EXCAVATIONS AT KNOWTH

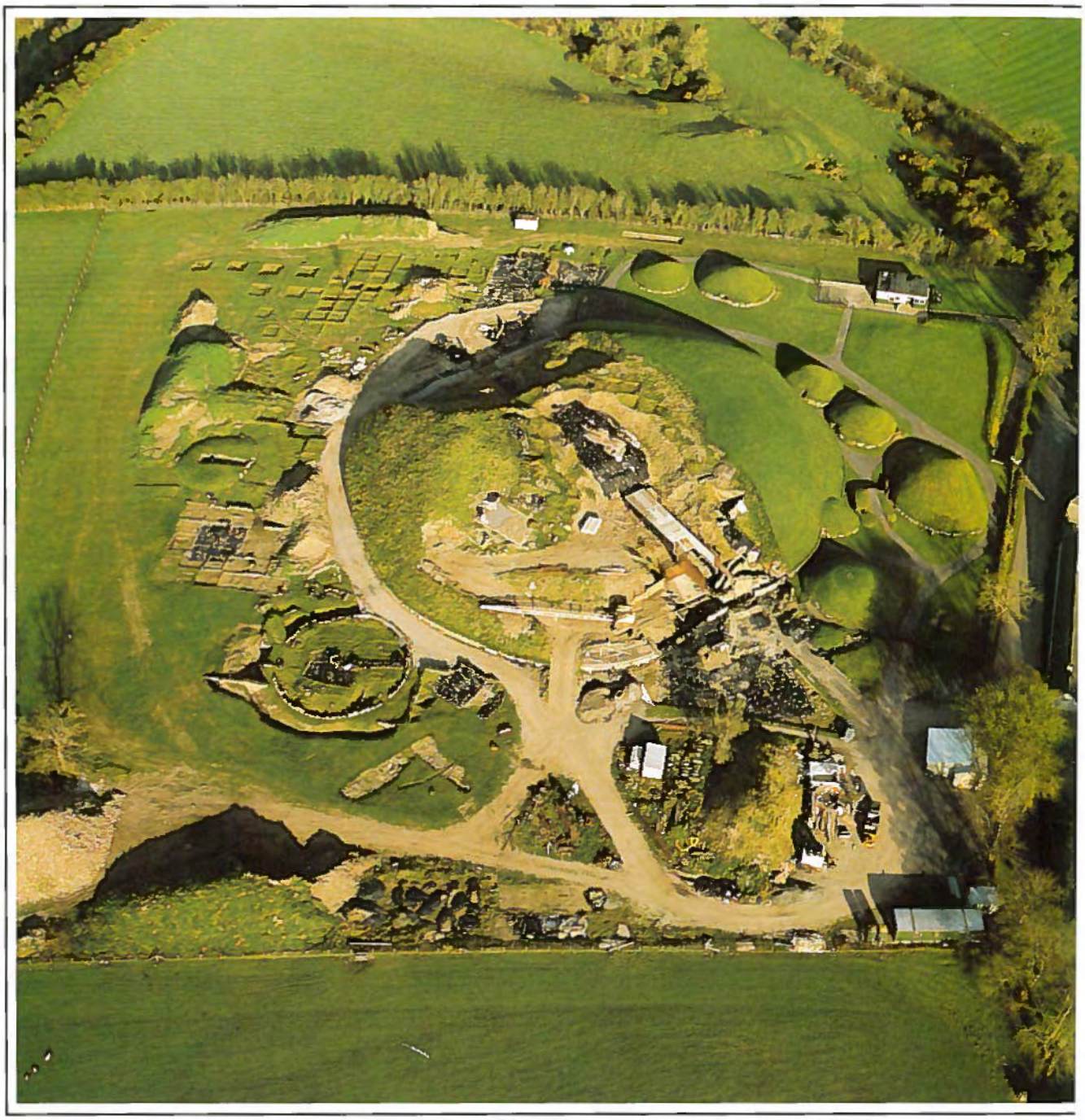
George Eogan

EXCAVATIONS AT KNOWTH 2

For

FRANK MITCHELL

in appreciation and with gratitude



Frontispiece. Aerial view of Knowth from south-east, showing the conserved portion of the site to the north; the area still under excavation and conservation is in the foreground 1995. Photo: (Mr. C. Brogan).

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EXCAVATIONS AT KNOWTH 2

Settlement and Ritual Sites of the Fourth and Third Millennia BC

GEORGE EOGAN and HELEN ROCHE

With contributions by Fiona Dillon, James Brindley, Edward Bourke, Brenda Collins and Finbar McCormick

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ACHOIMRE

Baineann an tuarascáil seo le gnéithe de na tréimhsí is luaithe de ghníomhaíocht daonna ag Cnodhbha. Cuireadh tús leo nuair a tháinig daoine a raibh nós na feirmeoireachta acu ar an láthair, agus sa tréimhse ina dhiaidh sin, beagnach 2000 bliain ar fhaid, faightear roinnt forásanna agus athruithe, ceann i ndiaidh a chéile. Léirítear sé cinn de chéimeanna mar seo i ndiaidh a chéile, ach i gcás céimeanna 3–4 is dhá leagan den choimpléasc céanna iad, an Coimpléasc de Photaireacht Mhaisithe.

1. ***Coimpléasc Luath Neoiliotach 'Iartharach'.*** Is é atá ann spás i gcóir tithe, 75m x 25m ar a laghad i méid. Faightear sraith úmais liathdhoinn ann. Tá iarsmaí structúrtha de chodanna de dhá theach dhronuilleacha, nó níos mó, agus i measc na n-earraí faightear arthaigh bhonnchruinne ghuailneacha a bhfuil fonsaí simplí orthu. Ní dhearnadh tochailt ach i gcuid den spás seo toisc gur chlúdaigh Uaimh 1 an fuíleach.

2. ***Compléasc Déanach Neoiliotach 'Iartharach'.*** Rinneadh tochailt ar chuid mhór den ionad cónaithe seo atá an taobh thiar den láthair agus foilsíodh tuairisc faoi in *Tuarascáil 1984* (Imleabhar 1). Is dócha gur teach fo-dhronuilleach i bhfoirm a bhí sa ghné is luaithe. Bhí dhá phailis mar fhálta timpeall ar spás a bhí 90m–100m trasna. B'fhéidir gur luaithe an ceann istigh agus gur fairsingiú atá sa cheann amuigh a chuaigh trasna an structíur fho-dhronuilligh. Leagan forbartha de chré-earraí neoiliotacha iartharacha a bhí sa photaireacht a fuarthas. Déantar trácht sa tuarascáil seo ar roinnt giotaí potaireachta a dtángthas orthu ó shin.

3. ***Coimpléasc de Photaireacht Mhaisithe: Uirlisí Tí.*** Sa chás seo freisin ní dhearnadh tochailt ach i gcuid den láthair mar dá ndéanfaí a thuilleadh oibre chaithfí cuid mhór den tulach in airde ar Uaimh 1 a bhaint amach. Aitríodh an limistéar go forleathan. Fuarthas fianaise as deich dtheach ar a laghad, gach ceann acu ciorclach. Ina measc fuarthas potaireacht 'Carrowkeel' agus potaireacht leathanfhonsach.

Maidir le srathú na cré is luaithe an t-áitreabh seo ná na huaimheanna (Céim 4) ach ar an ábhar go bhfuil potaireacht 'Carrowkeel' ann léirítear ionannas cultúrtha eatarthu araon.

4. ***Coimpléasc de Photaireacht Mhaisithe: Deasghnách.*** Ní phléitear an chéim seo sa tuarascáil seo ach luaitear anseo í toisc go léiríonn sí tréimhse chinnte ar leith ar baineadh úsáid as an láthair. Baineann sí seo leis an am ar tógadh na huaimheanna agus ar baineadh leas astu (Eogan 1984, 13–209; 1986).

5. ***Coimpléasc de Chré-earraí gearrtha.*** Tá beagán fianaise áitrithe ann ach faightear an chuid is mó den ábhar ó structúr deasghnách a bhí ciorclach i gcruth agus 9.11m x 8.10m trasna. Fáinne de chúig pholl is tríocha i gcóir cuaillí a bhí ann. Bhí an oscailt ar an taobh thoir. Rinneadh seo le cuaillí a bhí níos mó agus a thuilleadh cuaillí mar phóirse. Léiríonn ceithre chuaille ar an taobh istigh go raibh díon ar an structúr seo. Bhí na hearraí a fuarthas, potaireacht agus breochloch, go mórmhór scríobairí cruinne agus scríobairí boinn déanta as breochloch a baineadh as ábhar cailce ó oirthuaisceart na hEireann, caite timpeall na gcuaillí go hordúil agus go gréasach.

6. *Coimpléasc Bíocarach.* Foilsíodh trácht ar cheithre bhailíuchán de photaireacht bhíocarach. Léirigh tuilleadh taighde go raibh gné de chré-earraí gearrtha ag bailiúchán A agus go raibh bailiúchan D níos léithne ag síneadh soir agus ag luí lastuas de structúr na gcré-earraí gearrtha. Thángthas ar an gcúigiú bailiúchán (E) le déanaí ach ní dhearnadh amach cé chomh fairsing agus atá sé toisc go bhfuil iarsma de theach iar-Mheánaoiseach nár baineadh amach go fóill lastuas de. Taobh amuigh de chlaiseanna éadoimhne agus láithreacha teallaigh ní bhfuarthas aon fhianaise áitrithe sna bailiúcháin bhíocaracha. Dá ainneoin sin b'fhéidir gur iarsmaí áitrithe iad.

Idir an Aois Bhíocarach agus Aois Déanach an Iarainn níl aon fhianaise de ghníomhaíocht daonna ag Cnodhbha.

SUMMARY

This report is concerned with aspects of the earliest stages of activity at Knowth. These commenced with the arrival of people who practised farming, and the ensuing period, which was close to 2000 years in duration, is characterised by a series of developments and changes down to about 2000 B.C. Six successive stages are represented, but Stages 3–4 are two phases of the same complex, the Decorated Pottery Complex (Fig. 1).

1. *Earlier 'Western' Neolithic Complex*, located on the northern side of the hill-top, consists of an area of domestic activity, at least 75m by 25m in size. It is defined by a grey–brown humus layer. The structural remains consist of parts of two or more rectangular houses, and the artefacts include round-based shouldered vessels with simple rims. Only a portion has been excavated as the remainder was covered by Passage Tomb 1.

2. *Later 'Western' Neolithic Complex*. A large portion of this settlement, which is mainly on the western part of the site, has already been excavated and published in the *1984 Report* (*Volume 1*). The earliest feature, sub-rectangular in form, was probably a house. An area 90–100m in diameter was enclosed by two palisades. The inner one may have been the earliest, the outer, which extended across the sub-rectangular structure, may represent expansion. The pottery was a developed form of 'Western' Neolithic ware. Some further finds of pottery sherds which subsequently came to light are included in this report.

3. *Decorated Pottery Complex: domestic activity*. Again only a portion has been excavated, on the eastern and north-eastern side of the hill-top. To continue further work would entail removing large areas of the mound of Passage Tomb 1. Settlement was extensive. Evidence for at least ten possible houses came to light, all of which appeared to have been circular. Associated finds include Carrowkeel and Broad-rimmed pottery vessels and flint.

Stratigraphically, this settlement pre-dates the passage tombs (Stage 4), but the presence of Carrowkeel ware indicates cultural homogeneity between both.

4. *Decorated Pottery Complex: ritual*. This evidence was found throughout the site and is associated with the building and use of passage tombs. Seventeen smaller tombs have been published (Eogan 1984, 13–209; 1986). The main mound will constitute a separate publication.

5. *Grooved Ware Complex*. There is slight evidence for settlement on the northern and southern side of the hill-top. However, the bulk of the material comes from a ritual structure, circular in plan and 9.11m by 8.10m in external diameter, consisting of a ring of thirty–five post-pits. This circle is located 12m east of the entrance to the eastern tomb of Site 1. The circle also had its entrance on the east side, formed with larger posts and flanked with posts that represented a porch. The presence of four internal posts suggest that the building may have been roofed. The finds, pottery and flint, mainly round and end scrapers made from flint derived from the chalk deposits in north-eastern Ireland, were found within the post-pits.

6. *Beaker Complex*. Already four concentrations of Beaker pottery and flint have been published. These were located on the northern, southern, eastern and western areas of the site. Subsequent work has shown that there was also a Grooved Ware element at Concentration A, while Concentration D has proved to be more extensive, extending in part eastwards and overlying the Grooved Ware structure. A fifth Concentration (E) has recently come to light, on the south-eastern area of the site. The extent has not been determined because part of it is overlain by the remains of a Post-Medieval house, which have not been removed. Apart from shallow pits and fireplaces no evidence for structures has come to light in any of the Beaker concentrations. Nevertheless, these concentrations may have been the remains of settlements.

There is no definite evidence for activity at Knowth between the Beaker and Later Iron Age stages.

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CHAPTER I

INTRODUCTION

Excavations at Knowth (Frontispiece; Pl. I) have demonstrated that there was a long sequence of human activity at the site over millennia with an unexplained gap during the Bronze and Early Iron Ages (Eogan 1991). The sequence is largely based on comparative archaeological evidence.

Stratigraphy is limited and so are C14 determinations. The small number of C14 dates is due to a number of factors. Despite the large area excavated, only limited potentially reliable dating material came to light. In part, this is due to a scarcity of usable material, but also to the unreliability of samples. At least for charcoal this can be attributed to the possibility of contamination arising out of the long sequence of activity on the site. However, work over recent seasons has produced reliable samples and it is hoped that dates for these will become available shortly.

In pre-Bronze Age times, there was a succession of six main stages – Earlier 'Western' Neolithic, Later 'Western' Neolithic, Decorated Pottery – Passage Tomb Complex (firstly settlement and later the tombs), Grooved Ware and Beaker (Fig. 1). The terminology employed is that in current use and is based on pottery assemblages. The interpretation of each stage is generalised; for instance the 'Western' Neolithic is divided into two but the overall archaeology of that period in Ireland may have been more complicated. Furthermore, it is not known how long each complex endured or if there was a period of abandonment between them. The term 'Decorated Pottery Complex' has not hitherto been used, although decorated wares have been isolated and studied by Michael Herity (1974, 137–44; 1982), who considered them as relating 'to a tradition unified in time, space and environmental preference' (1982, 248). The presence of sherds of Carrowkeel Ware and Broad-rimmed Ware in the same layer at Knowth and also at Townleyhall II (Eogan 1963, 40–2, 51–61) indicates contemporary use of both wares and also links domestic and ritual activities into a single complex. As will be further discussed, wider implications arise out of this evidence. Broad-rimmed Ware integrates the Knowth settlement into a wider array of developments, notably other settlement sites, for example the 'Sandhills' sites, and another type of megalithic structure, the individual burials of the Linkardstown tomb type, and as secondary grave-goods in court

tombs and portal tombs. Decorated wares are widely dispersed spatially but also have a range and diversity of uses, which differ even within the broad categories of habitation and ritual (Sheridan 1995).

While the term Grooved Ware has been well-established in Britain since the mid-1930s, only the recent excavation of the circular wooden structure at Knowth, with its sealed Grooved Ware assemblage, has made it possible to consider the presence of a definite complex in Ireland. Activity by Beaker people has, of course, for long been recognised, but its context varies from grave-goods in megalithic tombs of the wedge-shaped class to settlement.

A feature of the excavations was the discovery of habitation evidence for all stages. In 1984 the first of a projected series of monographs was published. This was a report on Later 'Western' Neolithic, Beaker settlements and on seventeen passage tombs (Eogan 1984). Since then, extensive new evidence for settlement has emerged; it is this, together with a ritual building that can be assigned to the Grooved Ware Complex and some contemporary material, that constitutes the subject matter of this report. In order to comprehend and interpret the evidence from each phase as a whole, a summary of the settlement material that has been already published will be included; in addition this material will be taken into account in the overall discussion and evaluation.

Textual conventions

The finds have been deposited in the National Museum of Ireland by the Commissioners of Public Works. The Registration Number is E70, followed by the individual number for each find; throughout the text the digits E70 will be omitted. Regarding the presentation of finds, throughout this report they will, in the first instance, be listed after the relevant structure or feature so as to provide associated evidence. This will be followed by a detailed catalogue. Unless otherwise stated only featured or decorated pottery sherds are illustrated. These are presented at a half size unless otherwise indicated. Sherd numbers are quoted individually but joining sherds, for example 1200/6758, are described together and are counted as one sherd in the total numbers. In describing colour of fabric the convention orange/grey/orange is used to describe the colour of the exterior/core/interior of the fabric. Fabric was examined visually and the density of grit is described generally as being low, moderate or high; the apparent largest grit from each vessel was measured and is shown as (< = Xmm). In the case of pottery sherds, and all other artefacts, if a Figure number is not provided, it may be assumed that the object is not illustrated.

Dates, where possible, are referred to as radiocarbon years BP, followed by the laboratory number and then by a calibrated range at two sigma. The dates were calibrated using the Calib radiocarbon calibration programme (1987) – datasets based on Pearson and Stuiver (1986, 839–62).

The natural setting of Knowth

As the setting has already been discussed by G.F. Mitchell (Eogan 1984, 9–11), only a summary of the published results will be included. The archaeological site occupies the summit of a low hill that is slightly above the 200ft/60.96m contour (Eogan 1984, fig. 2). It is part of the western end of a shale ridge that constitutes much of the base geology of the area within the bend of the Boyne, Brugh na Bóinne. Subsequently, as a result of glacial action, the shales were covered by a layer of boulder clay, while lower down in the river valley gravels were deposited. The soils that emerged were grey-brown podzols, which in time were most suitable for agricultural purposes. From the end of glacial times there would have been continuous vegetational growth, so that, by the time the first farmers arrived, the area was heavily forested with deciduous trees which, by providing a canopy, would have prevented the growth of scrub. The shale ridge may also have had a lighter tree growth than that existing in its immediate neighbourhood. Nature would have provided pioneering farmers with ample natural resources such as timber, wild animals, fish, an accessible supply of water and – especially significant – potentially rich farming land.

Key to sections:

Earlier 'Western' Neolithic Complex, Decorated Pottery Complex and Beaker Complex.

- Humus
- Soft dark earth
- Redeposited boulder clay
- Dark brown earth
- Redeposited shale
- Natural: Shale/boulder clay
- Charcoal
- Black layer, Beaker Complex
- Ashy material
- Burnt earth
- Grey layer
- Yellow earth
- Iron pan
- Black layer, Decorated Pottery Complex
- Grey-brown humus, Earlier Western Neolithic Complex

CHAPTER II

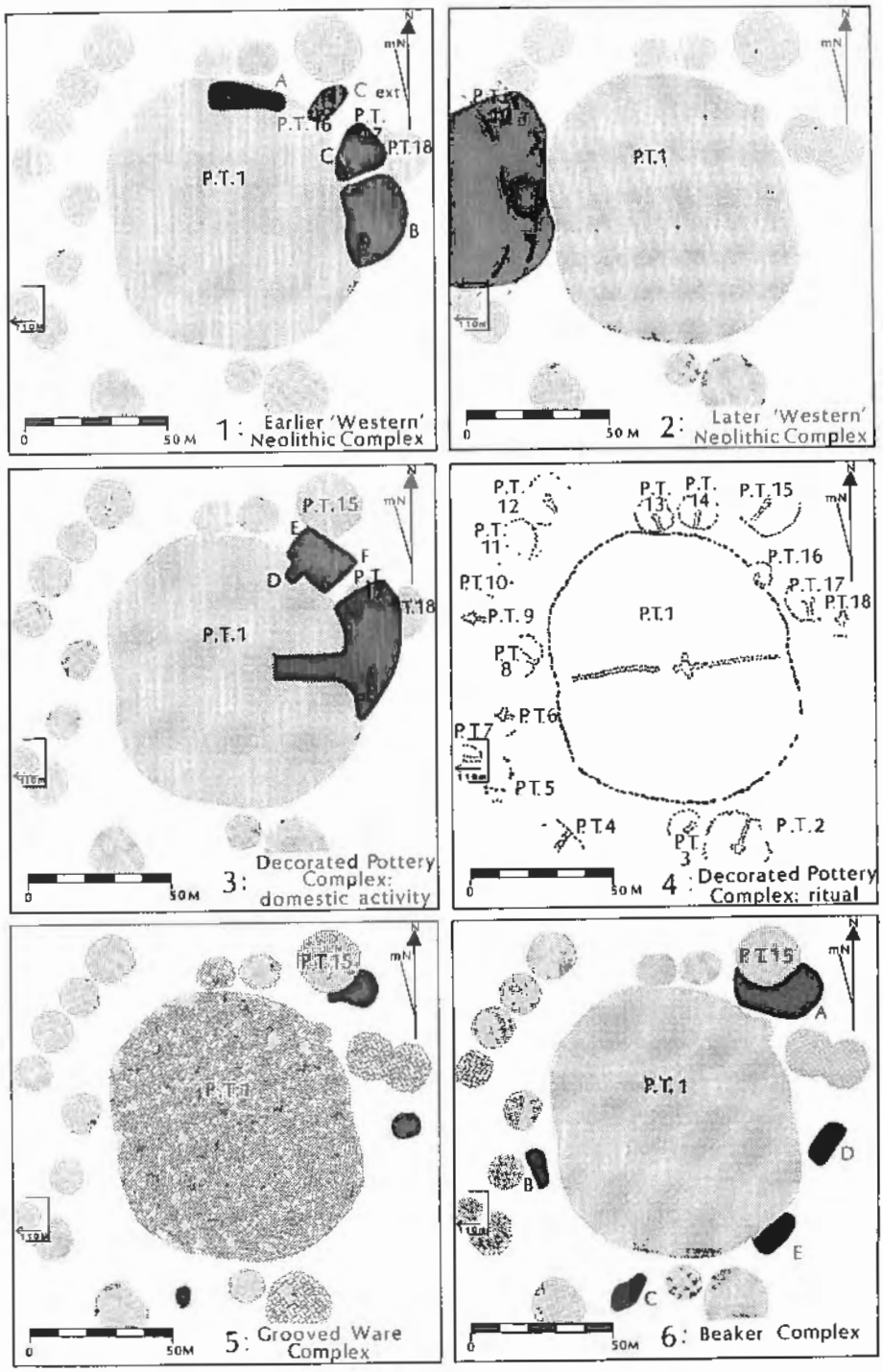
'WESTERN' NEOLITHIC COMPLEX

Introduction

As there is yet no definite evidence for Mesolithic settlement in this area of the Boyne Valley, it can be assumed that the first farmers constituted the earliest inhabitants. They were part of the Earlier 'Western' Neolithic cultural complex. Subsequently Neolithic settlement at Knowth became extensive, prolonged and varied. Previous excavations have established that there was a substantial Later 'Western' Neolithic habitation (Eogan 1984, 210–44). Recent work has uncovered further evidence for settlement, and of considerable significance is the fact that this is Earlier Neolithic and therefore pre-dates the material already excavated. The newly discovered settlement was found in an area about 46m to the north-east of the previously excavated Later 'Western' Neolithic site (Fig. 1: 1 and 2).

The distinction between Earlier and Later 'Western' Neolithic, as well as indications for a chronological succession, are based on the fact that there is no evidence for continuity, spacially or stratigraphically, between the settlement in the north-eastern area of the hill-top (Earlier 'Western' Neolithic) and that in the western area (Later 'Western' Neolithic). There is also a contrast between the finds from both areas. The pottery forms in use during the Earlier 'Western' Neolithic were round-based, shouldered vessels, with a simple rim, generally out-turned and rounded but sometimes bulbous or pointed; the shoulders were simple-angled. The fabric is poor in quality with a flakey, friable texture. This type of pottery can be compared to the *Dunmurry-Ballymarlagh styles* as defined by Case (1961, 175–7). The flint assemblage is also poor, with few tools being represented. Round-based, shouldered vessels were also used during the Later 'Western' Neolithic occupation on the site, but these vessels differ in form and fabric from the earlier assemblage. In general, the later pottery appears to be of better quality. The fabric is hard and in most cases 'corky' in texture. The form of the vessels is more developed, with elaborate T-headed rims and exaggerated, stepped or pointed shoulders. They compare well with the *Lyles Hill style* as defined by Case (1961, 178–80). The flint assemblage is also more accomplished and includes round and side scrapers. These differences suggest the presence of two separate and successive assemblages.

Fig. 1. Location of monuments and features of the six stages, 1–6 (Earlier Neolithic–Beaker) at Knowth (grey shading indicates position of passage tombs; dark shaded areas represent the combined extent of habitation debris or features and the spread of relevant finds which define Stages 1–3, 5–6).



1. Earlier 'Western' Neolithic complex (Figs. 2–3; Pls. 1–2)
Evidence for this stage, excavated during 1989–1990, is solely provided by the remains of domestic activity. A principal feature of this is a discontinuous layer of grey-brown earth, 75m by 25m and averaging 3cm deep but, as an unknown portion is covered by the mound of Passage Tomb 1, its extent has not been determined. With the exception of charcoal flecks, this material was sterile. As a result, it is likely that it represents a naturally-formed humus layer which was subsequently interfered with by the domestic activity, such as people trampling over it. In all areas it is directly on the natural boulder clay. The layer was best preserved when protected by later features, such as Passage Tombs 1, 16, 17 and 18. These areas with the greatest evidence of activity are termed Zones A–C (Fig. 1: 1). Zones A and B contained trench features (1–7), which represent the foundations for at least one house in each zone; in Zone C there was evidence for a spread of pottery and flint.

Zone A: Foundation trench features and associated material (Fig. 2; Pls. 1–2)
This area, situated on the north–eastern part of the hill-top, was subsequently covered by portion of the large mound of Passage Tomb 1. A limited area of the mound was removed in the course of excavation, but it was not possible to uncover the complete area of activity. Further excavation would have involved the removal of a sizeable portion of the large mound. Such an action was not considered advisable as the considerable portions which had already been investigated provided adequate information on its structure. The area available for excavation was also limited by subsequent activity. At some time after the settlement had gone out of use, but prior to the building of Passage Tomb 1, a trench, running in an east-west direction was dug through the area (see p. 15). Subsequently, during the early first millennium AD, Passage Tomb 1 was transformed into a defended settlement (publication pending). This involved the digging of a ditch around the base immediately behind the kerbstones. At that time part of the settlement was destroyed.

Three foundation trenches for one or more buildings, probably domestic structures (F.T. 1–3), came to light. They were cut through the layer of humus and extended into the underlying natural material. A thin grey sticky layer, 1cm thick, overlay the settlement. This can be interpreted as a naturally formed sod which accumulated over the houses after abandonment. As only portions of these trenches were exposed, it is difficult to interpret their exact nature, or whether one or more houses are represented. Foundation trenches 1 and 2 are parallel and therefore would appear to represent the side walls of a rectangular house. However, there are differences between the two. Trench 2 is curved at either end, as if it were part of a sub-rectangular house, whereas, from the exposed section of the eastern end of trench 1, it would appear to have run in a straight line. The other

Plate 1. Earlier 'Western' Neolithic domestic structure(s) on northern part of hill-top, Zone A. Part of the overlying mound of Passage Tomb 1 is visible. The uneven surface on the bottom left is a portion of the Late Iron Age ditch that surrounds the base of Passage Tomb 1.

difference is that regularly-spaced, deep post-holes, were found within trench 1 and only two shallow stake-holes were found in the eastern end of trench 2. Trench 3 is structurally similar to trench 1, and would appear to represent the eastern wall of a house, with the gap between the two trenches representing a doorway. Yet trench 3 is not perpendicular to trench 1 but is positioned at an angle to it, therefore making it difficult to explain the relationship between the two. As definite evidence for a straight-forward house plan is lacking, each trench will be discussed separately.

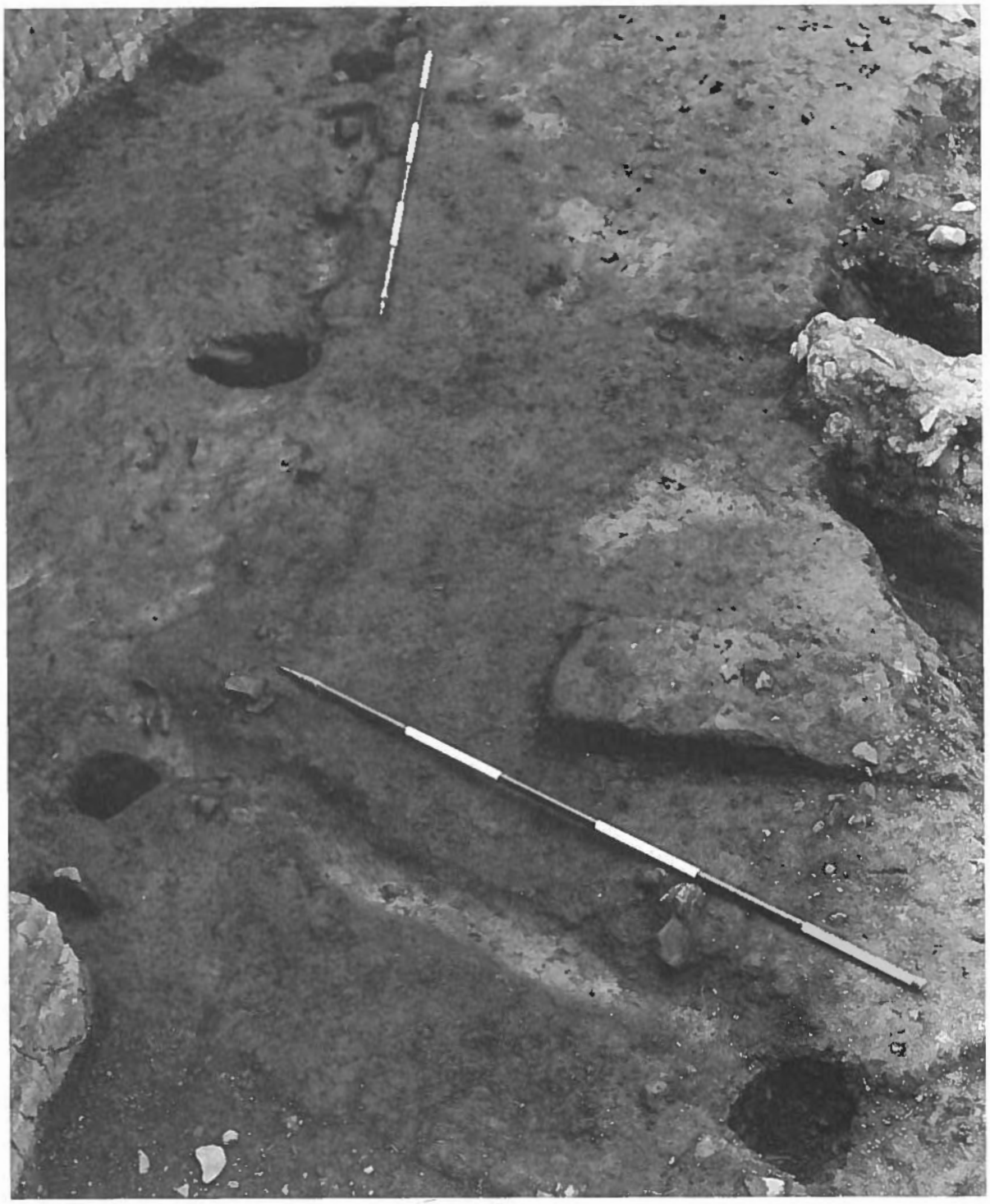
Foundation trench 1

This feature was on the south-western side of Zone A; its extent was only partly exposed, as the overlying mound was not removed at the western end. The excavated portion was 3.70m long and averaged 27cm wide by 14cm deep. The surface edges were irregular but the base tended to be flat. The fill consisted of a mixture of charcoal-rich clay and stones. Two C14 determinations, derived from charcoal samples from the trench, 5080±20 BP (GrN–20179) 3975–3789 cal BC, and 5040±15 BP (GrN–20180) 3948–3784 cal BC, place this feature firmly within the Earlier 'Western' Neolithic. Two large post-holes (1–2) were found within the trench, a third (3) was immediately outside its eastern end and a fourth (4) was located 42cm to the south of the trench. The post-holes were almost circular in shape and their dimensions indicate that they could have supported roof timbers. Post–hole 1 was on the limit of the excavated area and was only partly excavated; no. 2 measured 31cm by 27cm by 45cm deep; no. 3, 42cm by 28cm by 50cm and no. 4, 30cm by 27cm by 44cm. Their fill consisted of a gritty brown sticky earth with charcoal flecks and several packing stones averaging 20cm in diameter. No artefacts were recovered from the post-holes but the area immediately south of the trench produced two trimming flakes (5733a–b) and an unutilised flake (5783).

Foundation trench 2

This was 5.50m to the north of trench 1. The surviving portion, 7.80m long, is curved at both ends. It is regular in shape, averaging 33cm wide by 12cm deep. The fill consisted of gritty clay and small stones, measuring up to 9cm; gaps among the stones suggest that they may have acted as props for upright wall timbers. Two stake-holes (nos. 5–6) were found at the eastern end of the trench. Because of their small size – average 7cm by 8cm by 9cm deep – they could not have held heavy load-bearing timbers. A gap, 90cm wide, at the north-west corner, is probably a doorway. Just outside the opening was a spread of red ash, 1m by 63cm and less than 1cm deep. In view of its proximity to the doorway and the absence of evidence for burning *in situ*, it seems that the ash represents throw-out from internal hearths (see below). A pit (P.1), 77cm by 72cm by 41cm deep, is located 1.45m north-east of the trench. The fill consisted of a sterile mixture of loose moist boulder clay and brown earth.

Plate 2, left. Earlier 'Western' Neolithic domestic structure(s) on northern part of hill-top, Zone A. Trench 3 in foreground, Trench 1 to left.
Plate 2, right. Earlier Western Neolithic pits, Zone A, area 4, square 1a.



Finds: from fill of trench

Pottery:
*Note: The symbol * indicates that sherds from an individual vessel were found in different locations.*

Vessel 6: 2 bodysherds 5495, 5502 (* Zone A: hearth 1; within and immediately south of trench 3 and grey-brown humus layer).

A fragment (5695) too small to be assigned to a vessel.

From immediately north of the trench

Flint:
2 *unutilised flakes*: 5768–9.
Retouched flake: 5821.

Only a limited area was available for excavation between trenches 1 and 2; evidence for occupation consisted of two areas of burning. Both were very faint but may represent hearths, marked H.1 and H.2 on plan (Fig. 2). Hearth 1, 76cm by 44cm by 2cm deep, was located 1.40m north of trench 1, and was oval; only the faintest trace, consisting of burnt earth and red ash, survives. The second hearth, 49cm by 60cm, was found 96cm west of trench 3. Again the evidence was very faint, the burnt earth and ash being only 1cm deep. The only other feature found in this area was a narrow trench, marked 'T' on plan, 24cm long by 8cm deep.

From area close to hearth 1

Pottery:
Vessel 1: bodysherd 5454 (* Zone A: hearth 2; and immediately south of trench 3).

Vessel 5: bodysherd 5484 (* Zone A: immediately south of trench 3; fill of post–hole 7).

Vessel 6: 3 bodysherds 5492, 5498, 5501 (* Zone A: trench 2; within and immediately south of trench 3; grey-brown humus layer).

3 fragments (5696) too small to be assigned to vessels.

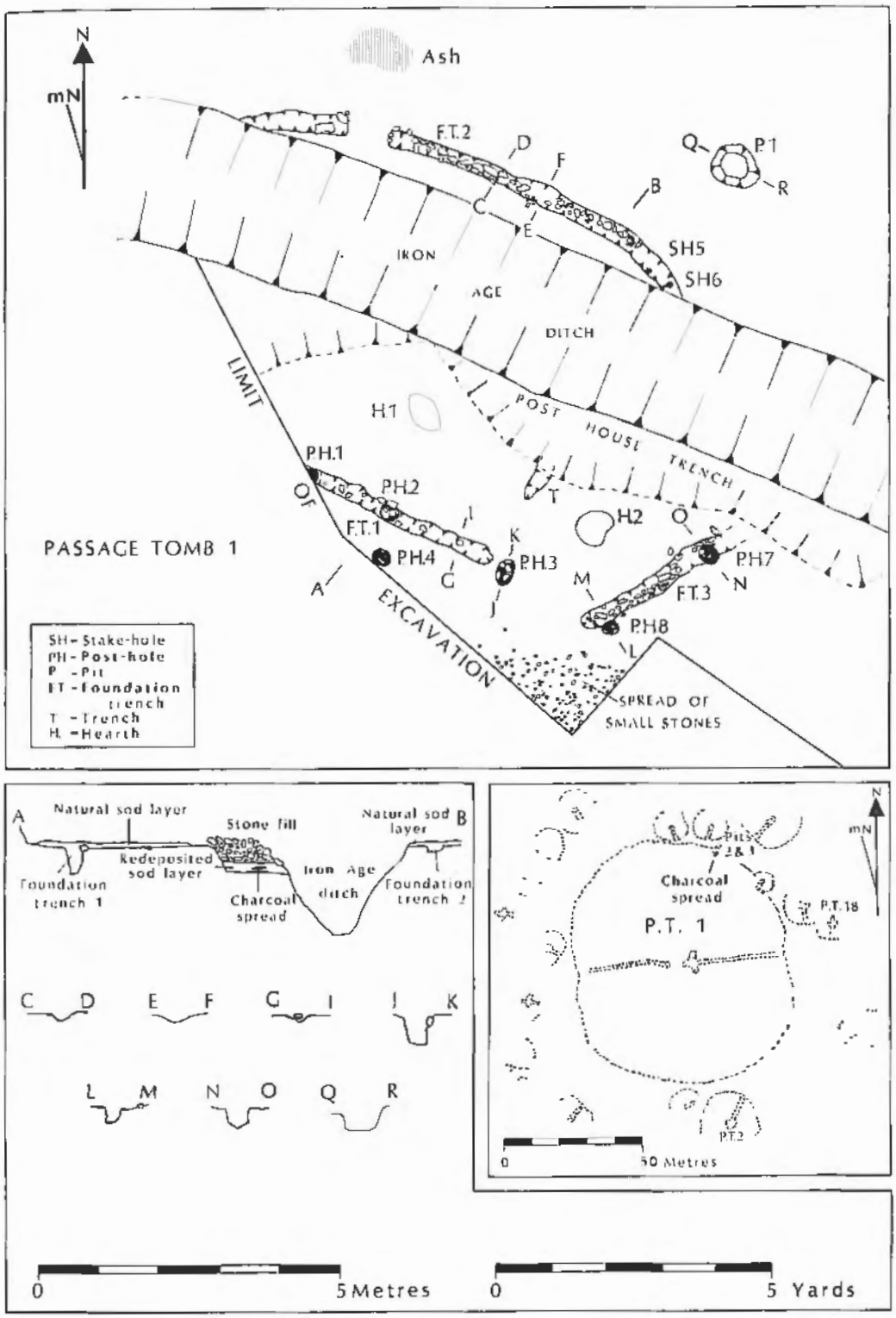
Flint:
Core rejuvenation flake: 5719.
Trimming flake: 5725.
2 *unutilised flakes*: 5766–7.
Chip: 5826.

From hearth 2

Pottery:
Vessel 1: rimsherd 5450 (Fig. 4), (* Zone A: hearth 1 and immediately south of trench 3).

Vessel 3: 2 rimsherds 5469 (Fig. 4), 5470.

Fig. 2. Earlier 'Western' Neolithic settlement: domestic structure(s) and their location on northern part of hill-top (Zone A).



Vessel 4: shoulder sherd 5472 (Fig. 4), bodysherd 5476, (* Zone A: immediately south of trench 3; grey-brown humus layer).

2 fragments (5697) too small to be assigned to vessels.

Foundation trench 3

This was 1.30m from the eastern end of trench 1; the surviving portion is 2.84m long. In width and depth it was similar to trench 1, and two post-holes (7 and 8) were also found within it. No. 7, which was situated on the eastern edge of the trench, was 33cm by 28cm by 25cm deep; no. 8 was 25cm by 22cm by 30cm deep. Both could have supported timbers of load-bearing weight. A spread of occupation debris consisting of dark organic earth and small stones was found approximately 60cm south of the trench and appears to be contemporary with it. It was only possible to excavate part of this area as the remainder was covered by Passage Tomb 1.

Finds: from fill of foundation trench

Pottery:

Vessel 2: (Fig. 4) rimsherd 5462, shoulder sherd 5463 (* Zone A: immediately south of trench 3).

Vessel 6: 2 bodysherds 5497, 5500 (* Zone A: trench 2; hearth 1; immediately south of trench 3; grey-brown humus layer).

Vessel 40: bodysherd 5692 (* Zone A: immediately south of trench 3; grey-brown humus layer).

12 fragments (5698–9) too small to be assigned to vessels.

From fill of post–hole 7

Pottery:

Vessel 5: 2 bodysherds 5482–3 (* Zone A: hearth 1; immediately south of trench 3).

From occupation debris south of trench 3

Pottery:

Vessel 1: 2 shoulder sherds 5451–2 (Fig. 4), 8 bodysherds 5453, 5455–61 (* Zone A: hearths 1 and 2).

Vessel 2: 5 bodysherds 5464–68 (* Zone A: trench 3).

Vessel 4: rimsherd 5471 (Fig. 4), shoulder sherd 5473, 4 bodysherds 5474, 5478–80 (* Zone A: hearth 2; grey-brown humus layer).

Vessel 5: rimsherd 5481 (Fig. 4), 4 bodysherds 5485–7, 5584 (* Zone A: hearth 1; fill of post–hole 7).

Vessel 6: rimsherd 5488 (Fig. 4), bodysherd 5505 (* Zone A: trenches 2 and 3; hearth 1; grey-brown humus layer).

Vessel 7: rimsherd 5508 (Fig. 4), 4 bodysherds 5509–12.

Vessel 8: rimsherd 5513 (Fig. 4).

Vessel 9: rimsherd 5514 (Fig. 4), 2 bodysherds 5515–16.

Vessel 10: 2 rimsherds 5517, 5519 (Fig. 4), shoulder sherd 5521, 4 bodysherds 5524–6, 5518.

Vessel 12: bodysherd 5529 (* Zone G: Decorated Pottery Complex in disturbed context).

Vessel 13: shoulder sherd 5530.

Vessel 14: 2 bodysherds 5532–3 (* Zone A: post-house trench).

Vessel 39: 2 rimsherds 5673–4 (Fig. 5), 8 bodysherds 5675–82.

Vessel 40: bodysherd 5694 (* Zone A: trench 3; grey-brown humus layer).

24 fragments (5700–1) too small to be assigned to vessels.

Trench post-dating house (Fig. 2)
As mentioned above, only portion of this feature was excavated as the northern side was destroyed by the digging of the late Iron Age ditch, and the remainder was covered by the large mound. The excavated portion was 11m long, up to 60cm deep and just over 1m wide. It runs in an east-west direction, but as the western end turns sharply to the south and the eastern end turns sharply northwards, it is difficult to interpret whether it continued in an east-west direction or curved to form a circular feature. It is clear from the nature of the fill that it did not silt up naturally, but was deliberately filled with a layer of sod material 15cm deep, which in turn was covered by a layer of stones 39cm thick. A small spread of charcoal possibly representing a hearth, 47cm by 45cm by 5cm deep, was found within the sod layers. Because of the limited area available for excavation, the function of this trench has not been established. Its date is also ambiguous, the only pointer being two bodysherds of Earlier 'Western' Neolithic pottery found at the base of the trench (vessel 14: 5531, 5534; * Zone A: immediately south of trench 3). As the natural sod layer which sealed the Earlier 'Western' Neolithic features does not occur over the trench (Fig. 2), it appears that the trench dates from a later stage of activity, but before the construction of Passage Tomb 1. If that were the case, the sherds of Earlier 'Western' Neolithic could have been accidentally incorporated in the fill.

Associated features, eastern section of Zone A (Fig. 2)
The natural grey-brown humus layer extended eastwards for 17m and averaged about 8cm deep. Within it were two pits (P.2–3), a spread of charcoal (due to their small size neither feature is included on the

detailed ground plan) and a scattering of pottery and flint. Pit 2, 12m to the north-east of trench 3, measured 45cm by 35cm by 10cm deep and contained a mixture of boulder clay and stones. No. 3, 10.5m to the north-east of trench 3, 44cm by 39cm by 8cm deep, had a fill of earth and charcoal. A spread of charcoal, 60cm by 40cm by 6cm deep was found close to it. A C14 determination of 5885±45 BP (GrN–18773) 4900–4683 cal BC was obtained from the spread. This is considerably earlier than the C14 dates from trench 1 and for equivalent settlement sites elsewhere, such as Newtown, Co. Meath, where charcoal samples from the foundation trench of the house yielded dates between 3971–3706 cal BC and 3936–3697 cal BC (Gowen and Halpin 1992, 25). It is therefore possible that the sample was contaminated with older charcoal which might have been derived from natural burning.

In an isolated location, 6.2m to the north-east of the eastern section of Zone A, pit features were found (Pl. 2, right). The first pit exposed was 76cm by 1.04m and 61cm deep, and the fill consisted of moist gritty clay with small stones throughout. This pit was cut on the eastern side by another pit, 1.84m by 1m and 29cm in maximum depth, and a small scoop, 27cm by 26cm and 12cm deep, had been cut into its base. The fill was similar to the former pit. The upper portion of both pits was cut by a post-Medieval drain. Directly to the north, a third, shallower pit was found, 95cm by 93 cm and 25cm deep; again the fill consisted of moist, gritty clay with small stones. Although these features are somewhat outside Zone A and finds were not found in association with the pits, they may be looked upon as Earlier 'Western' Neolithic in date, as all were cut from the old ground surface.

Finds: from grey-brown humus layer

Pottery:

Vessel 4: 2 bodysherds 5475, 5477 (* Zone A: immediately south of trench 3; hearth 2).

Vessel 6: 10 bodysherds 5489–91, 5493–4, 5496, 5499, 5503–4, 5506 (* Zone A: trench 2; within and immediately south of trench 3; hearth 1).

Vessel 15: 10 bodysherds 5536-45 (* Zone C: grey-brown humus layer).

Vessel 40: rimsherd 5683/5684 (Fig. 5), and a fragmented rimsherd 5685, 7 bodysherds 5686–91, 5693 (* Zone A: within and immediately south of trench 3).

63 fragments (5702, 5707) too small to be assigned to vessels.

