

The excavation of a late Neolithic Henge-type enclosure at Balfarg, Markinch, Fife, Scotland, 1977-78

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ABSTRACT

The earthwork enclosure of henge type at Balfarg, Fife has standing within it two orthostats and has been recognised by means of aerial photography since 1947. The site was totally excavated in advance of projected housing construction in 1977 and 1978. The excavation revealed clear evidence for the existence of a main timber circle, 25 m in diameter, set concentrically to the enclosure ditch. This timber circle was associated with a substantial assemblage of grooved ware as well as other material. There is some evidence to suggest that five other concentric timber circles exist on the site which, where any evidence survives, would appear to be palisade-type structures. Massive natural erosion and agricultural damage to the site has also meant that the precise plan of stone settings on the site will never be known but there is evidence to suggest that two stone circles have existed on the site one outwith the other with the western entrance to the site marked by a single portal stone. There is some evidence to suggest that the stone settings are later than the timber structures. Close to the centre of the monument a slab covered pit concealed an inhumation of a young adult accompanied by a handled beaker.

SECTION 1

INTRODUCTION

The site of the henge monument at Balfarg near Markinch, Fife (see figs 1 & 2) (NGR NO 281 032) has always been known by virtue of two massive standing stones which have remained set up on its interior. The land surrounding the stones has been cultivated, certainly since the period of agricultural improvement of the late 18th century, and almost certainly prior to that. This long history of farming exploitation has led to the total denudation of all surface traces of the existence of the earthwork monument. In June 1925 the Royal Commission for the Ancient and Historical Monuments (Scotland) described the two standing stones in the *Inventory* for Fife, Kinross and Clackmannan (RCAMS 1933). The entry reads:

'These two stones stand 350 ft above sea level about a quarter of a mile SW from the farmhouse at Balfarg. They are tall boulders of sandstone, roughly rectangular in shape but with somewhat pointed tops, and are set up in a line running NW and SE [this should presumably read NE and SW: *RJM*] at a distance of 43 ft 8 in from one another. Neither shows any trace of markings, nor do they appear to have been packed at the base.

The measurements are:

	West Stone	East Stone
Height	6 ft 7 in	5 ft 3 in
Girth at base	9 ft 8 in	12 ft 3 in
Girth at 4 ft up	11 ft	13 ft 2 in

They are not marked in Gothic letters on the OS Map xix SE. 17 June 1925.

This description sufficed still in 1978 except that stone packing was, by this date, clearly visible at the base of the stones and presumably this had been revealed over the intervening period of 50 years by agricultural and sub-aerial erosion. No record was made in 1925 of any visible earthwork features associated with the stones either in the published account or in the investigator's site notes.

The recognition of the association of the standing stones with a hengiform earthwork had to await the years immediately succeeding the Second World War when Dr Kenneth Steer initiated a programme of aerial photograph examination in Lowland Scotland. Photographs taken in 1947 of the standing stones revealed a penannular earthwork clearly delineated only on its N and E sides enclosing the area within which the stones stood. Atkinson in his paper of 1952 reconstructed, from the indications available on the air photograph, a circular ditched enclosure some 60 m in diameter with a bank outside the ditch and a single causewayed entrance on the WSW side. He postulated that the two remaining stones on the site comprised the remnant elements of a portal arrangement at the entrance and of a ring of orthostats set up on the interior of the monument. His reconstruction thus postulated a monument of Piggott's standard Class I type.

It was in January four years earlier that the *New Town (Glenrothes) Draft Designation Order* was also published setting out the need for a new community in central Fife to act as a focus for the, then, projected expansion of the Fife coalfield. Coalmining had for centuries formed a major element of local economy and the land upon which the Balfarg henge stands had been owned, prior to its transferal to the Glenrothes Development Corporation, by the Balfour family whose wealth was to some considerable extent derived from coalmining. Widespread mining activity in the area has led to serious problems of ground subsidence confronting the Development Corporation in its efforts to utilise land for housing construction. By the early 1970s it seemed certain that the land upon which the henge at Balfarg stood would be required, *faute de mieux* in the process of New Town expansion.

In 1977 the writer was invited by the Scottish Development Department (Ancient Monuments Branch), Inspectorate of Ancient Monuments, to carry out an investigation of the site prior to its destruction. The excavation of the interior of the site and a substantial sample of ditch fill was completed in two seasons totalling 3½ months of work. Prior to work commencing on the site further air photographic cover (flown by the Inspectorate's own Central Excavation Unit) and a magnetic gradiometer survey carried out by undergraduates of the Department of Archaeology, University of Edinburgh (Martin Munro and Louis Nebelsick) facilitated the exact location of the enclosure on the ground. It proved to be 65 m in internal diameter (from inner ditch lip to inner ditch lip) surrounded by a ditch c 8 m in width. The area of the internal platform comprised, thus, some 3318 sq m. At no point on the perimeter was any bank material visible *in situ* and consequently only a relatively small sector of bank was excavated. Its former presence was indicated by the existence of an evanescent band of 'protected' less weathered subsoil and this band where visible, indicating as it must the state of the bank in eroded condition, was some 10 m in width.

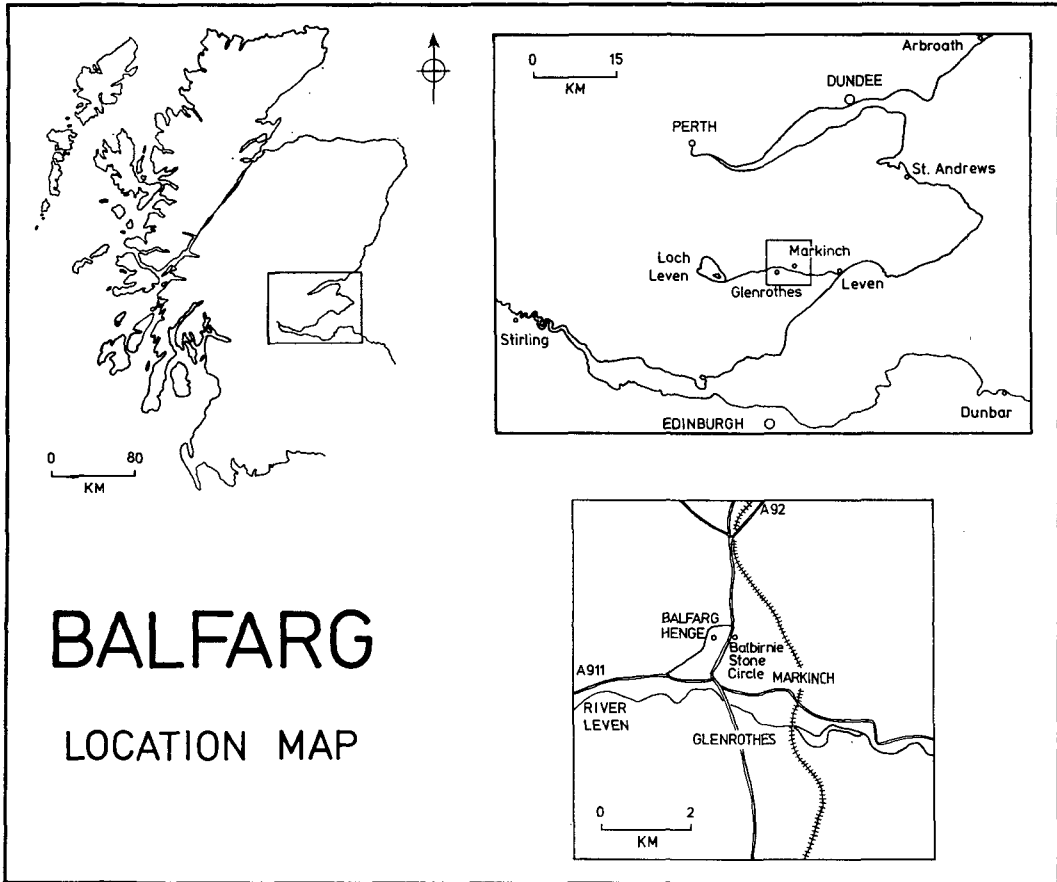


FIG 1 Location map

An overall diameter for the monument, therefore, of c 100 m and a total area of c 7865 sq m can be indicated, rendering it comparable in size to the Ring of Brodgar, Orkney.

Work on the site was divided into two phases. Firstly in 1977 the eastern half of the monument (the area furthest from the assumed western entrance causeway) was totally examined. Secondly in 1978 the western half of the monument including the entrance was excavated. The axis dividing the two halves was set 10 m to one side of the centre of the monument so that any central feature occurring within the monument would be excavated as a whole in the second season. The area furthest from the entrance was tackled first as the area likely to be least complex – an area where mistakes would be least disastrous.

THE EXCAVATION

The site was found to be set upon a slight knoll composed of very mixed glacial till and boulder clay. The subsoil surface of the site as revealed presented a bewildering pattern of differing soil compositions ranging from fine sand to large packed cobbles set in clay. The ditch which surrounds the knoll upon which the central platform of the site was set truncated a natural 'halo' of very fine concreted sand running around the interior platform, which would appear to be the

product of natural dune formation around the skirts of the knoll during late Glacial time. Excavation furthermore showed that the indistinct outline of the ditch on the S side of the site as detected by aerial photography and geophysical survey was indeed a reflection of archaeological reality. The site had been chosen with extreme care so that a natural gulley formed probably by glacial melt water streams on the S side of the site (see fig 2) had been utilised to form part of the enclosure circuit and the digging of the ditch had only been necessary around two thirds of the site's perimeter – the other third being marked off by this sharp natural declivity. Further possible evidence of the great care exercised in the selection of the site can be seen in the choice of a point where the interior of the site would be quite level. The flat topped knoll enhanced by a ditch for two thirds of its perimeter was set in a shallow basin of land bounded by low hills on all sides. To the NW the site faces the stark eminence of East Lomond Hill at a distance of c 7 kms while to the NE the low outline of Clatto Hill stands on the horizon.

Inspection of the surface of the interior of the site after removal of the ploughsoil by a Leibherr 911 wheeled mechanical back-acter immediately revealed a very serious degree of damage from a combination of natural erosion and modern cultivation. A depth of a metre and a half of slope wash and sub-aerial deposits to the S and W of the site within the natural gulley overlying the prehistoric surface serves as adequate demonstration of the degree to which erosion has been a feature of the landscape of which this site is a part and all indications suggest that up to 0.5 m, possibly more, of the prehistoric surface of the site has been eroded away since the 3rd millennium bc. Indeed Miss Wickham-Jones (see section 2) has pointed to polish imparted to the surface scatter of flint on the site by wind erosion. This total loss of the prehistoric surface from the interior of the site was aggravated by the marks of modern cultivation (see fig 33). These factors added to the *mélange* of variegated soils that forms the present-day subsoil surface presented considerable excavational difficulty and only by the most careful and repeated preparation of the archaeological surface linked to the scrupulous recording by photography and drawing of all the irregularities of that surface was it possible gradually to reconstruct some outline picture of the sequence of events and the architectural layout present on the site during its period of use. This repeated preparation by trowelling, however, had the inevitable consequence of the further removal of the very surface under study and feature depths as eventually recorded may sometimes be less than the diminished depth to which they actually survived prior to archaeological treatment.

The Enclosure Ditch. The clearest feature on the site from the very commencement of the investigation was the ditch. Apparently this had been dug as one exercise to a depth of approximately 2.5 m and the displaced material thrown up as a bank on the prehistoric surface at its outer lip. A berm some 2 m wide was apparent between the relatively unweathered subsoil which represented the prior existence of the bank and the outer lip of the weathering cone of the present-day ditch. The ditch was of a splayed U-profile at all points where it was sectioned and revealed no evidence of recutting or reshaping (see figs 3–5). The primary silt (Layer 6) comprised weathered material from the ditch sides and only after an interval does the asymmetry of the ditch filling indicate the slippage of much of the outer bank material back into the ditch. The whole upper half of the ditch fill comprised eroded material much of it wind-borne which again stands as witness to the active erosion prevalent in the area from an early date. The primary and secondary silts of the ditch (Layers 5 & 6) produced no artefactual material whatever, either in the course of its length or in the ditch butt by the SW entrance. Even flecks of charcoal were rare in these initial deposits, and only after a considerable quantity of bank material had moved back into the ditch is there, universally, an horizon of stability – a turfline (Layer 4) (see section 4) – which does incorporate small quantities of charcoal fleck. Following this the build-up of eroded material begins to take place (Layers 1 & 2).



FIG 2 Balfarg and its relationship to the stone circle at Balbirnie

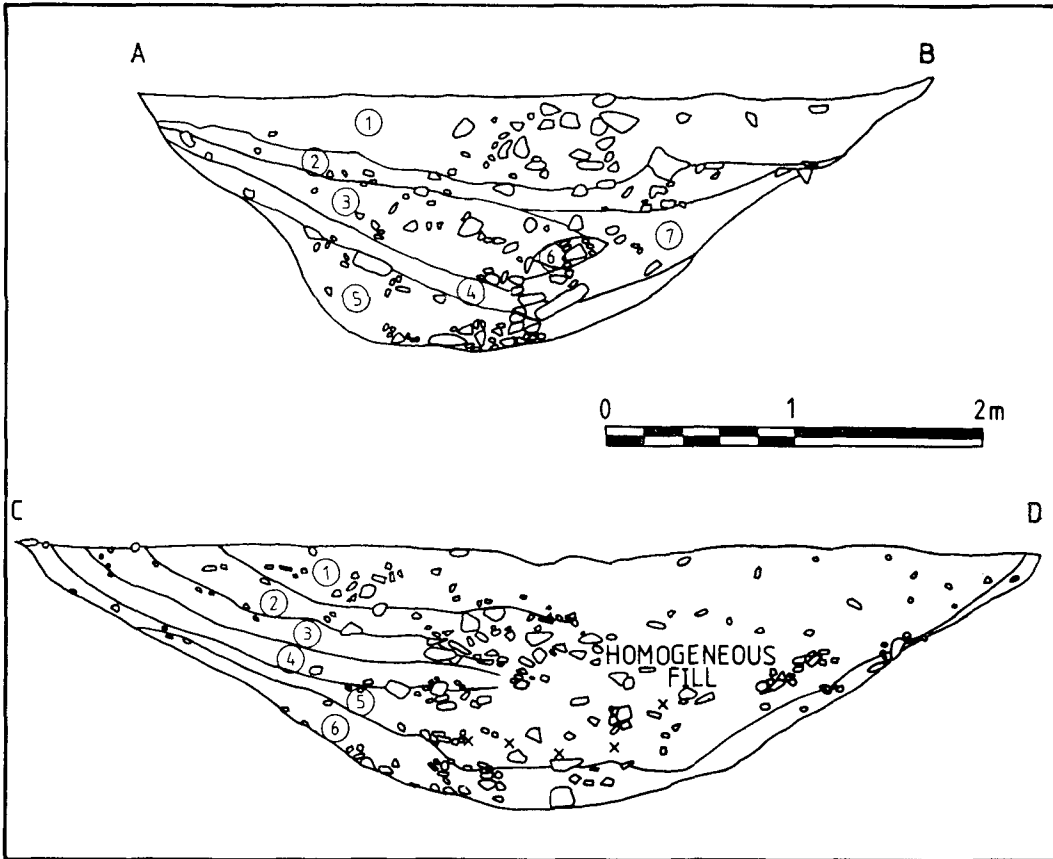


FIG 3 Ditch sections A-B & C-D

Key: Section A-B

- 1 Light brown, quite pebbly, concentration of large rocks in centre
- 2 Grey-brown, hard, clay-like, some small stones & charcoal pieces
- 3 Light brown, very pebbly
- 4 Dark brown silt, relatively stone free
- 5 Orange-brown, sandy & pebbly, concentration of stones in the middle
- 6 Dark grey due to charcoal, flints, sandy
- 7 Orange-brown, flints, few stones

Section C-D

- 1 Sandy
 - 2 Sandy, gravel & rock inclusions
 - 3 Same as 2 but harder
 - 4 Clay with grit
 - 5 Clay, gravel & rock inclusions
 - 6 Primary silt, rock inclusions
- × Charcoal

The evidence from the ditch alone immediately points to one of two possibilities. Either the ditch was assiduously cleaned out during the site's period of use – an activity for which there is no evidence but which could have occurred without leaving any tangible archaeological trace, or the whole site was kept scrupulously clean during its period of use. Neither hypothesis fits easily into any picture indicating that the site's use was for occupation. The ditch butt to the N of the W

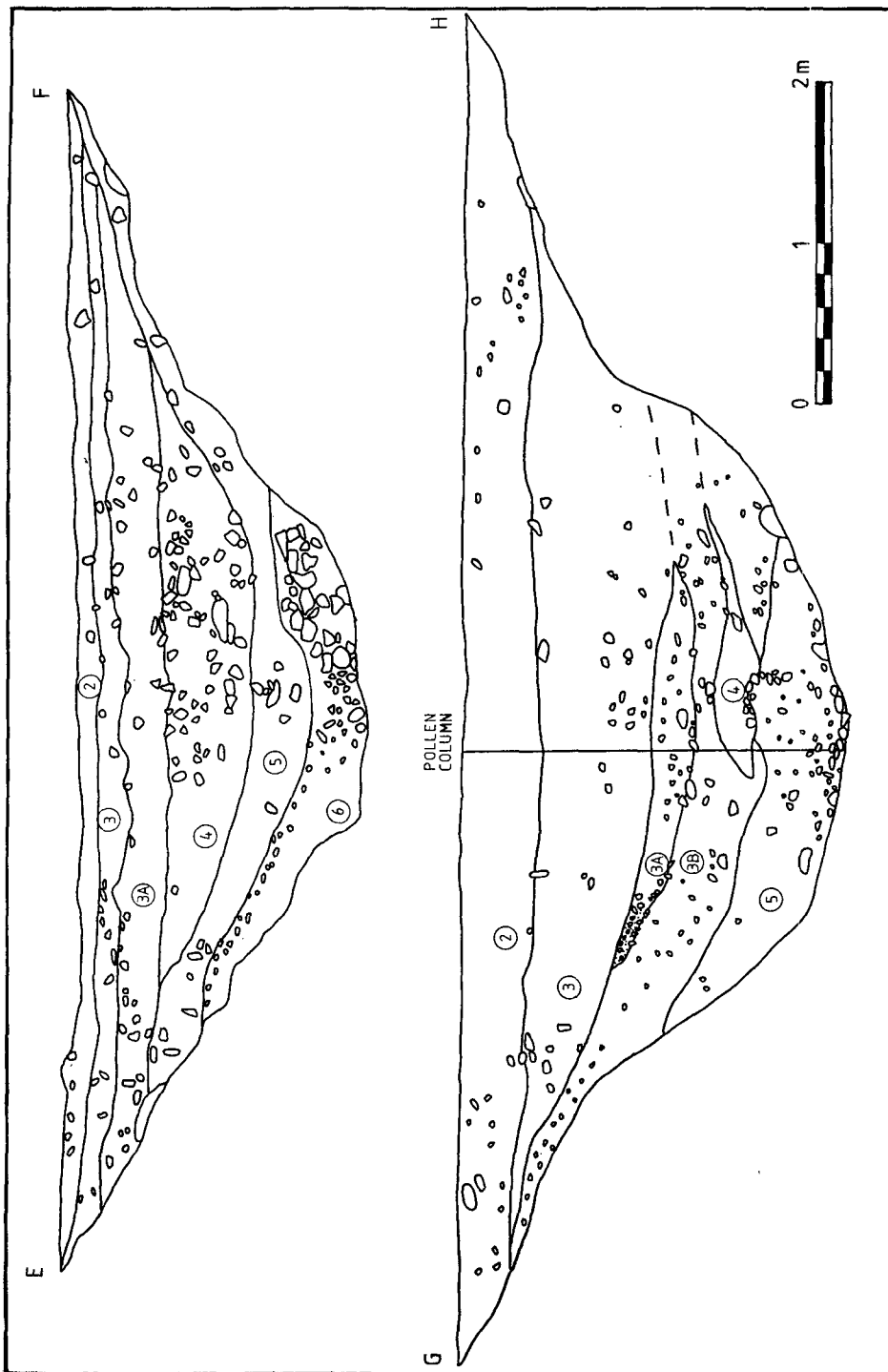


FIG 4 Ditch sections E-F & G-H

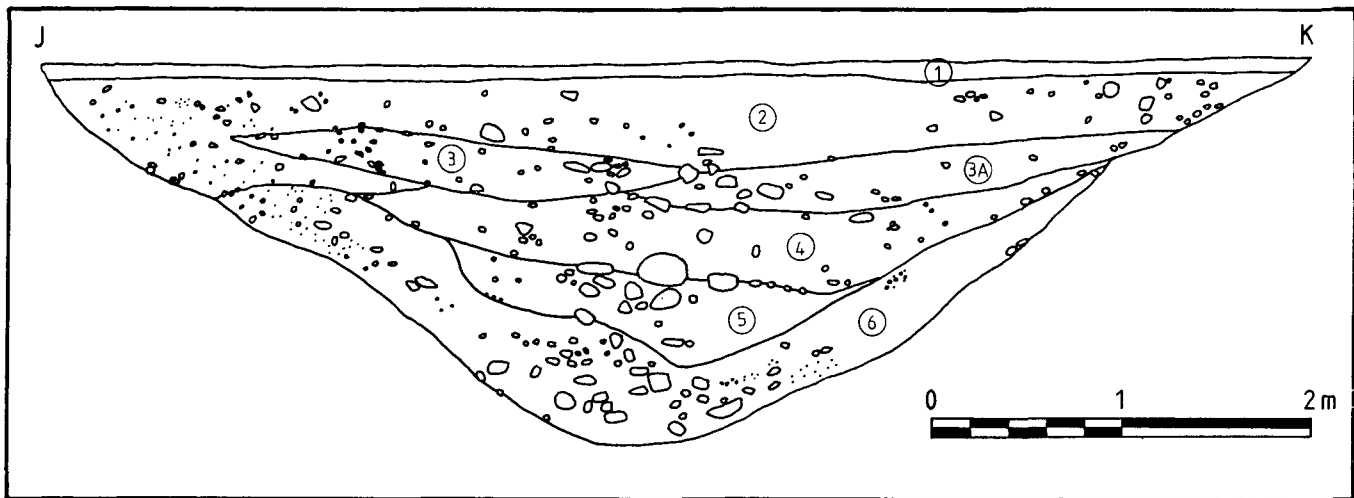


FIG 5 Ditch section J-K

- Key: 1 Plough soil
 2 Light orange-brown, small stones
 3 Sandy brown
 3a Dark brown, clayey
 4 Brownish/black, sticky clay
 5 Dark brown, clayey, stones
 6 Brown, sandy, small stones

entrance swelled out to produce a club-shaped ending, as did that at the SE extremity to a lesser extent. To the S of the W entrance however the ground dropped away into the natural declivity already described and no ditch butt was apparent; although the edge of the natural gully, being extremely abrupt at this point, caused the excavator not a little difficulty, happily resolved by the intervention of Professor Proudfoot. There is however the possibility that the natural contours were scarped deliberately on this side to enhance the clarity of the entrance causeway.

The Portal Stone (PS) (see fig 7). To the S side of the entrance, overlooking the depression to the S stood one of the two remaining standing stones present on the site. Presumably a portal stone, no evidence was retrieved of any equivalent stone socket on the N side of the entrance, and indeed if an orthostat had stood on the N side of the entrance symmetrically with that standing on the S side it might be expected that, unless it had been deliberately removed from the site, it would have tumbled into the ditch butt on the N side of the entrance causeway. No trace was found of it in this position. As will become apparent, however, the two remaining stones on the site were set, probably because of their exceptional size, into somewhat deeper sockets whence they either could not be dragged or disdained to fall. Where stone sockets can be pointed to with any degree of confidence elsewhere on this site they are extremely shallow and much disturbed by cultivation. Their filling comprises jumbled stone blocks – presumably packing stones tumbled into the voids left by the now absent orthostats. Some selection of rocks for packing the stone holes appears to have taken place avoiding easily laminating rocks present in the till which when rammed into position would simply have broken up. This selection of harder less friable rocks was of major assistance in the location of these minimal and difficult features – where location proved possible at all. No cultural debris of any kind was retrieved from any of the stone-holes including those of the two remaining stones, excavated after the latter had been lifted from position.

The Outer Stone Circle. Despite the retrieval of a number of possible and probable stone sockets, it is by no means clear what form the orthostatic layout on the site took. Six probable stone sockets (S'1–S'6 see figs 8–10 and Table 1) were located at approximately equal intervals along the eastern margin of the interior, set just within the inner lip of the present-day weathering cone of the ditch. Clearly a number of sockets set in this position would have disappeared altogether with the encroachment of the ditch lip through weathering. If these sockets represent the existence of a stone circle set up on the inner lip of the ditch such a putative ring would not correspond in position with either of the two remaining standing stones. Such a ring would comprise c 24 orthostats of which not one survives. Nevertheless the sockets, such as they are, are quite impressive particularly stone hole S'3 with its content of burnt material at its base, and the possibility of the existence of this outer stone circle at one stage of the site's development cannot be ruled out.



FIG 6 Key to symbols used in drawings of the features

- 1 Dark brown, loamy soil
- 2 Light brown, loamy soil
- 3 Dark sandy soil
- 4 Light sandy soil
- 5 Clay soil
- 6 Silty soil
- 7 Burnt soil
- 8 Gravelly soil

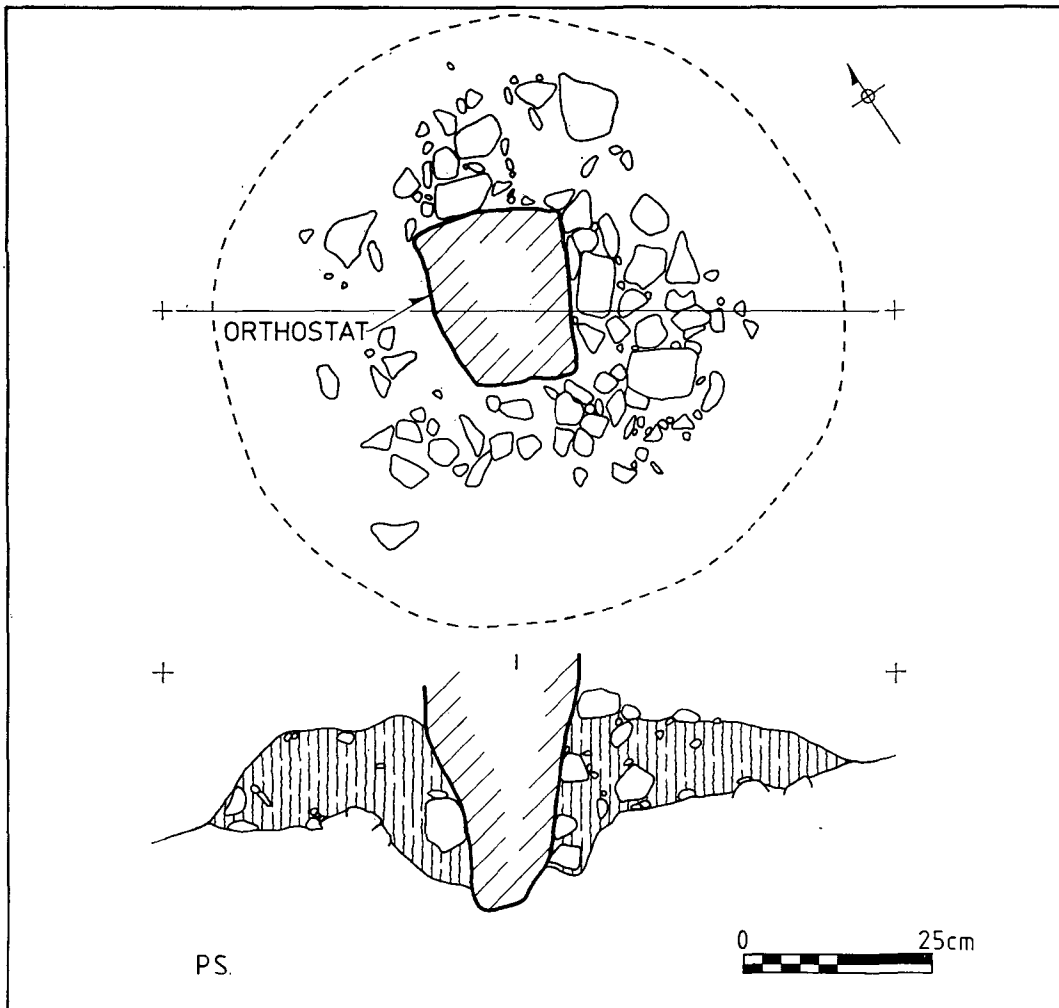


FIG 7 The portal stone

The 'Inner Stone Circle'. The inner present-day standing stone and the other clear stone sockets (S1, S3, S4 & S5 see figs 10–14 and Table 2) may well form all that remains of an inner circular setting with three deeper sockets in its SW sector. Such a setting would necessitate 12 orthostats, one of which remains erect today. These sockets were quite barren of any cultural material except for a tiny deposit of burnt bone located within S3. S2 (the socket within which the inner surviving orthostat stands) and S3 are by far the deepest (see sections: fig 12 & fig 13) and may well represent sockets for the most massive orthostats of the circle perhaps thus indicating the preponderance of taller monoliths in the western sector (see discussion below). Features S4, S5 & S1 are the only other sockets (see figs 14, 10 & 11) apparently to be linked with a stone circle on the basis of their distinctive shallow profile and selective stone packing. Stone sockets, if they existed between S1 and S2, would have disappeared in the process of erosion of the side of the natural gully set to the S of the site so that the disposition of sockets can be seen to be throughout the western sector of the henge with no equivalent occurrence in the eastern sector with the deepest

TABLE 1

The 'Outer Stone Circle' (for general layout see fig 40) Feature Schedule

Socket No	Sector	Filling	Artefacts	Diameter	Depth
S'1 (fig 8)	NNE	This feature, set on the very lip of the present-day weathering cone of the enclosure ditch comprises a shallow depression of uncertain outline with a uniform light-coloured sandy fill.	None	?1 m	0.10 m
S'2 (fig 8)	NE	A shallow depression in the subsoil surface filled with dark-coloured sandy loam.	None	0.80 m	0.12 m
S'3 (fig 10)	E	A depression in the subsoil surface differentially filled with lighter and darker loamy material with a patch of much comminuted charcoal in the lower fill. This feature is very close to the lip of the enclosure ditch and cuts through the line of post pipes (F1-F9) forming the evidence for outermost timber ring.	None	1.20 m max	0.25 m
S'4 (fig 9)	ESE	A depression in the subsoil surface filled with an undifferentiated sandy fill with selected stone packing present.	None	1.10 m	0.25 m
S'5 (fig 8)	SE	A shallow depression in the subsoil surface filled with an undifferentiated deposit of dark sandy soil.	None	1.30 m	0.20 m
S'6 (fig 9)	SE	A depression in the subsoil surface filled with a differentiated deposit of dark and light coloured loamy soil with selected packing stones apparently <i>in situ</i> .	None	1.50 m	0.30 m

sockets aligned on the western entrance with its apparently single portal stone (PS). S1 is a socket in remarkably fine condition with stone packing well compacted within its fill. This socket is set well on to the slope leading into the natural gully and at this point a greater depth of soil cover has accumulated perhaps protecting the socket from damage by the plough.

The two rings of stone sockets postulated above on the basis of the retrieval of badly damaged features often less than 0.20 m deep (see fig 40) and of unclear form, need not, of course, be contemporary and may relate to successive phases. No relationship could be established archaeologically between the two and the existence of other features, also apparently ruined stone holes, which do not lie upon either of the circles postulated, argues for a sequence of some complexity which given the archaeological techniques employed and the condition of the archaeological surfaces available can only be glimpsed and will never be fully appreciated.

The two remaining standing stones are of doleritic rock derived presumably from the Lomond Hills *massif* as a product of glacial movement. Outliers of this kind and size occur within 5 kms of the site on the slopes of East Lomond today. Each slab weighs between 8 and 10 tonnes. There is no evidence of deliberate shaping although the co-occurrence of a short squatter orthostat with a longer more pointed example is a feature noted in the West Kennet Avenue and commented upon from the point of view of its possible ritual significance (Keiller & Piggott 1936).

The beaker Grave F.XI (see fig 15). Set within the interior of the monument and in no clear relationship of concentricity with either putative stone circle or any other visible structure lay a substantial slab set in a depression in the subsoil surface and packed about with small stone blocks.

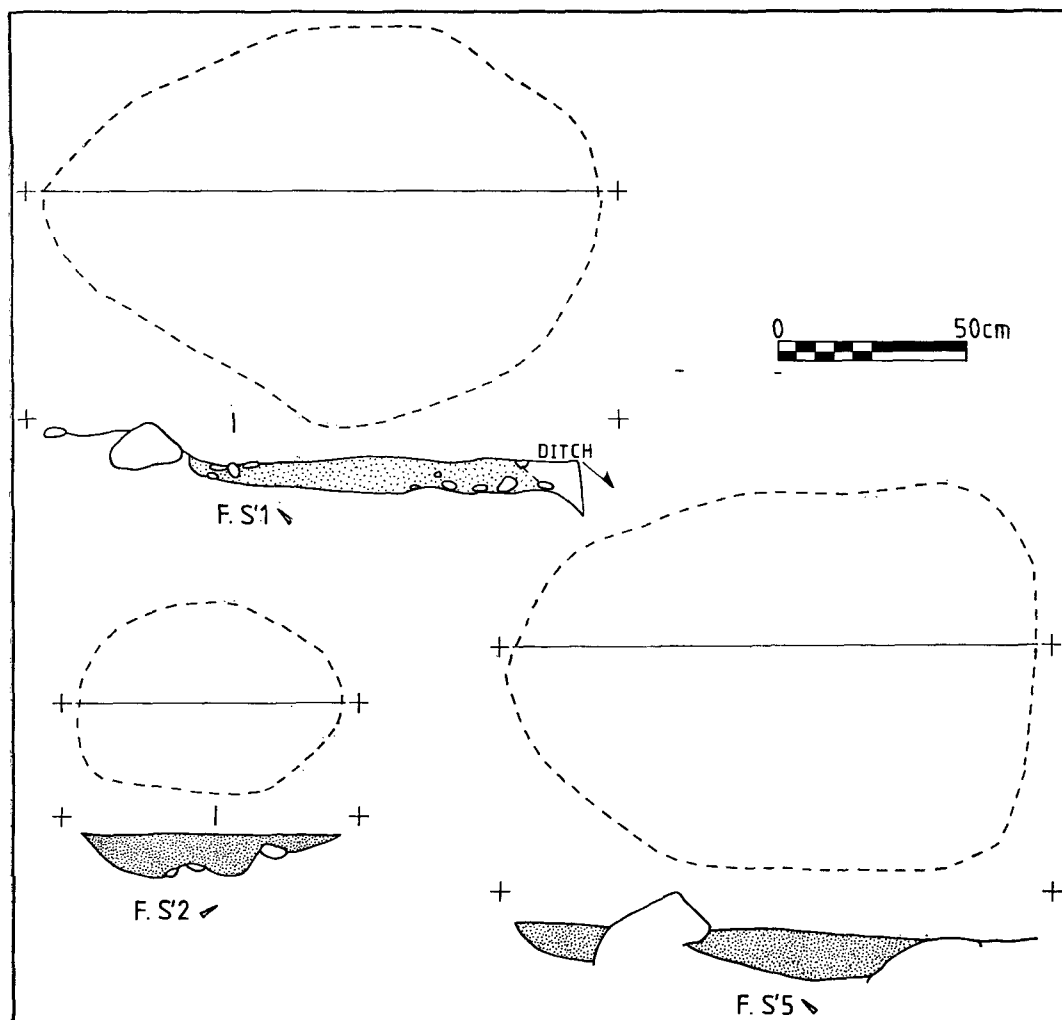


FIG 8 Features S'1, S'2, S'5

This slab weighed approximately $1\frac{1}{2}$ tonnes. Originally it must have lain set in a pit at least 0.40–0.50 m deep, depth now lost due to soil erosion on the site, so that, on retrieval, the slab lay just set into the subsoil surface. Only repeated trowelling preparation revealed that the slab lay set into the subsoil within a dug feature.

Upon raising the slab a sub-oval pit 1.50 m by 1 m filled with a uniform dark brown loose soil deposit was revealed. This filling continued unbroken throughout the pit's depth to its base which lay c 1.10 m below the present subsoil surface. Upon the floor of the pit the inhumation of a young adult lay in crouched position on its right side, facing E with its head to the S. Only the teeth (see section 6) and a tiny part of the left *tibia* survived and no 'shadow' was detected marking the position of the remainder of the body. These two remaining elements, however, make the general disposition of the inhumation quite clear. Placed also on the floor of the grave before the face and chest of the body, set on its base in upright position, was a handled beaker P50 (see

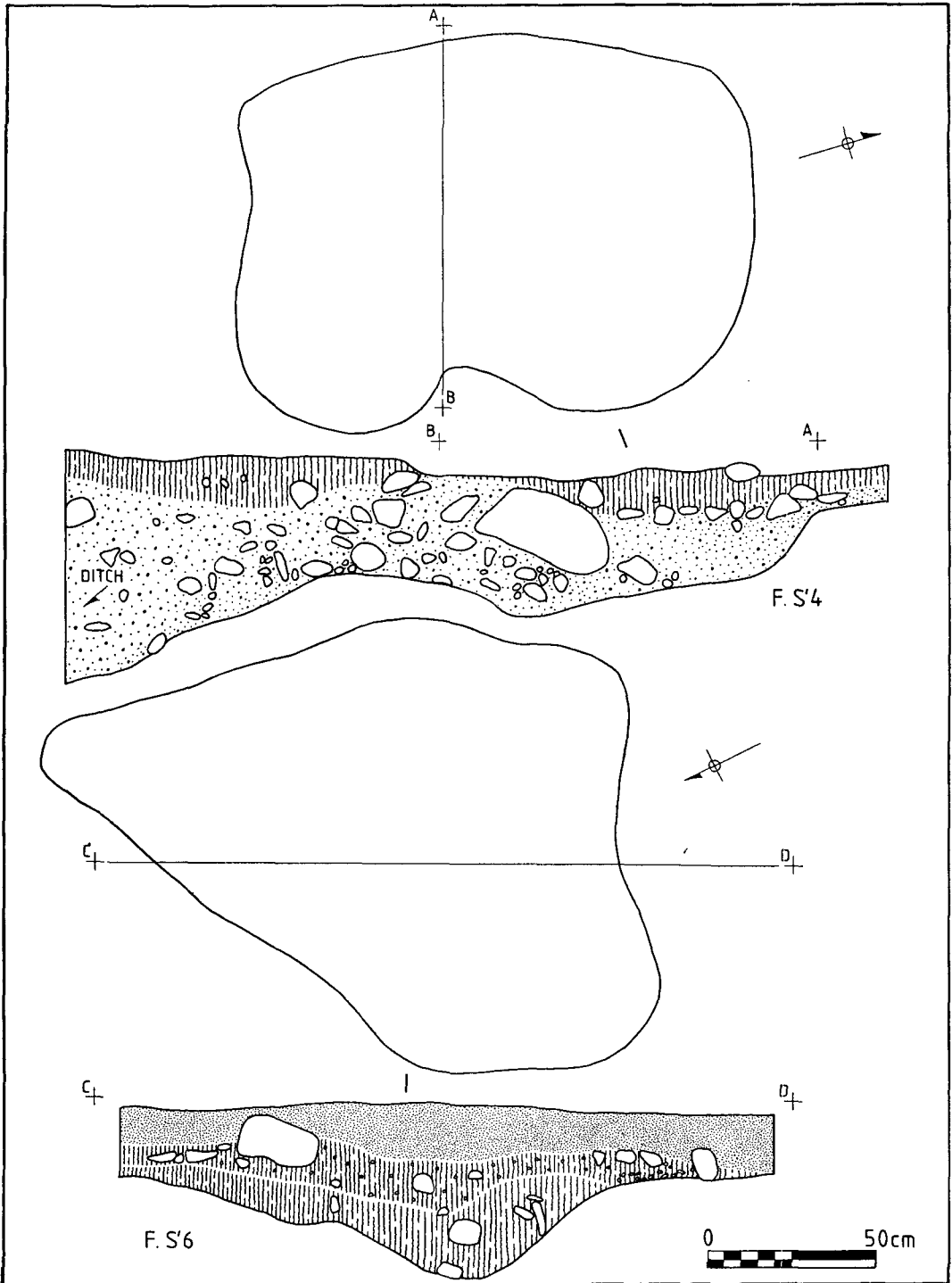


FIG 9 Features S'4 & S'6

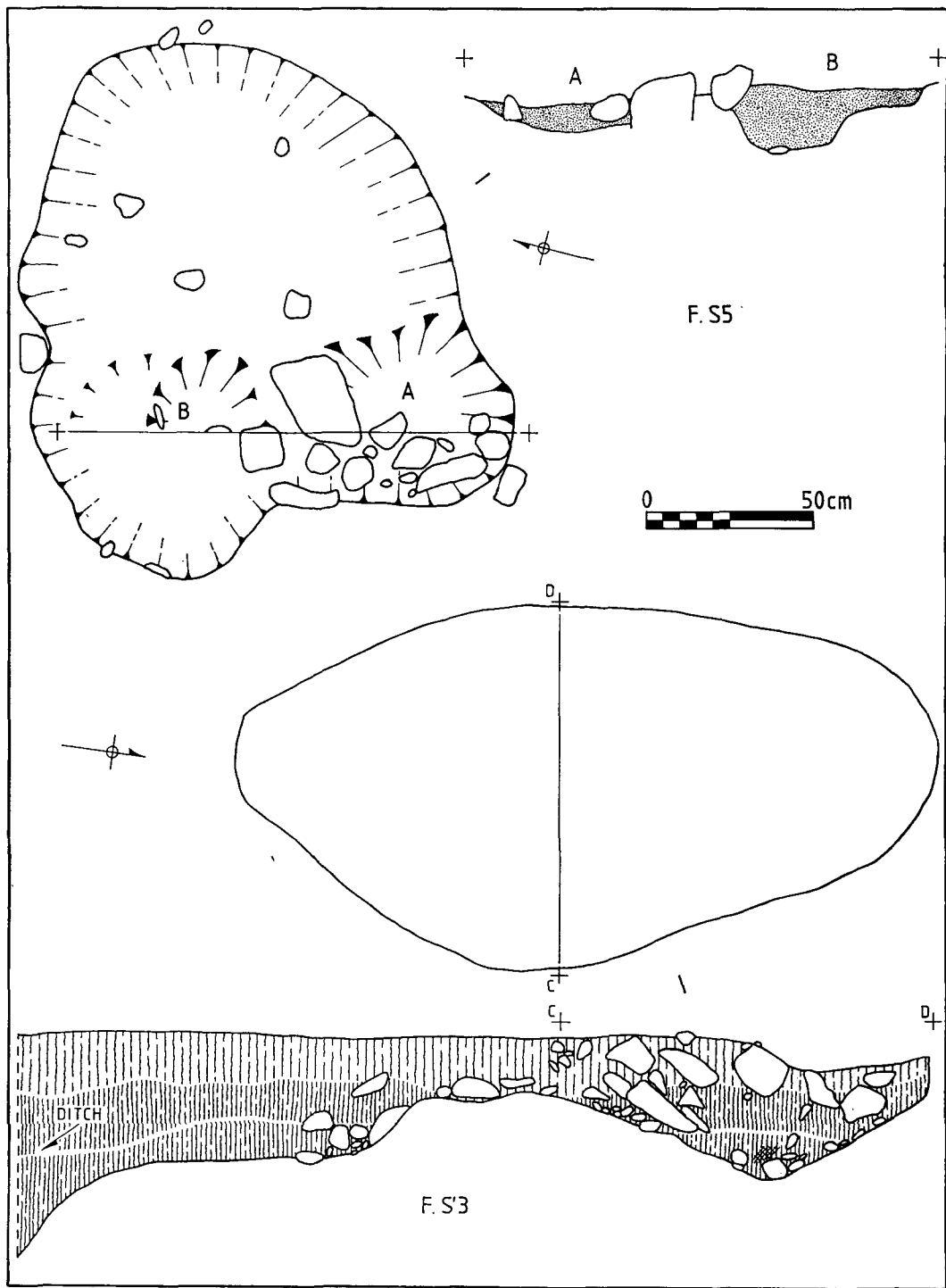


FIG 10 Features S5 and S'3

TABLE 2

The 'Inner Stone Circle' (for general layout see fig 40) Feature schedule

Socket No	Sector	Filling	Artefacts	Diameter	Depth
S1 (fig 11)	SSW	Dark sandy fill with a patch of much comminuted charcoal at the base. Selected stone packing still remaining <i>in situ</i> .	None	2.60 m	0.60 m
S2 (fig 12)	W	<i>Standing orthostat</i> set into an undifferentiated light loamy fill with selected packing stones <i>in situ</i> . The socket penetrates the subsoil to a depth of only 0.25 m.	None	2.40 m	1 m
S3 (fig 13)	W	Undifferentiated dark loamy fill with selected stone packing still <i>in situ</i> .	None	1.35 m	0.40 m
S4 (fig 14)	WNW	Undifferentiated light coloured sandy fill. A good deal of selected stone packing remains <i>in situ</i> . Apparently a setting of packing stones possibly reflecting the outline of the base of the now absent orthostat.	None	2 m	0.20 m
S5 (fig 10)	NW	Undifferentiated fill of dark coloured sandy soil. The socket has two smaller depressions in its base on its western edge. Some selected stone packing material remains apparently <i>in situ</i> .	None	1.55 m	0.18 m
PS (fig 7)	W	<i>Standing orthostat</i> set 1 m deep in a deposit of undifferentiated light coloured loamy fill. The edges of the socket in this instance were extremely unclear. Selected packing stones present.	None	?1.50 m	1 m

section 3 fig 45 & pl 7c). The handle of the beaker was turned to face the NW and thus was close to the probable position of the hands of the incumbent of the grave. The mouth of the beaker was covered by a thin slab of laminar stone and its interior was partially void. Set just to the N of the beaker, again on the floor of the grave pit, was a small knife of fine black flint in extremely fresh unabrased condition (L97). It is tempting to associate this fine beaker and its associated burial with its massive dolerite cover slab with the stone circle stage of the monument's development and indeed such an association between beaker elements and the lithic phases of construction on henge sites would be quite in keeping with information that we have from other sites (see discussion below.) There is however no archaeological reason or evidence for doing so. The grave is not set concentrically to either possible stone circle (although there is the bare possibility of some association with a timber structure (see section 7)) and there is no stratigraphical, structural or cultural link between the grave and any other feature. It is quite likely that the grave may have been inserted into the monument at a late stage in its use (or disuse) and that little or no connection may exist between one feature and the other.

