 1 deposit. Pairs of single body sherds from pits P46 and P43 (SF330 & SF335), and pits P43 and P47 (SF336 & SF345) are similar in fabric and may just possibly be from the same vessel but it would be unwise to read much into this.

In the light of this pattern of recovery from a discrete run of features, it might be tempting to suggest deliberate deposition. However, it must be emphasized that while these sherds are relatively fresh and unweathered, they are mostly very small (average size < 30 mm; average weight < 9 g) and no two sherds are unequivocally from the same vessel apart from pieces with recent breaks (now consolidated). Instead, the small size of the sherds and the heterogeneity of the material is more suggestive of the incorporation of a random scatter of fragmentary pottery lying in the vicinity during the digging and/or use of the pits. This is not to deny the possibility that the matrix of the pottery might have been deliberately introduced (for instance the sherds could have been lying in soil or midden invested with some symbolic significance) but there is nothing to suggest deliberate selection of the pottery itself.

A range of negative features lying within the enclosure — the post-holes and stake-holes referred to by Tavener (1987, 72) — perhaps then acquire greater significance, especially in the light of the recent excavations at Chapelfield, Cowie (Atkinson 1995). There, traces of a Neolithic settlement were revealed fortuitously in advance of a housing development. Excavation revealed evidence of oval and circular structures defined by stake-holes, post-holes and slots associated with a complex of pits. Viewing the Bannockburn evidence in this light, it is tempting to wonder whether the fragmentary but relatively unworn pottery could have been incorporated into the pits during the accidental disturbance or deliberate reworking of features and deposits associated with a phase of 'domestic' occupation on the site. This might also go some way to accounting for the presence of the 'outlying' pits (P55 to P58). In two cases, post-holes are cut into the fills of pits (P36 & P38) and, while tenuous, this points towards the following possible reconstructed



ILLUS 16 Selected Neolithic pottery

sequence, where pottery becomes incorporated either wholly accidentally or incidentally in the course of purposeful infilling of the pits in the final episode of activity (Phase 2/3): Enclosure 1 pits; *then* post-holes, stake-holes, putative occupation debris; *then* pits redug; Phase 2 stone linings and/or Phase 3 burning.

Only one other pit on the actual line of Enclosure 1, pit P17 at the junction of the west and north sides, produced pottery. This produced a single body sherd from the Phase 2 fill and a rim sherd from a vessel of good quality from the Phase 3 fill.

The clearest stratigraphic relationship recovered was the priority of fire pit P59 over Enclosure 2 (or technically just that portion of the enclosure). A single body sherd from pit P46

(SF315) is similar in fabric to a sherd from pit P59 (SF366) but it would be rash even to suggest that they come from the same vessel. However, individual sherds found in post-holes either dug into the fill of P59 (as in the case of SF363 from PH22) or from its immediate vicinity (SF357 from PH19) seem likely to represent pottery originally associated with the fire pit and accidentally incorporated into later features. What is noticeable about the pottery from P59 is that the average size and weight of the sherds is greater, suggesting a different pattern of sherd fracture and dispersal (from that of the Enclosure 1 pits). Whatever the precise function of pit P59, some of the sherds have been reduced or partially reduced as a result of re-firing, suggesting re-incorporation into the pit fills following breakage (eg SF365 & SF379). This combination of features tends to support the original excavator's suggestion that the fire pit may have been the focus for some kind of 'primary' activity such as cooking (Tavener 1987, 72).

By comparison, two of the post-holes of Enclosure 2 produced sherds (SF358 & SF342) whose abraded condition certainly suggests they were accidentally incorporated into these fills. The worn condition of these sherds, from the western areas of the site, contrasts with the fragmentary but relatively unabraded condition of the sherds from Enclosure 1. Attention may also be drawn here to the sherds of a carinated bowl recovered from an Area 4 ditch of the Iron Age promontory fort 300 m to the north and forming part of a range of artefactual evidence hinting at earlier prehistoric activity at that location (Rideout 1996, 236–7, illus 27).

Comparative material and date

Finds of Early Neolithic pottery from eastern and central Scotland have recently been surveyed by the present writer (Cowie 1992; 1993); despite the small size of the assemblage, the pottery from Bannockburn bears comparison with larger groups of plain bowl pottery amongst which carinated vessels form the most readily recognizable element. The range of fabrics present among the material from Bannockburn can be compared with the pottery from local sites such as Bantaskine near Falkirk, and Barbush, near Dunblane, but also from sites further afield in Perthshire, such as North Mains, Pitnacree and Croft Moraig (excavators' Group II). A particularly significant addition to the sites listed in the survey is the settlement at Chapelfield, Cowie (Atkinson 1995).

Radiocarbon determinations for related pottery in Britain and Ireland appear to range from the late fifth to mid-third millennium cal BC. However, Herne's (1988, 23–4) reappraisal of the dating evidence for Carinated Bowl assemblages suggests that the actual currency of classic or traditional Carinated Bowls, if strictly defined, may have been more restricted, and possibly limited to the first half of the fourth millennium cal BC.

In a report on the large assemblage of Early Neolithic pottery from Biggar Common, Sheridan has developed this model further, by suggesting that a working distinction may be made between Scottish assemblages characterized by 'traditional Carinated Bowl pottery', reflecting an initial phase with a markedly homogeneous Early Neolithic plainware tradition, and 'modified Carinated Bowl pottery', reflecting the appearance of local and regional variants (Sheridan 1995 and in Johnston, this vol). Although the group of sherds from Bannockburn is probably too small to be representative, the range of material present would be in keeping with Sheridan's category of 'traditional Carinated Bowl assemblages'. On balance, therefore, the date of the Neolithic pottery at Bannockburn is likely to lie between c 4000–3500 cal BC, but, as we have seen, the sherds recovered from the pit and post Enclosures seem to have been incorporated into the relevant feature fills when in an already fragmentary condition and may not be an entirely reliable guide to their date.

STONE ARTEFACTS

Ann Clarke

Flaked stone

This small assemblage of flaked stone features a number of different raw materials including chert, of a variety of colours, flint, pitchstone, quartzite and mudstone (33 pieces, see Table 1). Chert was the most common material in use and was selected for the manufacture of all the different artefact types. In contrast the use of the other raw materials was confined to more specific forms: a blade and blade-like flake of pitchstone; retouched flakes of flint; a bifacially retouched flake of mudstone; and a core of quartzite.

The cores indicate the presence of a degree of primary knapping. Those of chert are rough platform cores from which bladelets or blade-like flakes have been detached. The quartzite core is more of a flaked chunk than anything. Blades and blade-like flakes (those flakes which are not as parallel and straight-sided as true blades) are as common as flakes in this assemblage and the large proportion of blades to flakes, together with the occurrence of the two blade cores, suggests deliberate blade production. With the exception of the bladelet core, none of the blades and blade-like flakes could be defined as micro blades, as they are rather larger in size, though none is wider than 15 mm. None of the blades has been re-modified and retouch is confined to four flakes: one is a rough end-scraper and another two exhibit fine, nibbling retouch blunting the edges of the flake. The final retouched piece is a large, thick mudstone flake which has invasive bifacial retouch.