Flint:

Split pebble: 5713.
12 *trimming flakes*: 5720–4, 5726–32.
30 *unutilised flakes*: 5739 (Fig. 5), 5740–43, 5745–7, 5750–65, 5770–2, 5778–80.

Unutilised blade: 5737.
5 *utilised flakes*: 5803, 5806–9.
Utilised blade: 5802 (Fig. 5).
End scraper: 5813 (Fig. 6).
Side scraper: 5815.
Round scraper: 5816.
Invasively retouched flake: 5817 (Fig. 6).
Edge-trimmed blade: 5818.
2 *edge-trimmed flakes*: 5819–20 (Fig. 6).
2 *retouched flakes*: 5822–3.
Chip: 5825.
2 *flint fragments*: 5831–2.

Zone B: foundation trenches and associated material
The full extent of this zone was not determined as only portion of the overlying mound of Passage Tomb 1 was excavated and other areas were disturbed by Iron Age and Early Christian activity. The exposed portion of the western part of the zone was rectangular and measured 26m by 20m. Pottery sherds and flint were found scattered throughout the grey-brown humus layer.

Pottery: From the grey-brown humus layer
Vessel 31: shoulder sherd 5642 (Fig. 5), 8 bodysherds 5643–50 (* Zone H: Decorated Pottery Complex in disturbed context).

Vessel 36: 3 bodysherds, one of which is a false rim, 5507, 5669–70.
10 fragments (5704) too small to be assigned to vessels.

Flint:
Unutilised flake: 5784.

Foundation trenches 4-7 (Fig. 3)
Portions of four trenches (nos. 4–7) came to light in the southern and northern areas of Zone B. Nos. 4–6 were close to each other, no. 7 was some distance away to the north. Owing to the limited area that survived, it was difficult to distinguish the sequential relationship between them. However, their structural resemblance to the foundation trenches in Zone A and the fact that they contained the same type of finds suggest that they are contemporary and possibly the remains of one or more houses.

Trench 4. The uncovered portion measured 1.70m long by 13cm wide (on average) and 12cm deep. The southern end had been destroyed by activity at a later, indeterminate time. Because there was evidence for extensive Beaker activity at a higher stratigraphic level in this area (Eogan 1984, 245–322: Concentration D), perhaps the damage took place during the Beaker period of occupation. The north-western end of the trench was covered when a spread of quartz associated with the use of Passage Tomb 1 accumulated. The fill, which consisted of

gritty clay with charcoal flecks and stones, yielded fragments of Earlier 'Western' Neolithic pottery. A spread of grey-brown humus material extended eastwards from the trench for a distance of 2m by 2.50m. A hearth (H.3) containing ash and burnt earth, 54cm by 53cm by 4cm deep, was found 56cm to the west of the trench. A charcoal spread, 36cm by 19cm by 2cm deep, was found 1.6m west of the trench.

Finds: from the fill of trench 4

Pottery:
Vessel 27: shoulder sherd 5624 (* Zone G: Decorated Pottery Complex in disturbed context).

Vessel 29: bodysherd 5633 (* Zone H: Decorated Pottery Complex in disturbed context).

Flint:
Utilised flake: 5805.
Trimming flake: 5736.

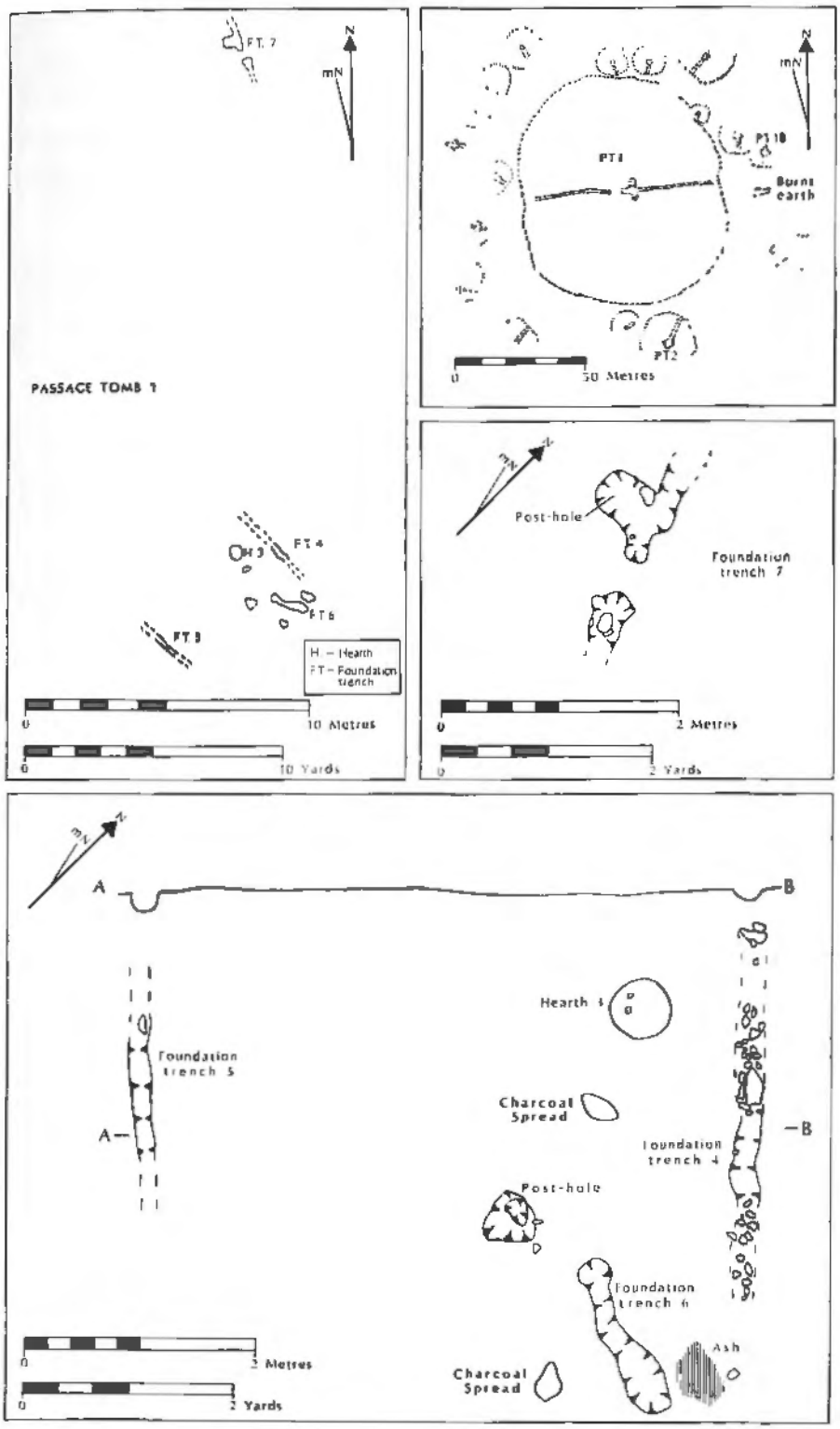
Flint: From the grey-brown earth associated with trench 4
Leaf-shaped arrowhead: 5811 (Fig. 6).
Unutilised blade: 5738.
3 *unutilised flakes*: 5749, 5788–9.
Chip: 5830.
7 *unworked quartz fragments*: 5835–5841.

Trench 5 survives for a length of 2m, the digging of the late Iron Age ditch (see p. 7) having destroyed the remainder. The surviving portion measured 12cm wide and 10cm deep. The fill consisted of charcoal-flecked brown earth and a few packing stones. Trenches 4 and 5 are similar in form and their north-west/south-east alignment indicates that they could be part of a single house. No artefacts were recovered.

Trench 6, 70cm long by 18cm wide (maximum) by 15cm deep, was located 74cm south of Trench 4. The fill consisted mainly of charcoal. Almost aligned with the trench but located 25cm to its west was a single post-hole, 23cm by 22cm by 40cm deep. Its charcoal fill yielded a C14 determination of 5345±20 BP (GrN–20181) 4324–4045 cal BC, which is earlier than those from foundation trenches 1–3. An ash spread, 58cm by 46cm by 2cm deep and a charcoal spread, 36cm by 23cm by 1cm deep, were found to the east and west of the trench at a distance of 6cm and 54cm respectively. No finds were directly associated with this feature. However, a number of flint pieces were found on the old ground surface just south of the trench and it can be assumed that they are associated with this feature. 3 *cores* 5716–18, a *trimming flake* 5735, 13 *unutilised flakes* 5748, 5790–5801, an *end scraper* 5814, 3 *chips* 5827–9 and 2 *irregular fragments* 5833–4.

Trench 7, although located approximately 15m north of trench 6, it was on the same stratigraphic level. The surviving portion is only

Fig. 3. Earlier 'Western' Neolithic settlement: domestic structure(s) and their location on eastern part of hill-top (Zone B).



1.85m long and averages 20cm wide and 19cm deep. The rest was destroyed by subsequent activity during the Early Christian period. The fill consisted of stones and charcoal-rich earth. A large post-hole, 45cm by 40cm by 42cm deep, situated in the western edge of the trench, contained charcoal-rich earth and stones.

Finds: from fill of trench

Pottery:
5 fragments (5703) too small to be assigned to vessels.

Finds: associated with trench 7

Flint:
Leaf-shaped arrowhead: 5812 (Fig. 6).
2 *cores*: 5714 (Fig. 5), 5715.
Trimming flake: 5734.
3 *unutilised flakes*: 5785–7.
Utilised flake: 5804.
Chip: 5824.

Eastern area of Zone B: (Fig. 1: 1)
The grey-brown humus layer was also detected in the eastern limits of this zone. Again it was immediately above the old ground level, was 1cm–3cm deep and contained small stones. Three areas of burnt earth were detected, one of which measured 16cm by 25cm in diameter and contained three unutilised flint flake fragments, of which two are burnt (7210a–c). The other patches of burnt earth had been cut by post-pits 2 and 19 of the subsequent Grooved Ware structure. Only one sherd of pottery was found in the grey-brown humus layer in this area, a simple-angled shoulder sherd (vessel 38, no. 5871).

Zone C: (Fig. 1: 1)
This extensive layer of grey-brown humus material was well defined, 17m by 9m by 2.5cm thick. No associated features were found but a substantial number of pottery sherds were found within the layer.

Finds: from grey-brown humus layer

Pottery:
Vessel 15: a bodysherd 5535 (* Zone A: grey-brown humus layer).

Vessel 16: 9 bodysherds 5547 (Fig. 4), 5548, 5550–6 (* Zone G: Decorated Pottery Complex in disturbed context).

Vessel 17: rimsherd 5557 (Fig. 4), 3 bodysherds 5559, 5560, 5562 (* Zone C: western extension).

Vessel 18: rimsherd 5564 (Fig. 4), 2 bodysherds 5572–3 (* Zones G and H: Decorated Pottery Complex in disturbed contexts).

Vessel 19: rimsherd 5574, shoulder sherd 5575 (Fig. 5), 3 bodysherds 5577–9 (* Zone C: western extension).

Vessel 20: 3 bodysherds 5581, 5583, 5586 (* Zone G: Decorated Pottery Complex in disturbed context).

Vessel 22: bodysherd 5599 (* Zone G: Decorated Pottery Complex in disturbed context).

Vessel 24: rimsherd 5618 (Fig. 5).

Vessel 26: shoulder sherd 5623 (Fig. 5).

Western Extension – Limited area of activity immediately west of Zone C (Fig. 1.1)

A thin layer of the grey-brown humus material, 2.4m by 4m and up to 1cm thick, was found in this area. No features were found, but Earlier 'Western' activity was represented by 12 sherds of pottery and 9 flint pieces within the layer. Because of the limited nature of the activity it is not looked upon as a separate zone, but as the western extension of Zone C.

Finds: from grey-brown layer

Vessel 17: 3 bodysherds 5558, 5561, 5563 (Zone C: grey-brown humus layer).

Vessel 19: bodysherd 5576 (* Zone C: grey-brown humus layer).

Vessel 23: bodysherd 5617 (* Zone G: Decorated Pottery Complex in disturbed context).

7 fragments (5705–6a–c) too small to be assigned to vessels.

Flint:

8 *unutilised flakes*: 5744, 5773–7, 5781–2.
Utilised flake: 5810.

Earlier 'Western' Neolithic artefacts found in a disturbed context in Zones G and H

As will be fully discussed in the next chapter, the grey-brown humus layer in Zones B and C was overlain by malleable black, charcoal-rich earth, representing subsequent occupation on the site by the Decorated Pottery Complex. However, some Earlier 'Western' Neolithic sherds were found within this later material in Zones G and H (pp. 60–71). As the Earlier 'Western' Neolithic stage was succeeded by a Later 'Western' Neolithic phase, although on a different part of the hill

(see below), and as there is no evidence to indicate an overlap between the two phases, it may be inferred that there was a chronological gap between the Earlier 'Western' Neolithic and the Decorated Pottery Complex. The intervening stage was the time of Later 'Western' Neolithic occupation. It is, therefore, unlikely that pottery of Earlier 'Western' Neolithic type found in the dark material was in use at the same time as the Carrowkeel and Broad-rimmed Wares. A likely explanation is that the Earlier 'Western' Neolithic pottery is in a secondary position as a result of disturbance. Zones B and C would have experienced intense activity during the Decorated Pottery Complex, not only in the erection and renewal of a number of houses but also in the subsequent building of passage tombs, especially 1, 17 and 18. This tomb building would have involved considerable soil disturbance, including interference with the grey-brown humus layer. In addition, owing to the soft nature of the Decorated Pottery Complex occupation layer, the Earlier 'Western' Neolithic sherds could have been easily incorporated into it. Accordingly, these sherds are being interpreted as originally belonging to the Earlier 'Western' Neolithic settlement but, as a result of disturbance, became displaced and incorporated into the later Decorated Pottery Complex occupation layer and features in Zones G and H (Zone G overlies Earlier 'Western' Neolithic Zone C and Zone H overlies Zone B). In view of this proposed explanation, they will be included in this chapter.

Zone G: Earlier 'Western' Neolithic Pottery in disturbed contexts, from Decorated Pottery Complex layer and features:

Decorated Pottery Complex occupation layer

Pottery:

Vessel 11: shoulder sherd 5520 (Fig. 4), 2 bodysherds 5522–3.

Vessel 16: rimsherd 5546 (Fig. 4), bodysherd 5549 (* Zone C: grey-brown humus layer).

Vessel 20: rimsherd 5580 (Fig. 5), 2 bodysherds 5587–8 (* Zone G: pit 1, pit 3; Zone C: grey-brown humus layer).

Vessel 21: shoulder sherd 5592 (Fig. 5), 2 bodysherds 5593–4 (* Zone G: pit 1).

Vessel 22: rimsherd 5596 (Fig. 5), 2 bodysherds 5597–8 (* Zone C: grey-brown humus layer).

Vessel 23: rimsherd 5600 (Fig. 5), shoulder sherd 5601, 13 bodysherds 5602–9, 5611–13, 5615–16 (* Zone G: pit 5; Zone C: western extension).

Vessel 25: rimsherd 5619, shoulder sherd 5620 (Fig. 5), bodysherd 5622 (* Zone G: pit 3).

Vessel 27: 4 bodysherds 5625–8 (* Zone B: fill of trench 4).

Vessel 28: 2 bodysherds 5629–30.

39 fragments (5710–5711) too small to be assigned to vessels.

Fill of pit 1 (see p. 61)

Vessel 12: (Fig. 4) rimsherd 5528 (* Zone G: trench 8; Zone A: immediately south of trench 3).

Vessel 20: 2 bodysherds 5582, 5585 (* Zone G: occupation layer and pit 3; Zone C: grey-brown humus layer).

Vessel 21: rimsherd 5591 (Fig. 5), bodysherd 5595 (* Zone G: occupation layer).

2 fragments (5708) too small to be assigned to vessels.

Fill of pit 3 (see p. 61)

Pottery:

Vessel 20: bodysherd 5589 (* Zone G: occupation layer and pit 1; Zone C: grey-brown humus layer) .

Vessel 25: (Fig. 5) shoulder sherd 5621 (* Zone G: occupation layer).

Fill of pit 5 (see p. 61)

Pottery:

Vessel 23: 2 bodysherds 5610, 5614 (* Zone G: occupation layer; Zone C: western extension).

1 fragment (5709) too small to be assigned to a vessel.

Trench feature 8 (see p. 61)

Pottery:

Vessel 12: (Fig. 4) rimsherd 5527 (* Zone G: pit 1; Zone A: immediately south of trench 3).

Hearth E (see p. 61)

Pottery:

Vessel 18: bodysherd 5571 (* Zone H: occupation layer; Zone C: grey-brown humus layer).

Zone H: Earlier 'Western' Neolithic Pottery in disturbed contexts, from Decorated Pottery Complex occupation layer:

Vessel 18: rimsherd 5565 (Fig. 4), 5 bodysherds 5566–70 (* Zone G: hearth E; Zone C: grey-brown humus layer).

Vessel 29: rimsherd 5631 (Fig. 5), bodysherd 5632 (* Zone B: fill of trench 4).

Vessel 30: rimsherd 5634, shoulder sherd 5635 (Fig. 5), 5 bodysherds 5636–40.

Vessel 31: (Fig. 5) rimsherd 5641 (* Zone B: grey-brown humus layer).

Vessel 32: 8 bodysherds 5651–8.

Vessel 33: rimsherd 5659 (Fig. 5), 2 bodysherds 5660–1.

Vessel 34: rimsherd 5662 (Fig. 5), bodysherd 5663.

Vessel 35: 5 bodysherds 5664–8.

Vessel 37: 2 bodysherds 5671–2.

10 fragments (5712) too small to be assigned to vessels.

FINDS: detailed description and catalogue

Introduction: **Pottery**

Of the 246 sherds forming this assemblage, most were fragmented, unfeatured bodysherds and many were poorly preserved and abraded. It is estimated that the remains of 40 vessels are present. This estimate is based on the featured sherds and on the nature of the fabric. Twenty-eight separate vessels are represented by individual rimsherds but the remaining vessels, consisting only of unfeatured sherds, should be regarded as probable vessels. The main vessel type represented in the assemblage is an undecorated, round-based shouldered pot of the *Dunmurry-Ballymarlagh styles* (Case 1961, 175–7). In addition there were the remains of two plain unshouldered bowls (Herity 1987, 148–9).

The ware of the shouldered bowls consists of a hard fabric between 35mm and 115mm thick, with a moderate to high grit content mainly of quartzite, sandstone, shale, fine greywacke and one example of grog (Appendix 1, p. 272). They range from orange to dark brown. Vessels 1, 3, 17, 22, 35 and 37 show evidence for burnishing. Neither sooting or burning was detected on any sherds. One bodysherd was decorated with a horizontal incised line on its exterior surface (vessel 16: 5547 – Fig. 4).

Evidence for plain unshouldered bowls consists of 21 sherds but these only constitute two vessels (vessels 39 and 40 – Fig. 5). The fabric is hard; vessel 40 has a smooth chalky texture. They are between 64mm and 87mm thick and have a low to moderate grit content, with inclusions similar to those mentioned above. The colour ranges from orange to dark brown.

The assemblage has close affinities to another Earlier 'Western' Neolithic house site in County Meath, that at Newtown (Gowen and

Halpin 1992, 25–7) and from other domestic sites further afield, such as Feltrim Hill, Co. Dublin (Hartnett and Eogan 1964, 20, fig. 9); Ballyglass, Co. Mayo (Ó Nualláin 1972, 55, fig. 3) and Ballynagilly, Co. Tyrone (ApSimon 1969, 167; 1976, 20, fig. 5).

Catalogue

Including pottery found in disturbed contexts in Decorated Pottery Complex Zones G and H. These zones overlie Earlier 'Western' Neolithic Complex Zones B and C.

Vessel 1 (Fig. 4) rimsherd 5450, 2 shoulder sherds 5451–2 and 9 bodysherds 5453–5461 (Zone A). Out-turned rim, slightly rounded and pinched back against the exterior wall of vessel, with simple-angled shoulder. Hard compact fabric with a moderate grit content (< = 1.0mm). Exterior surface is smooth and may have been burnished. Colour: Dark brown/grey-black/grey-black. Estimated rim diameter 165mm. T. 4.7–6.2mm.

Vessel 2 (Fig. 4) rimsherd 5462, shoulder sherd 5463 and 5 body sherds 5464-5468 (Zone A). Out-turned, pointed rim with simple-angled shoulder. Hard fabric but very porous with a moderate grit content (< = 1.2mm). Abraded, especially the exterior surface. Colour: brown/grey/dark brown. Estimated rim diameter 175mm. T. 5.0–6.2mm.

Vessel 3 (Fig. 4) rimsherd 5469 and rimsherd fragment 5470 (Zone A). Part of the exterior surface of the rim is missing but it appears to be out-turned and rounded. Hard compact fabric with a moderate grit content (< = 1.3mm). Exterior surface is smooth and probably burnished. Colour: dark orange throughout. T. 7.0mm.

Vessel 4 (Fig. 4) rimsherd 5471, 2 shoulder sherds 5472-3, no. 5473 is not illustrated, and 7 bodysherds 5474–80 (Zone A). Possibly not all from the same vessel but the fabric is too similar to enable distinction. The rim is beaded, and the shoulder is simple-angled. Chalky fabric with a high grit content (< = 5.0mm). The sherds are abraded with gritty and uneven surfaces. Colour: pale orange throughout. T. 6.0–6.4mm.

Vessel 5 (Fig. 4) rimsherd fragment 5481 and 6 bodysherds 5482–7, 5584 (Zone A). The exterior surface of the rim is missing but it appears to be out-turned and rounded. Hard, compact but slightly chalky fabric with a moderate grit content (< = 1.0mm). The exterior surface is burnished. Colour: brown/grey-orange/grey-orange. T. 5.2–5.7mm.

Vessel 6 (Fig. 4) fragmented rimsherd 5488 and 18 small, poorly preserved bodysherds 5489–5506 (Zone A). Only the interior surface

of the rim survives but it appears to be out-turned and rounded. The fabric is abraded and very friable with a high grit content (< = 5.5mm). Colour: grey-orange throughout. T. 7.5–8.0mm.

Vessel 7 (Fig. 4) rimsherd 5508 and 4 bodysherds 5509–12 (Zone A). The rim, abraded and damaged, appears to be out-turned and rounded. The fabric is friable and chalky with a high grit content (< = 3.8mm). The surfaces of all sherds are weathered and have a gritty texture, except for the interior of 5509 which is smooth. Colour: buff/orange-grey/dark orange. T. 6.4–7.7mm.

Vessel 8 (Fig. 4) poorly preserved rimsherd 5513 (Zone A), appears to be out-turned and rounded. The hard fabric is damaged and abraded on both surfaces and contains a moderate grit content (< = 2.7mm). Colour: orange/grey/orange. T. 7.0mm.

Vessel 9 (Fig. 4) rimsherd 5514 and 2 body sherds 5515–16 (Zone A). The rim is out-turned and beaded; its interior surface is missing. The fabric is hard and compact but slightly chalky in texture, with a high grit content (< = 2.5mm). Colour: brown/orange/brown. T. 7.0–7.9mm.

Vessel 10 (Fig. 4) 2 rimsherds 5517, 5519, shoulder sherd 5521, and 4 bodysherds 5518, 5524–6 (Zone A). The interior surface of the rim is abraded but appears to be out-turned and pointed. The fabric is abraded and friable with a moderate grit content (< = .05mm). Colour: dark orange/grey/dark orange. T. 5.5–6.4mm.

Vessel 11 (Fig. 4) a shoulder sherd 5520 and 2 bodysherds 5522–3 (Zone G). The rim is too fragmented to identify but it appears to be out-turned and rounded; the shoulder is simple-angled. Generally hard, compact fabric although some sherds are abraded and friable; high grit content (< = 1.0mm). Colour: orange-light brown/grey/brown-dark brown. T. 6.5–8mm.

Vessel 12 (Fig. 4) 2 rimsherds 5527, 5528 (Zone G) and a bodysherd, 5529 (Zone A), are probably from separate vessels but are too similar to enable distinction. The rim is out-turned and pressed back against the exterior surface of the vessel to give a flattened appearance. The shoulder is simple-angled. In general the fabric is hard and compact but becoming slightly flakey towards the core and contains a high grit content (< = 2.0mm). Colour: orange throughout. T. 3.5–3.9mm.

Vessel 13 shoulder sherd fragment 5530 (Zone A). Hard thin-walled fabric, with a chalky texture and a moderate grit content (< = 2.1mm). Colour: pale orange throughout. T. 3.0mm.

Vessel 14 4 bodysherds 5531–4 (Zone A). The fabric is quite friable with a high grit content (< = 3.0mm). Both surfaces of 5531 are

damaged but the other sherds have a fairly smooth exterior surface, although grits protrude through the surface, the interior surface also has a gritty texture. Colour: orange/grey-brown/grey-brown. T. 5.2–8.9mm.

Vessel 15 11 bodysherds 5536–45 (Zone A), 5535 (Zone C), probably represent two vessels but the fabric is too similar to enable distinction. This is a group of very abraded and fragmented sherds, but the fabric is hard and compact with a high grit content (< = 2.5mm). Colour: brown/orange/brown. T. 7.2–7.6mm.

Vessel 16 (Fig. 4) rimsherd 5546 (Zone G) and 10 bodysherds 5547–48, 5550–6 (Zone C), 5549 (Zone G). The rim is out-turned and rolled back against the exterior surface. Decoration occurs on one bodysherd (5547) in the form of a horizontal incised line. The fabric is hard but slightly flakey in texture with a high grit content (< = 1.0mm). The exterior surface is smooth with a soapy texture. Colour: orange/grey/ orange. T. 6.6–7.5mm.

Vessel 17 (Fig. 4) rimsherd 5557 and 6 bodysherds 5558–5563 (Zone C). The rim is out-turned and rolled back to form a point. The fabric is hard and compact with a high grit content (< = 1.0mm). Colour: orange/black/black. T. 6.5–6.8mm.

Vessel 18 (Fig. 4) 2 rimsherds 5564 (Zone C), 5565 (Zone H), and 8 bodysherds 5566–70 (Zone H), 5571 (Zone G), 5572–3 (Zone C). The rim is out-turned and rounded. The fabric is hard but very porous on both exterior and interior surfaces with a moderate grit content (< = 2.0mm). Colour: orange/orange/dark grey. T. 5.0–8.0mm.

Vessel 19 (Fig. 5) rimsherd 5574, shoulder sherd 5575 and 4 bodysherds 5576–9, (Zone C). The rim is bulbous in form, with a simple angled shoulder. The fabric is hard, with a high grit content (< = 2.5mm). Colour: orange throughout. T. 5.0–6.3mm.

Vessel 20 (Fig. 5) rimsherd 5580 (Zone G) and 9 bodysherds 5581, 5583, 5586 (Zone C), 5582, 5585, 5587–89 (Zone G). The rim is out-turned and rounded. The fabric is hard and compact with a moderate grit content (< = 2.3mm). The exterior and interior surfaces are smooth. Colour: dull brown/dark orange-grey/brown. T. 5.5–6mm.

Vessel 21 (Fig. 5) rimsherd 5591, shoulder sherd 5592 and 3 bodysherds 5593–5 (Zone G). The rim is out-turned and rounded, with a simple-angled shoulder. The fabric is very hard and porous with a moderate grit content (< = 2.0mm). Colour: orange/orange/dark grey-black. T. 4.5–7.0mm.

Vessel 22 (Fig. 5) rimsherd 5596 and 3 bodysherds 5597–8 (Zone G),

5599 (Zone C). The rim is out-turned and rounded. Hard, compact fabric with a high grit content (< = 1.0mm). Colour: orange throughout. T. 7.0–10.8mm.

Vessel 23 (Fig. 5) rimsherd 5600, shoulder sherd 5601 (not illustrated) and 16 poorly preserved bodysherds 5602–9, 5610–16 (Zone G), 5617 (Zone C). The rim is poorly preserved but it appears to be out-turned and rounded. This group of sherds is poorly preserved and abraded, and more than one vessel may be represented. The fabric is hard with a moderate grit content (< = 2.0mm). Colour: orange/grey/grey-black. T. 5.5–6.1mm.

Vessel 24 (Fig. 5) rimsherd 5618 (Zone C), which is out-turned and pressed against the exterior surface to give a flatter appearance (similar to Vessel 13). The fabric is hard but slightly flakey towards the core with a moderate grit content (< = 2.0mm). Colour: orange throughout. T. 5.5mm.

Vessel 25 (Fig. 5) rimsherd 5619, 2 shoulder sherds 5620, 5621 and one bodysherd 5622 (Zone G). Although the fabrics are similar, it is possible that two different vessels are represented. The rim is out-turned and rounded, and the shoulder is simple-angled. Hard, compact fabric with a moderate to high grit content (< = 2.0mm). Colour: orange/grey-brown/grey-brown. T. 4.8mm–7mm.

Vessel 26 (Fig. 5) shoulder-sherd 5623 (Zone C), of simple-angle type. Hard, compact fabric, the exterior surface has been burnished and contains a moderate grit (< = 1.0mm). Colour: dark brown-grey throughout. T. 5.8mm.

Vessel 27 shoulder sherd fragment 5624 (Zone B) and 4 bodysherds 5625–8 (Zone G). Hard, slightly flakey fabric with a high grit content (< = 1.0mm). The surfaces are abraded and have a rough texture. Colour: orange throughout. T. 5.5–6.7mm.

Vessel 28 2 bodysherds 5629–30 (Zone G). Thin-walled compact, chalky fabric with a moderate grit content (< = 2.0mm). Colour: orange/grey/orange. T. 4.6–5.0mm.

Vessel 29 (Fig. 5) rimsherd 5631 and 2 bodysherds 5632 (Zone H), 5633 (Zone B). The rim is out-turned and rounded. Poorly preserved but the fabric is hard and compact with a moderate to high grit content (< = 2.0mm). The exterior surface may have been burnished. Colour: brown/dark orange/dark orange. T. 3.8–9mm.

Vessel 30 (Fig. 5) rimsherd 5634, a shoulder sherd 5635 and 5 bodysherds 5636–40 (Zone H). The rim is out-turned and rounded, with a simple-angled shoulder. The fabric is compact but somewhat

Fig. 4. Pottery finds from Earlier 'Western' Neolithic settlement (vessels 1–12, 16–18).

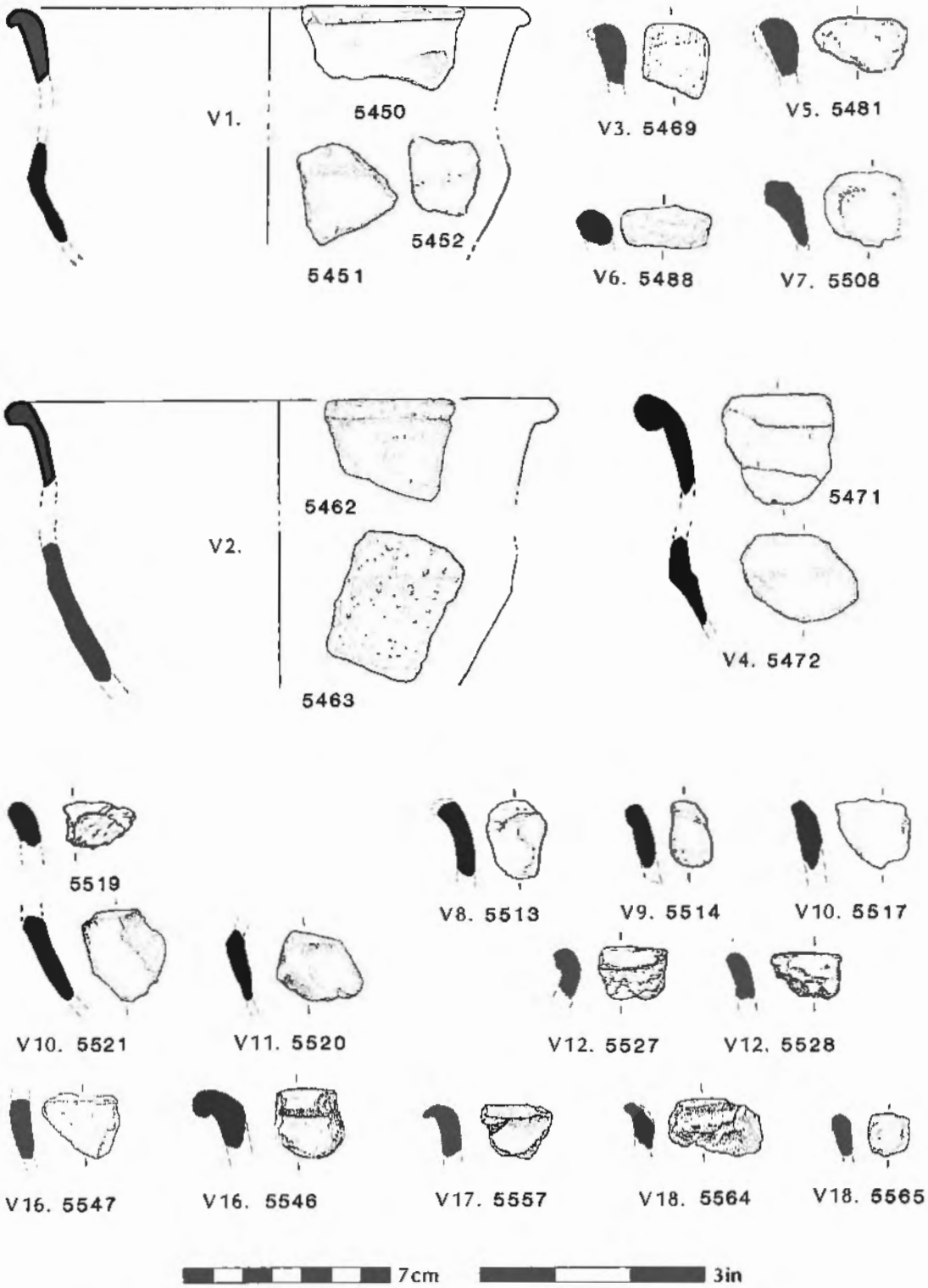


Fig. 5. Pottery and flint finds from Earlier 'Western' Neolithic settlement, (vessels 19–26, 29–31, 33–4, 38–40 and flint nos 5714, 5739 and 5802).

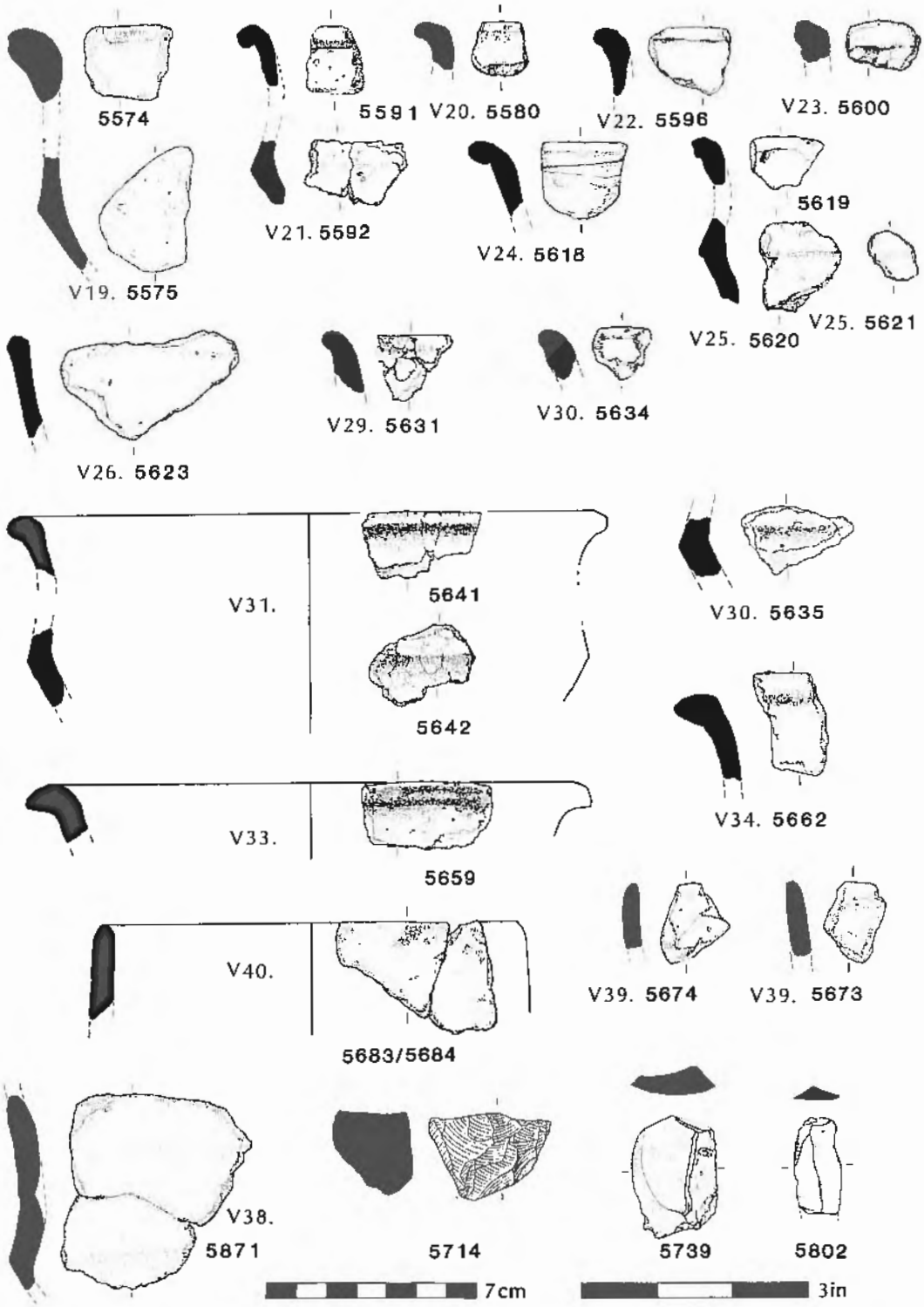
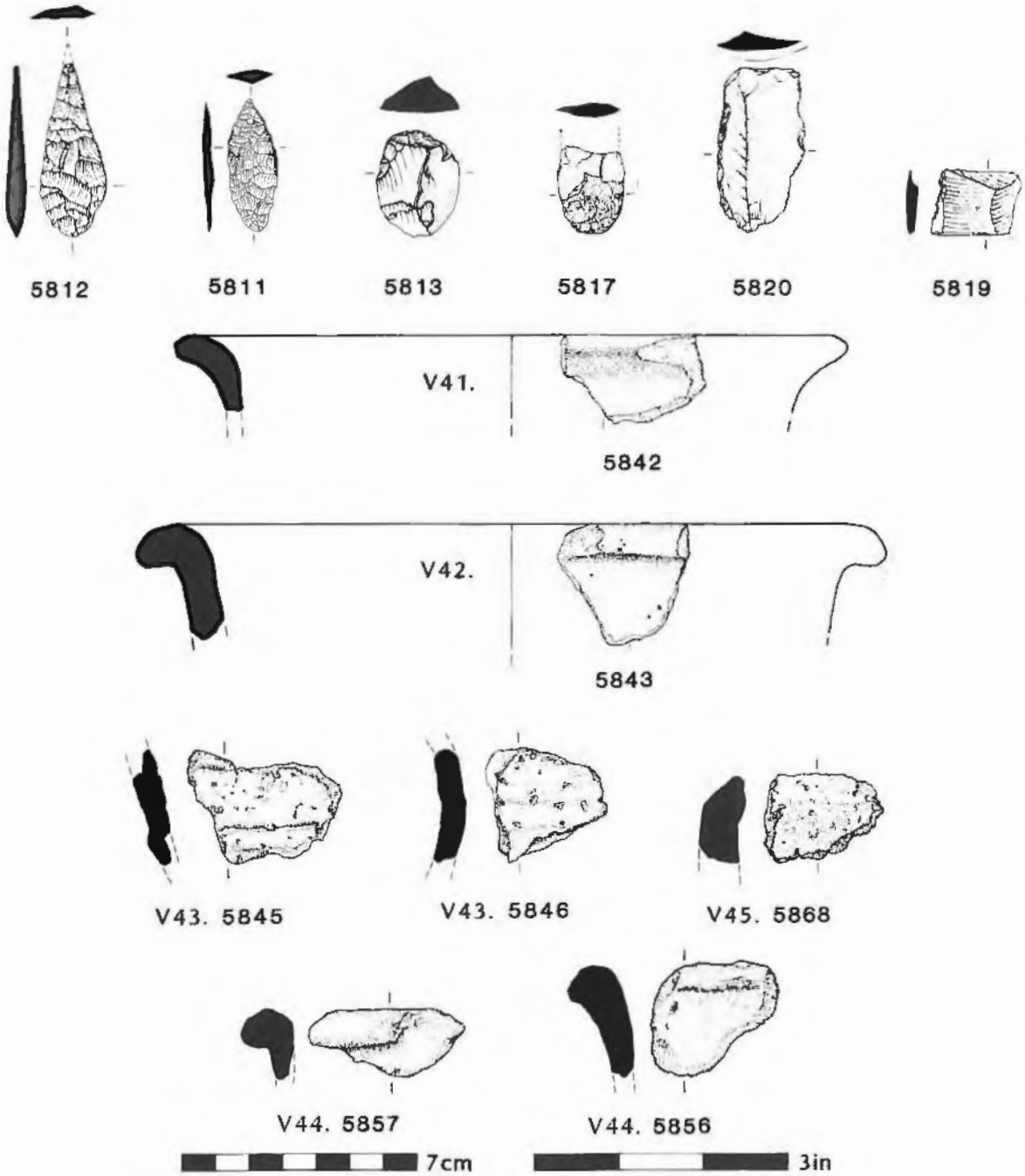


Fig. 6. Finds from Earlier 'Western' Neolithic settlement (flint nos 5811–3, 5817, 5819–20).
Later 'Western' Neolithic settlement (vessels 41–5).



abraded and flakey with a moderate grit content (< = 2.0mm). Colour: orange/orange/orange-black. T. 6.0–9.5mm.

Vessel 31 (Fig. 5) rimsherd 5641 (Zone H), shoulder sherd 5642 and 8 bodysherds 5643–50 (Zone B). The rim is out-turned and rounded; the shoulder is simple-angled. Hard compact fabric with a moderate grit content (< = 1.0mm). The exterior surface was burnished. Colour: brown/orange/orange. Estimated rim diameter 190mm. T. 5.5–6mm.

Vessel 32 8 poorly preserved and fragmented bodysherds 5651–8 (Zone H). Hard fabric but the surfaces are abraded and in some cases missing with a moderate to high grit content (< = 3.0mm). Colour: orange/orange/black. T. 7mm–1.8cm.

Vessel 33 (Fig. 5) rimsherd 5659 and 2 bodysherds 5660–1 (Zone H). The rim is out-turned and rounded with finger-nail marks on the exterior surface just below the rim. Hard, compact fabric with a high grit content (< = 2.0mm); the surface is abraded Colour: pale orange/pale orange/brown. Estimated rim diameter 175mm. T. 5.6–10mm.

Vessel 34 (Fig. 5) rimsherd 5662 and a bodysherd 5663 (Zone H). The rim is out-turned and rounded. The fabric is well fired, hard and compact with a high grit content (< = 2.0mm). Colour: orange throughout. T. 4.7–6.7mm.

Vessel 35 5 bodysherds 5664–8 (Zone H). Hard fabric with a high grit content (< = 1.0mm). Colour: orange-brown/grey-black/grey-black. T. 4.0–5.8mm.

Vessel 36 a false rim 5669 and 2 bodysherd fragments 5507, 5670 (Zone B). The hard porous fabric is considerably abraded with a moderate grit content (< = 1.0mm). Colour: orange/dark grey/orange. T. 5.6–5.7mm.

Vessel 37 2 bodysherds 5671–2 (Zone H), hard compact fabric with tiny cavities on both surfaces and a moderate grit content (< = 1.0mm). Colour: brown throughout. T. 4.5–6.9mm.

Vessel 38 (Fig. 5) shoulder sherd 5871 (Zone B) of simple-angled type. Hard, good quality fabric with a high grit content (< = 3.0mm). Colour: orange/grey/orange. T. 7.8mm.

Plain Unshouldered Bowls

Vessel 39 (Fig. 5) 2 rimsherds 5673–4 and 8 small bodysherds of similar fabric type but possibly from more than one vessel, 5675–82 (Zone A). The rim is unexpanded and rounded. The fabric is abraded, with an uneven surface and a moderate grit content (< = 2.6mm). Colour: orange/grey-black/black. T. 7.0–7.9mm.

Vessel 40 (Fig. 5) a rimsherd 5683/5684, a possible rim fragment (not illustrated) 5685 and 9 bodysherds 5686–94 (Zone A). The rim is unexpanded and rounded. The fabric is compact with a chalky texture, moderate grit content (< = 1.0mm). Evidence for a thin slip or smoothing on the exterior surface. Colour: orange throughout. Estimated rim diameter 139mm. T. 6.4–8.7mm.

Lithic assemblage

Fiona Dillon

Introduction
The assemblage consists of 130 lithics, 123 struck flint artefacts and 7 quartz fragments. These were associated with foundation trenches 1–7 in Zones A and B, but were dispersed in Zone C.

The raw material: Pebble flint forms 95% of the assemblage and is the sole knapped material. Flint naturally occurs in chalk and is black or dark grey in colour with a white chalky cortex. As a result of movement caused by glaciation, flint is broken into smaller units, pebbles, on which an outer skin or cortex forms, and these were also transported into non-flint bearing areas. The colour of pebble flint may range from cream to brown due to the absorption of minerals. No complete pebbles were found but the maximum flake length (49mm) and breadth (53mm) show that only small pebbles were exploited. As it is impossible to determine the source of pebble flint, the place of origin remains unknown. However, a possible source could have been the glacial tills from the immediate vicinity of Knowth which contain small quantities of flint (McCabe 1973, 358; Table 1). More extensive quantities of pebble flint are found on the coasts of Louth and Dublin (Hodgers 1973, 46; 1975, 199: Hartnett and Eogan 1964, 5).

Quartz forms 5% of the assemblage. Although it can be effectively knapped into tools, as at Knockadoon, Lough Gur, Co. Limerick (Ó Ríordáin 1954, 351, 408, pls. XXII, XLIX), there is no evidence for knapping at Knowth during this stage. All pieces are unworked and their form could be due to natural action. Small amounts are available locally in the glacial tills (McCabe 1973, 358; Table 1).