Another possibility to be considered at this juncture is the presence of any marking feature over the grave. The cover slab of the grave must have been set into the prehistoric surface to a depth of some 0.50 m and thus would not have been visible on the surface. Whether the pit into which the slab was set was left open or backfilled is not known – and indeed the possibility of a 'double decker' arrangement (cf Taversoe Tuick, Orkney) should not be ignored – the upper element of this arrangement having been destroyed. The most likely parallels however are the 'recessed graves' with stepped profile with a slab cover let on to the step such as Barclay has

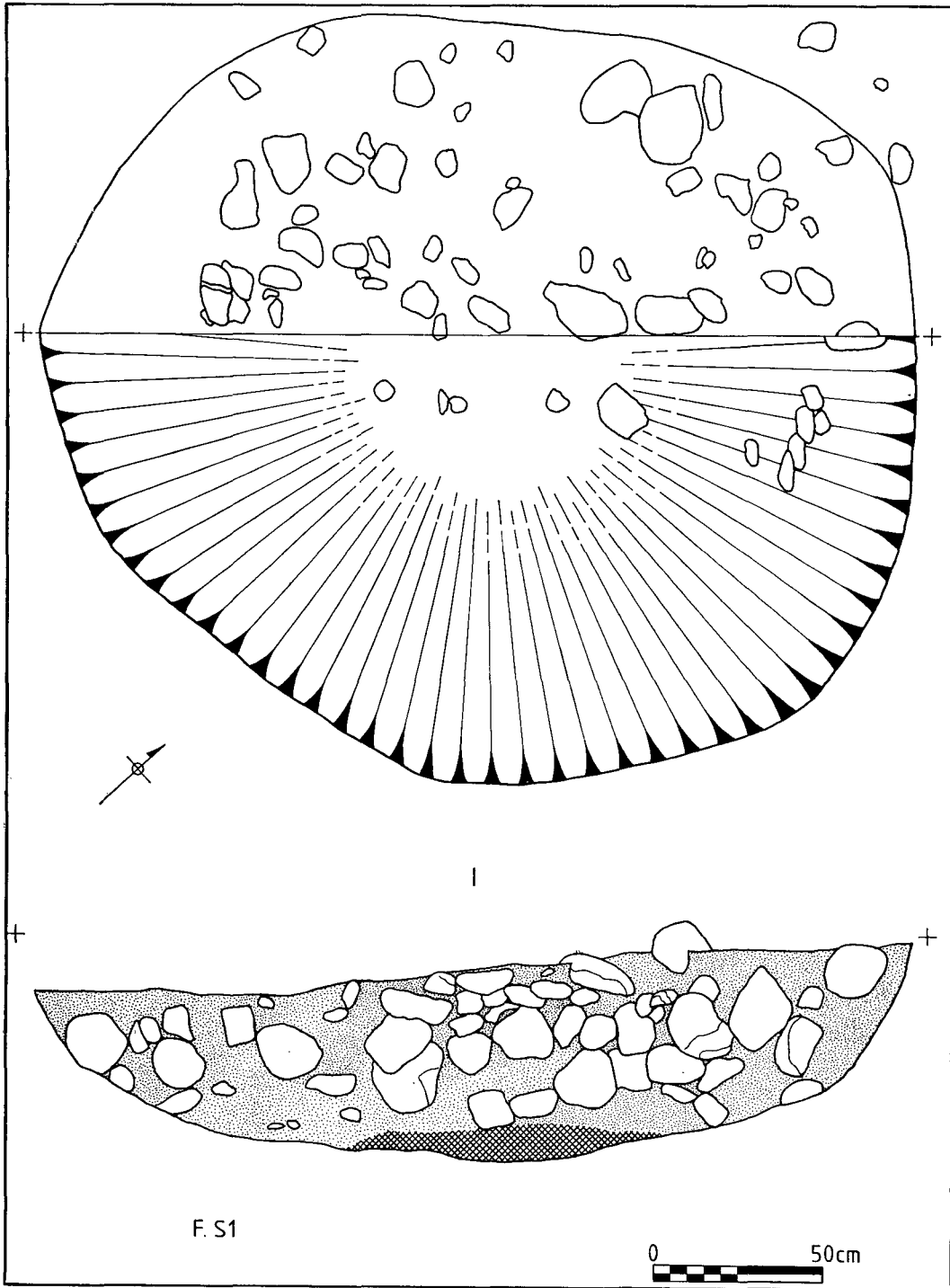


FIG 11 Feature S1

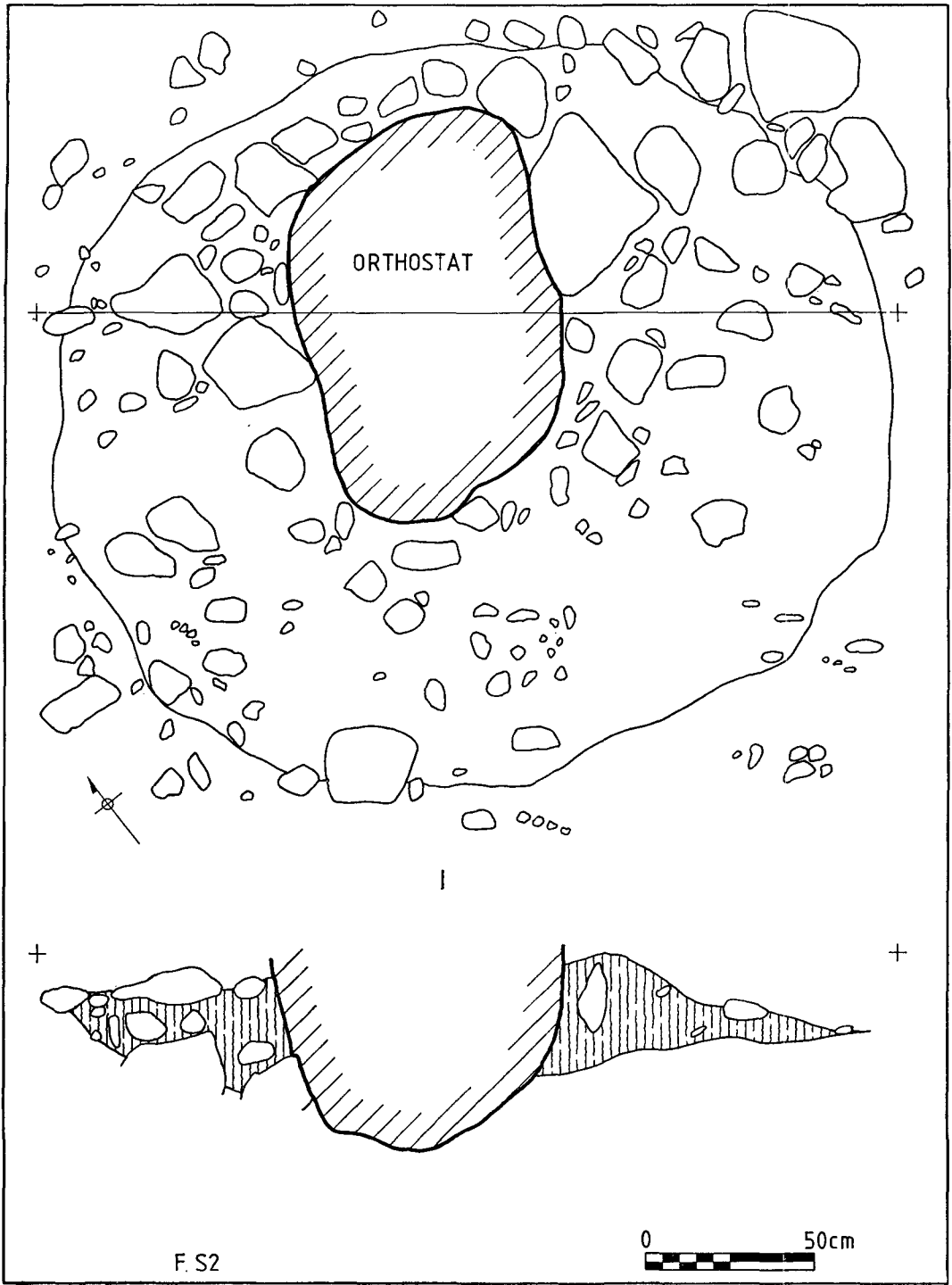


FIG 12 Feature S2

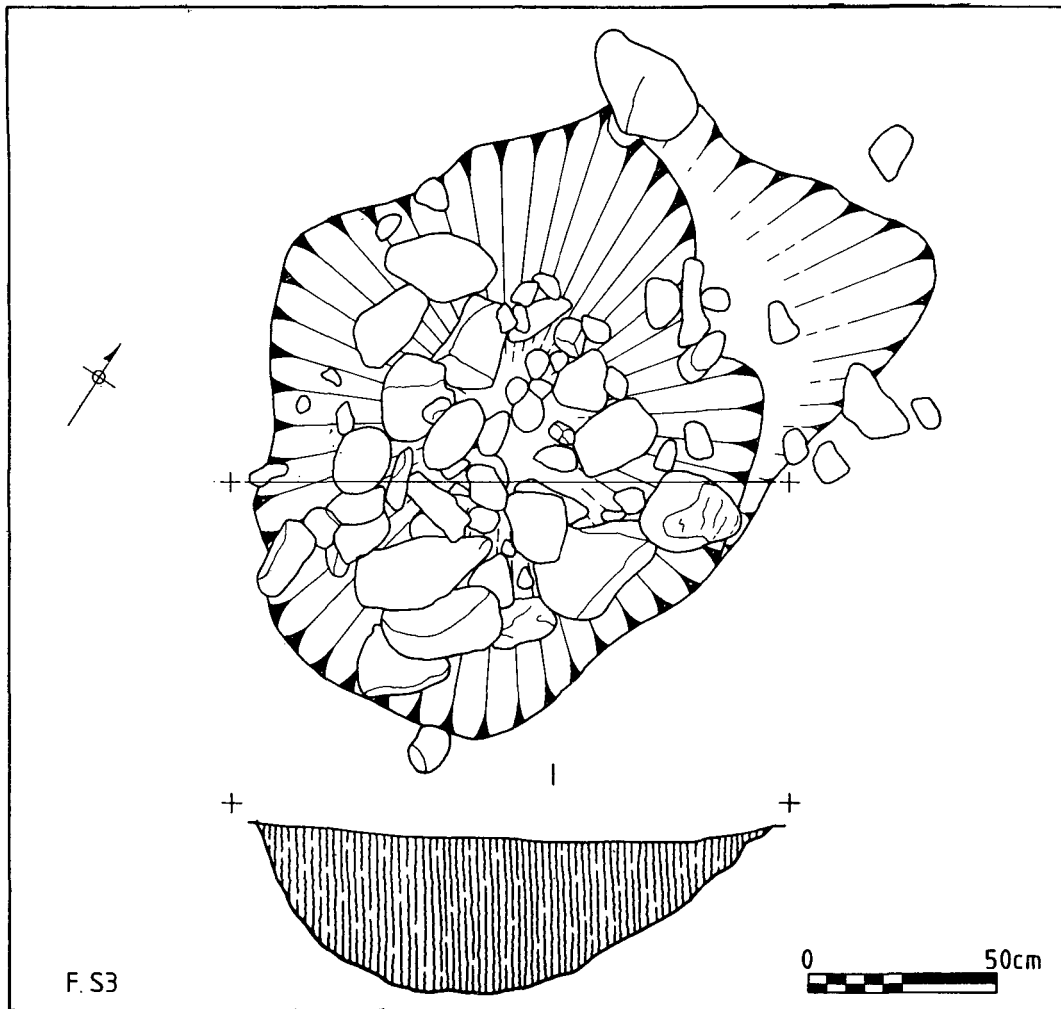


FIG 13 Feature S3

recovered within the enclosure at Strathallan (Barclay 1980) and which have also figured at Dryburn Bridge in E Lothian (Triscott 1979) (see discussion below). At Balfarg the 'step' has simply disappeared through erosion leaving the slab flush with the present-day surface but recessed into it. The parallels at Strathallan would suggest that the step, if this interpretation is correct, is of the order of 0.50 m in depth, perhaps offering some confirmation of the order of magnitude of erosion which has taken place at Balfarg.

A further likely possibility is that the position of the grave was marked by an earthen mound or a cairn set within the used or disused henge. Again no evidence can be adduced to decide this question one way or the other as, due to massive erosion and cultivation damage, any such surmounting feature has certainly been totally destroyed. If such a feature did exist it did not include any substantial earthfast feature (eg a surrounding ditch). Barrows set within henges are again a feature which would find ready parallels elsewhere in Britain, if such a feature did ever exist at Balfarg.

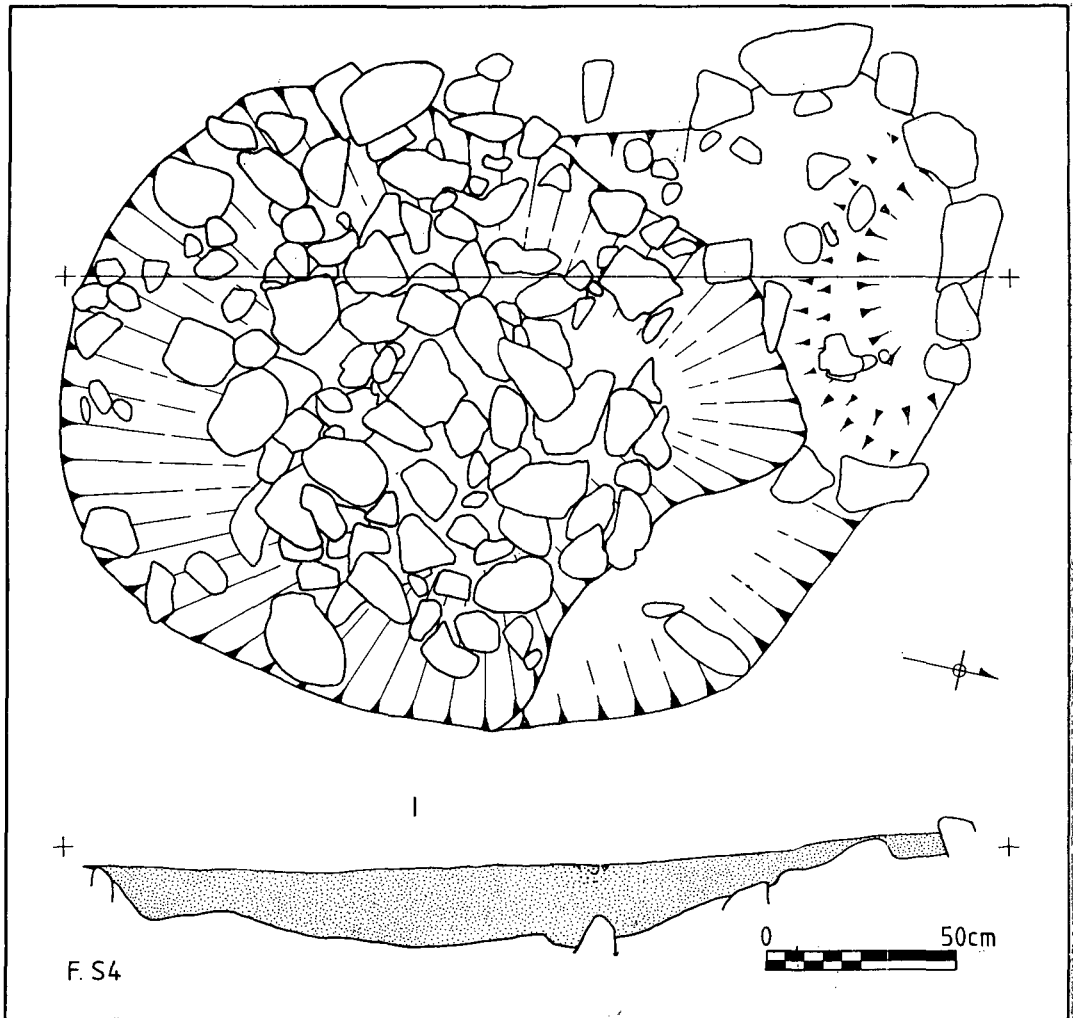


FIG 14 Feature S4

The Timber Circles: Circle A (see fig 40 & Table 3). If the stone setting pattern on the site must remain uncertain, it is to be feared that the earlier timber phases of construction must in part at least remain equally unclear. It is perhaps the best approach to deal first with the features of maximum clarity and thence move to more difficult areas.

Set concentrically to the arc of ditch on the N and E sides of the monument was a circular setting of 15 timber posts with one 'missing' or undetected member which may have been eliminated by erosion. This timber circle was approximately 25 m in diameter and was associated with a setting of two posts tangential to the circle on the W side in a 'portal' type arrangement. The positions of the timbers are witnessed archaeologically by earth dug sockets into which timbers of apparently varying diameter have been placed. The timbers of maximum diameter (c 1 m) would appear to have been set in the 'portal' sockets of the W side with indication of timbers of approximately equal diameter (0.40-0.60 m) in the sockets of the circle proper. Furthermore the

sockets of greatest *depth* also occur on the W side (1.2 m, with the outer twin setting comprising the two deepest sockets 1.5 m). In the deeper sockets of the twin setting, and in the SW sector of the circle itself, the timbers had been placed upright in the dug sockets and after some soil had been bedded around the base of the timber, large stones were rammed into the sockets to lock the upright in position. These stones appear to have been carefully selected from amongst the varied rocks present in the glacial till, usually comprising a greenish basalt which, unlike most of the rocks present, was not friable and prone to break up under hammering (a process already noted with reference to the stone settings).

In amongst this stone packing was found, notably in the deep socket A11 of the W sector, substantial quantities of late Neolithic pottery, flint work, tiny fragments of burnt bone and substantial quantities of charcoal. The charcoals were in block condition and unabraded in appearance and cannot have been long exposed prior to inclusion in the socket. No evidence, however, was forthcoming to positively indicate that this material had been burnt *in situ*. Samples of these charcoals were submitted to the radiocarbon dating laboratory within the Department of Chemistry in the University of Glasgow. Prior to destruction the samples were identified by Mrs Camilla Dickson as being from the wood of oak, alder, hazel and willow (see below section 8). On processing the samples yielded the following determinations.

2230 ± 50 bc	GU-1160	F.A13
2085 ± 50 bc	GU-1161	F.A11
2320 ± 60 bc	GU-1162	F.A11
2365 ± 60 bc	GU-1163	F.A11 (See section 8)

The stratigraphy within F.A11 is the most informative and would clearly indicate to the writer the presence of a vertical member to achieve the horizontal and vertical retention observed in the heavy rubble and artefactual content of the pit. However the soil disposition within the feature does not indicate as one might expect the 'shadow' of a post-pipe of any kind. Yet it is extremely unlikely that the post could have been withdrawn in antiquity without the radical disturbance of the disposition noted. We are left with the conclusion that either the soils in question at Balfarg will not support this kind of timber traces or else that drawing did take place but in such a manner (without lateral wobbling) as to leave the packing material undisturbed. Some minimal evidence for withdrawal of posts may be visible within the filling of F.A5 where minor features set within the top of the pit fill – if these are ancient – might indicate post withdrawal. Also within the filling of F.A3 apparent silting patterns are present suggesting that at some terminal stage in the life of the feature it had lain open and void for a period.

It will, of course, not have passed unnoticed that the gradation by size into the western sector of the circle is a feature also postulated (on largely negative evidence) for the later stone phase on the site and that one phase should possibly so directly reflect the other has interesting implications which will be discussed below.

One other feature occurs on the site of clear prehistoric origin. Set on the S side of the monument just within the timber circle described is a bowl-shaped pit (F.X2) clearly truncated containing a mass of burnt material, a quantity of cremated or burnt bone and among a number of sherds the base of a pottery vessel assignable to the class grooved ware (*P7*). The upper part of the vessel may have been the casualty of erosion and cultivation. One sherd of this vessel displays a direct and unweathered join with a sherd present within F.A8 of the main timber circle A presumably demonstrating the very close contemporaneity of this feature with the erection of the timber circle (see fig 24).

The pattern of artefactual distribution across the site associated with the sockets of the

TABLE 3
Timber Circle A (for general layout see fig 40) Feature Schedule

Socket No	Sector	Filling	Artefacts, etc	Diameter	Depth
A1 (fig 16)	NE	A uniform brown loamy soil filling.	None	0.75 m	0.12 m
A2 (fig 16)	E	A uniform brown loamy soil filling.	None	1.30 m	0.35 m
A3 (fig 16)	E	A uniform brown loamy soil with a single lens of gravel silting at its base. This silting phenomenon may indicate withdrawal of the vertical member leaving a void open to silting processes.	None	1.20 m	0.45 m
A4 (fig 17)	SE	A uniform brown loamy soil.	None	1.28 m	0.17 m
A5 (fig 17)	SE	A uniform brown loamy soil. There is the possibility of the insertion of two minor features into the top of the feature fill – again (cf A3) possibly hinting at timber withdrawal. This feature may have been over excavated – its recorded depth thus possibly somewhat exaggerated.	None	1.70 m	0.54 m
A6 (fig 18)	S	A uniform brown loamy fill contains a small quantity of stone packing or rubble the disposition of which would suggest a 'post-pipe' approximately 0.40 m in diameter.	<i>P5</i> (443, 431) <i>P19</i> (433) <i>P30</i> (424) <i>P31</i> (437, 433) <i>P35</i> (401) <i>P46</i> (430) Burnt bone (29)	1.30 m	0.60 m
A7 (fig 18)	SW	A uniform brown soil filling.	<i>L21-L30</i> <i>P1</i> (283, 312, 384) <i>P3</i> (227) <i>P4</i> (386) <i>P6</i> (337) <i>P7</i> (196) <i>P8</i> (198, 423, 279) <i>P11</i> (288, 346, 380) <i>P15</i> (381) <i>P17</i> (268) <i>P20</i> (199) <i>P22</i> (335) <i>P23</i> (279, 280, 379, 388, 390) <i>P25</i> (221) <i>P29</i> (345, 217) <i>P33</i> (266) <i>P34</i> (293) <i>P36</i> (215, 256, 272, 314, 382, 390) <i>P37</i> (338) <i>P41</i> (373, 220, 278) <i>P44</i> (387) <i>P45</i> (216) <i>P46</i> (315, 339) <i>P47</i> (271, 342, 390) Burnt bone (29)	1.36 m	0.35 m

TABLE 3—*continued*

Socket No	Sector	Filling	Artefacts, etc	Diameter	Depth
A8 (fig 18)	SW	A uniform brown loamy fill. The rubble (packing?) content of this socket would suggest in its disposition an upright member of diameter c 0.60 m.	<i>P7</i> (418) <i>P14</i> (419)	1.36 m	0.50 m
A9 (fig 19)	W	A uniform brown loamy fill to a depth of 0.15 m. The rest of the feature is filled with a dark coloured sandy soil.	<i>L31-L34</i>	1.50 m	0.75 m
A10 (fig 19)	W	A uniform brown loamy fill to a depth of 0.25 m. The rest of the feature is filled with a dark coloured sandy soil. Stone packing present within the upper layer would suggest the presence of a vertical member c 1.20 m in diameter.	<i>L35</i>	1.30 m	0.67 m
A11 (Figs 20 & 21)	W	<p>Eight distinct layers occur within this feature</p> <p>(1) Dark coloured loamy soil</p> <p>(2) Darker than 1</p> <p>(3) Light coloured loamy soil</p> <p>(4) Dark coloured loamy soil</p> <p>(5) Dark coloured sandy soil</p> <p>(6) Lighter coloured sandy soil</p> <p>(7) Layer of burnt material including fresh unweathered charcoals 0.20 m in thickness</p> <p>(8) Light coloured sand with charcoal flecks interspersed within it</p> <p>The layer (7) deposit furnished material for C 14 determinations GU-1161 GU-1162 GU-1163</p> <p>The pottery from this feature was distributed around the outer rim of the socket largely within layers (1), (2) and (4). The disposition of pottery and rubble within the features indicates the presence of a vertical member c 1 m in diameter.</p>	<p><i>L36-L75</i></p> <p><i>P1</i> (350)</p> <p><i>P2</i> (151)</p> <p><i>P7</i> (148, 189, 299)</p> <p><i>P8</i> (146, 147, 158, 173, 177, 183, 190, 212, 302, 306, 320, 326, 327, 328, 331, 332, 333, 350, 356, 362, 371, 392)</p> <p><i>P9</i> (244)</p> <p><i>P10</i> (135, 242, 299)</p> <p><i>P11</i> (150, 164, 178, 194, 299, 302, 327, 350, 367, 372, 398, 399)</p> <p><i>P12</i> (258)</p> <p><i>P16</i> (169, 239, 370, 400)</p> <p><i>P19</i> (359)</p> <p><i>P23</i> (176, 186, 236, 241, 245, 305, 350, 369, 394)</p> <p><i>P24</i> (365)</p> <p><i>P25</i> (238)</p> <p><i>P26</i> (325)</p> <p><i>P27</i> (299)</p> <p><i>P28</i> (233)</p> <p><i>P30</i> (142, 257, 299, 350, 376)</p> <p><i>P31</i> (299, 350)</p> <p><i>P33</i> (350)</p> <p><i>P34</i> (350)</p> <p><i>P36</i> (395)</p> <p><i>P38</i> (299)</p> <p><i>P39</i> (176)</p> <p><i>P40</i> (240)</p> <p><i>P46</i> (156)</p>	1.90 m	1.11 m

TABLE 3—*continued*

Socket No	Sector	Filling	Artefacts, etc	Diameter	Depth
			<i>P47</i> (156, 238) <i>P48</i> (350, 368) <i>P49</i> (304) Burnt Bone (24)		
A12 (fig 22)	W	A uniform layer of dark coloured loamy soil 0.15 m deep overlies a lighter loamy material within this socket.	<i>P16</i> (420)	0.90 m	0.45 m
A13 (fig 22)	NW	A uniform fill of dark coloured loam. Charcoal (GU-1160).	<i>L76-L82</i> <i>P24</i> (247, 248, 348)	1.0 m	0.35 m
A14 (fig 22)	N	A uniform dark coloured loamy fill.	<i>L83-L84</i>	1.40 m	0.31 m
A15 (fig 23)	N	A dark coloured loamy fill with pockets of light coloured loamy material – disturbed?	<i>L85-L87</i>	0.90 m	0.58 m
A16 (fig 23)	NNE	A uniform gravelly fill.	None	0.90 m	0.46 m
A17 (fig 23)	NE	A uniform filling of dark coloured loamy soil.	<i>L88-L89</i>	0.85 m	0.38 m

main timber circle A is of considerable interest. Firstly it should be observed that the 'uncontexted' occurrence of lithic cultural material on the site (ie lithic artefacts located within the ploughsoil and without other context on the subsoil surface) (see fig 25) corresponds very closely to the distribution of the sockets of timber circle A on the SW side of the site (F's A7-A12) precisely those features whose fill is richest in artefactual yield. It would seem reasonable to suggest that these lithic items were derived from the upper fill of these sockets by the action of cultivation and erosion. The high phosphate readings for this area of the site (see section 9) would also possibly seem to reflect the derivation of material from the upper filling of these features rich as the fillings are in organic and burnt bone material. The implications of this fall under two heads, one of which reflects upon the comparatively unitary nature of the flint assemblage recovered on the site. The other may also lead us to appreciate the degree to which derived material in ploughsoil may retain two dimensional stability over an extended period of agricultural activity. Once poor or lightly fired ceramic material is exposed in cultivated soil, however, it is likely to decay very rapidly and it is presumably for this reason that no ceramic material whatever was located in these circumstances. It should also be noted that the backed microblade *L19* lies well divorced from this concentration as indeed does the barbed and tanged point *L99*.

To the WNW of timber circle A the ploughsoil on the site was stratified above a layer (layer U2) of seemingly *in situ* rotted natural subsoil some 0.15 m thick lying above the natural surface. The nature and origin of this deposit is not clear. It extended over a good deal of the NW sector of the site (see fig 25) and sealed within it is a substantial assemblage of pottery in one major and isolated concentration (see figs 44-5). It was precisely within this area that fragments of the stone packing of an apparent palisade trench were located (pl 7a; see fig 40) which was lightly embedded in layer U2 on the projected line of timber circles F and E (see below) (E27 and F10) on the western side of the interior platform. Alarming no differential soil colour or texture was noted around this packing despite the most careful inspection to denote the presence of the palisade slot into which it must have been placed. No doubt, however, can be attached to the nature

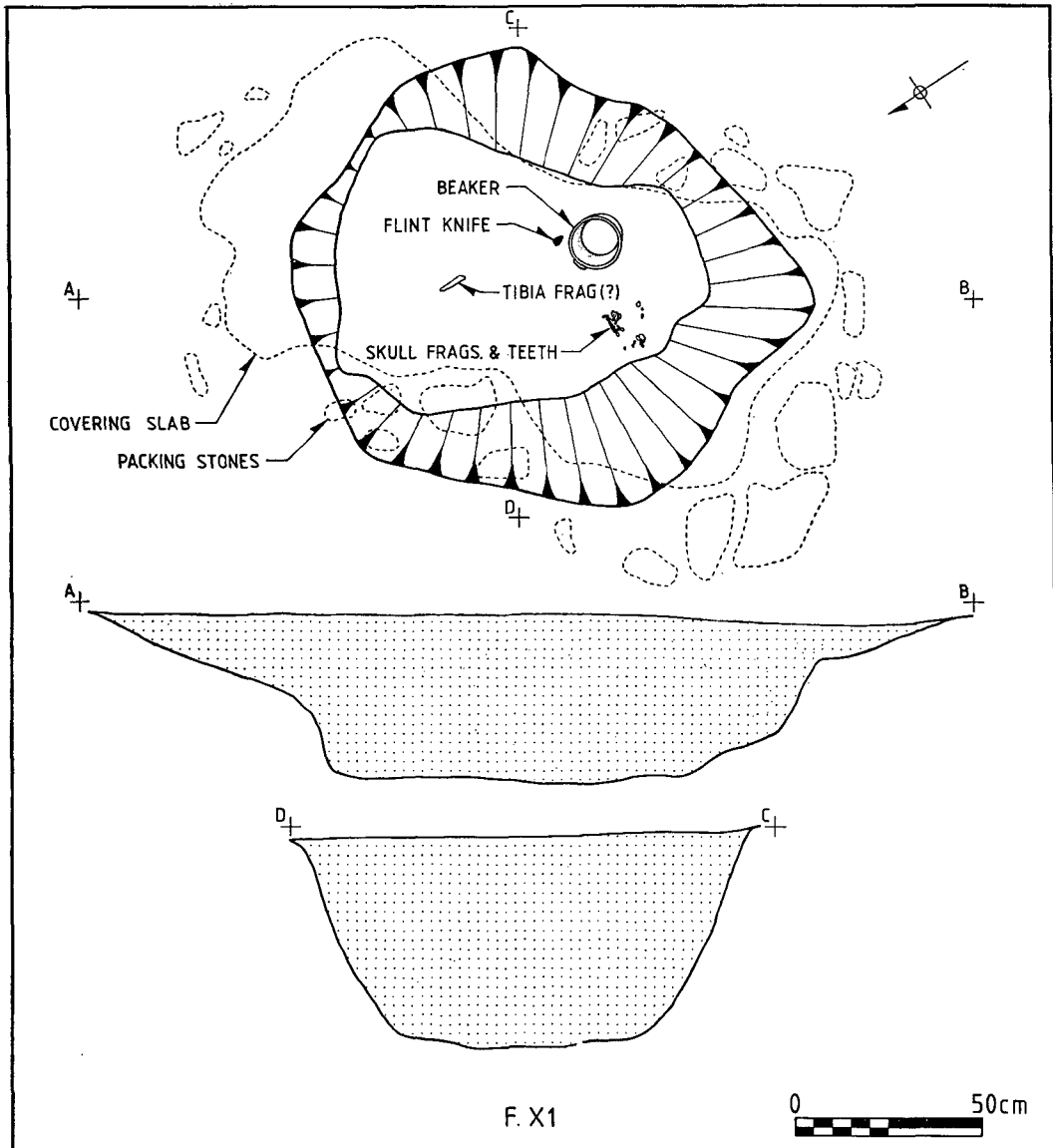


FIG 15 The beaker grave, feature X1

of the stone feature and its occurrence would appear to indicate that at this point erosion from the surface of the site has been somewhat less active. The concentration of pottery within Layer U2 did occur directly superimposed upon F.B37 as detected dug within the subsoil underlying this layer. This feature (see fig 28) is clearly of exceptionally large size in terms of the B ring and may represent the base of a feature undetected in layer U2 within which the pottery was concentrated. This feature as will be clear from both the published plan and section was apparent only as an extremely ill-defined stain on the surface of the subsoil and the precise situation here must remain unclear. Whether the pottery concentration was set in a soil feature which was undetectable with

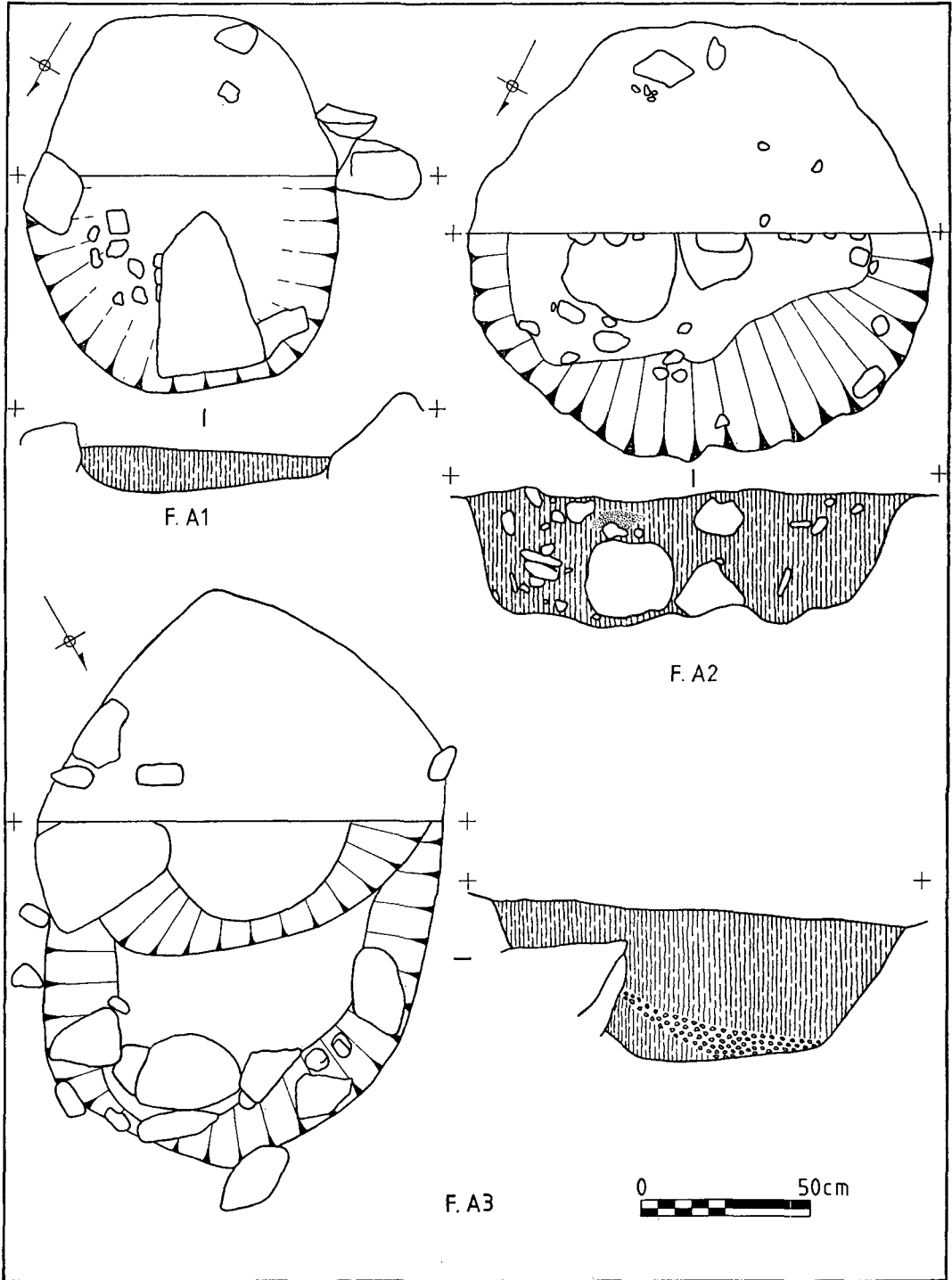


FIG 16 Features A1-A3

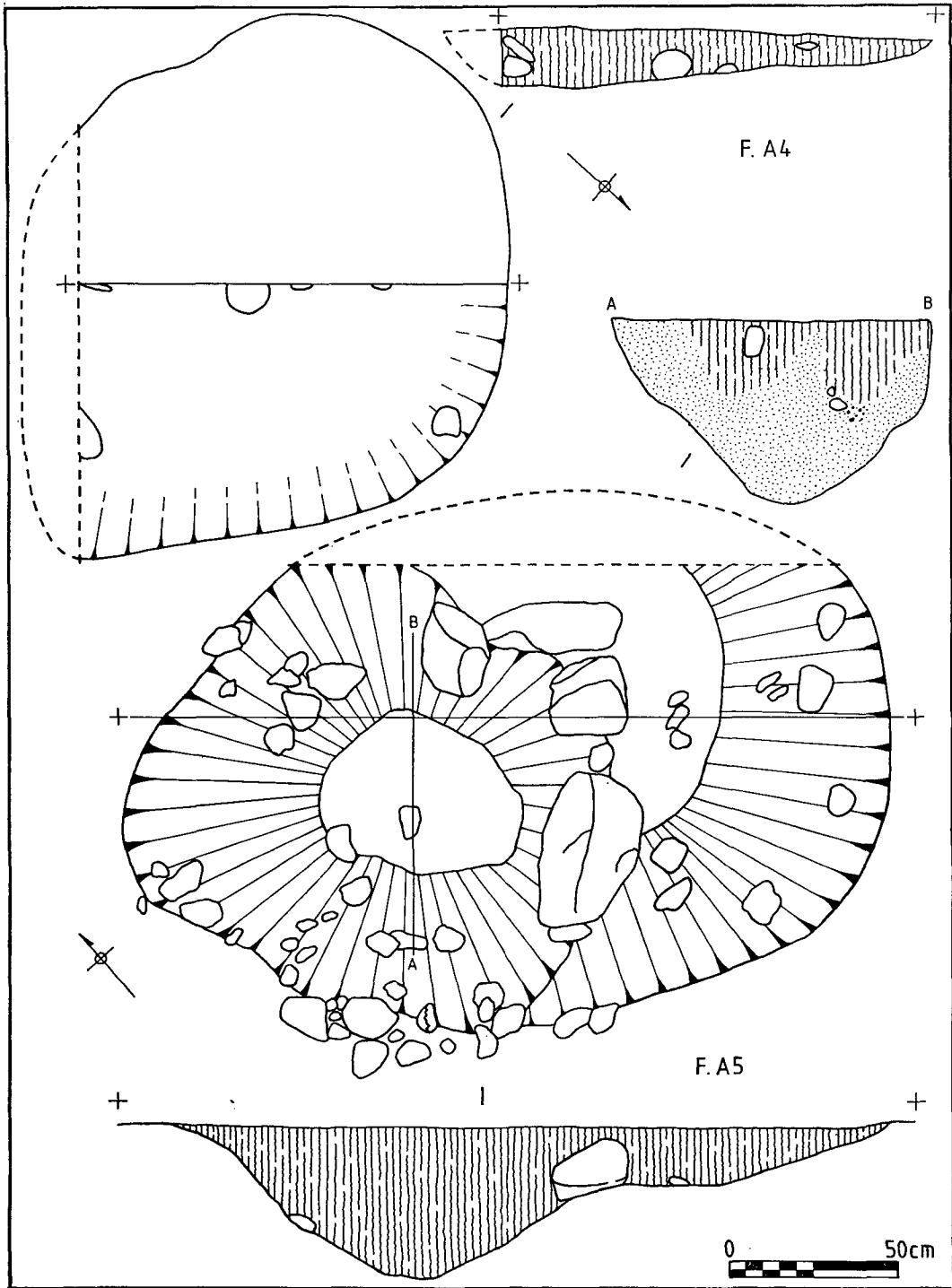


FIG 17 Features A4-A5

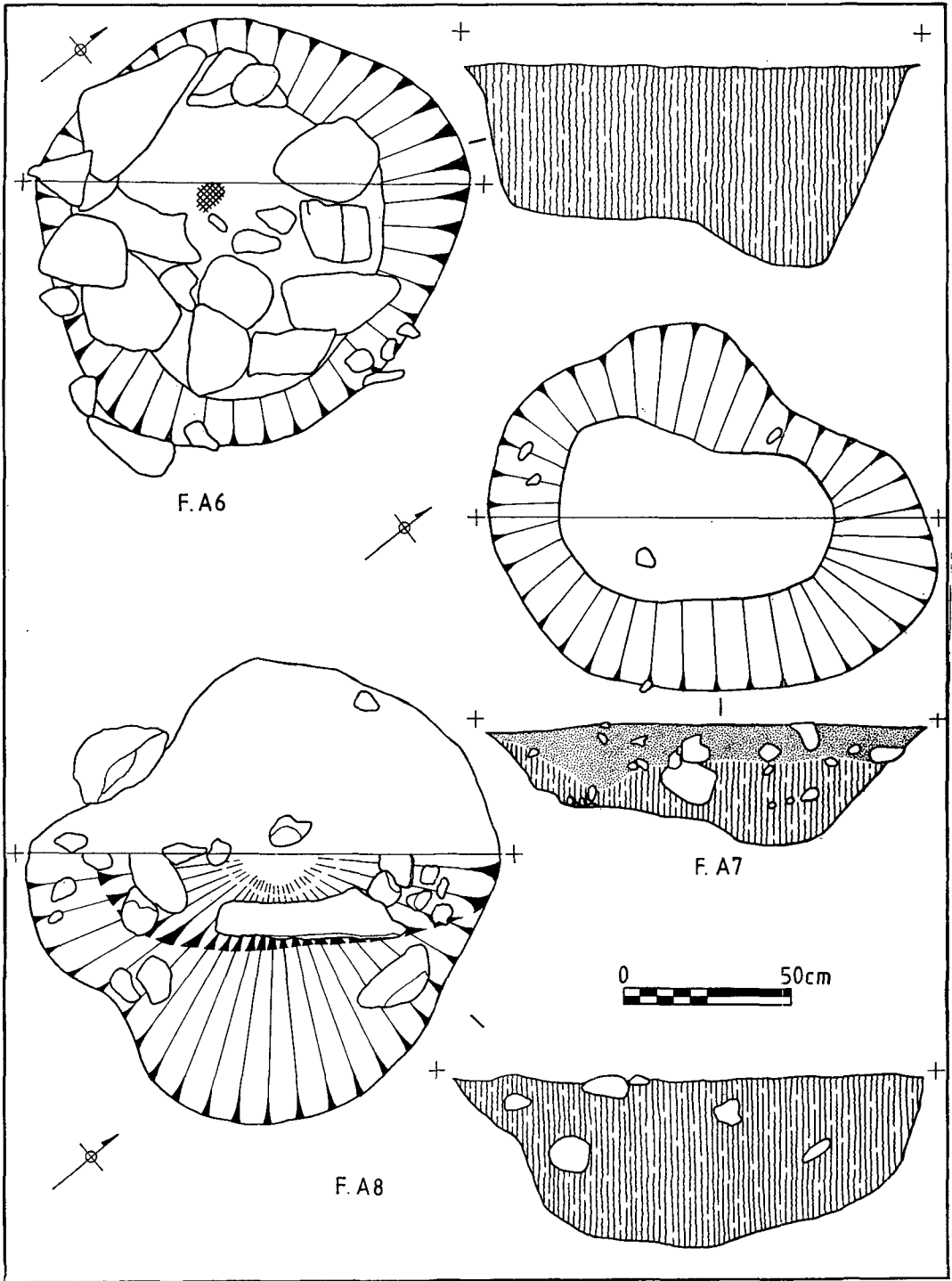


FIG 18 Features A6-A8

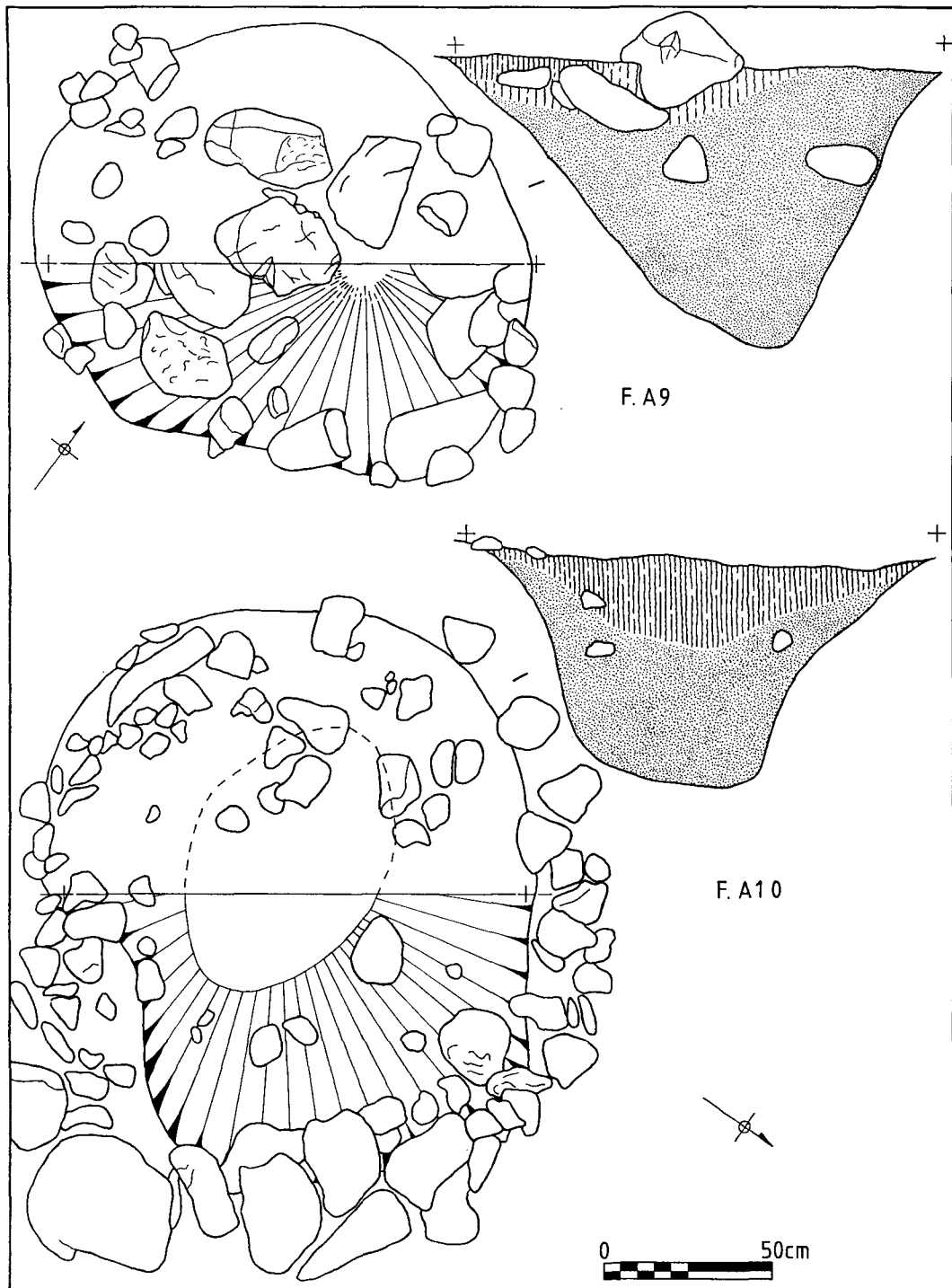


FIG 19 Features A9-A10



FIG 20 Feature A11 showing distribution of artefacts with first 0.50 m of depth

the archaeological techniques available on the site in 1978, or whether its preservation is a result of trampling into the natural subsoil, is a question which therefore cannot be answered.