TABLE 1
Stone artefacts: raw material and artefact types

	blade	blade/flake	flake	chunk	core	retouched
Chert	3	5	8	5	2	1
Pitchstone	1	1				
Flint			1	2		2
Quartzite					1	
Mudstone						1

TABLE 2
Stone artefacts: artefact and context type

	blade	blade/flake	flake	chunk	core	retouched
Pits	2	4	2	1		2
Misc features	2	2	1	1	1	
Soils			2	1	1	
Areas 2–22			4	4	1	2

Distribution

Although this is a small assemblage, a spatial examination of the flaked stone does indicate some differences in its distribution across the site (Table 5). Flint and chert were the only materials present in Area 2, over the area of Enclosure 2. Here flakes and chunks were most common and with the exception of the small bladelet core from the 'fire pit' (P59) there is no other evidence for

the production of blades in this area. The two edge-retouched flakes are also from the western part of the site, one in the 'fire pit' (P59) and the other from Area 15.

In Area 1, over the area of Enclosure 1, the flaked stone is generally found within the pits or the miscellaneous features; only two flakes, a core and a chunk, all of which are chert, were found outwith these contexts and are from the soils of this area. The flaked stone is present as single pieces in each feature and only in pit P25 are there three pieces of flaked stone present. With the exception of pits P3, P18 and P25 which contain flaked stone, the rest of the artefacts are from the pits along the southern edge of the alignment and from the miscellaneous features in the south-west of the interior, indicating a high degree of spatial concentration. The flaked stone comes from Phases 1, 2 and 3 of the various pits though deposition in the final phase was most common. Flaked stone of all types is present in this area but there is a possible association of blades and blade-like flakes with the pits and miscellaneous features of Area 1, as these artefact types do not occur outwith these context types (Table 2).

Other stone artefacts

Two of the seven non-flaked stone artefacts were apparently found in the Phase 1 fills of pits in Area 1 (Enclosure 1). In pit P9 a fine grinding slab (SF348, illus 17) was found near the edge of the pit. Although now broken, it has a distinctive regular concave ground face, very smooth and almost polished in the centre, which most probably resulted from its use in grinding and polishing hard substances, perhaps stone axes. This is unlikely to be a saddle quern because of its rather small size and smooth working face which, on a quern, tends to be roughened to facilitate grinding. The other piece (SF347 from pit P3, Phase 1 - illus 17) is a fragment of a large cobble upon which a shallow, oval depression has been pecked; its function is unknown.

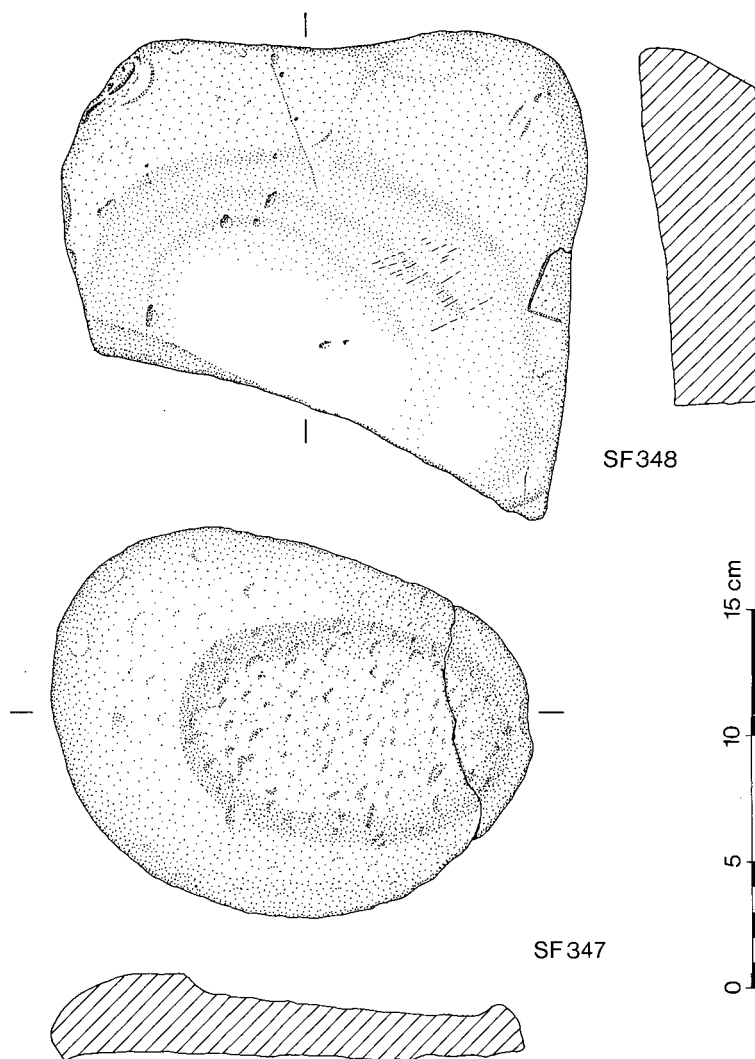
In Area 2, two cobbles were recovered from the 'fire pit' (P59) and may have been used as hammer-stones although they are too badly burnt to be certain.

The more finely worked pieces include a narrow jet ring (SF338 from the channel in Area 12) and a ground shale disc with a central perforation (SF350, Area 15). Finally, a flake from a polished axe of mudstone was found during field-walking in the vicinity of the site.

Discussion

Since this is a small assemblage and it is scattered over a number of contexts it is difficult to discuss its formation with any great certainty. The flaked stone with the emphasis on blade manufacture and the two flakes with blunting edge retouch are elements which are most commonly found in Mesolithic assemblages. There are certainly no later elements in the flaked stone assemblage in the form of particular scraper types or arrowheads which would suggest a clear Neolithic date. The degree to which 'Mesolithic' industries such as this continued into the Neolithic period is little understood at present because of the lack of excavation of early Neolithic sites and also by the general tendency to account for the presence of an 'early' assemblage in later contexts by the processes of redeposition. It is possible, though, at this site that not all of the artefacts are redeposited, particularly because most of the flaked stone comes from feature fills rather than from general soil layers extending across the site, and also because of the apparent differences in deposition between context types.

The blades and blade-like flakes may have been deliberately deposited in the pits and features of Area 1, in marked contrast to their absence from the rest of the site. This observation is supported by the presence of two pitchstone blades which were found in two of the pits.



ILLUS 17 Selected stone artefacts

Pitchstone is an exotic stone in local terms, and was probably imported from Arran. It is present in small quantities on Scottish sites of various periods and commonly in the form of small blades (Thorpe & Thorpe 1984). The function of these pitchstone artefacts is not understood but they clearly had an invested meaning and their deposition, together with blades of chert, in the pits from this site was most likely deliberate. Published examples of such depositional practices at similar sites are few, but at Balfarg a blade-like flake was found in an early Neolithic pit (Barclay & Russell-White 1993, 62 and illus 65: S1) and at Chapelfield, Cowie, pitchstone blades and debitage were found in pits of a possibly similar date (Atkinson 1995, 29).

A retouched flint flake and a perforated, ground stone disc were recovered from Area 15 (the deeply sedimented palaeochannel); this latter type is more commonly found in the later

prehistoric periods although a disc of a similar size but with a larger perforation was found in the barrow at North Mains, Strathallan (Barclay, 1983a, 225).

A catalogue of all stone artefacts may be consulted in the archive of the project records at the NMRS.

RADIOCARBON-DATED CHARCOALS

Charcoal identification

Michael Cressey

Eleven bulk samples were submitted for charcoal identification and all were greater than 5 g of flint charcoal. Recommendations were made for radiocarbon dating on the basis of sample size and species composition. The predominant species identified were *Quercus* (oak) with trace amounts of *Corylus* (hazel), *Pinus* (pine), *Alnus* (alder) and *Corylus avellana* (hazel) nut shells.