Technology: A flint knapping area did not come to light and, as a result, all stages of manufacture are not represented. Information about technology is provided by cores, flakes and a core rejuvenation flake. Five cores are present (nos. 5714–5718) which were knapped by using one (nos. 5715, 5717) and two platforms (nos. 5714, 5716, 5718). The platforms were prepared, which entailed the removal of a flake providing a non-cortical surface to facilitate knapping. The core

rejuvenation flake (no. 5719) does not refit with the cores indicating the use of other platformed cores.

Flakes account for *c.* 84% of the assemblage and can provide information about the core platform type and the knapping technique. Twenty-six flakes had intact platforms (Table 3, p. 38), and these can be divided into four groups.

(a) cortical – the platform is covered with cortex.
(b) prepared – the platform has been prepared by the removal of one or more flakes.
(c) faceted – the platform has been prepared by a series of parallel narrow flakes perpendicular to the axis of percussion.
(d) punch – the platform is non-cortical, but narrow due to punch knapping.

Prepared platforms (61.5%) dominated the assemblage, with punch platforms representing a group of small trimming flakes (see below). Two types of reduction techniques were used in the knapping; percussive reduction and bipolar reduction. Percussive reduction is the detachment of a flake by a direct or indirect (in the manner of a hammer and chisel) blow using either hard (e.g. stone) or soft (e.g. bone) hammers. 99% of the assemblage was produced by percussive reduction, with the use of indirect percussion predominating. The depth of the platforms (Table 4, p. 39) cluster around 2–5mm, with the larger platform widths representing direct percussion and the smaller widths representing trimming flakes (see below). A single example (no. 5713) of bi-polar reduction is present. This type of reduction, which is suited to small pebbles, was achieved by hammering but, in order to do this, the pebble had to be secured, vice-like, between two supports such as stones. Non-cortical flakes form 69% of the group, indicating that the preparation of cores was a feature. Secondary modification of the flakes is represented by trimming flakes which are the by-products of secondary working and the retouched pieces. The trimming flakes were produced by the application of pressure at a point; the flake detached had a characteristic punch platform. The 18 trimming flakes are dispersed throughout the excavated areas, with a maximum of three directly associated. This shows that the secondary working of flakes took place elsewhere. There is evidence for abrupt and invasive secondary working in the retouched pieces. The scrapers (nos. 5813, 5816) and edge-trimmed flakes and blades have abrupt secondary working to form a working edge. The leaf-shaped arrowheads (nos. 5811–12) and the retouched flake (no. 5817) have shallow invasive retouching, to thin and shape the flakes.

Catalogue (Table 1, p. 37)

(Flint unless otherwise stated)

Split pebble: 5713 (Zone A). This was produced by bi-polar reduction.

5 *cores:* 5714 (Fig. 5), 5715–18 (Zone B). All are pebble flint. No. 5714 (42mm by 29mm by 28.5mm) of Type E (Clark, Higgs and Longworth 1960, 216), was knapped on two planes, with negative scars extending around the circumference and on the proximal end. No. 5715 is a fragment of a single platformed core (45mm by 52.5mm by 21.5mm) probably Type A. Due to its fragmentary nature it is not possible to see whether the negative scars extended around the circumference of the core. Nos. 5716 and 5718 are two cores of Type B2. No. 5717 is a core of Type A2 (Clark, Higgs and Longworth 1960, 216).

Core rejuvenation flake: 5719 (Zone A). A fragment which was detached when the platform edge of the core was rejuvenated.

18 *trimming flakes:* **Complete:** 5721, 5723, 5725–9 (Zone A), 5734–6 (Zone B). **Part:** 5720, 5722, 5724, 5730–33a–b (Zone A).

2 *unutilised blades:* 5737 (Zone A), 5738 (Zone B), fragments.

63 *unutilised flakes:* **Complete:** 5739 (Fig. 5), 5740-3, 5745–7 (Zone A), 5744 (Zone C), 5748–9 (Zone B). **Part:** 5750–72, 5778–80, 5783 (Zone A), 5773–7, 5781–2 (Zone C), 5784–5801, 7210a–c (Zone B).

Utilised blade: (Fig. 5) 5802 (Zone A), a fragment.

8 *utilised flakes:* **Complete:** 5803 (Zone A), 5804–5 (Zone B), **Part:** 5806–9 (Zone A), 5810 (Zone C).

2 *leaf–shaped arrowheads:* (Fig. 6) 5811–2 (Zone B). Both are of Type 4C (Green 1980, Part i, 72). No. 5811 (39mm by 14.6mm by 4mm) is narrow, tapering to a point at both ends (breadth: length index 0.37). No. 5812 (53mm by 19.6mm by 4.5mm) is of pebble flint with a slightly asymmetrical base, with fine 'ripple' retouch extending over both faces.

2 *end scrapers:* **Complete:** 5813 (Zone A). **Part:** 5814 (Zone B). No. 5813 (Fig. 6), is fashioned on a robust secondary flake with abrupt retouch forming a blunt working edge on the distal end. No. 5814 is a fragment of a tertiary flake with abrupt retouch at the distal end.

Side scraper: 5815 (Zone A). A complete example fashioned on a secondary flake; the retouch forms an acute, sharp working edge on the lateral edge.

Round scraper: **Complete:** 5816 (Zone A). Fashioned on a thin tertiary flake with crude retouch forming a blunt working edge.

Invasively retouched flake: (Fig. 6) 5817 (Zone A). A fragment of a sub-rectangular flake with invasive 'ripple' retouch on both faces, thinning

the bulbar area. This piece seems to have been discarded or broken before it was complete. Closest parallels to this piece are a plano–convex knife or a crude leaf-shaped arrowhead.

Edge-trimmed blade: 5818 (Zone A). The lateral edge is retouched, forming a blunt edge facilitating the use of a primary edge as the working edge of the implement.

2 *edge-trimmed flakes:* (Fig. 6) 5819–20 (Zone A). Flakes with a lateral edge trimmed, forming a blunt edge facilitating the use of a primary edge as the working edge of the implement. No. 5820 is complete, sub-rectangular in shape with retouch on the lateral edge and both faces at the lateral and distal edges, possibly to facilitate hafting. Use wear is present on the primary edge. No. 5819 is a fragment with a lateral edge trimmed.

3 *retouched flakes:* **Complete:** 5821 (Zone A), 5822 (Zone A), **Part:** 5823 (Zone A). 5821–3 have irregular crude abrupt retouch, forming a blunted edge or notched edge.

7 *chips:* 5825–6 (Zone A), 5824, 5827–30 (Zone B).

4 *irregular fragments:* 5831–2 (Zone A), 5833–4 (Zone B), four fragments of which 5831 is burnt.

7 *unworked quartz:* 5835–41 (Zone B).

Comment

Lithic assemblages can provide information about access to and acquisition of raw material, the production of the tools and the range of tools in use during a particular period. As flint is the most suitable material for the production of tools, the absence of the exploitation of non-flint materials, e.g. quartz or chert, indicates that there was access to sufficient flint sources. As shown in Table 1, the assemblage has been grouped according to the various stages of tool production adapted from Peterson (1990, Table 1).

The precise place where the initial selection and testing of pebble flint took place is not known. However, debitage relating to the production of flakes and modification into tools is present, but is dispersed in the Zones A–C. These include 5 cores, a core rejuvenation flake and 18 trimming flakes. The isolated elements of knapping debris present show familiarity with two reduction techniques, percussive and bi-polar. As there is only a single example of bi-polar reduction, reasonably-sized good-quality pebbles were available.

Other features of the technology include the preparation of the cores and the use of single and dual platformed cores. Analysis of the cores, the predominance of tertiary flakes (69%) and the absence of

other knapping debris, shows that preparation of cores and the initial stages of knapping took place off the site. Unutilised flakes (48%) are the largest group in the assemblage, discarded as being unsuitable for further use as tools. Tools account for 17% of the assemblage, with the modified pieces accounting for 10% (2 leaf-shaped arrowheads, 4 scrapers, 3 edge-trimmed pieces, 3 retouched flakes, an invasively retouched piece) and unmodified tools accounting for 7% (a utilised blade and 8 utilised flakes).

Table 1: Earlier 'Western' Neolithic lithic assemblage.

No.	Artefact type	Frequency	Percentage
1.	*Selection of material*	0	0
2.	*Production of tools*	(25)	19
	Split pebble	1	
	Cores	5	
	Core rejuvenation flakes	1	
	Trimming flakes	18	
2a.	*Discarded pieces*	(65)	50
	Unutilised blades	2	
	Unutilised flakes	63	
3.	*Unmodified tools*	(9)	7
	Utilised blade	1	
	Utilised flakes	8	
3a.	*Modified tools*	(13)	10
	Leaf-shaped arrowheads	2	
	End scraper	2	
	Side scraper	1	
	Round scraper	1	
	Invasively retouched piece	1	
	Edge trimmed blade	1	
	Edge trimmed flake	2	
	Retouched pieces	3	
	Miscellanea	(18)	14
	Chips	7	
	Irregular fragments	4	
	Unworked quartz	7	
Total		130	100%

Discussion of Earlier 'Western' Neolithic Complex

Evidence for activity by Earlier 'Western' Neolithic people is found on the north-eastern side of the summit of the hill. The settlement, which consisted of three units (Zones A, B and C), none of which was protected, was defined by a spread of artefacts and structural features extending over an area at least 75m long. The exact width cannot be determined owing to the presence of the large mound but, at one point, it extended to 25m. As a result, its entire area was not available for excavation; in addition, parts had been removed by later activity on the site. The most substantial evidence, in the north-western portion (Zone A), represents the remains of possibly more than one house. The ground-plan was rectangular or sub-rectangular. While the evidence in the eastern area (Zone B) is more tenuous, the trenches,

Table 2: Earlier 'Western' Neolithic lithic assemblage. Analysis of cortex on lithic assemblage (Sample 119)

Cortex	Un-retouched struck flint	Retouched struck flint	Total	Percentage
Primary Pebble flint	1	1	2	2
Secondary Pebble flint	31	4	35	29
Tertiary Pebble flint	75	7	82	69
Total	107	12	119	100%

Table 3: Earlier 'Western' Neolithic lithic assemblage. Platform types (Sample 26)

Platform type	Un-retouched struck flint	Retouched	Total	Percentage
Cortical	3	0	3	11.5
Prepared	14	2	16	61.5
Faceted	0	0	0	0
Punch	6	1	7	27
Total	23	3	26	100%

nevertheless, may represent structures, including the remains of a rectangular house. The finds place them all in a similar cultural context, but that does not necessarily imply that they were contemporary. The C14 dates suggest that the structures found in the eastern portion of the area of occupation (Zone B) were the earliest 5345±20 BP (GrN–20181) 4324–4045 cal BC, with those located in Zone A being slightly later at 5080±20 BP (GrN–20179) 3975–3789 cal BC and 5040±15 BP (GrN–20180) 3948–3784 cal BC). It is not possible to say whether the initial settlement consisted of a single house that was later replaced nearby, or whether settlement consisted of more than one house in simultaneous use. The scatter of Earlier 'Western' Neolithic pottery from Zones A, B and C implies that the inhabitants of the entire area at least used the same type of pottery, so perhaps the settlement consisted of a small community rather than isolated houses. At Tankardstown, County Limerick, two seemingly contemporary rectangular houses were found 20m apart (Gowen and Tarbett 1988, 156).

A number of Earlier 'Western' Neolithic rectangular houses have now been excavated throughout the country. They have certain similarities to the structural features found at Knowth and, in all cases, share the same pottery assemblage. Ballynagilly, Co. Tyrone (ApSimon 1969, 165–8) is possibly the closest parallel to the Knowth house. Although there was no evidence for timber remains in the foundation trenches at Knowth, except perhaps for Zone B,

Table 4: Earlier 'Western' Neolithic lithic assemblage. Platform depths (Sample 25)

Intervals in mm	Un-retouched	Retouched	Total	Percentage
0–0.9mm	4	1	5	19
1–1.9mm	2	0	2	8
2–2.9mm	6	2	8	30.5
3–3.9mm	3	0	3	11.5
4–4.9mm	5	0	4	15
5–5.9mm	2	0	2	8
6–6.9mm	0	0	0	0
7–7.9mm	1	0	1	4
> 10mm	1	0	1	4
Total	22	3	26	100%

foundation trench 6 (p. 18), they resemble the Ballynagilly trenches in their irregular and fairly shallow form. The Knowth trenches average 13cm deep by 32cm wide; those at Ballynagilly are 20–30cm deep and 30–40cm wide. The estimated dimensions of the house at Ballynagilly are about 6.5m by 6m and it is likely from the surviving features that the Knowth house, or houses, were of similar dimensions. Amongst the range of C14 determinations from Ballynagilly are 4910±90 BP (UB–301) 3950–3389 cal BC, 5165±50 BP (UB –201) 4213–3818 cal BC and 5230±125 BP (UB–199) 4350-3780 cal BC, which are from material that is directly associated with the house and contemporary features. These dates are also broadly comparable to those from Knowth. Other houses which can be used for comparison are Ballyglass, Co. Mayo (Ó Nualláin 1972, 54), where dates associated with structure 2 range from 4680±95 BP (SI–1450) 3690–3106 cal BC to 4390±100 BP (SI–1461) 3360–2707 cal BC. The recently discovered rectangular house at Newtown, Co. Meath (Gowen and Halpin 1992, 25–7), produced dates of 3971–3706 cal BC and 3936–3697 cal BC. A date of 5105±45 BP (GrN-14713) 4030–3786 cal BC was obtained from Tankardstown, Co. Limerick. However, it should be noted that the surviving evidence for these houses is more complete and, in all cases, the foundation trenches are significantly more substantial – and the ground-plans more regular than those found at Knowth.

Rectangular houses dating to the Earlier 'Western' Neolithic period are also found in Britain. Parallels for the houses at Knowth can be cited in England and Wales at such sites as Haldon, Devonshire (Willock 1936, 1937; Piggott 1954, 33–4); Fengate, Peterborough (Pryor 1974, 6–13) and Llandegai, Caernarvonshire (Lynch 1976, 65, fig. 1). Other relevant sites are Buxton, Derbyshire, a very impressive rectangular house represented by large post-holes (Garton 1987, 250–1), and Clegyr Boia, Pembrokeshire (Williams 1953). These structures produced Earlier 'Western' Neolithic pottery.

The pottery assemblage at Knowth is limited, but includes rim forms that are predominantly either narrow, almost pointed, rolled over on the outward side, or beaded, while the shoulders have simple angles. Decorated vessels, except for an incised line on sherd 5547 (vessel 16), or coarse ware do not occur. However, when dealing with pottery, extreme caution must be exercised in basing evidence for cultural development or chronology on the shape of the rim or shoulder of a pottery vessel. As already noted, the pottery types represented can be paralleled in Case's *Dunmurry and Ballymarlagh styles* (Case 1961, 175–7), such as the finds from those type sites and from habitation material underneath the court tomb, Carnbane, at Ballybriest, Co. Derry (Herity 1987, 188–94). More relevant parallels for the pottery are found within the assemblages from the previously-mentioned house sites at Ballynagilly (Tyrone), Ballyglass (Mayo), Tankardstown (Limerick) and Newtown (Meath). Parallels are also present from the British rectangular houses, already discussed. The pottery assemblage from Llandegai is of similar form to that from

Knowth and the Welsh site has a C14 date of 5240±150 BP (NPL–223) 4360–3705 cal BC. In addition, vessels of Grimston Ware from Yorkshire have been cited as parallels for the *Dunmurry style* (Case 1963, 4, fig. 1, 1–5). It should also be noted that thin-walled vessels with pointed rims and simple shoulders have a wide distribution in Iberia and Brittany (L'Helgouac'h 1965, fig. 37:5).

Two leaf-shaped arrowheads, a side scraper and two end scrapers were the only flint artefacts found in association with the Earlier 'Western' Neolithic settlement at Knowth. Similar arrowheads were found at the previously-mentioned early rectangular houses, such as House 1, Tankardstown (Gowen 1988, 38, fig. 9). Despite comprehensive investigation, including sieving, only limited environmental evidence survived. A few grains of wheat indicate that agriculture was practised; the presence of hazelnut shells shows that other sources of food were exploited (Appendix 3). Animal bones were also scarce but cattle and pig were identified (Appendix 4).

Considerable new evidence for Earlier Neolithic houses has come to light in recent years in different parts of the country (p. 39) and no doubt many more await discovery. Therefore, it can be speculated that domestic settlement was widely dispersed during that period, yet, evidence from eastern Ireland for both domestic settlement and ritual activities is limited. Taking a more restricted area, the eastern coastal lands between Dundalk and Dublin are devoid of court and portal tombs. It is, therefore, difficult to locate the place of origin and regional background to the Knowth settlement. However, about twenty miles to the north are the southern limits of a well-established Earlier 'Western' Neolithic tradition consisting of the remains of both domestic and ritual activities, as the rectangular houses and stone long-barrow tombs of the court and portal varieties testify (de Valéra in Ó Ríordáin 1979, 100–29; Shee Twohig 1990, 16–36). The closest relevant area is the Kilmainham Wood region of north-east Meath, with the previously mentioned rectangular house at Newtown (Gowen and Halpin 1992) and the court and portal tombs nearby at Cornaville and Ervey respectively (Eogan 1958). Perhaps the Knowth settlement can be attributed to a southward movement from those parts, but with a change in ritual, megalithic tomb construction and use ceased to be a feature.

However, farming in Ireland need not have its origin in a single external source. Perhaps Ireland received a series of separate influences from slightly different external regions but with the northern third of the country subjected to influence more varied and comprehensive than that reaching other areas. Despite the foregoing reservations, one might suggest that the north Leinster coastal area did receive external influence. In that region, a relevant site is situated twenty miles or so to the south-east of Knowth, at Feltrim Hill in north County Dublin, close to the sea (Hartnett and Eogan 1964, 5–19). This site also produced *Dunmurry-Ballymarlagh styles* of pottery while, amongst the flint artefacts, leaf-shaped arrowheads and rounded scrapers were common.

No evidence for houses came to light, but the quarrying activity could have removed all traces, while the rescue excavations that took place on the then surviving portion of the hill were limited to small areas. The location of this site on a prominent rock-outcrop has parallels on the other side of the Irish Sea at Clegyr Boia, Pembrokeshire, and Carn Brea, Cornwall (Williams 1953; Mercer 1981a), while similar pottery has come from Llandegai, Caernarvonshire and Dyffryn Ardudwy, Merionethshire (Lynch 1976, 65, fig. 1).

The distribution of Earlier 'Western' Neolithic pottery is widespread in Atlantic lands. Eastern Ireland, including the coastal areas of Dublin and Meath, could have been independently settled by pioneering farming families, who were expanding their areas of activity on both sides of the Irish Sea. One could postulate that the mouth of the Boyne would have been attractive to early settlers, and the river could have acted as an inducement to venture inland to explore and settle the lands along or close to its banks. From the sea inland to Oldbridge, the river is tidal and wide, and it is likely that the marshy river bank would not have had a dense forest cover (G.F. Mitchell, pers. comm.). It may even have been possible to walk along the banks. In addition, the use of boats would have been feasible because, due to the width of the river, it is unlikely that it would have been completely blocked by fallen trees. Upstream from Oldbridge, penetration may have been more difficult, as the river valley narrows considerably. A thick canopy of high deciduous forest would have encompassed the dryland right up to the river edge, but the tree cover could have eliminated undergrowth, thereby allowing for an easier passage inland.

Was the supposed inland progression of those earliest farming settlers, despite the possible difficulties involved, simply the following of a natural feature in a spirit of adventure, curiosity, exploitation and expansion? Perhaps as a result of scouting it was noticed that the area within the bend of the river may have had special features that were attractive to early settlers. This area was, in Frank Mitchell's words, a 'geomorphological island' (Mitchell in Eogan 1984, 10), so perhaps it might have had a different vegetation from the surrounding area and therefore been more amenable and consequently more attractive to the establishment of settlement by primary farmers.

Without knowing precisely the locational background to these early farmers, it is difficult to explain their initial survival pattern and the manner by which habitus developed. It may be that the Knowth settlement was only one of many sites in the area, so that during the initial years, food could have been obtained from already established local farming families. Even if this were not so, it should have been possible for pioneers to survive by resorting to what nature provided. The area would have had supplies of wild fruits, animals and fish, which would have provided adequate sustenance pending the establishment of agriculture. While it is not yet possible to be absolutely certain, the structural evidence indicates that the Knowth settlement was not transient or occasional, but of a permanent nature.

2. Later 'Western' Neolithic complex

The main evidence for this complex comes from the western side of the hill-top, representing a slight shift in settlement focus to an area to the west of the earlier settlements. As the area between the Earlier and Later 'Western' Neolithic settlements lacks evidence for activity, the later settlement cannot be attributed to a gradual westward expansion. It has not been established if the site had been abandoned, but this is a possibility as a different area was chosen for settlement, and the material culture of the later stage differs from that of the earlier stage. For instance, as will be argued below, the pottery with more pronounced rims is part of the developed 'Western' Neolithic Ware, which then became widespread throughout Ireland. It is possible that a new group, who were not descendants of the earlier inhabitants, settled at Knowth. If so, from where has not been established, it would have emerged at a time when alterations were taking place in other regions and when changed pottery styles, such as the *Lyles Hill style* (developed rims, more exaggerated shoulders and the increased practice of decoration) had appeared (Case 1961, 178–80).

This settlement was larger than that of the earlier phase, and more substantial structures were a feature. Two main structural phases have been determined, a sub-rectangular structure and a later palisade enclosure, which represents growth and development and perhaps a more stable economy. As this material, together with some scattered pottery finds, has been fully published in the *1984 Report* (*Volume 1*, pp. 211–43), only a summary will be given here. However, a re-appraisal of aspects of both the pottery and flint is included. Additional material found during subsequent excavations will be added at the end of this summary.

Structure

This is sub-rectangular in form, 12.30m by 10.10m externally and 10.70m by 9.10m internally; the remains consist of a trench that had a gap at the north-east corner, most likely the entrance. On three sides, north, south and east, the trench penetrated the subsoil to an average depth of 40cm. Its width varied between 60cm and 80cm; there was no evidence for post holes. Perhaps a plank foundation into which upright posts were inserted was the form. The western wall was entirely different; it consisted of a trench 8.40m long, 1.45cm in average width and 97cm in average depth. Within it, longitudinally placed, was a row of eleven posts that penetrated the base to an average depth of 15cm. As this is so different to that occurring on the other three sides, one has to consider the possibility that this feature is a later addition, dug after the structure had gone out of use. If that were so, it is difficult to explain what purpose it would have served, as it seems unnecessary to have dug a fairly substantial structure to retain a series of functionally unexplained posts. It would be more logical to see it as part of the structure. As the predominant winds

come from the west, perhaps a more substantial wall was needed on that side.

Within the Structure, there was an area of rough cobbling slightly to the south and east of the centre, and closer to the northern wall there was a fire-place and an associated ash spread. Near the south-west corner, there were two other areas where fires had been lit, and nearby were pits. One of these pre-dates the Structure, as part of it was removed when the southern wall foundation was dug. It is difficult to associate any internal features with the Structure; however, the position of the hearth suggests that it was contemporary. There was no occupation layer but, as there was considerable subsequent activity, erection of palisades for instance, this could have been removed. Due to the absence of domestic refuse within the building, finds were rare and were virtually confined to the fill of the western trench, especially the lower level. Pottery predominated, the sherds being from round-based, shouldered vessels. The rims were prominent and expanded and sometimes faceted, their shoulders being also distinct. Tools mainly consisted of scrapers, especially of the rounded variety. If this trench is a contemporary part of the Structure, and not an added feature, finds within the fill indicate the presence nearby of a settlement that was in existence at the time the Structure was being constructed, or at sometime before that event.

Palisade enclosure

These are two curved palisade trenches. As is clear from the voids between the stones in the fill, the trenches held upright posts which were closely set and averaged 25cm in diameter. A gap on the eastern side, 3.20m long, with a scatter of pebbles over the surface, may have been an entrance to the inner (western) enclosure. The area between the palisades had features such as pits, and an area where flint knapping took place. On the west side of the western trench there was an area of pebbling, but no evidence for houses has emerged. Finds included pottery similar to that from the west trench of the Structure as well as rounded flint scrapers. The function that the palisades served is not precisely clear; a number of the already mentioned features such as pits occurred between them, so perhaps they demarcated an elongated area of domestic activity. However, it has not been possible to link these features unequivocally to the palisades; they could have been associated with the sub-rectangular Structure. It is clear that there was considerable activity in this area. Not all features were contemporary; an expansion in settlement took place, but it is difficult to determine a precise sequence. Nevertheless, it may be speculated that the sub-rectangular Structure was the first building, followed by the palisade enclosure. As the palisades are not concentric to each other, a further structural succession is suggested. The western trench could have been part of a primary circular enclosure that was about 70m in diameter. Later the area of settlement was enlarged to about 100m, a circumstance which would have made the inner

palisade redundant. At that time the Structure was also redundant, as part of the eastern palisade crossed over it. As already pointed out, features have turned up between the palisades but have not been related to other features. However, taking the inner palisade there are areas of pebbling, so perhaps activity took place within the palisades but so far no evidence for houses has emerged. If the palisades enclosed an approximately circular area, only a small percentage has been excavated and that portion was disturbed in places by the digging of later drains. Despite the absence of buildings in the area excavated, it is possible that the palisades represent an enclosed habitation area. There are problems in accepting this interpretation, the main one being that there is no evidence for the extension of palisades beyond their present ends. However, the trenches for each were relatively shallow. Also, the overlying layers are thick close to the large mound, and therefore provided protection. The layers become thin towards the west, and as such, provide very little protection, and therefore, ploughing could have removed all traces of the trenches.

No new structural features that could be assigned to the Later 'Western' Neolithic were found during excavations subsequent to the 1984 publication. Previously a scatter of Later 'Western' Neolithic sherds were found in the north-eastern part of the hill-top (Eogan 1984, 252; fig. 88). Subsequently a scatter of 29 sherds representing 5 vessels were found in Zone B. Sherds from vessel 3 were found on the surface of the grey-brown humus layer and were probably in their original position, but sherds representing vessels 1, 2, 4, and 5 were found within the dark, charcoal-rich habitation layer (Decorated Pottery Complex). Their presence in this layer is probably due to disturbance as was argued for the sherds of the Earlier 'Western' Neolithic pottery from the same layer (p. 21).

Catalogue of sherds

Vessel 41 (Fig. 6) rimsherd 5842, out-turned and rounded with faint rilling on the top and interior surface of the rim. The exterior surface was burnished, hard fabric with a moderate to high grit content (< = 1.0mm). Colour: brown–orange/brown-orange/brown-black. Estimated rim diameter 187mm. T. 6.0mm.

Vessel 42 (Fig. 6) rimsherd 5843 and a bodysherd 5844. The rim is out-turned and rounded above an almost vertical neck. The thick-walled fabric is hard with a high grit content (< = 2.0mm). Cavities are found on both exterior and interior surfaces of the sherds. Colour: orange/grey/orange. Estimated rim diameter 200mm. T. 9.0–10.0mm.

Vessel 43 (Fig. 6) shoulder sherd 5845, a sherd from the neck area 5846 and 9 bodysherds 5847–55. The shoulder is stepped. Hard fabric

but very porous and slightly abraded, with a moderate to low grit content (< = 2.0mm). Colour: orange/grey/black. T. 7.5–8.0mm.

Vessel 44 (Fig. 6) 3 rimsherds 5856–8, the last one being fragmented, but the surviving features show a resemblance to 5857 and 9 bodysherds 5859–67. The rim is out-turned and rolled back towards the exterior surface of the vessel. The fabric is hard and compact with a high grit content (< = 4.4mm). Colour: orange/grey/buff-orange. T. 6.8–10.0mm.

Vessel 45 (Fig. 6, interior) rimsherd 5868 and 2 bodysherds 5869–70. The rim is out-turned with a bevel on the interior surface. Thick-walled porous fabric with a moderate to low grit content (< = 6.0mm). Colour: dull orange throughout. T. 10.0–11.0mm.

Overall review of the pottery and lithic assemblage, including that from the earlier excavations

Pottery. Over 250 sherds of Later 'Western' Neolithic pottery have been found on the site, the bulk coming from the area of habitation on the western side of the hill. It was not possible to reconstruct vessels but, from examining the rims and fabric, it is possible to estimate that about 45 vessels are represented. The rim diameters measure up to 200mm.

In general the fabric is of good quality, with a high content of mainly quartz and shale grits. The exterior surfaces are smooth but porous; there is also evidence for burnishing. The colour of the fabric ranges from dark brown to pale orange. The rim form is typical of Case's *Lyles Hill style* (1961, 178–80), the majority being T-shaped with occasional rippling on the surface. Others are beaded or sometimes project downwards to form a barbed effect. These contrast significantly with the simple out-turned and pointed rims of the Earlier 'Western' Neolithic Complex. The shoulders also differ from the earlier Complex, being of the medium stepped or grooved form; however, simple angles are also found.

Lithic assemblage

Fiona Dillon

A total of 243 lithics consisting of flint, chert and quartz were found associated with the Later 'Western' Neolithic at Knowth (Eogan 1968, 324–7, 334; 1984, 211–44). In contrast to the preceding Earlier 'Western' Neolithic assemblage, chert and possibly quartz were exploited to

supplement the locally available pebble flint. In addition, elements of all the stages of lithic production and a range of tool types are present. Consequently a fuller picture of the lithic industry is possible.

Pebble flint is the predominant raw material. It forms two groups probably indicating that more than one local source was exploited: small pebbles (no. 970), *c.* 33mm in diameter, with smooth 'water-rolled' cortex, and larger pebbles (*c.* 57mm in diameter) of grey flint with thick textured cortex (no. 955). Two pieces of chalk flint were found (nos. 3841, 3844); however as no. 3841 can be paralleled amongst the scrapers from the Grooved Ware circular wooden building, they are probably intrusive. A small group of blade-like flints are patinated (no. 968) with some examples retouched after the patina had formed (no. 965). As patina does not appear to form in the Knowth soils, these pieces could have been knapped elsewhere or may have been re-cycled as the secondary modification was done after the patina had formed. The chert is of good quality and was knapped and modified into implements (nos. 76, 789, 893, 897 and 1040). One piece of worked quartz is present, a 'core', which has narrow negative scars possibly to produce 'points'. Examples of these narrow points were found in Knockadoon, Lough Gur (Grogan and Eogan 1987, 368, nos. 1692–93). The pebble flint, chert and quartz were available in the immediate locality of Knowth (above p. 33).

Technology: The flint knapping assemblage (nos. 952–1034), and areas outside the palisade trenches (Eogan 1984, fig. 78, Areas A–D) include elements from all the stages of lithic production. Examples of un-retouched primary flakes and tested pebbles (nos. 969–71) represent initial selection. Both bi-polar and percussive, direct and indirect, reduction techniques were used, with bi-polar reduction used on smaller pebbles. Core preparation of the platforms and the rejuvenation of cores featured. This is evident in the prepared platforms (nos. 3894, 3872–3). The flakes form two groups, those knapped by bi-polar reduction and those by percussive reduction. Both types of flakes were modified into implements. It was more usual to fashion the bi-polar flakes into scrapers (nos. 956–7), and the percussion flakes modified into knives, edge trimmed pieces and scrapers. The bi-polar flakes tend to have cortical platforms, and some examples have been modified into scrapers (nos. 961, 3870). In contrast to the flakes there is also a distinctive narrow blade industry (nos. 83, 967–8, 3844–5, 3854, 3875 – patinated), of which a number of pieces are retouched. A piece from the flint knapping area (Eogan 1984, 232, no. 954, fig. 78, Fl. k), and another from Area B (no. 3871) appear to be platform rejuvenation flakes from blade cores then re-used as scrapers. Evidence for secondary modification is provided by the retouched implements and the trimming flakes. The implements include round and end scrapers, knives and retouched flakes. The round scrapers are small, often fashioned from primary flakes (no. 3836), with abrupt even retouch (nos. 3837, 3870). The end scrapers

which are also small, have shallow invasive retouch at the distal end (no. 960). Cortical and non-cortical flakes are used. Other implements include knives with a lateral edge retouched to form a straight edge (nos. 3873–4). A fine example is made of chert (no. 789), with retouch on the dorsal and bulbar surfaces. A number of blades have abrupt retouch on the lateral edge (no. 968). No. 3844 is an unusual piece having a D-shaped cross-section with retouch on both lateral edges, producing a blunt edge and a sharp edge and is fashioned from flint derived from the chalk deposits from north-eastern Ireland.

Discussion of the Two Phases of 'Western' Neolithic Settlement

There are contrasts and comparisons between the Earlier and Later 'Western' Neolithic complexes. Both areas represent settlements associated with rectangular structures and round-based shouldered bowls. However, the later stage had a different location, the structures were more substantial and there is a wider range of artefacts. The pottery is heavier and 'corky' in texture, the surface is better finished off by smoothing and burnishing but, above all, the form of the pots differs in detail, especially in the shape of the rims and shoulders. The rims are more expanded, both internally as well as externally; angularity is a feature and so are flat surfaces such as the rims which may sometimes be decorated by rippling. The shoulders are more pronounced, stepped and pointed varieties being present. This pottery has good parallels in Case's (1961, 178–80) *Lyles Hill style* and it may be further noted that this site was also a focus for extensive settlement. The flint artefact assemblage also differs, both numerically and in form. Few artefacts are found in the Earlier 'Western' Neolithic. In contrast, during the Later phase artefacts were more common, the predominant type being the rounded scraper. During both stages pebble flint was the source of the raw material used. There is no evidence for ritual practices and even items such as personal ornaments are virtually non-existent. This is surprising as only a short distance to the north are the southern limits of the court tomb province where a rich assemblage of 'Western' Neolithic artefacts occur.

The Later 'Western' Neolithic was a time of large-scale activity at Knowth and, as not all features are contemporary, a lengthy period of time, several generations one may suspect, is represented. The enlarged area of activity suggests a larger population and possibly social nucleation; economically there is at least evidence for the keeping of domestic animals including cattle, sheep and goats (see Appendix 4) and for the cultivation of wheat. Only one C14 date is available, and that is 4852±71 BP (BM–1076) 3790–3384 cal BC, from a pit within the house. As that date is similar to those for the Earlier 'Western' Neolithic houses, perhaps this feature is not contemporary but represents Earlier Neolithic activity at that site. For long it has been recognised that the Lyles Hill and related assemblages represent a well established and flourishing Neolithic, Case's 'Middle' Neolithic

(1961, 220). It was an expansive stage throughout most of the country, not only in the north but also in the south, as is testified by pottery equivalent to the *Lyles Hill style* at Knockadoon, Lough Gur (Ó Ríordáin 1954, cf. fig. 12; Grogan and Eogan 1987, *cf.* fig. 40:129). The 'Western' Neolithic complexes had now reached a mature stage; additional land would have been taken into production and this could have contributed to the emergence of nucleated settlement.

What appears to be a comparable palisaded site has been revealed at Lyles Hill, Co. Antrim (Simpson and Gibson 1989). This, of course, was the hill-top where during previous excavations by Estyn Evans (1953), quantities of Later 'Western' Neolithic pottery were found underneath a cairn. There is a contemporary site on the nearby hill of Donegore (Mallory and Hartwell 1984). This enclosure consists of two concentric ditches. These were not continuous as a portion had not been dug; there was a palisade along the inner edge. The enclosed area was oval and measured about 200m by 160m. On a much larger scale, the peninsula of Knockadoon, Lough Gur, or at least its western portion, could have become, at this time, a major settlement that had natural protection (Ó Ríordáin 1954; Grogan and Eogan 1987). Like Knowth, settlement on Knockadoon could have commenced during Earlier 'Western' Neolithic times. Later it appears that enclosing the houses within a circular walled area became a feature and there was probably also an increase in population.

In addition to the large nucleated settlements, single farmsteads would also have been a feature. Such a farmstead may have stood at Site L, Newgrange and, although no traces of a house were found, evidence of settlement consisted of a dark layer of occupation-derived debris, six pits and a couple of areas where the surface of the natural earth had been burnt. The pottery is similar to that from the Later 'Western' Neolithic stage at Knowth (O'Kelly, Lynch and O'Kelly 1978, 263–9). At this stage of the Neolithic there was greater variation in settlement, improvement in agricultural production and probably an increase in population. This may have been the floruit of court tomb/portal tomb building in the northern part of the country. As these tombs are a reflection of settlement, it is clear that this was widespread in that area (*cf.* De Valéra in Ó Ríordáin 1979, Figs. 5 and 7), but probably also in other parts of the country. The virtual absence of the earlier pottery forms with pointed rims from Scottish tombs suggest that this may have been the time that court tomb building extended to Scotland (p. 98).

The entire 'Western' Neolithic phase in Ireland was doubtless an evolving stage. The earlier inhabitants need not have lived in isolation or in ignorance of contemporary developments, for they could have been part of a continuously developing system. Yet the contrast between the Earlier and Later 'Western' Neolithic periods at Knowth are obvious. This may suggest that there was a hiatus in settlement, an abandonment, with the presence of the Later 'Western' Neolithic representing reoccupation. Its source could have been some place in the general area but where cannot be determined.

The developments at Knowth did not take place in isolation, they coincide with large-scale changes in Ireland but also with changes abroad. Similar developments were also taking place in Britain, as the pottery with accentuated rims from the causewayed camp at Abingdon, Berkshire, shows (Avery in Case and Whittle 1982, 10–50).

CHAPTER III

DECORATED POTTERY COMPLEX

Introduction

On a national scale, this complex is characterised by major transformations in all aspects of culture. These include domestic settlement, ritual and artefacts. In particular, there is divergence in the ritual practices and some aspects of it; for example, individual burials of the Linkardstown tomb variety named after a County Carlow find (*cf.* Herity and Eogan 1977, 80–5), have regional preferences. As pottery provides the best evidence for integration, the term 'Decorated Pottery Complex' is proposed. This term has not previously been used, despite the fact that in 1982 Michael Herity visualised the existence of a Late Neolithic complex. The term is in keeping with the traditional and still accepted terminology for Irish Neolithic and Beaker stages, where pottery is used as the main defining factor, even though other constituents, such as monuments, are present. As will be discussed in more detail below, the material is wide-ranging and varied; for instance, there are several varieties of pottery while the associated monuments consist of both habitation and ritual sites. Furthermore, there is a tendency for specific artefact types to occur with a distinctive monument type. Evidence for the complex is fairly widespread and the location of the monument types can vary from river valleys and coastal sites to mountain tops.

This report is an account of the excavation of part of an area of settlement. These excavations took place over a four year period, 1989–1993. Like the Earlier 'Western' Neolithic settlement it was not possible to determine the full extent of this settlement, as portions of it lay beneath the mound of Passage Tomb 1. However, a sufficient area was exposed to show that it extended over an area that was *c.* 50m in length and *c.* 25m in maximum width (Fig. 7). The main defining feature is a discontinuous layer of dark charcoal-rich earth varying in thickness from 5cm to 12cm. It directly overlay the thin grey-brown humus layer on which Earlier 'Western' Neolithic activity took place (p. 7). Within this area 590 stake-holes, 17 hearths and 10 isolated pits were found. The stake-holes, averaging 5cm to 30cm deep and 4–10cm wide, were easily identified as they consisted of softer and darker material than the surrounding layer. In all cases the fill consisted of dark earth mixed with charcoal, which had silted down from the occupation layer above when the stakes were removed. The only identifiable objects to come from the stake-holes were a few hazelnut

shells and a flint flake. No complete ground-plan emerged but there are well-defined arcs and, in some cases, hearths appeared to be centrally placed in relation to the arc. Despite the fact that the evidence does not provide a clear-cut picture, it would appear that these stake-holes represent the remains of structures, most likely circular houses or huts. The majority of the stake-holes were vertical, which indicates upright walls. However, some sloped at an angle, thus indicating that either propping timbers were used in some of the structures, or that some posts were bent inwards to form a hemispherical frame. The houses were not divided internally. The house remains and other features tended to cluster in certain places but there was no evidence for external protecting features, such as palisades or ditches. This settlement may represent a transient camp for people on ancillary food-procuring activities, such as fishing or the acquisition of wild plants or fruit, and one to which they returned year after year. It could also have been the camp of passage tomb builders but not necessarily those who constructed Knowth. But, on the whole, it seems more likely that it was a domestic settlement occupied, possibly simultaneously, by more than one family.

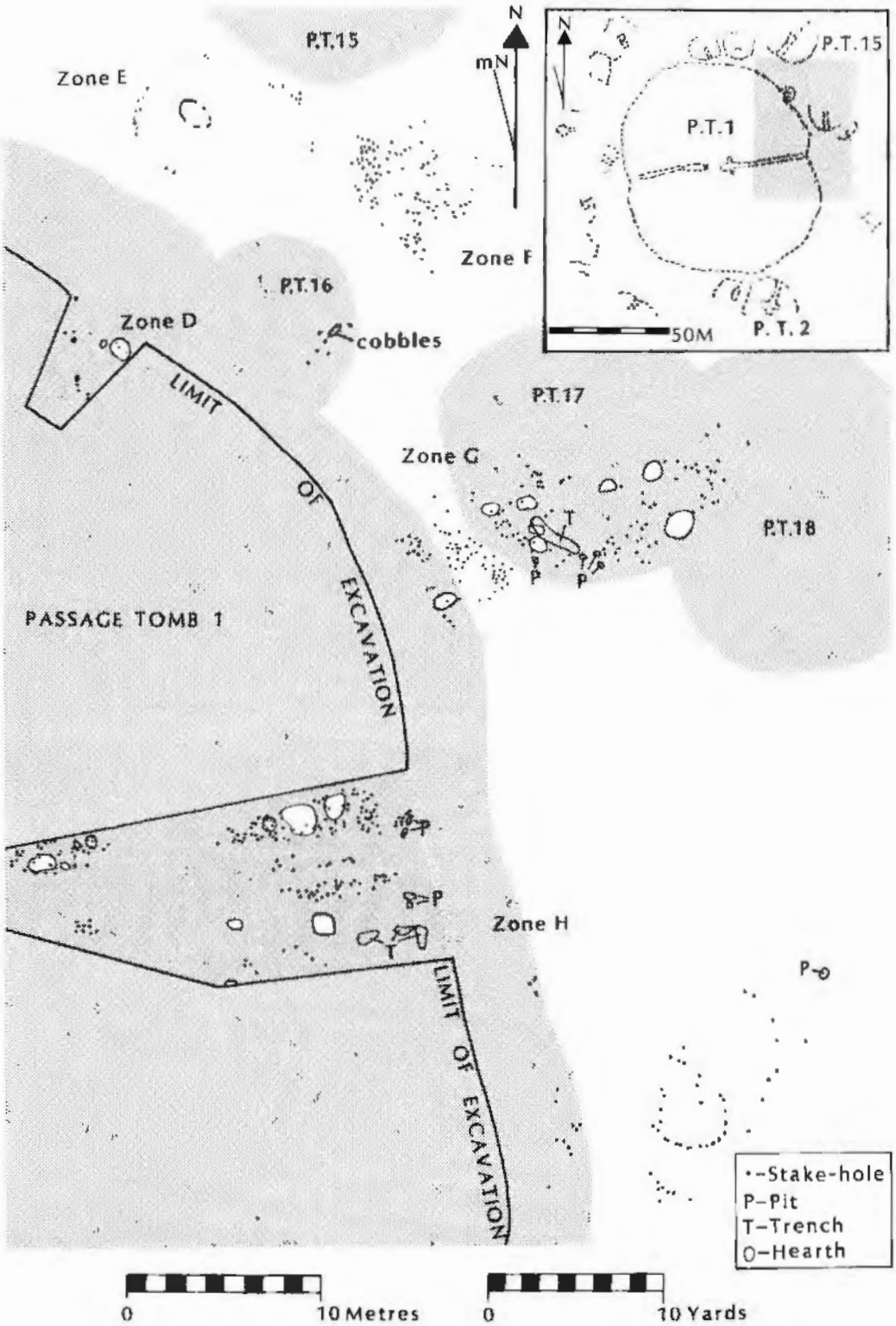
As will be discussed below, by the time this settlement commenced, substantial areas of natural forest had been cleared and an open farming landscape was in existence. It is, however, uncertain whether there was a lingering Later 'Western' Neolithic presence on the site. This notion may receive support from the presence of 27 sherds of Later 'Western' Neolithic pottery which were scattered throughout the dark charcoal-rich earth in Zones G and H. So it is possible that the Later 'Western' Neolithic complex may have survived to a limited extent; however, it seems more likely that the sherds were incorporated from the earlier complex due to disturbance, as seems to be the case with the Early 'Western' Neolithic sherds already discussed (p. 22).

Within the overall area of habitation, five main Zones of activity were evident. These are numbered D–H (Fig. 7) for convenience and do not imply continuity from the Earlier 'Western' Neolithic (Zones A–C).

Zone D: House 1 (Figs. 8 and 9; Pl. 3)

As part of the investigations of the mound of Passage Tomb 1, an area measuring 7m by 3.83m was excavated into the northern side. Underneath the mound evidence for occupation activity was found. Although the features revealed are considered to be the remains of a house, it is not possible to be absolutely certain as only a portion has been exposed, the remainder being covered by the mound of Passage Tomb 1. The digging of the late Iron Age ditch (p. 7) destroyed the northern portion of the exposed area. In the surviving area there was an arc of 5 widely-spaced post-holes, averaging 10cm wide and up to 30cm deep and a scatter of 7 stake-holes. The hard nature of the subsoil (boulder clay) would have caused problems if the larger posts

Fig. 7. Decorated Pottery Complex, areas of settlement: positions of Passage Tombs 1, 15–18 stippled.



were driven into the ground, so that it can be suggested that they were dug. To do so, a long-handled 'spoon-like' object would have been necessary. The post-holes and four of the stake-holes formed a rough semi-circle, and may be the remains of a circular structure that was about 7m in diameter. The wall posts were larger than those used in the other buildings that are assigned to this complex.

Internally there was dark, charcoal-rich habitation material, up to 5cm thick in places. The upper 3cm was darker in colour than the lower portion, which was grey/black in colour. This layer lay directly below the basal sod layers of the mound of Passage Tomb 1, separated only by a thin layer of iron pan. There was no evidence for a natural sod layer overlying the structure, suggesting that, in this zone, settlement continued up to the time the passage tomb was built. Dark habitation material was also present outside the presumed line of the walls of the house, but this faded away towards the western limits of the cutting. A small number of animal bones was found both inside and outside the house. These have been identified as representing cattle (Appendix 4).