Whatever the case the assemblage would appear to be a unitary one. The deposit produced sherds which Miss Henshall has indicated (see section 3) comprise fragments of 16 of the 49 grooved ware vessels whose presence is indicated on the site.

The occurrence of groups of sherds from one vessel (notably in the instance of vessels P8

TABLE 4

Table of vessels contained within Layer U2 (see fig 25).

Vessel	Sherds	Vessel	Sherds
<i>P6</i>	1	<i>P18</i>	4
<i>P7</i>	1	<i>P19</i>	1
<i>P8</i>	7	<i>P23</i>	2
<i>P9</i>	3	<i>P24</i>	17
<i>P10</i>	1	<i>P32</i>	1
<i>P11</i>	2	<i>P36</i>	3
<i>P13</i>	7	<i>P39</i>	1
<i>P16</i>	6	<i>P42</i>	1

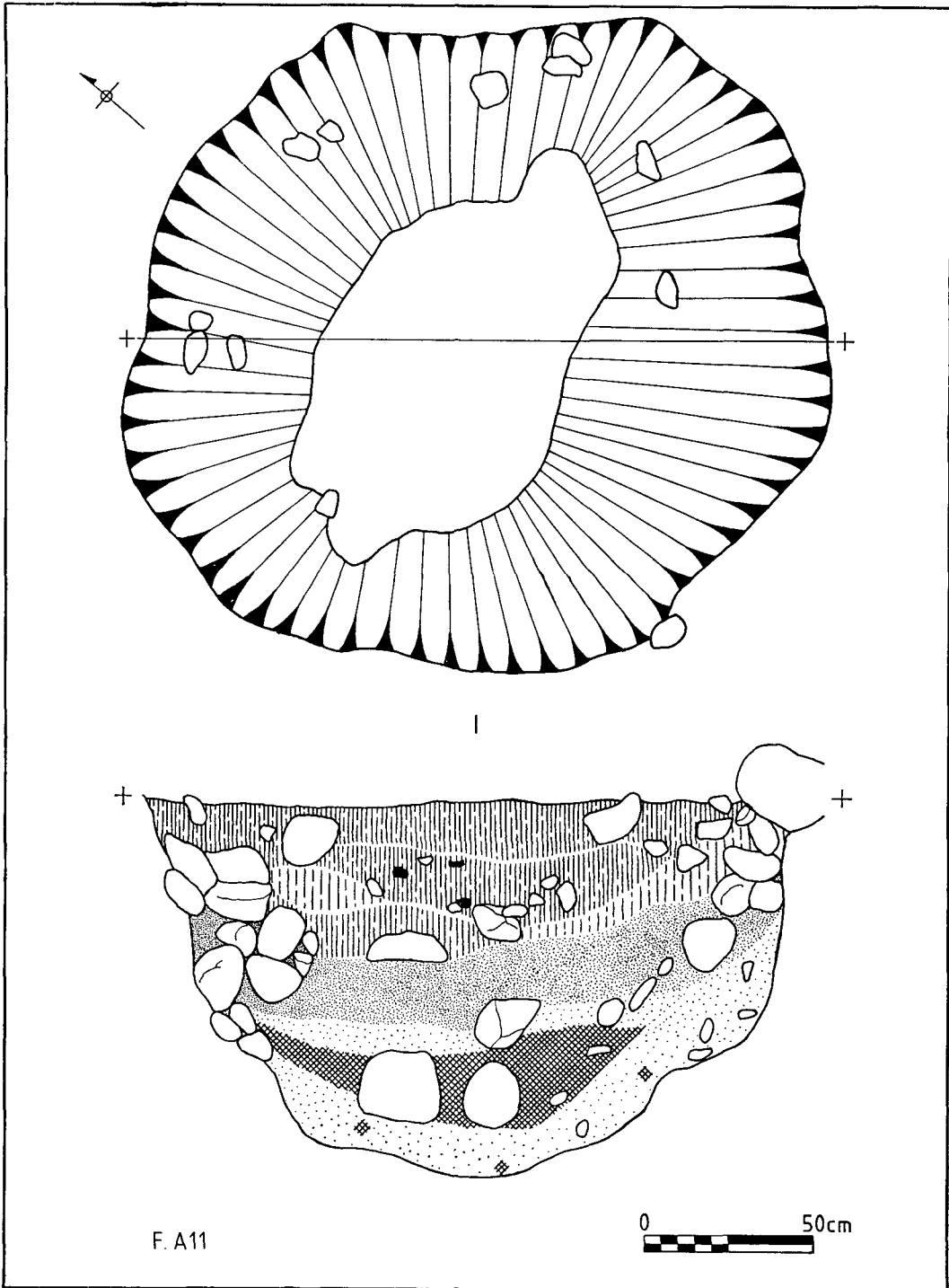


FIG 21 Feature A11

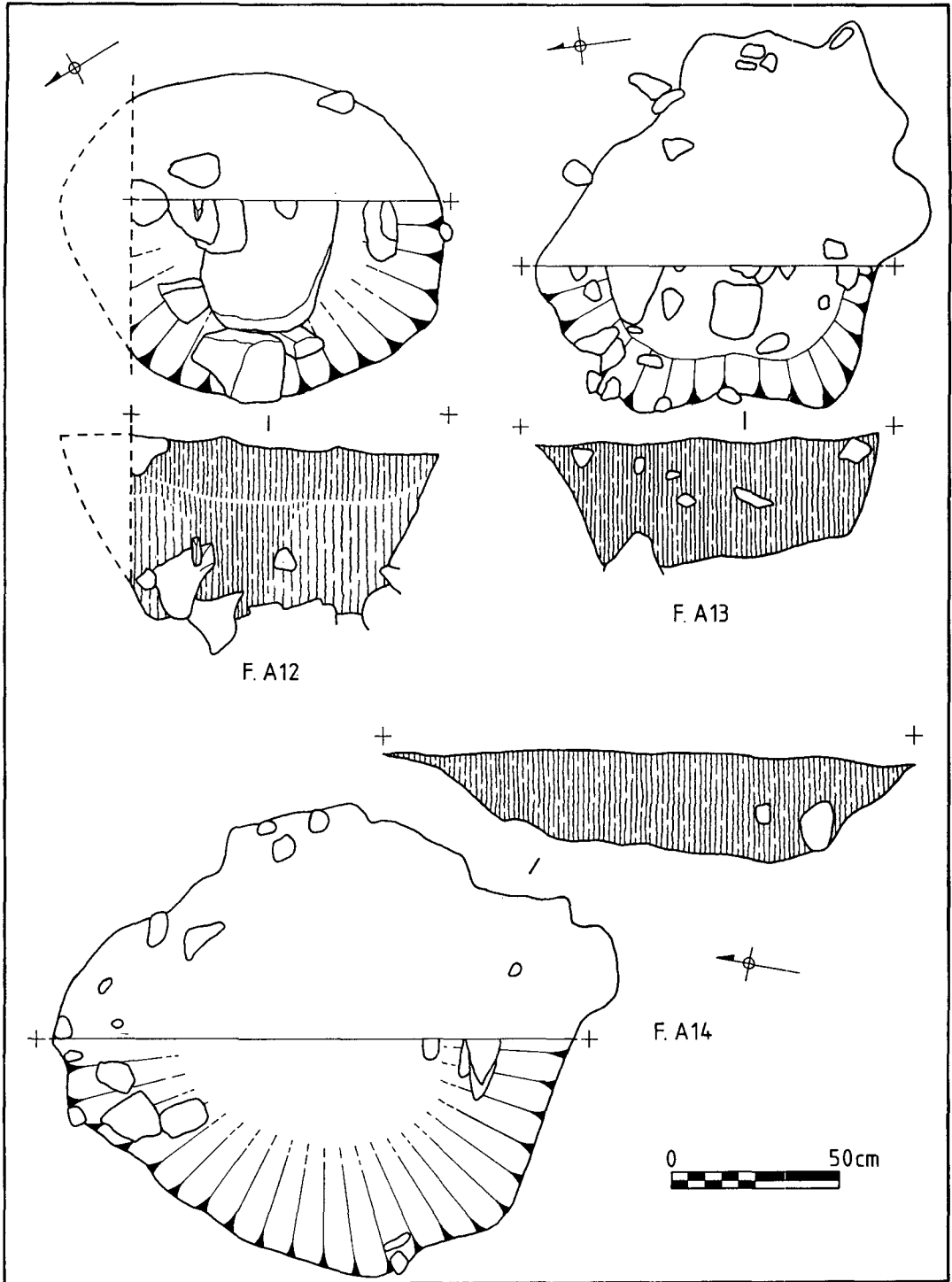


FIG 22 Features A12-14

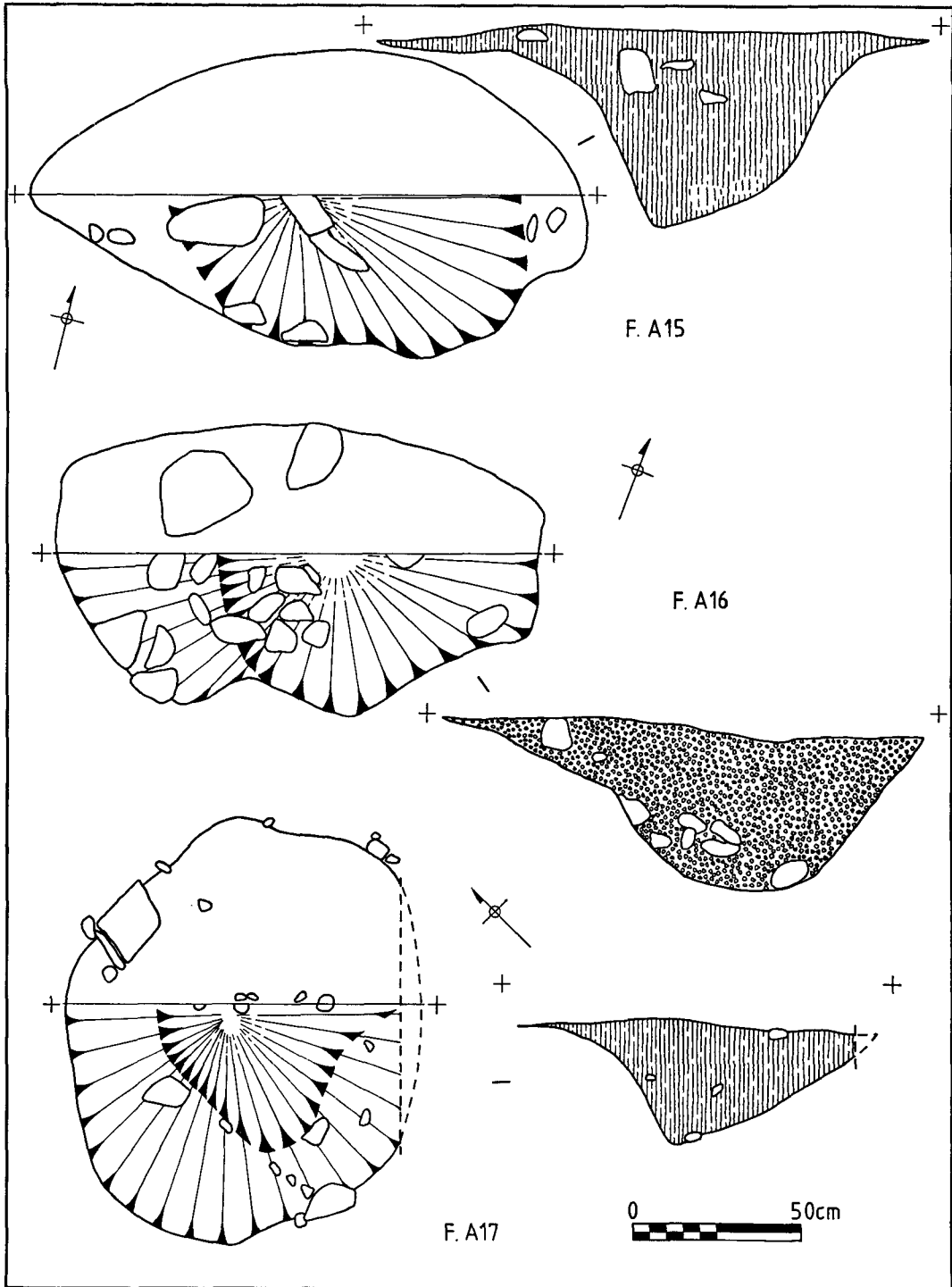


FIG 23 Features A15-17

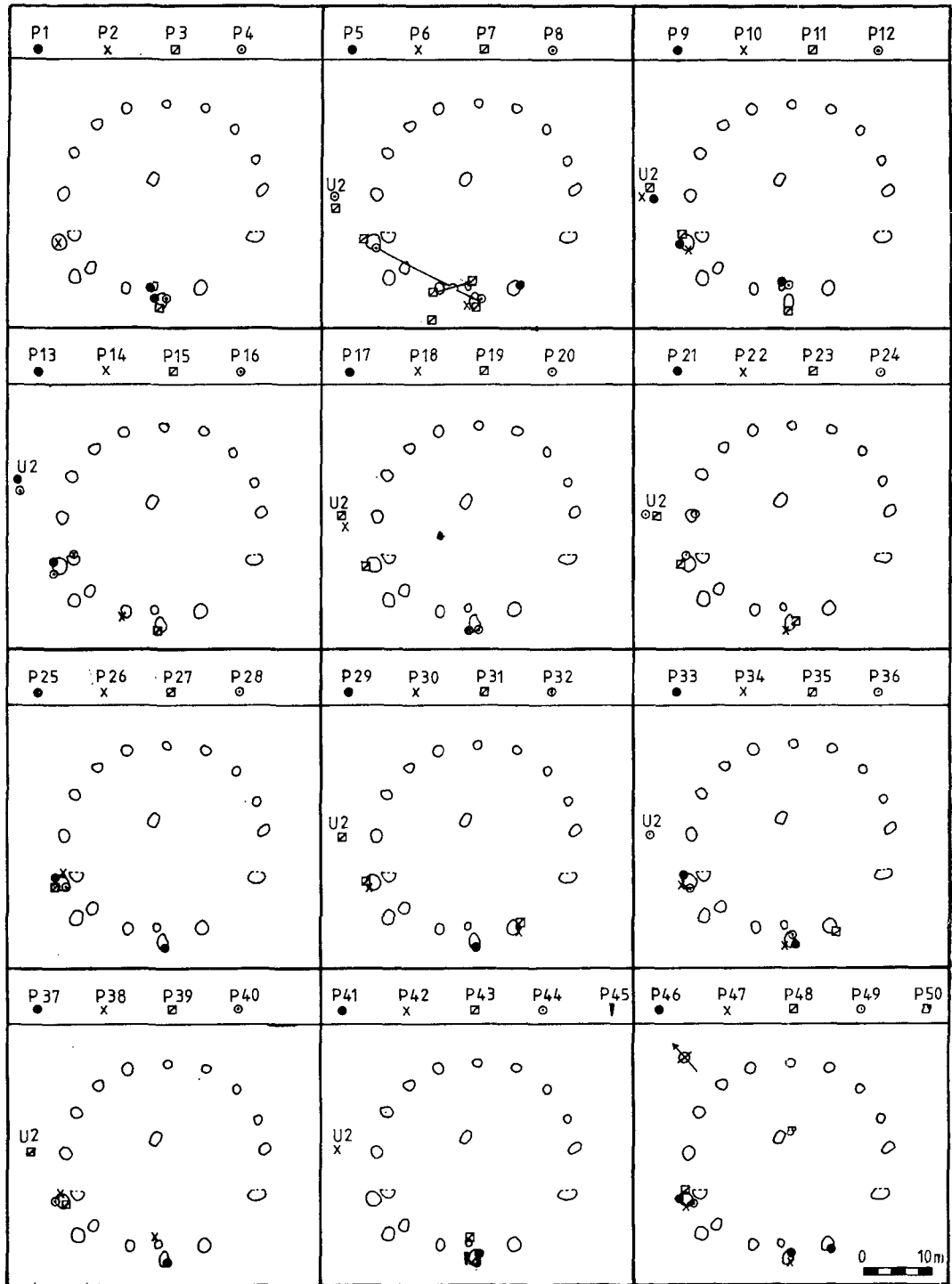


FIG 24 Distribution of pottery sherds within the post sockets of timber circle A, features X1 & 2, & layer U2

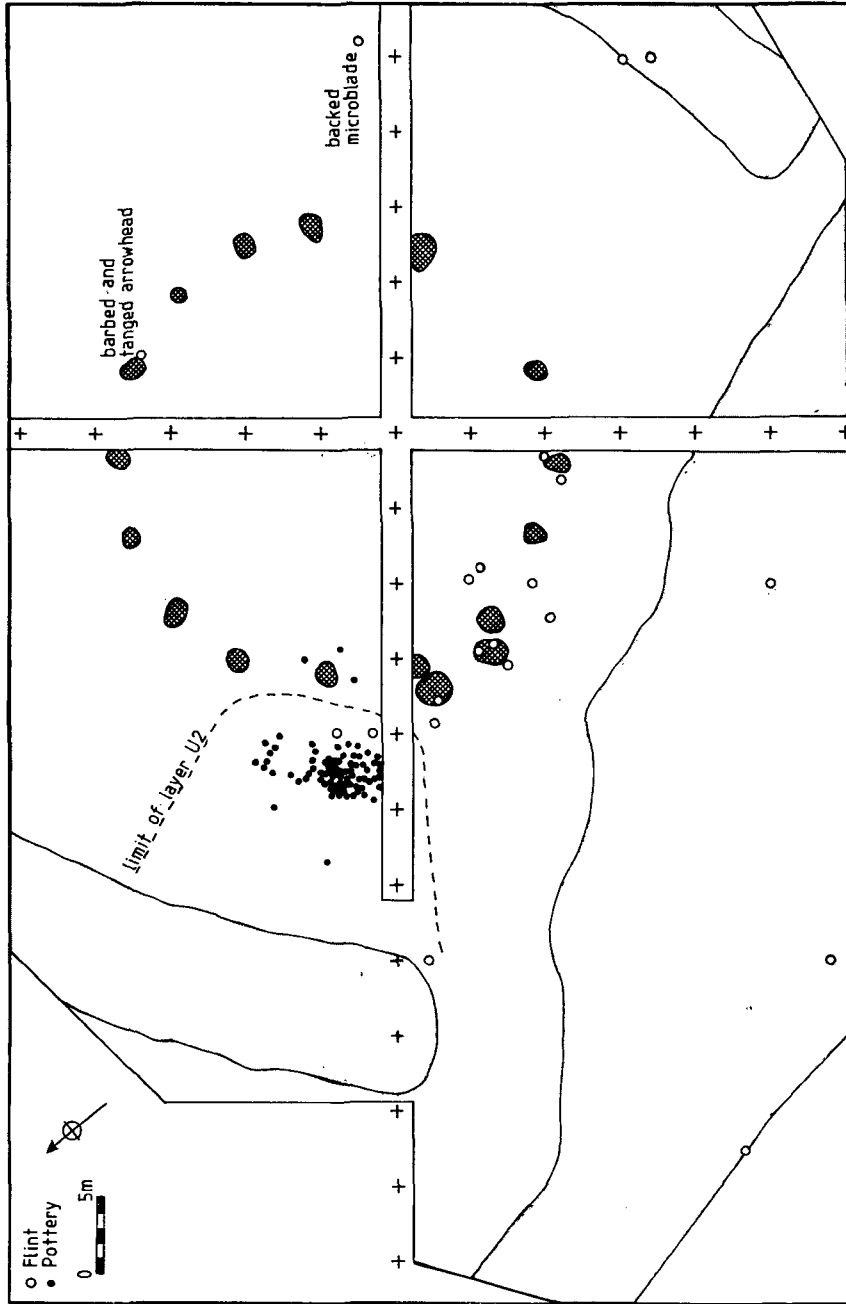


FIG 25 Distribution of uncontexted pottery & flint on the subsoil surface

P16 and *P24*) and their clearly defined and concentrated distribution would indicate to the writer the likelihood that this deposit is essentially *in situ*, if somewhat disturbed. The feature would appear to indicate that the destruction of vessels or the deposition of parts of vessels took place as an isolated phenomenon on the western side of the site. The restricted availability of layer U2 however with its implication of differential erosion should caution us against too close an interpretation of these data. No evidence of burning or any other activity was located with this material.

The interest of this group, apart from that relating to the enigmatic activity indicated out-with timber circle A, lies in the apparent close association of this group with the construction of timber circle A itself.

TABLE 5

Vessels contained within Layer U2 with fragments also in Timber Circle A features (see fig 24).

Vessel	F	Sherds	Vessel	F	Sherds
<i>P6</i>	A7	1	<i>P16</i>	A11	4
<i>P7</i>	A11	3		A12	1
	A8	1	<i>P18</i>	—	—
	A7	1	<i>P19</i>	A11	1
	(X2	7)		A6	1
	(plus one sherd		<i>P23</i>	A11	9
	dispersed on subsoil			A7	5
	surface to SW-U1)		<i>P24</i>	A13	3
<i>P8</i>	A11	24		A11	1
<i>F9</i>	A11	1	<i>P32</i>	—	—
	X2	1	<i>P36</i>	A11	1
<i>P10</i>	A11	3		A7	7
<i>P11</i>	A11	15	<i>P39</i>	A11	1
	A7	3	<i>P42</i>	—	—
<i>P13</i>	A11	1			

Of 16 vessels represented by sherds in the assemblage concentrated within layer U2 no less than 14 (82%) are represented by other sherds located within the sockets in the W and SW sector of timber circle A. Furthermore the occurrence of sherds in these sockets is in a number of instances (notably in the case of vessels *P7*, *P8*, *P11* and *P23*) in such quantity as to persuade the writer that their inclusion is not simply accidental. Indeed on the basis of the very high rate of inclusion of vessels from the U2 context into the timber circle A socket context (82%) and the high numbers of sherds involved the writer is tempted to go so far as to suggest that breakage having taken place in the restricted area to the W of the timber circle indicated by the occurrence of the material in layer U2, debris was deliberately taken from this location and placed within the sockets as part of the backfilling activity, along with burnt material not apparently incinerated at the layer U2 location. A glimpse is possibly thus achieved of the seemingly careful yet, seemingly, irrational processes surrounding the erection of the timber uprights of circle A.

The evidence of the pottery can also be extended to argue that at least part of timber circle A was erected as one exercise within a very short space of time.

From Table 6 and fig 24 it can be seen that *via* F.X2 and layer U2 all the ceramic-bearing features of timber circle A (A6-8, A11-18) can be closely linked to one another. It should be noted that over and above the vessel recognition set out by Miss Henshall in section 3, upon which this section of the report is entirely based, actual joining sherds are noted between F.A11 and F.A7 (vessel *P8*) and between F.A8 and F.X2 (vessel *P7*).

The deposition of pottery and lithic material within the sockets of timber circle A as part of

the backfilling process has been a useful indicator to associate the erection of one timber with another and to place the deposits within Layer U2 and F.X2 in context with the erection of the circle. Three further aspects remain to be discussed. Firstly we can simply point to the widely differing quantities (in crude terms of numbers of sherds and lithic artefacts) of material located within the backfill of different sockets of timber circle A (see fig 29). Clearly F.A11 and F.A7 received the vast bulk of the material (over 90%) deposited within these sockets and the fact that these sockets are separated by three others that received virtually no material (in two instances no ceramic material whatever) would appear to indicate to the writer that this distribution of material is far from random – perhaps a further hint of seemingly careful yet irrational conduct associated with the building of this circle. Socket A11 indeed received a considerable quantity of much fragmented burnt bone as well as a substantial portion of grooved ware vessels *P8* and *P23* parts of which also occur in Layer U2.

Secondly we must turn to consider feature X2 (see fig 30), a bowl-shaped pit 0.20 m deep and 0.80 m in maximum diameter set just within timber circle A on its SSW side. The pit contained

TABLE 6

Feature concordance within Timber Circle A indicated by pottery study with indication of concordance with deposition in Layer U2 and FX2.

A6							
X	A7						
	X	A8					
X	X	X	A11				
				A12			
			X		A13		
	X	X	X	X	X	U2	
	X	X	X				F.X2

a substantial quantity of unidentified burnt bone, a natural agate pebble, together with a considerable part of a grooved ware vessel (*P7*: seven sherds) together with fragments of five other vessels (*P1*: one sherd, *P9*: one sherd, *P12*: two sherds, *P38*: one sherd & *P43*: one sherd). The filling was unlike that of the sockets of the timber circle, largely composed of comminuted charcoal with visible traces of *in situ* burning. The ceramic assemblage clearly indicates the contemporaneity of this activity with the erection of timber circle A but the function of the pit remains obscure and it is only possible to point to the contrasting nature of the burnt filling and form of the feature to those of the timber circle. It must however, be clearly indicated that very substantial quantities of burnt bone (in comparative terms) and of ceramic (including the better part of vessels *P8* & *P23*) occur within timber socket A11 demonstrating that this density of material is not restricted to this feature.

Thirdly an extremely indistinct feature Z8 (see fig 35) was located very close to F.A1 on its E side. This feature contained a barbed and tanged flint point (*L99*). Sadly the association of this implement with timber circle A cannot be regarded as a clear one and the reader's attention should be drawn to Miss Wickham-Jones' comment that the cortication and patination of the piece has little in common with other lithic material securely contexted within the sockets of timber circle A.

The construction of the main timber circle on the site can therefore be seen to follow a closely linked prelude when burning of wood and bone associated with the destruction of a substantial number of pottery vessels took place. The breaking of the pottery may well have taken place at one specific point, located just to the W of the site to be used for the construction of the

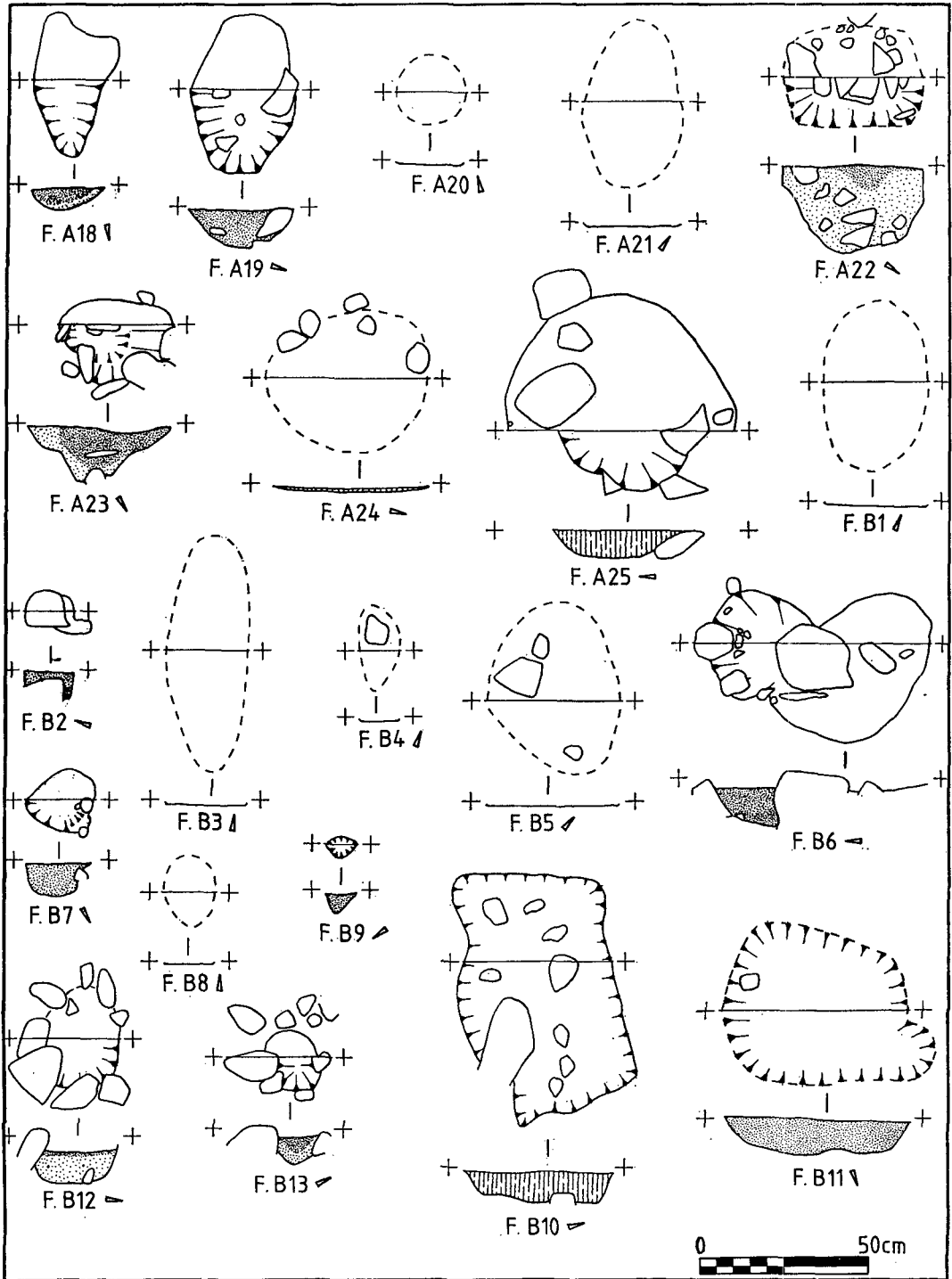


FIG 26 Features A 18-25; B1-11

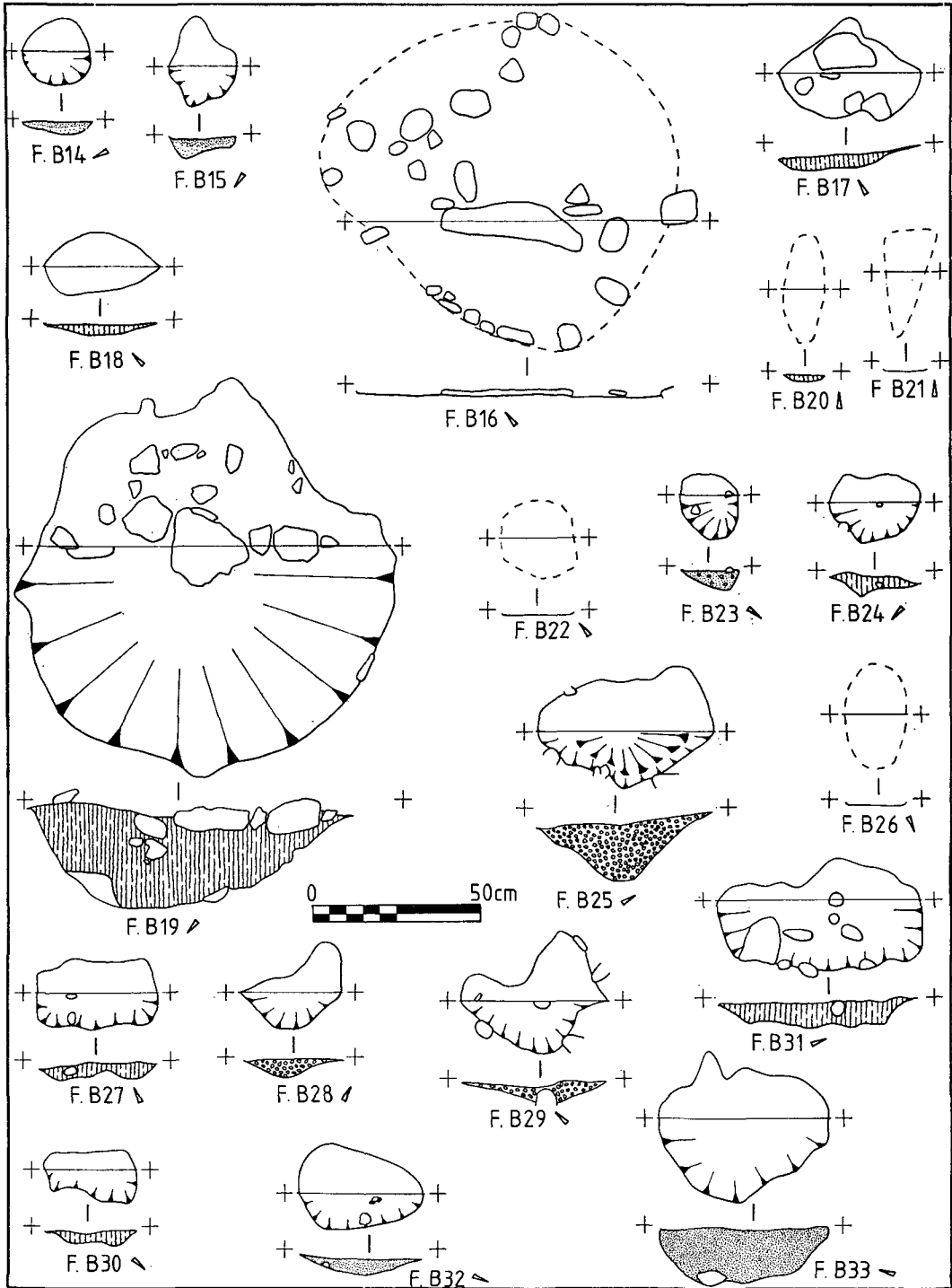


FIG 27 Features B14-33

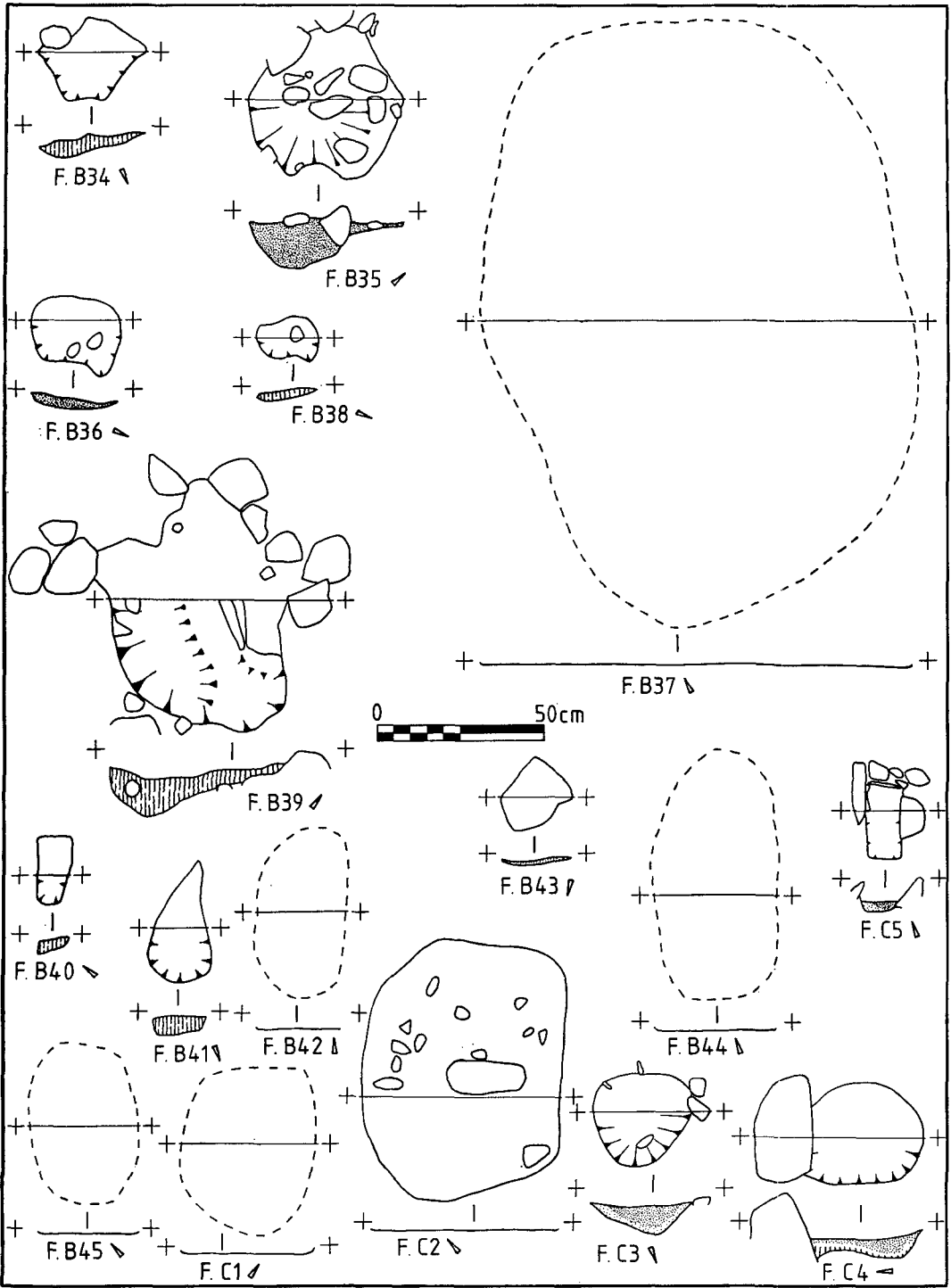


FIG 28 Features B34-35; C1-4

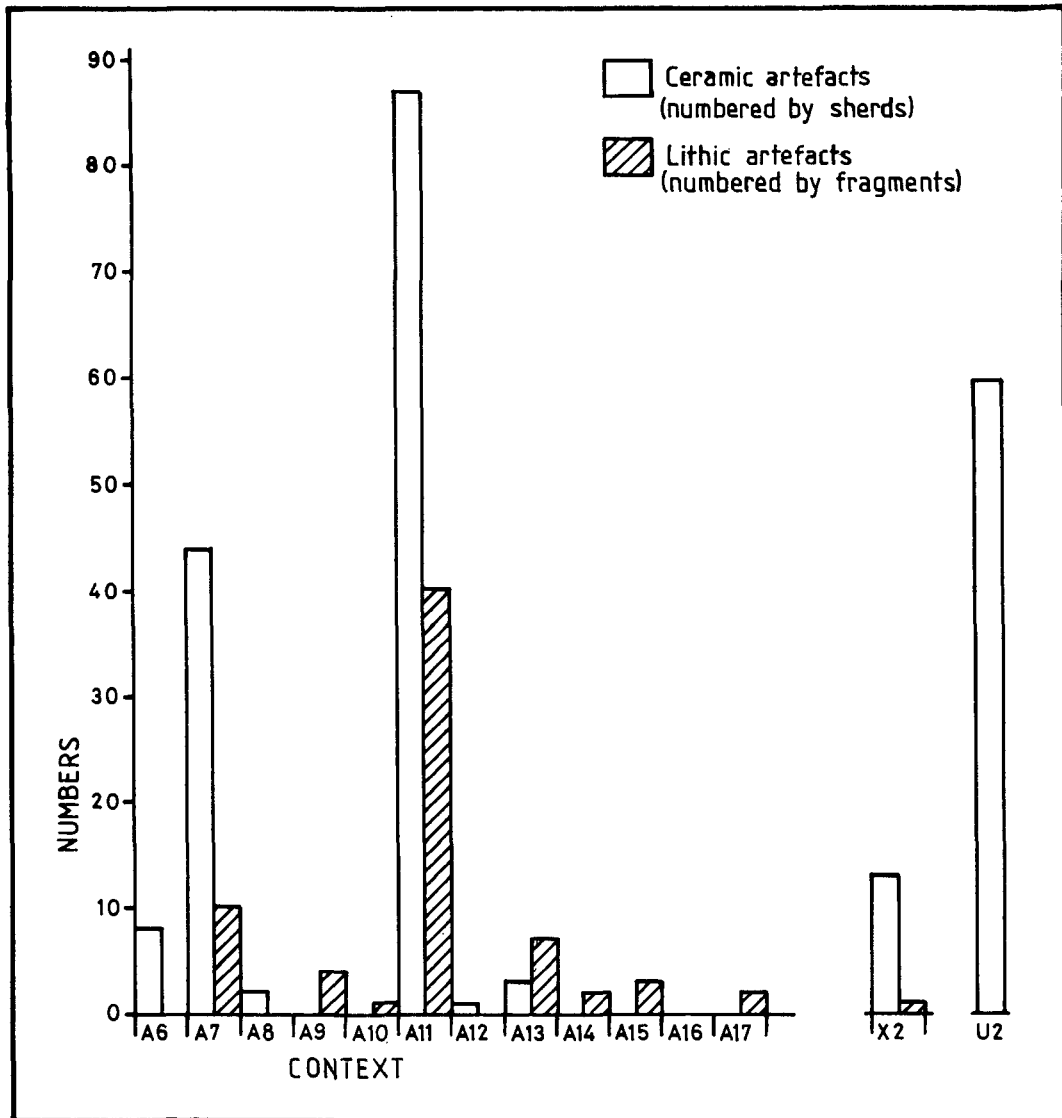


FIG 29 Histogram illustrating the number of ceramic & lithic artefacts within the sockets of timber circle A together with feature X2 and layer U2

main timber circle. Masses of the consequent debris were apparently then assiduously gathered up and deliberately deposited within the post sockets with the back packing tamped down around the newly erected timbers.

The writer would hasten to caution his reader against too dramatic an interpretation of these events. On a bitterly cold morning in November 1979 he was present on the site at Balfarg with a number of colleagues to supervise the re-erection of the two orthostats, after their extraction, as part of the programme of restoration on the site. Hot drinks were a *sine qua non* and small bottles appeared with which to reinforce these beverages. These containers, once exhausted, were tamped down into the wet concrete setting into which the orthostats were placed . . .