Methods Bulk-samples around or greater than 1 kg of charcoal were sub-sampled using a riffle-box and 25% of the sample was investigated. Charcoal pieces greater than 4 mm were suitable for identification, pieces below this size were deemed unidentifiable. The finer sieved fractions below 4 mm were hand-sorted for smaller fragments of roundwood and other charred macro-remains. Analyses were carried out on fractured charcoal samples using reflective light microscopy (x10–400 magnification) examining the transversal sections and where necessary longitudinal surfaces. Comparisons were made against in-house anatomical wood reference material and relevant keys listed in Schweingruber (1990). Attention was given to the possibility of contaminants such as coal, cinders and shell of which none was present.

Pits The sample from pit P1 contained only *Quercus*. Pit P6 (sample 0235) contained a mixture of charcoal taxa with predominantly *Quercus*, and trace amounts of *Corylus* and *Pinus*. The *Quercus* charcoal consisted of heartwood timber chippings, possibly suggesting woodworking debris. The *Corylus* and *Pinus* fragments were of roundwood. Pit P6 (sample 0823), pit P18 (sample 0267), and pit P18 (sample WH4992) contained only *Quercus* charcoal. Sample 0809 from pit P25 contained predominantly *Quercus* with only trace amounts of *Pinus*, *Corylus* and *Alnus*. Sample F3131, from the same context, described as a ‘possible plank’ was identified as *Quercus*. Sample 0805 from pit P25 also contained only *Quercus*.

‘Fire pit’ (F49) Sample 0827 contained charcoal recovered from the upper fill of what is described as a ‘fire pit’. The charcoal fragments were below 4 mm in size but 0.77 g of *Corylus avellana* nut shell fragments were recovered from this sample. From the same context, sample 0831 contained *Corylus* and *Pinus* charcoal in trace amounts (1.67 gm and 0.12 gm respectively). Fragments of *Corylus avellana* nut shells (0.66 gm) were also identified. Sample 0830 from the lower fill of pit P49 contained a much smaller number of *Corylus avellana* nut shell (0.09 g) and trace amounts of *Quercus* charcoal.

Post-hole PH43 Sample 0821 was taken from the fill of post-hole PH43, in Enclosure 2, and was found to consist exclusively of *Quercus*.

A more detailed report on the species identified and the condition of the charcoals is given in the archive of the project records at the National Monuments Record of Scotland (RCAHMS).

Radiocarbon dates: Results

J S Rideout

The charcoal which was identified included a preponderance of large-diameter oak. Because this is a slow-growing species — so that the wood itself may be considerably older than the event in which it was burnt — AMS dating rather than conventional dating was preferred. This method is appropriate to smaller samples and, consequently, allowed charcoals of faster-growing *Corylus* (hazel-nut shells and small roundwood) to be dated, as well as a selection of *Quercus* samples.

In the case of the *Quercus* charcoals, sub-samples were selected with the aim of minimizing the potential problem of dating old oak. Following a strategy proposed by Patrick Ashmore, a number of small sub-samples from the same contexts were submitted for accelerator dating. If the two or three resulting dates differed greatly, the youngest date in each case could be used as the most reliable indicator of the date of the felling of the timber. The predicted variation was not observed in the results, however, as seen here.

Pit P6 produced three calibrated dates from Phase 2 of Enclosure 1. These were remarkably similar, with a mean calibrated range of 4034–3816 cal BC. Possibly the date with the smallest error gives the most accurate indication of the date of the timber used, at 4040–3790 cal BC. Pit P25 also yielded a calibrated date range for Phase 2 of Enclosure 1; this was somewhat later than for the first pit, and with no overlap, at 3778–3384 cal BC. It may be, therefore, that the three dates from pit P6 are from oak which was itself a little older than the period of Phase 2 activity. Alternatively, activity at this monument could have stretched from the late fifth millennium cal BC until the mid, or even late fourth millennium cal BC.

The dates from Enclosure 2 were later again than the later Enclosure 1 dates, indicating that the post enclosure was constructed later than the pit enclosure. Again, sub-sampling from a single context produced two dates quite close to each other, with a mean calibrated date range of 3369–3041 cal BC. It is conceivable, however, that Enclosure 1 (Phase 3) was still in use, or that activity there had only recently ceased when the construction and use of Enclosure 2 was begun.

Finally, the single date from ‘fire-pit’ P59 is considerably older than any others with a range of 5621–5248 cal BC. This suggests either that there was contamination from earlier material (carbonized hazel-nut shells) or that the Carinated Bowl pottery from the pit is considerably earlier in date than previously thought. Given that most of the Carinated Bowl pottery from the site was found in Phase 2 or Phase 3 contexts in Enclosure 1, contamination by residual charcoal of Mesolithic date seems the more likely explanation.

All samples were submitted to the Scottish Universities Research Reactor Centre (SURRC); the results are set out in Table 3, below.

TABLE 3A
Radiocarbon dates

Context Post-ex interpretation	Sample or Sub-sample	Species Identified	AA-	Date (BP)
Lower, Phase 2, charcoal fill of pit P6	0823a	<i>Quercus</i>	20410	5145 ± 80
Lower, Phase 2, charcoal fill of P6	0823b	<i>Quercus</i>	20409	5130 ± 60
Lower, Phase 2, charcoal fill of pit P6	0823c	<i>Quercus</i>	20411	5135 ± 70
Phase 2 fill of pit P25	0809	<i>Corylus avellana</i>	20412	4830 ± 60
Upper fill of ‘fire pit’ P59	0827	<i>Corylus avellana</i> nut shells	20413	6530 ± 75
Fill of Enclosure 2 post-hole PH43	0821a	<i>Quercus</i>	20414	4490 ± 110
Fill of Enclosure 2 post-hole PH43	0821b	<i>Quercus</i>	20415	4530 ± 50

TABLE 3B
Calibrated dates

Context Post-ex interpretation	AA-	Date (BP)	1 sigma (cal BC)	2 sigma (cal BC)
Lower, Phase 2, charcoal fill of pit P6	20410	5145 ± 80	4035–3819	4222–3780
Lower, Phase 2, charcoal fill of pit P6	20409	5130 ± 60	3997–3820	4040–3790
Lower, Phase 2, charcoal fill of pit P6	20411	5135 ± 70	4031–3819	4215–3780
P6, Phase 2 average (average of above three)	–	5135.3 ± 39.6	3993–3825	4034–3816
Phase 2 fill of pit P25	20412	4830 ± 60	3696–3529	3778–3384
Upper fill of 'fire pit' P59	20413	6530 ± 75	5508–5368	5621–5248
Fill of Enclosure 2 post-hole PH43	20414	4490 ± 110	3360–2930	3510–2910
Fill of Enclosure 2 post-hole PH43	20415	4530 ± 50	3353–3103	3369–3041
PH43 average (average of above two)	–	4523.2 ± 45.5	3348–3103	3369–3041

MACROPLANT ASSESSMENT

Tim Holden

The main objective of this assessment was to make a rapid evaluation of the abundance and diversity of the plant remains. The assessment comprised all flotation samples submitted. Each sample, including the 1 mm and 0.3 mm size fractions, was scanned using a binocular microscope. A detailed account of the observations made is given in the archive of the project records at the National Monuments Record of Scotland (RCAHMS).