Two hearths were found within the house (H.a–b), both on the old ground surface. The largest (H.a), 1.32m by 1.18m and 12cm deep, consisted of lenses of charcoal and ash above a layer of fine red ash. It was sealed by a thin layer of habitation material which indicates that occupation in this zone continued after this hearth had gone out of use. The second and smaller hearth (H.b), 54cm by 38cm and 6cm deep, consisted of white ash with some charcoal flecks.

Finds: from house interior

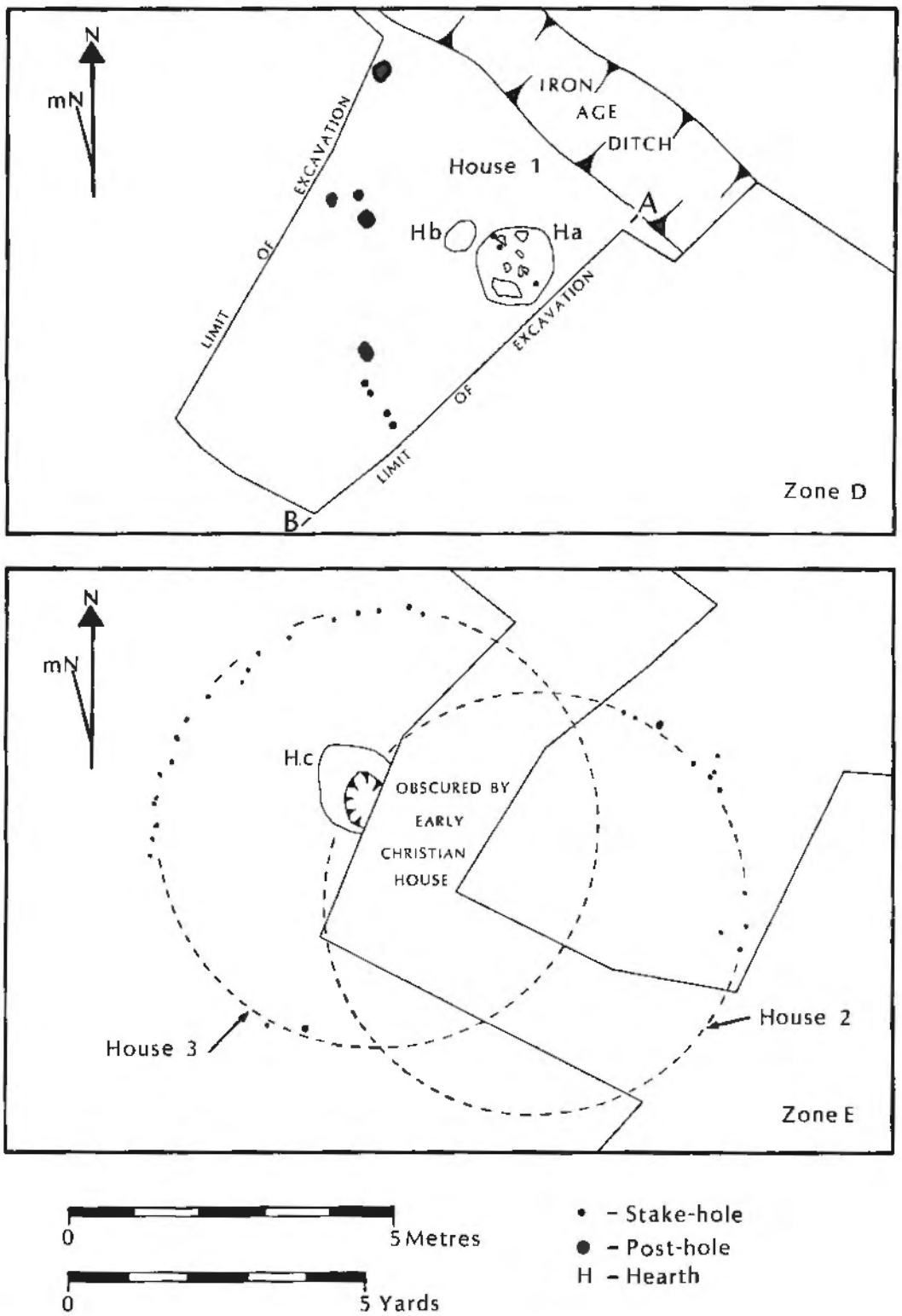
Pottery:
Vessel 1: 2 bodysherds 5872 (Fig. 16; Pl. II), 5873.
Vessel 2: bodysherd 5874 (Fig. 16).
Vessel 3: rimsherd 5875 (Fig. 16).
Vessel 4: rimsherd 5876 (Fig. 16).
3 fragments (5938 – not illustrated) too small to be assigned to vessels.

Flint:
Core rejuvenation flake: 5950.
Trimming flake: 5952.
7 *unutilised flakes*: 5965, 5966a–d, 5967–8.
3 *utilised flakes*: 6078–80.
Chip: 6107.

Zone E: Houses 2 and 3 (Fig. 8)
A concentration of stake-holes and a hearth (H.c) were found approximately 7m north of house 1. Due to the presence, at a higher level, of a house and souterrain dating to the Early Christian period (publication pending), it was not possible to uncover the entire area of settlement. Some of the stake-holes constitute a short arc, the

Plate 3, top. Decorated Pottery Complex, Zone D. House 1 under excavation. The overlying basal redeposited sod layer of the mound of Passage Tomb 1 is visible.
Plate 3, bottom. Decorated Pottery Complex, Zone D, House 1, hearths a (left) and b.

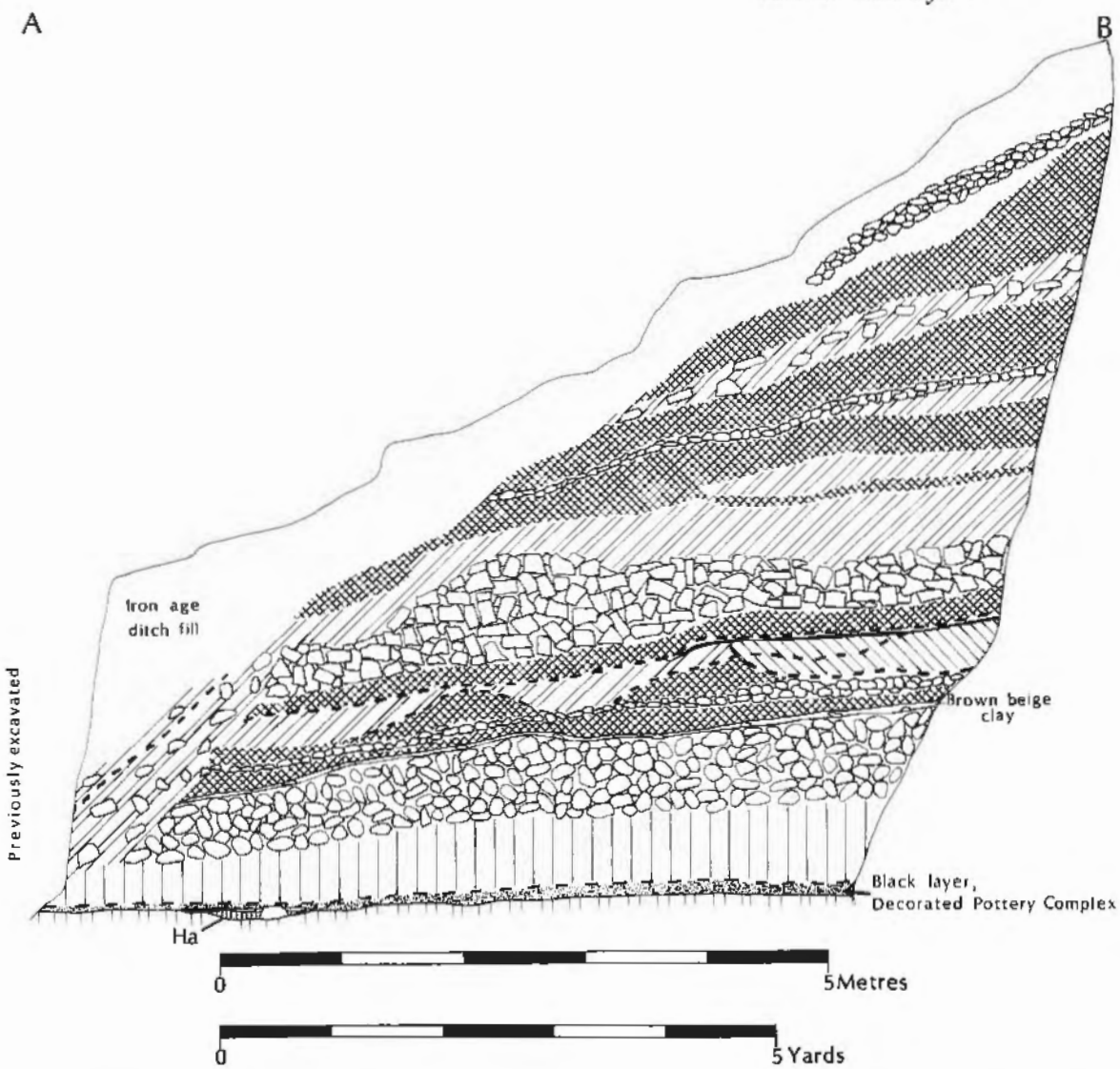
Fig. 8. Decorated Pottery Complex: ground-plans of houses 1–3, stake-holes and other features, Zones D and E.



remainder occur as small clusters. Taking the overall ground-plan of the stake-holes and bearing in mind its limitations, a somewhat oval area 9.3m by 6.75m may have been enclosed. If this constitutes a unit, the hearth would have been off centre. But there is also the possibility that the stake-holes could represent the remains of two successive circular houses. Because the hearth is on the line of the stake-holes of proposed house 2 but was not cut by them, it can be presumed that it overlay the stake-holes of house 2. This implies that the hearth was contemporary with house 3.

If this interpretation be correct, the remains of house 2, 6.50m in diameter, consists of an arc of 12 stake-holes averaging 7cm wide and

Fig. 9. Decorated Pottery Complex: section showing position of house 1 beneath mound of Passage Tomb 1, Zone D. "Black layer".



10cm deep, their fill consisting of gritty clay with charcoal flecks. A habitation layer was not found associated with this house, and no artefacts came to light.

House 3 was subsequently built; this was a well-defined circular building, 7m in diameter. The surviving evidence consists of an arc of 21 stake-holes averaging 6cm wide and 12cm deep. The fill within the stake-holes was mainly soft clay, some shale and flecks of charcoal. A thin layer of charcoal-rich habitation debris, averaging 4cm deep and containing several flint scraps, covered the interior of the house.

The hearth (H.c) was slightly off-centre, and located on the old ground surface; part of it was destroyed at the time that the previously-mentioned souterrain was constructed. The surviving portion measures 1.54m by 1.20m and 14cm deep. The accumulation of ash and charcoal suggests that it had been in use over a period of time. The basal layer, 10cm thick, consisted of red ash and burnt earth and, as the material was uniformly red, intensive burning is suggested. There was a scoop or shallow pit in the centre of the hearth, which penetrated the natural earth and measured 65cm by 24cm and 30cm deep. Within the scoop a spread of black ash and charcoal overlay a layer of red ash and burnt earth. A quantity of burnt animal bone was found within the black ash and charcoal layer. Above this level was a layer of black ash and charcoal, containing further burnt bone fragments. These have been examined by Catryn Power (Department of Archaeology, University College, Cork), who identified them as representing cattle and pig.

The features within the house were sealed by a thin grey sterile layer which measured about 3cm in maximum depth. This is interpreted as a natural sod layer which accumulated above the area of habitation after it went out of use. A number of flint pieces were found to be associated with these structures. These consist of a trimming flake (no. 5953), 7 unutilised flakes (nos. 5969–74, 6074), a knife (no. 6095) and 2 chips (nos. 6108–9).

During previous excavations, a flint thumb scraper (no. 7) was found underneath the mound of Passage Tomb 14; a probable Carrowkeel Ware sherd (no. 602) and a flint flake (no. 603) were found in the same context under Passage Tomb 15 (Eogan 1984, figs. 49 and 54). These finds are now included as representing part of the assemblage of finds associated with Zone E. No. 603 is re-published in this report.

Zone F: stake-hole concentration (Figs. 10 and 11)

Structural remains consisted of 109 stake-holes, small in size and averaging about 6cm by 5cm by 6cm in depth. These may represent a series of houses, at least some of which must have been successive. Although complete circles could not be distinguished, there is a hint of two short arcs. These are referred to as houses 4 and 5 and both could have been in simultaneous use. House 4 consists of an arc of 7 stake-holes enclosing an area about 5.50m in diameter, and house 5 of

an arc of 6 stake-holes possibly up to 6m in diameter. A habitation layer was not found associated with the houses nor with the rest of the stake-holes. There was a small cobbled area, 35cm by 27cm and seemingly incomplete, in the southern portion of this zone very close to some of the stake-holes. The rest of it may have been removed during the building of Passage Tomb 16.

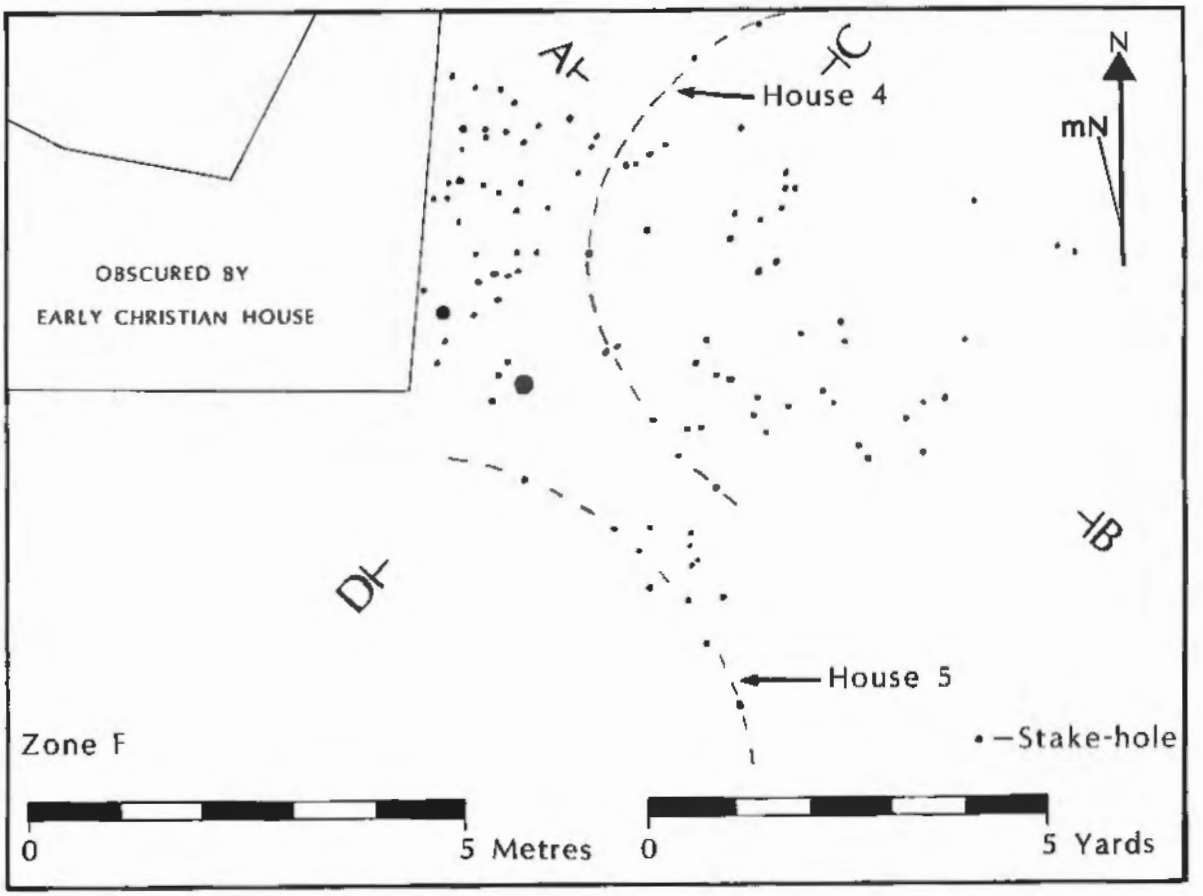
Except for these features, the habitation evidence in this zone is not extensive. However, the building of Passage Tombs 1, 15 and 16, in close proximity, would have extensively disturbed this area and it would seem that the surviving evidence for habitation is just a portion of what originally existed.

Finds: pottery

Vessel 5: rimsherd 5877 (Fig. 16; Pl. II), 3 bodysherds 5878–80.
Vessel 6: bodysherd 5881 (Fig. 16; Pl. II), fragment 5882, 4 fragments, (5939), too small to be assigned to vessels.

Finds already published (Eogan 1984, 127–28; Fig. 54), which were found beneath the mound of Passage Tomb 16 should also be

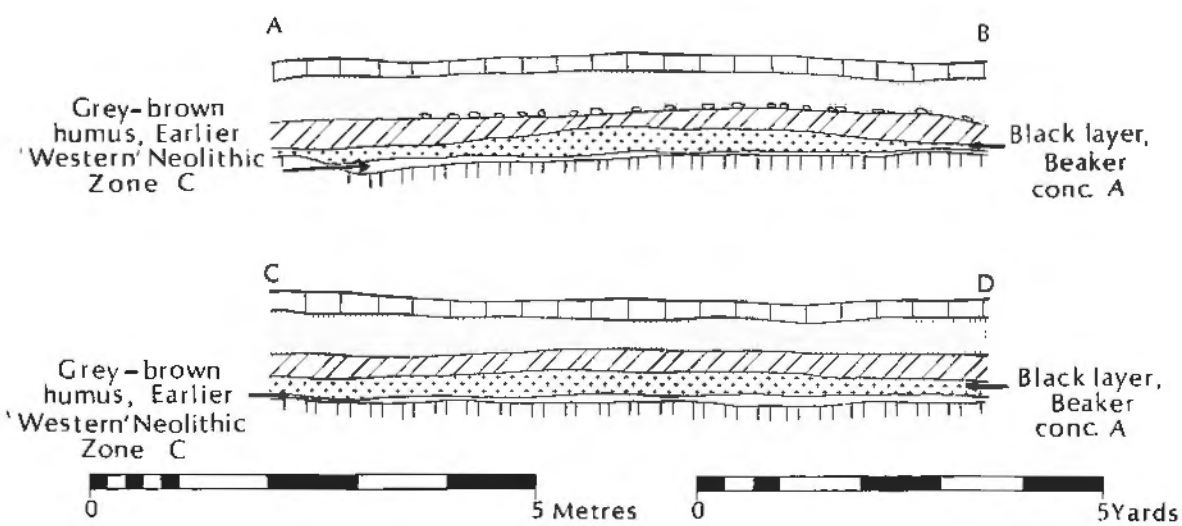
Fig. 10. Decorated Pottery Complex: ground plan of houses 4–5, stake-holes and other features, Zone F.



included as part of the evidence for settlement in Zone F, and accordingly are re-illustrated in this report (Figs. 17 and 19). These include sherds of Carrowkeel Ware, representing an estimated 6 vessels (nos. 646–652) and 5 flint flakes and chips (nos. 653–657).

Zone G: stake-hole concentration (Figs. 12 and 13; Pls. 4–5, top)
This concentration produced extensive evidence for habitation. However, the digging of the late Iron Age ditch (p. 7) cut through part of it on the south-western side. The dark charcoal-rich habitation layer was up to 12cm deep, and was overlain by a thin grey natural sod layer, which separated the habitation layer from the mound material of Passage Tombs 17 and 18. This natural sod layer does not extend beneath the mound of Passage Tomb 1, where the mound material lies directly on the habitation material. This implies that Passage Tomb 17 and 18 were built at a later stage than Passage Tomb 1. Portion of this zone was previously excavated (Eogan 1984, 133) and two C14 dates were obtained from the charcoal-rich habitation layer, 4875±150 BP (UB-318) 3990–3350 cal BC and 4795±185 (UB-319) 3990–3040 cal BC. During recent excavations, considerable evidence for settlement activity was found within the dark occupation material; 181 stake-holes, 8 hearths (H.d–k), 4 pits (P.1–4), a small trench (T.1), as well as flint and pottery were found. The stake-holes ranged from 5cm to 21cm deep and between 4cm and 10cm wide. They appear to

Fig. 11. Sections across houses 4–5. The remains of Decorated Pottery Complex stake-holes were observed on the surface of the grey-brown humus layer (Earlier 'Western' Neolithic Complex). Habitation debris was not found in association with Decorated Pottery Complex features in Zone F.



represent a succession of circular structures. Again no complete circle remains but at least 3 arcs of stakes (houses 6–8) were identified.

House 6 consisted of an arc of 15 stake-holes with a diameter of about 6m. A hearth (H.d) was centrally placed, and was dug into the subsoil to a depth of 20cm. It tended to be oval in shape and measured 1.18m by 84cm wide. The fill consists of a mixture of red ash, burnt earth and several small stones. A stake-hole was found at the base of the hearth, indicating earlier structural features in the area.

House 7 consisted of an arc of 10 stake-holes and appears to be just under 6m in diameter. The hearth (H.e) was situated off-centre, and it was roughly circular in shape, 1.08m by 96cm wide by 10cm deep. It was formed by digging a scoop into the habitation layer which had started to accumulate. Two phases of use were detected, firstly the digging of the scoop and its subsequent use as a hearth and, secondly, a setting of small stones placed on its surface, though there was no evidence, such as burning, to suggest that it was subsequently used as a hearth.

House 8 may have measured over 6m in diameter and was represented by 11 stake-holes. Although hearths i, f and j were situated within the boundaries of this suggested house, it is not possible to confirm if any of them were contemporary with the house.

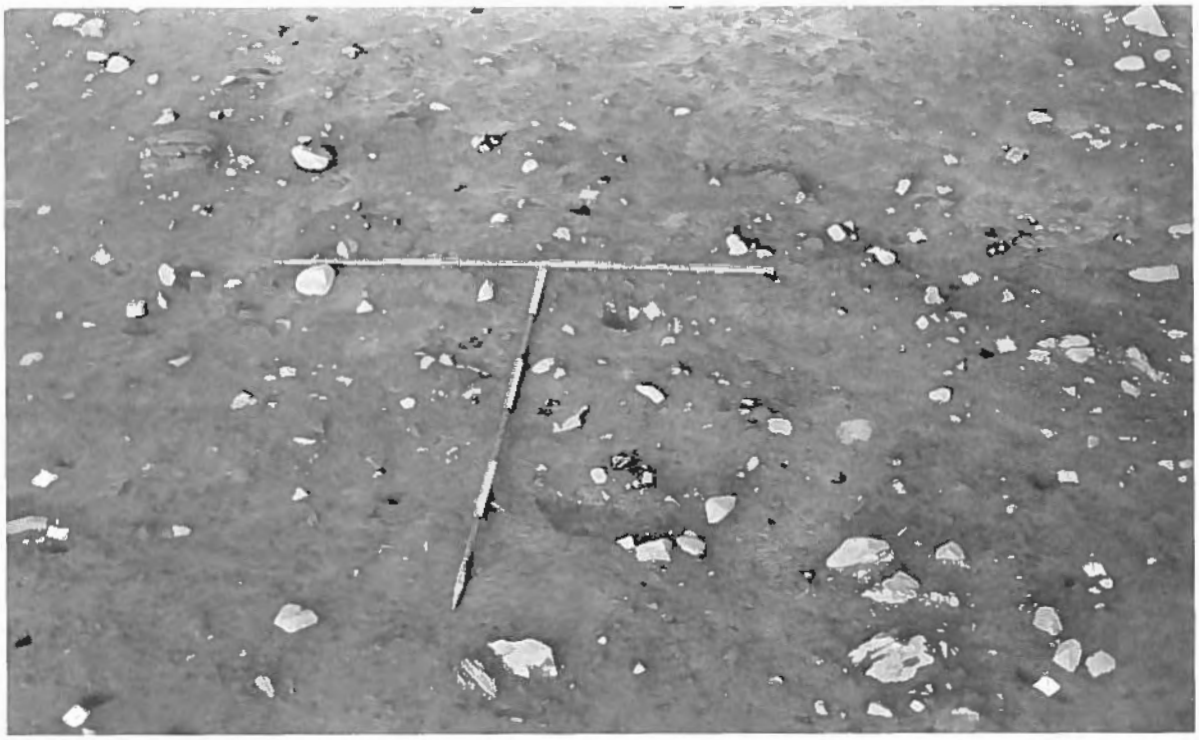
Contemporary features within the zone, but which cannot be assigned to particular houses, consist of 6 hearths (f–k), 4 pits (1–4) and a trench (T.1) (Fig. 12). Hearth f was the only substantial example, consisting of a shallow scoop containing a mixture of charcoal and earth. Hearths g–k survived merely as stains of burnt earth and ash on the ground, generally less than 1cm deep. Four pits (1–4) were found in the same general area as the hearths (Fig. 12). These were small, averaging 24cm wide and up to 25cm deep. Sherds of Earlier 'Western' Neolithic pottery were found in 3 pits (nos. 5528, 5582, 5585, 5589, 5591, 5595, 5610, 5614, 5621, 5708 and 5709 – described on p. 23); apart from this, the fill consisted of the same black habitation material into which they were cut.

The trench (T.1) ran in an east-west direction; it was 1.86m long and 12cm deep. An amount of occupation-derived debris had already accumulated when this trench was in use, as it was cut from a level within the black layer. The fill consisted of the same black habitation material, except that it contained a much higher quantity of charcoal flecks. The trench appears to have been in use during an early phase of this habitation area as it was sealed by a later hearth, and stake-holes were dug into it when it was no longer functioning. The only find within the trench was a sherd of Earlier 'Western' Neolithic pottery (no. 5527), which is interpreted as being in a secondary position (p. 23).

Finds: As all came from the general spread of habitation debris, it was not possible to associate them directly with a particular structure or feature.

Plate 4, left. Decorated Pottery Complex, Zone G. Stake-holes, remains of houses 6–8 and associated hearth. Portion of the overlying passage tomb, no. 17, is visible at the top of the photograph.
Plate 4, right. Decorated Pottery Complex, Zone G. Stake-holes, remains of houses 6–8. Portions of the overlying kerbs of Passage Tomb 1 (nos 5–6) are visible at the top left-hand side and those of Tomb 17 (nos 6–7) on the bottom right.

Plate 5, top. Decorated Pottery Complex, Zone G. Close-up view of hearth e.
Plate 5, bottom. Decorated Pottery Complex, Zone H. House 9.



Pottery:

Vessel 7: 2 bodysherds 5883–4.

Vessel 8: bodysherd 5885 (Fig. 16).

Vessel 13: 2 rimsherds 5903/5904, 5905, 6 bodysherds 5906–10a, 5910b, (Fig. 16; Pl. II).

Vessel 14: rimsherd 5911, bodysherd 5912 (Fig. 16), 6 fragments 5913–18.

Vessel 15: bodysherd 5919.

Vessel 16: 3 bodysherds 5920 (Fig. 17), 5921–2, 3 fragments 5923–5.

Twenty-four fragments, not illustrated (5940), too small to be assigned to vessels.

Flint:

Core rejuvenation flake: 5951.

2 *trimming flakes*: 5954–5.

3 *unutilised blades*: 5962a–b, 5963.

51 *unutilised flakes*: 5975–6025.

Utilised blade: 6077.

7 *utilised flakes*: 6081–7.

Knife: 6096.

2 *edge-trimmed blades*: 6098 (Fig. 19), 6099.

4 *retouched flakes*: 6101–4.

2 *chips*: 6110–11.

3 *unworked chert fragments*: 6118–20.

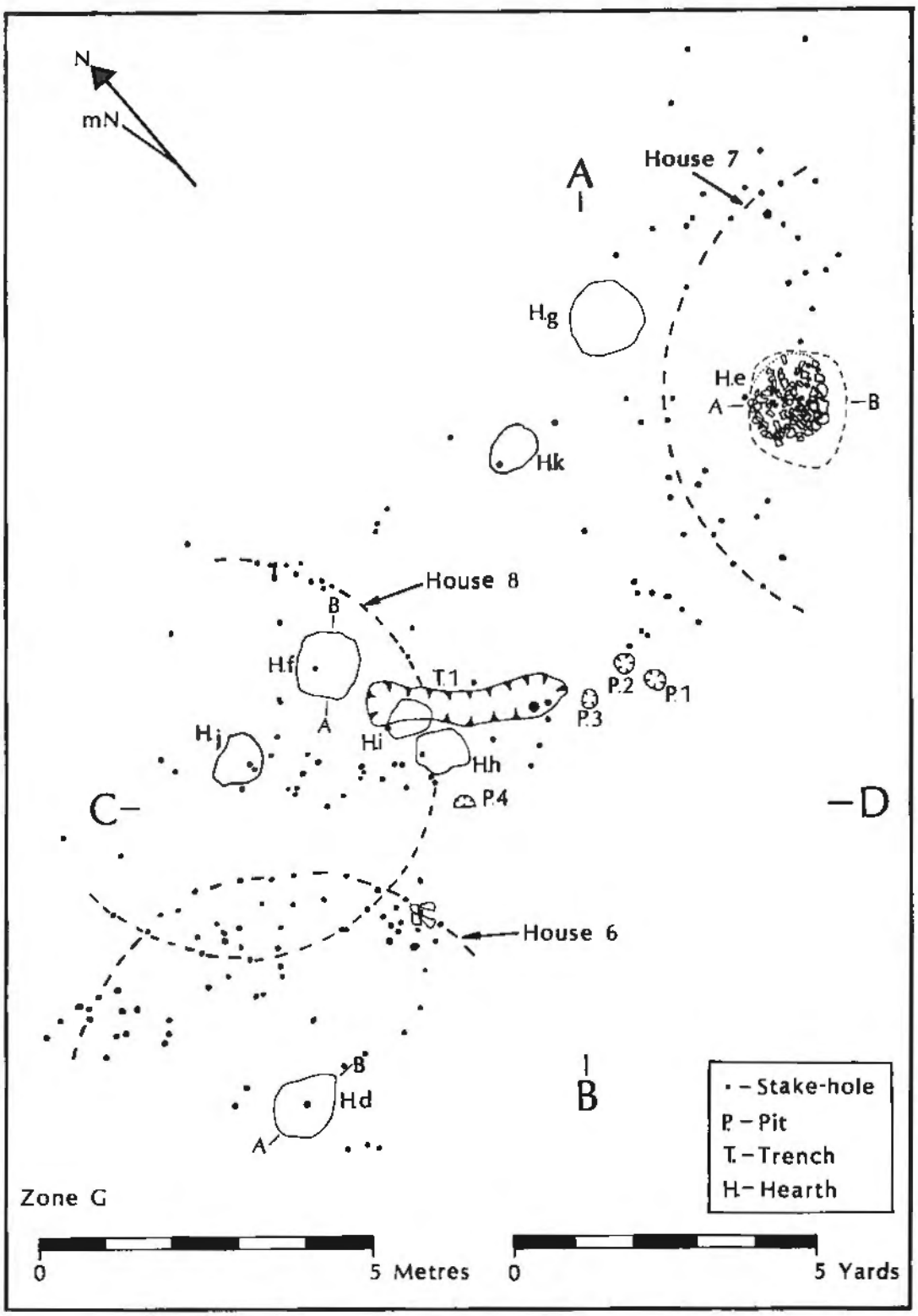
Flint flakes and chips (nos. 718–24 [Fig. 19], 730–2), which were found on the surface of the habitation material during previous excavations (Eogan 1984, 133, fig. 55), are now included as part of the assemblage of finds associated with Zone D.

Zone H: stake-hole concentration (Figs. 14 and 15; Pl. 5, bottom)

This is located in the eastern part of the hill-top. As Passage Tomb 1 was built over part of the area, only a limited portion was uncovered. Even that was bisected by the construction of the eastern passage and, subsequently, part was destroyed by the late Iron Age ditch (p. 7). The habitation material which consisted of a dark layer, up to 10cm thick, was mainly confined to the north-western portion of this zone. As in Zones D and G, this layer was found directly below the mound material of Passage Tomb 1, indicating that the building of the tomb followed immediately after the abandonment of the settlement.

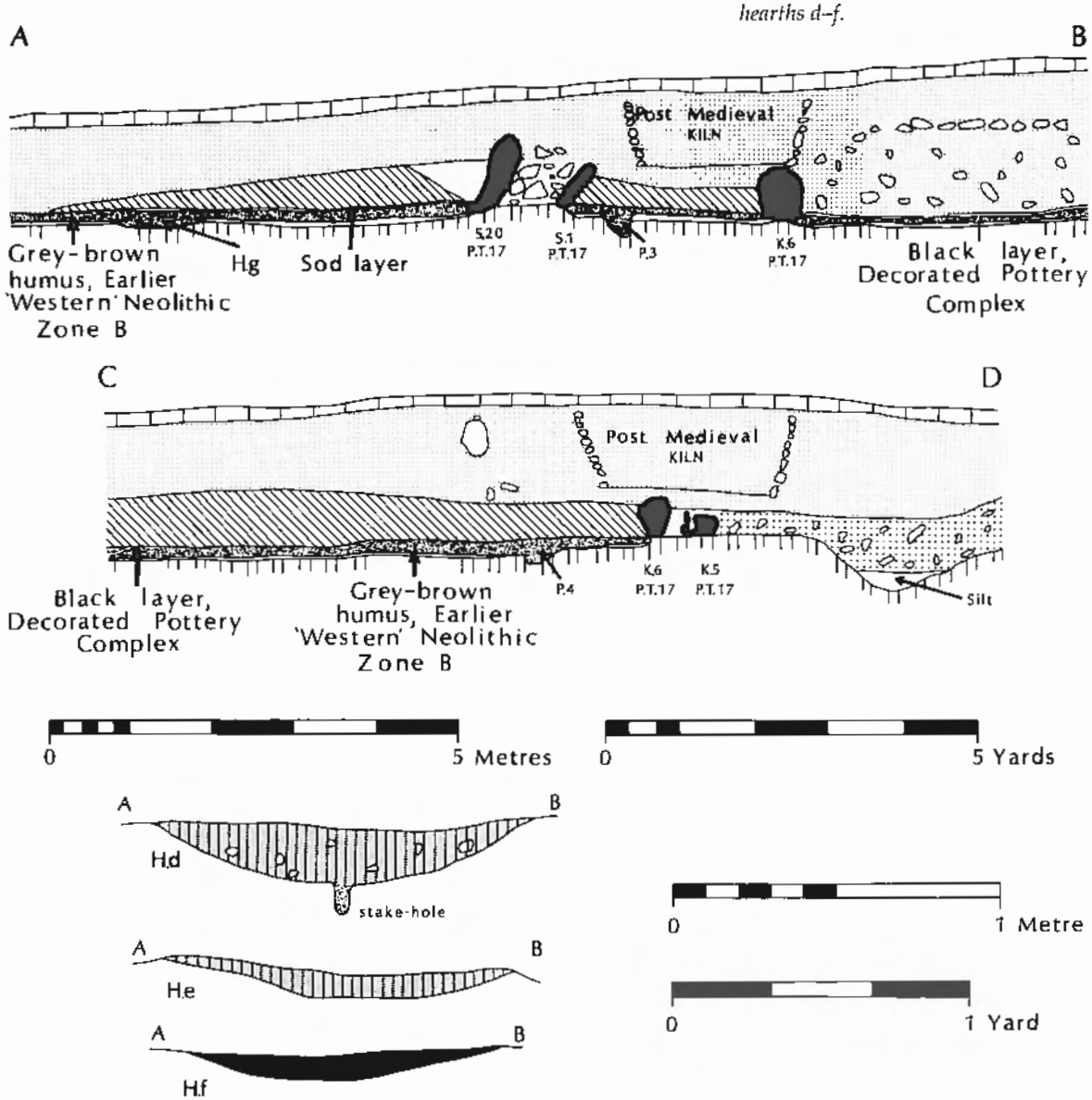
The structural remains consist of 255 stake-holes averaging 7cm wide and between 7cm and 16cm deep, probably representing several successive circular houses. Complete circles could not be traced, but arcs of post-holes suggest a minimum of at least 6 houses. Because of the limited area excavated on either side of the eastern tomb passage, it was not possible to attempt reconstructions in that area. However,

Fig. 12. Decorated Pottery Complex: ground plan of houses 6–8, stake-holes and other features, Zone G.



about 20m to the south-east, a concentration of stake holes appears to represent two houses nos. 9 and 10. **House 9**, represented by a fairly complete arc of stake-holes, tends to enclose a circular area, 3.75m in diameter. On the northern side only 2 stake-holes were present, but in the southern portion the arc was complete with the stake-holes being approximately 10–15cm apart. No evidence for a habitation layer was found. The fact that this area was overlain by a Beaker layer (Concentration D – Eogan 1984, 286–304) might suggest that the house belonged to that period. However, stake-built structures were not found in any of the other Beaker Concentrations on the site and, regarding house 9, the stake-holes are structurally similar to those in Zone G

Fig. 13. Decorated Pottery Complex: sections across houses 6–8 and hearths d–f.



which were sealed underneath Passage Tomb 17. An arc of 6 stake-holes defines **house 10**, which would have been about 4.50m in diameter.

Other features uncovered in Zone H were 6 hearths (l–q), 3 charcoal spreads (1–3), 6 small pits (5–10) and irregular spreads of rough cobbles. In the north-eastern part of this concentration (the area of the passage of Tomb 1), there was a spread of red and white ash which contained fragments of unidentifiable burnt bone. These spreads were derived from three hearths (Nos. l–n) which were found 2m apart and appear to be contemporary. Nos. l and m were in hollows which had been cut into the natural boulder clay, and n–q were directly on the grey-brown humus layer which underlay the black habitation material. As it was only possible to expose part of the habitation material, it is difficult to explain the sequence of events in the area. However, a number of stake-holes cut through the hearths and therefore suggest that successive building took place.

Hearth l, the largest, measured 1.13m by 1.10m by 24cm deep. A band of white ash containing fragments of unidentifiable burnt bone stretched across its surface, but it is not clear if it was part of the hearth or was derived from another or possibly later feature, as it was not possible to expose the full extent of the white ash. The fill consisted of layers of red ash, black ash and burnt stones, measuring up to 8cm in diameter.

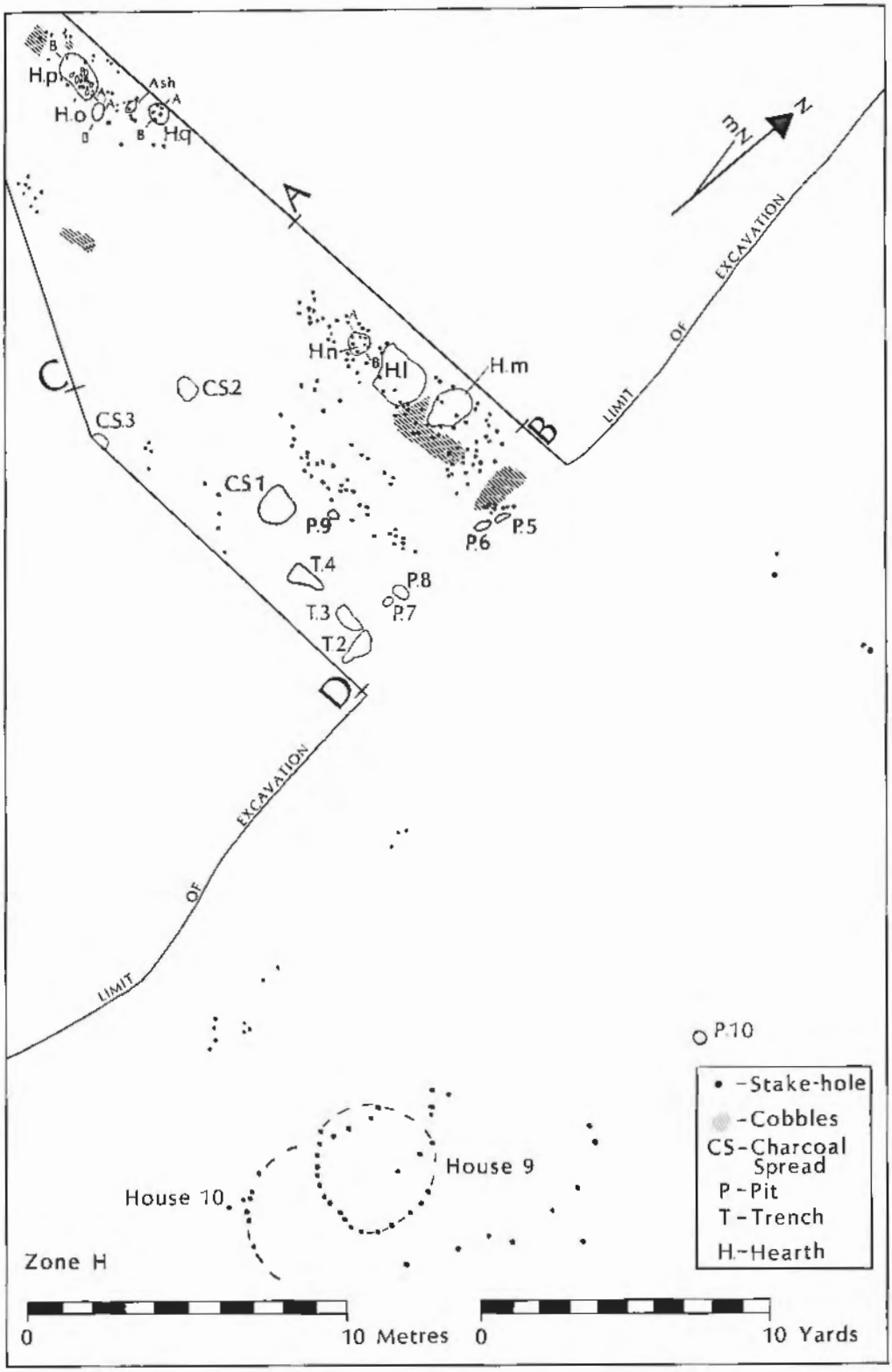
Hearth m, 70cm by 72cm by 7cm deep, consisted of layers of red and yellow ash; it also contained burnt stones up to 10cm in diameter.

Hearth n, a layer of white ash covered by a layer of red ash, and measuring 42cm by 36cm by 7cm deep.

Hearths o, **p** and **q** were found about 9m west of the previous concentration of hearths. **Hearth o** was 48cm by 32cm by 5cm deep. The southern edge of **Hearth p** was subsequently damaged by the digging of sockets for the orthostats of the eastern tomb passage. As a result, the surviving portion is oval in shape with a stone foundation consisting of small rounded cobbles; it measures 1.40m by 80cm by 12cm deep. White ash, 5cm deep, was found above the foundation, and this ash was covered by a layer of red ash containing patches of charcoal, measuring up to 7cm deep. The northern side of **Hearth q** was covered by the mound of Passage Tomb 1, so that it was only possible to excavate part of this feature. The exposed area measured 50cm by 64cm by 15cm in maximum depth. It consisted of a layer of red ash, 10cm deep, which was partially covered by a layer of white ash measuring up to 5cm in maximum depth. A spread of red and white ash, measuring 48cm by 30cm by 2cm deep, was located 30cm to the west. This was possibly throw-out from the hearth.

It should be mentioned that, although stake-holes were found in the south-eastern area of Zone H, the black habitation layer was absent. Here, a layer of grey charcoal-rich sticky earth, containing fist-sized stones, was found. 6 small pits (5–10) were found cut into this layer, but were not directly associated with any of the suggested houses. Pits 5–8 were found close together, and contained stones and small deposits

Fig. 14. Decorated Pottery Complex: ground plans of houses 9–10, stake-holes and other features, Zone H.



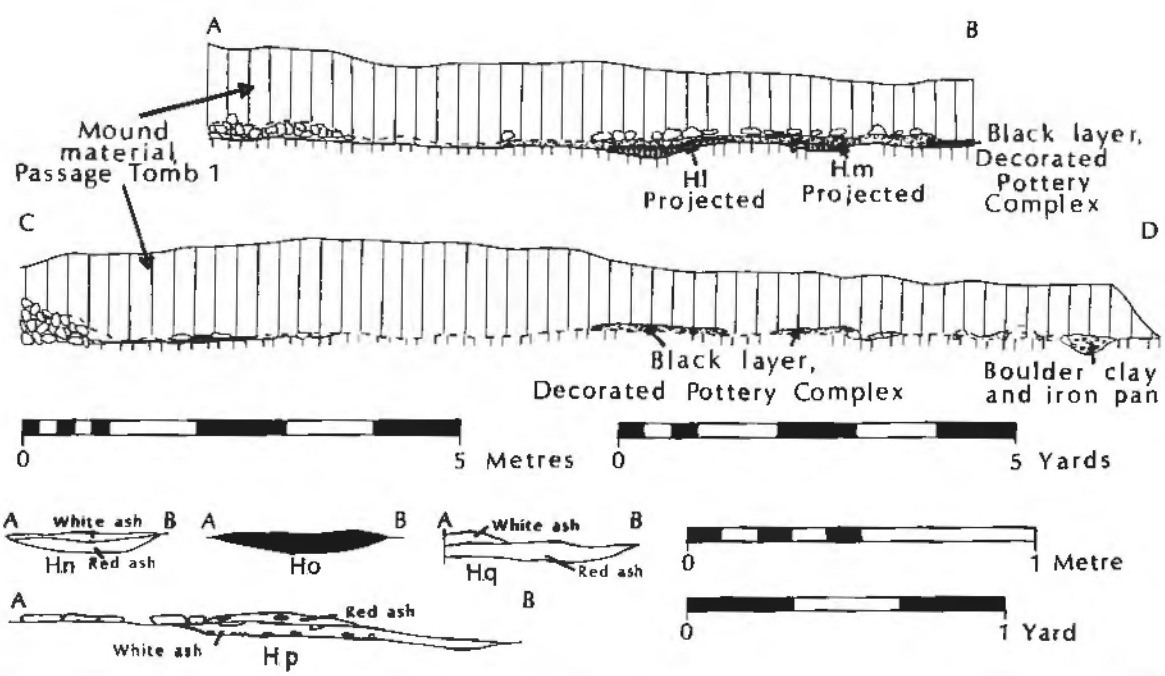
of unidentifiable burnt bone. Pit 5 measured 44cm by 27cm wide by 10cm deep; Pit 6, 35cm by 30cm by 8cm deep; Pit 7, 30cm by 15cm by 12cm deep and Pit 8 contained charcoal rich earth and small stones; it measured 33cm by 32cm by 23cm deep. Pit 9 measured 15cm by 8cm by 3cm deep. Pit 10, 32cm by 23cm by 18cm deep, was found 16.2m east of the main concentration of pits. The fill was a brown earth mixed with boulder clay and small stones, within which sherds of a Broad-rimmed vessel (Vessel 17 – Fig. 17) were found.