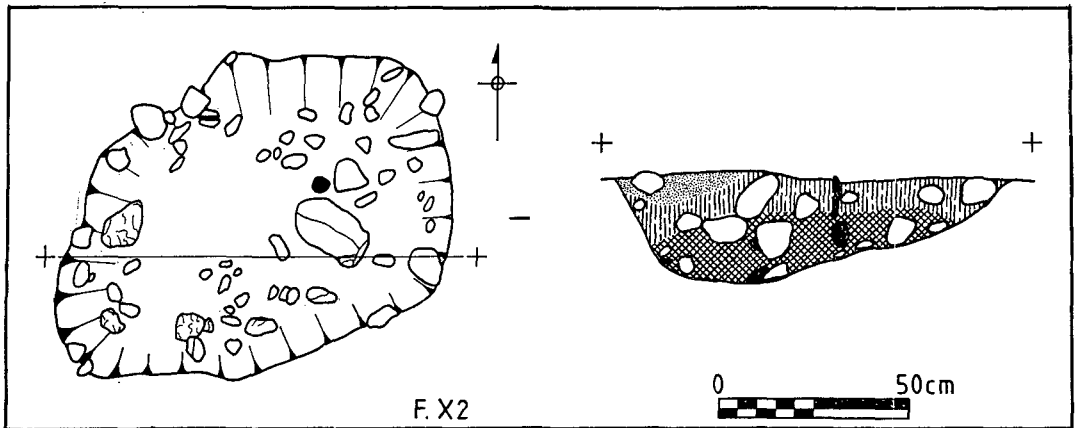


FIG 30 Feature X2

Other Timber Structures. Around the perimeter of the site on the E and N sides clearly visible from the earliest stages of the excavation was a very dense scatter of stone set just within the ditch lip but not concentric with the ditch and apparently sub-circular in form (see fig 38). The stones simply rested on the subsoil surface and did not appear to be associated with any detectable continuous dug feature. Complex sectioning of this stone concentration revealed that it covered a number of fairly evenly spaced extremely shallow depressions. One of these depressions produced traces of burning at its base (S'3). It is these depressions which have been interpreted as traces of the outer stone setting. However set within the protection afforded by this mass of stone, and retrieved only by the fortunate placement of axial sections, was an arc of clear timber uprights each upright no more than 0.15 m in diameter and placed at approximately 0.60 m centres relative to one another (F.F1-F9) (see fig 34). This arc is clearly concentric with both ditch and the main timber circle already discussed while the arc of 'stone sockets' set beneath the stone scatter is not. The stone scatter itself is assumed to be the product of the erosion of both timber and stone features with the stone packing of both being dispersed into a broad ring by disturbance and left *in situ* with the sub-aerial erosion of their soil matrix. The arc of timber uprights would appear to be cut through and interrupted by the S'3 depression interpreted as a stone socket (see figs 10 & 34) and this superimposition, vestigial as it is, forms the basis of the argument for the priority of timber structure on this site over stone structure.

The existence of a second timber structural arc on the lip of the ditch, clearly representing a palisade-type structure, may act as a suitable point of departure for our consideration of the tenuous evidence for the existence of timber structures other than the main timber circle A on the internal platform of the site at Balfarg. Before such evidence can be assessed it is necessary that some brief consideration be taken of the method whereby evidence from the interior was recovered and examined. The ploughsoil blanketing the site had been removed by mechanical means which revealed the surface of the orange/yellow glacial till which underlay this cultivated layer. The surface of the subsoil layer was respected most carefully during the stripping process. In order to remove the debris left by the machine and to clean the surface to a state suitable for archaeological inspection the whole interior was first hoed and then trowelled after subdivision into a 5 m inspection and surveying grid. Once preparation was complete, a process involving the removal of some 0.10 m of subsoil surface, a complete coverage by drawing was undertaken at the scale 1:20 illustrating each stone and every apparent subsoil anomaly then visible. The recording of

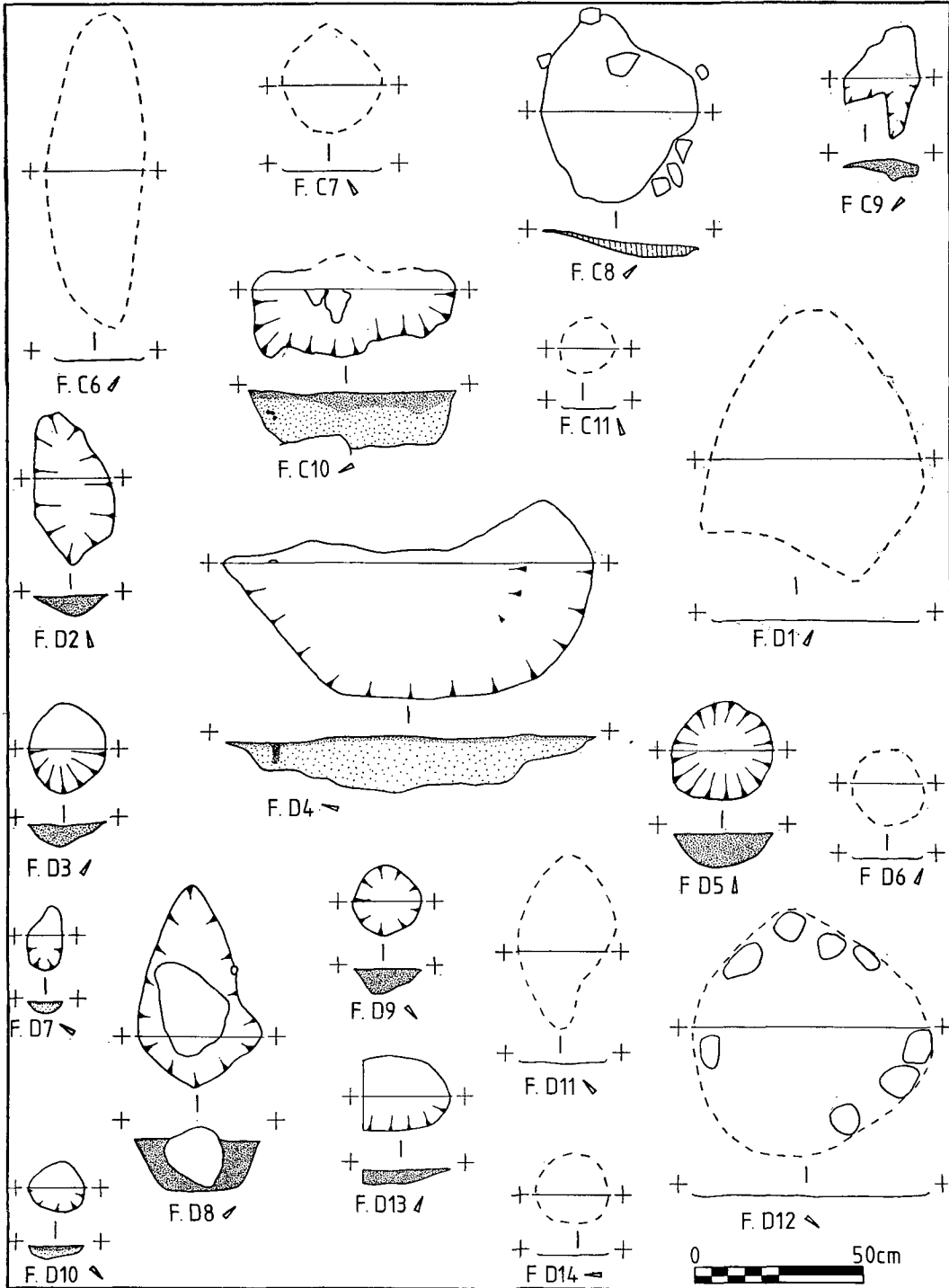


FIG 31 Features C6-11; D1-14

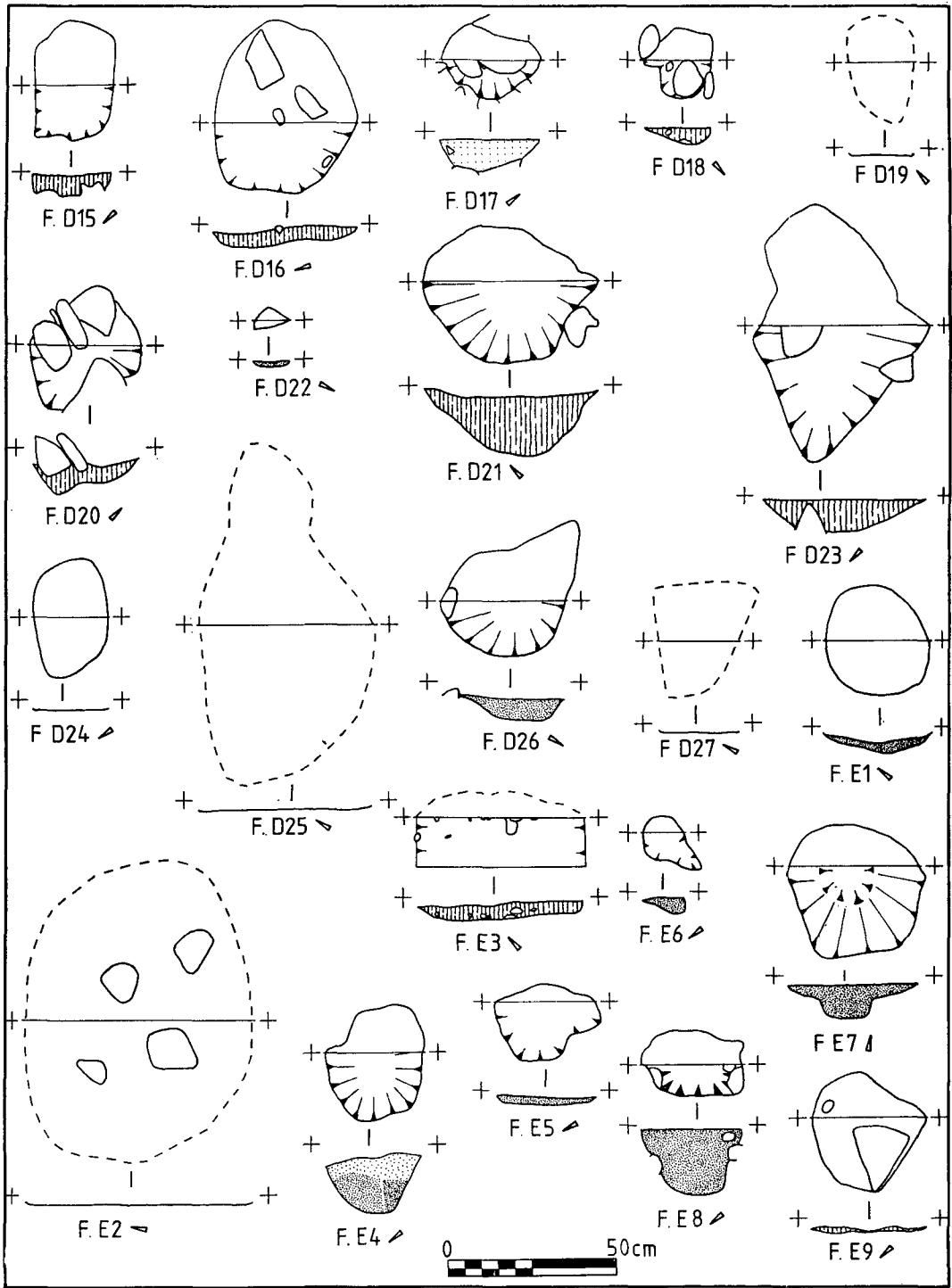


FIG 32 Features D15-27; E1-9

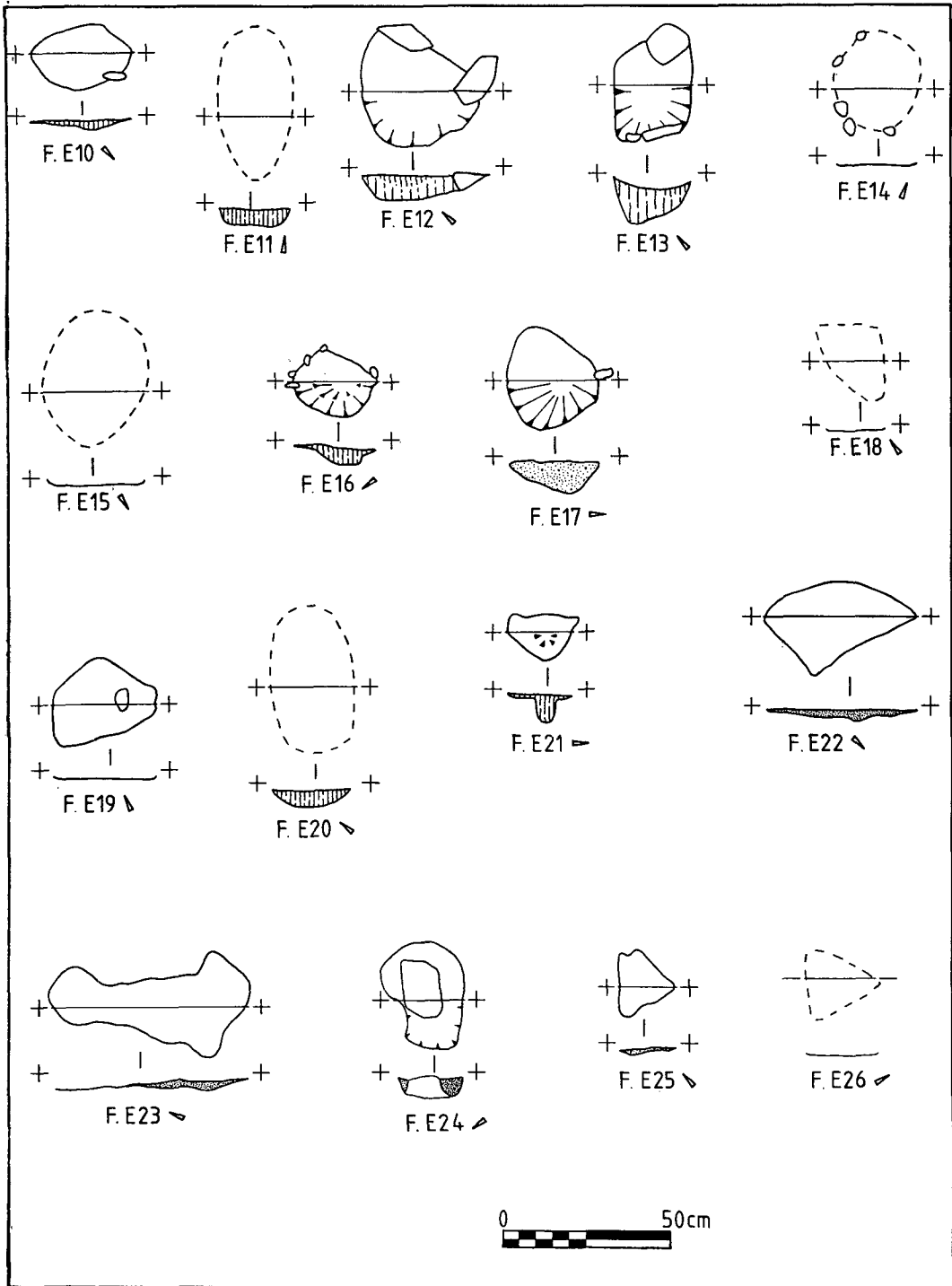


FIG 33 Features E10-26

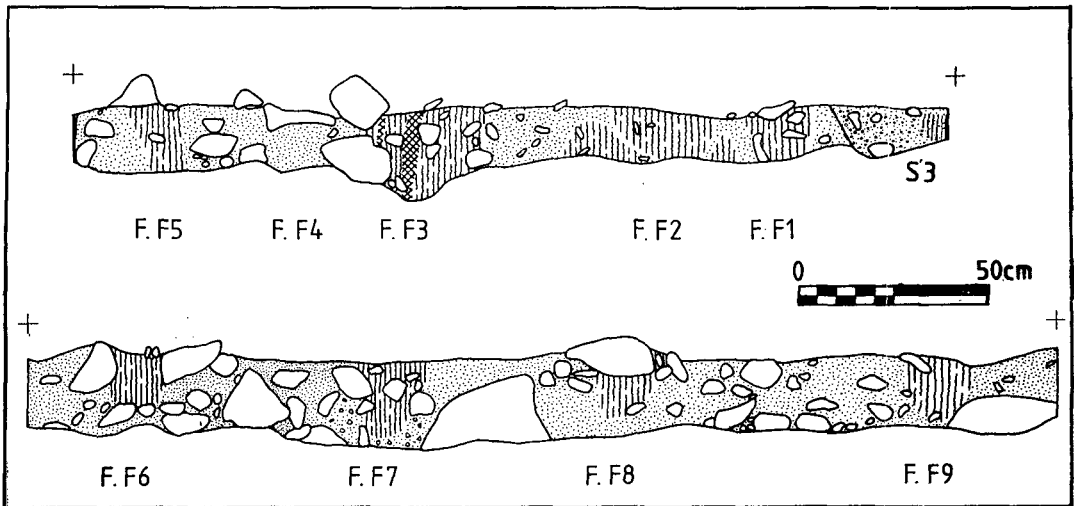


FIG 34 Features F1-9

each stone was felt to be an important exercise in that it was clear that, while the soil might have blown away, the stones would not have and might, despite later agricultural disturbance, have left some indication of their original disposition on the now lost prehistoric surface. Many hundreds of subsoil anomalies became visible with the exposure of this surface although extreme weather conditions, and the variegated nature of the subsoil already mentioned, made these initially and indeed ultimately difficult to assess. All those visible were recorded in the drawing process, numbered and excavated (see fig 39). The most obvious anomalies were those created by modern ploughing (see fig 37) and these were all excavated in order to ensure that no previously existing features remained concealed. It is apparent from the plan that a large number of linear features set on recurrent NW-SE axes could be readily recognised as plough-marks presumably representing a recent phase of sub-soiling. These, together with a number of features which produced clear evidence of modern origin (ie by containing artefacts of modern or recent date) were plotted and removed from further consideration (see fig 37).

With this process complete a very large number of anomalies remained for consideration – a process which entailed the excavation of every example and their recording by photographs and plan and profile drawing. The filling of these anomalies or features ranged from, occasionally, a clearly defined dark grey stain putatively due to the decay *in situ* of an organic member to a uniform brown/yellow loamy filling which defined the vast majority. Frequently colour differentiation was minimal and excavation was based upon differential texture or sometimes simply upon the basis of groups of stones dipping at steep angles which were interpreted as evidence of feature packing. Especially on the western side of the site erosion had been less severe so as to leave groups of stones, clearly packing stones, as indications of where features had existed in the past (eg F10 and E27). It should be emphasised that at no point is any one of these putative features in excess of 0.20 m in depth.

Figs 39 and 38 are the product of this process showing the distribution of all soil features and the stone on the site. Intuitively apparent from both is a predominant 'circularity' at a number of points over the interior. The 'circularity', which would appear to be a concentric phenomenon, is also concentric with the main timber circle, the existence of which is archaeologically beyond

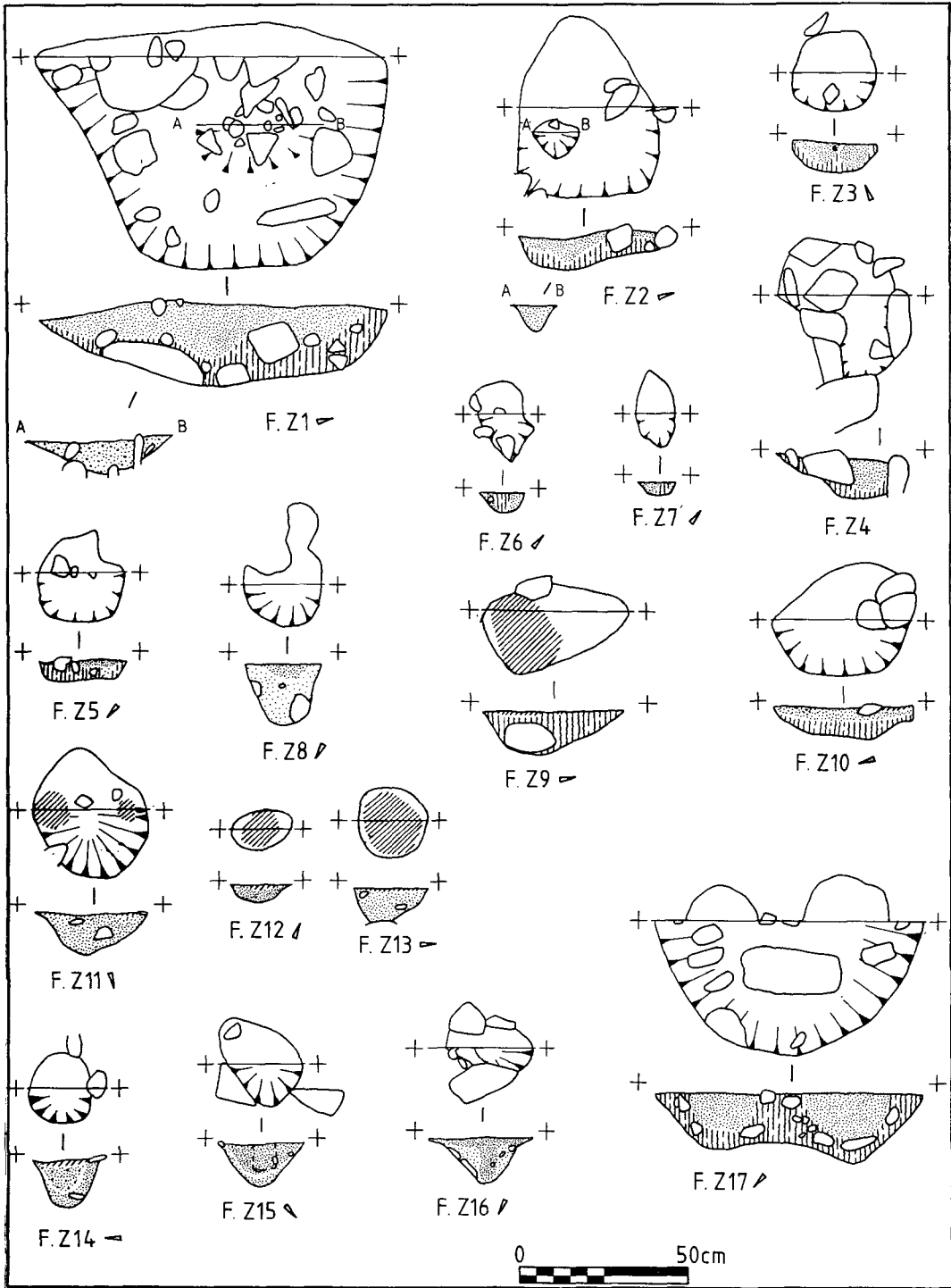


FIG 35 Features Z1-17

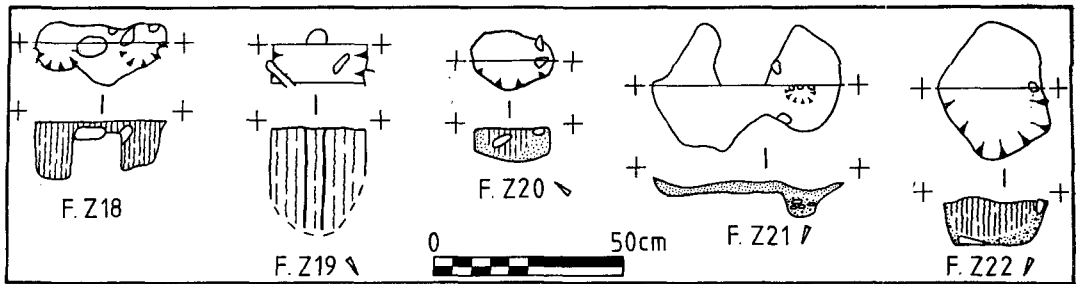


FIG 36 Features Z18–22

doubt (even if its interpretation is open to question). The ‘circularity’ is witnessed both in the ‘stone’ record and in the ‘soil feature’ record. Both in terms of area of stone where packing has remained *in situ* despite the total erosion of any earthfast feature and in terms of the earthfast features themselves, clear arcs of contiguous groups were visible on the ground.

Nevertheless a considerable body of features either non-prehistoric or relating to non-concentric features existed and so dense was this background that it was a matter of considerable doubt as to whether any understanding of the form of the monument could be retrieved. It would have been possible on the establishment of certain arcs to ‘follow’ these in a selective fashion. This process was deliberately avoided and each 5 m square of the interior was excavated independently so that at least at one level of perception and selection, the result is a relatively valid one.

The question then must remain of the methods whereby this mass of information could be dealt with and ordered. The approach adopted consisted of the statistical analysis of the distribution of all features over the interior testing in the first instance all circles of concentricity to the known timber circle at diametric intervals of 0.25 m over the whole site (see section 7). It is clear from this survey (which has been conducted with the patient co-operation of the Statistics Department in the University of Edinburgh) that for five different radii, both larger and smaller than that of the known circle, arbitrarily chosen rings fall on a very substantial concentration of detected features (see fig 46). Account has been taken in this process of the decreasing significance of the unexcavated baulks as one moves away from the centre of the site. Twenty random centres (this the maximum number in the light of financial and temporal limitations) other than those of the known timber circle have also been generated and tested to provide a comparison with those generated from the known centre. Comparison indicates that those concentrations of detected features concentric with timber circle A have a probability of less than $\frac{1}{3}$ of being due to random factors. The resultant image (fig 40) exhibits the possibility of five concentric circles of dug features, other than, but concentric with, timber circle A, all concentric with one another and with the ditch. These circles were denominated circles B–F.

When this mathematically derived model of the distribution of detected features is compared with the stone scatter distribution (see fig 38) it is found that at least three of the concentric circles (B, E and F) predicted coincide exactly with marked concentricities in the stone distribution – it is to be noted that the known timber circle A does not. Furthermore they coincide with five arc-groups of soil features perceived on the ground at the time of excavation.

The evidence for the existence of these five circles is summarised for convenience in Table 7.

The five circles were in the first instance computed mathematically from the total ‘feature’ scatter on the site. Of these computations only that for *Circle B* approached acceptability on

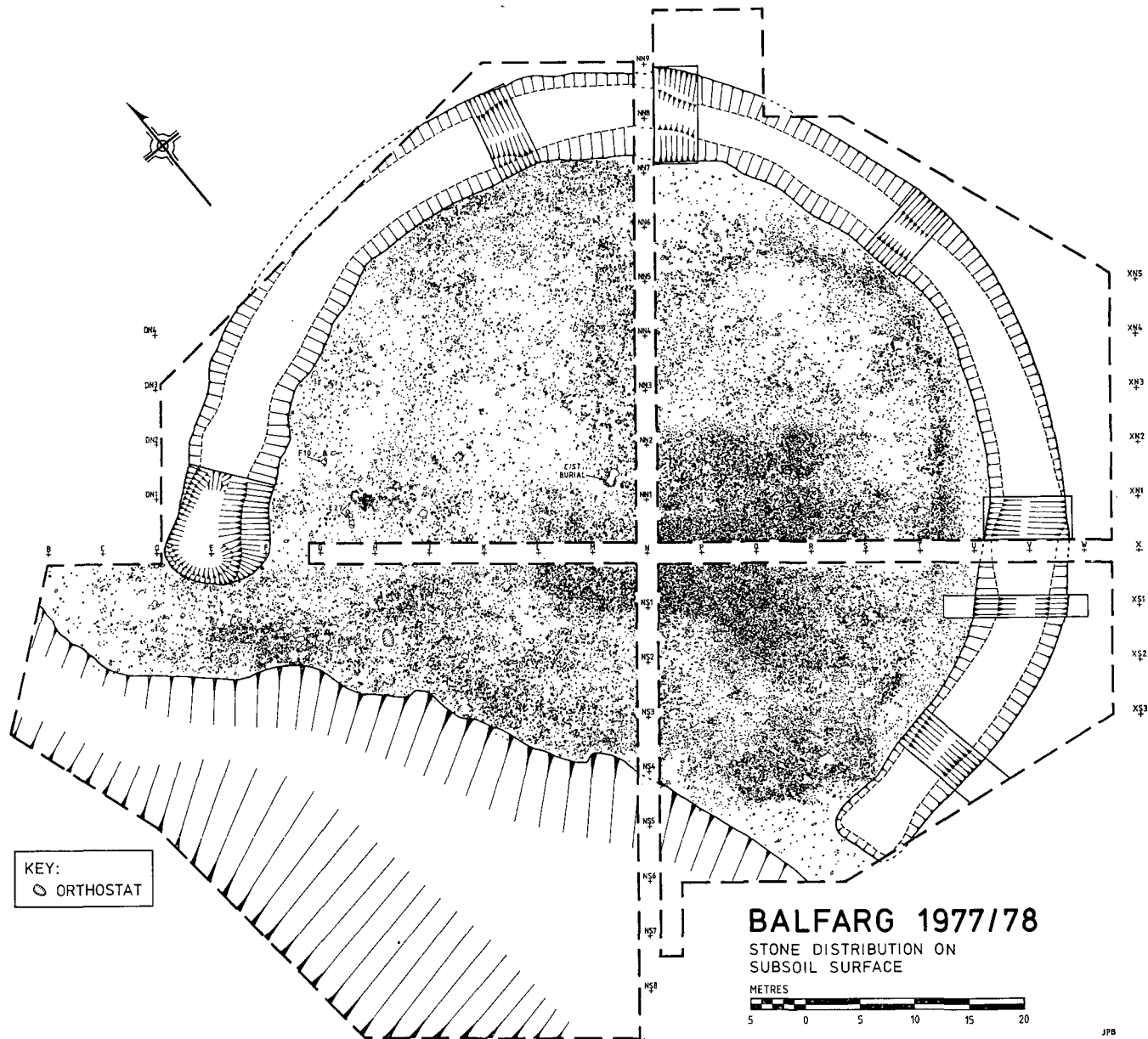


FIG 38 Stone distribution on subsoil surface

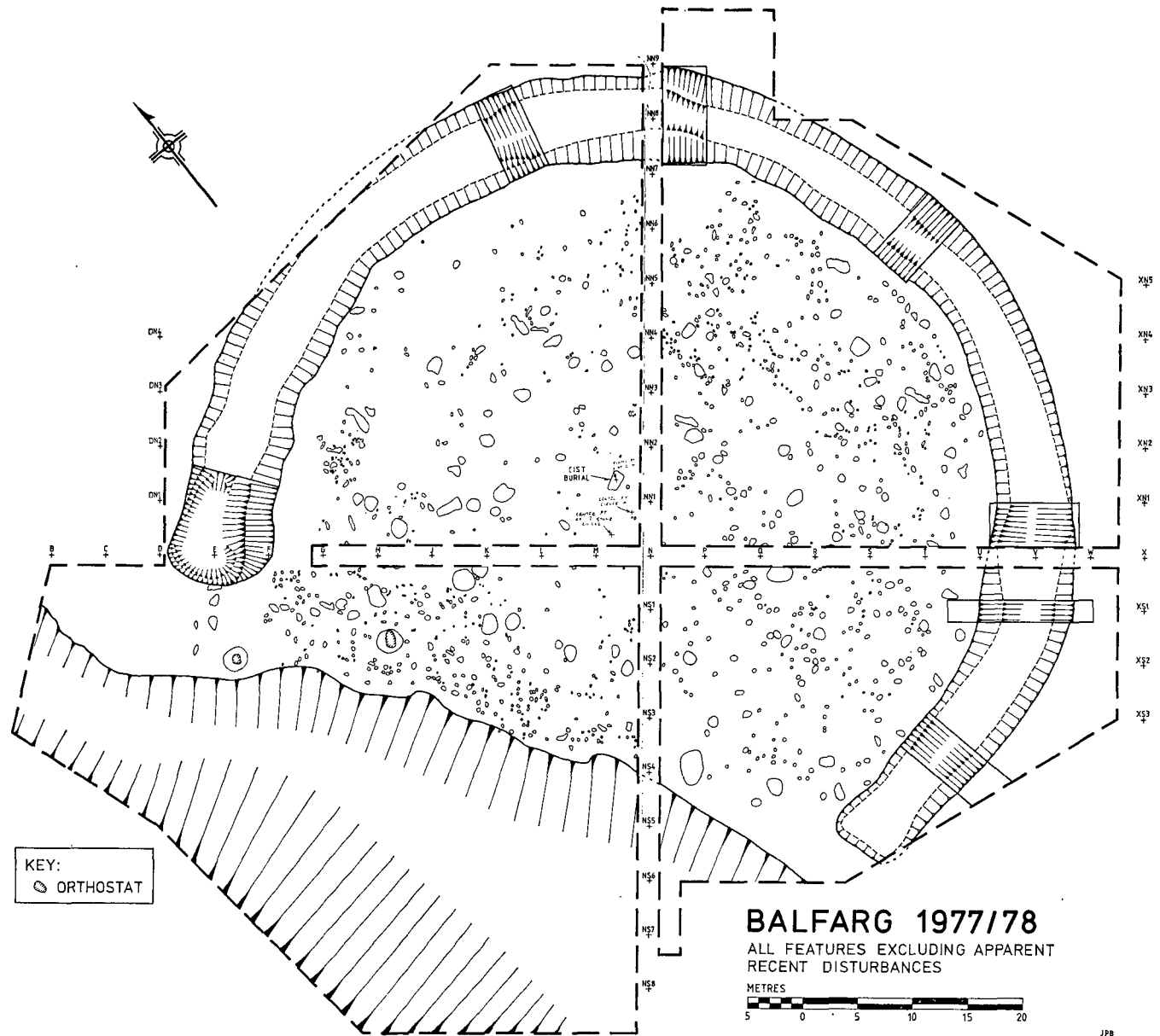


FIG 39 All features excluding apparent recent disturbances

JPB

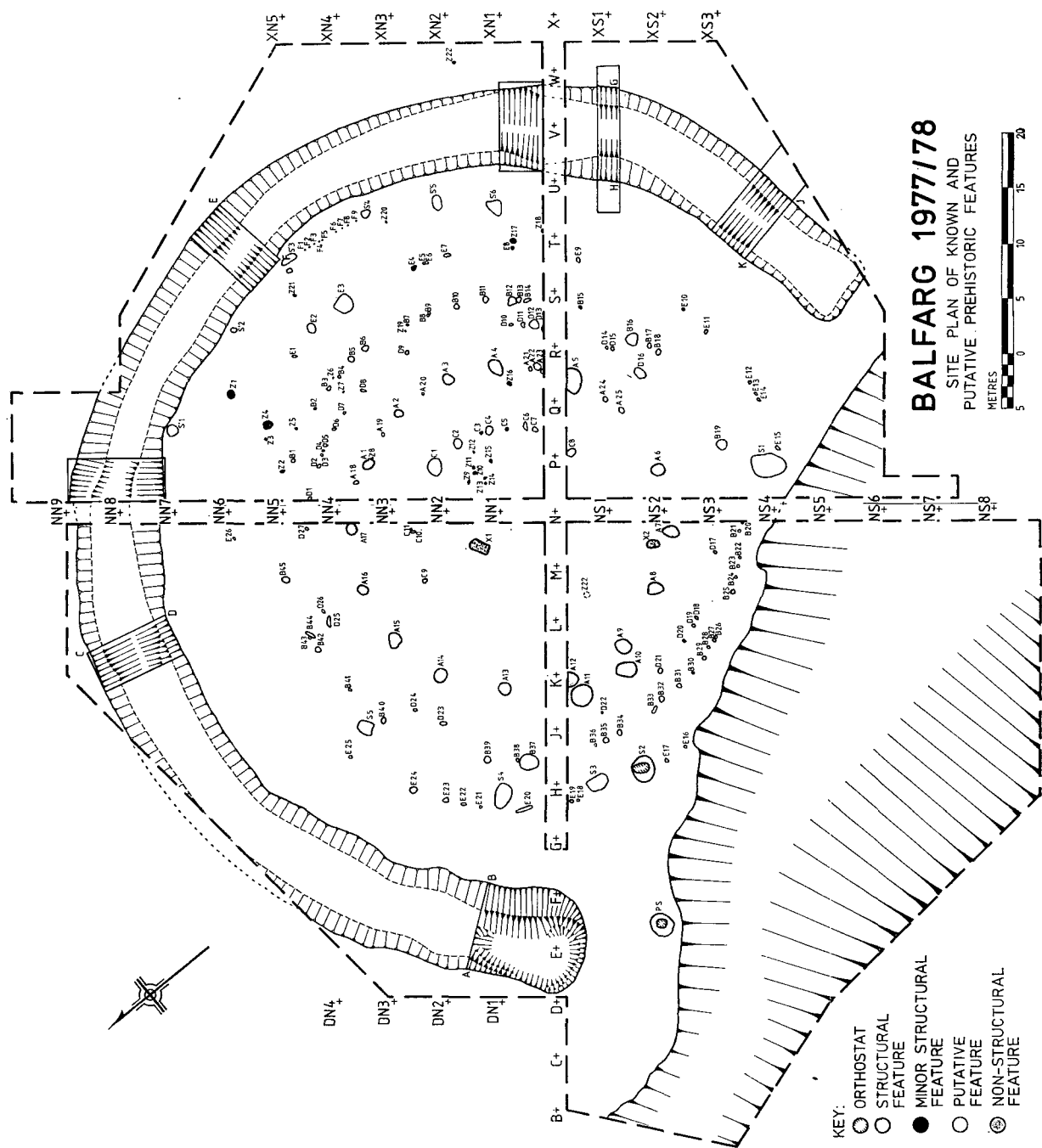


Fig 40 Site plan of known and putative prehistoric features

TABLE 7

Indicating the means of identification of timber circles B-F

Circle	'Statistical'	'Excavational'	'Stone scatter'
B	✓	✓ Z5 Z2 Arc B12-B14	✓ E quadrant
C	?	? C11/10 Z22	—
D	?	✓ Arc D5-13	? E & N quadrant
E	?	✓ E4-7 Z17 E27 palisade packing	✓ E & N quadrant
F	?	✓ F10 palisade packing Arc F F1-9	✓ W & N quadrant

statistical grounds – and then only if backed by independent evidence. This evidence exists in the clearly concentric pattern marked in the stone scatter and in the existence on the circle of F's Z5 and Z2 – indubitably post sockets and the arc of features B12-B14 – closely spaced features which were clearly defined but contained no 'post-pipe' element.

Circle C is the only postulated circle of which there is no clear reflection in the stone scatter present on the site. The high number of features on this circumference however is given some archaeological substance by the occurrence of a highly persuasive palisade slot fragment (F.C11/10) which contained six lithic fragments (L90-5), C5 and a further extremely ill-defined feature Z22 which contained three fragments of burnt flint (L100-2). In this context it should be borne in mind that, timber circle A aside, only three features of the many hundreds on the internal platform contained artefacts of any kind.

Circle D is most clearly seen in the arc of features D5-D13 all of which were convincing upon excavation (with the exception of D11 and D12). Added to this in both the eastern and northern quadrants the circumference of this circle is reflected in the stone scatter pattern of the eastern and possibly the northern quadrants.

Circle E is again clearly evident within the stone scatter and in this instance on the western side of the site two short stretches of stone packing survive (E27 see Pl 7). The extraordinary difficulties of the subsoil are best illustrated by the inability of a number of experienced excavators under various conditions to perceive any soil change associated with these stone features. Other highly persuasive features associated with this circle are E4-7, E8 and Z17 a very clearly defined feature with evidence of structural function.

Circle F has by virtue of the protection afforded by the dense stone scatter on the outer limits of the internal platform produced clear evidence (F1-9) of a palisade-type structure (see above). This arc is complemented by the existence in the western sector of a stretch of stone palisade slot packing, the context for which was once again unexcavatable (F10 see fig 38).

A number of features were quite independently recognisable by virtue of their clarity and the presence of artefacts or other indications of their anthropogenesis within their filling. These features have been suffixed Z in this report so that they can be clearly seen apart from other soil feature evidence.

In the centre of the site remnant traces exist of one further structure founded upon small posts set into sockets only the bases of which survive (F's Z9-15). This group of structural features is distinguished from all others on the site by the presence of clear traces of burning within the bases of the sockets, represented by flecks of charcoal and substantial discoloration to a burnt orange of the natural subsoil. This setting of posts is almost certainly only a randomly partial representation of the original total pattern and no confident statement can be made of the original form of the structure that they represent. F's Z9, 12, 14 and 15 might be seen as representing the corners of a rectilinear feature but in the circumstances this can be regarded as no more than a suggestion. This structure cannot be dated relative to any other feature on the site and is not

central to any of the circular settings detected. In that it has clearly succumbed to burning it may possibly be linked to the initial Phase O activity on the site which clearly also involved much burning activity but this again can only be put forward as a suggestion which, in the circumstances, cannot be substantiated.

The writer has endeavoured not to gloss over the difficulties of the evidence for structure upon the internal platform at Balfarg. It must be emphasised that the validity of the reconstruction proposed is at least questionable. The firm evidence for the existence of each circle has been described. All other features in the circles depicted in fig 40 showed no more validity than the background 'mush' of features detected and excavated elsewhere on the site and shown in fig 39. However the mutual support offered by excavational, stone scatter and mathematical evidence is sufficient to have prompted him to exercise this interpretation. All features depicted in fig 40 and interpreted as remnant structural elements of timber circles are appended to this report in plan and section. All other features were recorded at the same level and the record deposited with the site archive.

SUMMARY

The henge monument at Balfarg appears to exhibit a number of elements all of which clearly lie within the broader traditions associated with this class of site. Due to the quite appalling degree of erosion on the site and to the nature of the monument itself it is not always clear in which order these elements came to be present on the site. For ease of reference, on less than *satisfactory grounds*, the sequence on the site will be expressed as four 'events'.

- Event 0 The use of the western area of the enclosure as an area where wood and bone were burned and pottery broken which had itself become involved in incinerary processes. This event seems to occur shortly prior to event 1a.
- Event 1 (a) The excavation of a circle of 16 pits and the probable erection within them of posts with a 'porch' arrangement in the western sector (Timber Circle A) within the area defined by ditch and bank and concentric to these 1(d). The digging and filling of a small pit containing burnt bone and pottery (FX2) is associated with this event
 (b) Associated with 1(a), as a matter of possibility and not certainty, are a series of timber circles unrelated archaeologically and only partially detected. Where these survive to an extent where any degree of archaeological reconstruction is possible it would appear that concentric circles of much lesser timbers were set at intervals of 0.60 m, centre to centre.
 (c) A further structure of uncertain outline (Z9-15) was erected near the centre of the monument and burned down. Debris from Event 0 was buried within the back packing of Event 1a thus providing an archaeological sequence.
 (d) (of uncertain place within the sequence) the digging of the U-shaped ditch and the placement on its outer side of the derived material to form an external bank.
- Event 2 From the relationship between F.S'3 and timber socket F.F1 it would appear that stone uprights were erected upon the site at a subsequent date to Events 1(a) and 1(b). Two stone circles appear to be represented – an inner represented by five stone sockets (S1-S5), one with an orthostat still remaining in position. Apparently linked with this development is the erection of one certain portal slab (PS) in the western entrance to the monument. It is

also likely that an outer circle of uprights existed (S'1–S'6) which is represented by only one arc of probable stone sockets in the NE sector just within the inner lip of the enclosure ditch. It has been suggested that if the detected spacing of uprights is representative then the inner circle would have had about 12 stones and the outer about 24 stones.

Event 3 At some point a pit was dug on the site and this was covered by a slab at a point some depth below the original ground surface. The pit was found to contain the inhumation of a young adult accompanied by a handled beaker and a flint knife blade.

SECTION 2

REPORT ON THE ANALYSIS OF THE FLAKED STONE ASSEMBLAGE

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Introduction

The assemblage of flaked stone at Balfarg comprises 102 pieces, including ten unworked pebbles. Six different materials are represented: flint, quartz, quartzite, agate, mudstone, and a coarse stone. Some of the pieces were collected from the surface of the monument but the majority came from the excavated features, mainly post holes relating to the timber phase of the structure. In addition, there are two grave associations, a possible cremation pit (F.X2) and a short cist containing an inhumation burial accompanied by a handled beaker (F.X1).

In the discussion that follows, when dealing with material and technology the assemblage will be treated as a single unit as the different locations demonstrate no significant variation. Each context and its meaning will then be examined in the light of other information from the site.

The Material

i Flint

Flint makes up 80% of the assemblage. It is the easiest of stones to knap and turn into useable flakes and so, despite that here it is not of the highest quality, its predominance is not unusual. There are, however, no flint deposits near to Balfarg. Fresh black flint such as that of East Anglia does not occur in Scotland and existing Scottish sources are all of weathered pebble nodules of varying sizes and concentrations. At Balfarg the gravels do not contain flint in sufficient quantity and the nearest source lies in the alluvial deposits between Wormit and St Fort on the N Fife coast (Collins & Wickham-Jones 1978). However, flint pebbles may also be gathered from beaches around the coasts of Scotland and the Fife coast, where nodules have been collected in recent times, (Geikie 1900, 184), may well have yielded a convenient and adequate supply. On the E coast it would seem that the pebbles are transported by the action of seaweed (Piggott & Powell 1949, 160), from offshore flint beds.