No evidence of waterlogging was recorded from any of the contexts sampled. It has been assumed, therefore, that charred plant remains are ancient in origin and uncharred material modern in origin. This is supported by the species composition of the uncharred assemblage which is typical of improved agricultural land in Scotland and probably derives from recent agricultural practice, having travelled down the archaeological profile via the action of worms and other invertebrates.

Results

Enclosure 1 Although the majority of samples from this structure produced significant quantities of wood charcoal the identifiable cereal grains and seeds/fruits recovered were very few. Of a total of 89 flotation samples no more than three produced identifiable cereal remains, consisting of single grains of wheat from samples 1360, 1428 & 1449 representing the second phase of activity in pits P11, P23 & P25. In two of these the grains were morphologically similar to *Triticum aestivo-compactum* (bread/club wheat) while the third was more like *Triticum dicoccum* (emmer wheat). Both of these crops are already known from the Scottish Neolithic with both having been found in large numbers from the timber hall at Balbridie, Grampian (Fairweather & Ralston 1993) and emmer wheat recovered from Lairg, Sutherland (Holden forthcoming). Wheat is much less common on later Scottish archaeological sites so there is no reason to suggest that these grains do not actually represent Neolithic cereals, rather than later contaminants. Other identifiable species are limited to occasional fruits of *Ranunculus flammula* (lesser spearwort) and *Galium aparine* (cleavers). *R flammula* is a common component of wet grassland and other damp places while *G aparine* often grows in hedgerows and disturbed land and is frequently recovered in association with winter sown cereals. The significance of these two species is difficult to ascertain with certainty. It is possible that they represent weeds of cereals as both can be found in agricultural fields under appropriate conditions. In this instance, however, it is more likely that they became charred along with the bulk of the wood, having been growing on disturbed ground close to the point of conflagration.

Enclosure 2 This area is characterized by low concentrations of charcoal and extremely low numbers of other charred botanical remains. Modern seeds and roots were, however, present in higher proportions than in Area 1 (Enclosure 1). Cereal grains were recovered from just two samples (3448 & 3467) and, though poorly preserved, three were identified as cultivated barley (*Hordeum sativum* indet.). Barley is known to have been a commonly cultivated cereal in Scotland through the Neolithic and in all subsequent periods. In the earliest mainland sites it is generally the naked form which tends to predominate (eg at the later prehistoric settlements at Lairg or Cairnwell: Holden forthcoming and this vol), but this is gradually replaced so that by the Iron Age the hulled form is far more common. The grains from Area 2 were not in a condition whereby hulled or naked varieties could be separated; it is difficult, therefore, without direct dating, to state with confidence that these are of Neolithic date. The provenance of these grains is further open to question because these strata were overlain by medieval rig and furrow and the presence of modern seeds and root penetration in the Neolithic sediments indicate that a degree of downward movement of material into earlier levels has occurred.

Conclusions

The levels of sampling and analysis of the charred plant remains from both the pit and post enclosures were such that if cereal or other remains had been present they would have been recovered and identified. The absence of these elements cannot be explained in terms of poor preservation or the lack of opportunities for their becoming charred: large quantities of well-preserved wood charcoal were recovered from a broad spectrum of contexts across the site, so that burnt cereals would also have occurred if cereals had been present in any quantities. Therefore, the most obvious explanation for the exceptionally low levels of cereal grain recovered is simply a general paucity of grain on, or around, the site when any of the burning events took place. If this explanation is valid, it would appear unlikely that the site was concerned with the routine activities normally associated with the domestic processing of cereal grain.

The small amount of grain present precludes any detailed interpretation of the assemblage. It is of some note, however, that all the cereal grains recovered from Enclosure 1 were of wheat while all those recovered from Enclosure 2 were of barley. There is no obvious explanation for this, but it is possible that the barley is a contaminant derived from later agricultural sediments and should, therefore, be treated with some caution.

GENERAL DISCUSSION

J S Rideout

ENCLOSURE 1

Phase 1

The foregoing account of the enclosures at Bannockburn accepts the original interpretation of the site as a monument formed by three phases of activity. Furthermore, the apparent segmentation of the enclosure boundary — suggested by consecutive pits forming short arcs — indicates that it was constructed in individual sectors, possibly over a long period of time. This is not unusual for rectilinear monuments of Neolithic date, although details of construction differ. On a different scale, a cursus monument or bank barrow known as the Cleaven Dyke, near Blairgowrie in Perthshire, appears to have been constructed in both large and small segments with between two and five deliberate gaps in the central bank, the larger sections being constructed as linked dumps (Barclay *et al* 1995; Barclay & Maxwell 1995). A ditch-defined rectilinear

enclosure at Dorchester, cut by the ditch of a *cursus*, had four breaks in the ditch in the areas excavated (Whittle *et al* 1992, 149, fig 4) and, at the same site and apparently incorporated into the *cursus*, a larger D-shaped enclosure had a causewayed ditch (*ibid*, 153–4, fig 7 and 156, fig 9).

None of the evidence recorded indicates the function of the pits in Phase 1. The artefacts assigned to this phase are not from secure contexts and must, therefore, be treated with caution. No carbonized seeds were found in the macroplant samples. In short, it would appear that the pits were excavated then left to weather and fill up. The source of the fills is not clear. Some silted deposits clearly weathered from the sides of the pits, but the depth of the fills overall suggests that another source must also be identified. If this source was the spoil derived from pit-digging in the first instance, then the original spoil mounds must have been made quite close to the pits themselves. The pattern of deposition of the fills did not indicate where the spoil was dumped but, as Tavener suggests (1987, 71), it is likely that several years at least would have passed before the pits could have re-filled through weathering and erosion alone. Although Reynolds (1977, 35) records that an experimental pit excavated in chalk at Butser Farm had accumulated no erosion deposits after five years, this author's own observations in Stirlingshire suggest that features cut through gravel can accumulate re-fill very quickly.

There is no evidence that the Phase 1 pits were post-holes. Despite the fact that Phase 2 activity would have removed traces of post-pipes or evidence of removed posts, the single phase pit P14 contained no such evidence and the surviving Phase 1 deposits were identified by the excavators as silting rather than deliberately dumped post-hole fills. It is possible, therefore, that when Phase 1 was completed, forming an arrangement of empty or substantially empty pits, it resembled the segmented embanked pit-alignments in the North York Moors which have low segmented banks either outside or inside the lines of pits (Lofthouse 1993). It may have been created as a marker or boundary for an area of activity inside (or even outside) it or, alternatively, to demarcate an area to the north or south of the monument. The large gap between pits P48 and P49, together with the outlier pits P51 and P52, could be interpreted as an entrance.

There were few or no cultural materials in the Phase 1 deposits. Evidently little or no domestic activity of the sort that would have produced artefact debris or carbonized material was taking place in the area. Sherratt (1991, 50) suggests that Neolithic 'ritual pits' may have been used for the disposal of ritually significant but inedible parts from sacrifices; such material which would not have survived in the soils at Bannockburn. It is also possible that, before they were allowed to silt up, the pits were kept clean and free from non-ritual 'polluting' material. If this was the case, however, it is likely that any occupation material from the immediate vicinity would have found its way into the pits after abandonment. However, as nothing of the sort was found, it must be considered possible that there was simply little or no domestic activity on the site before, during, or for some time after the pits had served their original purpose in Phase 1.