There were also 3 charcoal spreads (1–3) in this area. No. 1 was 1.12m by 90cm by 5cm deep, No. 2, 72cm by 54cm by 4cm deep, and the uncovered portion of No. 3 was 40cm by 18cm by 5cm deep.

Three trench-like features (2–4) were found close together, but it has not been possible to determine what function they served. All contained a grey sticky material with a high quantity of charcoal flecks. In addition, Trench 2, 1.25m by 65cm by 10cm deep, contained a small pocket of unidentifiable burnt bone. Trench 3 measured 1m by 35cm by 12cm deep, and Trench 4 measured 1.20m by 50cm by 9cm deep.

Irregular spreads of rough cobbles were found in the western part of this concentration. They were poorly preserved, mainly because of later activity, including the construction of the eastern passage of Passage Tomb 1 and, subsequently, by souterrain building during the Early Christian phase of occupation on the site. However their stratigraphical position suggests they were part of the Decorated Pottery complex.

Fig. 15. Decorated Pottery Complex: north-western end of Zone H, sections across hearths n–q.



Finds:

Pottery:
Vessel 9: rimsherd 5886 (Fig. 16; Pl. II), bodysherd 5887.
Vessel 10: 2 rimsherds 5888–9 (Fig. 16; Pl. II), 5 bodysherds 5890, 5891 (Fig. 16), 5892–4, 4 fragments 5895–8.
Vessel 11: 3 bodysherds 5899–5901 (Fig. 16; Pl. II).
Vessel 12: bodysherd 5902 (Fig. 16).
Vessel 17: 3 rimsherds 5926–8, and 50 fragments 5928a (Fig. 17; Pl. II).
Vessel 18: 2 bodysherds 5929–30.
Vessel 19: rimsherd 5931 (Fig. 17).
Vessel 20: rimsherd 5932, 2 bodysherds 5933 (Fig. 17), 5934, 3 fragments 5935–7.

Flint:
Bipolar split pebble: 5949.
6 *trimming flakes*: 5956–61.
Unutilised blade: 5964.
50 *unutilised flakes*: 6026–73, 6075–6.
4 *utilised flakes*: 6088–91.
3 *hollow scrapers*: 6092–4 (Fig. 19).
Knife: 6097 (Fig. 19).
Edge-trimmed flake: 6100
2 *retouched flakes*: 6105 (Fig. 19), 6106.
Chips: 6112–17.
24 *unworked chert fragments*: 6121–44.
2 *quartz fragments*: 6145–6.
Quartzite pebble: 6147.
4 *rounded pebbles*: 6148–51.
Unworked fragment of miscellaneous stone: 6152.

Finds: Detailed description and catalogue

Introduction: **Pottery**
There is a total of 134 sherds from this settlement, but many are small and poorly preserved. An estimated 20 vessels are present (27 vessels if those previously published are included), but no complete vessel survives. The identification is based on featured sherds, decorative motifs and the nature of the fabric. Ten definite vessels can be identified by individual rimsherds (vessels 3, 4, 5, 9, 10, 13, 14, 17, 19 and 20), and the remaining examples should be regarded as probable vessels.

Two vessel types are present, Carrowkeel Ware (vessels 1–12), and Broad-rimmed Ware (vessels 13–20). Both varieties are characterised by a rounded body but Carrowkeel Ware is more globular in shape. The rim form also differs, Carrowkeel Ware having a slightly inturned pointed or flattened rim, whereas Broad-rimmed Ware has

prominent, club-like rims with flat and slightly convex upper surfaces, generally with a subtle cavetto neck. The decorative features most common on Carrowkeel Ware are stab-and-drag ornament and bird-bone impressions. More varied decoration is found on Broad-rimmed vessels, and this includes finger-nail impressions, grooved lines, impressed dots and cord impressions. In general, the fabric is thick-walled and sometimes very coarse, with large angular grits, although the quality of the Broad-rimmed vessels is usually superior to that of Carrowkeel Ware. The variety of grits selected are similar in both wares, consisting mainly of quartzite, but shale, sandstone, dolerite and shell were also used (Appendix 1).

Catalogue

Carrowkeel Vessels

Vessel 1 (Fig. 16; Pl. II) 2 bodysherds 5872–3 (Zone D). Hard fabric with a slightly chalky texture and a moderate grit content (<=3.0mm). Decoration consists of oblique rows of stab-and-drag impressions divided by an undecorated band. Colour: pale orange-buff throughout. T. 9.2–11.1mm.

Vessel 2 (Fig. 16) bodysherd 5874 (Zone D), hard, slightly flakey texture with a moderate grit content (< = 4.3mm). It is decorated with parallel rows of stab-and-drag ornament, most of the stabs being at a sharp angle. Colour: dull orange/black/black. T. 12.4mm.

Vessel 3 (Fig. 16) rimsherd 5875 (Zone D), hard flakey fabric with a high grit content (< = 4.4mm). The surface is abraded, but traces of oblique stabs are present on the flattened top of the inturned rim. A shallow horizontal groove is present just below the rim on the exterior surface. This surface also has two faint curved rows of shallow stab-and-drag ornament. Colour: orange-buff/grey/orange–buff. T. 14.7mm.

Vessel 4 (Fig. 16) poorly preserved, weathered, rimsherd fragment 5876 (Zone D). The rim is out-turned. Hard fabric with a slightly chalky texture with few visible grits (< = 2.5mm). There is no evidence for decoration. Colour: dark orange/grey-black/grey-black. T. 7.8mm.

Vessel 5 (Fig. 16; Pl. II) rimsherd 5877 and 3 bodysherd fragments 5878–80 (Zone F). The fabric is hard and coarse in texture with a moderate grit content (< = 6.8mm). The rim curves very slightly inwards and the flattened top is decorated with parallel transverse grooved lines, the exterior surface being decorated with curved rows of fine, closely spaced stab-and-drag ornament. Colour: bright orange/black/orange. T. 8.4–12.5mm.

Vessel 6 (Fig. 16; Pl. II) bodysherd 5881 and a fragment 5882 (Zone F). Hard fabric, coarse in texture with a moderate to high grit content (< = 5.5mm). Decoration consists of parallel rows of stab-and-drag impressions. Colour: bright orange/black/orange. T. 14.3mm.

Vessel 7 2 bodysherds 5883–4 (Zone G), poorly preserved and abraded. Hard, slightly flakey fabric with a moderate grit content (< = 2.0mm). There is no evidence for decoration. Colour: orange/black/orange. T. 4.6–9.4mm.

Vessel 8 (Fig. 16) bodysherd 5885 (Zone G), hard fabric with a slightly flakey core and a moderate grit content (< = 2.8mm). Smooth surface with a slightly sooted interior surface. Decoration consists of parallel lines of deep, almost circular stab-and-drag impressions. Colour: orange/black/black. T. 11.1mm.

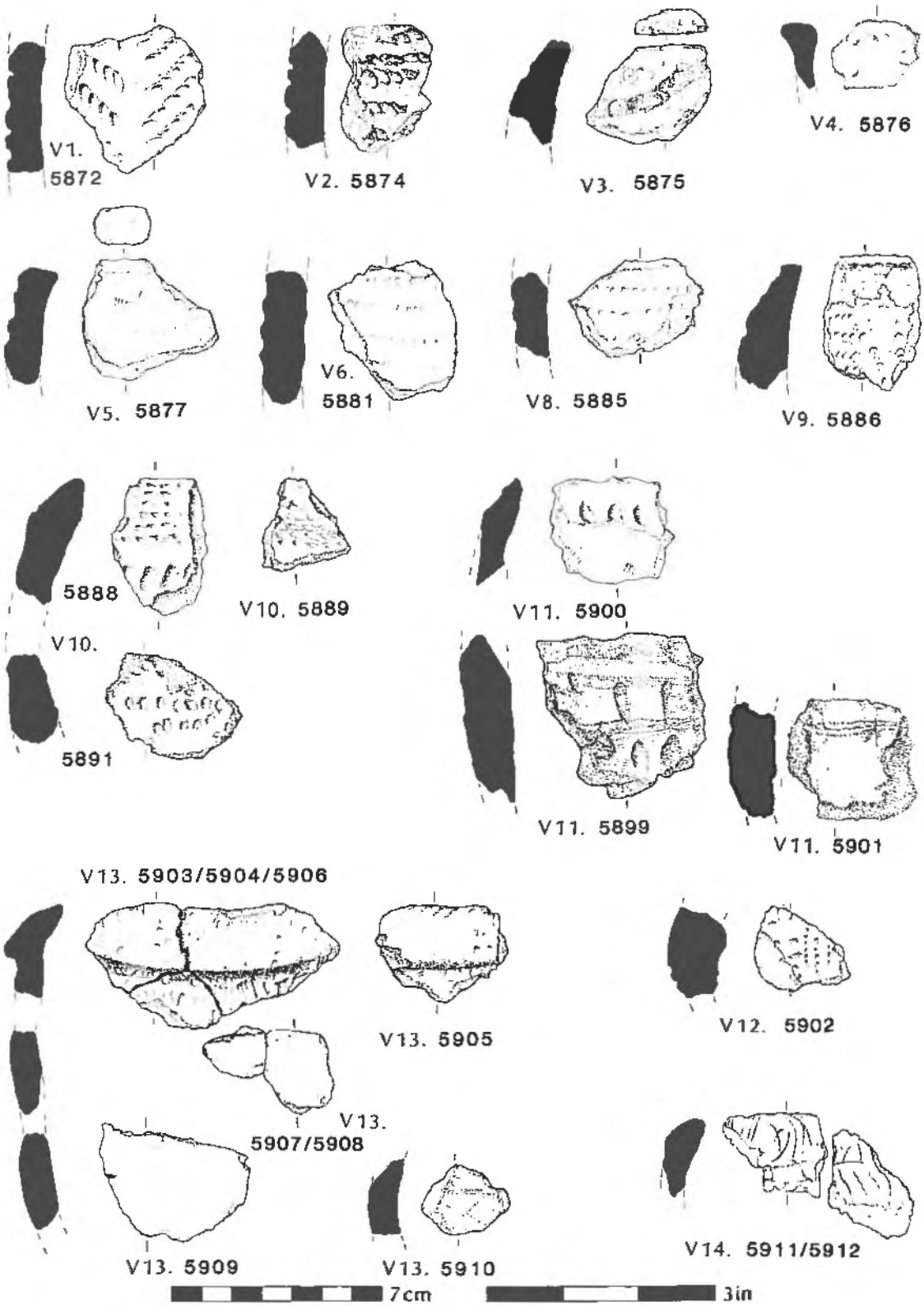
Vessel 9 (Fig. 16; Pl. II) rimsherd 5886 and a bodysherd fragment 5887 (Zone H). The rim curves gently inwards, its top is flattened. Hard, flakey fabric with a moderate grit content (< = 3.7mm). Traces of sooting are present on the exterior surface. The flattened top of the rim is decorated with transverse oblique rows of fine stab-and-drag impressions. The upper part of the exterior surface is missing but the lower portion is decorated with two panels of decoration. One panel consists of parallel rows of vertical triangular-shaped stab-and-drag impressions. The other panel is formed by horizontal rows of closely spaced stab-and-drag impressions. Colour: grey/black/black. T. 11.2–14.2mm.

Vessel 10 (Fig. 16; Pl. II) 2 rimsherds 5888–9, 5 bodysherds 5890–4 and 4 fragments 5895–8 (Zone H). The rim, which is pointed, curves gently inwards. Hard, crumbly fabric with a high grit content (< = 3.0mm). Sooting is present on both surfaces. The top of the pointed rim is decorated with stab impressions while the exterior has six horizontal, closely spaced rows of shallow stab-and-drag impressions. These give the impression of cord decoration. Below this there is a slightly sunken plain panel below which are horizontal rows of large stab-and-drag impressions. Colour: orange-black/black/black. T. 13.5–15.1mm.

Vessel 11 (Fig. 16; Pl. II) 3 bodysherds 5899–5901 (Zone H). Very hard fabric with a high grit content (< = 5.0mm). The combined decoration from the sherds would suggest that the vessel was decorated with horizontal rows of stab-and-drag impression. Two different implements were used, one to create a broad D-shaped impression, the other a rounded groove. The rows were divided by a deep grooved line. Colour: buff-orange. T. 12.5–16.5mm.

Vessel 12 (Fig. 16) bodysherd 5902 (Zone H), hard, dense fabric with a moderate grit content (< = 3.0mm). Decoration consists of parallel

Fig. 16. Decorated Pottery Complex: pottery finds (vessels 1–6, 8–14).



rows of fine stab-and-drag impressions, running at right-angles to each other. Colour: orange/grey/orange. T. 18.2mm.

Broad–rimmed vessels (Zones G and H)

Vessel 13 (Fig. 16; Pl. II) 2 rimsherds 5903/5904, 5905 and 6 bodysherds 5906–10 a–b (Zone G). Hard, dense fabric with a moderate grit content (< = 2.0mm). The surface of the rim is decorated with two panels of ornament, broad transverse oblique lines and dot impressions enclosed in a triangular frame. Around the circumference of the neck of the vessel there are clusters of rounded stab-and-drag impressions and possible bird bone impressions. The body is decorated with slightly curving and vertical shallow grooved lines, giving a rippling effect to the exterior surface. Colour: orange-black throughout. T. 8.4–9.6mm.

Vessel 14 (Fig. 16; Pl. II) rimsherd 5911, a bodysherd 5912 and 6 fragments 5913–18 (Zone G). The rim curves inwards to form a point. Poorly preserved flakey fabric with a moderate to high grit content (< = 3.5mm). The exterior surface of the rim is decorated with overlapping thumb-nail scorings; a faint horizontal line is present at the base of the rim, and below this line there is a slightly concave neck which is decorated with broader thumb-nail impressions. Colour: dark brown/black/dark brown. T. 9–12.4mm. Broad-rimmed related.

Vessel 15 bodysherd 5919 (Zone G), poorly preserved, both surfaces are missing. Hard fabric with a moderate grit content (< = 4.4mm). Colour: grey-brown throughout.

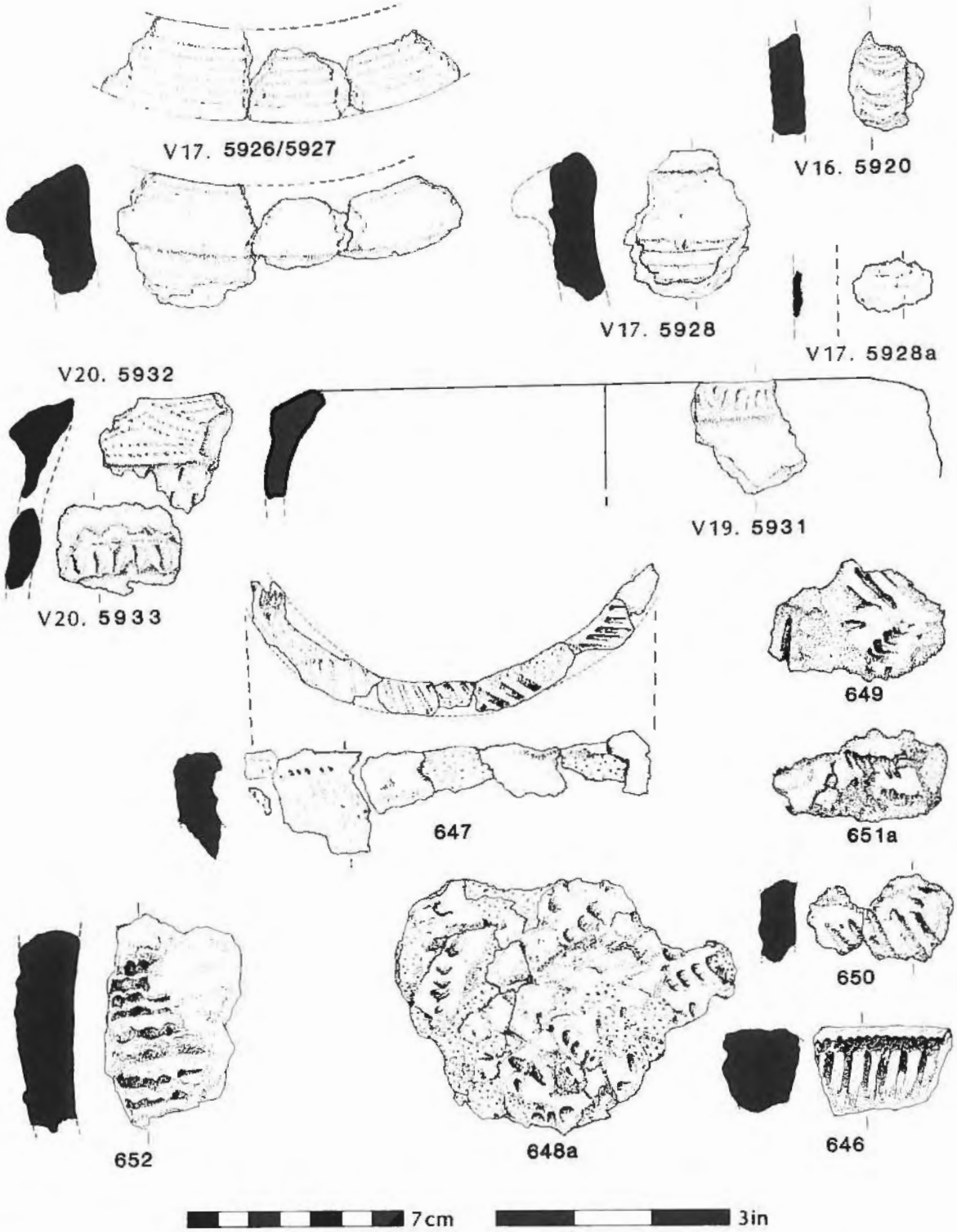
Vessel 16 (Fig. 17) 3 bodysherds 5920–2 and 3 fragments 5923–5 (Zone G). The hard fabric has a moderate grit content (< = 2.6mm). Decoration consists of curved thumb-nail impressions extending from a central panel. Colour: orange/orange/black. T. 8.7–10.5mm.

Vessel 17 (Fig. 17; Pl. II) 3 rimsherds 5926–8 and 50 fragments of varying degrees of preservation and size 5928a (Zone H). Coarse, quite friable, fabric with a high grit content (< = 4.4mm). Areas of the interior are fire-blackened. The rim is decorated with six grooved lines which extended around the circumference of the rim, and these were bordered by oblique lines on the inner and outer edge of the rim. There are horizontal grooved lines on the body below the rim. Colour: dark brown throughout. T. 11.2–14.1mm.

Vessel 18 2 bodysherds 5929–30 (Zone H), abraded and poorly preserved. Hard fabric with a moderate grit content (< = 3.0mm). Colour: brown-orange/black/black. T. 10.7–11.0mm.

Vessel 19 (Fig. 17) rimsherd 5931 (Zone H), with a broad rim less exaggerated than the previous examples; it is inturned, forming a

Fig. 17. Decorated Pottery Complex: pottery finds (vessels 16–17, 19–20).



sharp bevel on the exterior surface, the top being abraded. The fabric, with a high grit content (< = 3.0mm), is slightly flakey in texture with burnt encrusted matter present on the overall exterior surface and some patches on the interior surface. The surface of the rim is decorated with impressed dots and a transverse oblique line; vertical lines decorate the beveled area. Colour: black throughout. Estimated rim diameter 182mm. T. 11.4mm. Broad-rimmed related.

Vessel 20 (Fig. 17) rimsherd 5932, 2 bodysherds 5933–4 and 3 fragments 5935–7 (Zone H). Hard fabric but crumbly in texture with a moderate grit content (< = 2.5mm). The rim is decorated with fine cord pattern, forming V-shaped designs and horizontal rows, and there is a faint incised line immediately below the rim. On the neck, and below it, are the remains of two horizontal rows of deep triangular-shaped stab-and-drag impressions. Two broken incised lines divide the rows from each other. Colour: orange/grey-brown/grey-brown. T. 12.7–13mm.

Lithic assemblage

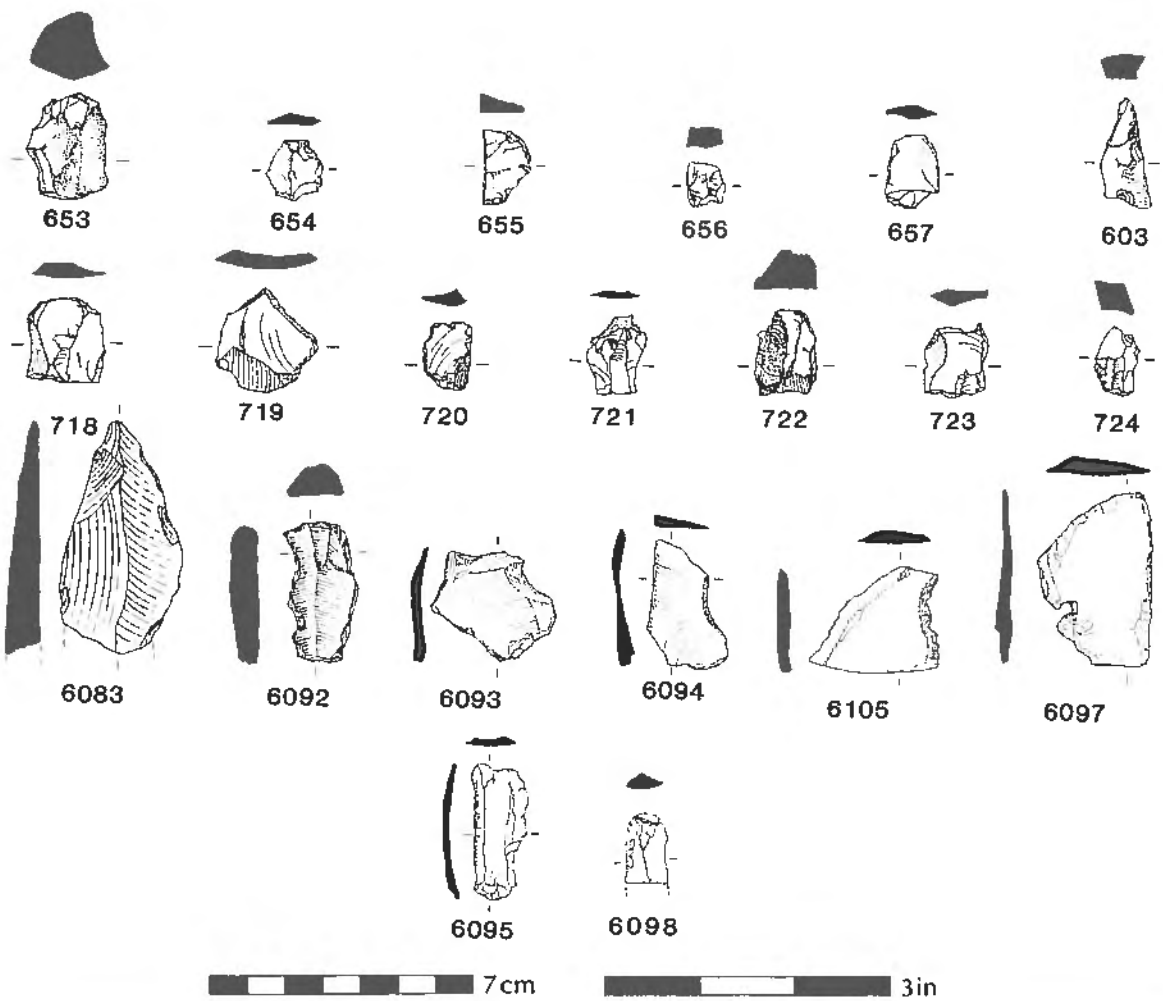
Fiona Dillon

Introduction (Table 6, p. 83)
Including the 17 pieces already published, there are 208 lithics in this assemblage. Although the size of the assemblages varies in each zone, this appears to be related to the survival and density of the habitation material rather than being a reflection on specialised activity areas.

Fig. 18. Decorated Pottery Complex: pottery finds (vessels 21–5).

The raw material: Two types of raw materials, flint and chert were knapped. Glacially deposited pebble flint, which could have been acquired locally, is the dominant raw material, forming 51% (107 pieces) of the assemblage. 38 pieces are burnt. Possible evidence for the use of re-cycled flint is represented by no. 5949 which is a water-rolled patinated large flake, probably the product of bipolar reduction. The water rolling and patination took place after the flake was struck. A small group (20 pieces, forming 10%) of grey flint is from the chalk deposits in the north-east of the country (referred to as 'chalk flint' from here onwards). A hoard of sixteen flakes of chalk flint was found at Passage Tomb 2, deposited under the overhanging side of kerbstone 26 and therefore post-dating the tomb (Eogan 1984, 24–25, fig. 10). They contain blanks of hollow scrapers and so perhaps, they date from the Decorated Pottery Complex, as hollow scrapers were not a feature of the subsequent Grooved Ware or Beaker Complexes. If they

Fig. 19. Decorated Pottery Complex: flint finds.



date to this stage (Decorated Pottery Complex), at least some large pieces of chalk flint were being imported. Thirty five pieces (17%) of poor quality chert are present, of which 8 are worked. Four pieces (nos. 6082–4 and 5974) were found together near orthostat 20 of Passage Tomb 17 (Zone G). Chert is available in the local glacial tills (McCabe 1973, 358; Table 1) but its primary source is in the limestone bedrock which also occurs locally. There are 2 pieces of unworked quartz (.9%), quantities of which occur around the entrances to both tombs in Passage Tomb 1, so that these pieces could be chance inclusions. Also present are 5 pebbles (2%) and a stone fragment (.4%).

Technology. Evidence of technology is found in the by-products of knapping, cores, flakes, modified tools and debris. No natural or tested pebbles or cores were found. Cortical analysis (Table 7, p. 83) shows 6 primary flakes (Zone G; nos. 6103, 5986, 6097: Zone H; nos. 6037–8, 6062) are present, of which 4 are un-retouched artefacts (nos. 6037–8, 5986 and 6062). Two core rejuvenation flakes (nos. 5950–1) are present. The analysis of intact flake platforms shows a predominance of prepared platforms, indicating that core preparation featured (Table 8, p. 84). The range of platform depths (Table 9, p. 84) reflect the different percussion techniques, direct, indirect percussion and pressure flaking. One group with depths of less than 1mm are trimming flakes. The second group have platform depths of between 2–3mm, the product of indirect percussion, while the remaining larger platforms were produced by direct percussion. Knives (nos. 6095–7) provide the best evidence for sophisticated knapping. These were fashioned on thin parallel-sided flakes. Evidence for the secondary modification of knapped flakes is limited with only 10 trimming flakes present. The low number of the flakes and their dispersal in the habitation layer indicates that the secondary modification of flakes, like the initial knapping, took place away from the living areas. However the sophistication of the secondary retouch is illustrated by the fine regular denticulated edge on knives (nos. 6095–6). Although the number of modified tools is low, a diverse range of retouch techniques is present. The knife (no. 6095) has a fine denticulated edge, the 'backed' flakes (nos. 6098–99) have a steep blunted edge and the concave scraper (no. 6093) has a regular abrupt retouch forming its working edge.

Catalogue

(Flint unless otherwise stated)

Bipolar split pebble: 5949 (Zone H), patinated and water-rolled, which occurred after knapping. Subsequently it was collected, possibly for re-use or re-cycling.

2 *core rejuvenation flakes*: **Complete:** 5950 (Zone D). **Part:** 5951 (Zone G), both of glacial pebble cores. No. 5950 is a 'tablet' type with

negative scars extending around the circumference of the flake and with cortex on the dorsal face. Scarring on the cortex indicates its use as a platform. No. 5951 is a rejuvenation flake, removed from the side of the platform to facilitate knapping. No. 5951 is burnt.

10 *trimming flakes*: **Complete:** 5952 (Zone D), 5959–61 (Zone H). **Part:** 5953 (Zone E), 5954–5 (Zone G), 5956–8 (Zone H).

4 *unutilised blades*: 5962a, b, 5963 (Zone G), 5964 (Zone H). No. 5964 is burnt.

115 *unutilised flakes:* **Complete:** 5969–71 (Zone E), 5979, 5981, 5983, 6002, 6018 (Zone G), 6026, 6035, 6051, 6066 (Zone H). **Part:** 5965, 5966a–d, 5967–8 (Zone D), 5972–3, 5974 (chert), 6074 (Zone E), 5975–8, 5980, 5982, 5984–6001, 6003–17, 6019–25 (Zone G), 6027–34, 6036–50, 6052–7, 6058(chert), 6059–65, 6067–73, 6075–6 (Zone H).

28 pieces (24%) are burnt (Zone E: 5972–3, 5978, 6074. Zone G: 5979, 5985, 6005, 6007, 6012–15, 6022–25. Zone H: 6035, 6037, 6044, 6049, 6053–54, 6063, 6070–73, 6075).

Utilised blade: **Complete:** 6077 (Zone G).

14 *utilised flakes*: **Complete:** 6078 (Zone D), 6082 (chert) (Zone G), 6088, 6090 (Zone H). **Part:** 6079–80 (Zone D), 6081, 6083 (chert [Fig. 19]), 6084 (chert), 6085–7 (Zone G), 6089 (chert), 6091 (chert) (Zone H). Nos. 6082–4 are part of a group of chert pieces which also include 5974 (above unutilised flakes). The laminar shape of 6083 bears a slight resemblance to a Late Mesolithic 'Bann flake' or, to use the current term, 'butt-trimmed flake'. However, although the platform is missing, it lacks the diagnostic large bulb of percussion and retouch on the proximal lateral edges. In addition, the other three flakes (nos. 5974, 6082, 6084) in the group have no characteristics of Late Mesolithic technology and all may be attributed to the Decorated Pottery Complex.

3 *hollow scrapers:* (Fig. 19) 6092 (chert), 6093–4 (Zone H). 3 examples with small shallow concavities forming the working edges on the lateral sides of flake fragments.

3 *knives:* **Complete:** 6095 (Fig. 19 – Zone E). **Part:** 6096 (Zone G), 6097 (Fig. 19 – Zone H). These are characterised by a lateral edge of the flake retouched into a straight edge. Nos. 6095 and 6096 are secondary flakes of pebble flint with the lateral edge finely worked into a denticulated straight edge. No. 6097 is made of grey flint and has the lateral and distal ends retouched, possibly to facilitate holding or hafting the implement. No. 6096 is burnt.

2 *edge-trimmed blades:* 6098 (Fig. 19), 6099 (Zone G). Fragments of blades with slightly triangular cross-sections and steep retouch on a

lateral edge. The working edge is the primary edge for cutting with the retouched edge blunted to facilitate holding or hafting. No 6099 is burnt.

Edge-trimmed flake: 6100 (Zone H), a small secondary flake which is finely retouched to form a blunt 'scraping'-type edge.

6 *retouched flakes:* **Complete:** 6103 (Zone G). **Part:** 6101–2, 6104 (Zone G), 6105 (Fig. 19), 6106 (Zone H). All have irregular abrupt retouch. No. 6105 is a flake fragment with crude retouch on the lateral edge. No. 6102, a fragment of a tertiary flake with a retouched notch at the distal end. No. 6101 is a tertiary flake, with the retouch forming a V-shaped hollow on the lateral edge. No. 6103 is a primary flake with crude retouch forming a jagged working edge. No 6104 is a fragment of a secondary flake with fine retouch sporadically along the lateral edge.

11 *chips:* 6107 (Zone D), 6108–9 (Zone E), 6110–11 (Zone G), 6112–17 (Zone H). 6 show evidence for burning (6109, 6111, 6113–5, 6117).

27 *unworked chert pieces:* 6118–20 (Zone G), 6121–44 (Zone H).

2 *unworked quartz pieces:* 6145–6 (Zone H). No 6145 is a regularly shaped fragment, 6146 is a natural fragment.

Quartzite pebble: 6147 (Zone H).

4 *rounded pebbles:* 6148–51 (Zone H), all unworked.

Unworked fragment of miscellaneous stone: 6152 (Zone H).

Comment

The analysis of the raw materials shows that pebble flint was the predominant raw material, but with a small quantity derived from the chalk areas of north-east Ireland. Although only a small amount of such flint is present, it indicates an early stage of contact with that part of the country.

If the assemblage is examined as a whole, or as groups from the individual zones, two characteristics emerge: the low representation of artefacts from the different production stages of knapping, and the low number of implements (7%). Although isolated elements of the production stages are present, i.e. rejuvenation and trimming flakes, their numbers and dispersion indicate that the production of the implements or tools took place elsewhere, although that might have been close-by. As in the Early and Later 'Western' Neolithic assemblages the largest group is the unutilised flakes (55%). Fifteen modified implements and 15 unmodified pieces form 14% of the assemblage. A surprising aspect of the assemblage is the low

representation of scrapers, an implement which tends to dominate the retouched assemblages in the preceding and succeeding phases at Knowth. Three crude hollow scrapers are present, forming 6% of the retouched assemblage. This contrasts with the flint assemblage from the nearby contemporary settlement at Townleyhall II where scrapers, predominantly hollow scrapers, account for 63% of the retouched assemblage (Eogan 1963, 43–48). Scrapers were also found at Fourknocks I (Hartnett 1957, fig. 5, 1:9, 1:44) although in smaller numbers. At Knowth, knives or 'cutting' implements slightly predominate over scrapers and show greater skill in their production.

As a substantial settlement was present in Knowth, the low number of implements and the lack of cores and knapping debris may indicate that production of the artefacts took place elsewhere, either

Table 5: Decorated pottery Complex lithic assemblage.

No.	Artefact type	Frequency	Percentage
1.	*Selection of material*	(1)	0.5
	Split Pebble		
2.	*Production of tools*	(12)	6
	Core rejuvenation flakes	2	
	Trimming flakes	10	
2a.	*Discarded pieces*	(119)	57.5
	Unutilised blades	4	
	Unutilised flakes	115	
3.	*Unmodified tools*	(15)	7
	Utilised blade	1	
	Utilised flakes	14	
3a.	*Modified tools*	(15)	7
	Hollow scrapers	3	
	Knives	3	
	Edge trimmed blade	2	
	Edge trimmed flake	1	
	Retouched flakes	6	
	Miscellanea	(46)	22
	Chips	11	
	Unworked chert	27	
	Unworked quartz	2	
	Quartzite pebble	1	
	Rounded pebbles	4	
	Miscellaneous stone fragment	1	
Total		208	100%

on the site or close by. Likewise the paucity of implements may indicate that domestic activities may have been carried out in designated zones.

Table 6: Decorated pottery Complex lithic assemblage. Raw material analysis (Sample 208)

Raw Material	Frequency	Percentage
Flint	(165)	79
Chalk	20	
Pebble	107	
Burnt	38	
Chert	(35)	17
Worked	8	
Unworked	27	
Quartz	2	1
Quartzite pebble	1	0.5
Rounded pebbles	4	2
Miscellaneous stone	1	0.5
Total	208	100%

Table 7: Decorated pottery Complex lithic assemblage. Analysis of cortex on lithic assemblage (Sample 165)

Cortex	Un-retouched struck flint	Retouched struck flint	Total	Percentage
Primary			(6)	
Chalk flint	3	1	4	3
Pebble flint	1	1	2	1
Secondary			(26)	
Chalk flint	2	1	3	2
Pebble flint	19	4	23	23
Tertiary			(95)	
Chalk flint	7	6	13	10
Pebble flint	75	7	82	61
Total	107	20	127	100%

Finds from mound material of passage tombs

Except for the eastern chamber of Passage Tomb 1 grave goods are rare in the other tombs and, apart from a few flint chips, they do not include objects of pottery and stone. As these tombs were damaged, grave goods could have been destroyed or displaced. It is possible that the sherd of Carrowkeel Ware which was found in the corner of the right-hand recess of the chamber of Passage Tomb 2 might be the last remains of a vessel that accompanied a burial in that recess (Eogan 1984, 23–4). However, both pottery and lithics have been found in the

Table 8: Decorated pottery Complex lithic assemblage. Platform types (Sample 21)

Platform type	Flakes	Retouched pieces	Total	Percentage
Cortical	4	0	4	19
Prepared	9	2	11	52
Faceted	1	0	1	5
Punch	5	0	5	24
Total	19	2	21	100%

Table 9: Decorated pottery Complex lithic assemblage. Platform depths (Sample 21)

Intervals in mm	Un-retouched	Retouched	Total	Percentage
0–0.9mm	5	1	6	28
1–1.9mm	1	0	1	5
2–2.9mm	5	0	5	24
3-3.9mm	1	0	1	5
4-4.9mm	2	0	2	9.5
5-5.9mm	2	1	3	14
6-6.9mm	1	0	1	5
> 10mm	2	0	2	9.5
Total	19	2	21	100%

covering mounds. Mound material mainly consisted of boulder clay which was available locally.

Finds that previously came to light in the boulder clay mounds of Passage Tombs 7, 12, 13, and 15–17 were published in *Volume 1* (Eogan 1984, figs. 49, 54 and 55). The pottery represents up to six vessels, all of Carrowkeel Ware (Tomb 15, nos. 604–9; Tomb 16, nos. 658–9; Tomb 17, no. 733). A total of 84 flint pieces were found; these included hollow scrapers, round and end scrapers, blades, flakes and chips (Tomb 7, no. 47; Tomb, 12, nos. 21–6; Tomb 13, no. 13; Tomb 15, nos. 610–35; Tomb 16, nos. 661–707; Tomb 17, nos. 734, 737 and 738).

Subsequently, 12 sherds of pottery were found in the mound material of Passage Tombs 16 and 17 during recent excavations. Again all were Carrowkeel Ware, representing an estimated 7 vessels, making a total of 14 vessels from the mounds (Fig. 18). Vessels 21–5 came from the mound of Passage Tomb 16 and vessels 26–7 came from the mound of Passage Tomb 17 (see catalogue).

Carrowkeel Ware and stone objects have also been recorded from the mound material of the two passage tombs at Fourknocks, Co. Meath (Hartnett 1957, 228–9; 1971, 47–62). As Carrowkeel pottery has been found in association with Passage Tomb burials at the Mound of the Hostages, Tara, Co. Meath (Herity 1974, 253), perhaps those sherds found in the mound material at Knowth were deposited as part of ritual practices. However, Carrowkeel Ware has not been found associated with any of the burials at Knowth, but it has turned up in the habitation area. It may have been incorporated in the mounds if some of the habitation material were utilised when the mounds were being constructed. However, Broad-rimmed Ware, which is also present in the habitation material, has not been found in the mounds. This is significant, as its absence may indicate that Carrowkeel Ware was deliberately placed in a ritual manner within the mound material.

Carrowkeel vessels

From mound of Passage Tomb 16

Vessel 21 (Fig. 18) inturned rimsherd 5941, with lug, possibly Carrowkeel Ware. Hard fabric with a high grit content (< = 6.3mm). The top of the rim is decorated with oblique stabs. The upper surface of the lug is decorated with a row of curved stab impressions. Colour: orange/grey-black/grey-black. T. 12.0mm.

Vessel 22 (Fig. 18) inturned rimsherd 5942. Hard, slightly friable fabric with a moderate grit content (< = 2.3mm). The top of the rim is decorated with oblique rows of horseshoe-shaped bird-bone impressions. There is a horizontal row of stab-and-drag motifs below the rim. Colour: brown-orange/black/black. T. 8.5mm.

Vessel 23 (Fig. 18) bodysherd 5943, thick-walled, friable fabric with a

high grit content (< = 5.0mm). Decoration occurs on the exterior surface in the form of deep bird-bone impressions. Colour: orange/black/black. T. 24.2mm.

Vessel 24 (Fig. 18) bodysherd 5944, hard, slightly friable fabric with a high grit content (< = 3.0mm). Decoration occurs in the form of horizontal rows of fine stab-and-drag motifs. Colour: orange/black/black. T. 13.6mm.

Vessel 25 (Fig. 18) Rimsherd 5945, bodysherd 5946a and 11 fragments (5946b). The inturned rim is poorly preserved and most of the exterior surface is missing. The fabric is thick-walled and friable with a high grit content (< = 11.9mm). All sherds are poorly preserved and, as a result, little of the exterior surface survives. Evidence for fire-blackening is present on the exterior surface. No evidence for decoration survives. Colour: orange/dark grey/orange. T. 9.0–27.2mm.

From mound of Passage Tomb 17

Vessel 26 poorly preserved bodysherd 5947. Thick-walled, hard fabric with a high grit content (< = 6.4mm). Both surfaces are abraded. No evidence for decoration. Colour: orange/black/orange. T. 26.1mm.

Vessel 27 4 poorly preserved bodysherd fragments 5948a–d. Hard but friable fabric with a high grit content (< = 7.8mm). Burnt encrusted matter is present on the interior surface, the exterior surface being missing. Colour: grey-brown throughout.

Discussion of Decorated Pottery complex

Parallels and comparisons

Professor Mitchell's investigations of charcoal from Townleyhall II (Mitchell in Eogan 1963, 38–9) have indicated that high forest was absent from the vicinity at the time when that settlement was functioning. That view has been substantiated by Professor Groenman-van Waateringe's palaeobotanical studies at Knowth – samples taken from mound material of Sites 1, 3, 14, 15 and from portion of this settlement previously excavated underneath Tomb 17 (Eogan 1984, 325–9) – where the evidence again indicates that the landscape had been considerably opened up by the time that this settlement was functioning. Similar evidence has also been found at Newgrange (Groenman-van Waateringe and Pals in O'Kelly 1982, 219–223). This is to be expected in view of the previous extensive 'Western' Neolithic activity. No doubt some woodland survived but generally Brugh na Bóinne was now an open farming landscape, with buttercups, nettles and other weeds growing in the pastures. Cereal cultivation was also taking place, as the grains of wheat show. There

were also patches of scrub which included blackberries, brambles and crab apples (Groenman-van Waateringe and Pals in O'Kelly 1982, 219–23; Monk ibid., 223–5).

Before going on to discuss the wider issues of this settlement, its chronology must be considered. Regarding relative chronology, a natural sod layer had formed over the Earlier 'Western' Neolithic house foundations, Trenches 1–3, Zone A (p. 7), before Passage Tomb 1 was constructed. This was also the case with the eastern palisade trench of the Later 'Western' Neolithic stage which was covered by a sod layer that had formed before Passage Tomb 1 was constructed (Eogan 1984, 242). In short, where evidence is available, it shows that Passage Tomb 1 post-dates both the Earlier and Later 'Western' Neolithic stages. The subsequent habitation of the Decorated Pottery complex also predates the tomb building, as Tombs 1 and 16–18 overlie it. House no. 3, Zone E, was sealed by natural sod and Passage Tomb 15 was built overlying an adjacent portion of this sod layer (Eogan 1984, 102). Furthermore, in Zone G, kerbstone 7 of Passage Tomb 1 had been placed directly on the dark habitation material, indicating that this tomb was built immediately after the abandonment of the habitation. However, a natural sod layer was found overlying the habitation layer in the northern part of Zone G. As this layer was in existence when Passage Tombs 17 and 18 were constructed, it shows that these passage tombs were built at a later stage than Passage Tomb 1. The absence of sod over House 1, Zone D, indicates that in that area settlement continued down, or close to, the time of the building of Passage Tomb 1.

The homogeneity of the dark habitation layer must now be considered. Its most diagnostic find is pottery, which includes two forms of globular bowl. One is distinguished by having stab-and-drag decoration and unexpanded rims (Carrowkeel Ware), the other by a broad rim and different forms of incised and impressed decoration (Broad-rimmed Ware). However, sherds of Earlier 'Western' Neolithic pottery, similar to those associated with the rectangular house/houses in Zone A (p. 7), were found at different depths in the dark habitation layer in Zone G. Taking this evidence at its face value, it might appear that a type of 'Western' Neolithic pottery characterised by simple rims and shoulders was used over a very long period. Other factors run counter to this view. For instance it would seem extraordinary that a particular form of pottery vessel would remain in use for centuries alongside the developed Later 'Western' Neolithic, throughout a period when Neolithic society was changing, and continuing on into an even later stage when the Decorated Pottery complex was in existence. Perhaps there is another reason, rather than survival in use, as to why Earlier 'Western' pottery occurs in the dark habitation layer. Zone G, where the mix occurred, is of limited extent, but it was a place of intensive use during the time of the Decorated Pottery Complex, firstly by house building and subsequently by tomb building, not only two smaller tombs, Passage Tombs 17 and 18 but also portion of

Passage Tomb 1. If one assumes that the Earlier 'Western' pottery was originally part of that spread in the humus layer (grey-brown layer), which has been observed elsewhere in this area, the already mentioned disturbance could have displaced both it and the overlying dark charcoal-rich layer (Decorated Pottery complex), thereby creating a mix (cf. p. 22). There is other evidence to show that the Decorated Pottery layer, which was soft and dark in colour, easily consolidates. This is demonstrated by the fact that after the removal of the outermost orthostats of the passage of Tomb 17, possibly in the Early Christian period, material from the Decorated Pottery layer (black layer) filtered in and became indistinguishable from that surrounding it (publication pending). It was only when the black layer was removed over the area that the sockets came to light. Therefore, it seems that the Earlier 'Western' sherds subsequently became incorporated into what would have been the overlying Decorated Pottery complex layer as a result of building and general activity in the area, the only contemporary pottery of that layer being Carrowkeel and Broad-rimmed Wares.

The settlement covers an extensive area, the portion exposed measuring *c.* 25m by *c.* 50m. This evidence, and the fact that there was a layer of occupation debris that averaged 10cm thick, in addition to the remains of perhaps 10 houses, is an indicator of a considerable population group or groups. It is clear that not all houses were in simultaneous occupation. This, and the fact that the entire area of settlement has not been defined, make it impossible even to guess how many houses were lived in at the same time. The overall duration of the settlement is another problem, but the superimposition of at least 6 houses in Zone H indicates a lengthy occupancy. The life of one of these houses cannot be determined, but if one guesses 25 years, that indicates an occupation lasting, say, 150 years at that particular place. It has not been established if the other zones of occupation were contemporary with Zone H. They may represent successive stages of expansion; if that were the case, one has to speculate on a much longer period of settlement. From a beginning at an, as yet unrecognised, place on the hill-top, settlement could have expanded. But in the course of this, existing houses may have been abandoned while new ones were built. If that were the case, the settlement could have lasted over some centuries. Unfortunately there is no corroborative backing for such an assumption from C14 dating or from finds.