Balfarg is only about 8 kms from the coast and it is likely that this particular source was exploited, either directly or indirectly. The individual pieces in the collection are not large, they are often flawed and many varieties of colour and states of cortication and patination are present. The cortex does not often survive but where it does it is well worn, rounded and crushed. All of this indicates the use of pebble nodules as a primary source and two examples of such pebbles have survived unbroken, probably because of their small size, (L31 & L32).

The presence of two pieces with remnant polishing must be noted briefly here (L53 & L70). They probably represent the broken parts of a polished axe which was originally made from a larger nodule than those apparent otherwise upon the site.

ii Other Stones

The assemblage is one of imported flint occasionally supplemented by local stones such as quartzite and possibly quartz and mudstone. There is no secondary working upon any piece that is not flint so

that, although unmodified flakes may have been used as tools quite efficiently, the importance of the non-flint items is small.

Quartz and quartzite form 8% of the collection. Both pebbles and flakes are present and it is probable that these stones, together with the other non-flint materials, were removed from the local gravels as required. Quartz flakes show little regularity and the recognition of man-made pieces is difficult. Although flaked quartz assemblages do exist (Lacaille 1940, 324–8), none of the pieces at Balfarg is sufficiently diagnostic to be certainly man-made and the use of quartz here must remain doubtful. The working of mudstone is similarly difficult to identify and the only stones, apart from flint, of which there is definite evidence of knapping are quartzite and the coarse stone. These do not form a large or important part of the assemblage.

Agate is present in a small quantity but only as tiny unworked pebbles representing its natural occurrence in the local gravels. There is no evidence to suggest that it was flaked.

Before developing a more detailed study of this assemblage a few points must be made about its present condition. It has already been noted that a wide variety of colours is present. Flint is naturally black, any colour is due to the effect of minerals upon the stone after its removal from the primary context. The many colours that are represented in this assemblage may be expected in cases where a pebble source is involved. Although this variety is rich there is no evidence of selection on the basis of colour on the part of the knappers.

As it survives 65% of the collection is corticated to some degree. Cortication is the matt, opaque skin that may occur on the surface of a flint with time (Shepherd 1974, 114–18). This accounts for the pale grey or cream colour of many of the pieces. Patination, which is only seen on 22% of the pieces, is the lustrous sheen which sometimes develops subsequent to cortication. These two conditions are a response to local soil composition and vary widely from site to site, or even within a site. They cannot necessarily be said to be indicative of the nature of the assemblage in prehistoric times.

In this context another form of sheen present upon a few of the pieces must be noted. This is a lustre which does not always cover the whole artefact. When examined under a microscope it is seen to be formed of random pitted hollows. It is due to the action of the wind abrading the surface of the stone and is an indication of the extent to which the post depositional environment has affected the assemblage. It is interesting to note that the majority of pieces so affected come from the surface of the site and the tops of the features.

Technology

i Primary Knapping

The technology used upon an assemblage may be affected by many factors, for example, the material worked, the material used to work it and cultural or traditional preconditions. It is therefore important to look for as much evidence as possible of manufacturing techniques. As well as evidence from cores and related fragments much detail may be gathered from the flakes that commonly form the body of material from any site. This latter source of information is particularly important at Balfarg where there is little direct debris from knapping, the main technological process in question. There is no evidence for other processes, such as heat pretreatment.

The basic raw material from which the knappers were producing their pieces was rounded pebble nodules often containing inclusions and flaws and not usually of a large size (see above p 115). One core only was found upon the site and came from the general surface. Two platforms have been formed at 90° to each other from which flakes have been removed, as the core is almost exhausted the scars are not large. The existence of one core rejuvenation flake, removed from the face scarred by previous flakes to create a new platform, and of one core trimming flake, the result of striking off a projection between scars at the edge of a platform, demonstrates the use of other regularly formed cores. These three pieces are the only direct evidence of knapping on site. The information that they provide about controlled knapping turning the pebbles into artificially platformed cores, from which flakes could be struck, may be filled out by evidence from the products of this knapping, the flakes themselves.

The evidence from the flakes for the basic break-up of the nodules falls into two main categories. That from their platforms and that from the bulbs of force and other general characteristics of the ventral face. Where these survive they give information not only about the preparation of the pebbles for knapping but also about the hammers used and, occasionally, the techniques of the blow. In addition, information from the shape and overall characteristics of the flakes reflects the success of these processes. Fifteen of the

flakes preserve evidence of their platforms; only on three, all secondary flakes, have natural cortex surfaces been used. On the rest an artificial platform has been formed using a flake scar and two of these show further refinement as the platform has been faceted. The removal of small flakes in this technique enables a better seating for the hammer and increased control over aspects of the knapping process such as the force and angle of the blow thus resulting in a more regular flake.

Details of the hammers and methods of flake detachment used are suggested by only 14 flakes. The platform, bulb of force and ventral characteristics all vary with the type of hammer so that from an examination of these features and their groupings the type of hammer used may be postulated. Soft hammers, for example wooden batons, tend to leave wide platforms with a lip on the ventral edge, a diffuse bulb of force and a general absence of ripples or other features on the ventral surface. Harder, medium hammers, such as antler, are distinguished by narrower platforms with no lip, a more pronounced bulb of force and, on even quality flint, ripples and sometimes other features such as *errailure* or fissures on the ventral surface. The use of a hard, stone, hammer is most often marked by a very pronounced bulb of force, sometimes almost the entire cone is visible. The platform width may vary and it will occasionally show clear ring cracks from failed strikes. The ventral surface tends to bear all the characteristics of *errailure*, fissures and ripples. While no individual flake may be used as a reliable indicator of technique the examination of an assemblage provides an opportunity for such detail to be isolated. Of the flakes at Balfarg demonstrating the type of hammers used the most common to leave evidence was the medium hammer on nine flakes. Four flakes showed the use of soft hammers and only two that of a hard hammer.

The numbers of flakes from which this sort of information may be extracted is small as much of the collection is broken, 15 pieces having lost their proximal ends. The surviving information does give valuable insights into the primary process of knapping. Careful control of both hammer and nodule are necessary in order to make the most of a resource which was not of good quality and which had to be brought on to the site. The use of a variety of hammers, together with the artificial production of platforms, sometimes further refined by faceting, amply demonstrate the knowledge and general control of the stone technicians.

The success of their skill is reflected in the overall regularity of the assemblage. Although many of the flakes are now broken and none are very large the majority were of a regular shape with edges quite suitable to use as tools. There is also an unusually high percentage of inner flakes for an assemblage based upon pebble flint suggesting a style of knapping which permitted the maximum number of flakes to be removed from the centre of any nodule.

There is no evidence in the collection for the use of punches or the bipolar technique whereby the core itself is seated on to an anvil prior to percussion. These techniques are frequently used to facilitate the knapping of pebble nodules but at Balfarg they were ignored. It would seem that sufficient control was exercised through other techniques to maximise the utilisation of the resource. Whether these techniques were known but discarded for other reasons (for example cultural constraints), cannot be surmised.

There is little direct evidence of on-site knapping and it is possible that manufacture took place elsewhere. However, as well as the core and associated pieces several flakes from the body of the assemblage demonstrate a combination of attributes such as, smallness, thinness, irregularities of the edges, lack of platform and negative bulb of force. These indicate that they are neither deliberately produced flakes, nor the broken debris from such, but are the *débitage* that is inevitably detached during the knapping process. As these are unlikely to be deliberately transported by man it would seem that a small amount of knapping was taking place within the monument. One may of course postulate the dumping of knapping debris as a ritual act within the henge but the small amount involved does not suggest this.

ii Secondary Modification

Many of the pieces would form efficient tools without further work and a few do have traces of macroscopic edge damage which may be a sign of use. However, nine pieces demonstrate the use of retouching to modify their shape and one of these, together with one non-retouched piece, illustrates the use of artificial polishing upon the flint.

There is little evidence of selection for secondary working on any basis other than size and individual quality. Four of the items, (L19, L71, L97 & L99), represent morphological types documented upon other sites and so, if it is presumed that the knapper had these templates in mind when choosing the blanks, considerations of shape must have been involved. The other five tools do not represent known morphological types but rather seem to have been retouched in positions and ways to fit the task in hand. This

air of expediency may be exaggerated by the fact that all five tools are broken so that the original shape is not visible. However, with one exception, all of the morphologically recognisable types are also broken and it is not, in any case, certain that a tool's working life ended with breakage. In their present form all but two, (*L71* & *L97*), are so small as to suggest the use of a haft and the lack of defined shape would indicate that, apart from certain well regulated types, the aim when making a tool by retouching was to build an efficient functional edge.

All of the broken tools, except *L71*, do in fact have retouch truncated by breakage so that they must have originally held larger retouched areas. It would have been quite feasible though, as noted above, for use to have continued after breakage (with the possible exception of *L99*).

In contrast to the primary processes of knapping, the secondary modification of pieces demonstrates less control. The retouch is very irregular and edges are often heavily undercut. This edge damage may be the result of use but could also be an indication of unskilful knapping. One piece alone differs, *L19*, a microblade which has been carefully backed by the removal of a series of tiny parallel flakes.

Polishing was not necessarily part of the repertoire of the knappers at Balfarg although remnants survive on *L53* and *L70*. The former is an unretouched inner flake, the latter, also an inner flake, has a small area of retouch truncated by a lateral break; both come from the same feature. The polishing is visible to the naked eye but becomes clearer under a microscope. The striations are short, about 2.0 mm in length, of rounded cross section and appear in separate blocks of parallel groups running at various angles to one another. The scars of surface flaking, which must demonstrate a modification process prior to that of polishing, have been smoothed off but not obliterated.

In neither case does the polishing cover the whole artefact. It extends over one facet of *L53* and over the ventral surface and a tiny area of the dorsal surface of *L70*. Both pieces appear to have been subsequently flaked and broken. It does not seem as if the polishing was carried out to make a tool of either piece, nor could it have been carried out upon the pieces at their present size. It would seem that these are two broken remnants of an originally larger implement, probably a polished flint axe. This is interesting as it is the only evidence for the use of polished axes upon the site, although it is of course possible, particularly as the pieces are so small, that they were already broken when they arrived. In any case, the axe must have been made from a nodule larger than those necessary to make the pieces in the rest of the collection, although there is no indication that the flint itself is of any better quality.

The origin of the axe and whether or not it was used upon the site remains unknown, but after it had been broken one small piece was retouched and used as a separate tool and subsequently broken again. Another small piece, also possibly reused, found its way into the fill of the same feature.

The technology used to manufacture the assemblage was perfectly adequate, although not particularly sophisticated. The raw material was not of a high quality but, using a variety of hammers with no specialised knapping techniques, the knappers were able to produce regularly shaped flakes which would be efficient tools without further modification. In addition, with rather irregular retouch they prepared the edges of a few of the pieces. This produced a better functional edge and, in some cases, was used to shape the piece to represent a common morphological type.

One piece stands out from the rest as being representative of a different tradition of knapping. It is the backed microblade, *L19*, found on the subsoil. Such blades require a more controlled primary knapping process and the retouch shows more skill than that of the other tools, being both smaller and more regular. There is no other evidence of microlithic working amongst the assemblage and it seems likely that this blade is an intrusive element from other activity in the area.

Morphology and Culture

The unimportance of specific morphological tool types on the site severely restricts any comparative work that may be carried out between this assemblage and those of similar sites elsewhere in Britain. At Balfarg, while the raw material places considerable constraints upon the flintworker, there would appear to have been little use of techniques (for example bi-polar flaking of pebble cores) which might have overcome these difficulties. This affected the tools produced so that the majority were not designed according to preconceived cultural modes but were simply a way of creating an efficient functional edge upon any given blank. The exceptions to this are the three pieces, *L99*, a barbed and tanged point, *L71*, a bilaterally edge-retouched tool, and *L97* a unilaterally retouched tool (knife). These were retouched with the aim of producing a particular morphological type and may be examined in greater detail.

Barbed and tanged points may be made with many different techniques upon different types of

material. This morphological type occurs frequently throughout the British Isles and is commonly held to be indicative of a late Neolithic/early Bronze Age date. However, it would be unsound to draw any conclusions on the grounds of lithic evidence alone as to the cultural or chronological associations of the site particularly from the isolated occurrence of one morphological element only. In some areas members of a specific class of tool were in use at periods both earlier and later than elsewhere. Furthermore, if one adheres to the often quoted function of 'arrowhead' or 'projectile point' for this type it is clearly possible to postulate accidental mechanisms for its arrival upon the site which do not associate it with the main collection at all. It was located within a feature possibly associated with main timber circle A, however the state of cortication and patination of the flint link it most closely with the backed microblade, *L19*, already argued (see above p 118) not to be contemporary with the bulk of the collection. The retouch however is irregular and would not be out of place amongst the other items of the assemblage, unlike *L19*.

The second piece, *L71*, is more interesting. It is securely stratified within the fill of one of the larger post holes of the main timber circle. It may be associated morphologically with a class not common in Scotland. About 200 examples were listed by Callendar (1928, 177), but more are known today.

The majority however come from a collection made in one field on the farm at Airhouse, Channelkirk, Berwickshire. Unfortunately, the collection was made some time ago and has since been dispersed but 42 of the pieces were presented, together with a representative selection of other types from the site, which yielded much flint, to the National Museum of Antiquities of Scotland.

The pieces vary in size but morphologically are all very similar. There is a wide, usually convex, apex with concave sides curving to a narrow, blunt base. Callendar called them both 'triangular' and 'sub-triangular' implements, (1928, 166 & 177), but they are also registered as, 'halberd shaped arrowheads', 'rhomboidal transverse arrowheads', 'triangular transverse arrowheads', 'prototype lopsided arrowheads' and, more generally, '*petit tranchet* derivatives'. In overall morphology they approximate most closely to Clark's 'class D *petit tranchet* derivative' (1934, 44-50) and the piece from Balfarg would fit in well with this comparison.

However, there is one important difference. Although the result is almost identical, at Balfarg this tool has been manufactured in a totally different fashion. The majority of those available for inspection in the National Museum are true *tranchet* types with a broad, curved apex formed on a side edge of the flake by the removal of thinning *tranchet* blows. The flakes are generally smaller and thinner than that from Balfarg and the sides are shaped by various types of retouch. In contrast, the piece from Balfarg is made with its apex at the distal end of a specifically shaped flake, the dorsal ridges of which demonstrate that the morphology of the implement follows that of the flake. The right side has not required modification at all. The apex is formed not only by *tranchet* thinning, but also by the subsequent removal of small retouch flakes. The left side of the distal was snapped in the primary manufacture of the flake and there is no retouch in this area, the resultant slightly concave edge has been left as an irregularity to the apex. The flake is much thicker and heavier, with steeper edges than most of its parallels.

Although differences in technology may be the response of local techniques to different raw materials, other comparisons are lacking. The ascribed use of the arrowhead, for example, is unsupported as no use-wear analysis has been carried out. Similarly, the majority of pieces come from surface collections with no structural, chronological or stratigraphical associations. At Airhouse the class was associated with a large variety of other types, axes, barbed-and-tanged points, and lop-sided and triangular points among others. There was no archaeological context although the number of waste flakes led Callendar to suggest that these 'sub-triangular implements' were being manufactured upon the spot (1928, 179). A few of these implements were found on the farm adjacent to the S upon which the henge of Overhowden, Berwickshire, stands but, unfortunately, no exact location is recorded.

The type is defined by morphology only and can offer only morphological information. No parallels are noted in Fife, the majority are in SE Scotland with a few to the N, for instance at Carsie, Perthshire; Tannadice, Angus; and Culbin Sands, Morayshire. They are also found, in similarly small quantities, further to the S, in England (Green 1980, 100).

L97 was located, together with the handled beaker, in the cist situated near the centre of the monument. It is not necessarily to be associated with the main assemblage but, except for the condition of the flint which shows less cortication and more patination than the other pieces, none of its attributes are out of place when listed amongst those of the main collection. The different appearance of the flint may be due to local conditions prevailing within the cist.

This flint is small and chunky with irregular sides. One side only is retouched, with large and shallow

but irregular scars. Traditionally it would be called a knife but it is clearly impossible to apply a functional name on purely morphological information, and indeed there is no obviously efficient cutting edge on this example. Retouched pieces like this, of varying shapes and sizes, occur in a variety of associations, both beaker and otherwise and are particularly well documented with burials. However, for the identification of such a wide group to be valid there should be parallels on levels such as morphology, technology, function and culture many of which are in this case lacking. While the importance of placing an artefact of worked flint with the body in a grave is well represented elsewhere, cultural meaning cannot, as yet, be recovered and this piece must remain as a small individual item, possibly personal equipment, included with the burial.

Distribution

There is no conclusive evidence to suggest that the flaked stone assemblage from Balfarg is contemporary with either the construction of, or the use of, the henge. Two pieces have already been seen to have a doubtful association with the main assemblage (*L19 & L99* see above p 118) and although it is possible that the rest forms the domestic debris of the builders this cannot be proved.

The assemblage comes from three different contexts, burials, post holes and surface soils. The two burials contained seven pieces, a single item in one and a group of six in the other. The single piece, *L97*, is the fine retouched flake. This was placed alongside the beaker in front of the inhumation set within the cist. The significance of this find and its associations has been discussed above.

The group of six pieces, one chip of mudstone and five flakes of flint, two of which were burnt, were contained within F.X2. In this case any positive association is doubtful. Although none of the pieces had been retouched this could be an example of the practice of including struck flakes with a burial. Alternatively, and probably more likely, the pieces may have been accidentally incorporated from the ground surface into the general fill of the feature, and furthermore, a small number of burnt pieces do exist amongst the general assemblage. It is possible, therefore, that while the two burnt pieces are to be associated with the burial, the rest are an accidental inclusion.

Within the fill of the post holes the random distribution of pieces suggests that their introduction is accidental. The most appropriate explanation for their presence seems to be that, together with other debris, for example pottery sherds and fragments of bone and charcoal, they had already been deposited upon the ground around the newly dug post hole and were subsequently gathered up with their gravel matrix in order to pack the post-socket.

The ground cover of refuse seems to have been thickest in the western sector, elsewhere there is very little artefactual material incorporated into the post holes. This may be due to the lack of preservation over other areas of the site where the features appear to be truncated. However, the distribution of material from the surface soil is also concentrated in the W. Although this latter concentration could also be the result of better preservation, it is possible that the activity leading to the formation of these deposits was focused in this area. Nothing is known of the time difference between the deposition of this material and the erection of the timber structure but the condition of other finds, such as the pottery and charcoal, suggests that it was not long.

The surface material is likely to provide the best evidence obtainable for activity in a primary context. It is probably domestic although, unfortunately, the spread of deposits is very thin with no concentrations suggesting knapping or any other activity. This lack of information may have been exaggerated by the movement of parts of the assemblage into the post holes. As *débitage* does survive there is some indication that artefacts were being produced as well as used on the site but no finer detail remains. In addition, although a few of the pieces have been burnt, their distribution forms no distinct pattern, with the exception of the two that came, together with unburnt pieces, from the cremation pit.

Summary

The flaked stone assemblage is composed almost entirely of flint, with a few items of other stone demonstrating that, when necessary, the knappers were quite prepared and able to work stones other than flint. The non-flint materials were probably gathered locally while the flint came from further afield, most likely the coast. Unfortunately, no evidence remains for the mechanisms of this importation of flint but it would not have been hard for the inhabitants to have collected and transported it themselves.

The flint itself is often slightly flawed and the nodules are unlikely to have been large but, without

using particularly specialised techniques, they were broken into flakes that were generally of a regular appearance. Many of these would have provided efficient tools without modification and some do demonstrate macroscopic edge damage although this is not necessarily due to use. A few only were retouched with an irregular technique which, on the majority of pieces, was not used to form a pre-conceived cultural type. The retouched items do not appear to have been selected for any particular reasons other than basic quality and size. When a particular functional edge was needed any convenient flake might be used, even the broken fragments of a polished flint axe.

Of the three morphological classes that may be paralleled the associations with the assemblage of two, *L19* the backed microblade and *L99* the barbed and tanged point, are doubtful. The third, *L71*, may be paralleled on a morphological level with a general class, found mainly in surface collections from SE Scotland, of *tranchet*-ended forms commonly called arrowheads. A fourth piece, *L97*, of a more irregular morphological class, may be paralleled at a depositional level with the general tradition of placing modified flakes within graves. This is a widespread practice, however, and in this case associations such as those of culture or chronology are more probably to be provided by the pottery, also within the grave, than by the stone artefact. Because of the lack of comparison on levels such as technology, function, culture and morphology, little information is provided by typological comparisons with other sites.

The assemblage may be divided into different archaeological contexts but, unfortunately, the primary association of any part of it with the monument is not confirmed by the stratigraphy, either horizontal or vertical. The evidence points to the existence upon the old ground surface of a spread of debris, probably domestic, possibly thickest in the SW corner of the site. Some of this was incorporated into the fill of the post holes of the timber elements of the henge as the ground surface was shovelled up and used for post packing. There is nothing from which to gauge the interval separating the deposition from the disturbance although it may not have been long and the refuse may well be that of the builders.

The remains of this primary flint assemblage are too scanty to allow any reconstruction of activities on the site. It may indicate a brief occupation immediately prior to the development of the site but it may also be due to a general lack of preservation. There are other indications amongst the assemblage of the results of erosion forces at work, the existence of wind gloss upon some of the pieces, for example, and the large number of pieces that are broken. This latter may be the result of treatment in antiquity but could also be due to depositional treatment through time. The evidence of macroscopic edge damage may supplement this, as in some cases it could be a result of depositional friction in gravels.

As well as domestic activity the lithic assemblage is represented in one other of the activities present upon the site. This is burial. There are possibly two burials, an inhumation and a possible cremation. While one item of flint was positively associated with the inhumation, the association with the possible cremation is less secure but it is possible that at least two pieces were burnt in the cremation process and four others may have been included at a later stage.

There exist, therefore, primary associations for the stone assemblage at Balfarg with the activities of domestic occupation and burial, and secondary associations with that of the construction of the early phase of the monument.

NOTES TO THE CATALOGUE

- i All pieces are flint unless otherwise stated.
- ii When examining the pieces they are always held with the dorsal face uppermost and the proximal end towards the observer.
- iii Dimensions are given in millimetres in the order; length: width: thickness. In the case of cores, chips and chunks these axes have obviously been arbitrarily chosen.
- iv Length is measured along a line at 90° to the platform of the piece, width is in the same plane and at 90° to the length along a line across the widest part of the flake, thickness is measured from the ventral surface to the highest point of the dorsal surface along a line perpendicular to the length and width.
- v Chips and chunks have neither a platform nor a ventral surface. The largest dimension of chunks is over 15 mm; that of chips is under 15 mm.
- vi The morphological tools are merely pieces that have been retouched. In typing these pieces few items are readily paralleled by conventional morphological types and allocation of a name has been left to the end of an entry as this is largely a subjective matter. No functional information is implied by these terms. As conventional type-names imply a degree of function, in the few cases where they

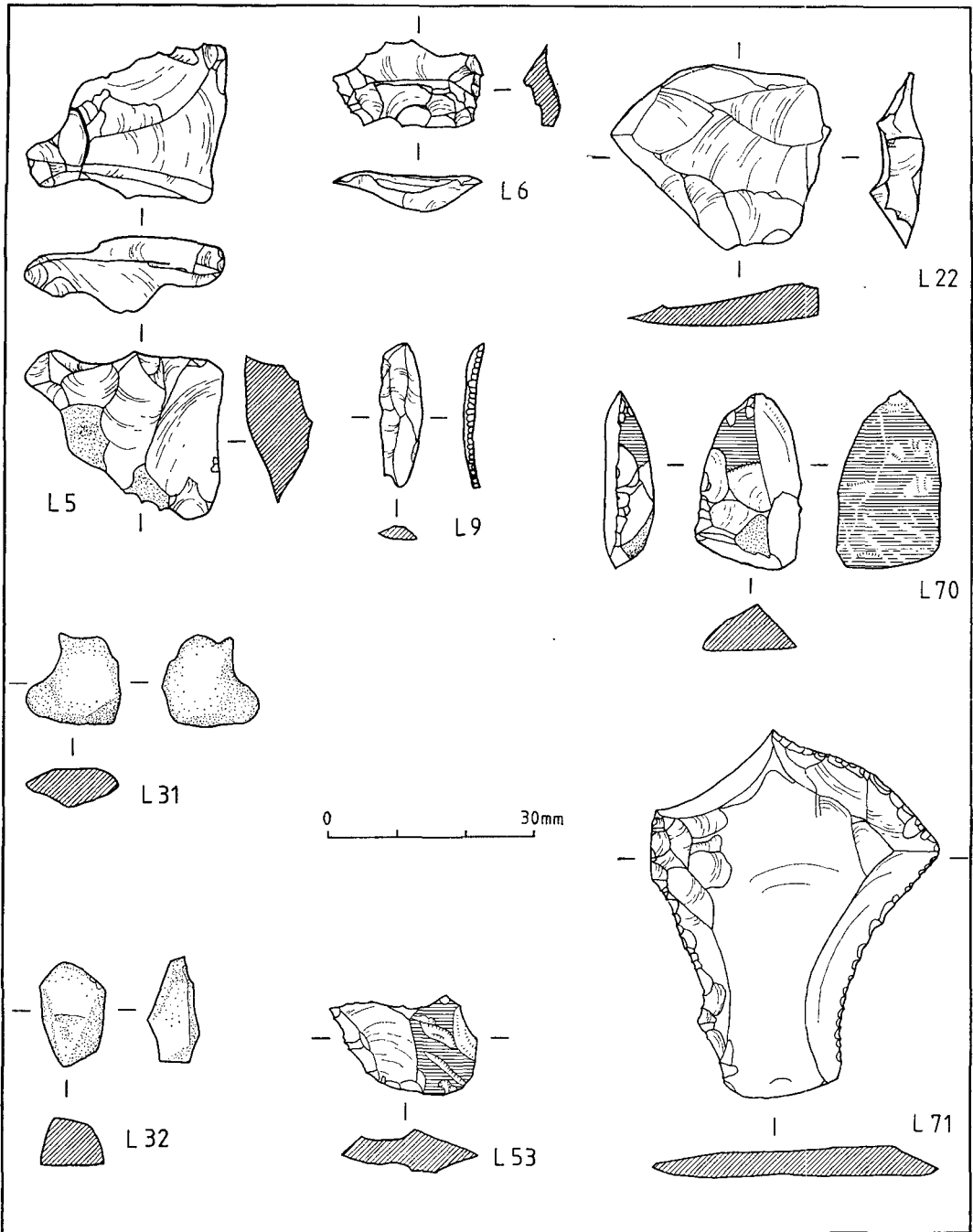


FIG 41 Flint

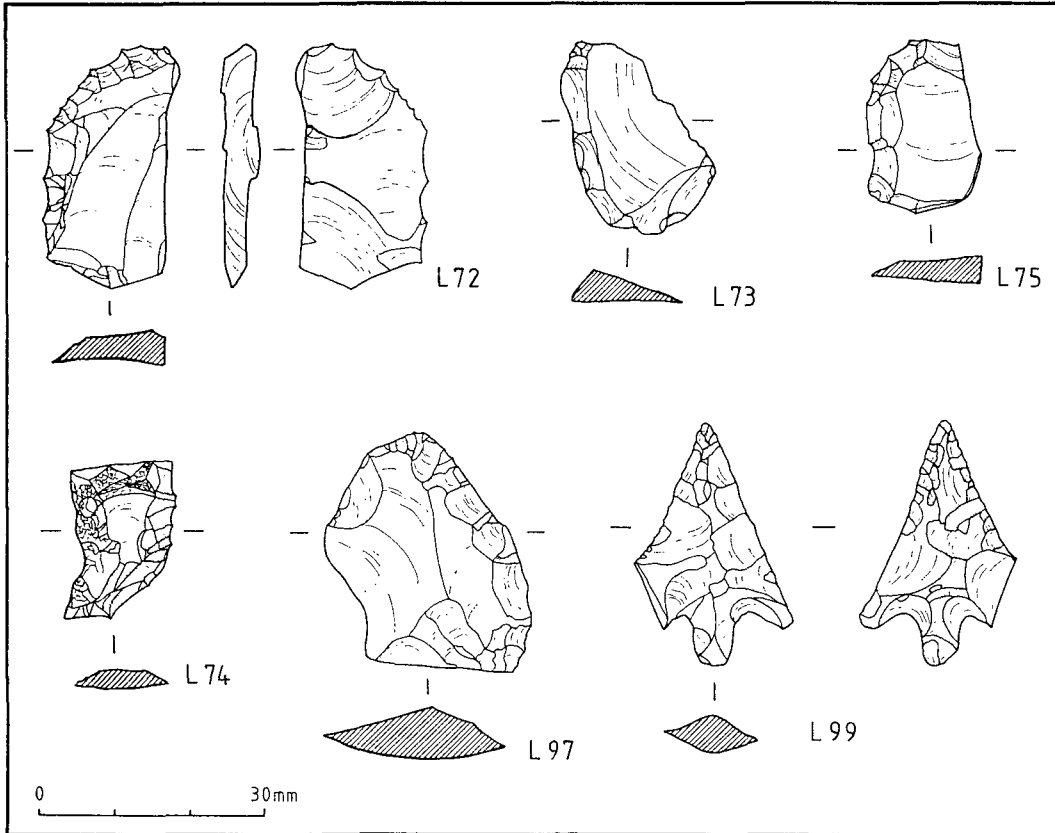


FIG 42 Flint

might be considered appropriate they have been placed in parenthesis following a morphological type name.

- vii Where possible the hammer technique used to detach a piece has been noted. See general text (p 117), for the detachment features reflecting the use of different hammers. Note that individual flakes can never be used reliably as indicators of technique, the detail is drawn from a comparison of all the flakes of the assemblage.
- viii Macroscopic edge damage has been noted where apparent. This generally consists of the removal of small flakes and may be due to use although this can not be verified without the use of a high powered microscope.
- ix Cortication refers to the matt discoloration, usually white or cream, which may cover the surface of a flint with time. Patination is the lustrous sheen that may subsequently develop (Shepherd 1972, 114-8).
- x The following abbreviations have been used; l: left edge angle, r: right edge angle, d: distal edge angle, p: proximal edge angle.

CATALOGUE OF THE FLAKED STONE PIECES

Uncontexted, ie within modern ploughsoil or resting unassociated upon the subsoil surface.

Natural Pebbles

Cat
No

L1 Banded agate; purple-cream; patinated; 34:28:23; wind polished.

1

- L2* Banded agate; cream-white; 26:26:14.
L3 Agate; red; patinated; 19:09:07; wind polished.
L4 Agate; red; patinated; 13:06:04.
- Core
L5 Red-orange; flawed; two artificial platforms at right angles; six strikes; 21:26:11.
- Core Trimming Flake
L6 Pale grey; medium hammer; artificial platform; 12:20:14; wind polished.
- Secondary Chip
L7 Burnt; pink, corticated; 08:06:02.
- Primary Flake
L8 Quartz; translucent white; natural platform; 28:20:09.
- Secondary Flakes
L9 Orange-red; broken; distal surviving; 13:16:03.
L10 Pale grey; partially corticated; lightly patinated; broken; middle surviving; flawed; macroscopic edge damage on right edge; 14:14:03; r 53.
- Inner Flakes
L11 Honey; medium hammer; faceted platform; 28:16:03.
L12 Pale grey; corticated; lightly patinated; medium hammer; macroscopic edge damage on left edge; 20:22:03; l 40.
L13 Grey; slightly corticated; hard hammer; 21:21:10.
L14 Pale grey; corticated; 17:12:04.
L15 Honey; macroscopic edge damage on right edge; 26:06:03; r 69.
L16 Cream; partially corticated; broken; proximal surviving; soft hammer; artificial platform; 15:12:03.
L17 Pale grey; slightly corticated; lightly patinated; broken; proximal surviving; medium hammer; artificial platform; 10:16:04; wind polished.
L18 Pale grey; slightly corticated; broken; middle surviving; macroscopic edge damage on right edge; 15:14:02; r 22.
- Retouched Piece
L19 Inner flake; pale grey; corticated; broken; proximal surviving; artificial platform; straight parallel sides; straight proximal; right edge blunted by retouch; 25:05:02; r 64; l 42; Backed Microblade.
- Natural pebble
L20 Agate; translucent pink; flawed; 21:15:13.

CONTEXTED WITHIN FEATURES

Feature A7

- Natural Pebble
L21 Agate; translucent pink; patinated; 09:07:05; wind polished.
- Core Rejuvenation Flake
L22 Inner; honey; slightly corticated; artificial platform; new platform at 90° to old; 25:30:08.
- Secondary chunk
L23 Mudstone; pale grey-pink; 15:21:10.
- Primary Flake
L24 Coarse stone; pale brown; 12:19:05.
- Secondary Flakes
L25 Quartzite; grey; 40:26:09.

- L26* Burnt; pale grey-white; partially corticated; broken; proximal surviving; 25:15:05.
L27 Honey; natural platform; 16:13:03.

Inner Flakes

- L28* Pale grey; slightly corticated; broken; proximal surviving; parallel sides; macroscopic edge damage on right side; 28:15:06; r 32; l 53.
L29 Pale grey; slightly corticated; 18:16:05.
L30 Honey; medium hammer; artificial platform; 12:15:03.

Feature A9

Natural Pebbles

- L31* Cream; cortical; 13:13:05.
L32 Pink; corticated; patinated; 15:08:07.
L33 Quartz; white; 13:12:06.

Secondary Flake

- L34* Pale grey; corticated; flawed; 30:42:12.

Feature A10

Secondary Flake

- L35* Burnt; red; 23:09:05.

Feature A11

Split Pebble

- L36* Quartzite; dark grey; 86:61:30.

Primary Flakes

- L37* Cream; cortical; 22:18:04.
L38 Dark grey; corticated; broken; proximal surviving; 11:21:04.
L39 Cream; cortical; broken; proximal surviving; 16:18:06.
L40 Cream; cortical; 13:12:02.
L41 Honey; broken; left half surviving; artificial platform; 15:09:04.
L42 Cream; cortical; patinated; 14:10:02.

Secondary Flakes

- L43* Quartzite; dark grey; natural platform; 33:27:09.
L44 Quartzite; dark grey; 26:22:06.
L45 Burnt; white; corticated; calcined; lightly patinated; broken; middle surviving; 12:11:03.
L46 Burnt; white; corticated; calcined; patinated; 10:13:03.

Inner Flakes

- L47* Burnt; white; corticated; calcined; patinated; 23:30:07.
L48 Honey; medium hammer; 31:19:09.
L49 Pale grey; patinated; broken; proximal surviving; medium hammer; faceted platform; 21:28:05.
L50 Cream; corticated; broken; proximal surviving; 26:16:03.
L51 Pale grey; partially corticated; 19:17:05.
L52 Burnt; white-pink; corticated; calcined; lightly patinated; 20:20:05.
L53 Pale grey; broken; proximal surviving; dorsal surface right half shows signs of artificial polishing; 14:20:06.
L54 Honey; soft hammer; artificial platform; 14:18:06.
L55 Burnt; white; corticated; calcined; lightly patinated; broken; segment surviving; 16:15:03.
L56 Pale grey; partially corticated; 25:05:09.
L57 Pale grey; 20:14:04.

- L58 Pale grey; slightly corticated; 19:14:03.
- L59 Pale grey; slightly corticated; broken; proximal surviving; 13:18:04.
- L60 Pale grey; partially corticated; broken; proximal surviving; 19:13:03.
- L61 Pale grey; slightly corticated; broken; segment surviving; 14:14:05.
- L62 Pale grey; slightly corticated; lightly patinated; broken; proximal surviving; 22:10:02.
- L63 Quartzite; pale grey; 15:15:03.
- L64 Pale grey; broken; proximal surviving; 17:11:01.
- L65 Cream; corticated; broken; segment surviving; 17:07:02.
- L66 Cream-pale grey; corticated; broken; segment surviving; 16:09:05.
- L67 Pale grey; partially corticated; 09:13:02.
- L68 Burnt; white; corticated; calcined; broken; segment surviving; 11:10:01.
- L69 Quartz; translucent white; 11:07:03.

Retouched pieces

- L70 Inner flake; pale grey; slightly corticated; patinated; broken; segment surviving; triangular plan; straight sides converging to blunt point at distal; straight proximal; irregular edge retouch on proximal end of left side; scars of surface flaking on ventral with artificial polishing on top; distal end of left side dorsal face also small area of artificial polishing; 23:14:07; r 60; l 75; Broken Miscellaneous Tool (re-used part of polished axe).
- L71 Inner flake; pale grey; partially corticated; broken; left half of distal missing; straight proximal; concave left and right sides curving outwards to distal; wide splayed distal with beak formed by breakage; irregular edge-retouch on left side and right half of distal; macroscopic edge-damage on right edge; 53: 40:05; r 52; l 66; d 77; p 40; Bilaterally Edge-Retouched Tool – sub-triangular implement.
- L72 Inner flake; pale grey; partially corticated; broken; left half surviving; damaged ventral; convex left side; blunt proximal; irregular edge-retouch on left side and distal; 32:16:05; l 70; d 79; p 35; Broken Edge-Retouched Tool (side scraper).
- L73 Inner flake; pale grey; slightly corticated; patinated; broken; proximal surviving; convex left and right sides; blunt point at proximal; deep irregular edge-retouch on left side; shallow irregular edge-retouch on right side; macroscopic edge-damage on left side; 22:21:05; l 60; r 44; p 72; Broken Edge-Retouched Tool.
- L74 Inner flake; burnt; white; corticated; calcined; broken; proximal right segment surviving; convex edge; edge retouch on right side; 20:14:04; r 56; Broken Edge-Retouched Tool.
- L75 Inner flake; pink-brown; slightly corticated; broken; distal left segment surviving; irregular left; shallow truncated edge-retouch on left side; 22:14:05; l 41; Broken Edge-Retouched Tool.

Feature A13

Secondary Chunk

- L76 Mudstone; pale grey-cream; 20:13:06.

Inner Flakes

- L77 Dark grey; lightly patinated; 18:14:05.
- L78 Translucent white; 10:20:04.
- L79 Burnt; white-pink; corticated; calcined; lightly patinated; broken; middle surviving; parallel sides; macroscopic edge-damage on right and left edges; 10:16:05; r 35; l 31.
- L80 Honey; 13:17:03.
- L81 Honey; 22:11:06.
- L82 Pale grey; corticated; lightly patinated; 15:13:03; wind polished.

Feature A14

Secondary Flake

- L83 Pale grey; lightly corticated; broken; proximal surviving; soft hammer; 20:15:06.

Inner Flake

- L84 Honey; soft hammer; artificial platform; 13:14:03.

Feature A15

Secondary Flake

L85 Honey; 13:20:07.

Inner Flakes

L86 Honey; 22:17:05.

L87 Cream-pale grey; corticated; 18:12:03.

Feature A17

Inner Flakes

L88 Burnt; white; corticated; calcined; broken; segment surviving; 16:08:04.

L89 Pale pink; 15:10:03.

Feature C10/11

Secondary Chip

L90 Mudstone; cream-red; 13:14:08.

Secondary Flake

L91 Pale grey; slightly corticated; lightly patinated; medium hammer; natural platform; 15:13:03.

Inner Flakes

L92 Pale grey; corticated; 11:13:02.

L93 Burnt; white; corticated; calcined; broken; segment surviving; 06:14:03.

L94 Burnt; white; corticated; calcined; 09:11:02.

L95 Honey; slightly corticated; 08:07:01.

Feature XI within packing of cover slab of cist.

Secondary Flake

L96 Mudstone; pale grey-honey; patinated; natural platform; 16:24:07.

Feature XI associated with handled beaker and inhumation

Retouched piece

L97 Secondary flake; pale grey; slightly corticated; lightly patinated; hard hammer; natural platform; convex right side; irregular left side; straight proximal; blunt distal; shallow irregular edge retouch on right side and distal; macroscopic edge damage on left side; 30:24:08; l 40; r 57; d 52; Unilaterally Edge-Retouched Flake (flake knife).

Feature X2

Natural Pebble

L98 Banded agate; cream-grey; corticated; patinated; flawed; 15:11:09.

Feature Z8

Retouched piece

L99 Inner flake; white; corticated; broken; left barb missing; triangular plan; straight sides converging to a point; notched base with protruding central stem; irregular bifacial surface retouch; 31:18:06; Bifacial Barbed and Tanged Point. Pl 7b.

Feature Z22

Inner Chips

L100 Burnt; cream; corticated; calcined; 06:05:01.

L101 Burnt; cream; corticated; calcined; 07:06:02.

L102 Burnt; cream; corticated; calcined; 07:05:01.

SECTION 3

REPORT ON THE POTTERY FROM BALFARG, FIFE
Audrey Henshall and Roger Mercer

Excluding the handled beaker (see below p 133), the total quantity of prehistoric pottery recovered amounts to over 9 kg (20 lb) in several hundred sherds, the majority small and featureless. The minimum number of pots represented is 37, comprising three which can be almost entirely reconstructed, 22 other distinctive rims, 11 wall sherds or groups of sherds which clearly do not belong to these rims, and one base sherd which judging by its fabric belongs to yet another vessel. This total could be increased to 43 by including decorated wall sherds which do not appear to belong to any of the pots enumerated except for the possibility they are from the lower parts of vessels otherwise recognised only by a rim sherd.

In general the fabric is dark, shading to mid-brown; the occasional pale buff or pale grey or pink tones are certainly or probably due to subsequent scorching. On the whole the fabric is hard, or even very hard, but the temper generally includes quite large grits even in the thinner sherds. Some smaller pots, such as *P4* and *P21*, have only fine temper giving a harsh gritty texture. Some of the larger pots with much temper, such as *P24* and *P25*, are reminiscent of good quality cinerary urns. Often there is a thin slip on the outside, less often inside also, but a few such as *P13*, *P15*, *P16*, *P18*, *P40*, have a thicker slip giving a rather soapy texture to the surface. Joins between building rings are seldom obvious but can sometimes be detected, and are quite clear on *P8* and *P15*. *P7* is unusual for, besides being very heavily gritted, it is friable and pale, probably due to burning. The sherds *P24* are also distinctive, particularly the appearance of the outer surface with the small angular stone temper breaking the surface slip.

On the whole the sherds show little evidence of weathering, and the worn sherds are normally those which have been softened or made friable by scorching, as *P7*, *P13*, *P18*, or *P41*. Quite a number of the sherds have been scorched, for instance one of the three sherds of *P18* and some of *P13*, the lower part of *P8*, and the bases of *P23* and *P44* among others. It is also evident that many, if not all, the pots were in domestic use, for some have thick encrustations of carbonised matter inside or outside as noted in the catalogue.

On a base sherd of *P7* there is an impression, very difficult to see, but giving the vague appearance of radiating lines with connecting lines near the edge of the base. This is presumably from some kind of coarse circular mat or basket on which the pot had been placed eccentrically while still in a soft state. A more convincing mat impression is preserved on one of the sherds from Rinyo, Orkney (Childe & Grant 1947, 34; Henshall 1950, 152).

No pot is sufficiently entire for the rim to base profile to be constructed from the sherds, though *P7* lacks only the top-most rim portion (*P6* being just possibly a fragment of the missing rim), and the complete profiles of *P8* and *P23* can be reconstructed with confidence on paper. These three vessels, and as far as can be seen all the rest, are straight-sided tub-shaped pots, but it should be noted that apart from these only in six cases (*P2*, *P18*, *P19*, *P26*, *P31*, *P36*) can the angle of the rims be assessed from the sherds. The rim forms are simple, characteristically flat or with a slight internal or external bevel, though some of smaller diameter are rounded in section. The rim *P31* is unusual in having been thinned by shaving away the inner surface. A number of rims have an internal moulding formed by an applied fillet. In size the rim diameters range from 130 mm (5 in) to 355 mm (14 in) or more, and the base diameters from about 115 mm (4.5 in) to 330 mm (13 in). The wall thickness varies from the delicate 4 mm (0.2 in) of *P4* to the heavy 13 mm (0.5 in) of *P8*, *P16* and *P25*.

Decoration outside is by incised lines, jabs, applied cordons and rows of perforations, sometimes in combination. Some pots are likely to have been undecorated, and certainly *P23* was plain outside. The incised lines, appearing on 17 vessels, may be wide and fairly light (*P1*, *P16*), or wide and deep (*P2*, *P12*, *P13*), or quite fine (*P17*), or deeply cut (*P3*); occasionally as on *P7* they take the form of elongated stab-and-drag. On sherds *P1* to *P4* incised lines are combined with jabs, round on *P3*, slanting on the others. On *P2* the jabs are in a double row alternately from opposite directions to produce a wavy relief line. Otherwise jabs only occur on sherds *P41* as deep semicircular depressions, and on the cordons of *P19* in the form of irregular triangular or round impressions. Applied cordons with finger-tip impressions are a feature of *P16*, and there are undecorated cordons on seven other pots, of which two cordons (*P22*, *P29*) are double. On some pots the cordons tend to break away, leaving faint scars on the surface (*P24*) or detached fragments (*P29*). As well as cordons, *P16* is decorated with two rows of perforations; a single row also survives on *P40*, and possibly *P9* should be included here. In all cases the perforations were made

before firing. Two vessels, *P42* and *P43*, have finger-nail decoration on the wall, and two examples of finger-tip nicks occur on detached cordons, *P30*.