It seems likely that the scatter of small pits in the south-west corner of Enclosure 1, and possibly some of the larger ones such as the 'outlier' pits to the south and south-west and pit P59, represent activity of some sort between Phase 1 and Phase 2. Described by the excavator as stake-holes and small post-holes (Tavener 1987, 72), their function is obscure. Features also interpreted as stake-holes, however, formed parts of houses at the settlement site at Chapelfield, Cowie (Atkinson 1995), and given the shallowness of the trench or ditch elements of these houses it is conceivable that, at Bannockburn, similar features have been removed by erosion. One of the post-holes cuts pit P38 of Enclosure 1, in Phase 1, but is itself cut by the re-excavation of that pit in Phase 2 (and a second pit may have cut P36); this indicates a tight grouping of features within the same period. If this miscellany of features represents domestic activity, as suggested by Cowie

(above), one must ask whether mundane activity was allowed to impinge on the remains of a ritual monument.

It is possible that, although domestic in origin and appearance, the activity was in some way related to the continuing, if changing, function of the monument. The relatively large number of flaked stone from these small features is noteworthy. It has been observed elsewhere that 'the idea that ritual corresponds entirely to religion is incorrect' (Richards & Thomas 1984, 214). Equally, the apparently mundane can be present within a ritual context. Thus, it is possible that the two small features cutting pits P36 and P38 were markers, possibly inserted before the original pits disappeared entirely, and that evidence for other such markers was either not identified during the archaeological excavation of the site or was removed by later Phase 2 activity. Domestic activity may even have been an integral or at least a necessary part of the use of the monument, possibly as the context in which materials were produced for use in the next stage, during the re-cutting of the pits in Phase 2.

Phase 2

Attempts to address the function of earlier Neolithic pits have been made using reference to shape, profile, fill patterns and other obvious attributes, mostly without success. Reynolds (1977, 35) advocates a more careful response, observing that 'a pit is a structure and consequently deserves minute examination and recording of its walls, floor, shape and capacity'.

A number of the excavated pits revealed that a stone lining, and possibly some timber too, was inserted within deliberate re-cuts. In some cases, deep, near-vertical re-cuts were lined with stones set in a matrix of soil clearly differentiated from the Phase 1 fills. Could this represent the erection of large timber posts? This seems unlikely: the stones were arranged with too much care and do not generally appear to have been placed as 'packing stones'. Where large Neolithic post-pits with packing stones have been excavated elsewhere, as at Meldon Bridge, the stone is surrounded by dumped soil (Burgess 1976, 164 fig 9.4) and the recorded sections clearly show post-pipes and upper weathering cones. Furthermore, the larger post-pits at Meldon Bridge and post-pits on henge monuments such as North Mains, Strathallan, have ramps to facilitate the insertion of the posts (*ibid.*, 159, fig 9.3; Barclay 1983a, figs 3, 4 & 6–9). None of the pits at Bannockburn exhibited the 'heart-shaped' fills which typically result from posts rotting *in situ* (Reynolds & Barber 1984, 99, 101 fig 1). Although superficially similar in section to the Bannockburn pits, the 'external shafts' at Milfield North henge, Northumberland (Harding 1981, 101–5, fig 13), do not display the same pattern of sedimentation. Nonetheless, the possibility that posts may have been deliberately removed from these pits must be considered. The burnt material in the bottom of the pits could be seen as similar to that found dumped into some of the post-pits at Meldon Bridge (*op cit*). It is clear from the surviving lining in pits P45 and P18 (illus 7 & 8, respectively) that these features would have held massive timbers, at almost 1 m in diameter, but there is no evidence of the level of disturbance to both stone lining and the upper fills which would have ensued had posts of this diameter been removed.

Two pits at Easterton of Roseisle appear to offer the closest parallels to the pits at Bannockburn in Phase 2, although there are no available illustrations to confirm this (Young 1896a & 1896b, reviewed by Walker 1968). These were also stone-lined pits, c 1.5 m diameter and c 1.5 m deep, containing charcoal, wood ash and pottery. They were interpreted by Young, first as cremation pits (1896a), but later as storage pits with timber superstructures (1896b, 241). At Milfield South henge, Northumberland (Harding 1981, 95–9), a possible funerary function was attributed to another, although later, feature superficially similar to the Phase 2 pits at

Bannockburn. This large pit contained a rectangular stone setting like many at Bannockburn but had been cut by a large, apparently ramped pit, identified as a post-pit (*ibid*, 98 fig 7).

Other possibilities might include storage pits, storage vats, open or closed smoking pits, rubbish pits, cremation pits or even pit-traps for animals driven by a hunt. Pits with deep profiles (as in some of the profiles in both Phase 1 and Phase 2) are often interpreted as storage pits for cereal grain. Experiments with grain storage have proved of limited success (Bowen & Wood 1967; Reynolds 1974 & 1977) and is only likely to have been possible on chalk sites. (This is clearly indicated by a distribution map with these features — now, admittedly, somewhat out of date — compiled by Field *et al*: 1964, 368, fig 7). Even on chalk sites, a lining was assumed to be necessary (see Bowen & Wood 1967, pl 1a). Although lining was present at Bannockburn there was little evidence of stones on the pit floors and, unless much of it was removed before the pits filled up, it would not have been sufficient to seal the contents from the surrounding damp, often wet soils. Finally, the presence of wood charcoal at the pit bottoms, but without quantities of carbonized grain, also indicates that they are unlikely to have been used for cereal storage. Similarly, given the lack of a complete or continuous lining, it is unlikely that the pits were used as vats to store wet foodstuffs, an idea explored by Evans (1982).

It is hard to imagine how the pits could have been used for smoking food, particularly if they were closed or covered for this purpose. The problem would be one of air supply and regulation. During the excavation, however, it was demonstrated that a fire could be sustained in the pits. A lining of stone and till was inserted in one of the pits when it had been fully excavated, and a fire was set using twigs, small branches, a small log and some turf. The fire burned slowly for over two days and most of the material (c 5 kg of fuel excluding the turf) was consumed. Some charcoal remained, but there were no signs of burning on the stones. Thus, it is possible that the pits were used for cooking pits. The lack of carbonized cereal or burnt bone does not support this speculation (see Barclay 1983b, 64; Rideout 1995), though if the pits were ritual features, any food which was cooked or even accidentally burnt might have been deliberately and carefully removed.

Kinnes (1994, 96) observed that ‘the purpose of the pit [in early prehistory] . . . appears to be for placement, not for functional storage or tidy-minded refuse disposal’. Likewise at Bannockburn, burial of rubbish also appears an unlikely explanation, unless this act was invested with a ritual significance. Nonetheless, Wainwright interpreted alternating deposits of ‘black ashy material’ and clean gravel in pit 44 at Broome Heath as ‘disposal of rubbish’ in the final use of a timber-lined storage pit (1974, 17 fig 12). In contrast, although more than one layer of charcoal-rich material was present in some of the Phase 2 fills at Bannockburn, others exhibited signs of burning *in situ* on, or very near, the pit bottoms. This suggests that simple waste disposal was not their intended function, an observation made on similar grounds of pits at Balfarg (Barclay & Russell-White 1993, 166–7).

In summary, it is impossible to positively identify a function for the pits in Phase 2; there is no evidence that they were post-holes, or pits for storage, smoking or rubbish disposal. In any case, it may have been that, as with Phase 1, the enclosed (or excluded) space formed by the pits as a group was more important than the creation of a series of pits as individual receptacles.