Regarding wider social issues, the domestic architecture is adequate for its purpose; nevertheless, it is mundane and straightforward and the construction of the buildings did not require any great skills or knowledge. Some of the houses are larger than others but, despite that, all display similarities in design and form. None stand out as a homestead of special importance, a house that served as the residence of a significant person such as a leader, whether secular or spiritual. As already noted at Zone H, up to 6 houses could have been in contemporary usage, although this cannot be proven.

Extending this speculation, it may be suggested that at a given time when the settlement was at its height, about 12 houses were in contemporary use, but this could only indicate a population of about 60 people, possibly less, and even if that were the case, hardly more than half of the inhabitants would have been available for work, either general or specialised. It is also difficult to explain the precise nature of the settlement. Perhaps it was to serve a special need such as the living place of tomb builders, or of people engaged in seasonal activities associated with farming, or possibly with fishing in the nearby Boyne (p. 52). On the other hand, it could have been a farming settlement where a number of families lived. If so, there is no information available about the organisation or whether farming was practised individually or collectively. Of course, the evidence available is only for a portion of a cluster, and one may assume that there were other contemporary settlements in the area. This is suggested by the fact that there is evidence for others, two at Townleyhall and possibly another at Newgrange. If a catchment area of 5 miles is considered, then perhaps one could speculate that there was a considerable population, possibly numbering a few hundred people in the area.

Despite the large area investigated, artefacts were not plentiful. Although an estimated 34 pottery vessels were found (both from the habitation material and the mounds of the passage tombs), few flints can unequivocally be accepted as artefacts. It should be pointed out that it is possible that at least some of the flint assigned to this phase might have been derived from the preceding 'Western' Neolithic stages due to disturbance, as was argued for the Earlier 'Western' Neolithic pottery (p. 22).

Concerning parallels in Ireland for the Knowth settlement, some of the finds and also the domestic structural evidence clearly links it to other settlement sites, but also to non-passage tomb ritual sites. The best parallels for the settlement evidence come from Brugh na Bóinne itself, in particular Townleyhall II (Eogan 1963, 40–63). This settlement, which can be assigned to the Decorated Pottery Complex, was sealed underneath a passage tomb. There was no delimiting or protecting feature at the edge, and the oval area measured about 16m by 11m. The buildings were wooden stake structures with fire places but, due to intensive renewal, the precise shape and number could not be determined, although the presence of short arcs of stake-holes hint that the houses were circular in shape. The finds assemblage was rich and varied. The pottery consists of Carrowkeel Ware, Broad-rimmed Ware and a small number of sherds in the Later 'Western' Neolithic tradition. In contrast to the Knowth settlement, the flint assemblage consisted of a range of very well-made tools, notably scrapers, especially the rounded and hollow varieties. This may have been the remains of a single house that was renewed on several occasions (Eogan 1963, 42–61).

There is a related site nearby, Townleyhall I (Liversage 1960). Here the oval area, close to 8m by 6m, had an enclosing bank and

external ditch and, internally, 150 stake-holes and a fireplace came to light. Again renewal took place on several occasions; precise shapes could not be determined, but it is likely that they were circular. In contrast to Townleyhall II, finds were few, but they were characteristic and consisted of a few flint scrapers of end-of-blade and hollow varieties as well as a stone axehead. A sherd of Broad-rimmed Ware was found with a burial, the cremated remains of an adult.

There is also some evidence for contemporary activity at Newgrange. This includes the foundation of a round hut, externally slightly over 4m by 3m. There were also 2 circular post-built structures, one 7m in diameter, the other 3m in diameter. These were in the area of Grooved Ware/Beaker activity, so their cultural affiliation has not been established but, structurally, they resemble the Knowth houses. The only find that can be directly assigned to any of these structures is a piece of a stone bowl, a unique object, from the hut foundation (O'Kelly 1982, 77). Significantly there was a sherd of a Broad-rimmed vessel and hollow scrapers from this area. It may also be noted that stake-holes turned up at Site Z at Newgrange (O'Kelly et al. 1978, 294, fig. 16). Stake-holes, as distinct from post-holes, are a feature of Decorated Pottery Complex structures at Knowth.

Outside Brugh na Bóinne, good evidence for passage tomb settlement is not forthcoming. However, the presence of circular houses and their location may suggest contemporary activity. At Sliabh Breagh, in the hill country a few miles to the north of Brugh na Bóinne, excavations produced evidence for two circular wooden houses. One was 6m in diameter, its wall consisted of two concentric rings of post-holes and there was a central hearth. In the other house, about 5m in diameter, the wall consisted of a single ring of post-holes. Finds included sherds of 'Western' Neolithic pottery, flat-based vessels and stone artefacts, such as stone axeheads, flint rounded scrapers and arrowheads (Herity and Eogan 1977, 49; Cooney and Grogan 1994, 44).

An interesting concentration of up to 100 circular stone structures occurs at Mullaghfarna, just beneath portion of the Carrowkeel passage tomb cemetery in County Sligo. This is spread over an area measuring approximately 213m by 23m (700 by 77ft). These structures vary between 6–8m in diameter and the wall foundations consist of two concentric rings of stones with a rubble filling (Macalister et al. 1912, 331–2, pl. 23). No dating is available for any of these sites, and their possible contemporaneity with the passage tombs is only suggested in view of their proximity to the cemetery.

On the eastern slopes of Knocknareagh, 33m or so below the summit, with its passage tomb cemetery and overlooking Carrowmore, there is a group of at least 6 hut sites. Excavation has taken place at 3 of these; they are mainly oval in form and consist of a bank with outer ditch enclosing a circular living area. It appears that posts were erected on or outside the bank, and that most of these were leaning inwards; perhaps the structure was a 'wig-wam' type hut.

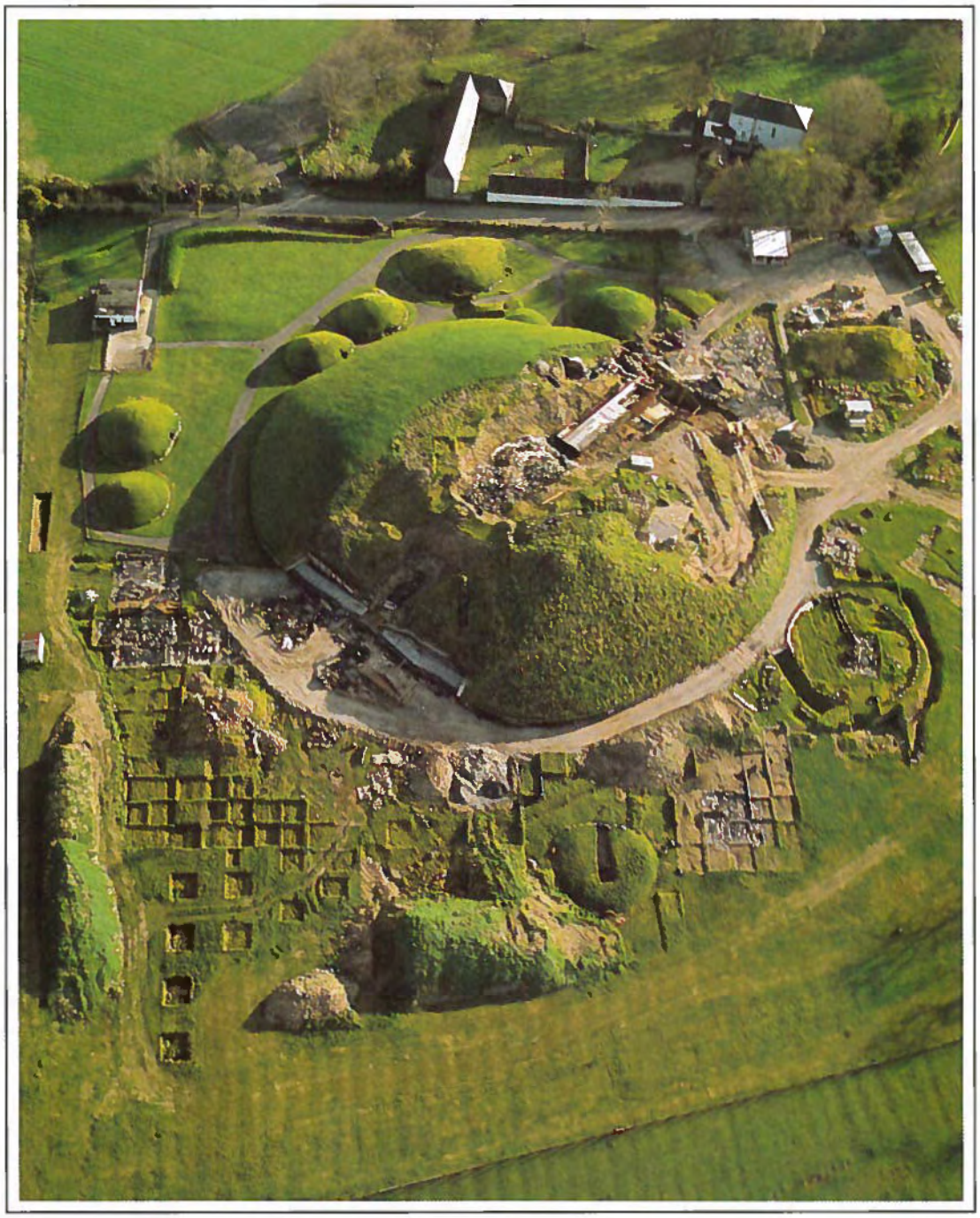


PLATE I. *Aerial view of Knowth from south-west, showing the conserved portion of the site to the north; the area still under excavation and conservation is in the foreground (1995). Photo: (Mr. C. Brogan).*

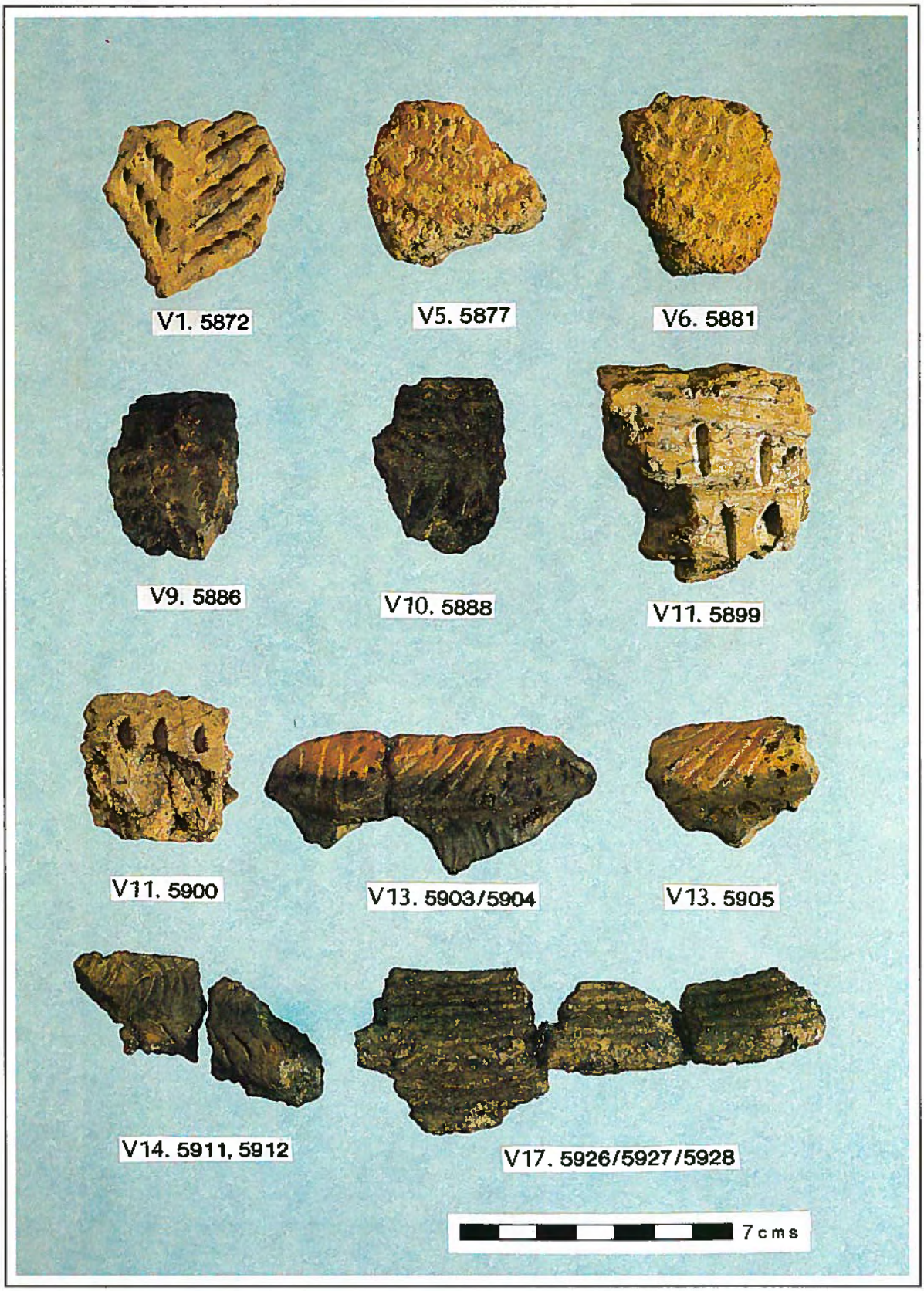


PLATE II. *Decorated Pottery Complex: pottery sherds, Carrowkeel (vessels 1, 5–6, 9–11) and Broad-rimmed ware (vessels 13–14, 17). Photo: (Mr. C. Brogan).*

PLATE III. *Grooved Ware Complex, circular wooden structure: selection of rim sherds (exterior surface), (vessels 1–3, 5, 8, 20). Photo: (Mr. C. Brogan).*

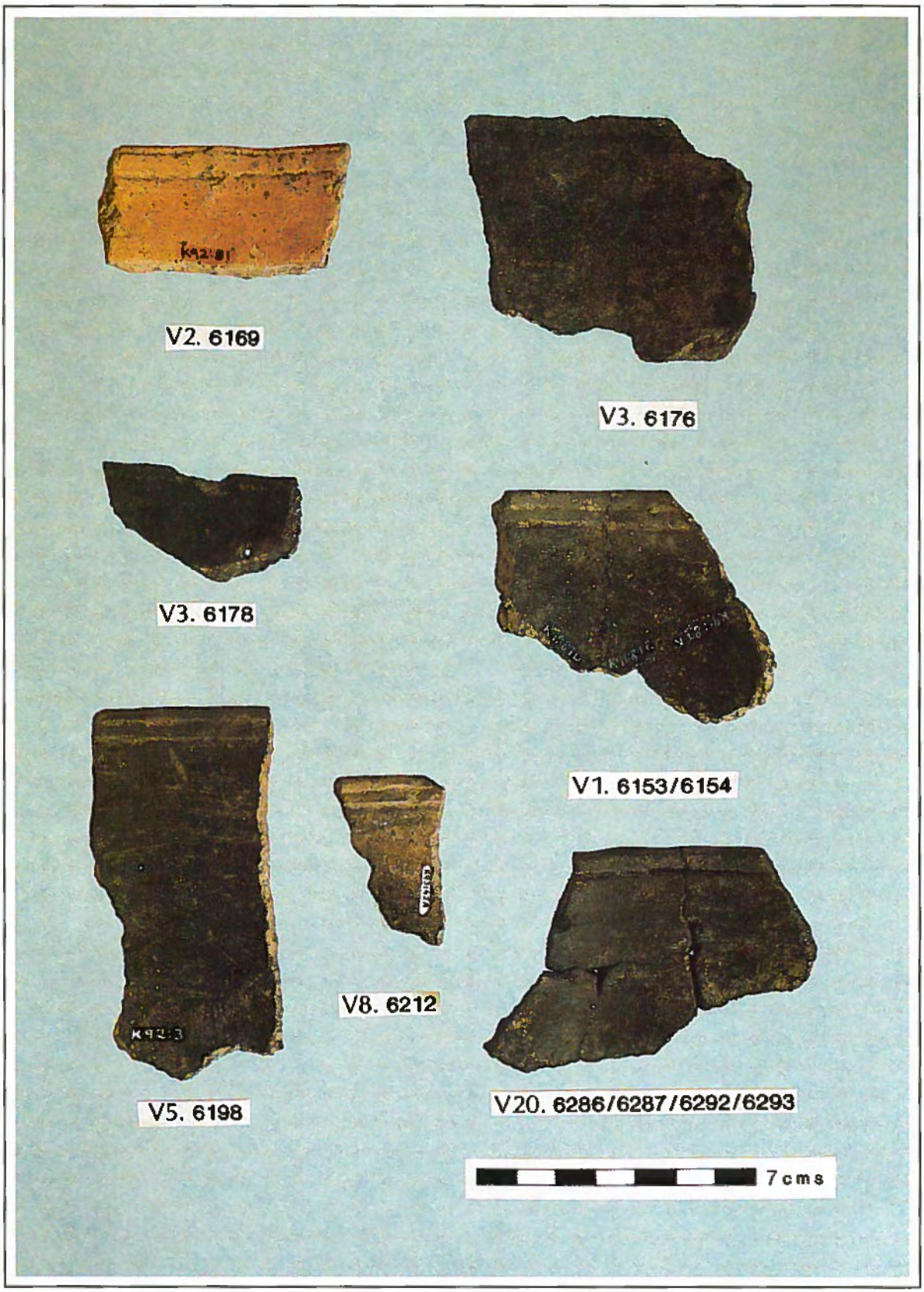


PLATE IV. Grooved Ware Complex, circular wooden structure: selection of rim sherds (interior surface), (vessels 2–3 are decorated with cord impressions, vessels 1, 5, 8 and 20 with grooves). Photo: (Mr. C. Brogan).

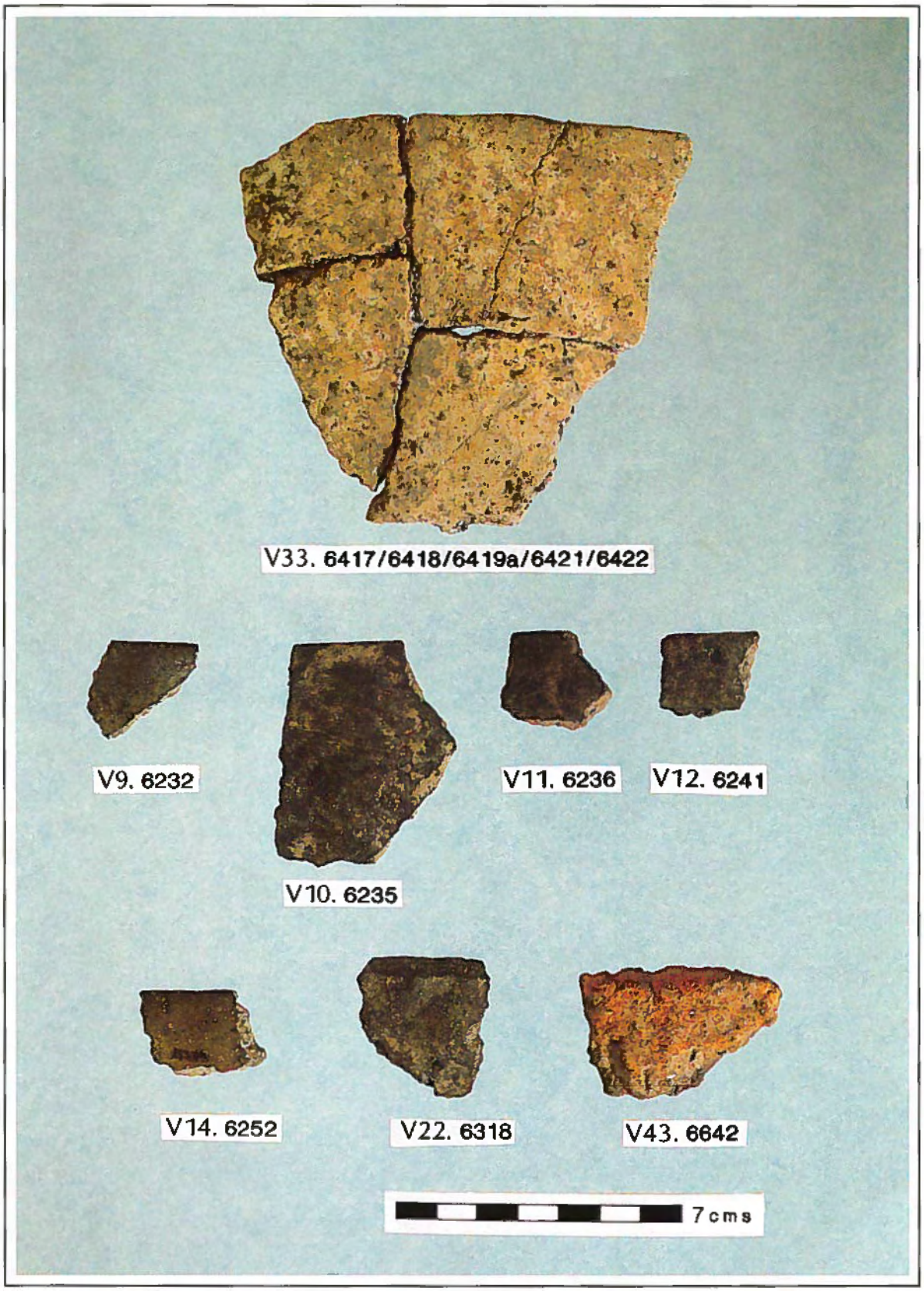


PLATE V. *Grooved Ware Complex, circular wooden structure: selection of rim sherds (exterior surface), (vessels 9–12, 14, 22, 33, 43). Photo: (Mr. C. Brogan).*

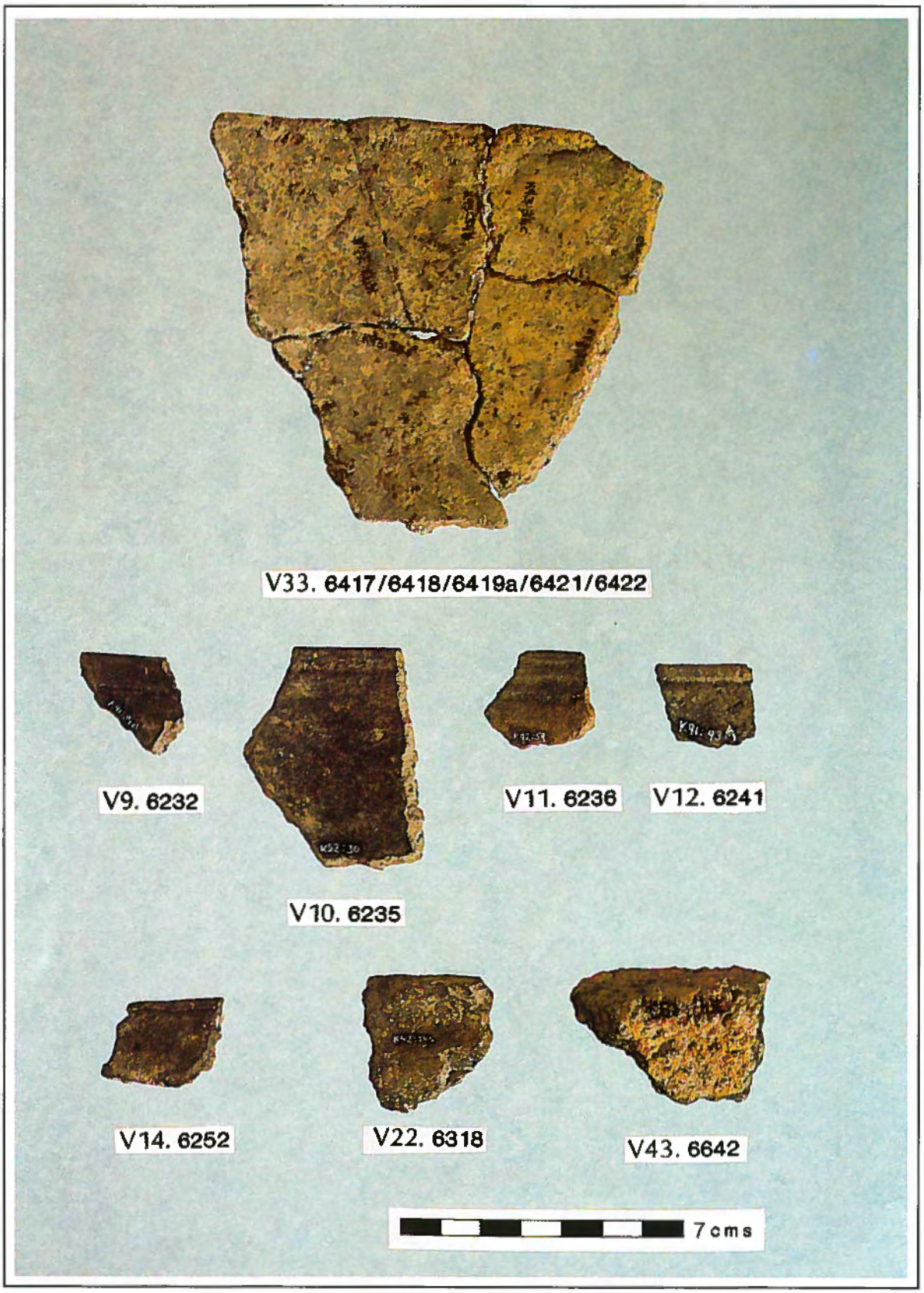


PLATE VI. *Grooved Ware Complex, circular wooden structure: selection of rim sherds (interior surface), (vessels 9–12, 14, 22, 33, 43). Photo: (Mr. C. Brogan).*

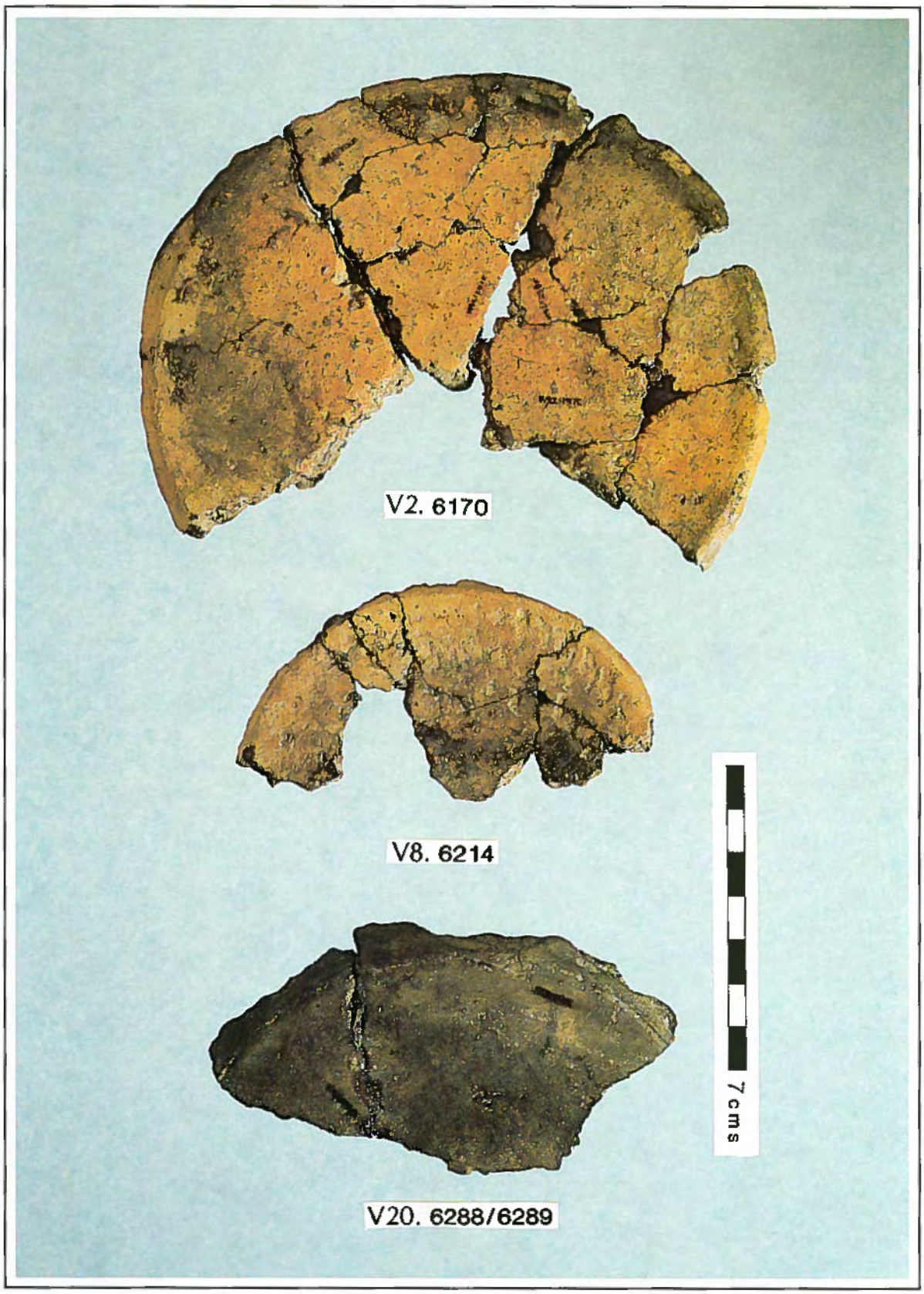


PLATE VII. Grooved Ware Complex, circular wooden structure: base sherds (exterior surface), (vessels 2, 8, 20). Photo: (Mr. C. Brogan).

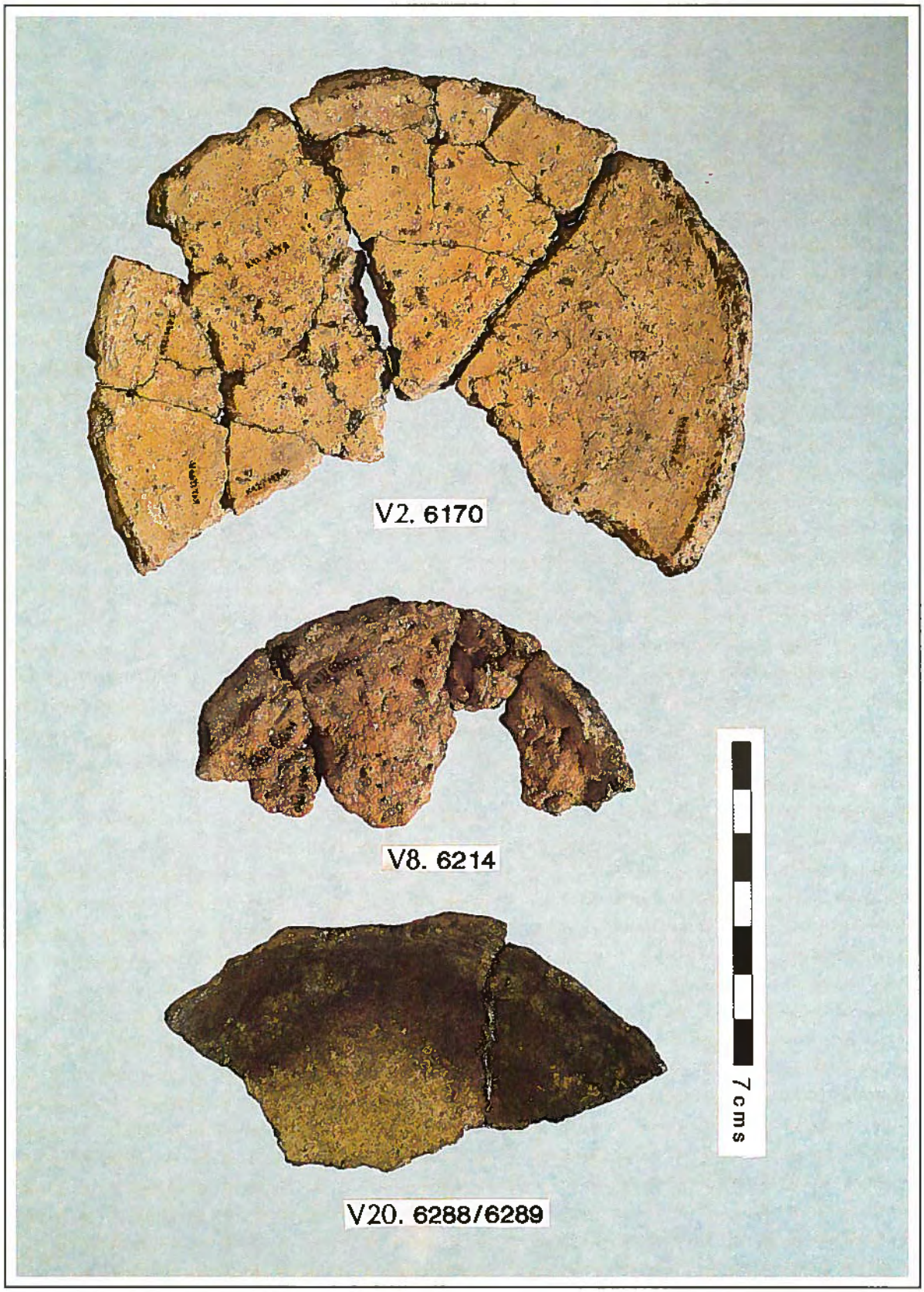


PLATE VIII. *Grooved Ware Complex, circular wooden structure: base sherds (interior surface), (vessels 2, 8, 20). Photo: (Mr. C. Brogan).*

PLATE IX. *Grooved Ware Complex, circular wooden structure: flint scrapers. Photo: (Mr. C. Brogan).*

PLATE X. *Grooved Ware Complex, circular wooden structure: flint cores, core rejuvenation flake, unutilised flakes, utilised flake and irregular fragment. Photo: (Mr. C. Brogan).*

PLATE XI. *Grooved Ware Complex, circular wooden structure: stone axe-head. Photo: (Mr. D. Jennings).*

PLATE XII. *Grooved Ware Complex, circular wooden structure: baked clay objects. Top row Nos. 7475 and 7474; centre No. 7485; bottom Nos. 7487 and 7478. Photo: (Mr. D. Jennings).*

Hollow scrapers predominated but rounded scrapers, knives, points and arrowheads were present in small numbers. Pottery was virtually non-existent, but amongst the few sherds that survived, two with cord decoration have parallels amongst the Broad-rimmed Wares (Bengtsson and Bergh, in Burenhult 1984, 216–318).

There is an enigmatic site in Scotch Street, Armagh, which consists of a roughly circular area up to 12m in diameter, enclosed by a ditch about 1m wide and about the same in depth. A gap on the south-east side indicates the entrance. The interior had been very much damaged, and the finds come from the ditch fill. These include sherds of both 'Western' Neolithic and Carrowkeel Ware and flint artefacts (Hamlin and Lynn 1988, 8–10).

Origin and development of the Decorated Pottery Complex

On the present state of our knowledge, an evaluation of the origins of the Decorated Pottery complex poses problems and raises questions. However, it can be demonstrated that composite, yet complementary, assemblages arose that shared features, and had a number of common aspects. But ritual diversification was also a feature. As yet we do not have sufficient evidence to indicate whether the change or changes with all their elements took place simultaneously throughout the country, followed by a progression, or if new cultural instalments reached some areas, whether originating within or outside the country. Neither is it possible to know if some of the initial elements became obsolete and, therefore, had a shorter life span than others. It does, however, appear that the emergence and subsequent development of the Decorated Pottery Complex was a complicated process to which the existing Later 'Western' Neolithic complex contributed, along with new influences from different areas abroad. It must be seen in the context of wide-ranging alterations that were taking place, not only within Ireland but outside it too. For instance, on the evidence of the C14 determinations, it may have been that the builders of the Linkardstown-type tombs were the harbingers of ritual change, or at least were an early manifestation of it, but the same C14 evidence also indicates that building and use of these tombs was confined to a couple of centuries (Brindley and Lanting 1989/90). Even if this were so, the pottery unequivocally links them into a wider range of activities. On the whole, it is evident that the different elements of the Decorated Pottery Complex are broadly contemporary, and represent different fashions and styles in artefacts, different burial modes and even possibly a different settlement pattern. As will be shown the use of some earlier monuments, such as court tombs (p. 93), continued. New pottery styles, such as necked vessels, may have emerged due to influences from the Later 'Western' Neolithic wares (but see Sheridan 1995, 8, 11). Hollow scrapers may represent direct continuity, but other features lack forerunners. That is so with the Linkardstown-type cists and, in particular, passage tombs.

At Knowth and Townleyhall II, domestic settlement pre-dates passage tombs. Although such evidence is only clearly available from these two sites, it is possible that settlement also pre-dates other passage tombs, such as Baltinglass, Co. Wicklow (Walshe 1941). The question, therefore, arises: was there a stage of Irish prehistory, the evidence for which is domestic, between the end of the 'Western' Neolithic and the time when large-scale ritual activities such as the building of passage tombs took place? Tomb-building and other ritual practices could then be attributed to the absorption of new ritual practices from abroad by the established inhabitants. These postulated, recently acquired, practices could have differed regionally: passage tombs mainly in the northern third of the country and in the hill-country of Wicklow in the east, Linkardstown-type tombs in south Leinster and north-east Munster, and by the continuation of the more traditional practice of re-using the earlier court and portal tombs in some northern areas.

Clear evidence for **domestic settlement** comes from Knowth and the two Townleyhall sites. The other sites mentioned, all of which are close to passage tombs, may well be contemporary with them (p. 90). The coastal 'Sandhills' and related inland sites, such as the lake sites of Lough Enagh, Co. Derry and Island McHugh, Co. Tyrone (Piggott 1954, 317–21; Case 1961, 189–96; Herity 1982, 361–2, 371–2), constitute another form of settlement. This is widely distributed in the northern part the country. Evidence for structures is limited. Nevertheless, in the Dundrum sandhills, Co. Down, Collins (1952, esp. pp. 8 and 18) discovered what may be described as the remains of simple circular huts defined by post-holes. At Site 1 the structure was about 3m in diameter. At Site 6 the structural evidence consisted of stake-holes set in a curved position; if this were part of a circular wall, the enclosed area would have been less than 1.5m in diameter and, therefore, could only have been a simple shelter. These sites produced a good assemblage of finds. The pottery was mainly Broad-rimmed 'Sandhills' Ware, but there were some 'Western' sherds. Amongst the stone artefacts, scrapers (hollow, round and end of blade) predominated. At Whitepark Bay, Co. Antrim, investigations at the end of the 19th century produced evidence for twenty circular huts averaging 6m in diameter, which may also date from these times (Herity and Eogan 1977, 99, fig. 36). Not too far away, at Ushet Lough, Rathlin Island, there are the remains of three hut sites that average between 4.5m and 5.5m in diameter. Circular houses are also known from much farther to the south, on Knockadoon, Co. Limerick, at Sites C, D, K and L (Ó Ríordáin 1954, 321–84; 384–413; Grogan and Eogan 1987, 305–36; *cf.* Herity and Eogan 1977, 104–107, fig. 37). The latter houses may have been associated with a Class 1A pottery assemblage, a more highly ornate and later form of 'Western' Neolithic, but which also forms part of the Decorated Pottery Complex. However, due to the absence of a good stratigraphical record, it is difficult to establish the cultural positioning of the circular houses.

Ritual changes were diverse. Court and portal tombs, referred to under the generic term long-barrow tombs by de Valéra (in Ó Ríordáin 1979, 102), were re-used. Up to thirty of the excavated court tombs yielded decorated wares, as did five or so portal tombs (Herity 1982, 317–37). Some court tombs may even have been built when passage tombs were current. Broad-rimmed vessels, of the type occurring in the Knowth settlement, found in the chamber of Ballyedmond Park, Co. Down, court tomb were considered to have been primary (Herity 1982, 262–3), but at other sites they were secondary. At Annaghmare, Co. Armagh, the excavator stated that necked and globular bowls were in a layer above that containing plain, seemingly Early 'Western', Neolithic wares (Waterman 1965, fig. 7b). Portal tombs have also produced decorated wares, such as Ballykeel, Co. Armagh and Greengraves, Co. Down (Herity 1982, 317–18). There may even have been interchange of ideas and beliefs between court and passage tomb builders. Perhaps the stone long cairn (Cairn E) containing a passage tomb at Carrowkeel, Co. Sligo (Macalister, Armstrong and Praeger 1912, 323–4, pl. 17 bottom) might be due to influence from the cairns of court or portal tombs. There is also the question of whether the resemblance between court tombs with transeptal chambers (de Valéra 1965) and passage tombs with cruciform-shaped chambers is due to influence from the latter on the former or if the court tombs with transeptal chambers emerged as a result of influence from the lower Loire region of Brittany.

New forms of burial also emerged. These include simple pit burials, as at Kiltale, County Meath (Hartnett 1951), or at Cahirguillamore, County Limerick (Hunt 1967); on rare occasions a rock crevice or cavern, as at Annagh, County Limerick, was used (Ó Floinn 1992). But there were also more substantial structures, such as megalithic cists of the Linkardstown type. As a result of excavation, at least ten positive examples are known. The chamber, centrally placed under a round mound, varied in shape, although many have a polygonal form. They may be divided into two compartments and extra external walling is a feature.

Despite the fact that different types of burial structures were used, the burial rite and grave goods were similar in the majority of these pit and cist burials. Burial was a single period event, the rite was predominantly inhumation and usually only the remains of one person were placed in the grave, mainly youngish males. Grave-goods were a feature, but these are restricted in number. The classic grave-good is the necked vessel with horizontal or near horizontal rim, but other types of pottery also occur, as do some other objects (Herity 1982, 255–6). These burials have features which resemble those in passage tombs, such as stone settings under the mounds and pins with evenly expanded heads. It may also be noted that necked vessels (in particular Style 1i; see below) have angular and linear decoration, as has the megalithic art of some passage tombs. However, what, if any, relationships they hold to the passage tomb complex is not clear.

The most impressive and grandiose burial monument was the passage tomb, differing from others not only in its burial rite (cremation) but also in the wider range of grave goods (personal ornaments in addition to pottery) and, above all, in the sophistication of its architecture and – on some sites – in its art (Herity 1974). Distribution is mainly in the northern third of the country, but with examples occurring in east and south Leinster and into Munster, thus overlapping in a general way with the Linkardstown-type cist. This overlap is not pronounced; for instance in east Leinster the passage tombs are mainly confined to the hill country of south Dublin and Wicklow, whereas the Linkardstown-type burials are generally on the lower land (compare O'Kelly 1989, figs. 45 and 66).

Artefacts also constitute a coherent aspect of the Decorated Pottery Complex. Some pottery forms have already been mentioned, and it is pottery that forms the bulk of the finds, consisting of a series of decorated round-based vessels, though not all have the same profile. Case (1961) defined six types, but Herity (1982) has produced a more generalised classification, in some cases incorporating a number of Case's forms. These are –

Style 1: Necked vessels of which there are three varieties (e.g. Case's *Ballyalton Bowls*).

(i) Necks are almost horizontal. Such vessels occur as grave-goods in individual burials (megalithic cists of Linkardstown type), but also in some pit burials and portal tombs.

(ii) Neck at angle. Mainly found as secondary grave-goods in court tombs i.e. Annaghmare, County Armagh, and portal tombs, i.e. Ballykeel, County Armagh.

(iii) Long neck. Mainly found as secondary grave-goods in court tombs, i.e. Ballymarlagh, County Antrim.

All are decorated. Style 1(i) has the most elaborate with bands of horizontal, vertical and oblique lines and also angular motifs. Style 1(ii) has hurdle patterns, arcs and parallel lines while, in Style 1(iii), closely parallel lines predominate.

In summary, Necked Vessels were mainly used as funerary vessels. Variety (i) principally occurs in individual burials in megalithic cists and in pit burials, whereas varieties (ii) and (iii) occur in long cairn court and portal tombs. After the cord-decorated globular bowls (Style 3i), necked vessels are the most common decorated pottery from secondary deposits in the long cairn tombs. They have also been found on habitation sites.

Style 2: Broad-rimmed vessels (Case's *Sandhills Western, Dundrum Bowls, Murlough Bowls and Limerick style*). The rim, generally flat, occurs above a lightly concave neck. Decoration can occur on both rim

and body, and it is normally applied by incision or by impressing a cord. It may be arranged in lines parallel to the edges or placed transversely. This form is mainly found on habitations, i.e. Townleyhall II, County Louth, but it also occurs in burials. These are more frequently in court tombs (as secondary deposits), i.e. Clontygora, County Armagh, and also in individual burials, i.e. Linkardstown, County Carlow.

Style 3: Globular bowls; (i) Globular bowls with mainly cord impressions (Case's *Goodland Bowls*). (ii) Carrowkeel Ware with stab-and-drag impressions (Case's *Carrowkeel Ware*). As Herity (1974) had already studied the finds from passage tombs, he did not include Carrowkeel Ware in his 1992 study. However, it is mentioned here under the general heading of Style 3.

(i) Globular bowls. These bowls occur as secondary grave-goods in court tombs, where it is the most common decorated pottery, i.e. Ballyalton, County Down, in individual burials of Linkardstown-cist type, in pit burials but also on habitation sites, i.e. Island MacHugh, County Tyrone, and the possible ritual site at Goodland, Co. Antrim. In contrast, Style 3i is never found as grave-goods in passage tombs.

There are also some plain globular bowls. These are found mainly on habitation sites. Hemispherical-shaped bowls may be related.

(ii) Carrowkeel Ware. This variety is integral to the passage tomb complex, occurring with burials and in the make-up of the mounds, but also in habitations.

Style 4: Exotic vessels. This small group is not coherent and has only been found in court tombs, i.e. Tamnyrankin, County Derry and Ballymacaldrack, County Antrim. The decoration mainly consists of cord ornament arranged in parallel lines or panels (e.g. Case's *Ballyalton Bowls*).

Except for passage tombs, where there is a range of finds – stone beads and pendants, bone/antler pins and occasionally globular vessels of the Carrowkeel variety – finds from the other burials, apart from pottery, are sparse. The bone pin/toggle with domed head from individual burials is the most common ornament (Herity 1982, 255).