The fragmentary state of the collection prevents appreciation of the more elaborate motifs which were evidently used beside the simpler decoration. The almost complete pot *P7* bears a rather disorganised overall decoration of horizontal chevrons executed with paired incised lines. Enough survives of the upper part of the smaller *P1* to show a neater and more elaborate design involving a diamond drawn in double lines above a zone of horizontal lines with the triangles between filled with jabs; other sherds with similar decoration may or may not belong to a lower register. The crudely drawn pattern on *P4* uses jabs to fill areas perhaps intended as horizontally elongated diamonds. Indications of patterns based on diamonds and/or triangles, or perhaps chevrons, are provided by *P2* and some of the wall sherds *P11* and *P16*. The neatly hatched decoration of *P12* is exceptional in the assemblage, and the largest sherd suggests that triangles were included in the design. The bold decoration of *P13* involved one or more zones of vertical chevrons with undecorated zones. Four pots have groups of incised lines below the rim, in the case of *P8* above a plain body, but in the case of *P2* (and possibly *P10* if this is part of *P11*) above other decoration.

Chevrons below the rim appear in relief on *P18* and *P19*, by applied cordons. The fragments of the two largest pots, *P24* and *P25*, bear horizontal cordons, in the case of the former at least two spaced out on the body with slanting or nearly vertical cordons approaching the base. Of the other pots bearing horizontal cordons, *P16* is noteworthy for its elaborate but careless decoration, with two (or more) heavy cordons below the rim decorated with finger or thumb impressions and a row of perforations above and between the cordons, and below these roughly incised slanting lines; detached sherds probably from this pot show a large-scale pattern of horizontal and slanting multiple lines perhaps forming triangles.

A feature of the assemblage is the high proportion of internally decorated rims. Incised lines were used on *P10*, wide grooves on *P1* and *P18*, incised lines with jabs on *P2* repeating the external decoration, stab-and-drag on *P38*. On others a fillet was applied, projecting boldly on *P6*, and divided into ribs by scored lines on *P23* with an appearance similar to the external decoration of *P22*, but in other cases giving the effect of a low moulding, double on *P27* and *P28*. Sherd *P39* bears three rows of cord impressions inside the thickened rim.

There is little difficulty in accepting the whole assemblage as grooved ware, for the forms of the pots, the range of sizes, the profile and internal decoration of the rims, and much of the external decoration, are all typical. There is considerable variation in the fabrics but none can be isolated, and the appearance of characteristic grooved ware decoration on large and small, coarse and fine, unifies the collection. The technical competence of the potters should not cause surprise, for most grooved ware is of good quality, and the extraordinarily heavy friable fabrics with very thick slips considered characteristic of the Orcadian sites have tended naturally enough to dominate the scene in Scotland: it should be remembered that even at Rinyo and Skara Brae well made smaller vessels do occur (Childe & Grant 1947, 34; Henshall 1979, 78 quoting verbal information kindly supplied by Dr D V Clarke).

The circumstances of the deposition of the pottery, and its condition, also point to its being a single assemblage, for, as explained (p 96) it all appears to belong to the first phase of activity on the site, immediately pre-dating the first structures.

A re-assessment of grooved ware has been undertaken by Wainwright and Longworth (1971), but as will be seen the Balfarg assemblage does not tally with any of the four styles they defined. In their publication is a list of Scottish grooved ware sites (1971, 300-6), to which may now be added two groups of sherds from significant contexts, in a henge monument at Stenness and a passage-grave at Quanterness, both in Orkney (Ritchie 1976, 20-5; Henshall 1979). In general simple rim profiles are normal, and linear decoration inside the rim, by incision, grooving or fillet, is diagnostic and widespread; the proportion of pots with such decoration is high at Balfarg. The techniques of grooved and incised decoration in groups of horizontal or slanting lines, and the use of double or multiple lines to outline a motif, are again characteristic features. External cordons are not so common in Scotland except in Orkney, but do appear at Luce Sands, Wigtownshire (McInnes 1964, 47-8). Jabs and impressions are not common at Balfarg, but once, or perhaps twice, are used in a characteristic manner to fill areas of a pattern.

Four decorative techniques each found only once at Balfarg, are unusual on N British grooved ware. On sherd *P2* there is the raised wavy line, giving a similar appearance to the fine cordons with opposed jabs which appear for instance on a single sherd at Tentsmuir, Fife, or Carnaby, Yorkshire (Longworth 1967, 78, no 5; Manby 1974, 27, no 10). Sherd *P3* has incised lines with a row of fine dots, paralleled at Tormore, Arran, on a small bowl (Henshall 1972, 181, 305, 372). On *P12* there is the use of deep close hatching for an area, probably a triangle, a common enough motif but here carried out in a

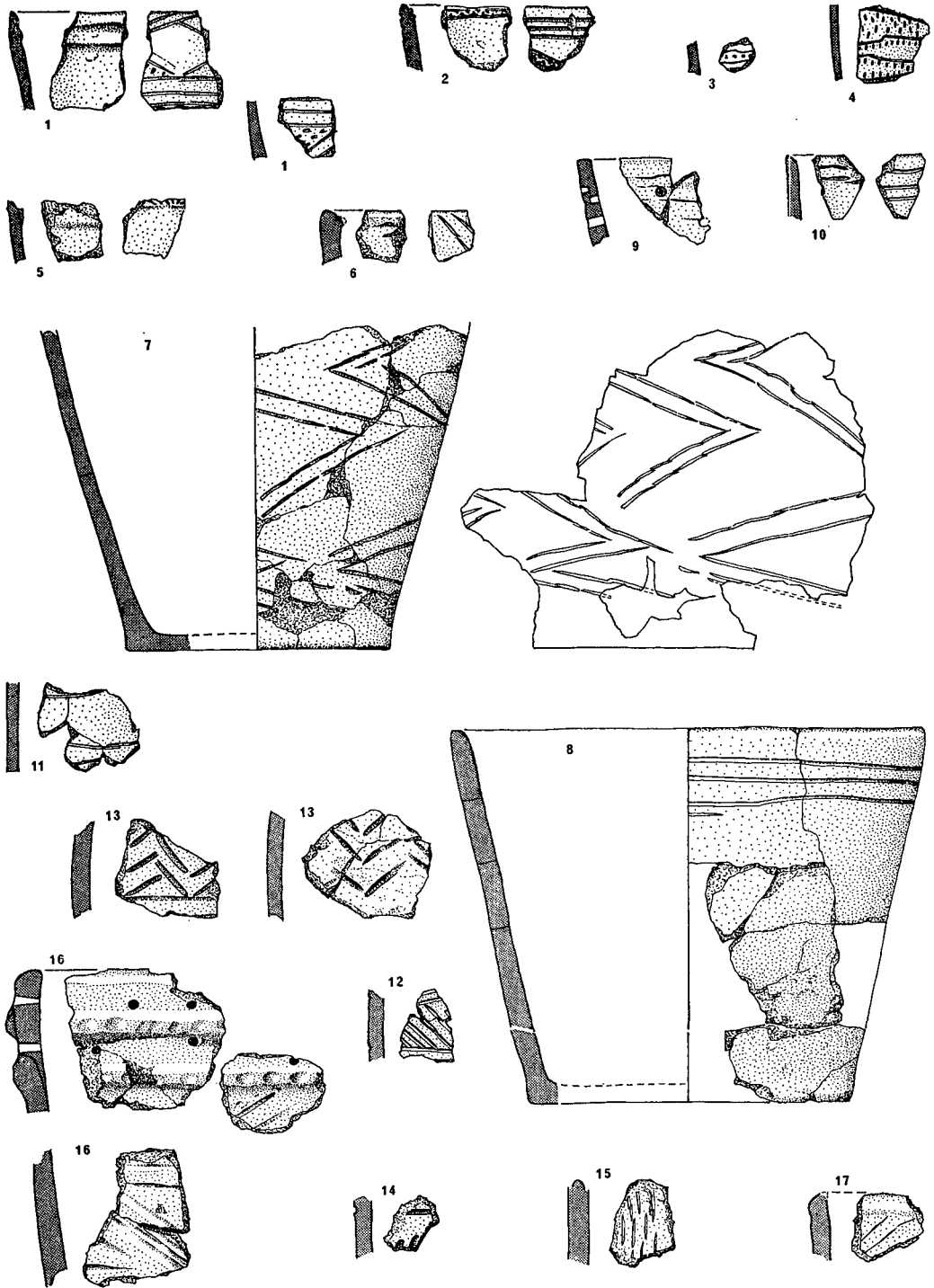


FIG 43 Grooved ware

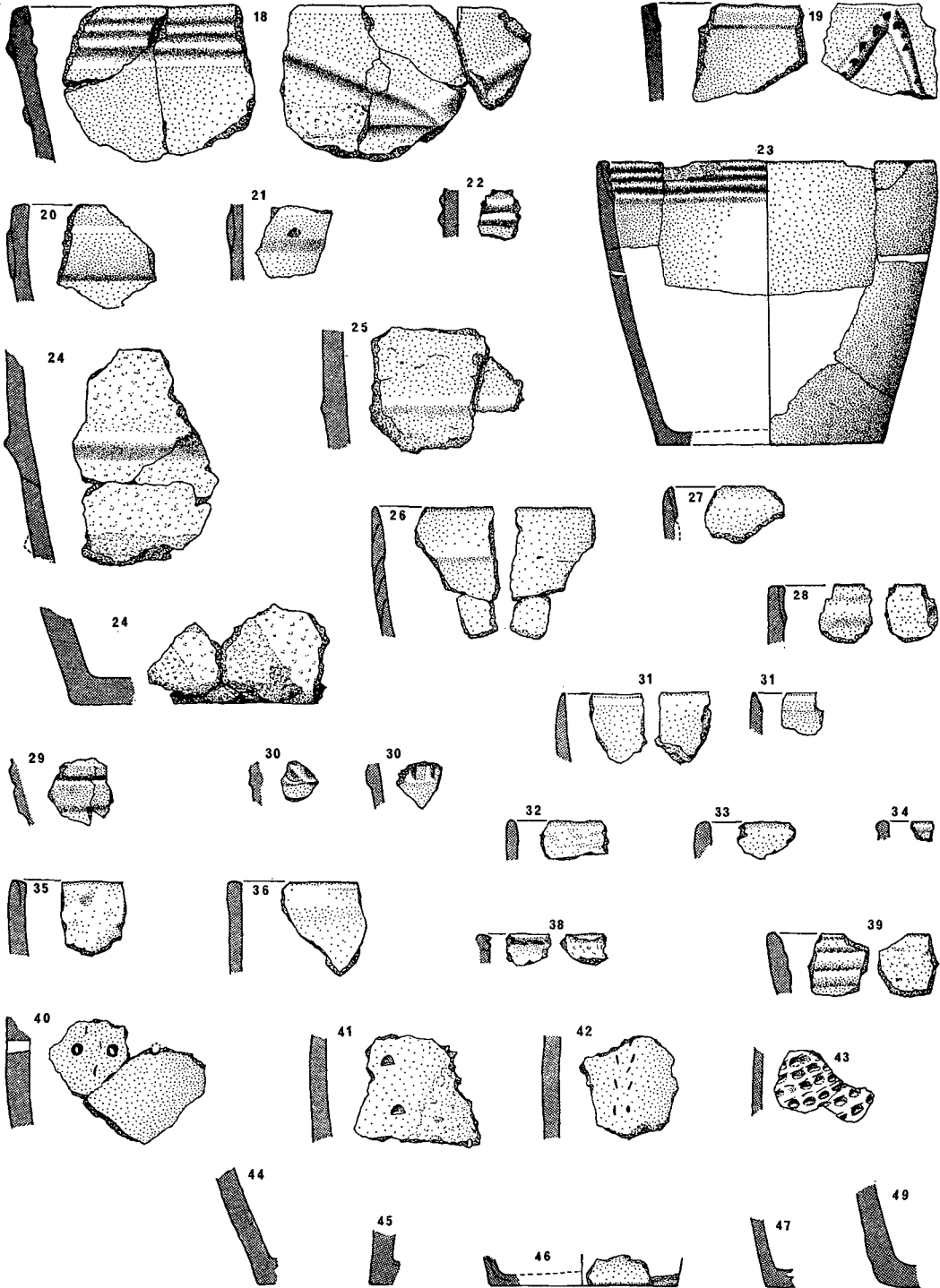


FIG 44 Grooved ware

manner reminiscent of Unstan ware in the N, or the Durrington Walls style of grooved ware in the S (Wainwright & Longworth 1971). The heavy cordons on *P16* with a row of thumb or finger impressions, and the rows of perforations, are distinctly rare (see comments below).

The single sherd with string impressions inside the rim might suggest beaker connections, as also the heavily nail-nicked rusticated sherd *P43*, except for the early date of the Balfarg assemblage. Both techniques appear as minor elements in grooved ware collections. A very similar rim for instance is in the collection of sherds from across the Firth of Forth at Archerfield, East Lothian (Curle 1908, fig 5, 1), where there is also rustication on fabrics indistinguishable from the undoubted grooved ware, as is also the nail-nicked sherd *P42* at Balfarg; both techniques can also be seen on the grooved ware from Luce Sands. The finger-nail nicking on cordons is less easy to parallel, but a somewhat similar treatment may be seen at Luce Sands. However the use of impressions on a cordon, as *P39*, is considered by Wainwright and Longworth to be a feature of the Rinyo style, and the Balfarg sherd recalls pot *1* from Quanterness with its impressed chevrons.

The geometric motifs, a diagnostic feature of grooved ware, are present at Balfarg, with evidence of chevrons, triangles and diamonds. The most elaborate pattern, on *P1*, utilising double lines to define diamonds and triangles with an infilling of jabs, may be compared with the well-known bowl from Unival, North Uist (Scott 1948, 26, pl 7) and, less closely, with sherds from Quanterness, Rinyo and Skara Brae (Childe & Grant 1939, 25, pl 22A). Vertical chevrons below the rim are in plastic decoration, though possibly some incised fragments could be of this motif. The unusual horizontal chevrons of *P7* are used, once, at Archerfield, East Lothian, and appear also in Yorkshire (Manby 1974, 74, no 11). The sherds of the large *P24* with spaced horizontal cordons have the appearance of a cordoned urn, except for the slanting or nearly vertical cordons at the wide base. The spaced horizontal cordons unassociated with other decoration are without parallel in grooved ware as far as the writer knows, but the vertical cordons and width of the base in relation to the diameter of the upper part indicating almost vertical walls, bring the pot indubitably into the grooved ware tradition, with a partial parallel at Skara Brae (Clarke 1976, fig 13.3), and parallels in Yorkshire (Manby 1974, 43–52) and many examples in the Durrington Walls style. A pot which is plain except for multiple incised lines below the rim is unusual, but the use of such lines on decorated pots is a common feature in all major Grooved Ware assemblages.

P16 is a curious vessel, of interest in combining several decorative techniques, and *P18* may be similar in this respect if sherd *P40* really belongs to it. Together these vessels provide partial parallels for a puzzling sherd from Tentsmuir, Fife (Longworth 1967, 78, fig 8,8). The thumb-impressed cordons allied with incised decoration on *P16* also recall the curious sherds from the passage-grave of Bargrennan, Kirkcudbrightshire (Piggott & Powell 1949, 151, 152; Henshall 1972, 307, nos 1–3, 447). The horizontal rows of perforations bring to mind the tub-shaped pot, undecorated except for a row of perforations below the rim, from Garrochar, Kirkcudbrightshire, and also a single rim sherd from Stevenston Sands and two rim sherds from Coalhill, both Ayrshire (Reid 1944; unpublished, BMC 347 and HH 337 in NMAS). The former contained a cremation. Two sites exposed in the sand-dunes at Walney Island, Lancashire, have produced similar pottery. It is undated: at one site the sherds were mixed with iron slag, but the report suggests a medieval bloomery had disturbed an earlier midden. A third site in the dunes has produced typical grooved ware sherds, and from the limited investigations the two pottery groups appear to have a discrete distribution (Barnes 1956, with other references).

Undecorated vessels must also be kept in mind, for at Balfarg, as at Skara Brae, Rinyo, and Quanterness, such pots form a considerable proportion of the assemblage. Considering the variety of fabrics at Balfarg, and lack of diagnostic features especially when the form is not apparent, the recognition of such sherds elsewhere is a problem. In particular the sherds from the stone circle at Croft Moraig, Perthshire (Piggott & Simpson 1971, 10–11), and some of the ring-cairns might well belong to this tradition, as tentatively suggested some time ago (Henshall 1972, 286).

The nearest site to Balfarg which has produced grooved ware is Balbirnie, Fife (Ritchie 1974, 15, 18–20). The two small sherds *29* published as grooved ware have incised decoration in two directions (the sherds now having been joined together). They came from a stone hole of the phase I circle. There is no exact parallel for this decoration at Balfarg, though something similar may have been present on *P12* and *P17*. However, looking at the other sherds from Balbirnie with the Balfarg assemblage in mind, it seems to the writer that some could well be classified as grooved ware, for instance the two rims of smallish undecorated pots *22* and *28*, and the similar rim *27* which has double rows of faint impressions on the outside, wall sherds *12* with narrow spaced cordons, and *14* with wide grooves, and perhaps also the two rim sherds *8* and *9* with incised decoration. All these are from the much disturbed phase 3 cairn.

However sherds of a number of undoubted cinerary urns are present, and the problem is to distinguish the two groups of ceramic. In his excavation report Ritchie has indicated the possible relationship between these two sites (1974, 8), and see also below p. 165.

Dr McInnes has suggested that one of the sherds from Cairnpapple, West Lothian, may also be grooved ware, its low knob and its fabric being comparable to certain grooved ware sherds from Luce Sands (McInnes 1964, 47). Another Scottish henge, Stenness in Orkney (Ritchie 1976, 20-1, 22-5), has produced grooved ware, though not closely similar to that from Balfarg. In England, of course, the association of grooved ware with certain henge monuments has long been apparent (Wainwright & Longworth 1971, 252.)

It is perhaps not surprising that the Balfarg assemblage does not fit neatly into any of the four styles defined by Wainwright and Longworth (1971, 236-43) on the basis of collections from the S of England and Orkney. The liking for horizontal decoration, internal lines below the rim, the use of impressions especially for filling areas, and finger-pinched decoration, all appear in the Clacton style, but heavy cordons are diagnostic of the Durrington Walls and Rinyo styles, and twisted cord and the hatching of areas is confined to the former. The complex plastic patterns, step-rims, scalloped rims, and grooved cordons of the Rinyo style are all absent at Balfarg, as are also the distinctive triple-line diamond motifs discussed by Ritchie (1976, 20-1).

Apart from the Orcadian sites, the grooved ware finds from Scotland are sparse, and are mainly casual finds or from eroding middens. In east-central Scotland there are sherds from Tentsmuir, Fife, and North Berwick, Archerfield and Hedderwick in E Lothian (Longworth 1967, 75-8, 90-1; Cree 1908, 271-7; Curle 1908; Stevenson 1946, 143). The few sherds from the first site exhibit similarities (multiple incised lines, internal rim grooves, geometric motifs, impressions, wavy relief line) and some differences (fine cordons, incised lines on the rim edge). The sherds from Archerfield provide closer parallels, (incised horizontal chevrons, cord impressions in grooves inside the rim of an apparently undecorated pot, multiple ribs both inside and outside, nail-pinching, and also similarities in the fabrics). Reasonably enough, local sub-styles may be expected to emerge when larger assemblages of material are available for study.

In the present state of knowledge regarding Scottish grooved ware, the Balfarg assemblage is of considerable importance in spite of its fragmentary condition, for it contains sherds of many more pots than any other site except for three in Orkney, and includes a wide range regarding size, fabric, and decoration. An assemblage coming from east-central Scotland is particularly welcome helping to counter-balance the Orcadian material and form a link with northern England and thus with the southern province of grooved ware, added to which is the significance of its context in an early phase of the development of a henge monument with four radio-carbon dates. These show that the Balfarg pottery is contemporary with that from Stenness and Quanterness, and with the middle phases of Skara Brae, whilst it is considerably earlier than that from the classic sites of Durrington Walls and Woodhenge. As already indicated, problems of identifying grooved ware, and of its relationships with other classes of Neolithic and earlier Bronze Age pottery, are again brought to our attention.

ACKNOWLEDGMENTS

My thanks are due to Dr J Close-Brooks, and Mr R B K Stevenson for contributing information contained within this report.

ASH

THE BEAKER (P50)

This vessel (fig 46; pl 7c) was located in upright position in front of the face and chest of the crouched inhumation present in a slab-covered pit within the henge at Balfarg (F.X1) It is of handled 'tankard'-like form, of extremely friable fabric and although located complete was much fractured. The fabric is heavily tempered with fine grits and displays a dark brown/black core with a dark brown surface on the interior and a mid-brown external surface to which a slip has apparently been applied. The construction of the vessel has clearly been upon a basal disc with building rings developed for the walls and the handle applied to the outer surface. The form of the vessel is simply cylindrical with a slightly raised (pinched out ?) cordon 30 mm below the rim. The handle springs with slightly expanded terminals from this cordon and

returns to the vessel 15 mm from the base, again with an expanded terminal. The cubic capacity of the vessel (to the brim) is 1.54 l (2.9 pints).

With the fabric still in 'green' condition decoration has been etched crudely on to the exterior surfaces using a pointed tool of some kind. The decoration consists of a horizontal zone of etching set above the cordon and below the plain rim of the vessel, 11 columnar metopes of etching which cover the body of the vessel and which are reflected in decoration upon the external surface of the handle, and a further horizontal zone defining the base of the wall. No decoration exists on the base of the vessel. The horizontal zone below the rim of the vessel consists of horizontal lines crossed by diagonal hatching running 'top right to bottom left' except for one shorter stretch (for about a quarter of the circumference of the vessel) where the hatching is 'top left to bottom right'. This scheme could be interpreted as the rapid work of a right-handed person who for the sake of speed did not wish to turn the vessel and completed the last quarter with his hand behind the vessel. The columnar metopes are approximately 90 mm high and range from 30–40 mm in width. The columns alternate between parallel sided and roughly lozenge-shaped metopes. They are firstly defined by 1–2 encircling lines and then the interior filled with crudely executed cross-hatching. The basal horizontal zone comprises horizontal etched lines crossed by diagonal hatching from 'top left to bottom right' and it may be supposed that the vessel was inverted in order to execute this decoration.

Handled beakers are, of course, a relatively rare phenomenon within the British Isles with only one other clearly defined and contexted example occurring in Scotland. This other example is that from Mains of Craichie, Dunnichen, Angus (Coumts 1971, 46, fig 83A) although the form here is quite different, resembling far more the handled bowls of bipartite form with horizontally zonal etched decoration particularly well known from Dorset. The Mains of Craichie vessel was however associated within a cist with a triple-riveted bronze dagger or slightly ogival form with omega-hilt, best paralleled by those of Gerloff's 'Eynsham Variant' of her Flat-riveted blade category (1975, 45). At Eynsham, Oxon, the dagger was associated with a beaker of Clarke's FP class (Clarke 1970, 43) – a plastic rusticated ware, usually roughened by finger pinching – and recognised by him as late in the British beaker sequence (equivalent to S4). Gerloff herself (1975, 47) following Piggott (1963, 86ff), would suggest broad contemporaneity for the dagger type with her Armorico-British phase of the Wessex Culture but accepts Clarke's suggestion that S4 beaker association would suggest, at least, overlap with the later phase of the Wessex Culture (characterised by Gerloff's Camerton-Snowhill dagger types). She in turn, points to the slight ogivality of the Eynsham daggers, replicated at the Mains of Craichie, and the distinctively lobed heel, also a feature at Craichie, that link this dagger type with those of the later phase of the Wessex Culture.

The only other handled beaker in Scotland would therefore, on the basis of typological comparison of its associated dagger with similar examples elsewhere in Britain, appear to relate to a period contemporary with the *floruit* of the Wessex Culture in the S, dated in terms of uncalibrated radiocarbon chronology 1650–1250 bc.

Clarke, reviewing the occurrence of handled beakers in Britain (1970, 245–53), showed them to be a phenomenon very predominantly confined to England S of the River Tees. Both by association and by integral decorative content Clarke shows them to be linked with his S1–S4 series of vessels while again on the grounds of ceramic association (the hybrid handled beaker from Bincombe, Dorset and the handled bowl from Winterbourne St Martin, Dorset, itself the closest available parallel to the Mains of Craichie vessel) he pointed to Wessex 2 parallels. In his developmental sequence 'tankard' or 'cylindrical' handled beakers were latest and in his view clearly to be linked with the Wessex 2 *floruit* (Clarke 1970, 252). He, in this context, draws attention to the radiocarbon date from the site at Cottage Field, Wattisfield, Suffolk from a deposit yielding handled beakers of 1570 ± 150 bc (BM-77). He argues that handled beakers were introduced during his W/MR 'influx' from the Rhineland with ultimate ancestry in Vučedol/Bell beaker alignments in Eastern Europe but also points to hypothetical wooden prototypes and the existence of handled cups executed in shale, amber and gold present in the Rhineland, the Low Countries and in Britain at a date equivalent to Reinecke's Bronze A2. Such cups are certainly present in Britain by the beginning of Wessex 2 to judge by the presence of a 'Hybrid Camerton-Snowhill' dagger with a handled shale cup in the burial at Farway Down Barrow 61 near Honiton, Devon (Gerloff 1975, 258). In view of the reservations felt by Lanting and van der Waals (1972) as to the invasive nature of 'W/MR' development in southern Britain we may prefer now to see handled beaker development as an insular response to the presence of such exotic cup-types, taking place at a date during the development of the Wessex Culture and contemporary with the later developed series of beakers in Britain represented by Clarke's S and N series and by Steps 4–7 of Lanting and van der Waals' view of British beaker chronology.

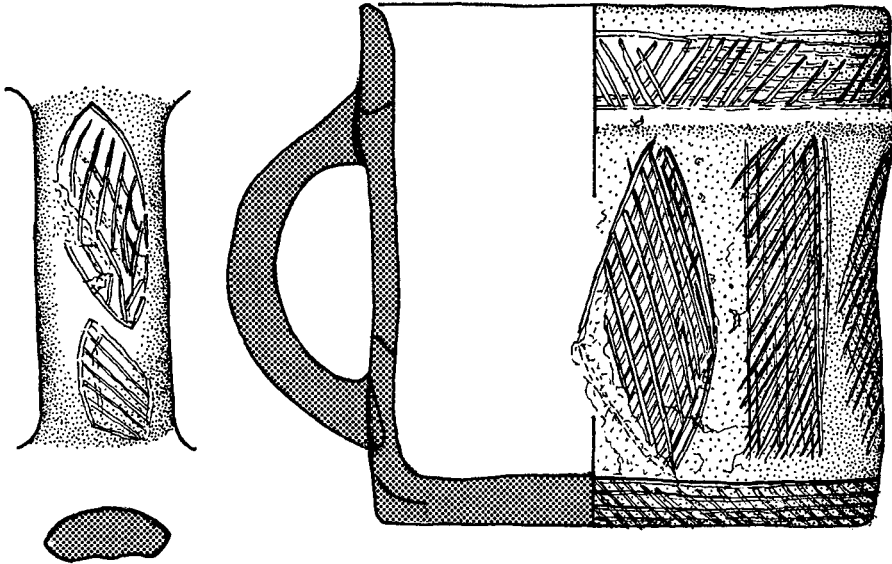


FIG 45 Handled beaker (scale 1:2)

Case (1977) places the handled tradition within his Late Phase, pointing again to the influence of early Bronze Age ceramics on the Continent which must clearly have stimulated the style and form of the exotic cups discussed above.

The closest actual parallel to the Balfarg beaker itself would appear to be that from Aldro Barrow 116, in the E Riding of Yorkshire which also displays the two defining narrow horizontal zones with columnar metopes occupying the body of the vessel. Its cylindrical form is also closely similar to that of the Balfarg vessel with the exception of the slightly omphaloid base, bevelled rim and basal decoration at Aldro which are not replicated in the Balfarg example. The Aldro example was published initially by Mortimer (1905, 54, fig 101) where it is described as occurring in a large rectangular grave, below the barrow, measuring '9 feet in diameter'. Within the grave were four inhumations. One, apparently only the upper half of the body of a small middle-aged individual, was accompanied by a small AOC beaker, a type which Case (1977) suggests has a very long life. A second inhumation of a youth of 10–12 years of age was apparently associated with a crushed beaker set in front of the face of the burial which Clarke (1970, corpus no 1216) assigns to his S1 style. The third inhumation also a youth of some 10–12 years was lying close to the handled beaker. A burnt unaccompanied burial lay almost directly beneath the third. No other associated goods were retrieved by Mortimer and it is necessary to assume that all four inhumations are contemporary if the ceramic association is to be accepted. The disturbed nature of the first burial and the clear stratigraphic superimposition revealed by the positions of the third and fourth may well indicate that this is not the case.

The weight of the evidence would appear to indicate that the beaker at Balfarg represents activity on the site at a date after 1500 bc (in terms of uncalibrated radiocarbon chronology). It is a type unusual in Scotland but with well-attested funerary associations in England which may reflect the influence upon a basal 'beaker using' stratum of new types of exotic vessel appearing in southern Britain during the latter stage of the early Bronze Age.

Two other handled vessels of the period are known to the writer from Scotland – one from Balmuick, Perthshire (Boston 1884) and the other from Cairnhill, Monquhitter, Aberdeenshire (Anderson 1902). Both are illustrated by Clarke (1970, fig nos 1081 & 1074) and both are classified by him as Food Vessels. The sharply bevelled rim and tripartite form of the latter example makes this relegation outwith the 'beaker' category understandable although in the former case the denial of beaker status does seem a little perverse. Clarke argues that the Balmuick vessel is 'a FV clearly based on the Rillaton metal type'. Neither find has any known associations although if the link with the Rillaton cup is accepted in the instance of the Balmuick vessel then the association of the former with a dagger of Gerloff's Type

Camerton or Snowhill (the fragment is insufficiently diagnostic to allow differentiation) would accord well with the typo-chronological horizon (Wessex 2) suggested for the date of the handled beaker form in Scotland.

The writer is indebted to Mr Trevor Cowie, NMAS, for assistance with tracing information on the Balmuick and Monquhitter beakers.

RJM

CATALOGUE OF SHERDS

The ware is usually mid to dark brown, fairly hard.

The excavation record numbers are given at the end of each entry, commas denoting joined sherds, semi-colons detached sherds assigned to the pot with reasonable confidence, the numbers of illustrated sherds given first. Uncontexted sherds (ie those located within plough soil or unassociated upon the subsoil surface are denoted U.) Contexted sherds are assigned their feature (F) numbers.

- P1* Six sherds including one from the rim, all apparently from one pot; decorated, on outside with wide incised lines and jabs, on inside of rim with two wide grooves. Rim diameter 150–180 mm (6–7 in). Sooty accretion outside. FX2/8; FA7/283; FA7/312; FA11/350; FA7/384.
- P2* Rim sherd, diameter about 150 mm (6 in); decorated, outside by boldly incised lines and a double row of alternating jabs, inside the rim by two incised lines, a double row of alternating jabs producing the effect of a raised wavy line. FA11/151.
- P3* Tiny wall sherd, rather gritty ware, decorated by deeply scored fine incised lines (two pairs surviving, with a row of jabs between. FA7/227.
- P4* Wall sherd, hard gritty ware with fine mica, diameter about 130 mm (5 in); decorated with irregular incised lines and jabs roughly arranged in horizontal rows. FA7/386.
- P5* Two wall sherds probably from just below the rim; decorated, outside with a slight horizontal ridge and above vestiges of nicks or ends of slanting incisions, inside with part of a wide applied cordon. FA6/443; FA6/431.
- P6* Rim sherd, rather heavily gritted, slipped surface inside and outside; from a large pot, the sherd having no detectable horizontal curve. Decorated, outside with firmly incised lines, and possibly a cordon 30 mm (1.2 in) below the rim as the lowest surviving point seems to be everted; inside the rim an applied cordon mainly broken away. Just possibly part of *P7*, the difference in fabric being due to scorching of the latter. FA7/337.
- P7* Sherds comprising about one third of a pot, but lacking the rim; also other sherds probably from this pot. The ware hard and pale grey except where burnt, heavily gritted including a proportion of large grits, some of quartz. Decoration by bold incised lines, sometimes elongated stab-and-drag. Sooty accretion in one area inside. At the top, and through the centre, broken along a building ring. On the rough surface of the base of one sherd are vague and coarse impressions, presumably from a mat or basket; in an area 185 by 40 mm (2.5 by 1.7 in) some lines about 4 mm (0.15 in) wide seem to radiate towards the edge but not from the estimated centre of the base, and other lines run roughly concentrically with the edge of the base. FX2/96, FX2/97, FX2/106, FX2/111, FX2/112, FA8/418; U2/78; FX2/98; FX2/115; FA11/148; FA11/189; FA7/196; FA11/299; U/405.
- P8* Sherds comprising nearly half a pot but lacking the base, dark brown to buff ware with external slip, scorched pink near the base, ring-built, black accretions inside and outside; decoration by boldly incised lines. U2/61, U2/78, FA11/146, FA11/147, FA11/158, FA11/173, FA11/183, FA11/188, FA7/198, FA11/212, FA11/302, FA11/306, FA11/320, FA11/326, FA11/327, FA11/328, FA11/331, FA11/332, FA11/333, FA11/350, FA11/356, FA11/362, FA11/371, FA11/392. Also a number of undecorated wall sherds likely to be from this pot, and four sherds from the basal angle possibly from this pot. U2/17; U2/66; U2/86; FA11/177; FA11/190; FA7/423; U2/37; U2/90; FA7/279; FA11/356.
- P9* Rim sherd similar to *P8* but much thinner ware, diameter 230–255 mm (9–10 in), partial perforations from both outside and inside before firing, and part surviving of a total perforation. Decorated with two irregular incised lines. Also wall sherds possibly from this pot, one with an incised line. FA11/244; U2/4; U2/99; FX2/106; U2/118.
- P10* Five small rim sherds from a pot with a large diameter in proportion to the thin walls; decorated, outside by three boldly incised lines, inside by two deep but irregular lines. U2/83; FA11/135; FA11/242; FA11/299.

- P11* Twenty wall sherds from two or more pots similar to *P9* and *P10* (some possibly from *P10*, mostly thinner ware than *P9*); all decorated with incised lines, in most cases seemingly running horizontally, on the larger sherds in groups of two or three. On the sherd illustrated irregular deeply scored lines slanting as well as horizontal (at the top and lower right edges as illustrated the sherd has broken along incised lines); diameter 180–200 mm (7–8 in); comparison of diameter and wall thickness shows this is not part of either *P9* or *P10*. FA11/327, FA11/357, FA11/366; U2/59; U2/99; FA11/150; FA11/164; FA11/178; FA11/194; FA7/288; FA11/299; FA11/302; FA11/327; FA7/346; FA11/350; FA11/367; FA11/372; FA7/380; FA11/398; FA11/399.
- P12* Five wall sherds from the same distinctive pot, pale grey rather friable heavily gritted ware, diameter about 150 mm (6 in); decoration by wide deep carefully drawn incised lines. FX2/115, FX2/408.
- P13* Eight wall sherds probably from one pot, diameter about 280 mm (11 in), brown-black ware (some sherds burnt pink outside), slip on outer surface and on inner surface which is notably smooth. Decoration by wide roughly executed incised lines certainly or probably in chevrons except one large sherd which is plain below a horizontal line. Some sherds with sooty accretion inside. U2/65; U2/120; U2/23; U2/25; U2/68; U2/72; U2/121; FA11/258.
- P14* Wall sherd, slipped surface, decorated with wide deeply incised lines. FA8/419.
- P15* Wall sherd from a large pot with no detectable horizontal curve, the dark grey ware heavily tempered with fine grits, a thick pink slip on both surfaces, broken along a building ring. Decorated with vertical incised lines. FA7/381.
- P16* Five sherds from the rim and body of a large pot, 305 mm (12 in) or more in diameter at the mouth, hard ware with large grits, a slip on outer surface, the inner surface flaked away near the rim, ring building detectable. Decoration by two (or more) applied cordons bearing thumb or fingertip impressions, a row of perforations above and between them, and below them lightly incised wide lines in groups (? of three) both horizontal and slanting. Some sooty accretion outside. FA11/239; U2/82; U2/3, U2/80; U2/95; FA11/370. Also seven burnt wall sherds with incised lines possibly from this pot. U2/38; U2/85; FA11/169; FA11/400; FA12/420.
- P17* Rim sherd (but lacking the edge on the inner upper side of the bevel), decorated by fine incised lines. FA7/268.
- P18* Rim sherd and wall sherd from a large pot, rim diameter 355–380 mm (14–15 in), slip on inner and outer surfaces, the wall sherd scorched pink; decoration by applied cordons. Some sooty accretion outside. (See also *P40*). U2/1, U2/36, U2/88; U2/94.
- P19* Rim sherd, diameter about 305 mm (12 in), dark brown but scorched red-grey inside; decorated, outside by applied cordons bearing jabs, inside by a cordon lining the rim; black accretions outside. Also a small undecorated rim sherd, and a wall sherd with similar cordon, both probably from this pot. (See also *P22*). FA11/359; FA6/433; U2/81.
- P20* Rim sherd, diameter 255–280 mm (10–11 in), scorched pink inside, decorated by a wide applied cordon below the rim, black accretion outside. FA7/199.
- P21* Wall sherd with cordon, similar to *P20* but cordon narrower, ware thinner and more gritty with fine temper; the cordon bears the impression of a large ? seed. U2/22.
- P22* Two small wall sherds, decorated by an applied band formed into two ribs. The ware similar to *P19*, possibly the same pot. FA7/335.
- P23* Sherds from the rim and upper part of a pot, decorated inside the rim by an applied strip formed into four ribs by deep wide incised lines; also sherds from the base and lower wall, and unattached wall sherds almost certainly from the same pot. One building ring detectable. Black accretion outside both main pieces. FA11/245, FA11/305, FA11/350; FA11/236, FA11/394; U2/48; U2/55; FA11/176; FA11/186; FA11/241; FA7/279; FA7/280; FA11/369; FA7/379; FA7/388; FA7/390.
- P24* Many wall sherds and sherds from the base, apparently all from one large vessel with a distinctive ware, the internal diameter of the body 355–380 mm (14–15 in), the external diameter of the base 255–280 mm (10–11 in). The ware is brown-dark grey but scorched in places, often breaking along building rings, fairly hard and heavily gritted, with slipped surfaces, the notable feature being the outer surface where smallish grits project below the slip or break its surface giving a crisp uneven finish. Decoration by applied cordons which tend to break away, at least two horizontal cordons on the body, and one small worn wall sherd appears to bear cordons in two directions, the lower wall sherds bear faint scars of slightly slanting or vertical cordons running up from the base.

- FA13/247, FA13/248, FA13/348; U2/38, U2/39; U2/18, U2/69, U2/93, U2/102, U2/105; U2/24; U2/35; U2/45; U2/46; U2/47; U2/58; U2/67; U2/71; U2/74; U2/84; FA11/365.
- P25* Two wall sherds from a very large pot, scorched buff-pink, slipped surfaces; a slight cordon on each sherd, black accretion inside one. FA7/221; FA11/238.
- P26* Rim sherd, slip on both surfaces, ring-built, diameter about 180–200 mm (7–8 in); a slight thickening inside the rim. FA11/325.
- P27* Rim sherd, similar ware and size, an applied strip forming the inside of the rim below which the surface is rough as if another strip had broken away. FA11/299.
- P28* Rim sherd, pink slip on outside and rim edge, an applied strip inside the rim forming two slight and irregular cordons. FA11/233.
- P29* Two fragments of applied decoration broken away from the exterior of a large pot. FA7/217; FA7/345.
- P30* Ten small wall sherds probably from several pots, all with fragments of applied decoration; the two illustrated have cordons with impressions made by pinching between paired nails and by finger-tips. FA11/142; FA11/257; FA11/299; FA11/350; FA11/376; FA6/424.
- P31* Four rim sherds probably from the same pot, diameter 130–150 mm (5–6 in), the largest sherd scorched pink inside, black accretion outside. The rim has been thinned by cutting away the inner surface leaving faint bevels. FA6/437; FA11/299; FA11/350; FA6/433.
- P32* Rim sherd, hard grey ware with uneven surface, diameter 140 mm (5½ in). U2/62.
- P33* Two rim sherds possibly from the same pot, heavily gritted ware, one scorched pink inside, black accretion outside. FA11/350; FA7/266.
- P34* Tiny rim sherd. Also another rim sherd, scorched to a pale grey surface, possibly from this pot. FA7/293; FA11/350.
- P35* Rim sherd from a large pot, hard black ware with relatively small grits, rather rough uneven surface, slight scorching inside, black accretion outside (a hollow below the rim probably accidental). FA6/401.
- P36* Rim sherd, diameter about 180 mm (7 in), hard dark grey ware with harsh surface, a slight hollow below the rim gives a vaguely collared profile. Also a small rim sherd, and a wall sherd with a hint of the collared profile, both probably from this pot. U2/19; FA7/216; U2/70. Also a number of wall sherds of the same distinctive ware, some probably from this pot, but some seemingly from a larger vessel. U2/63; U2/64; U2/76; FA7/215; FA7/256; FA7/272; FA7/314; FA7/382; FA7/390; FA11/395.
- P37* Wall sherd lacking outer surface, the inner surface bevelled at one corner evidently from an internally bevelled rim; soft pinkish ware, slipped surface, ? scorched. FA7/338. Not illustrated.
- P38* Rim sherd, buff ware, slipped surfaces but most of outer surface missing; inside the rim a row of stab-and-drag (looking rather like a cord-impression). Also another small rim sherd possibly from this pot. FX2/110; FA11/299.
- P39* Rim sherd, the inner surface worn, the rim thickened on the inside and bearing two lines of cord impressions (possibly another line immediately below the rim). Also a small wall sherd possibly from just below the rim of this pot. FA11/176; U2/5.
- P40* Wall sherd from a large pot, heavily gritted, slip outside, ware similar to *P18* and perhaps part of the same pot; a row of perforations made from the outside, a faint nail impression (perhaps accidental). Black accretion outside. FA11/240.
- P41* Three wall sherds, internal diameter 200 mm (8 in), slipped surfaces, all scorched; all decorated with widely spaced deep semi-circular impressions. FA7/373; FA7/220; FA7/278.
- P42* Wall sherd, internal diameter about 150 mm (6 in), the outer surface slipped; decorated with light paired nail nicks. U2/73.
- P43* Three wall sherds, hard black ware with only fine grits, pale grey outside (probably scorched), dark grey inside, internal diameter 150 mm (6 in), broken along building rings; decorated with deep finger-nail impressions with a faint nick above each, arranged seemingly in slanting rows. FX2/108.
- P44* Sherd from the lower wall and basal angle, ware distinguished by being heavily gritted with small sharp grits, scorched outside, base diameter about 330 mm (13 in). FA7/387.
- P45* Sherd from lower wall and basal angle, slip outside, horizontal striations inside, base diameter 305–330 mm (12–13 in). FA7/216.

- P46* Piece of flat base, and sherds from the basal angle, slip outside and inside, probably all from one pot, base diameter 115 mm ($4\frac{1}{2}$ in). FA7/315; FA7/339; FA11/156; FA6/430.
- P47* Sherd from the lower wall and basal angle, heavily tempered with small grits, slip outside, base diameter 180–200 mm (7–8 in); also another base sherd and three wall sherds possibly from this pot. FA7/271; FA11/156; FA11/238; FA7/342; FA7/390.
- P48* Two sherds from the base, ware similar to *P47* but a larger thicker vessel, outer surface of wall and basal angle missing. FA11/350; FA11/368. Not illustrated.
- P49* Sherd from the lower wall and basal angle, black accretion inside. FA11/304.
- P50* Handled beaker, found crushed but now restored, of very friable ware heavily tempered with fine grits including mica and quartz, black core, a mid-brown slip outside, dark brown rougher surface inside with two hollows where inclusions have burnt out (the largest 2 mm long); much of the lower surface of the base has crumbled away. Two building-ring joints can be detected in the walls, and the junction between handle and wall, and wall and base is clear. Roughly incised decoration. FX1/230.

SECTION 4

THE POLLEN EVIDENCE

Dr Graeme Whittington

The infill of the ditch was sampled at 50 mm intervals at three separate locations. Only in ditch cutting G–H at a depth of 0.90 m within layer 4 was there found to be any countable concentration of pollen grains. At that level, the location of a buried soil, the pollen evidence suggests that the site was under grassland. Hazel and alder were also present, the latter probably associated with the many wet hollows in this glacial dumping ground. All the pollen was badly damaged, suggesting that the soil in which it occurred remained uncovered by further infill for a considerable period.

SECTION 5

FRAGMENTS OF CALCINED BONE

Mary Harman

Small fragments of calcined bone were found in five features. Most of the pieces were soft and worn at the edges and none was larger in any dimension than 17 mm; while it was possible to say that some of the fragments were parts of diaphyses from mammals of the size of a sheep or larger, none was specifically identifiable, though two small fragments, possibly part of the petrous temporal bone, found in the Main Timber Circle FA11 might be so.

Features X2, A6, S3, A11 and A7 contained the following numbers of fragments (weights in brackets) respectively: 60–80 (8 gm), 2 (2 gm), about 30 (3 gm), 135–165 (24 gm) and about 20 (2 gm). All included pieces of diaphysis except for the fragments from feature A7.

SECTION 6

THE DENTITION FROM THE SLAB COVERED BURIAL PIT (FX1).