Phase 3

Whatever the function of the Phase 2 pits, they eventually infilled (or were deliberately backfilled) with deposits more topsoil-like than the earlier fills. Tavener (1987, 72) described the difficulty of saying whether Phase 3 fills represented distinct and deliberate activity, or were simply the final

deposits in Phase 2. Certainly in some of the pits, the latter interpretation could be correct; but in others, such as pit P38 where the cut for Phase 3 is both steep and deep, this is patently not the case. In any case, some pits ascribed to Phase 3 have no identifiable Phase 2 fills (though some have activity that is either Phase 2 or Phase 3). It is possible, therefore, that the type of activity represented by Phase 3 was similar to that represented by Phase 2, the two being different manifestations of the same ongoing activity.

Most of the Neolithic pottery from the pits came from upper Phase 2 or Phase 3 deposits. On other sites, deliberate deposition of pottery in pit fills has been suggested, as in the Early Neolithic pits at Balfarg, Fife (Barclay & Russell-White 1993, 166–7), at Littleour, Perthshire (Barclay & Maxwell 1996), and perhaps also at pit FAE on Site F (a group of pits and smaller features) at Douglasmuir, Angus (Kendrick 1995, 35 and illus 6). Whittle (1988, 55) draws attention to the large quantities of potsherds from some of the pits at Broome Heath, but at Bannockburn the number of sherds involved was much smaller (13 in total) and it is difficult, therefore, to say what significance can be attached to their presence.

ENCLOSURE 1: SUMMARY

It is clear from the evidence that activity was taking place at Bannockburn which can be identified with the concept of structured deposition. What is unusual here is that the pits not only show evidence of ‘ritual’ use but that they also combine to form a distinct shape in plan. Previously identified sites with structured or deliberate deposition of material have contained isolated pits or groups of pits with no apparent pattern. While the lack of pattern may be the results of the constraints on the areas excavated — as at Hillend, Clydesdale, where one of three pits had been recut and contained pottery (Armit *et al* 1994, 116–17, illus 3 & 4), or at North Carnaby Temple, Yorkshire (Manby 1974, 37–43) — it is noticeable that there are no recorded instances of structured deposition from rectilinear pit-defined enclosures. Elsewhere, the ‘external shafts’ at Milfield North henge, Northumberland, formed a ring around the henge (Harding 1981, 101–5, fig 12); similarly, an arc, or part of a ring, of Early Neolithic pits surrounded the stone circle at Cairnwell, Aberdeenshire (Rees, this vol); though both are later in date than the enclosures at Bannockburn.

In plan, Enclosure 1 resembles the later (late fourth/early third millennium cal BC) structure at Littleour, Angus (Barclay & Maxwell 1995 & 1996), and the later Structure 1 and Structure 2 at Balfarg, Fife (Barclay & Russell-White 1993). The Balfarg structures were radiocarbon dated to the last quarter of the fourth millennium to mid-third millennium cal BC (*ibid*, 161). Unlike Enclosure 1, both are defined by post-holes. The bow-ended forms are reminiscent of ditched enclosures and pre-long barrow features elsewhere (see comparative plans in Loveday 1989, 65 fig 4:9) and it is possible, as hypothesized by the excavators at Bannockburn, that Enclosure 1 had a funerary function. Again, this could have been performed within the pits or within the enclosure. Barclay’s preferred interpretation of the rectilinear timber structures at Balfarg was that they may have been enclosures around excarnation platforms, as part of the mortuary structure tradition (Barclay & Russell-White 1993, 169–82). It is possible that Bannockburn Enclosure 1 had a similar function and that the internal features have been removed by ploughing. Any post-holes or pits of no great depth which had existed in the centre of the enclosure, on top of the low ridge, are likely to have been seriously eroded. An alternative, but highly speculative interpretation is that the Phase 1 pits were used for excarnation or temporary burial, the bodies decomposing either with or without any covering of soil, before being removed to final resting places elsewhere.

Further discussion of the enclosure is hindered by the lack of information about the full extent of the monument. It is possible that there was no eastern end, and the site was similar to the U-shaped enclosure at Barford (Loveday 1989, 53 fig 4:2), or that the eastern end was no great distance to the east of Area 1 and mirrored the western end, resembling the structures at Balfarg and Littleour in proportion (*op cit*). It is even possible, though perhaps less likely because of an intervening knoll to the east, that the monument was an early cursus of considerably greater length than was recorded.

ENCLOSURE 2

Although the dates from Enclosure 2 are a little later than those from Enclosure 1, it is possible that both were visible, or possibly in use, at the same time. Indeed, they may have combined to form a barrier which directed movement from north to south through the 10 m gap between them. Like Enclosure 1, the extent of Enclosure 2 is uncertain, but it is possible that the western end was somewhere near the former valley to the west (see Area 15, above) which was then a much more pronounced feature. If so, the enclosure would have been about 115 m in length. As the sides of the enclosure were not parallel, it is also possible that it was intended to form a trapezoidal plan (if the sides continued on their courses, they would meet c 400 m from the east end).

Whatever its final original form or function, it is clear that both Enclosure 2 and Enclosure 1 belong to the tradition of Neolithic rectilinear monuments including cursuses and long mortuary enclosures (Loveday & Petchey 1983). With a length of at least 90 m and a maximum width of 27.5 m, Enclosure 2 is larger than a contemporary post-defined enclosure at Douglasmuir, Angus (Kendrick 1995) — at c 65 m by c 20 m — and the long mortuary enclosure at Inchtuthil, Perthshire (Barclay & Maxwell 1991, 34 illus 7). On the other hand, it is not as long as other similar sites in eastern Scotland known from aerial photographs, including the Balneaves cursus, near Douglasmuir (Maxwell 1978, 41 pl XIX), or the ditched cursus at Blairhall, Perthshire (RCAHMS 1994, fig 17c). Douglasmuir and Balneaves, and possibly Blairhall, have single transverse divisions, features not apparent at Bannockburn. Such internal divisions might possibly have been missed during the excavation or might have been removed by ploughing. Another possibility is that the apparent internal divisions at Balneaves and Kinalty (see comparative drawings in Barclay 1995) are old terminal lines, and that the northern part of Balneaves and the southern part of Kinalty were once discrete enclosures similar in size to Bannockburn Enclosure 2, and also Milton of Guthrie 1 and 2 in Angus, and Bennybeg in Perthshire, at c 25–30 m wide and c 105–125 m long (Kenny Brophy, pers comm).

CONCLUSIONS

Excavation has shown that most of the structural remains at Cowie Road, Bannockburn, represent Neolithic activity associated with two rectilinear enclosures dating from perhaps as early as the late fifth millennium cal BC until some time in the early third millennium cal BC. It is possible that the two enclosures overlapped in date, representing a long tradition in the area of ritual activity associated with structures in the cursus/long mortuary enclosure tradition. Earlier, Mesolithic, activity is possibly indicated by a single anomalous radiocarbon date from a Neolithic pit. Combined with the results from neighbouring prehistoric sites to the north (Rideout 1996) these enclosures show that the area may have been continuously occupied from the Mesolithic period until the present day.