Regarding chronology, as has already been noted, pottery in particular, but also some of the monuments, provide relative dating and cross-references for the various elements, thereby providing evidence for cultural interchange between the temporal and spiritual activities of the people, and indicating broad contemporaneity for these activities. As yet, dates are limited, those from the small passage tombs of the Sligo region predate those from passage tombs elsewhere (Burenhult 1984, 128–46; Bergh 1995, 107–8). Further clarification is needed with regard to these dates but, even if coastal communities

were erecting small passage tombs in different parts of Europe from around 4000 cal BC, this need not mean that a wider complex arose. The main range of C14 dates from passage tombs are around 3500–2900 cal BC. Dates for Linkardstown-type tombs, pits and related burials fall within 3600–3350 cal BC (Brindley and Lanting 1989/90, 1–7). Bearing in mind the small number of C14 dates for this overall period, it may be suggested that the Decorated Pottery Complex came into existence around 3500 cal BC and continued for a number of centuries.

At a time not yet precisely determined, but seemingly around the middle of the 3rd millennium bc (during the second half of the 4th millennium in calibrated years), widespread and diverse changes were underway in Ireland and in other parts of Europe. These changes were of considerable magnitude and affected domestic and ritual activities, artefacts and possibly most aspects of everyday life. International contacts appear to have been strengthened. The archaeological evidence indicates that a new social and ritual fabric emerged. Society appears to have consisted of loose collective cultural units which shared common features and which, at least to some extent, had territorial links. C14 dates are limited (Herity 1982, fig. 15; Brindley and Lanting 1989/90); nevertheless the pottery evidence, Broad-rimmed vessels in particular, provides cross-references between a variety of monuments and activities. As examples of cross-referencing, Carrowkeel Ware, which is typical of passage tombs, and Broad-rimmed Ware were associated in a homogeneous occupation layer at Knowth and Townleyhall II. Townleyhall II also had a plain globular bowl. Broad-rimmed Ware is also known from the megalithic cist at Linkardstown and from several of the so-called 'Sandhills' settlement sites. which also produced other forms of decorated wares, including cord-ornamented globular bowls and necked vessels, both forms being again in association in the cavern burial at Annagh, County Limerick. Necked vessels, Broad-rimmed Ware and cord- and stab- and drag-decorated Globular vessels are, therefore, common to different types of burials.

While native development and stimulation were a feature, external inspiration was most significant. The country had opened up to new and diverse ideas and possibly people, while a paramount feature was the influence that Ireland would exert externally. The emergence of this stage of the Neolithic was, therefore, a complex event that led to the rise of composite yet complementary complexes that shared features, and had a number of common aspects, but also had their individual characteristics. The factor or factors that motivated these events cannot be clearly identified. Perhaps internal growth arising from the maturity of the Later 'Western' Neolithic complex or, on the contrary, their decline were amongst them, but international developments probably played a significant role. It is, therefore, clear that the complex consisted of diverse components, some of which were native in origin, while others were foreign. Furthermore some of the components had regional preferences.

The changes that took place in Ireland were not isolated insular events. They coincided with, or were part of, wide-ranging changes that were taking place in other parts of Europe. These included native developments, borrowings, interchange and people on the move. The manifestations of such changes in Ireland are provided by the emergence of new monument types (domestic and ritual), but also artefacts, the most diagnostic of which was decorated pottery.

Amongst the elements of this new complex, the passage tombs are the most distinguished and significant aspect. The tombs do not have forerunners in Later 'Western' Neolithic complexes in Ireland; therefore their emergence must be due to external inspiration, likely from Atlantic lands to the south. However, this need not mean that a southern Atlantic ritual complex was implanted in its entirety in Ireland; it was not a monolithic organism that was transplanted from abroad. Nevertheless, it is a new perspective in the prehistory of Ireland. Tomb architecture and morphology and some associated features, in particular the art, have their background in Iberia (*cf.* Eogan 1990) but other features, such as pestle-hammer pendants and the Carrowkeel Ware, are not natives of that region. It appears that a passage tomb assemblage expanded spatially and simultaneously in the range of its material culture and ritual practices. While there are distinctive regional variations, there was also a common underlying relationship over this vast area of Western Europe that extended from Andalusia in the south to the Shetlands in the north. This spread northwards of the complex to Ireland – and further afield – brings it into a new latitude that had an existing but different cultural complex – the Later 'Western' Neolithic.

In the south Scandinavian/north German Middle Neolithic, highly decorated pottery was a feature, the main technique used in its decoration being stabs (**Tieftstich**) (Midgley 1992, 418–74). The background to single burials of the Linkardstown type has not yet been established, although closed megalithic, polygonal-shaped chambers, some with double walling under round mounds of uncertain date, are known from Iberia (Leisner 1956, Taf. 22) and Brittany (Giot, L'Helgouac'h and Monnier 1979, 221–2). The latter, which are associated with the great long mounds, date from early in the Neolithic.

Parallel developments were also taking place in Britain. In England, the new complex is represented by Peterborough Ware which is mainly found on domestic sites, and which consists of three styles, Ebbsfleet, Mortlake and Fengate (Piggott 1954, 303–16; Megaw and Simpson 1979, 166–70). Megaw and Simpson considered Peterborough pottery as representing 'development from and continuation of traditions arising out of the regional forms of Windmill Hill pottery of southern Britain'. They considered that the traditions were united in the 'general deterioration of fabric in comparison with earlier pottery styles, the increasing elaboration of vessel form, particularly the rim, and the use of impressed

decoration'. From the Irish point of view, the Mortlake style and Carrowkeel Ware have features in common, so there may have been cross-fertilisation. The sherd from Burial II, Townleyhall I has parallels amongst the Bryn Yr Hen Bobl material (Lynch 1970, 68–70, fig. 28). Globular bowls are known from different areas of Neolithic Europe, such as in Iberian Passage Tombs but, due to the coarse nature of the ware and its decoration, perhaps the Carrowkeel variety was influenced from the Peterborough complexes of Britain.

Other pottery styles could also have emerged as part of an amalgam of events in Britain and Ireland. Ireland and, in particular, western Britain shared common features. Broad-rimmed Ware is also known from the Isle of Man and the Ronaldsway culture (Bruce and Megaw 1947), where in North-Western England, at Ehenside Tarn, Cumberland (Piggott 1954, 295–9), there is evidence for 'Sandhills' settlement. Scotland provides definite evidence for change. 'Sandhills' settlements are known, as at Townhead, Rothesay, Bute (Scott 1964, fig. 11), while new pottery styles became a feature of the megalithic tombs, both Clyde court tombs and passage tombs. Despite regional variations, the latter type in particular reflects influences from Ireland (Eogan 1992). Different varieties of decorated wares were used. These include Achnacree bowls, necked vessels equivalent to Irish Style 1, ii–iii (Beacharra B and C, Piggott 1954, 171–3), Broad-rimmed vessels (Beacharra A), plain hemispherical bowls and cups, Hebridean pottery and Unstan Ware (Henshall 1963, 105–10; 1972, 100–4, 152–54). Decorated wares are a feature of both Clyde court tombs and passage tombs; simple bowls, necked vessels and broad-rimmed vessels are the principal forms found. For instance, the Clyde tomb at Beacharra, Argyll, contained only decorated wares (Scott 1964). The pottery evidence suggests that the bulk of the Scottish Clyde tombs are late, contemporary with passage tombs, and constituting part of the Decorated Pottery complex. The difference could be one of location and not chronology, court (Clyde) tombs largely occurring in the south-west and passage tombs in the north. Henshall (1972, 164) has however surmised that only the final deposits survived, implying that the primary ones were cleared out at a time when the Decorated Pottery deposits were inserted. In Scotland, Achnacree type bowls are also a feature of Clyde tombs, though rarely occurring in passage tombs, but tombs of the later type have their own distinctive wares, Hebridean (as the name implies, concentrated in the Hebrides) and Unstan Ware, concentrated in the Orkneys.

The Decorated Pottery complex of Ireland emerged in a land that had a thriving farming community. While earlier monuments, the long cairn (court and portal) tombs, were sometimes used and while some of the pottery types such as Knockadoon Class 1a, and flint artefacts such as hollow scrapers, could have had their ancestors in the 'Western' Neolithic complex, it is difficult to evaluate the overall significance of the contribution that the preceding Later 'Western' Neolithic complex made to the Decorated Pottery complex. It is clear

that large-scale replacement took place with most elements, including domestic dwellings, ritual practices and the changes in some artefact types. All of these features clearly show that the Decorated Pottery Complex represents a major break with the past, ritually and domestically, but also in wider issues that effected the execution of large-scale building enterprises, the organisation of labour and, most likely, an alteration of society itself. The 'Western' contribution to all of this can not as yet be unequivocally evaluated; perhaps all that took place was an intensive modification of the 'Western' Neolithic culture by the introduction of new ritual practices which, amongst other things, involved the construction of more elaborate and monumental funerary architecture and the adoption of a different form of domestic architecture. But the evidence indicates that this is too restricted a view, and that fundamental and wide-ranging changes took place which represent more than an internal alteration of 'Western' Neolithic culture. It certainly represents new ideas and attitudes, and its conception may even have involved new people arriving from overseas.

Brugh na Bóinne was an area where outstanding developments took place during the time of the Decorated Pottery Complex. Here, magistral stone structures serving a ritual function were constructed; these present an utterly contrasting situation to the meagre wooden domestic buildings. Amongst the tombs are great monuments that are out of the ordinary, not only due to their vast size but in the elaborateness of their design and in the lavishness of their appearance. In addition, there are other features such as the placing of prestige objects within the tombs and the art on the structural stones. With its five hundred or so known decorated stones, Brugh na Bóinne has the greatest concentration of megalithic art. Its hinterland has a further one hundred and fifty or so stones. This alone is a most significant occurrence, highlighting a significant area, an area of ritual grandeur. Not only did these tombs surpass the needs required for burial; the large tombs, in particular, totally exceeded it. Such tombs show that a cult of the dead was, on a grand scale, an integral part of ritual power. But this cannot be looked at in isolation. Society must have possessed material wealth, otherwise it could not have afforded the cost of creating or acquiring specialists in different fields, as well as the workers needed to build – and then to maintain – such grandiose edifices (Eogan 1986; O'Kelly 1982). The presence of specialists indicates stratification based on skills and knowledge but were there other forms of stratification? The great sites in particular are classic examples of monumental architecture (Trigger 1990). As Trigger has pointed out, such architecture is a feature of complex societies composed of ranked classes, with a leader that has the power, amongst other things, to organise massive building programmes. For instance, in the Old Kingdom of Egypt, the construction of royal tombs correlates with kingly power. For Knowth, and Brugh na Bóinne generally, the building of the tombs demanded leadership and

indicates the presence of individuals of an exalted state, but the settlement evidence does not yet provide an indication of the nature of such leadership. It may well have been theocratic rather than secular.

CHAPTER IV

GROOVED WARE COMPLEX

Introduction

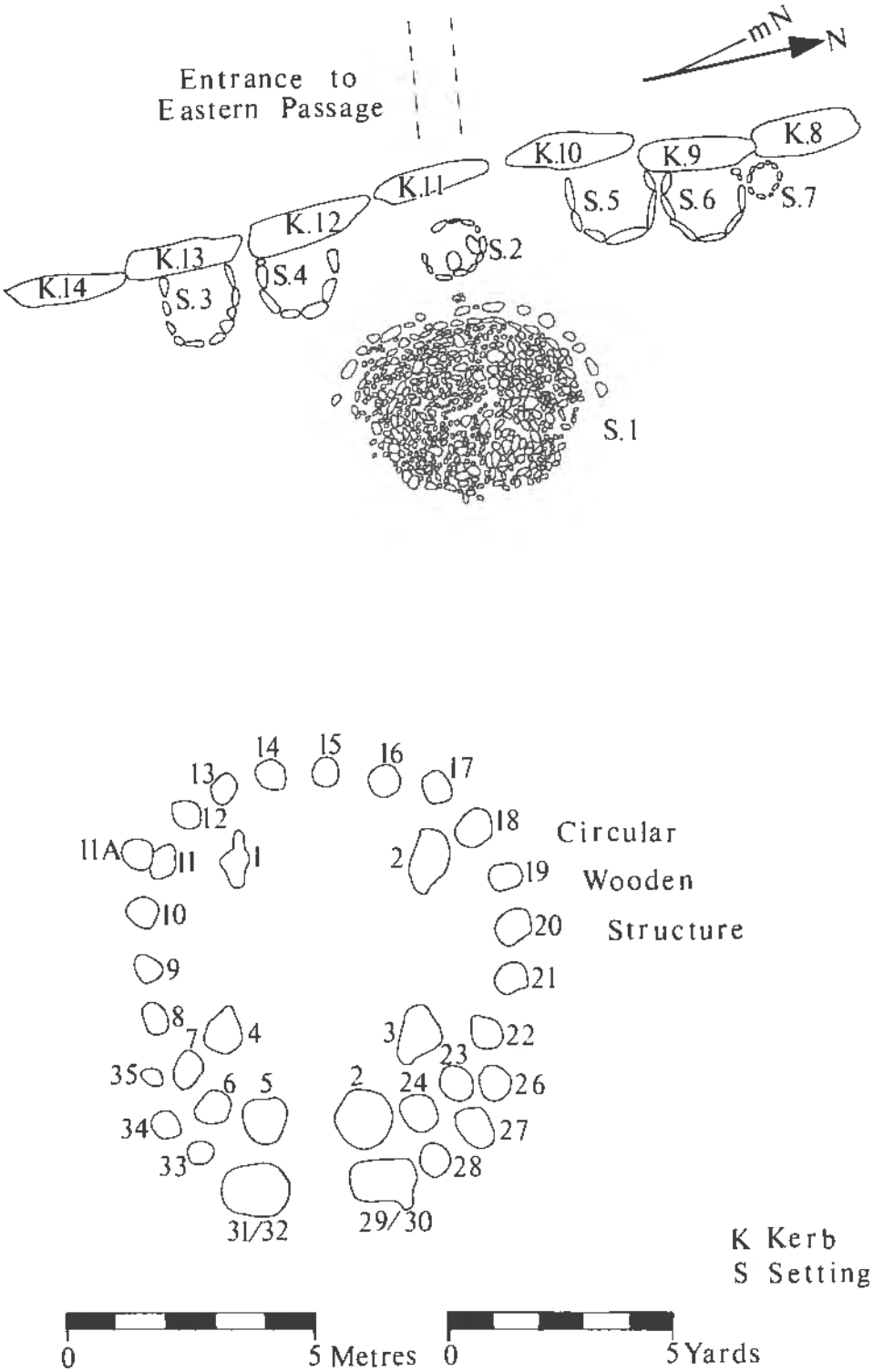
The term Grooved Ware has for long been used in Britain, where different styles have been identified (Wainwright and Longworth 1971, 236–243). In view of differences between Grooved Ware found in Britain and Ireland, the term 'Irish Grooved Ware' has been used to distinguish the Irish material (Brindley in Eogan 1984, 313; Sweetman 1985, 209). As it is considered that the Irish material is related to at least varieties of that found in Britain, the term Grooved Ware will be used in this report in the same general way that the term Beaker is used. The presence of Grooved Ware at Knowth has already been recognised (Gibson 1982, 180; Brindley in Eogan 1984, 313). Pottery of the same family has also been noted at Newgrange (Gibson 1982, 212; Cleary in O'Kelly, Cleary and Lehane 1983, 63, 100; Sweetman 1985, 209). Grooved Ware is also known from other parts of Ireland, such as the enclosure at Grange, Co. Limerick (Ó Ríordáin 1951, 64–7) and at Ballynahatty, Co. Down (Hartwell 1994, 11; fig. 2). It was, however, only with the discovery of the Knowth wooden circular structure and its finds that a positive, diagnostic and distinctive closed Grooved Ware assemblage came to light.

Ritual Site – Circular Wooden Structure (Figs 20–7; pls. 6–9)
During the excavation of Beaker Concentration D, the presence of two pits was detected (Eogan 1984, fig. 106, then termed post-holes A and B but now designated post-pits 13 and 14). Part of what is now termed the upper fill of the post-pits was excavated but no finds were then noticed. On the resumption of excavations in this area during the Summer of 1991 (continuing during 1992 and completed in 1993), it soon emerged that further 'post-holes' were present and that these represented the remains of a substantial wooden structure (preliminary report published in *Antiquity*, Eogan and Roche 1994).

The structure, situated in the eastern area of the site, is located at a distance of 12m from the entrance to the Eastern Tomb (Fig. 20). It was close to the Earlier 'Western' Neolithic settlement (Trenches 4–7) and on the periphery of the Decorated Pottery Complex.

The post-pits were cut through a layer of grey-brown humus, 2cm deep, which represents the level of the Earlier 'Western' Neolithic Complex on the site (see above p. 7). Directly above this was a thin dark brown layer, 2–3cm deep, similar in consistency but darker in

Fig. 20. Grooved Ware Complex: location of the circular wooden structure and the entrance area of the Eastern Tomb, Passage Tomb 1.



colour than the underlying Earlier 'Western' Neolithic layer. It is the only layer that can be associated with the activity within the circle as it sealed the post-pits, and a small number of Grooved Ware sherds (nos. 7490–7528, 7690–7703) and lithics (nos. 7529–7636) were found within it. However, apart from those pieces, it was sterile and a hearth or even charcoal flecks were not present within the layer. This activity was overlain by gritty black earth containing pebbles which represented the north-eastern limits of Beaker Concentration D (Fig. 50; see p. 232; Eogan 1984, 286–304). It was possible to distinguish between the Beaker black layer and that which represents the Decorated Pottery Complex, because the former was drier in consistency and contained small stones.

The structure measured 8.37m by 7.15m and was defined by 35 wooden posts, the only surviving evidence for these posts being the 33 post-shafts in which they would have stood. Nos. 29/30 and 31/32 contained two posts in each pit, a feature which is also present at British timber circles (Gibson 1994, 197). The entrance, situated at the eastern side of the structure, was defined by 4 large post-pits, nos. 5, 25, 29/30 and 31/32, which are more substantial in size than those which form the circle and provide a porch-like feature. The entrance area was further elaborated by the presence outside the circle of 3 post-pits (nos. 26–8), and three pits (nos. 33–5) flanking each side of the porch. Pits 33–35 are unusual as they are the only examples in which post-shafts (the area in which a wooden post would have stood) were not detected. Despite this lack of positive evidence, it is possible that they may have held uprights which would have created a facade. The main body of the structure is defined by a single ring of 24 post-pits, with an average interval of 65cm between each post-shaft. The only exception is pit 11a which is situated outside the circle. This was dug very close to no. 11 and, as it contained a sherd of Grooved Ware, a large scraper and flakes, some of chalk flint, it is part of the structure. Its purpose is difficult to establish, unless it can be connected with some sort of repair work, for example, to prop an unsteady post. There are four post-pits (nos. 1–4) within the circle, and these form an almost perfect square. The entire layout of the structure is symmetrical, structured around an east-west axis defined by a diameter running through the entrance, which faces east.

Nine small stones were found around the exterior circumference of the structure (Fig. 21). These stones project from the natural subsoil, but there is no evidence for a cut associated with them. Because of their small size, averaging about 15cm in diameter, it is not certain whether they were deliberately placed and, therefore, associated with the structure, or if they are a natural feature. However, such stones are absent from the natural boulder clay in this area. Their spacing, 2–3m between each stone, and the fact that they are not present in the area in front of the entrance, suggests that they represent an outer boundary for this special structure. In Britain, circular wooden structures are often located within henge monuments (Gibson 1994,

191–212), and it could be suggested that these small stones could symbolise a surrounding enclosure.

Individually, the post-pits varied somewhat in size and form, the main difference being the variation in depths and the fact that some were cylindrical in shape while others tapered gradually from mouth to base. The internal post-pits (nos. 1–4) and those which form the porch area (nos. 5, 25, 29/30 and 31/32) are the largest, measuring up

Fig. 21. Grooved Ware Complex: ground-plan of circular wooden structure and positions of small stones (in solid black) around circumference.

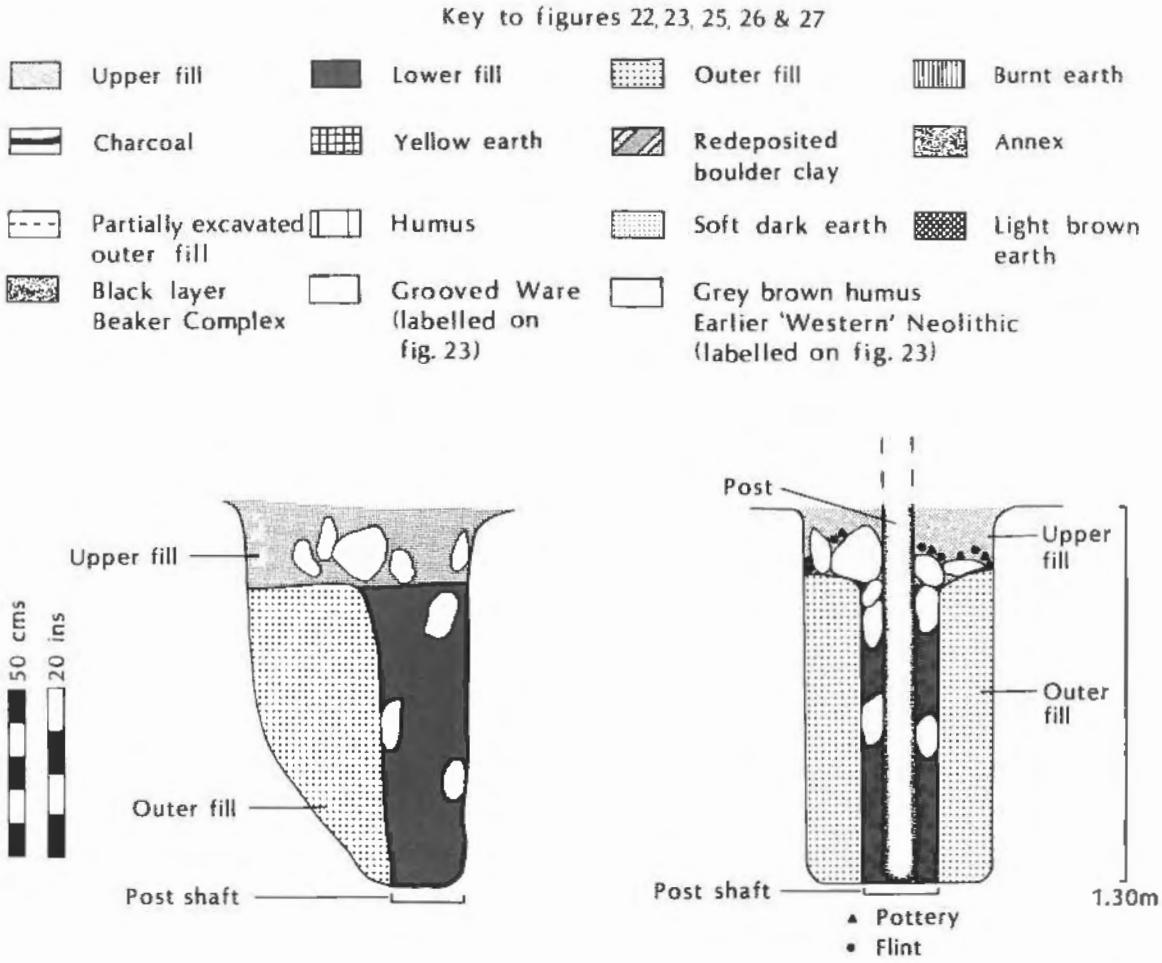
to 1.32m in width and 1.30m in depth. Those forming the rest of the structure and facade were generally smaller, 50cm to 80cm in diameter and 66cm to 1.18m deep.

Three distinctly different types of fill were identified within the post-pits. These are the *fill of the post-shaft*, the *outer fill* and the *upper fill* (Fig. 22). The fill within each post-shaft consisted of dark brown to black earth containing charcoal flecks. This material was distinct, having a damp sticky consistency and becoming increasingly wet towards the base. Stones, possibly used for packing, were found in all post-pits and they mainly consisted of water-rolled stones probably derived from the Boyne. Many showed signs of breakage which might have taken place at the time that they were being packed around the post. More 'exotic' packing stones were sometimes used, including quartz, hornfelsed banded siltstones and green-grit fragments (Mitchell 1992, 128–145). These would have been readily available, their source being the nearby spread in front of the eastern tomb, Passage Tomb 1, where they must have had a special significance as part of the passage tomb ritual. It is possible they were still accorded a special role by being deposited within the post-pits in the same manner as finds, and were not just used as functional packing stones. As a parallel, one can cite the careful selection of distinctive packing stones at the Balfarg, Fife, timber circle (Mercer 1981b, 81). The *outer fill* consisted of hard packed shale with a small content of boulder clay. This material was unusually dense and, when first uncovered, it resembled the natural shale and boulder clay layers on the site. The material is obviously backfill, but the dense consistency could not have been achieved by backfilling in the normal way. It seems reasonable to suggest that the material was actually compounded to create a hard compact texture. The *upper fill*, which lies above both the post-shaft and the outer fill, consists mainly of boulder clay and stones, with additional amounts of shale and boulder clay in certain post-pits. The consistency of this fill was different than the other two already described. It lacked the damp/wet sticky texture of the fill in the post-shafts and was much looser in consistency, and contained more boulder clay than the *outer fill*. It should be emphasised that the three areas of fill were easily identified and were distinctly different from each other.

Three of the central post-pits (nos. 1, 2 and 4) differed in detail from the others, as each had a scoop or annex which was dug into the surface of the fill, close to the edge, after backfilling. Post-pit 3 did not contain annexes, but protrusions on the east and west edges of this post-pit may be equivalent features. The eastern annex of post pit 2 appears to have been dug at the time of backfilling, as the cut for the annex was not detected on the surface of the pit (Fig. 25). The annex was partially cut into the undisturbed boulder clay at the edge of the pit and also extended into the upper fill. It was sealed with redeposited boulder clay which formed part of the *upper fill*. Concentrations of Grooved Ware sherds, flint and a stone axe were

found within these scoops. Throughout the report, these features will be referred to as 'annexes'. Deposits of charcoal and red ash were present in some post-pits, but mainly in the area of the *upper fill*. This phenomenon was most common within all four central post-pits, especially within the annexes. A few pieces of wood, identified as oak by Aonghus Maloney (Wetland Unit, Department of Archaeology, UCD), were found in the post-shaft of no. 4. For exact descriptions of the fill within the post-pits see detailed descriptions below (pp. 123–48). In all instances the post-shafts and the *upper fill* were fully excavated and the *outer fill* was only completely investigated in post-pits 13, 16, 23, 24, 26, 27, 28 and pit 33. The remainder were left unexcavated in order to leave portions of the fill for study at some future date. As has already been mentioned, evidence for activity in the interior or exterior of the structure was limited.

Fig. 22. Grooved Ware Complex, circular wooden structure: left: cross-section through post-pit 24; right: schematic cross-section of a post-pit.



Form and Function

In discussing the reconstruction of this structure, various alternatives have been explored (Appendix 2). An important aspect is in deciding whether it was roofed or consisted of free-standing posts. It can be argued that, since it lacks distinct internal habitation debris, as well as a domestic hearth, and because a drainage trench was not found around the external circumference of the structure, it would not have been roofed. However, the function of the structure should be considered. If it represents a form of temple or 'sacred place', as is suggested by the nature of the finds within the post-pits and in their deliberate deposition, the absence of a hearth or other evidence for domestic activity would support a non-domestic function. It has been suggested that similar sites in Britain may have been unroofed structures consisting of free-standing posts, perhaps joined with lintels, for example Balfarg in Scotland (Mercer 1981b, 153) and Sarn-y-bryn-caled in Wales (Gibson 1992, 88). An argument often used is that the size of many of the British structures would be too great to carry a roof, without excessively large spans between supports. However, the roofing of the Knowth structure would not present such difficulties. It is about 8m in diameter and has internal posts and a porch-like feature (see Appendix 2 for details). It is not possible to indicate the exact height of the structure. On some British sites, the length of the ramp (which did not occur at Knowth) has been taken as a guide to the height of the post (Mercer 1981b, 149–50). The suggestion is that about one third of the post was buried in the pit. On that assumption the Knowth posts would have reached a height of about 2 metres above ground. Preservation could have depended on a number of factors, so the duration of the building cannot be established. The vulnerable part of each post is at the junction with the soil, so protection of that part from the rain would add to the life span. Taking an average calculation, Wainwright and Longworth (1971, 224–5) suggested that a post loses 2 inches (5cm of its diameter) every fifteen years. If that calculation were used for the posts in this structure, it would have become unstable after about 30 years.

Construction and Destruction

Reconstruction of the way in which posts were erected is dependent on the interpretation of how the structure fell into disuse. For this it is difficult to offer an unequivocal explanation, and more than one interpretation can be put forward.

(i) The structure was burnt down.

(ii) The upright posts rotted *in situ*.

(iii) That posts were deliberately removed, either totally (the digging out of the complete post) or partially (the removal of the post as far as the base of the *upper fill*), from the post-pits at a time when the structure no longer served a purpose.

Each of these interpretations is now discussed in turn.

(i) **Burning of structure**

This view can be discounted as there is little evidence for charcoal or burnt soil on the surface of the post-pits. Patches of charcoal and ash were found within the upper fill of some of the pits but, from their location and the fact that there is virtually no evidence for burning of finds, except for a small number of flint from post-pit 3, it would appear that the ash and charcoal was incorporated with the backfill, or as deliberate deposits. Charcoal flecks were also found within the fill of post-shafts. It is possible that the base of the posts were charred in an effort to preserve the timber, which would account for charcoal in this area of the fill.

(ii) **Posts decayed *in situ* interpretation**

If the posts decayed *in situ*, and therefore no disturbance of the post-pits occurred, it can be suggested that the construction of the structure was carried out in a complex and deliberate fashion and that the finds were formally placed within certain areas of the fill. The stratigraphic order within all post-pits was consistent, indicating a similar sequential backfill. Based on the evidence, the following is a suggestion as to how the sequence of construction and back-filling was accomplished. Firstly, the pit was dug, then a wooden post was placed in an upright position, usually against the side adjoining the interior of the circle. Its position was clearly defined by the presence of moist dark fill with finds. The pit was then back-filled with the material previously removed from it. This was carried out in two stages (i. outer fill and the fill around the post; ii. upper fill, fig. 22). The *outer fill* consisted of shale with a limited amount of boulder clay, and was packed firmly into one side of the pit. On excavating the material, it was difficult to distinguish it from the surrounding natural shale and boulder clay. As already discussed (p. 105), its dense consistency was such that it could not have been achieved by straight forward back-filling, and it may be assumed that the soil was pounded, probably with a timber post, as the fill was being inserted. Simultaneously, the area immediately around the post (*post-shaft*) was back-filled with brown earth and stones, probably packing stones. Quantities of finds were found within the post-shaft, which suggests that they had been placed around the post; this is significant as finds were totally excluded from the area of the *outer fill*. There was a clear-cut division between both fills along a vertical plane; no mixing of fills occurred and the stones and finds never protruded into the *outer fill*. This emphasises that back-filling was simultaneous but, in order to maintain exclusivity between both fills, some barrier material, such as tree bark, must have been used. However, no such material survived within the post-pits. This order of back-filling generally reached about three-quarters of the way up the pit. The remainder (*upper fill*) was back-filled with a mixture of boulder clay, brown earth, packing stones and some shale, though finds were also dispersed throughout it. After back filling, small annexes were dug into the surface edges of some post-pits and finds were deposited within them.

In this explanation, the fundamental reason for the simultaneous back-filling of the post-shaft and the *outer fill* would be to facilitate the placing of finds in an ordered and significant fashion around the circumference of the post. This structured deposition of artefacts within the pits is most significant, not only regarding the range and number of artefacts, but particularly in the manner in which they were placed, and the fact that deposition focused on the central and entrance post-pits.

The main argument against the suggestion that the posts decayed *in situ* is that post ghosts were not identified in the *upper fill*, except for post-pit 2. An explanation for this could be that decay of the post would have commenced at the junction between the earth and the air (i.e. ground surface). When this progressed sufficiently far, the upper part of the post would snap off, but the base of the timber would have remained intact. It is possible in this situation that material at ground level could have been trodden in by subsequent activity, and would seal the top of the fill without percolating down to the base of the post-shaft. Subsequent rotting of the base of the post would explain the liquid nature of the fill of the post-shafts.

Plate 6. Grooved Ware Complex, circular wooden structure from east. The entrance area is at the bottom of the photograph.

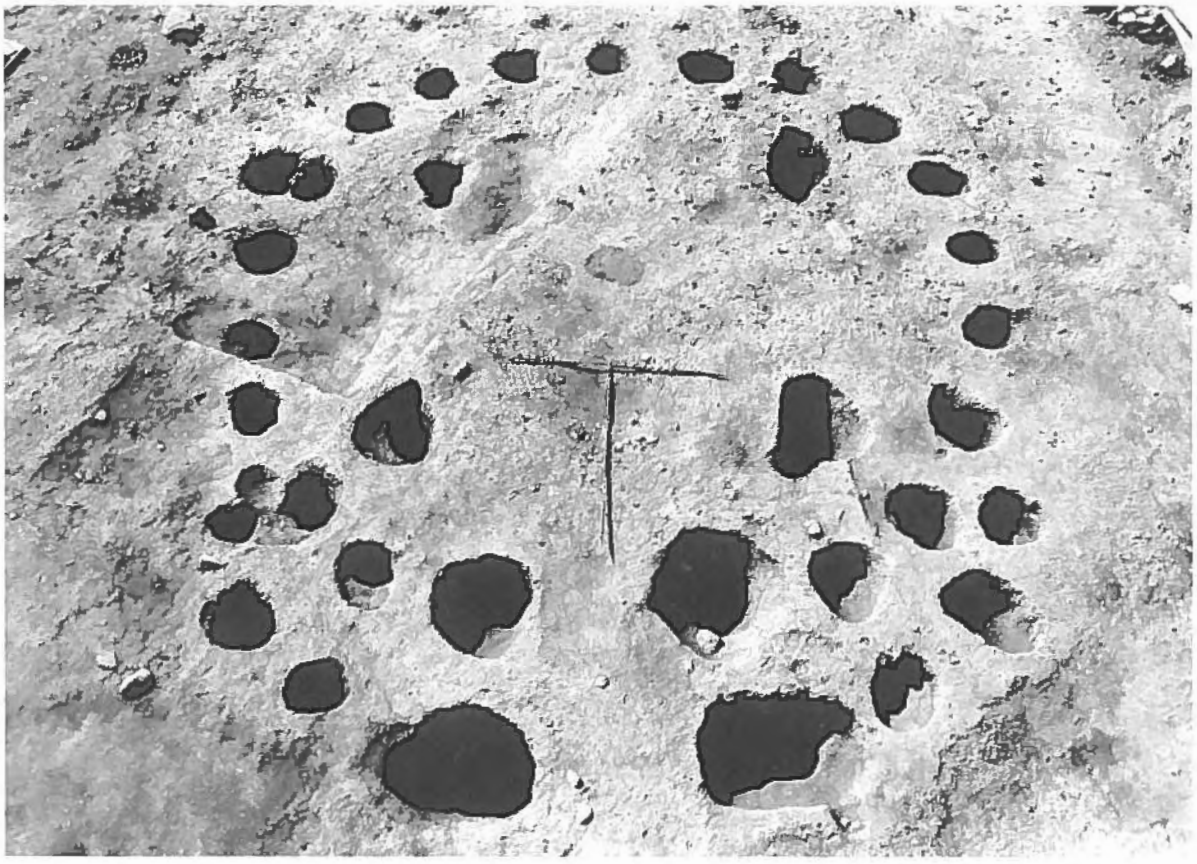


Plate 7, top. Grooved Ware Complex, entrance to circular wooden structure from east.
Plate 7, bottom. Grooved Ware Complex, circular wooden structure: post-pits 29/30.

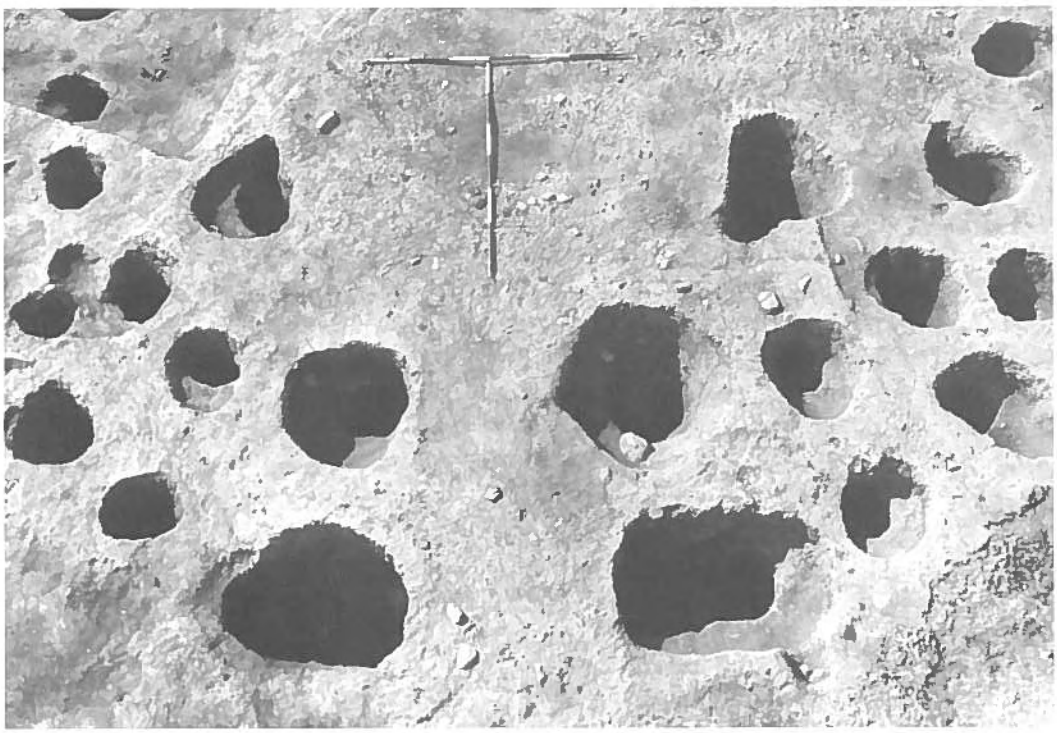
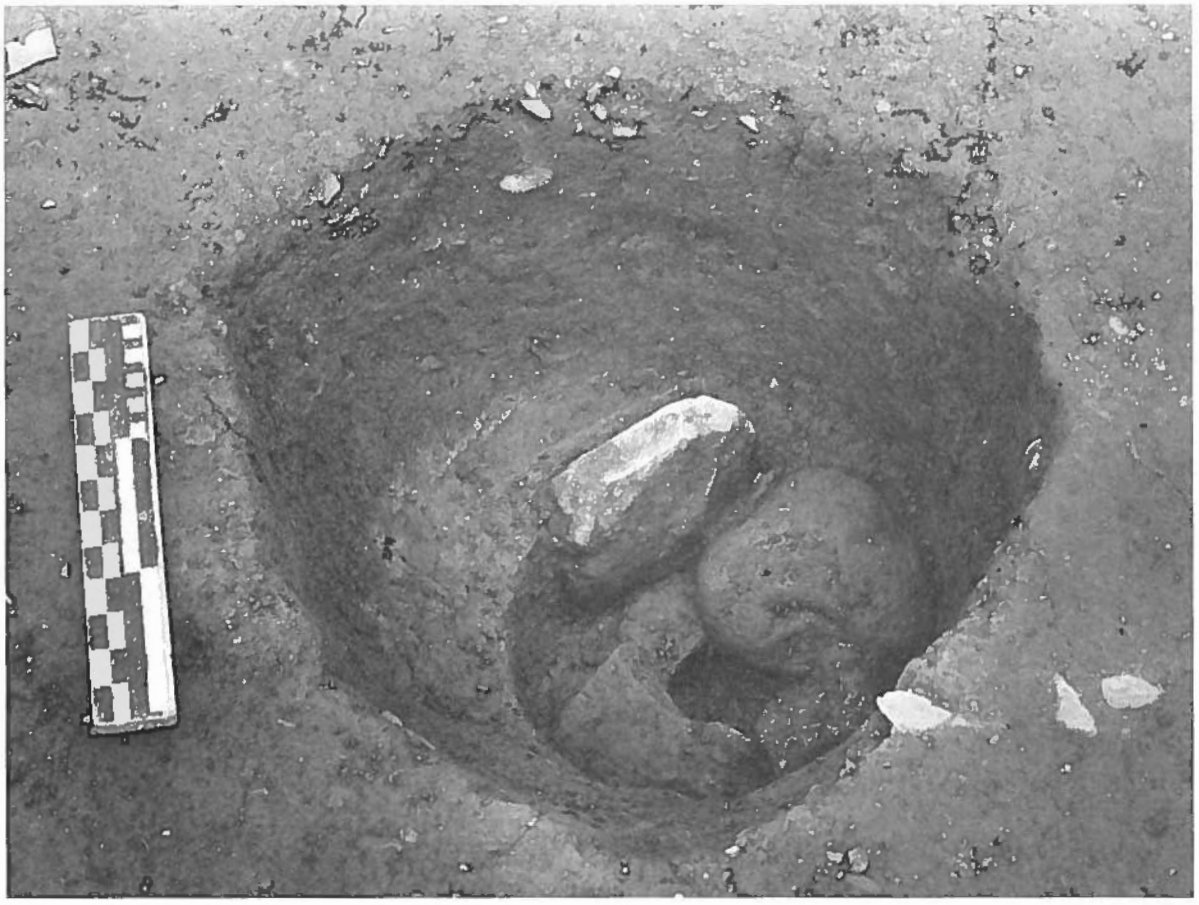


Plate 8, top. Grooved Ware Complex, circular wooden structure: post-pit 2. Plate 8, bottom. Grooved Ware Complex, circular wooden structure: post-pit 4.

The concept of weathering cones. On similar British sites, the presence of finds in the upper area of post-pits have been attributed to the presence of weathering cones. Wainwright and Longworth discussed the presence of weathering cones at Durrington Walls (1971, 25; Wainwright 1973, 12–23). In his paper on The Sanctuary, Overton Hill, Wiltshire, Pollard explains their occurrence as being the result of the decaying process of the wooden post 'while the lower part of the post will be gradually replaced by degradation products, solution around the top of the post-hole will result in the formation of a weathering cone, which will act as a trap for material that had previously accumulated around the post' (Pollard 1992, 215). Although Pollard's schematic section of a post-hole (1992, fig. 2) certainly resembles a section through any of the post-pits of the Knowth structure, it can be said with confidence that weathering cones were not a feature at Knowth. This can be substantiated by a

Plate 9, left. Grooved Ware Complex, circular wooden structure: post-pits 11, 11a.
Plate 9, right. Grooved Ware Complex, circular wooden structure: post-pit 26.



number of reasons. Firstly, the weathering cone explanation is reasonable in a chalk environment, where acid from rainfall will erode and dissolve chalk deposits. In the heavy clay environment at Knowth, rainfall would have little impact on the soil profile. The *upper fill* is quite consistent throughout the 35 post-pits, being a mixture of brown earth, boulder clay, shale and packing stones – clearly the result of back-filling to support the post and not the result of solution followed by silting, as with a weathering cone. The presence of boulder clay and shale within the *upper fill* is also relevant, as it shows that the backfill consisted of the material that had already been dug out of the pits. An examination of the width of the post-shafts, taking into account the number of packing stones which were placed around the upstanding posts, is also revealing. It can be estimated that the diameter of the posts varied but, in most examples, the diameter would not have exceeded *c.* 12cm, with the largest examples measuring *c.* 15cm in diameter. Taking into account the size of the posts and the slow decaying process of an oak upright in a clay matrix, it is not envisaged that they would have created a large cavity at any particular stage. The surrounding back-fill (upper fill) could easily have fused together, as the post slowly decayed, filling the cavity left by the rotting post. Furthermore the formation of weathering cones by solution and silting is a slow process leaving traces of stratigraphy within the cone. If the *upper fill* represented a weathering cone, there should be obvious stratigraphical differences within the fill, as it silted up slowly with earth and finds. This is not the case at Knowth. No obvious or subtle stratigraphical differences were visible there, and the *upper fill* consisted of a consistent mixture

Fig. 23. Grooved Ware Complex, circular wooden structure: cross-sections A–B: east-west, C–D: southeast-northwest.

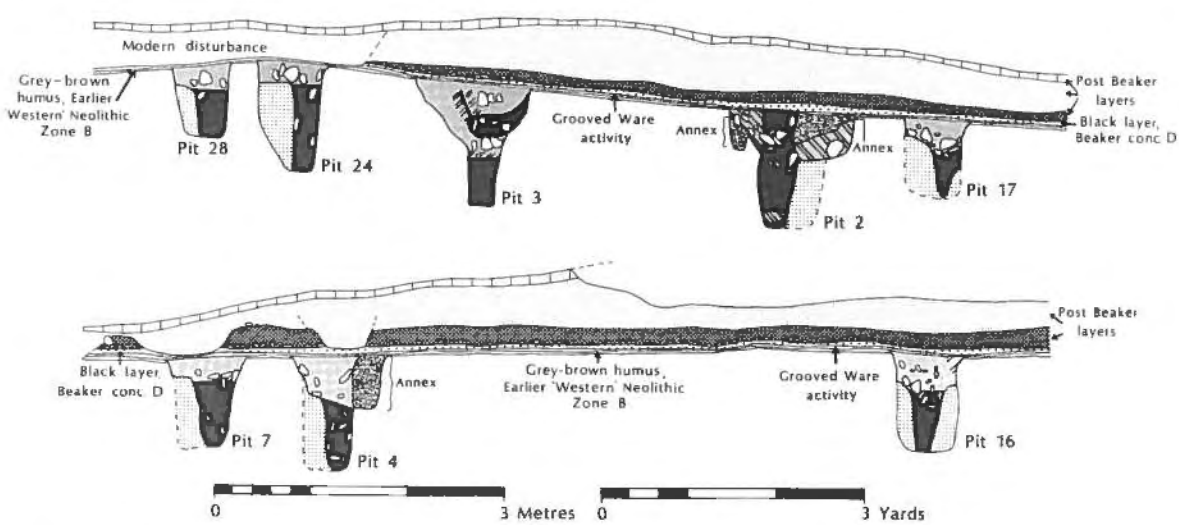


Fig. 24. Grooved Ware Complex: ground-plan of circular wooden structure showing position of packing stones and positions of small stones (in solid black) around circumference.