Dorothy A Lunt

When the specimen was received, the teeth of the maxillary left quadrant were visible on the surface of the mass of soil. In the anterior region, some small pieces of alveolar bone had survived and the teeth here appeared to be still in their correct positions. The first and second molars had obviously become dislodged and had been replaced. The third molar however seemed to be in its original position, and was placed at a higher level than the other teeth; ie it had been unerupted at death. Although the roots of these teeth had suffered from *post-mortem* damage due to soil conditions, they were fairly well preserved.

The left mandibular teeth were found scattered in the soil at a lower level than the maxillary teeth and were not in their original positions. The canine, second deciduous molar, and all three permanent molars were recovered. There had been almost total post-mortem soil destruction of the roots of these teeth and only the enamel caps of the crowns had survived. Anterior to the canine there was a mass of shattered fragments of incisor crowns. Both upper and lower incisors could be recognised, but individual teeth could not be reconstructed.

The loose teeth were removed and the maxillary alveolar fragments were consolidated with PVA before removal. At a deeper level in the soil mass, the canines and premolars from the right side of both jaws were found, not in their correct relative positions. Still lower in the soil mass, the first and second permanent right molars of both jaws were uncovered, still in occlusion with one another. Both third molars were found to be lying in positions which indicated they had been unerupted at death. The roots of all the teeth on the right side had completely disappeared due to post-mortem soil action.

Apart from the incisors and the mandibular left premolars, the dentition is complete: it may be charted as follows:

R	L
876543	2345678
876543	3 E678

As the permanent molars on the right side were still in their original positions, it was possible to observe that the second molars had erupted fully into the functional position. The root of the maxillary left second molar is partially preserved and appears to be fairly complete though it is not possible to say whether the final stages of formation of the apex had occurred.

All four third molars were unerupted. Sometimes the third molars remain embedded in the jaws throughout life, but in this case the evidence suggests that the teeth were still developing. The crowns have a slightly brownish colour which indicates that the enamel is not yet fully mature. In the presence of severe *post-mortem* destruction of tooth roots it is difficult to be certain exactly how far the development of these teeth had proceeded, but in the maxillary left quadrant, where roots were best preserved, it appeared that little or none of the root had yet formed.

The evidence from the stage of development of the second and third molars suggests that the most probable age at death was c 14–18 years (assuming development was normal and progressing at a rate comparable to that seen nowadays).

The very slight degree of attrition of the functional teeth supports this age estimate. Both from the stage of attrition and the probable stage of development of the third molars, it would seem that age at death may well have been at the earlier rather than the later end of the suggested age range.

The teeth are large, well-formed and well-calcified: there is no evidence of hypoplasia. Nor is there any evidence of dental caries.

The presence of the mandibular left second deciduous molar, obviously still in function, is unexpected. There are two possible explanations: (a) the second premolar, which should have replaced it, had failed to develop. This tooth is sometimes congenitally absent; (b) the second premolar had developed but had failed to erupt and was lying in an abnormal position, embedded in the jaw. As the bone has not survived and both mandibular left premolars are missing, it is impossible to discover which solution is correct.

ADDENDUM

Recently, a method for sexing individuals using canine tooth measurements has been developed by Scilli *et al* (1977). Their study was based on prehistoric Amerindian material from the Ohio valley, and the linear discriminant function which was calculated refers *only* to this population. Using it, they calculated sex with a 20.6% probability of classification error.

Scilli and co-workers point out that the magnitude and pattern of sexual dimorphism in the canines *may* be the same in other human populations as in the prehistoric Amerindian, and *if* that is the case the results they present may be taken as the general case for sex discrimination based on canine size. Although this has in no way been established, or even tested, it seemed that it might be interesting to apply the published linear discriminant function in the case of the Balfarg individual.

The results are as follows:

Linear discriminant function L

Average value Amerindian males	31.8644
Average value Amerindian females	29.1875
Value separating sexes	30.5259

(values above this classified as male, below as female)

Value for Balfarg individual	31.0366
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However, a similar linear discriminant function based on adequate numbers of clearly sexed Scottish Bronze Age skulls would be required before sex may be assessed with confidence.

SECTION 7

STATISTICAL ASSESSMENT OF THE EVIDENCE FOR CIRCULAR ARRANGEMENTS OF THE SOIL FEATURES

J P Brock and D A Williams

Introduction

The large number of undifferentiated features discovered during the Balfarg excavations presents innumerable problems of analysis. It is thought that, for the most part, purely subjective interpretations of this archaeological data can be of little value as any type of structure desired – from circular to rectilinear – can be created through the simple connection of features. The analysis presented here determines the statistical significance of circular associations of features centred on known points of archaeological importance.

It is hypothesised that if structures existed at one time aside from the archaeologically discernable circle (circle A), their most likely form would be circular. This argument is based on two different forms of archaeological evidence. First, circle A from Balfarg is as near to exact circularity as one might expect Neolithic builders to achieve. Second, similar structures at monuments such as Durrington Walls, Wiltshire (Wainwright & Longworth 1971); Mount Pleasant, Dorset (Wainwright 1979); and the 'Sanctuary', Dorset (Cunnington 1931) are not only circular, they have a number of circles radiating from approximately the same centre points.

Description of data

The following three points in the interior of Balfarg Henge were chosen for examination:

- 1 The centre point of circle A, which was accurately located using the 'least squares' method suggested by Atkinson (1971, 355–8).
- 2 The estimated centre point of the beaker cist inhumation.
- 3 The centre point of a putative stone circle, the remains of which consist of an arc of five large features (numbers S1, S2, S3, S4, and S5). Atkinson's method was again employed.

From each of these centre points concentric circles were drawn at regular interval radii and the number of features intersected by the circumference counted. Radii at 0.25 m intervals were used for the circle A centre point, the other two points being tested at 0.50 m intervals. The circumferences were then corrected to allow for the unexcavated baulks and the erosion in the south-western area of the site at the limits of the natural gully. The number of features intersected by each circle can be divided by the corrected circumference to give the mean number of features intersected per metre of circumference. These means are shown in figures 46 and 47.

The apparent upper peaks in these results encourage examination as to how far they might have deviated from expected values. To pursue this, control data were generated comprising counts of features intersected by nests of circles of radii 2.5, 5.0, 7.5, . . . , 30.0 metres, centred at 20 randomly selected points. The means and the standard deviations for the different radii of these control data are shown in figure 45 plotted against the data for the centre point of circle A.

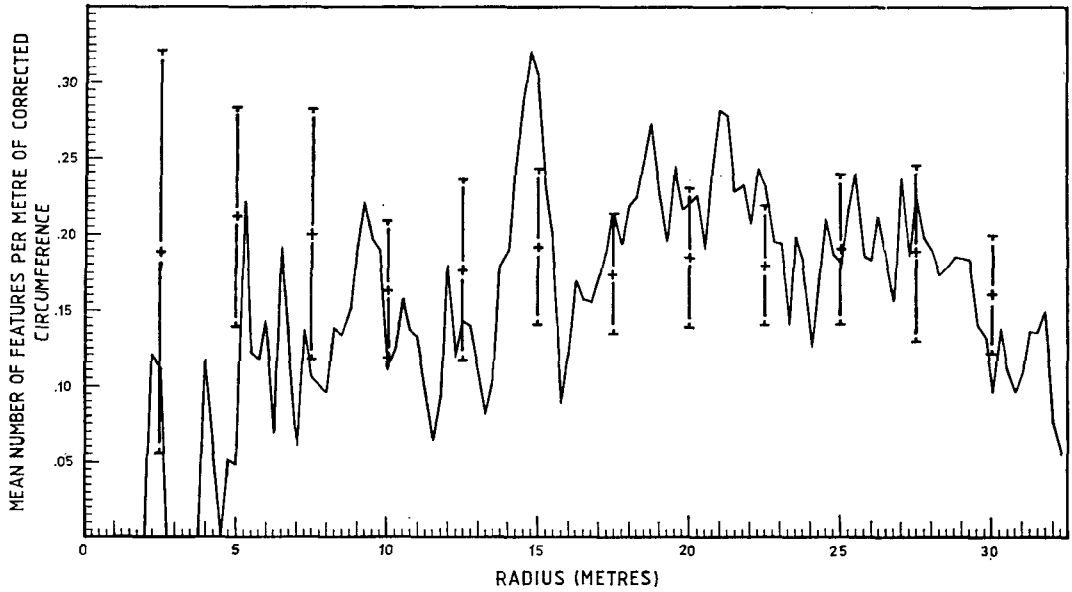


FIG 46 Data for centre point of circle A plotted against means and standard deviations of control data

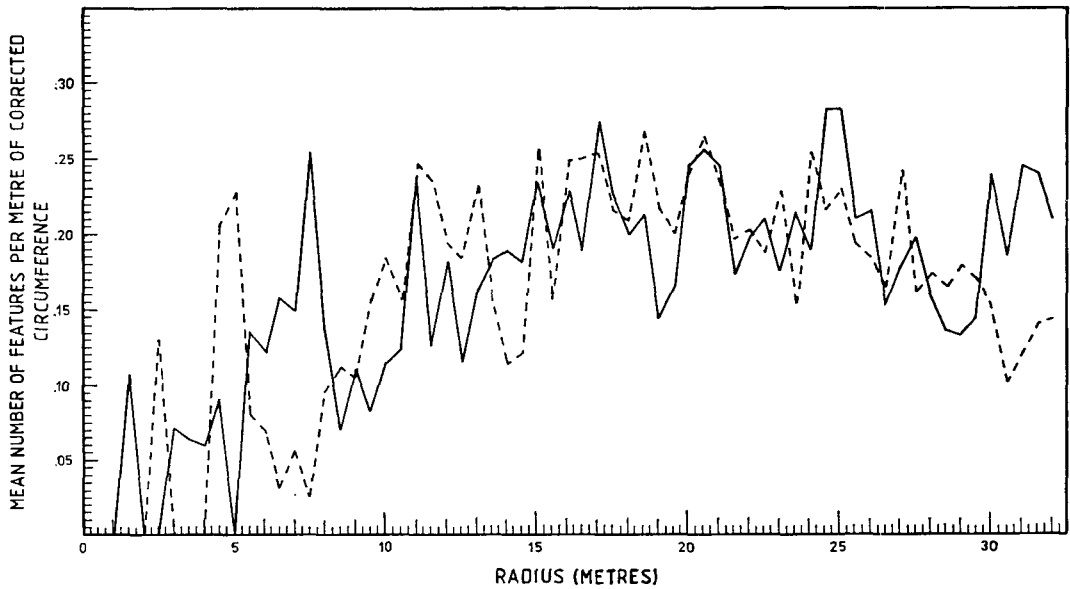


FIG 47 Data for centre points of beaker cist inhumation (solid line) and putative stone circle (broken line)

The data described above from the selected and random centre points are stored in the archive with the other excavation material.

Analysis of the control data

The model fitted assumes that the number of features intersected by a circle is a Poisson variable with a mean proportional to the corrected circumference of the circle. The estimated relationship is:

$$\text{Expected number of features} = 0.1823 \times (\text{corrected circumference}).$$

The standard error of the estimate 0.1823 is 0.0033. The deviance about the model is 264.9 with 239 degrees of freedom, the Pearson chi-squared statistic is 257.3. These indicate that the fit of the model is satisfactory.

The possibility that the expected number of features may depend additionally on the radius of the circle or the position of the centre point was investigated. There is no evidence for any such relationships.

The purpose of obtaining and analysing these control data is to establish how many features have to be intersected by a circle before the result can be regarded as indicative of a constructed circle rather than a random arrangement. The appropriate statistical measure of the difference between the observed and expected number of features of a circle is the standardised difference. This is defined as $(\text{Observed} - \text{Expected}) / \sqrt{\text{Expected}}$, and is approximately a standard Normal variable. The five circles with highest standardised difference are noted in Table 8.

TABLE 8

Control data circles with highest standardised difference.

Centre point number	Radius	Corrected circumference	Expected no of features	Observed number	Standardised difference
19	7.5	37.57	6.85	15	3.11
4	20.0	116.24	21.19	35	3.00
14	15.0	86.00	15.68	27	2.86
12	2.5	11.69	2.13	6	2.65
9	15.0	85.87	15.65	25	2.36

The probability that the largest of 260 independent Normal variables exceeds 3.10 is greater than 0.2, so these extreme values cannot be regarded as exceptional.

Analysis of data from centre point of circle A

Applying the relationship estimated above the standardised differences were calculated for the circles concentric with circle A. The observations with large standardised differences are shown in table 9:

TABLE 9

Circles with highest standardised differences concentric with circle A.

Radius	Corrected circumference	Expected no of features	Observed number	Standardised difference
1 14.5	82.81	15.10	24	2.29
2 14.75	84.38	15.38	27	2.96
3 15.00	85.95	15.67	26	2.61
4 18.75	109.71	20.00	30	2.24
5 21.00	123.95	22.60	35	2.61
6 21.25	125.52	22.88	35	2.53

Circles 1, 2, and 3 correspond to circle A. Even so their standardised difference is less extreme than that of two of the control observations.

The question to be answered is whether circles 5 and 6 are significant evidence in favour of a second constructed circle. It must be borne in mind that circles differing in radius by less than a metre can intersect common features and their counts cannot be assumed to be independent. In effect there are

about 30 independent observations. The probability of obtaining a standardised difference as great as 2.60 is approximately 0.005, but attention has been drawn to circles 5 and 6 because they have the most extreme values. The probability that the largest of 30 independent Normal variables is greater than 2.60 is approximately 0.13. It is this probability that should, it is suggested, be used as the significance level of the evidence in favour of the existence of a second constructed circle. The weight of the evidence cannot therefore be regarded, on statistical grounds alone, as being very strong.

Analysis of data from centre of beaker cist inhumation and centre of putative stone circle

There is only one extreme case from these two centre points which arises with the beaker cist inhumation as centre. This is shown in table 10:

TABLE 10

Circles with highest standardised differences concentric with the beaker cist inhumation.

Radius	Corrected circumference	Expected no of features	Observed number	Standardised difference
24.5	145.64	26.55	41	2.80
25.0	148.78	27.12	42	2.86

Again assuming that this represents the maximum of a sample of 30 independent Normal variables the probability of obtaining a value greater than 2.80 is approximately 0.07. This level of significance is not convincing evidence in favour of a constructed circle of radius approximately 25 metres, but it does suggest that this possibility should be considered.

Discussion

It is clear from the above that there are no independent statistical grounds for identifying any circles concentric with the tested centre points aside from circle A. There are, however, two circles that might be acceptable provided archaeological evidence exists to support them. The first circle (circle B), concentric with circle A and having a radius of approximately 21 metres, corresponds well with the distribution of stones on the subsoil of the monument (see main report, fig 38). This indicates a probable palisade-type structure and lends quite strong support for the acceptance of the circle. The other circle, centred on the beaker cist inhumation, is lacking in supportive archaeological evidence and can therefore be rejected.

SECTION 8

CHARCOAL IDENTIFICATION OF RADIOCARBON SAMPLES AND THE RESULTS OF RADIOCARBON ASSAYS UNDERTAKEN UPON THESE SAMPLES

Charcoal Identifications by Camilla Dickson, Dept of Botany, University of Glasgow
Radiocarbon Dating by Michael J Stenhouse, Dept of Chemistry, University of Glasgow

Sample 1. Main timber circle feature A11. Sample from base of feature of block charcoal incorporated within back-filling.

Identification *Quercus* c 115 gm (wet weight). Timber over 20 cm diameter.
Salix c 0.7 gm (wet weight)
Alnus c 0.4 gm (wet weight)
? coal (one piece) c 0.5 gm (removed from sample)
Unidentified charcoal 46 gm.

Radiocarbon Assay. Error is expressed at the $\pm 1\sigma$ level of confidence.

GU-1163 4315 \pm 60 bp
 $\delta^{13}\text{C} = -24.8\text{‰}$
= 2465 \pm 60 bc.

Sample 2. Main timber circle feature A7. Sample from base of feature of charcoal incorporated within backfilling.

Identification *Alnus* c 18 gm (wet weight). Timber over 20 cm diameter.
Salix c 0.5 gm (wet weight)
Corylus c 0.1 gm (wet weight)
Quercus < 0.1 gm (wet weight)
 Unidentified charcoal c 27.6 gm.

Radiocarbon Assay. Error is expressed at the $\pm 1\sigma$ level of confidence.

GU-1160 4180 \pm 50 bp
 $\delta^{13}\text{C} = -25.5\text{‰}$
 = 2230 \pm 50 bc.

Sample 3. Main timber circle feature A11. Sample from within filling of feature. Charcoal probably incorporated within backfilling.

Identification *Alnus* c 32 gm (wet weight). Over 20 cm diameter.
Salix c 4.2 gm (wet weight)
Corylus c 3.0 gm (wet weight)
Quercus c 1.7 gm (wet weight)
 Unidentified charcoal c 48 gm.

Radiocarbon Assay. Error is expressed at the $\pm 1\sigma$ level of confidence.

GU-1161 4035 \pm 50 bp
 $\delta^{13}\text{C} = -25.8\text{‰}$
 = 2085 \pm 50 bc.

Sample 4. Main timber circle feature A11. Sample from within filling of feature. Charcoal probably incorporated within backfilling.

Identification *Quercus* c 20.5 gm (wet weight). Timber over 20 cm in diameter.
cf Quercus c 3.6 gm (wet weight)
salix c 1.3 gm. (wet weight)
Alnus c 1.0 gm (wet weight)
 Unidentified charcoal c 9 gm.

Radiocarbon Assay. Error is expressed at the $\pm 1\sigma$ level of confidence.

GU-1162 4270 \pm 60 bp
 $\delta^{13}\text{C} = -24.3\text{‰}$
 = 2320 \pm 60 bc.

Mrs Dickson notes that much of the charcoal appears to be in fresh unabraded condition and Dr Stenhouse adds

'the wood dated in each case was:

GU-1160 *Alnus*
 GU-1161 *Alnus*
 GU-1162 *Quercus*
 GU-1163 *Quercus*

Thus any combination of C-14 dates should be done on specific types, viz

GU-1160 & GU-1161 4108 \pm 35 bp (2158 \pm 35 bc) *Alnus*
 GU-1162 & GU-1163 4293 \pm 42 bp (2343 \pm 42 bc) *Quercus*

On the basis of the individual results and the above combinations, further combination is not warranted. Presumably, the younger of the above combinations, ie 4108 \pm 35 is more representative of the date of occupation of the site, but not necessarily so, since the difference in date may reflect the differing life span of the timbers represented.'

SECTION 9

THE PHOSPHATE SURVEY

C F E Pare and L D Nebelsick

A phosphate survey was undertaken during the 1978 excavation, taking advantage of the trowelled subsoil and prepared sections of the W half of the henge (fig 48). The distribution of phosphates on the cleaned surface was mapped by taking 146 samples on a grid with 5 m intervals (exhibiting a range of values from 0.11–1.44 gm phosphate/kg soil) designed to detect phosphate distribution patterns, which could be used in interpreting prehistoric henge use. A further 64 samples were taken from soil profiles both within and outside the henge, in an attempt to detect contamination of the subsoil by post-henge activity. The laboratory method was tested by performing 10 analyses of one sample, the resulting standard deviation of 0.055 gm phosphate/kg soil testifies to the accuracy of the chemical method. Further samples were analysed from 165 randomly selected features to isolate a prehistoric component of features, with phosphate concentrations intermediate between those of ploughmarks and of naturally filled features.

Prehistoric phosphates are expected to remain in the soil owing to the mineralisation of organic phosphates over time, generally rendering 70% insoluble (Gardiner & Walsh 1966). For this reason, a rigorous chemical process is required to liberate insoluble phosphates (*normally associated with iron and aluminium ions in acid soil*) which owe their persistence in the soil to this insolubility. The process falls into two parts: (i) solution of phosphates, (ii) the quantitative evaluation of phosphates dissolved.

Firstly, each sample was dried at room temperature and sieved through 1 mm mesh. The soil was then intimately mixed with $\text{NaNO}_3/\text{KNO}_3$ powder and fused at 450 °C in a muffle furnace. The resulting fused pellet of soil was then boiled in hydrochloric and nitric acids, to obtain a solution of all the soil phosphates (McQuaker & Fung 1975). One millilitre of the solution was diluted, and the phosphate stained by a mixed reagent comprising sulphuric acid, ammonium molybdate, ascorbic acid, and potassium antimonyl tartrate. The density of the resulting blue colour is directly proportional to the phosphate concentration, and can be measured using a spectrometer (Murphy & Riley 1962). The spectrometer was calibrated regularly using solutions of stock phosphate (potassium dihydrogen phosphate): in this way, concentration of phosphate in microgrammes phosphate/kilogrammes of soil was obtained.

The investigation of samples from soil profiles outside the henge shows a mean subsoil concentration of 0.43 gm phosphate/kg of soil; inside the henge, impressive phosphate incrementation is shown by a mean level of 0.80 gm phosphate/kg of soil. Moreover, the low phosphate levels outside the henge imply that leaching from the ploughsoil would play a minimal role in the contamination of the subsoil (reinforcing results from other workers; Cook & Heizer 1965; Gaarder 1930; Proven *et al* 1969). The pattern of phosphate distribution inside the henge is mapped in fig 48. Fairly homogenous low levels are obtained from the NW Quadrant of the site, with highest phosphates in the SW Quadrant, especially around the ditch causeway and the paired portal entrance. It is possible that the difference between the high phosphate levels of the SW Quadrant and the low levels of the NW Quadrant may be explained by differential trowelling depth.

The attempt to isolate a prehistoric phosphate characteristic proved statistically inconclusive, as the phosphate range from the colluvium layer (directly over the subsoil) was indistinguishable from that of the prehistoric features (excluding ploughmarks and naturally filled features).

To explain the distinctive distribution of phosphates within the henge, we can imagine ways the subsoil could have been physically mixed with richer sources of phosphate. For example by ancient and modern plough damage, which implies spreading of the truncated ditch's and post-holes' fills. The well-defined phosphate track leading through the entrance into the central post-hole circle of the henge suggests that the phosphate enrichment occurred while the internal structure, as well as the ditch and bank, were still standing. This can be envisaged by prehistoric phosphate enrichment, presumably by deposition of (i) urine or faeces of man or animals, or (ii) refuse derived from bone, meat, fish, plants, or skeletal remains (Cook & Heizer 1965).

The evidence of phosphates should be studied in conjunction with artefactual distribution and distribution of organic remains, in order to come closer to an interpretation of henge use.

The writers would like to acknowledge with gratitude the assistance and advice of Drs B and J H Ottaway of the University of Edinburgh, and also Jim Nebelsick, whose contribution of much time and energy helped make the survey a success.

SECTION 9

DISCUSSION

R J Mercer

. . . 'Surely not in vain
 My substance of the common Earth was ta'en
 And to this figure moulded, to be broke
 Or trampled back to shapeless Earth again'

Rubaiyat of Omar Khayyam

Fifth edition, 1889, Stanza LXXXIV

Rendered into English Verse by Edward Fitzgerald.

The archaeological evidence for the construction and use of the henge monument at Balfarg has been summarised as the progression of a series of events (0–3). All of these events merit individual discussion and that which follows naturally owes a vast debt to the scholarship and research of other workers in the field. Considerations of space and the patience of the reader have prompted the writer to discuss only specific aspects of the henge monument 'problem' upon which the results of the Balfarg excavation may be thought to throw some light. The discussion conducted by Piggott (1948), Atkinson *et al* (1951), Burl (1969), Wainwright (1969), Catherall (1972) and Ritchie (1974 & 1976) is the basis to which these remarks are appended.

The Ditch and Bank

The henge monument at Balfarg is defined by a severely circular arc of ditch and bank which however is not complete, a 60 m wide gap existing on the southern side where a natural gully has been used to complete the boundary of the enclosure. In its excavated state, whereby the prehistoric profile was probably to some extent recreated, this gully flooded throughout the winter of 1979/80 (not an exceptionally wet season) and there is probably good reason to suppose that this depression may well have flooded in prehistory. A careful choice of siting, a phenomenon familiar from many sites of this type, has also clearly been made to create as level a platform as possible for the interior of the site.

The incompleteness of the ditch circuit at Balfarg is, as far as the writer is aware, a unique feature in Britain. The far greater earthwork enclosure at Marden, Wiltshire (Wainwright *et al* 1971b) may, of course, be said to exhibit a similar disposition with three sides enclosed by a massive earthwork and the fourth (SW) side enclosed by the headwaters of the Wiltshire Avon and its floodplain. However the layout of the whole enclosure at Marden is far more 'empirical' with none of the symmetry featured at Balfarg. The curious and little understood enclosure at Waulud's Bank, near Dunstable, Bedfordshire (Dyer 1964) where a semi-circular enclosure is sealed-off by the head-waters of the river Lea may also be brought to our attention. However in this latter instance, while a cultural connection is present, in that this site has produced decorated sherds of grooved ware in the primary silts of the ditch and from the old land surface beneath its cognate bank, nevertheless there is as yet no reason to link the site, with its external ditch and internal bank, with the henge monument tradition *sensu stricto*.

The location of the henge in a wider sense, set on a slight rise within a depression, at the

edge of which, at widely varying distances, a prominent and varied skyline is visible, must also be noted. To the W the site looks directly on to (without benefit of a recent conifer plantation) the eminence of East Lomond, and Clatto Hill forms a focal point of the horizon to the NE. This setting at the focus of a panoramic landscape view is a tendency clearly visible at other henge sites (Milfield, Northumberland and Strathallan, Perthshire are examples within reasonable geographical range) which may to some extent relate to the function of the sites or to the sensibilities of their builders.

Such a view from the centre of the monument, it must be borne in mind, would be impeded to a substantial degree by the existence of the external bank. At Balfarg it was not possible to retrieve any information concerning the width or extent of the bank which has completely disappeared and therefore little can be said of its reconstructed 'prehistoric' height. Bearing in mind, however, the consistent siting of these monuments in this fashion it may well be that the bank summit was a position whence the skyline could be observed, looking outwards as it were, as much as a position from which activities in the central area could be observed looking inwards.

The Main Timber Circle

The Timber Circle Complex. One major circle of 15 pits was located within the henge enclosure at Balfarg. A 'gap' in the ring on the SE side may be presumed to indicate that a sixteenth pit existed, which was either not archaeologically detectable in the circumstances of excavation or had been totally obliterated by erosion since the third millennium bc. Set outwith this circle of originally 16 pits on the western (WSW) side were two further more massive pits forming a 'porch'-type arrangement.

The evidence, particularly from pits A6, A8, A10, A11, A12 and A14, would appear to indicate that these pits had acted as groundfast support sockets for vertical timbers (see above p 81). In the absence of any evidence to the contrary it is assumed that all 15 of the surviving pits set on this circle were of similar function.

It has been accepted in the treatment of prehistoric timber structures that the depth of post-socket will reflect in some degree the length of timber supported within that socket. In the case of structures where ramps leading into sockets have been constructed to facilitate the erection of the post it would appear to the writer that further information is available.

Atkinson (1979, 132) has stated with reference to the erection of the sarsen uprights using ramps at Stonehenge that 'the stone to be erected was . . . aligned radially upon the stone-hole, supported horizontally on rollers of large diameter, so as to raise it as far as possible above the surface. It was then dragged forward still on a radial line so that the front end, that is the base, began to overlay the ramp. By previous trial and error the rollers would have been positioned so that as the centre of gravity of the stone passed over the leading roller . . . *it overbalanced tipping the base squarely into the hole the lower part of the outer face resting on the ramp*' (writer's italics). This point of balance achieved by the orthostat or timber upright at the fulcrum of the uppermost end of the ramp is crucial to this technique of erection. It is thus probably reasonable to assume that the length from the uppermost end of the ramp to just short of the furthest edge of the socket will represent one half of the *mass* of the timber to be erected. If it is assumed that the volume of the member, per unit length, is roughly constant then this distance will also represent approximately half of the length of the member to be erected (see fig 49). Using the diagram, the distance ab therefore equals $\frac{\text{length of member}}{2}$ so that the length of the member equals length 2ab.

In the Durrington Walls South Circle (Wainwright *et al* 1971) 66 individual vertical members are supported within dug sockets to which ramps are appended. A survey of the ratio

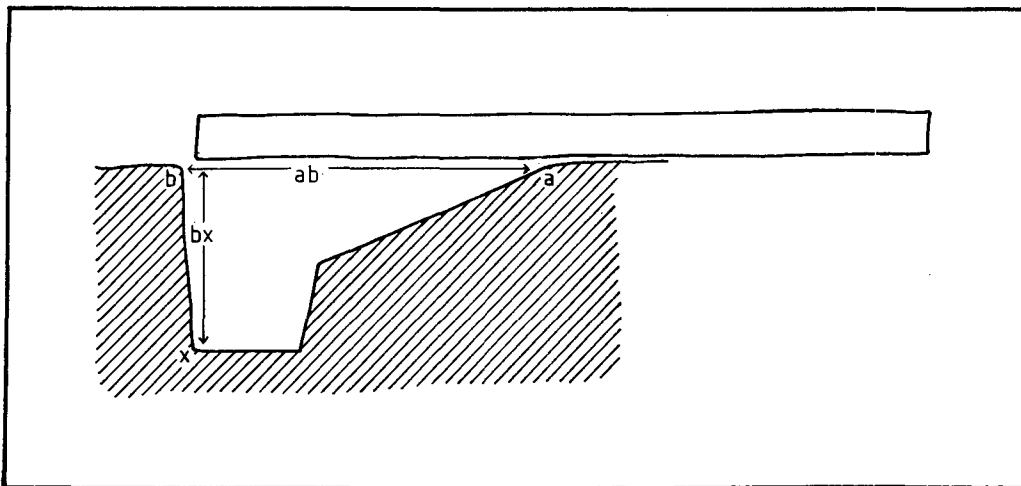


FIG 49 Diagram to illustrate the method of timber erection using ramped post holes and post sockets for calculation of timber length

between socket depth (bx) and the length $2ab$ shows (see fig 50) a broad range of timber length ratio to socket depth between 1:2 and 1:5, but a very major concentration in the area 1:3–1:3.5. At Woodhenge, information concerning lengths ab and bx is available only in four instances in the 16 ramped posts of the third circle (Cunnington 1929). As expressed the ratios are F6, 1:3.5; F12, 1:3.6; F14, 1:3.9; and F16, 1:3.2. At the 'Sanctuary', Overton Hill, this information is not available but at Arminghall, Norfolk (Clark 1936) two ramped post-sockets were excavated by Clark and the information available yields ratios of $bx:2ab$ of 1:3.3 and 1:3.4. Very generally, therefore, on the basis of the limited data available a ratio of 1:3.5 socket depth to post height seems to be an optimum relationship sought by prehistoric engineers on this type of site. The writer will use this relationship to provide approximate estimates of the height of timbers set in the sockets of Circle A at Balfarg, where, of course, no ramps for timber erection were found (possibly due to erosion) and this more satisfactory basis for timber length calculation is not available.

It is clear on the grounds of geomorphological, artefactual and excavational evidence that the subsoil surface of the site at Balfarg has been subjected to very considerable sub-aerial erosion leading to a loss of possibly as much as 0.50 m of the subsoil surface plus a turfline above that. It is assumed for the purposes of this very approximate reconstruction that a total of 0.50 m of surface had been removed and that the ratio of 1:3.5, indicated above on other evidence, applies. The figures given in Table 11 reflect most importantly (and of course this reflection would occur whatever the figures adopted for the loss of subsoil and the ' $bx:2ab$ ' ratio) the clear differential in height of timber, by and large, from the E side of the circle to the W. The pattern does exhibit some slight irregularities (eg posts A3 & A5) but bearing in mind the constraints of approximation inherent in this approach, and also bearing in mind that sockets may have been deepened on occasion to bring a slightly overlong member 'down to size', the picture to emerge does seem to be very consistent. It has already been pointed out that the platform within the ditch at Balfarg is almost exactly level and this is certainly so over the diameter of Circle A. The obvious inference to be drawn, therefore, is that the posts ranged in height from tall posts in the W sector (A9–A12), possibly ranging from 3–4 m in height, to shorter posts in the E sector possibly between 2 and

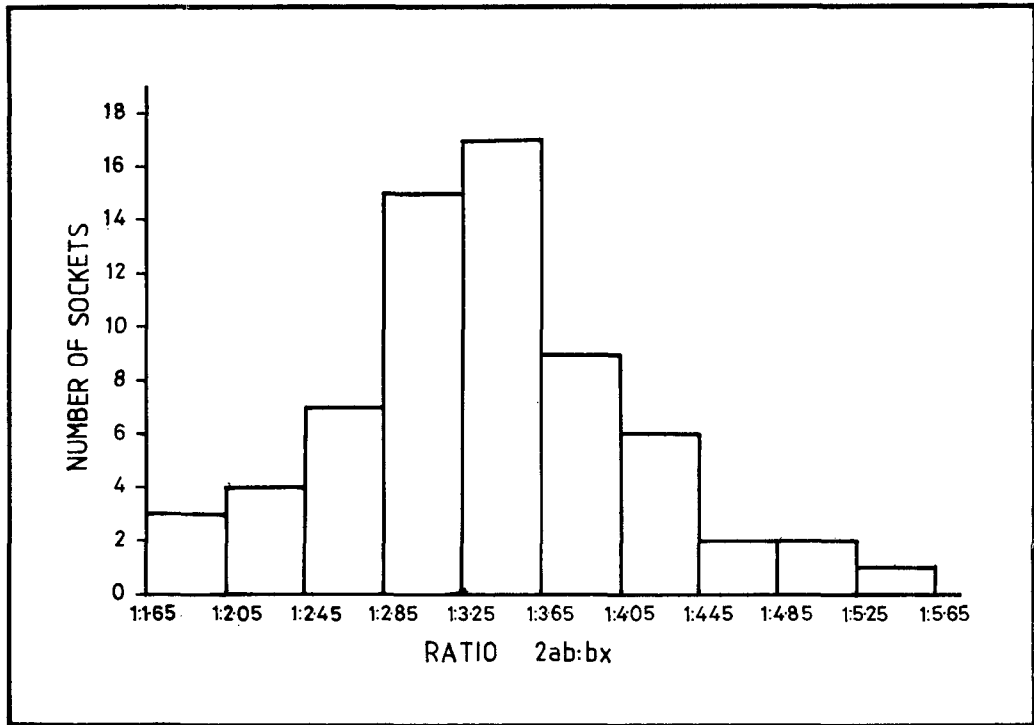


FIG 50 Histogram illustrating the preponderance at Durrington Walls (S circle) of a consistent ratio between timber length and socket depth

TABLE 11

To illustrate the reconstruction of possible timber lengths in the main timber circle A at Balfarg.

Feature	Depth	Erosion	Total Depth	X3.5 = timber length
A1	0.12 m	0.50 m	0.62 m	2.17 m
A2	0.35	0.50	0.85	2.97
A3	0.45	0.50	0.95	3.32
A4	0.17	0.50	0.67	2.34
A5	0.45	0.50	0.95	3.32
A6	0.60	0.50	1.10	3.85
A7	0.35	0.50	0.85	2.97
A8	0.50	0.50	1.0	3.50
A9	0.85	0.50	1.35	4.72
A10	0.70	0.50	1.20	4.20
A11	1.10	0.50	1.60	5.60
A12	0.50	0.50	1.00	3.50
A13	0.35	0.50	0.85	2.97
A14	0.25	0.50	0.75	2.62
A15	0.57	0.50	1.07	3.75
A16	0.45	0.50	0.95	3.32
A17	0.37	0.50	0.87	3.04
A25?	0.10	0.50	0.60	2.10

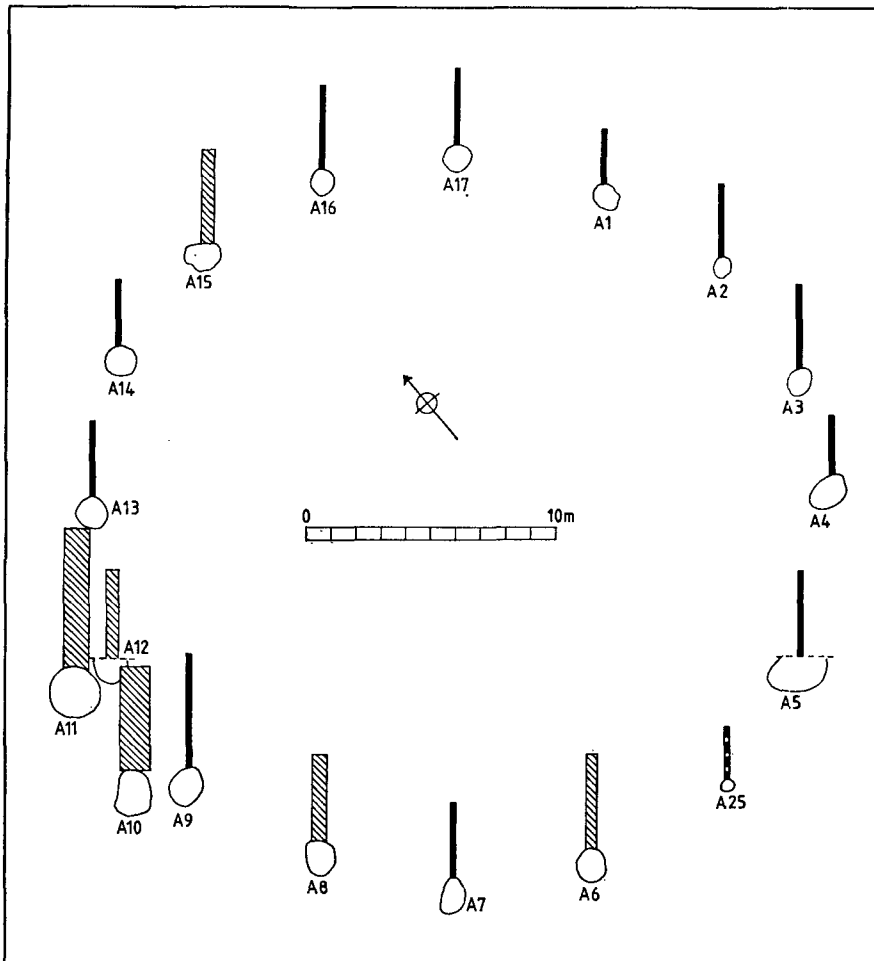


FIG 51 Diagram to illustrate timber length and diameter as calculated for timber circle A at Balfarg

2.5 m in height (see fig 51). While varying in height quite considerably over the whole circumference of the circle such evidence as we have from post sockets A6, A8, A12 and A15 would indicate that the diameter of the posts was relatively consistent – registration within the post-socket ranging only between 0.45–0.60 m. What does appear clearly is that this order of post size is not used for the ‘portal’ uprights on the western edge of the circle. Here in both instances the disposition of material within the post-sockets indicates posts over 1 m in diameter. The distinction here is emphasised, the writer feels, by a consideration of the weight of timber involved.

There is little evidence for the type of timber of which the posts were composed. Mrs Camilla Dickson (see section 8) has identified charcoals from post sockets A7 and A11 as *Quercus* (Oak), *Salix* (Willow), *Alnus* (Alder) and *Corylus* (Hazel). The writer feels that these charcoals do not reflect the nature of the timber post in the socket but are accidental inclusions in the back-packing. Nevertheless they do give some indication of timber availability on the site and in terms of timber of 1 m+ in diameter it is likely that oak was the timber used. Green oak weighs of the order of 67 lb per cubic foot (Wainwright *et al* 1971, 220) or 1073.34 kg per cubic metre. If one

accepts a diameter of c 0.50 m for the posts of the circle and c 1 m as diameter of the 'porch' posts and if we can use the heights as calculated above for the timbers which are assumed to be oaken, then:

TABLE 12

To illustrate calculation of possible weights of timbers of the main timber circle A at Balfarg.

Post socket	Volume M ³	Weight	
A1	0.426	457.24 kg	(0.45 tons)
A2	0.583	625.75 kg	(0.62 tons)
A3	0.652	699.82 kg	(0.69 tons)
A4	0.459	492.67 kg	(0.48 tons)
A5	0.652	699.82 kg	(0.69 tons)
A6	0.756	811.44 kg	(0.79 tons)
A7	0.583	625.75 kg	(0.61 tons)
A8	0.687	737.38 kg	(0.72 tons)
A9	0.926	993.91 kg	(0.97 tons)
A12	0.687	737.38 kg	(0.72 tons)
A13	0.583	625.75 kg	(0.61 tons)
A14	0.514	551.69 kg	(0.54 tons)
A15	0.736	789.97 kg	(0.78 tons)
A16	0.652	699.82 kg	(0.69 tons)
A17	0.596	639.71 kg	(0.63 tons)
A25?	0.412	442.22 kg	(0.43 tons)
A10	3.298	3540.59 kg	(3.48 tons)
A11	4.398	4720.79 kg	(4.64 tons)

From the above calculation, which naturally carries no implication of detailed accuracy, it can be seen that the timbers of the main circle 'A' at Balfarg probably ranged in weight upwards from half a ton towards a ton and that the porch timbers were very much more substantial ranging between 3½ and 4½ tons.

The Varying Height of Timbers in Circle A

The range of height in timbers of the main timber circle A is apparent in fig 51, posts of varying height occurring throughout the circle with apparently the shortest members in the E (A2, A1) and the longest in the W (A8, A9, A12). If such is the case then it would appear extremely unlikely that this timber circle represents a roofed structure as has been suggested (Wainwright *et al* 1971) for the superficially similar structures at Durrington Walls and elsewhere. This conclusion would appear to be supported (see below) by the greater size of the Balfarg circle complex which renders overall roofing extremely unlikely. Rather, then, than looking S for the conceptual parallel for Balfarg we should perhaps turn our gaze northwards to the Recumbent Stone Circles of the NE (Burl 1976, 160–190) and the possibly related Clava type cairns (Henshall 1963, 12–39).

The Clava type cairns, concentrated in their distribution in the area around present-day Inverness, display a number of features of interest in connection with our consideration of structure at Balfarg. They are, of course, unique on the British mainland in their association of 'chambered tomb' and stone circle within one architectural complex. Their cognate stone circles are frequently graded through the circumference of the circle so that the tallest orthostats are ranged in the SW arc. Very little is known of their cultural background – the well-known early find of 'flat-rimmed' pottery from Balnuaran of Clava telling us little although perhaps raising the suggestion that such wares may, at least in part, supplant the more distinctive grooved ware in the

embarrassing distributional *hiatus* still to be associated with this latter ceramic class between Fife and the Pentland Firth. The origins and chronology of the Clava group are, as a consequence of this cultural poverty and the lack of securely contexted radiocarbon dates, again little understood. However the morphologically tempting parallels with the Boyne tombs, particularly that at New Grange, Co Meath, still remain. The decorative links proposed originally by Childe (1931, 133) between Boyne Valley passage grave art and the decoration of Grooved Ware in the Northern Isles, chronologically now quite acceptable, again may add a further dimension to this complex pattern of cultural osmosis.

Links between the Clava Cairns and the, again, highly individual class of Recumbent Stone Circles in NE Scotland are morphologically undeniable, if again little understood. These sites comprise stone rings often located with scrupulous care to obtain a level site (at Berrybrae (Burl 1976, 184) and Loanhead of Daviot (Kilbride-Jones 1935)) and once again the individual orthostats (frequently 12 in number) are graded so that the most massive stand in the SW sector of the circle and here these flank a massive and again on occasion carefully levelled recumbent slab. As with Clava Cairns, cremation rite and widespread burning plays an important role on these sites. At Loanhead of Daviot as well as much burning activity, the central area is at an early stage embellished by a rectilinear timber setting which Ritchie (1974, 11) has pointed to as a parallel to the rectilinear stone setting placed centrally within the Balbirnie stone circle, itself associated by proximity and to some extent culturally with Balfarg (see below). The characteristic recumbent slab is not easily paralleled elsewhere apart from within another isolated group of similar circles, apparently somewhat later in date, in SW Ireland. Yet Burl has pointed to the existence of the great recumbent blocking slab across the entrance to the grave at New Grange (Daniel *et al* 1964) and sites like Kintraw A, Argyllshire (Peltenburg 1974) perhaps representing the link through to the E of Scotland. The writer, in passing, would simply ask the reader to note that a recumbent timber set in the W 'porch' setting at Balfarg would be extremely unlikely to leave any archaeological trace whatever and would form a feature very similar to that to be seen in lithic form at the recumbent stone circle, early in Burl's postulated sequence for this group, at Easter Aquorthies, Aberdeenshire (Burl 1976, 173).

The translation of monument design from timber into stone is, of course, a feature with which we are fully familiar at this period and the writer will only draw attention in this context to the geographically proximate example at Croft Moraig, Perthshire (Piggott & Simpson 1971) where a circular timber setting with a possible 'porch' type arrangement was ultimately replicated in stone. The cupmarks and quartz pebble scatter present on this site must inevitably bring us back to the Clava tomb series and the recumbent stone circles.

A little more information is available to enable us to provide a chronological perspective to recumbent stone circle development. A number of these sites have been excavated, few in a fashion which we would now regard as adequate. Yet the cultural material located within them is consistent in that little occurs to indicate a pre-beaker horizon for their initial development and it is clear that they continued in use well into the formal early Bronze Age. Burl (1976, 172-4) has set out the arguments for the range and internal sequence of this chronology and commences their development at a point, in radiocarbon years, at the very beginning of the second millennium bc.