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APPENDIX 1 — TABLES 1–4

TABLE 4
Phases in pits

Pit (P-)	Phase 1	Phase 2	Phase 2 stone lining	Phase 3	illus	notes
1	■	■	■	■	—	
2	■	—	—	■	—	
3	■	?	?	■	—	
4	■	■	■	?	—	
5	■	■	■	?	5, 11	
6	■	■	■	■	—	
7	□	■	■	■	—	
8	■	■	■	■	—	
9	□	■	■	■	—	
10	■	■	■	—	—	
11	■	■	■	—	—	
12	■	■	■	□	—	
13	□	■	■	■	—	
14	■	—	—	—	—	
15	■	□	—	□	5, 10	
16	■	□	—	□	—	
17	■	■	■	■	5	
18	■	■	■	■	8	
19	■	■	■	■	—	
20	■	—	—	■	—	
21	■	■	—	■	—	
22	■	□	?	□	—	

23	■	□	?	□	—	
24	■	□	?	□	—	
25	■	■	■	—	5	
26	?	?	?	?	—	totally sampled pit, probably a Phase 1/2 but poss 1/2/3, with stone lining
27	■	■	—	■	—	cuts Pit 27a
27a	□	—	—	—	—	pre-dates Enclosure 1?
28	?	■	—	?	—	
29	■	■	■	■	—	
30	■	■	■	■	5, 9	
31	■	■	■	■	—	
32	■	■	—	?	—	
33	■	■	■	—	—	
34	□	■	■	—	—	
35	■	■	■	?	—	Probable Phase 3 fill removed before dawn
36	■	■	■	?	—	
37	■	■	■	■	5	
38	■	■	■	■	6	
39	■	■	■	■	6	
40	□	■	■	■	—	
41	■	■	■	□	—	interpretation unsure, top of fills removed before section drawn
42	■	—	■	6	—	
43	■	■	■	■	—	
44	■	—	—	■	—	
45	■	■	■	■	6, 7	
46	■	■	■	—	6	this is Pit A (section) in interim, wrongly located on interim plan (actual location is B on plan)
47	□	■	■	■	—	
48	■	■	■	■	—	
49	■	■	■	■	—	
50	□	?	?	?	—	
51	?	?	?	?	—	not excavated
52	■	—	—	—	—	shallow pit, probably cuts F3122
53	■	—	—	—	—	very shallow
54	■	—	—	—	—	
55	■	—	—	—	6	may be genuine outlier pit
56	?	?	?	?	—	
57	■	■	—	—	—	may be genuine outlier pit
58	?	—	?	?	n/d	

Key ■ present
□ probable
? uncertain or unknown
n/d not drawn

TABLE 5

Phase 1 details

Note: a question mark indicates uncertainty of presence of the phase

Pit	Width	Depth	Neolithic pottery	Stone artefacts	Dating samples	Macroplant work?
1	1.15	0.32	—	—	—	yes
2	1.15	0.10	—	—	—	—
3	1.18	0.33	—	346, 347	—	yes
4	1.26	0.59	—	—	—	yes
5	1.65	0.60	—	—	—	—
6	<1.72	0.58	—	—	—	—

7	<1.02?	<0.40?	-	-	-	-
8	<0.95	0.36	-	-	-	-
9	<1.13?	<0.38?	-	348	-	-
10	<1.42	0.80	-	-	-	-
11	1.47	0.70	-	-	-	yes
12	1.29	0.49	-	-	-	-
13	<1.15?	<0.34?	-	-	-	-
14	1.45	0.47	-	-	-	-
15	1.11	0.53	-	-	-	-
16	<1.35	0.49	-	-	-	-
17	<1.11	0.95	-	-	-	-
18	<1.65	>0.61	-	-	0267	-
19	<1.32	<0.47	-	-	-	-
20	<1.13	0.40	-	-	-	-
21	1.44	0.50	-	-	-	-
22	1.23	0.48	-	-	-	-
23	1.76	0.39	-	-	-	yes
24	1.53	0.55	-	-	-	-
25	1.64	0.65	-	-	-	yes
26	?	?	-	-	-	-
27	>1.11	0.36	-	-	-	-
27a	>1.61?	0.67?	-	-	-	-
28	?	?	-	-	-	-
29	<1.36	0.66	-	-	-	-
30	<1.24	0.75	-	-	-	-
31	<1.36	>0.88	-	-	-	-
32	1.18	0.71	-	-	-	-
33	<1.42	0.55	-	-	-	-
34	<1.50?	<0.68?	-	-	-	-
35	<1.42	0.87	-	-	-	yes
36	<1.28	0.79	-	-	-	-
37	<1.95	>0.84	-	-	-	-
38	<1.45	0.81	-	-	-	-
39	<1.10	0.45	-	-	-	-
40	1.02?	0.40?	-	-	-	-
41	<1.43	0.52	-	-	-	-
42	1.32	0.77	309, 316	-	-	-
43	<1.00	0.58	-	-	-	-
44	1.45	0.68	-	-	-	-
45	1.34	0.60	-	-	-	-
46	1.39	0.78	-	-	-	-
47	<1.08?	<0.81?	-	-	-	-
48	<1.20	0.72	-	-	-	yes
49	<1.45	0.82	-	-	-	-
50	1.58	0.94	-	-	-	-
51	?	?	-	-	-	-
52	2.00	0.31	-	-	-	-
53	1.51	0.09	-	-	-	-
54	0.80	0.39	-	-	-	-
55	c1.30	0.94	-	-	-	-
56	?	?	-	-	-	-
57	<1.56	0.83	-	-	-	-
58	?	?	341	-	-	-

TABLE 6
Phase 2 details

Pit	Width	Depth	Stone lining?	Neolithic pottery	Stone artefact	Dating sample	Macroplant work?
1	0.90	0.33	yes	—	—	—	yes
2	—	—	—	—	—	—	—
3	?	?	?	—	—	—	—
4	1.23	0.50	yes	—	—	—	yes
5	1.38	0.55	yes	—	—	0235	—
6	1.72	0.63	yes	—	—	0823	yes
7	<1.02	<0.40	yes	—	—	—	—
8	0.90	0.27	yes	—	—	—	—
9	1.13	0.38	yes	—	—	—	—
10	1.42	0.68	yes	—	—	—	—
11	1.47	0.70	yes	—	—	—	yes
12	>0.85	0.47	yes	—	—	—	—
13	1.15	0.34	yes	—	—	—	yes
14	—	—	—	—	—	—	—
15	1.19?	0.54?	no	—	—	—	—
16	0.99?	0.47?	no	—	—	—	—
17	<1.11	0.83	yes	326	—	—	—
18	1.43	0.59	yes	—	—	—	—
19	1.32	0.47	yes	—	—	—	—
20	—	—	—	—	—	—	—
21	1.40	0.48	no?	—	—	—	—
22	1.02?	0.52?	no?	—	—	—	—
23	1.43?	0.45?	no?	—	—	—	yes
24	1.18?	0.64?	no?	—	—	—	—
25	1.44	0.63	yes	—	353 354 361	0809 0805	yes
26	?	?	yes	—	—	—	—
27	1.42	0.37	no	—	—	—	—
27a	—	—	—	—	—	—	—
28	?	?	yes	—	—	—	—
29	1.36	0.60	yes	—	—	—	—
30	1.22	0.63	yes	—	—	—	—
31	<1.23	0.91	yes	—	—	—	—
32	>1.05	0.66	no	—	—	—	—
33	1.42	0.47	yes	—	—	—	—
34	1.50	0.68	yes	—	351	—	—
35	<1.42	0.78	yes	—	—	—	yes
36	1.20	0.73	yes	—	—	—	—
37	1.95	0.89	yes	—	—	—	—
38	1.36	0.69	yes	—	—	—	—
39	1.10	0.41	yes	—	—	—	—
40	1.02	0.40	yes	—	—	—	—
41	1.43	>0.36	yes	327	—	—	—
42	—	—	—	—	—	—	—
43	1.00	0.48	yes	—	—	—	—
44	—	—	—	—	—	—	—
45	1.30	0.56	yes	337	—	—	—
46	1.04	0.73	yes	315 330	—	—	—
47	1.08	0.81	yes	345	—	—	—
48	0.96	0.66	yes	—	317	—	yes
49	1.45	0.82	yes	—	—	—	—
50	?	?	?	—	—	—	—
51	?	?	?	—	—	—	—
52	—	—	—	—	—	—	—
53	—	—	—	—	—	—	—
54	—	—	—	—	—	—	—
55	—	—	—	—	—	—	—