If we accept this chronology, then clearly recumbent stone circle development is taking place at a stage culturally and chronologically later than the earliest development of henges in Scotland as indicated by both the material and the radiocarbon dates from Stenness and Balfarg itself. Thus the henge tradition may well be a major influence in the development of the recumbent stone circle and indeed possibly even Clava Cairn traditions. The 'hengiform' structures in Easter Ross (Woodham 1955) and in the Inverurie area (Broomend of Crichtie, Tuach, etc) may be the

foci at which we will be able to observe these transitional processes taking place. It is interesting in this connection that the circularity of the Balfarg timber circle would conveniently agree with Burl's scheme for stone circle development (Burl 1976, 48) whereby severely circular structures would appear to be early, taking precedence over more complex oval arrangements both in northern and southern Britain.

Within the henge tradition the internal relationships of the timber circle are also far from clear. Apart from the recently excavated henge at North Mains, Strathallan (Barclay 1980) there are no other timber circles of similar scale known in Scotland. Strathallan on grounds of its cultural material and its form would appear to be somewhat later than Balfarg. Its timber circle shows no evidence of gradation in size of members into any one sector and may, in life, have looked very different from Balfarg. There is however (Barclay pers comm) wide and random variation in post-socket depth and, where ramps to assist with post-erection do survive, in ramp length. Either we have to accept an irregular and widely differing height of timbers above ground, or as perhaps seems more likely, a deliberate policy of placing longer members in deeper sockets to attain equal height over ground. Further discussion of this point must await the forthcoming publication of this important site.

The site at Knappers Farm, Dunbartonshire (Mann 1937) is one where the possibility of concentric rings of posts exists but where the information available in its present state will not allow any confident statement. Cairnpapple in W Lothian (Piggott 1948) in its second period is a site in many ways very similar to Strathallan. It too is a Class II henge with a setting of 24 uprights in a flattened circle on the internal platform. However, at Cairnpapple, Piggott interpreted the sockets as supports for orthostats on the grounds of stone chips found in one of the sockets and the presence on the site of a later cairn (Period III) with 20 kerbstones and two cist slabs which he postulated were derived from the earlier stone circle. He also felt able to trace the form of the butt of one of the kerbstones in the filling of socket no 8. It would seem cavilling to argue against such evidence, much of it a good deal more substantial than that the writer has produced from Balfarg, but it must be said that much of it is essentially circumstantial and that the steep-sided form of some of the sockets and a possible truncated ramp in socket 16 might suggest a possible reinterpretation as a timber circle. The shallowness of some of the sockets may be seen as an objection to this suggestion, but an old land surface has been lost from the site (known because it is sealed and protected beneath the later Period III cairn) to the extent of c 0.75 m. With this deposit *in situ* socket 16 (the deepest) might well have been 1.70 m in depth and socket 19 (the shallowest) just short of a metre in depth. These depths compare with those suggested for the timber circle at Balfarg and are not widely divorced from those at Strathallan. In conjunction with relatively steep profiles they do seem however to be perhaps unsuitable for orthostat reception and the irregular and widely differing disposition of deeper and shallower sockets may be yet another factor linking Strathallan with Cairnpapple and placing both in contrast to the situation at Balfarg.

Elsewhere in Britain close parallels to Strathallan lie in the Milfield Basin near Wooler in Northumberland (Harding 1981) and elsewhere further afield. Parallels for the Balfarg timber circle are more difficult to perceive and our attention must once again focus on the southern circle within the great earthwork enclosure at Durrington Walls. Use of the 'ramp method' to calculate timber height on this site (see fig 52) indicates a very consistent concentration of longer timbers within the E-SE sector of the circle. The differential in the case of the outer circle ranges from timbers 4.6 m in length in the N to 8.4 m in length in SE returning to 4 m in length in the S. In the case of the innermost circle the range in length is less pronounced ranging from 4 m to 6 m. Again irregularities do occur but the trend is absolutely clear. The parallel with Balfarg is

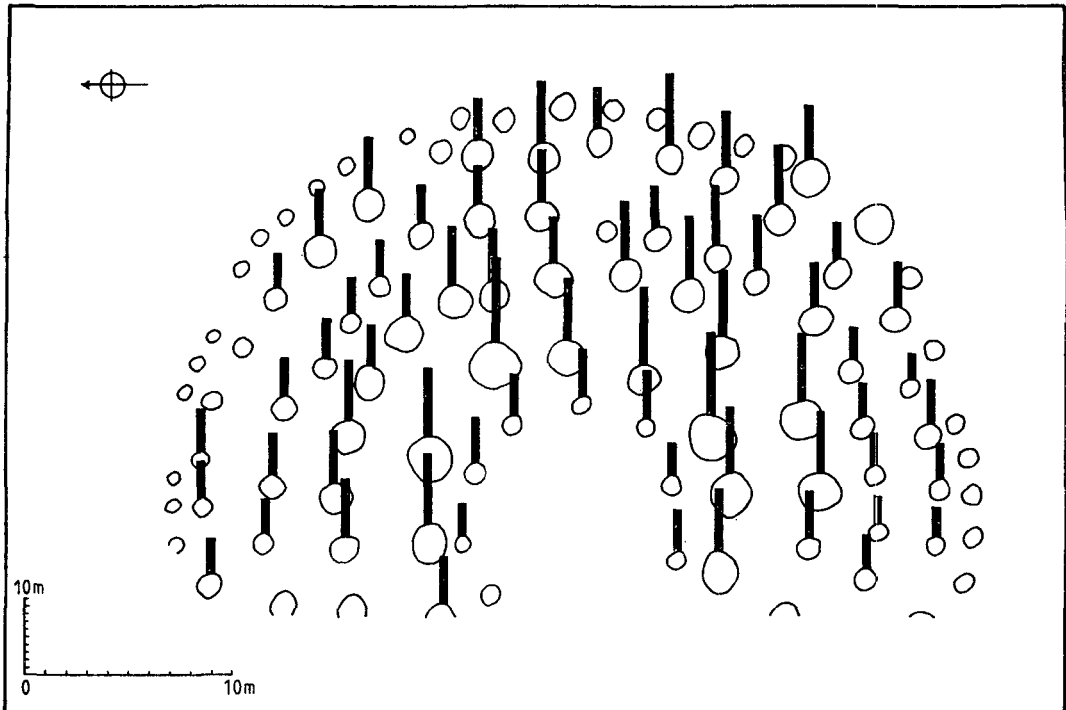


FIG 52 Illustration of timber lengths calculated using 'ramp method' at Durrington Walls (S circle: plan after Wainwright 1971)

apparent in all except orientation but at Durrington another factor supervenes. Here the site is set upon a slope running away to the SE and the drop in height OD over the total diameter is of the order of 3.50 m. The outer circle which covers the entire drop noted above has a compensation into the SE sector of 3.80 m in average timber length and the innermost circle a compensation of 2 m – approximating to the drop over the shorter diameter. The writer would suggest that here we see a consistent pattern of levelling of the tops of timbers to produce a truly horizontal upper limit to the timber uprights as a whole – a suggestion already put forward for the Strathallan site. At Strathallan, if this activity is taking place, it may be because of the use of timbers of different length as the site is substantially horizontal and the disposition is random. At Durrington Walls 'South Circle' however because of the slope upon which the site is built, the levelling activity is more sophisticated producing an equally horizontal upper limit to the timber uprights against the slope of the site. By contrast, at Balfarg, while the site is almost exactly level and indeed seems to have been selected to this effect, a similar consistent anomaly in timber length is to be noted.

The possible production of an horizontal upper limit to the timber uprights at Durrington is, of course, of the greatest interest because a truly horizontal ring-beam might be required for the erection of the kind of roof postulated by Wainwright on the basis of Musson's study (Musson 1971) of architectural possibilities on the site. Indeed a rather different procedure of 'digging in' uprights of standard length to produce a horizontal upper limit has been suggested in the instance of the Pimperne, Dorset, round house, dated to the later 1st millennium bc (Harding 1974, 39).

However a further inference gained by the use of the 'ramp method' to calculate timber height is a consistent diminution of the length postulated by Wainwright (on the basis of a 25° roof pitch) for the upright timbers of the Durrington South Circle.

TABLE 13

Comparison of the average length of timber in the Durrington Walls S circle as calculated by Wainwright (1971) and by the 'Ramp Method'.

	Average length of timber	
	Wainwright <i>et al</i> 1971	'Ramp Method'
South Circle 2F	7.6 m	5.42 m
2E	11.2 m	9.0 m
2D	8.9 m	7.23 m
2C	7.0 m	5.16 m
2B	5.4 m	5.77 m

If this diminution is upheld it would imply a number of difficulties, including a substantial flattening of pitch for the roof, for the interpretation of this post circle as the foundation for any kind of roofed structure. Cunnington, as long ago as 1935 (1935, 13), pointed out the way in which prehistoric engineers at Stonehenge dug differently sized sockets in order to raise or lower sarsen uprights of uneven length to a point where the platform upon which the lintels were to be placed was exactly horizontal. The writer is brought to wonder whether we should place this consideration alongside the many other carpentry parallels at this unique site to reassess the nature of some of the timber circles located within British henge monuments.

Whatever the solution to this problem, the timber circle at Balfarg with its broadly graduated length of timbers into the WSW sector on level ground and the situation at Durrington where, apparently, timbers of varying height are selected to compensate for sloping ground and the third situation at Strathallan (and indeed at Woodhenge and the Sanctuary) where timbers of varying length are differentially set into the ground, apparently randomly, possibly to achieve a level upper surface, indicate a wide range of problems and objectives in prehistory which on morphological grounds archaeologists have tended to subsume under one overall heading.

The Subsidiary Timber Circles. It may be useful briefly to summarise the evidence for the existence of these circles.

1 The clear excavational recognition of arcs of shallow depressions marked by soil fill different from their subsoil matrix – Circles B and F. These arcs would appear to represent the presence of closely spaced posts of minimal diameter and, where direct evidence exists (Circle F), the spacing would appear to be of the order of 0.60 m centre to centre with posts of c 0.10 m diameter being used.

2 Over the whole site at Balfarg a plethora of soil-dug features were recovered by repeated and standardised inspection of the interior surface. Statistical analysis of these features based upon the concept of concentricity with the known main timber circle A revealed that features clustered on a number of circumferences concentric with circle A. Only one of these was found to be statistically highly significant (Circle B).

3 A complete record of all stone scatter on the site was made and, while this is to a large extent natural in origin, clear arcs are to be observed in the stone scatter which coincide with the 'statistically' and 'excavationally' predicted circles (B, D, E, F). Thus all three approaches are mutually supportive combining to present as objective an approach as possible to reconstruction on the site.

Arbitrary centres were also generated and tested but significant circles were not found to emerge. The only other finding as a result of this approach was a statistically significant circle of features centring on the beaker cist F.X1 which itself is set eccentrically to the main circle A. No

independent archaeological evidence was recovered during the excavation for the existence of this circle and its presence on the site must remain an open question. Indeed, it must be emphasised that the reconstructed plan at Balfarg (see fig 40) cannot be deemed to display the same order of validity as plans at similar sites in southern Britain where preservational circumstances were, on the whole, more fortunate.

If the suggested arrangement of six circles is accepted, however, the parallels for such a structure may be instructive in that the apparently related circles at Durrington Walls, Wiltshire (South Circle), (Wainwright *et al* 1971), 'Woodhenge', Wiltshire (Cunnington 1929) and 'The Sanctuary', Overton Hill, Wiltshire (Cunnington 1931) all display six concentric rings of timber structure (although at Woodhenge the arrangement is egg-shaped rather than circular). Furthermore it may be noted that the most massive timber uprights at both Durrington South Circle and the Sanctuary are those in the ring 'second outwards' from the centre as would appear to have been the case at Balfarg.

The degree of similarity between these sites is also emphasised by the number of posts present in the circle. At Balfarg 16 posts are suggested in the main timber circle on the site, a figure replicated at Woodhenge (Ring C) and in the main 'Bank Holiday Ring' at the Sanctuary, Overton Hill. Indeed of the 26 individual timber circles present at Balfarg, Durrington, Mount Pleasant (Wainwright 1979), Woodhenge and the Sanctuary, 15 are numbered on a factorial base of four. Catherall (1974) has drawn attention to this apparently non-random ordering which seems to have very little constructional relevance and may indicate a cultural link between these sites a good deal more difficult to assess archaeologically.

The closeness of parallel between Balfarg and the Durrington South Circle particularly and the other southern English sites mentioned is only broken by consideration of scale. The overall maximum diameter at Woodhenge is 44.1 m, while the diameters at Durrington South Circle and the Sanctuary are 38.9 m and 20.1 m respectively. At Balfarg, if the reconstruction is correct the diameter of the outermost circle F, apparently of small closely set timber uprights, is 60–63 m if the circle was complete and not penannular. It is presumably necessary to suggest a loss some 7 m (maximum) from the south-western edge of the site by natural weathering of the sides of the natural gully forming the boundary of the site in this direction if this circle was complete. Such a large structure, as has already been suggested, almost certainly cannot have been roofed in the manner suggested for the southern sites.

Considerations of scale also lead us to consider the size of the timbers themselves. At Balfarg in timber circle F, on the evidence of the retrieved post-pipes, c 0.10 m would appear to be the average diameter of each timber member with spacing of 0.60 m centre to centre.

The smallest timbers present at Durrington South Circle Phase II (Circle 2F) are 0.24 m in average diameter and during Phase I (Circles 1C and 1D) 0.18 m in diameter – still nearly twice the stature of the known Balfarg posts. In the more slightly built monument at Mount Pleasant the average post diameter would appear to be of the order of 0.28 m. At Woodhenge the smallest observed post diameter is of the order of 0.24 m (Circle E). Furthermore the slightest and most closely spaced circles in the S of England are 1 m centre to centre (Woodhenge 'A' Ring) and 1.5 m (Mount Pleasant, Durrington South Phase II, Durrington South Phase I and the Sanctuary). Again these intervals are of the order of double those at Balfarg.

The timber circles at Balfarg have their closest parallels, indeed, with the much slighter 'stake hole' circles beneath round barrows. This is an apparently widespread phenomenon in Britain and is associated in part with an early stage in barrow development. Well documented examples exist in the instance of barrow 40 in the Brenig Valley in Denbighshire (Lynch *et al* 1974) where stakes 0.05–0.10 m in diameter were driven in to the subsoil at intervals of 0.60–0.80

m in four concentric rings, the diameter of the outermost being 13.3 m associated with a primary burial with a collared urn. Close by at Brenig 42 an irregular circle of stakes was erected prior to the construction of the mound of the barrow and these stakes had been linked by woven hurdling to provide a revetment for an internal bank appended to the ditch. Wainwright (1979) has implied relationship in design between the southern English henges and similar stakehole circles retrieved by Fox at Sheeplays 293' (Fox 1959, 129–43) where the outermost of four concentric stake rings is c 15 m in diameter and at Tregulland (Ashbee 1958) where two certain rings exist also – the outer 8 m in diameter.

In all cases the stakes are closely spaced at 0.50–0.80 m centres and the hurdling demonstrated at the Brenig valley site may possibly be extended to all. The associations in three instances are with primary graves containing collared urns, and a possible link with timber circles *sensu stricto* may be seen at the Brenig Valley ring-cairn 44 where the cairn is surrounded concentrically by a circle of substantial posts 0.30–0.40 m in diameter set 3 m apart and buried within or beneath the outer bank of the cairn. Radiocarbon evidence shows that the ring cairn Brenig 44 was almost certainly only used as a funerary monument in the later stages of its development with the deposition of collared urns with a cremation associated with a radiocarbon determination 1280 ± 70 bc. The primary phase of this ring cairn is dated 1680 ± 100 bc.

The juxtaposition of spaced timber circle and stake circle must also recall to our attention Barrow 1, Poole, Dorset excavated in 1949 by Humphrey Case (Case 1952). Here a partially intact inner ring of stake holes set at 0.50–0.60 m centres would appear to be revetting a turf mound – a task that could be performed adequately only if the stakes were linked by scantling or hurdling. Concentric with this feature was a ring of 19 timbers 1.5 m apart and some 0.25 m in diameter with porch-like complications associated with an entrance causeway across the barrow ditch. In essence this site comprises a round barrow set within a Class I henge monument with a timber circle 8.7 m in diameter.

Once again it would seem reasonable to suggest that a superficially similar structural pattern within monuments of similar class may represent widely differing prehistoric structural reality. It is clear that stake circles beneath round barrows are generally later than the closely spaced circular timber settings at Balfarg which are assumed on the grounds of their concentricity to be contemporary with the main timber circle A. The very close spacing of the timbers at Balfarg is felt by the writer to indicate that the rings were intended to act as a delimitation or barrier and were probably linked by fencing of some kind as may be indicated by similarly disposed timbers at Brenig 42. It may be that the origins of timber circles beneath earlier Bronze Age funerary monuments, frequently suggested (eg Case 1952) to lie within the henge tradition in a general sense, may now be linked more specifically to origin in henge construction. The implications linked with the possible existence of a timber ring centred upon the beaker burial placed secondarily within the monument at Balfarg are of considerable interest. However the writer feels that the evidential support for the existence of this feature is so frail as not to warrant even the substance which might be imparted by comparative discussion.

In summary the evidence at Balfarg would appear to indicate an uncertain number of concentric rings of closely spaced small diameter timbers which the writer would suggest on parallels drawn from elsewhere might have supported scantling or hurdling fencing. The existence of such features is not paralleled within henge monuments elsewhere in Britain but is clearly a feature of early Bronze Age round barrow construction often appertaining to primary activity on these sites and certainly observable within the round barrow tradition from an early stage. A more clearly traceable ancestry for this form than hitherto within the henge tradition is proposed on the basis of the Balfarg evidence. Behrens (1981) has recently suggested that the excavated evidence from

the site at the Schalkenburg nr Quenstedt on the E edge of the Harz Mountains (some 50 kms NW of Halle, GDR) indicates the existence of five concentric egg-shaped enclosures marked by slots into which closely set palisade timbers had been placed. Associated pottery of the *Baalberg* phase of the *Trichterrandbecher* (TRB) culture in the area was recovered with indications that the site had fallen into disuse by the time that *Bernburg* elements of the same culture were present on the site. These latter elements are associated locally with radiocarbon determinations c 2400 bc. These palisaded enclosures are *not* set within any ditched enclosure. Behrens goes on tentatively to link this site with other 'henge-like' enclosures in Bavaria and Moravia published by Maier (1962) which range quite widely in date within the Central European middle Neolithic. Clearly we are, as yet, a long way from the definition of any European 'henge tradition', but the structural similarities between one element at Balfarg and the Schalkenburg enclosure, and their broad chronological parity, is perhaps of some interest in this regard.

The Stone Circles at Balfarg. The evidence for the existence of stone settings at Balfarg is, in the writer's opinion, so poor that he feels it to be unlikely that the presence of stone settings on the site would have been put forward at all had the surviving stones not existed. This approach to the site was in some measure conditioned by conjecture as to the presence of stone rings which has figured in all previous commentaries on the site (Atkinson 1952; Burl 1976). The evidence for the existence of stone circles is a series of very shallow scoops occasionally with loose stone rubble associated (packing?). For the inner circle there are five features (S1-5) which may be the remnant of a setting, and for the outer circle there are six features (S'1-6).

The evidence for the priority of timber over stone structures is also minimal. It is evident that both the suggested outer and inner stone circles could have only been erected when those timber circles suggested on the basis of the recovered plan were either not present on the site or had been removed. The timber complexes were therefore not contemporary with the stone element and a stratigraphical succession is noted in one instance where stone hole S'3 of the outer setting is seen to cut through the post pipes visible in axial section pertaining to Circle F.

The inner stone circle exhibits five sockets (one with the upstanding stone present today). It is not possible to describe the arc of a true circle through the centre of these features so that it would appear that some subcircular arrangement may have been involved. It may be that the closely spaced and deep socketed S2 and S3 may have formed a portal arrangement in which case, based on the spacing of S1, S4 and S5, a further ten stones would have completed the subcircle at a spacing of c 14 m between stones. This would realise a total of 12 stones, two more closely spaced than the others in the W sector. Twelve stones is, of course, a familiar number of stones at other stone circle sites in Scotland, particularly in recumbent stone circles in the NE and the Clava Cairn series, and narrower than normal spacing between portal stones or the pillars flanking recumbent slabs again a familiar practice (Easter Aquorthies, Aberdeenshire; Castle Frazer, Aberdeenshire). The outer ring is clearly, if the scoops on the inner edge of the ditch (S'1-S'6) are correctly interpreted, somewhat irregular in spacing but if the average spacing of 8 m is followed then c 24 stones would comprise this outer circle. Perhaps one may recall the timber?/stone circle setting at Cairnpapple, West Lothian and the timber circle A at Strathallan, Perthshire, both with 24 members.

If the reconstructions proposed do bear any relationship to former reality a number of points are worthy of remark.

(a) Apparently the stone settings are both subcircular although in what exact setting and whether this setting is determined geometrically is impossible to say. To this extent similarity with settings in other henge monuments both in England and Scotland is readily demonstrable.

In Scotland the henges at Stenness, Orkney and Cairnpapple, W Lothian and Strathallan, Perthshire all produce subcircles of 12 and 24 uprights.

(b) Double concentric settings are more common than might be immediately apparent. Burl (1976) would catalogue 12 examples from England and a similar number from Scotland (Machrie Moor Circle no 5, Arran, Strathclyde is a well known example). The best known example is that at the Sanctuary, Overton Hill, Wiltshire. However that at Balfarg (if both settings were co-existent) is unique, set as it is within an earthwork enclosure of henge type.

(c) If the succession suggested by the stratigraphical position of S'3 is valid then a process of 'lithicisation' is implied for the site at Balfarg with at least one element of stone construction later than one element of timber. Certainly it would appear to be extremely unlikely that both elements could have co-existed. If the stone structures are *generally* later than the timber structures then it is possible to see two links which may express some continuity from one monument to the other.

1. Stone holes S2 and S3 would appear to represent the making of an entrance by closely spaced stones – one, S2, with its contained orthostat still standing and one, S3, an equally deep and broad socket set to the N at a distance of 2.5 m. This spacing is not repeated at any other point. S4 is set 9 m to the N and S5 14 m to the N again. To the S any stone socket more than 5 m from S2 will have been lost in the weathering of the slope of the natural gully. If this interpretation is correct it would appear that the portal element of the inner stone circle reflects in orientation and perhaps even to some extent in structure the portal of the timber circle.

2. The survival of the stone sockets of the inner circle is restricted to the western sector. S1 was in good condition and sockets between this example and S2 may well have become the casualties of erosion from the edge of the gully. S2 is, of course, still furnished with its orthostat and S3 is again in good condition. S4 and S5 are very shallow, characterised by their selected stone packing remaining in a slight dish-like depression. No other sockets of this circle survive although it is possible that the very shallow feature E3 is another. It would seem most likely that all other sockets have been completely obliterated by surface erosion on the site – as stone holes they in all likelihood were quite shallow and easily dispersed.

The survival of sockets on the western flank of the circle is presumably due to their greater depth in this sector. The two deepest sockets as they survive are indeed the two 'portal' sockets. It is suggested by the writer that this clear bias in the distribution reflects very directly the layout already seen in the main timber circle A and that if we can accept that the depth of stone sockets reflects the height of members supported in them then it would appear that the highest orthostats may have occurred in the S to W quadrants of the circle in so far as it is only in this area that sockets survive and that within this sector sockets progressively deepen so that the portal sockets are deepest of all.

The outer circle postulated on the grounds of the six possible stone holes preserved near the inner lip of the ditch in the NE sector (S'1–S'6) is altogether less certain in that there is no presently standing orthostat to indicate its position or confirm its existence. The sockets are all equally shallow and only in the case of S'3 betrayed any differential stratigraphy. Here as with S1 of the inner circle a patch of much comminuted charcoal lay at the base of the socket.

Cultural and Chronological Aspects. The considerable quantity of grooved ware pottery from the site was found in two principal contexts:

1. Within the sockets of the timbers of main circle A and then very largely within the sockets of the westernmost timbers (Fs A6, A7, A8, A11, A12 & A13).

2. Within the eroded subsoil surface, Layer U2, (possibly packed in undetected features,

possibly a result of trampling) on the western side of the site to the N of the western entrance (see fig 25). In both cases the sherds would appear to be the result of random breakage, in the case of (1) by direct evidence and in the case of (2) by secondary association, prior to the erection of the timber circle on the site. Much of the pottery is burnt or heavily scorched and exhibits evidence of burnt deposits on its interior surface. In general the sherds are unabraded and little weathered. It would appear, therefore, that they constitute evidence of activity on the site immediately prior to the construction of the main timber ring, activity which includes the production of burnt material and breakage of pottery vessels. This activity, whatever its nature, and it included the production of the small surviving quantities of unidentified burnt bone from the site, was apparently relatively confined to the western sector of the interior, indicating once again at this primary stage of the site's use (as witnessed by the archaeological evidence) the importance of this area, later to be emphasised by the more massive members of both timber and stone circles. The pottery collected is exceedingly fragmentary and incomplete, indicating possibly the accidental nature of its inclusion within the archaeologically surviving contexts of the site. Two exceptions to this observation exist. One is the material from F.X2 a pit packed with burnt material including unidentified burnt bone fragments, whence P7 was retrieved, a considerable part of one vessel lacking its rim. It is conceivable that this pit did originally contain an entire vessel as a deliberate deposit (in upright position?) and that attrition by ploughing and erosion has brought about the dispersal of the greater part. Certainly this pit bears no relationship to other structural groupings on the site and of itself produced no evidence of use as a structural base. The second is the high proportion of vessels P8, P11 and P23 retrieved from F.A11.

The assemblage of sherds, discussed by Miss Henshall above, is presumably dated by its close association with charcoals in the pits of the main timber circle, to the last four centuries of the third millennium bc. The assemblage, while exhibiting general similarities with the grooved ware pottery style elsewhere in Britain, would appear to express considerable individuality, not fitting neatly into the framework for the subdivision of this style proposed by Longworth (Wainwright *et al* 1971). Relatively close similarities in detail of pottery decoration and form with assemblages present elsewhere in southern Scotland may indicate the emergence of a relatively localised style, within the broader tradition, restricted to this region. If with the retrieval of further substantial assemblages this should prove to be the case it perhaps should not surprise us unduly.

The higher survival value of the lithic assemblage on the site has inevitably produced a more dispersed pattern of retrieval and a less even and clear contextual picture for this material. None of the stones located on the site, and recognised as subject to human use, need have come from any great distance, apart probably from the polished flint axe – two reused fragments of which were located. Miss Wickham-Jones (see above) has indicated the overall impression of considerable skill on the part of the knappers involved in the production of this limited assemblage and the *ad hoc* nature of much of the working. This latter aspect may well reveal the replenishment of tool kits during working on the site (construction) and the notable lack of specific tool types on the site may be seen as an indicator that persistent and prolonged domestic activity was not a feature of site use. Cultural indicators are consequently few. The barbed-and-tanged point (L99) is imperfectly contexted (located in one of the least persuasive 'features' of the interior Z8) and its condition and appearance would link it most closely to only one other lithic object on the site, a backed microblade (L19), almost certainly an accidental deposition. Within post-socket A9 of the main timber circle however a further lithic type denominated by Miss Wickham-Jones a 'sub-triangular implement' (L71) and most closely approximating to Clark's 'Class D *petit tranchet* derivative' arrowhead typology (Clark 1934), was located. This type set in its more satis-

factory context would be perfectly 'at home' in a late Neolithic setting and the observed occurrence of similar types within the flint scatter located close by the henge at Overhowden Burn, Berwickshire may once again hint at the possibility of local tradition of a wider nature only to be clarified by the retrieval of substantial assemblages from firmly dated sites.

The cultural and chronological connotations of the main timber circle (and possibly its cognate timber arrangement) are Balfarg is thus, to a limited extent, clear. Even this degree of clarity cannot be shed, however, upon the stone construction phases on the site – themselves so sketchily perceived.

No artefacts are to be clearly associated with any features pertaining to putative stone structures on the site. Burning was noted in the base of two 'stone sockets' (S'3 & S1) but so imperfect was the stratigraphic seal in both instances, so likely the use of burning to destroy the stones at any period and so diminutive the samples that it was not considered wise to submit the samples for radiocarbon assay. The date of the putative lithic structures on the site must therefore remain unknown although the stratigraphic relationship between S'3 and timber ring F would indicate that the outer stone setting was later than the outer timber circle. Such a succession of timber giving way to stone is a phenomenon well attested on other henge sites in Britain. At the Sanctuary, Overton Hill, the succession is clearly evidenced stratigraphically, and the stone holes contained, among other forms, presumably casually incorporated, sherds of beaker pottery with comb decoration (Cunnington 1931, 322, pl VII, 2) which mark a cultural 'date' *post quem* this construction took place. Inference of a less clear nature may be drawn from the small beaker (of Clarke's BW type) located within a grave associated with a tightly crouched inhumation right next to and on the inner side of stone hole 12 in the 'Stone and Post ring' on this site. Cunnington points out that the stone hole could scarcely have been dug after the grave and this, if dug after the erection of the stone, would have undoubtedly threatened the stability of the latter, so close is it. She felt able therefore, to indicate a degree of contemporaneity between the two discrete features.

At Mount Pleasant (Wainwright 1979) similarly, we can observe the succession of a timber circle complex associated with grooved ware sherds, in this instance, giving way to a stone-built 'cove'-type structure. The ditch surrounding this complex has a stability horizon within its fill which would appear to coincide with the date of the erection of the secondary stone structure. Fresh sarsen flakes and stone mauls occur on this horizon associated with charcoals which have yielded a radiocarbon determination BM-668 1680 ± 60 bc and beaker pottery in a wide range of decorative styles (AOC, W/MR, N₁/MR, N₁/D, & S2-4 in Clarke's terminology). Given the long life postulated by Case for AOC forms (based, admittedly, to some extent upon the Mount Pleasant dated context: Case 1977) this scholar would see major activity covering the refurbishment of henge monuments concentrated at the junction of his Middle and Late Phases of beaker development in Britain at a date c 1700 bc.

Stonehenge II (Atkinson 1956) is, of course, a further example where lithic construction within a henge is to be associated with the introduction of beaker pottery on to the site and a C14 date 1620 ± 110 bc (I-2384), and here apparently relatively rapid rearrangement of the plan culminates in the construction of Stage IIIA also linked with beaker ceramics and a C14 date 1720 ± 150 bc (BM-46) (sherds of W/MR and S2(W) types from this site are present in Salisbury Museum).

The absence of beaker sherds from the collection located beneath the bank at Avebury and from the primary silt of the enclosure ditch and the presence of weathered beaker sherds from a stakehole associated with Stone-hole D, an oddly placed stone within the southern Inner Circle, might indicate some form of lithic construction at Avebury at a period when beaker pottery was in use or still present on the site.

In southern Britain, then, we can perceive a relatively narrow horizon for lithicisation on the basis of limited radiocarbon evidence, an horizon which is, however, certainly not associated with the initial stages of beaker development as it is at present understood but consistently linked with beaker pottery of predominantly Case's (1977) 'Middle Phase'.

There is of course no evidence whatever to enable us to transmit this chronological evidence to the phase of stone construction at Balfarg as no cultural or chronological evidence exists clearly appertaining to this phase. However, a rehearsal of the evidence from elsewhere may help to set this activity in its broader context.

Unrelated to the stone structural activity on the site and bearing no obvious geometrical relationship with any structural phase, a pit sealed with a slab weighing approximately 1 ton contained the much decayed remnants of a young adult (male?) burial (see Dr D A Lunt above: p 139), a flint knife of unabraded appearance (see Miss Wickham-Jones above: L97) and a handled beaker (P50) placed apparently in upright position before the face and chest of the interment. The affinities, cultural and chronological, of the beaker are discussed above (see p 133) and it will suffice to say at this juncture that on the basis of parallel association this beaker would appear to have been deposited at a date after 1500 bc in terms of uncalibrated radiocarbon chronology. While beaker activity is a relatively common feature on henge sites at a secondary stage in their development (at Hanborough, Oxon (Catherall 1974), Gorse Bigbury, Somerset (Apsimon 1949; Tratman 1966), Avebury (Smith 1965), Durrington, Woodhenge and Stonehenge in Wiltshire, Mount Pleasant in Dorset, Maiden's Grave, Rudston, Yorks, (McInnes 1964) and Llandegai, Caernarvonshire (Houlder 1968), the siting of graves containing beaker material within these monuments is a far less common phenomenon and one largely restricted to Scotland. The only English example of such a grave is, in fact, that from the primary deposit at Fargo Plantation, Wilts (Stone 1939) which by virtue of its size (7.3 m maximum diameter), while it reflects Class II henge monument design, may well have had other connotations. Three pits containing crushed beaker vessels were located just within the lip of the ditch at Llandegai henge B but it is unclear whether these pits contained any form of interment.

Clearly defined examples of beaker interment within henge monuments of stature occur only in Scotland and may thus comprise a further element of regional tradition. Apart from the grave at Balfarg, two graves, sadly neither of them clearly associated with the Stage II henge monument (see above) occur at Cairnpapple, W Lothian. Here one grave set close to 'stone-hole' 8 contained a beaker of Clarke's N/NR series (Clarke 1970, corpus no 1790) and the so-called N grave on the site had placed within it two beakers both of Clarke's N2 series (Clarke 1970, corpus no 1791 & 1792). At Ballymeanoch, Argyllshire (Greenwell 1866) a beaker of Clarke's N3(L) class (Clarke 1970, corpus no 1530) was located within a cist beneath a cairn built within the henge. In no instance, it should be noted, can beaker pottery be held to occur in an incontrovertably primary context in any henge monument either of Class I or of Class II type.

At Strathallan henge (Barclay 1980 & forthcoming) a number of burials in the interior were located during the total excavation of this site only one of which has beaker associations, (Grave E), a cremation grave in a pit accompanied by a beaker. All the remaining accompanied burials on the site were associated with food vessels or contained within inverted collared urns set again within pits. However, once again a late beaker involvement in henge burial is upheld. One of the food vessel burials, Grave A, and a further unaccompanied interment, Grave B, were located in cists placed in deeply stepped pits with a stone slab cover set well down into the pit upon the step. It has been suggested (see above) that this arrangement may have existed in the case of the beaker burial at Balfarg – the cover slab here being sited well below the original, now eroded, land surface. This arrangement also appears to have been present at Dryburn Mains,

East Lothian (Triscott 1979 & forthcoming) where burials were associated with food vessel pottery forms. It may be that here we are in the presence of the emergence of a localised burial tradition at the tail end of the period of beaker grave furnishment fashion when food vessel forms are attaining dominance. Again uncalibrated radiocarbon chronology would justify a date shortly after 1500 bc for such a development.

The Relationship with the stone circle and cairn at Balbirnie

The proximity of the stone circle and cairn excavated by Dr J N G Ritchie in 1972 (Ritchie 1974) prompted then the statement that 'it is an attractive hypothesis to imagine the Balfarg-Balbirnie complex as the ceremonial centre for the region extending in date from about 3000 BC (2300 bc) to the beginning of the 2nd millennium BC (1300 bc)'. Nothing located during the excavations at Balfarg during 1977-78 would render this thesis any less attractive today. However the examination of the henge may have produced evidence enabling the relationship between the two monuments to be assessed on a less informal basis. The primary phase of the Balbirnie stone-circle is linked to the first detected series of structural events at Balfarg by the occurrence in both contexts of grooved ware associated with burning – at Balbirnie cremation burials within the stone holes were located. Miss Henshall (see above) has indicated that other sherds uncertainly attributed at Balbirnie in 1974 may now also be assigned to this class in the light of her study of the Balfarg pottery. These latter sherds emanate from a probably derived context in the make-up of the Phase 3 cairn. Both monuments may therefore be seen to develop from the same culture-base. Unfortunately no radiocarbon evidence is available from the first phase at Balbirnie, but Ritchie points to the prevalence of stone-hole and pit cremation in the latter half of the third millennium bc – pointing to the secondary standing stone dug into the turf mound at Pitnacree (Coles & Simpson 1965, 38) the socket for which contained cremated bone and much charcoal yielding a radiocarbon assay 2270 ± 90 bc (GaK-602). The other salient feature of Phase I at the Balbirnie stone circle was, of course, the rectilinear central feature set within the circle. No clear parallel existed for this feature at Balfarg but Ritchie, again in his discussion (1974, 9-10), relates this type of structure to henges elsewhere where similar or related features occur and, indeed, expanded this inventory by his own work at Stenness in Orkney (Ritchie 1976).

Phase II sees the setting within the centre of the stone circle at Balbirnie of a series of four cists and a further burial deposit. None of these cists follow the 'stepped' pattern suggested for the original form of the cist at Balfarg. Only two remained intact and one produced upon excavation a food vessel and flint knife accompanying the cremated bones of an adult female and a child. Lying on the natural subsoil 2 m from the SW corner of the central rectilinear setting rested a crushed beaker of Clarke's Late Southern (S4) type lying between two charred planks and associated with a single jet disc bead. This beaker would sit well, on the typo-chronological bases proposed by both Clarke (1970) and Lanting and van der Waals (1972), as a near contemporary of the handled beaker located within the central cist at Balfarg and it is interesting to note the radiocarbon date obtained from the charred timbers associated with the Balbirnie beaker of 1330 ± 90 bc (GaK-3425) – a date perhaps just a little later than would be applied to such a vessel on typo-chronological grounds. This second phase of activity at Balbirnie can perhaps be seen as correspondent to the emplacement of a central cist at Balfarg on grounds of the close relationships of the furniture with these interments. If this tenuous link is accepted then GaK-3425 may perhaps furnish a further hint as to the date of this latest phase of activity at Balfarg.

There is no evidence for activity on the site of the Balfarg henge after this stage but at Balbirnie the site appears to be incorporated within a new monument – a cairn of medium and

small-sized boulders which is constructed after the cists of Phase II have been opened and robbed. This cairn is associated with the deposition of substantial quantities of cremated human bone representing 16 or more individuals in scattered 'caches' within its structure. These cremations were in turn apparently associated with sherds of urn pottery with both collared and cordoned forms being present. This later phase of activity at Balbirnie perhaps indicates that a change of tradition has taken place at a point some time after 1500 bc. Within the new tradition the great henge monument had no place and was abandoned, as most of its peers appear to have been abandoned at this time, whereas the smaller stone circle at Balbirnie was after destruction of existing burials on the site 'converted' by its incorporation within the cairn to become a funerary site of a rather different kind.

One other site must attract our attention before drawing to a close this aspect of this discussion. This is the site at Meldon Bridge near Peebles excavated by Colin Burgess (Burgess 1976). The site is not a henge monument and has been described by the excavator as a 'Neolithic defended promontory complex'. The defences comprise a row of massive timbers stretching across the promontory between the Lyne Water and the Meldon Burn with small timber sockets interspersed with the larger forming the foundations for that which the excavator interprets as a massive palisade. Only a very few of the timber sockets are ramped in order to facilitate the erection of the vertical members and these are apparently concentrated in the northern (uphill) sector of the palisade as excavated. Here the comparison of socket depth to ramp length (see above) indicates timbers 3.10 m–3.50 m in length with socket depth to present ground surface of 1.10 m–1.20 m – a ratio of approximately 1:3 (see above).

Two important aspects of this vastly important site have direct bearing upon the information retrieved from Balfarg – its date and its associated cultural assemblage. Two of the sockets of the timber palisade on the western side have produced material yielding radiocarbon assays.

Har-796 2330 bc ± 80 (burnt wood at the base of feature B3).

Har-797 2150 bc ± 130 (charcoals from the packing of feature D2).

It will immediately be noted that these dates are statistically indistinguishable from the dates for the construction of the main timber ring A at Balfarg and for those from the ditch and central features at Stenness, Orkney. Within the limits of archaeological inference it may be suggested that these sites all bear a very close chronological relationship one to another. The interest of this observation becomes apparent when the contrasting material assemblages from the sites are juxtaposed. At both Stenness and Balfarg grooved ware is the totally dominant form in the primary contexts of these sites. At Meldon Bridge not a single sherd of grooved ware has been located but within a number of pits on the interior surface of the enclosure vessels have been found, linked to the palisade by virtue of their associated chronology, which appertain to distinct pottery styles. A glimpse may thus be caught of the complexity, social, functional and cultural, which may lie concealed behind the contrasting pottery styles which form such a salient feature of the British late Neolithic and the early Bronze Age.

The excavation at Balfarg has demonstrated the existence of a henge monument in southern Fife of unorthodox layout which does not allow ready placement within Piggott's twofold classification. Set within the ditch in its earliest structural phase is a circular timber monument with its closest parallels in southern Britain – although these parallels, on the basis of radiocarbon chronology, are recognisably later in date. In common with the similar monuments in Wessex this early timber phase at Balfarg is intimately associated with the deposition of a ceramic form with related forms distributed throughout the British Isles – grooved ware. The chronological disparity of this monument with those further South (a position held in common with Stenness) poses one problem for the future. The cultural disparity of the site with other sites ostensibly of similar date and

perhaps related design is a further problem. The solution to both may lie in the investigation of sites at present only recognised as shapes on air photographs. But the association of what appear to be hengiform monuments with a palisade of Meldon Bridge type (St Joseph 1976) at Forteviot, Perthshire may present a way forward in this particular enquiry.

The timber monument at Balfarg was of uncertain duration but at some point appears to have been replaced by a stone circle, a sequential development paralleled, again, in the South, which also remained upon the site for an unknown period of time. Its life as a ritual focus may well have ended before it too became derelict – ultimately to survive only as two monoliths in a flat meadow. Again at an uncertain point within that process a young person, possibly male, was buried in a pit covered with a slab within the monument. This interment was accompanied by a late variant of a vessel within the beaker tradition.

With this final act, archaeologically visible and datable by virtue of its distinctive ceramic association, the 800 radiocarbon years life of this monument draws, in so far as we can perceive it, to a close. Thenceforward decay and destruction point inexorably to the condition in which it is recognised from the air as a henge monument in 1947. It is a measure of the fascination which this class of monument has commanded for millennia that it is now to be respected, its ditches recut in their uppermost layers, its orthostats re-erected, as the recreation area of a modern settlement. It is to be hoped that its new role is as long lived and as demanding upon human potential as its former role appears to have been.

ACKNOWLEDGMENTS

Firstly I must thank the Scottish Development Department for making available the funds for excavation and post-excavation work which have made the project possible, and their Inspector of Ancient Monuments, Patrick Ashmore, for his support and advice. I must thank Dr Graham Ritchie for free access to material associated with the Balbirnie Stone Circle and its excavation. To Dr Anthony Harding of the University of Durham I offer my thanks for generous access to the Milfield henge report prior to its publication (Harding 1981) and to Dr D V Clarke for advice in the preparation of this report. Further I must thank Mr Gordon Barclay (Central Excavation Unit, SDD) for free access to his own excavation records from the henge site at North Mains, Strathallan, Perthshire prior to his own publication (Barclay forthcoming). I must also thank most warmly the officers of the Glenrothes Development Corporation, notably Mr G Leitch and Mr G Reid, without whose active assistance the execution of the project would have been in very many ways a great deal more difficult if not impossible. My gratitude is also due to Professor Bruce Proudfoot of St Andrews University whose vital assistance with complex and, to the excavator, baffling geomorphological difficulties on the site solved a great many problems. The writer must also thank a number of scholars who have given their time and effort to the consideration of various problems relating to the site – Dr Graeme Whittington (pollen), Dr Dorothy Lunt (human dentition), Miss Audrey Henshall (ceramics), Mrs Camilla Dickson (charcoal identification), Miss Caroline Wickham-Jones (flintwork), Miss Mary Harman (burnt bone) and Messrs Pare and Nebelsick for their attention to geophysical and soil survey. The staff of the Glasgow University Department of Chemistry radiocarbon dating laboratory have promptly furnished the determinations published within this report and I am grateful to Dr Michael Stenhouse for his assistance in this connection. The staff of the National Museum Conservation Laboratory also deserve my thanks, particularly Lesley Nock who so skilfully restored the handled beaker from the central cist. For the time-consuming analysis of the soil-dug features of the site I

am much indebted to James Brock (then research assistant within the Department of Archaeology) and David Williams of the Department of Statistics, University of Edinburgh. James Brock and Miss Jane Blair executed all of the drawings which elucidate this report, with the exception of those illustrating the pottery which are the work of Miss Henshall.

Finally I must thank my site supervisors Miss Alison McIntyre, Mrs Marjorie Kenworthy, Mrs Fiona Christie Boyle, Mrs Magdalena Midgley, Miss Sharon Dixon, Mr Ewan Horne and Mr James Brock, for bearing with the difficulties of the site and pay tribute also to over 100 volunteers both local and from far afield who worked on an extremely difficult subsoil under often rigorous conditions. My wife cooked for and managed the domestic aspects of the excavation to most excellent effect. Last, but by no means least, I would wish to thank Messrs Menzies & Co Ltd and my machine driver on the site Geordie Nicholson whose skills and professionalism made possible much of what was done.

All recorded information relating to the excavation at Balfarg – drawings, site documents, site notebooks – has been deposited with the National Monuments Record, 54 Melville Street, Edinburgh where it has been accessed under the index number 1980/8 and Drawing nos FID/459. Much information (for example details of all soil features) not published here for reasons of space, and economy (and humanity) is available within this archive.

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The Society is indebted to the Scottish Development Department (Ancient Monuments) for a grant towards the cost of this paper.



a Feature E 27



b Barbed-and-tanged point



c The handled beaker