56	?	?	?	-	-	-	-
57	1.56	0.79	no	349	-	-	-
58	?	?	?	-	-	-	-

TABLE 7
Phase 3 details

Pit	Width	Depth	Neolithic pottery	Stone artefact	Modern Pottery	Dating sample	Macroplant work?
1	0.68?	0.24?	-	-	-	0299	yes
2	0.33	0.12	-	-	-	-	-
3	0.45	0.30	-	-	-	-	yes
4	?	?	-	-	-	-	yes?
5	?	?	-	-	-	-	-
6	1.10	0.41	-	-	-	0807	yes
7	0.68	0.40	-	-	-	-	-
8	0.41	0.23	-	-	-	-	-
9	0.67	0.35	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	0.85?	0.37?	-	-	-	-	-
13	0.95	0.30	-	-	-	-	yes
14	-	-	-	-	-	-	-
15	1.19?	0.54?	-	-	-	-	-
16	0.99?	0.47?	-	-	-	-	-
17	1.11	0.52	322	-	-	-	-
18	0.92	0.44	-	329	-	WH4992	-
19	0.76	0.29	-	-	-	-	-
20	> 0.83	0.35	-	-	-	-	-
21	0.95	0.43	-	-	-	-	-
22	1.02?	0.52?	-	-	-	-	-
23	1.43?	0.45?	-	-	-	-	-
24	1.18?	0.64?	-	-	-	-	-
25	-	-	-	-	-	-	-
26	?	?	-	-	-	-	-
27	0.80	0.17	-	-	-	-	-
27a	-	-	-	-	-	-	-
28	?	?	-	-	-	-	-
29	0.82	0.58	-	-	-	-	-
30	0.66	0.48	-	-	-	-	-
31	1.06	0.75	-	-	-	-	-
32	1.08?	0.20?	-	-	-	-	-
33	-	-	-	-	-	-	-
34	-	-	-	-	-	-	-
35	1.42?	0.46?	-	324	GR3360	-	yes
36	?	?	-	-	-	-	-
37	1.11	0.76	-	308	-	-	-
38	0.70	0.59	-	-	-	-	-
39	0.74	0.40	-	307	-	-	-
40	> 0.50	0.35	314?	-	-	-	-
41	> 0.74?	0.54?	-	-	-	-	-
42	0.81	0.52	-	310	-	-	-
43	> 0.58	0.57	334 335 336	-	-	-	-
44	0.80	0.37	323	-	-	-	-
45	> 0.66	0.46	-	-	-	-	-
46	-	-	-	-	-	-	-
47	0.63	0.74	-	-	-	-	-
48	-	-	-	-	-	-	-
49	1.45	0.67	-	-	-	-	-
50	?	?	-	-	-	-	-

51	?	?	-	-	-	-	-
52	-	-	-	-	-	-	-
53	-	-	-	-	-	-	-
54	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-
56	?	?	-	-	-	-	-
57	-	-	-	-	-	-	-
58	?	?	-	-	-	-	-

APPENDIX 2

MEDIEVAL AND LATER FEATURES

In addition to the Neolithic features described above, a suite of much later features and associated pottery attests to medieval settlement and agriculture in the vicinity. Up to 22 agricultural furrows, aligned NW/SE, crossed the eastern end of the site (illus 4). The relic ploughsoil in the furrows produced pottery of 13th- to 17th-century date. In addition, medieval and post-medieval pottery was recovered from a range of other contexts which included post-holes (Area 11), migrated soil or ‘hill-wash’, and modern ploughsoil (via surface collection). The furrows also produced two chert flakes and part of a modern glass bottle.

A modern drain trench crossed the northern part of the site, cutting Enclosure 1, and an engineer’s test pit was cut into the interior of this enclosure (these are shown as A and B in illus 4). The line of the drain is clearly visible on oblique aerial photograph RCAHMS: ST/2916 (illus 2).

Medieval pottery

D Hall

The pottery from the adjacent fort and homestead are published elsewhere (Hall in Rideout 1996) but is considered in the discussion below. The material from the pit and post enclosures has been sorted into identifiable fabric types and is described separately. The fabrics have been identified by eye only; no petrological examination has been carried out. A full catalogue can be consulted in the archive of the project records at the National Monuments Record of Scotland.

East Coast Redware There are 18 sherds of this fabric which vary in colour from red brown to light brown with grey cores. It belongs to an identified Scottish East Coast tradition dating between the 13th and 15th centuries (Hall 1996, 126). There are documentary references to earlier potteries in Stirling and at St Ninians in 1521 and 1549 (Caldwell & Dean 1992, 7).

Gritty Ware A single sherd of dark grey gritty fabric, glazed dark green, comes from a post-hole within Enclosure 1. This may belong to the White Gritty Ware tradition and could date between the 12th and 15th centuries (Hall 1996, 127).

Throsk-type Ware There are seven sherds in this reduced grey fabric from surface collection and plough furrows. They all resemble products of the Throsk kilns and may date to the 16th or 17th centuries (Caldwell & Dean 1992).

The small group of medieval pottery from all four Bannockburn sites (see also Rideout 1996) includes fabric types identifiable with those known from excavations of medieval sites elsewhere

in Scotland. However, it is interesting that the fort produced fabric types that may represent local products of the Bannockburn/Stirling area. None of this putative local fabric was recovered from either the excavation of the homestead or the pit and post enclosures described here. These fabric types are particularly interesting as they seem to suggest a 14th/15th-century date, whereas the nearby kiln site of Throsk is known for 17th-century production, and no earlier production has been identified so far. As the bulk of the pottery comes from topsoil horizons it might not be regarded as particularly significant, but the presence of what may be previously unrecognized local fabrics is an important discovery, for which confirmation and comparisons should be sought in any further excavation in the area.

Cartographic sources

Jim Rideout

It is difficult to transpose the areas of rig & furrow shown on General Sir William Roy's military survey of Scotland (1755–9) onto modern maps with any degree of accuracy, but rig is shown by Roy in the present area in various alignments. Ruins 120 m to the north of the site, identified as 'Wester Greenyards' on the 1st edition of the Ordnance Survey (Stirlingshire Sheet XVII, 1865; surveyed 1860) are probably the latest remains of a farm recorded by Pont when he surveyed Scotland at the end of the 16th century (a farm named 'W Greenyards' is marked on Blaeu's published version of this survey; reproduced in Stone 1991, 59) but Pont's manuscript records two other neighbouring farms, simply called 'Greenyardes' and 'Greenyards' (Stone 1989, 165). The furrows, pot sherds and even some of the post-holes not aligned on Enclosure 2 are remnants of continuing medieval and post-medieval settlement at Greenyards.

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