Fig. 25. Grooved Ware Complex, circular wooden structure: cross sections of pits 1–10.

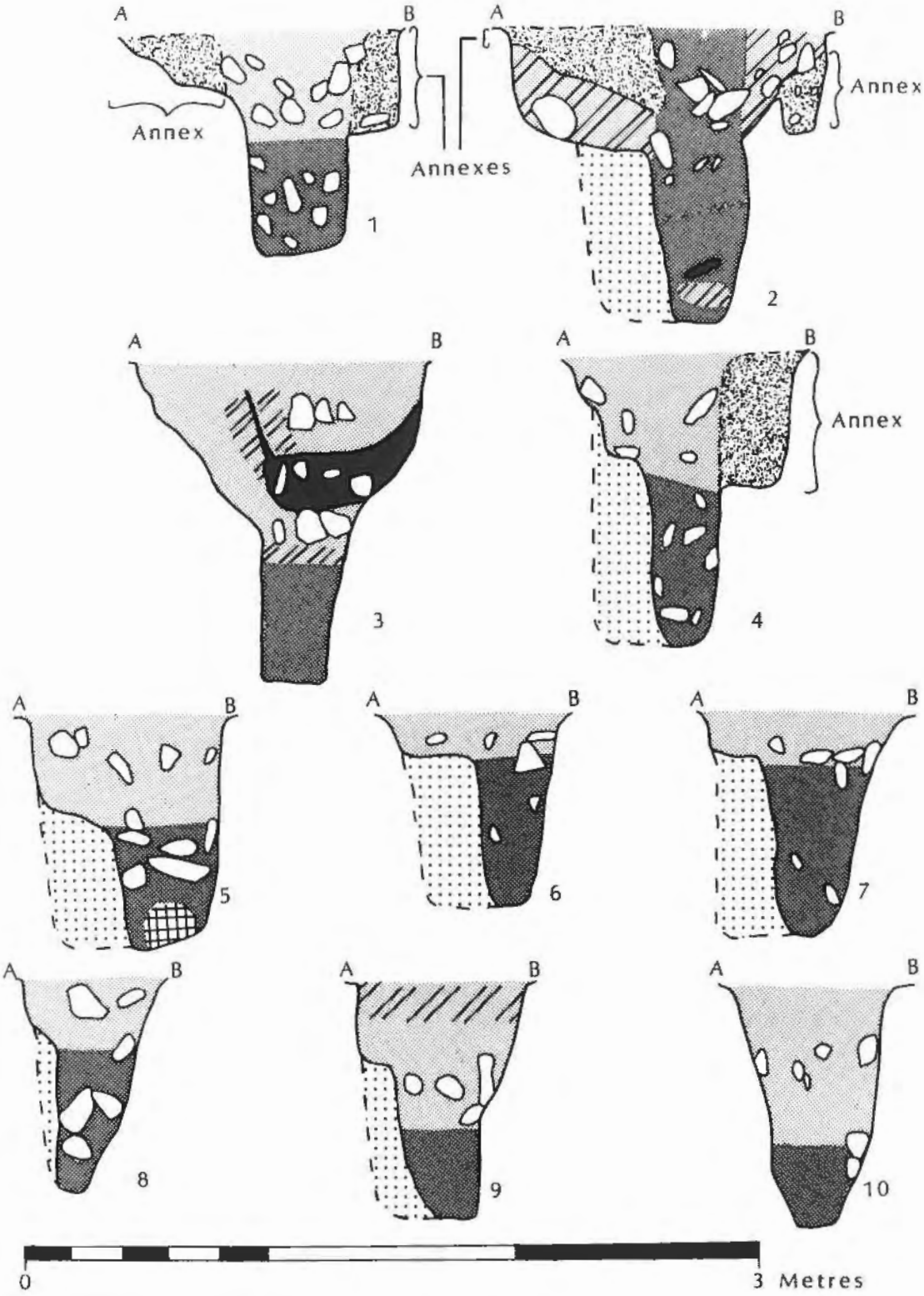


Fig. 26. Grooved Ware Complex, circular wooden structure: cross sections of pits 11–22.

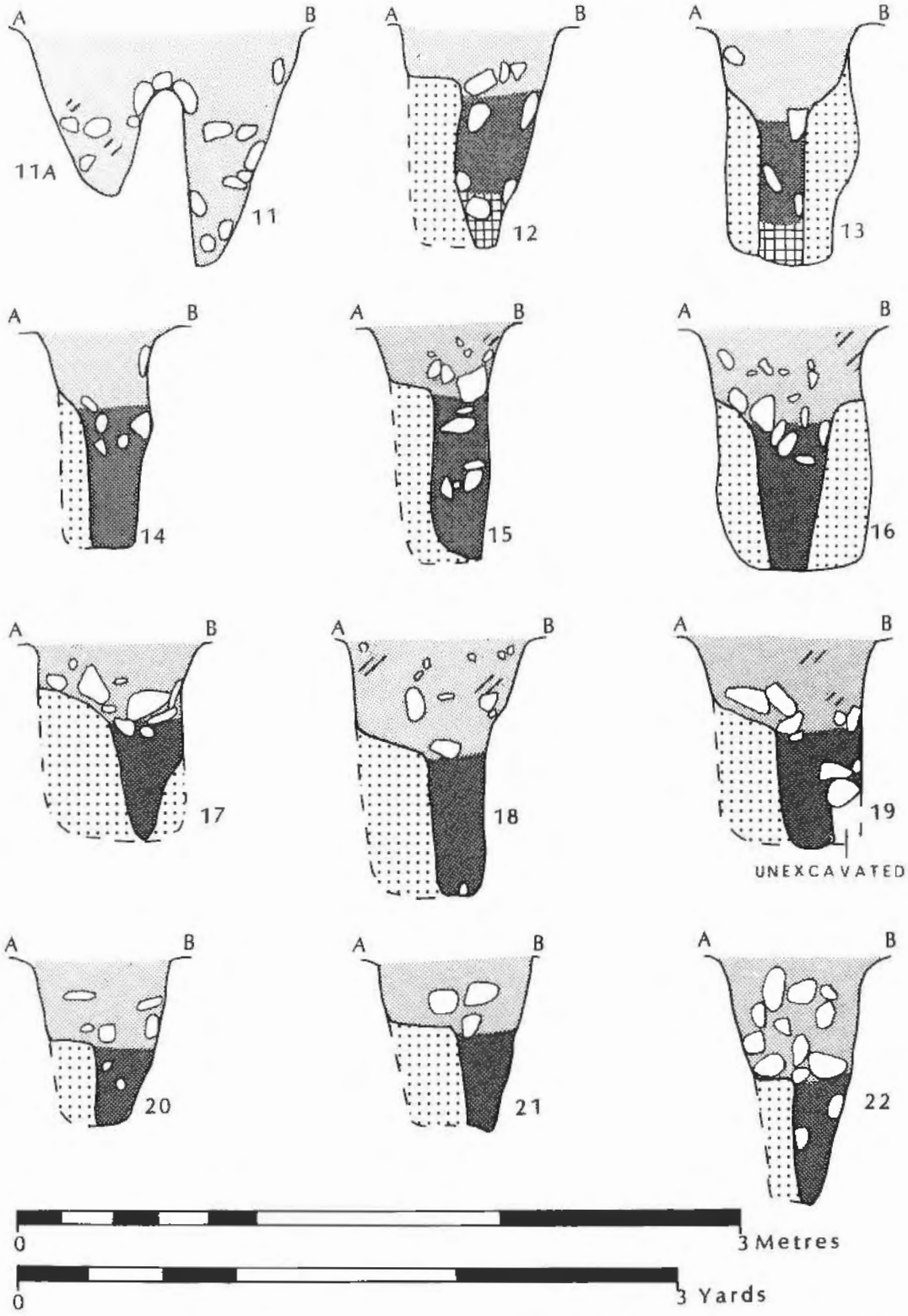
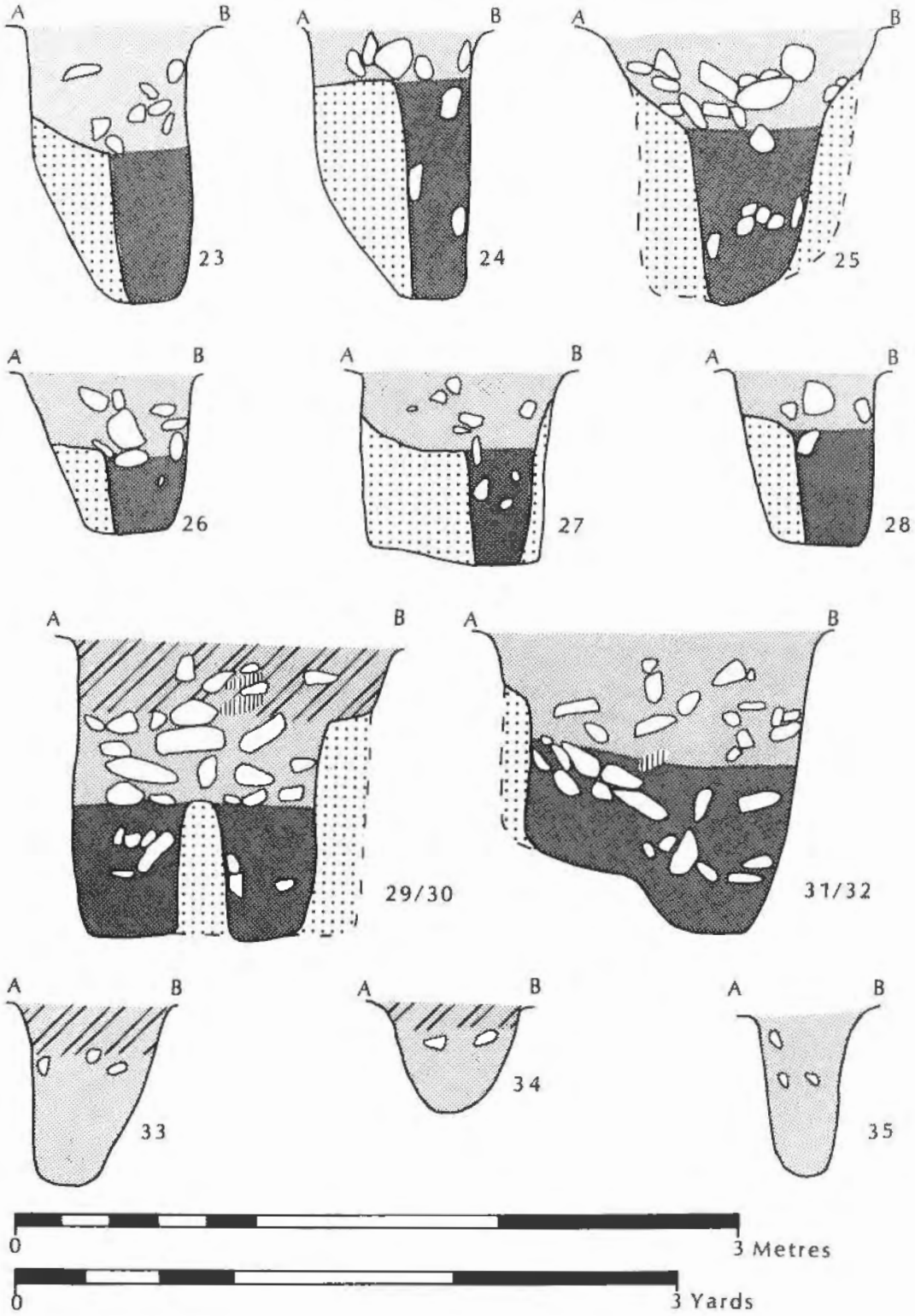


Fig. 27. Grooved Ware Complex, circular wooden structure: cross sections of pits 23–35.



which had been deliberately back-filled, with artefacts included, once the post was erected.

The presence of the annex features in three of the central post-pits also militates against the idea of the presence of a weathering cone. These annexes, except for the eastern annex of post-pit 2, were cut into the side of the pits after back-filling had taken place, so that they were themselves deliberately back-filled with earth and ash, throughout which finds were dispersed. The fact that the same assemblage of finds found in these annexes is also found in the post-shafts and the upper fill, argues against the weathering cone model. The presence of the only complete axe head associated with this structure (no. 7399), in the east annex in post-pit 4, also emphasises the ritualistic nature of the deposition of the finds.

If the weathering cone explanation were to be used for the Knowth structure, the only layer which could be interpreted as the cone would be the *upper fill*. However, as already noted, the profile of the upper fill does not fit the profile of the classic 'weathering cone'. Moreover, in the absence of any defined habitation layer, it seems unreasonable to suppose that up to 72 flints and 66 pottery sherds (post-pit 2), and 60 flint and 40 pottery sherds (post-pit 4) would 'filter' down into the weathering cone of a single post, having accumulated only in the vicinity of these posts. It is also significant that, although the Grooved Ware structure was directly overlain by a layer containing Beaker pottery, not one sherd of Beaker was recovered from the *upper fill* (or other portions of the fill) of any post-pit.

Structured deposition of finds. In examining the exact positions of the finds it appears most likely that they were all placed within the post-pits as part of one single act of deposition and did not, at a later stage, filter down from the surface as the post decayed, forming a weathering cone. As already stated, Pollard proposes that a weathering cone acts 'as a trap for material that had previously accumulated around the post'. With regard to the structure under discussion, it does not seem conceivable that the finds, or even some of the finds, in the *upper fill* were derived from the surface around the post. Finds were placed around the circumference of the post, from the base to the surface (upper fill), and appeared to be deliberately excluded from the *outer fill*. The finds assemblage within each post-pit is most consistent, i.e. the predominance of fresh flint consisting of large scrapers and flakes and Grooved Ware, representing a single sealed assemblage. Chalk flint was rarely used at Knowth before or after the Grooved Ware Complex, and the large end- and end-and-side scraper is exclusively associated with this Complex. Returning to the argument regarding the filtering of finds from around the circumference of the post into the weathering cone, certain details, especially concerning both pottery and flint, refute this explanation. First of all, as already stated, finds are consistent from the base (post-shaft) to the surface of the upper fill, forming a single assemblage. In the same

way, finds were placed around the circumference of the post from the base of the post-shaft to the surface of the upper fill. An example which demonstrates that finds were placed within the shaft during back-filling is vessel 23, where portions of its base (6340/6341, 6342, 6343/6344, 6345 and 6346) were found near the bottom of the shaft of post-pit 13, while a bodysherd (6347) and a rimsherd (6339) from the same vessel were found in the upper fill. The consistent nature of the finds and the implication that they were all deposited in a deliberate fashion becomes more obvious when finds from other individual post-pits are examined. A good example of deliberate deposition is provided by sherds representing vessel 34 from post-pit 4, where sherds from the same vessel were found throughout all areas of the fill (except the outer fill). Sherds 6451–6, 6477–8 come from the post-shaft, sherds 6435, 6447–50 come from the upper fill and sherds 6436–38, 6445–6, 6457–74, 6479–87 come from the west annex. This distribution certainly indicates a single deliberate deposition. The pattern of deliberate deposition is repeated in the following post-pits, nos. 8 (vessel 25), 16 (vessel 26), 22 (vessel 42) and 29/30 (vessel 42). There are also examples where sherds from more than one vessel were deposited in this manner in the same post-pit, as in post-pit 2 (vessels 34 and 37), post-pit 15 (vessels 3 and 43), post-pit 17 (vessels 2, 6 and 21) and post-pit 25 (vessels 40 and 42). There is also a symmetrical pattern in the distribution of the flint, especially in the entrance post-pits. There, the number of flints on either side of the entrance is almost equal. 38% of the flint assemblage was found in the four central post-pits, which consisted mainly of large scrapers (Fig. 41), again emphasising the deliberate and selective placing of finds within the post-pits (for further details see p. 220).

(iii) **The deliberate destruction of the circular structure**

An alternative interpretation to the above argument is that the posts were deliberately removed, either completely or partially, from the post-pits. If the posts were completely removed, then it can be suggested that the construction of the timber circle could have been carried out in a straight-forward manner. Large pits were dug to accommodate the upright posts, and then posts were positioned against the side facing the interior of the circle. The pits were then back-filled, mainly with shale which was pounded around the post to form a dense compact consistency. In this argument, the post-shafts appear to represent the full extent of the upright posts, which suggest a diameter of about *c.* 30cm for most timbers.

As post ghosts were not identified in the area of the *upper fill*, except for post-pit 2, this fill could be attributed to the digging out of the upright posts. The material within the post-shafts and the upper fill would then represent the back-fill which was inserted after the post had been removed and would, therefore, be later than the erection of the structure. If this interpretation is correct, the outer fill would have originally extended up as far as the surface of the pit. At a

later stage, when the structure was being dismantled, a pit (upper fill) could have been dug to expose a portion of the post. But the lower portion would still be secured and, as a result, it could be difficult to remove. To facilitate this, it would have been necessary to have rocked it backwards and forwards to loosen it. The material which had been dug out could then have been back-filled with the addition of boulder clay obtained from another source, as the fill surrounding the post consisted mainly of shale, though there was very little shale within the upper fill.

This interpretation does not, however, explain the presence of finds in the lower part of the post-pits. It seems unlikely that finds were placed within the outer fill during construction, not only because none was found within the excavated areas of the outer fill, but also because the pounding carried out to produce such a dense fill would have crushed the pottery sherds. This suggests that the finds were placed in the post-pits after the posts had been dug out. While the posts were still standing, pottery sherds and flint could have been placed on the surface of the structure around the posts. When the posts were eventually dug out, it is possible that the finds were included with the back-fill in both the post-shaft and the upper fill. If it is accepted that the posts were removed, then the annexes would have to be dug into the surface of the post-pits and finds deposited, after the removal of the post and when back-filling had occurred.

It is also necessary to explore the possibility that posts were partially removed from the post-pits. In this case, the upper fill again represents re-digging of the pit to expose the upper portion of the post. However, instead of rocking the posts for removal, they were hacked out at the level of the base of what is now called the upper fill. This would not change the manner in which the structure was constructed, but it would explain the consistency of three different areas of fill within nearly all post-pits. If the posts were completely removed and then the post-pits back-filled, it is difficult to explain the three types of fill within all the post-pits, as they would be more likely to contain a fairly homogeneous fill throughout. However, if the posts were only partially removed, then the area of the post-shaft can be considered to have been undisturbed and to represent the remains of the decayed post. If this interpretation is correct, then the finds within the post-shafts were deposited at the time of the construction of the structure and, therefore, probably served a ritual function.

However, during excavation, there were no signs of obvious disturbance within the post-pits of a kind which would have occurred if the posts had been removed. Also, the fill described within the post-shaft, the *outer fill* and the *upper fill*, is consistent throughout the majority of the post-pits (Figs. 25–7), as if carried out in a uniform fashion as part of a single-phase construction. If the posts had been removed and then back filled, it is unlikely that such consistency would have been achieved.

If the posts were dug out and the material were replaced in the

post-pits, there should not be such a difference between the fill of the post-shaft and the upper fill. Finds were found pressed against the outer fill; this would not happen if they were just thrown in. Neither can the difference between the two fills be attributed to rocking the post backwards and forwards to remove it, because this would crush the pottery. In examining the size and shape of the upper portion of the post-pits, they can be seen to have been very regular, with the position of the post-shaft almost always on the interior side of the post-pit. It seems unlikely that, if a secondary cut were dug to remove the post, it never extended outside the original edge of the post-pit, or that it rarely encircled the post. Another point is that stones were never visible on the surface of the post-pits before they were excavated. It would seem possible that, if the posts were dug out out and then the material had been back-filled, some stones would protrude through the surface. The pottery sherds are very fresh and unabraded, which suggests that they were not exposed above ground for a long period of time. This can be contrasted with the Grooved Ware sherds which were found lying unprotected, weathered and abraded, on the surface in Concentration A (Eogan 1984, 245–260). It can thus be argued that the sherds found in the post-pits of the circular structure were broken and immediately placed within the post-pits.

An explanation as to why there is a difference between the fill within the post-shafts and the *upper fill* could be that, although most of the post was removed, the lower portion was left in the post-shaft. If that were the case, then the suggestion that finds were ritually placed during the construction of the structure can still be accepted. There would have been no rocking of the post, which explains why the pottery sherds were not crushed.

Conclusions

Having reviewed the evidence, the authors believe that the argument in favour of the posts decaying *in situ* is the strongest. The consistent pattern of the fill throughout the post-pits does not suggest a random back-filling and, as already stated, it appears strange that, if digging took place to facilitate the removal of the post, the original edge of the pits was not altered or damaged. The consistent nature and the distribution pattern of the finds also argues for a single deliberate deposition. As already mentioned, in post-pit 4, sherds of vessel 34 were found in the fill of the post-shaft, the upper fill and the annex. This argues against finds being placed in a random fashion or accidentally filled in, after the total or partial removal of the post. The evidence points to a single act of deposition at the time the structure was being constructed. The concentration of rimsherds and basesherds within the entrance post-pits and those opposite the entrance (Fig. 40) also argues for a single act of deposition. Similar patterns concern the flint assemblage where almost the same numbers were found in each of the entrance post-pits, and where the majority

of the large scrapers were found in the central post-pits (Fig. 41).

It would be difficult to explain why such enormous effort would have been expended if the finds were placed within the post-pits after the removal of the post, and when the structure was no longer in use. If the partial removal of the post theory is accepted, it is difficult to explain why the upper part of the fill was not back-filled with the material that had been dug out, i.e. mainly shale, and why all, except one annex, were dug into the surface of the central post-pits. Therefore the preferred interpretation is that the finds were deliberately and carefully deposited at the time of the construction of the structure, and that the posts eventually decayed *in situ*.

Stratigraphic description of fill within post-pits (Figs. 25–7)
In all cases the fill within the post-pits will be described from ***bottom to top****.*
In this section the finds are only listed; they will be described in detail in the catalogue which follows. The listing follows the stratigraphic descriptions of each post-pit. The following symbols are used –

/	=	joining sherds are described together, i.e. 1463/3657.
+	=	post-pit(s) in which additional sherds from the same vessel were also found.
[PS]	=	finds were found within the post-shaft.
[UF]	=	finds from the upper fill.

Post-Pit 1 measured 1.15cm by 59cm at the mouth and 90cm deep. The post-shaft, which was towards the western side of the pit, was cylindrical in shape and could be observed to a height of 48cm above the base of the pit. The lower 22cm consisted of black charcoal-rich earth, very sticky and wet in consistency, especially towards the base. The fill from the upper area of the shaft consisted of dark brown gritty earth with the odd patch of boulder clay, shale and charcoal flecks. This post-pit did not contain *outer fill*. The *upper fill*, 42cm in depth, consisted of boulder clay, brown earth and shale. There were two annexes, cut into the eastern and western edges of the *fill* respectively. The western annex measured 24cm by 11cm by 14cm deep, its fill consisting of red ash and brown earth. The eastern annex measured 18cm by 13cm by 21cm deep. The fill consisted of dark brown earth with charcoal flecks.

List of finds:

Pottery:

Vessel 7: bodysherd 6208 [PS], (+ 8, 19).

Vessel 17: bodysherd 6268 [East Annex], (+ 27, 29/30).

Vessel 23: 7 bodysherds 6350–6 [PS], (+ 12, 13, 19).

Vessel 27: bodysherd 6405 [UF], (+ 5, 8, 22, 27).

Vessel 37: bodysherd 6508 [West Annex], (+ 2, 19).

Flint:
2 *core rejuvenation flakes*: 6677–8 [East Annex].

2 *unutilised blades*: 6721, 6728 [East Annex] .

37 *unutilised flakes*: 6851 [PS], 6740-41, 6742 (Fig. 32), 6743, 6748, 6749 (Fig. 32), 6848 (Fig. 32), 6949–50, 6872 [UF], 6744 (Fig. 32), 6746–7, 6852–5, 6856–71 [East Annex], 6873–4 [West Annex].

Utilised blade: 7212 (Fig. 33),[East Annex].

4 *utilised flakes*: 7214–5 (Fig. 33), [UF], 7216 (Pl. X), 7217 [East Annex].

5 *end scrapers*: (see below pp. 166-8 for end scrapers Groups 1–5) Group 1: 7263 (Fig. 33; Pl. IX), [UF], 7264 (Fig. 33), [East Annex], Group 2: 7273 (Fig. 33), [East Annex], Group 5: 7300–1 (Fig. 34), [UF].

Side-and-end scraper: 7315 (Fig. 35; Pl. IX), [East Annex].

3 *round scrapers*: 7323 (Fig. 35), [UF], 7324 (Fig. 35; Pl. IX), 7325 (Fig. 36), [East Annex].

2 *side scrapers*: 7339–40 (Fig. 35; ; Pl. IX), [East Annex].

Retouched flake: 7351 [West Annex].

Irregular fragment: 7388 [East Annex].

Rounded stone: 7445 [UF].

Unworked fragments of miscellaneous stones: 7451 [UF].

Bone objects:
2 *polished bone objects*: 7488–9 (Fig. 37), [PS]

A fragment of burnt bone was found in the post-shaft

Post-pit 2 measured 1.30m by 75cm at the mouth and 1.21m deep. The post-shaft, which was on the southern side of the pit, tapered from 41cm at the top to 17cm at the base. This is the only example where the entire post-shaft was visible from the top of the post-pit to the base. Its fill consisted of dark organic, charcoal-rich earth which became wet and sticky towards the base. A lens of boulder clay occurred 12cm above the base of the post-shaft, while a dense concentration of charcoal was found above it. The *outer fill* (not fully excavated) was confined to the north-western side of the pit and consisted of compacted shale. It measured 24cm at its widest and reached a height of 72cm from the base of the pit. The *upper fill*, 54cm deep, consisted of moist, dark-brown earth and shale with a high charcoal content; this was flanked on the east and west sides by boulder clay, the eastern area of which had a higher charcoal content. Two annexes were cut into the eastern and western edges of the post-pit, both extended into the undisturbed boulder clay. The western annex measured 20cm by 12cm by 17cm deep. Its fill consisted mainly of charcoal with a limited brown earth content, and the edges of the annex were reddened, suggesting *in situ* burning. The eastern annex measured 18cm by 21cm by 20cm

deep. The fill consisted of dark brown earth with a high charcoal content and three small stones. It was sealed with *upper fill* backfill.

List of finds:

Pottery:

Vessel 8: rimsherd 6212 (Fig. 28; Pls. III and IV), [UF], 4 bodysherds 6228–9 [PS], 6226–7 [UF], (+ 4, 16, 19).

Vessel 14: rimsherd 6252 (Fig. 30; Pls. V and VI), [UF], fragment 6254 [UF],(+ 16).

Vessel 32: 2 fragments 6414–15 [UF], (+ 16).

Vessel 33: 3 rimsherds 6417/6418/6419a (Fig. 31; Pls. V and VI), 6419b, 6420 [West Annex], 13 bodysherds 6424, 6426, 6430–1 [UF], 6421–6422 (Fig. 31), 6423, 6425, 6427–9, 6432–3 [West Annex], (+ 16).

Vessel 34: 4 bodysherds 6439–40 [PS], 6441–2 [UF]), fragment 6476 [West Annex], (+ 3, 4, 8).

Vessel 36: 3 false rims 6493–4, 6495/6496 [West Annex], basesherd 6492 (Fig. 31), [UF], 7 bodysherds 6497/6498, 6499–6500 [UF], 6501–4 [West Annex]), fragments 6505 [UF], (+ 4).

Vessel 37: 8 bodysherds 6509, 6516 [PS], 6510–11, 6513–15 [UF], 6512 [West Annex], (+ 1, 19).

Vessel 39: 4 basesherds 6544, 6545/6546 (Fig. 31), 6547/6548, 6549 [East Annex], 6 bodysherds 6552–3 [West Annex], 6550–1, 6554–5 [East Annex].

Vessel 41: basesherd 6583/6584 (Fig. 31), [West Annex], 5 bodysherds 6585, 6588–9 [West Annex], 6586–7 [East Annex].

Flint:

Core: (Type B3) 6670a [PS]

Core rejuvenation flake: 6679 [East Annex].

2 *trimming flakes*: 6692, 6701 [UF].

2 *unutilised blades*: 6722, 6729 [UF].

50 *unutilised flakes*: 6903–4, 6909 [PS], 6750–3, 6756, 6875–6, 6878–6902, 6910–17 [UF], 6754–5, 6905–8 [East Annex], 6877 [West Annex].

4 *utilised flakes*: 7218–21 [East Annex].

10 *end scrapers*: Group 1: 7265 (Fig. 33), 7266 (Fig. 33), [UF], 7267 (Fig. 33), [East Annex]), Group 2: 7274 (Fig. 34), [UF], 7275 (Fig. 33), 7276 (Fig. 34), [East Annex]), Group 4: 7293 (Fig. 34), [PS]), Group 5: 7302 (Fig. 34), 7303–4 (Fig. 35), [UF].

Double–ended scraper: 7321 [East Annex].

Round scraper: 7326 (Fig. 36), [PS].

Side scraper: 7341 (Fig. 35), [UF].

2 *retouched flakes*: 7352 [UF], 7348 [West Annex].

Chip: 7366 [UF].

4 *irregular fragments*: 7389–92 [UF].

2 *unworked quartz*: 7410–11 [UF].

Rock crystal: 7441 [UF].

3 *rounded stones*: 7446 [UF], 7447–8 [East Annex].

4 *unworked miscellaneous stone fragments*: 7452a, 7452b, 7453–4 [UF].

Clay objects:
3 clay object fragments 7459–60 [UF], 7461 [PS].

Unburnt animal bone and burnt bone were found in the area of the post-shaft and the upper fill (see Appendix 4 for details).

Post-Pit 3 measured 1.26m by 83cm at the mouth and 1.29m deep. The post-shaft, positioned towards the western side, was cylindrical in shape, averaged 34cm in diameter and could be observed to a height of 67cm above the base of the pit. The fill within the lower part of the shaft consisted of black charcoal-rich earth, becoming wet and sticky in consistency towards the base. This was overlain by a deposit of boulder clay. This post-pit did not contain *outer fill*. The *upper fill*, 62cm deep, consisted mainly of dark brown earth with a high shale and boulder clay content. There was a vertical length of charcoal, 42cm by 4cm, within this layer. This may have resulted from a charred stake which was driven down through the pit. Below this, and before the pit narrows to form the shaft, was a band of charcoal-rich material.

List of finds:

Pottery:
Vessel 22: bodysherd 6334 [UF], (+ 21, 22).

Vessel 28: bodysherd 6406 [UF].

Vessel 34: 2 bodysherds 6443 [PS], 6444 [UF], (+ 2, 4, 8).

Vessel 38: 3 bodysherds 6532–4 [UF], (+ 20).

Vessel 40: 2 bodysherds 6556–7 [UF], (+ 5, 6, 21, 22, 25, 29/30, 31/32, 33).

Vessel 42: fragment 6635 [UF], (+ 15, 22, 23, 25, 27, 29/30).

Vessel 43: basesherd 6643 [UF], 10 bodysherds 6650–9 [UF], (+ 15, 17, 25, 33).

Vessel 44: 2 basesherds 6660–1 [UF], 3 bodysherds 6662–4 [UF], 2 fragments 6665–6 [UF].

Flint:
3 *trimming flakes*: 6702–4 [UF].

3 *unutilised blades*: 6723, 6730–1 [UF].

53 *unutilised flakes*: 6764 (Pl. X), 6919–21, 6925–6, 6936–40 [PS], 6757–61, 6762 (Pl. X), 6763, 6918, 6922–4, 6927–35, 6941–62 [UF].

Utilised blades: 7211 [PS].

6 *utilised flakes*: 7244–5 [PS], 7222, 7223 (Fig. 33), 7243, 7246 [UF]).

2 *end scrapers*: Group 1: 7268 (Fig. 33; Pl. IX), [PS]), Group 3: 7288 (Fig. 34), [UF].

3 *round scrapers*: 7327–9 (Fig. 36), [UF].

7 *chips*: 7367–9 [PS], 7370–3 [UF].

Unworked chert: 7405 [PS].

16 *unworked quartz*: 7412 [PS], 7413–27 [UF].

Rock crystal: 7442 [UF].

2 unworked miscellaneous stone fragments 7455–6 [UF].

Clay objects:
2 clay object fragments 7462–3 [PS].

Unburnt animal bone and burnt bone were found in the area of the post-shaft and the upper fill (see Appendix 4 for details).

Post-Pit 4 measured 93cm by 77cm at the mouth and 1.23m deep. The post-shaft, which was on the northern side of the pit, was cylindrical in shape, averages 26cm in diameter and could be observed to a height of 68cm above the base of the pit. The fill consisted of black, organic charcoal-rich earth becoming darker in colour, and wet and sticky, towards the base. Fragments of wood found against the northern edge of the post-shaft have been identified by Aonghus Maloney as representing oak. The *outer fill* (not fully excavated) was confined to the southern side of the pit and consisted of compacted shale. It measured 25cm at its widest and reached a height of 73cm from the base of the pit. The *upper fill*, 56cm deep, consisted of moist brown earth with a high charcoal content. An annex measuring 29cm by 27cm by 54cm deep, was cut into the western side of the pit. The lower 43cm of the fill within the annex consisted of dense black charcoal and three small stones, the largest measuring 12cm in length. The upper 9cm consisted of dark brown earth and shale with a high charcoal content.

List of finds:

Pottery:
Vessel 8: bodysherd 6225 [PS], (+ 2, 16, 19).

Vessel 20: 2 bodysherds 6290 [PS], 6291 [West Annex], (+ 5, 6, 7, 8, 11a, 31/32).

Vessel 34: basesherd 6435 [UF], 3 false rims 6436–8 [West Annex], 30 bodysherds 6451–6 [PS], 6447–50 [UF], 6445–6, 6457–74 [West Annex], 12 fragments 6477–8 [PS], 6479–88 [West Annex], (+ 2, 3, 8).

Vessel 36: 2 fragments 6506–7 [UF], (+ 2).

Flint

4 *core rejuvenation flakes*: 6681 [PS], 6680 (Pl. X), 6687–8 [West Annex].

6 *trimming flakes*: 6707 [PS], 6705, 6708–9 [UF], 6693, 6706 [West Annex].

41 *unutilised flakes*: 6976–80 [PS], 6765–7, 6773, 6963–71, 6981, 6991–3 [UF], 6768–72, 6972–75a, 6975b, 6982–90 [West Annex].

2 *utilised flakes*: 7224, 7247 [PS].

11 *end scrapers*: Group 1: 7269 (Fig. 33), [West Annex], Group 2: 7277–8 (Fig. 34), [West Annex], Group 3: 7291 (Fig. 34), [PS], 7290 (Fig. 34), [UF], 7289 (Fig. 34; Pl. IX), [West Annex]), Group 4: 7295 (Fig. 34), [UF], 7294 [West Annex]), Group 5: 7307 (Fig. 35), [PS], 7305–6 (Fig. 35), [West Annex].

Double-ended scraper: 7322 (Fig. 35), [PS].

2 *round scrapers*: 7330–1 (Fig. 36; Pl. IX), [West Annex].

3 *retouched flakes*: 7353 (Fig. 36), 7354 [UF], 7349 [West Annex].

Chip: 7374 [PS].

Irregular fragment: 7393 [UF].

Polished stone axe: 7399 (Fig. 37; Pl. XI), [West Annex] .

Worked stone: 7402 (Fig. 37), [West Annex].

2 *unworked quartz*: 7429 [UF], 7428 [West Annex].

2 *rounded stones*: 7449–50, [West Annex].

Clay objects:

2 clay object fragments 7464 [UF], 7465 [West Annex].

Unburnt animal bone and burnt bone were found in the post-shaft, the upper fill and the west annex (see Appendix 4 for details).

Post-pit 5 measured 92cm by 88cm at the mouth and 94cm deep. The post-shaft was on the western side of the pit, was cylindrical in shape, averaged 38cm in diameter and could be observed to a height of 52cm above the base. Its fill consisted of dark charcoal-rich earth which became sticky and darker in colour, with a higher charcoal content towards the base and packing stones. The fill in the centre of the lower part of the shaft was yellow in colour, sticky in texture and contained charcoal flecks. The *outer fill* (not fully excavated) was confined to the eastern side of the pit and consisted of compacted shale. It measured 27cm at its widest and reached a height of 57cm from the base of the pit. The *upper fill*, 43cm deep, consisted of rich brown earth containing shale, patches of boulder clay, charcoal flecks and packing stones.

List of finds:

Pottery:

Vessel 16: bodysherd 6263 [PS], (+ 22, 25).

Vessel 20: rimsherd 6285 (Fig. 30), [PS], (+ 4, 6, 7, 8, 11a, 31/32).

Vessel 25: bodysherd 6363 [PS], 2 fragments 6372–3 [PS], (+ 8, 9, 14, 17, 18).

Vessel 27: bodysherd 6401 [PS], (+ 1, 8, 22, 27).

Vessel 40: bodysherd 6558 (Fig. 31), [PS], fragment 6582 [PS], (+ 3, 6, 21, 22, 25, 29/30, 31/32, 33).

Flint:

Trimming flake: 6694 [UF].

2 *unutilised blades*: 6732–3 [UF].

39 *unutilised flakes*: 6774, 6775 (Fig. 32), 6776, 7020–4 [PS], 6777–81, 6994–7019 [UF].

Utilised flake: 7248 [UF].

3 *end scrapers*: Group 1: 7270 (Fig. 33), [PS], Group 2: 7280 (Fig. 34), [PS], 7279 (Fig. 34), [UF].

Round scraper: 7332 (Fig. 36), [PS].

Retouched blade: 7347 [UF].

2 *notched flakes*: 7358–9 [UF].

7 *chips*: 7375–7a–e [UF].

Unworked quartz: 7430 [UF].

Clay objects:

3 clay object fragments 7466a–c [PS].

Unburnt animal bones were found in the post-shaft and the upper fill (see Appendix 4 for details).

Post-pit 6 measured 62cm by 63cm at the mouth and 77cm deep. The post-shaft, which was against the western side of the pit, could be observed to a height of 62cm above the base of the pit. It tapered from 33cm at the top to 17cm at the base. The fill was a dark charcoal-rich earth becoming darker and wetter towards the base. The *outer fill* (not fully excavated) was confined to the eastern side of the pit and consisted of compacted shale. It measured 26cm at its widest and reached a height of 62cm from the base of the pit. The *upper fill*, 17cm

deep, consisted of a gritty brown earth containing a mixture of boulder clay, shale and charcoal flecks. Packing stones were found within the upper fill.

List of finds:

Pottery:
Vessel 20: bodysherd 6298 [UF], (+ 4, 5, 7, 8, 11a, 31/32).
Vessel 40: bodysherd 6559 [UF], (+ 3, 5, 21, 22, 25, 29/30, 31/32, 33).

Flint:
6 *unutilised flakes*: 7027–8 [PS], 6782–3, 7025–6 [UF].
6 *utilised flakes*: 7228 (Fig. 33), [PS], 7225–7, 7249–50 [UF].

Clay objects:
A clay object fragment 7467 [UF].

Post-pit 7 measured 79cm by 58cm at the mouth and 89cm deep. The post-shaft, which was on the western side of the pit, could be observed to a height of 65cm above the base of the pit and tapered from 39cm at the top to 12cm at the base. The fill consisted of charcoal-rich black earth which becomes wet and sticky towards the base. The *outer fill* (not fully excavated) was confined to the eastern side of the pit and consisted of compacted shale. It measured 18cm at its widest and reached a height of 70cm from the base of the pit. The *upper fill*, 24cm deep, consisted of brown gritty earth with a mixture of boulder clay, shale and charcoal flecks. A date of 3985+35 BP (GrA–448) 2588–2459 cal BC, was obtained from charred material from the interior surfaces of Grooved Ware sherds from this post-pit.

List of finds:

Pottery:
Vessel 20: basesherd 6288/6289 (Fig. 30; Pls. VII and VIII), [PS], (+ 4, 5, 6, 8, 11a, 31/32).

Flint:
Core rejuvenation flake: 6682 [UF].
Trimming flake: 6695 [UF].
9 *unutilised flakes*: 6784–5, 7029–35 [UF].
End scraper: Group 5: 7308 (Fig. 35), [UF].
Transverse arrowhead: 7346 (Fig. 36), [UF].
Unworked quartz: 7431 [UF].

Post-pit 8 measured 64m by 49cm at the mouth and 87cm deep. The post-shaft which was on the north-eastern side of the pit, tapered from 35cm at the top to 11cm at the base and could be observed to a height

of 58cm above the base of the pit. The fill consisted of a black charcoal-rich earth which was sticky in consistency, especially towards the base of the pipe. The *outer fill* (not fully excavated) was confined to the north-eastern side of the pit and consisted of compacted shale. It measured 6cm at its widest and reached a height of 62cm from the base of the pit. The *upper fill*, 29cm deep, consisted of a gritty brown earth with a mixture of boulder clay, shale and charcoal flecks.

List of finds:

Pottery:

Vessel 7: rimsherd 6207 (Fig. 30), [PS], (+ 1, 19).

Vessel 10: rimsherd 6235 (Fig. 28; Pls. V and VI), [PS].

Vessel 20: bodysherd 6296 [PS], (+ 4, 5, 6, 7, 11a, 31/32).

Vessel 25: basesherd fragment 6362 [PS], 5 bodysherds 6367–8 [PS], 6364–6 [UF], 6 fragments 6375–9 [PS], 6374 [UF], (+ 5, 9, 14, 17, 18).

Vessel 27: 2 bodysherds 6402–3 [UF]), (+ 1, 5, 22, 27).

Vessel 34: bodysherd 6475 [PS], (+ 2, 3, 4).

Flint:

2 *trimming flakes*: 6710–11 [PS].

14 *unutilised flakes*: 7039–7043, 7044 (Fig. 32), 7045, 7046 (Fig. 32), 6788–9 [PS], 6786–7, 7036–7 [UF].

Unutilised flake: 7038 [PS], was recovered from the base of the shaft.

3 *utilised flakes*: 7252 [PS], 7229, 7251 [UF].

End scraper: Group 5: 7309 (Fig. 35), [PS].

3 *chips*: 7380a [PS], 7378–9 [UF].

Irregular fragment: 7394 [PS].

Clay object:

A clay object fragment 7468 [UF].

Fragments of burnt bone were found in the post-shaft.

Post-pit 9 measured 55cm by 47cm at the mouth and 96cm deep. The post-shaft, which was on the eastern side of the pit, could be observed to a height of 62cm above the base of the pit and tapered from 42cm at the top to 14cm at the base. The lower 34cm had a higher charcoal content and is sticky in consistency; the upper 28cm of the post-shaft

consisted of a rich brown earth containing shale and charcoal flecks. Packing stones were found within the post-shaft. The *outer fill* (not fully excavated) was confined to the southern side of the pit and consisted of compacted shale. It measured 12cm at its widest and reached a height of 65cm from the base of the pit. The *upper fill*, 24cm deep, consisted mainly of boulder clay and packing stones.

List of finds:

Pottery:
Vessel 19: bodysherd 6277 (Fig. 30), [UF], (+ 15).
Vessel 25: bodysherd 6369 [PS], (+ 5, 8, 14, 17, 18).

Flint:
Unutilised flake: 7047 [UF].
Utilised blade: 7213 (Fig. 33), [UF].

Clay objects:
A clay object fragment 7469 [UF].

Post-pit 10 measured 66cm by 61cm at the mouth and 94cm deep. The post-shaft was in the centre of the pit, and it tapered from 66cm at the top to 14cm at the base. The lower portion consisted of a charcoal-rich black sticky earth. The upper 60cm consisted of brown gritty earth with a mixture of boulder clay, shale, charcoal flecks and packing stones. *Outer fill* was not detected.

List of finds:

Flint:
End scraper: Group 2: 7281 (Fig. 34), [UF].

Post-pits 11 and **11a** were found side by side, just 8cm separating the two.

Post-pit 11 measured 48cm by 63cm at the mouth and 96cm deep. The post appears to have been centrally placed and measured 6cm at the base. The fill consisted of boulder clay, brown earth and packing stones. *Outer fill* was not detected.

No Finds

Post-pit 11a measured 63cm by 61cm at the mouth and 65cm in depth. The post appears to have been centrally placed and measured 10cm at the base. The fill consisted of a gritty brown earth with a high boulder clay content, shale and charcoal flecks. Only a few small stones were found within the pit. *Outer fill* was not detected.

List of finds:

Pottery:
Vessel 20: bodysherd 6297 [UF], (+ 4, 5, 6, 7, 8, 31/32).

Flint:
5 *unutilised flakes*: 6790–1, 7048–50 [UF].
End scraper: Group 4: 7296 [UF].
Side-and-end scraper: 7316 (Fig. 35; Pl. IX), [UF].
Round scraper: 7333 (Fig. 36), [UF].
2 *notched flakes*: 7360 (Fig. 36), 7364 [UF].

Post-pit 12 measured 65cm by 56cm at the mouth and 92cm deep. The post-shaft which was on the north-eastern side of the pit could be discerned to a height of 60cm above the base of the pit and tapered from 32cm at the top to 15cm at the base. The lower 25cm of the fill consisted of yellow sticky clay, while the upper 40cm of the post-shaft consisted of a dark charcoal-rich earth. The *outer fill* (not excavated) was confined to the south-western side of the pit and consisted of compacted shale. It measured 21cm at its widest and reached a height of 71cm from the base of the pit. The *upper fill*, 27cm deep, consisted of a gritty brown earth mixed with boulder clay, shale, charcoal flecks and packing stones.

List of finds:

Pottery:
Vessel 3: bodysherd 6191 [PS], (+ 15).
Vessel 23: bodysherd 6348 [PS], (+ 1, 13, 19).

Flint:
Utilised flake: 7253 [PS].
2 *end scrapers*: Group 1: 7271 (Fig. 33), [UF], Group 5: 7310 [UF].

Clay objects:
2 clay object fragments 7471 [PS], 7470, [UF].

Burnt animal bone fragments were found in the post-shaft (see Appendix 4 for details).

Post-pit 13 measured 65cm by 55cm at the mouth and 97cm deep. The post-shaft was in the centre of the pit; it was cylindrical in shape, averages 16cm in diameter and could be observed to a height of 66cm above the base of the pit. The lower 16cm of the fill consisted of yellow sticky boulder clay with charcoal inclusions, while the upper 50cm of the post–shaft consisted of a charcoal-rich black earth, sticky in consistency. The *outer fill* (fully excavated) encircled the post-shaft and

consisted of compacted shale with the odd patch of boulder clay. It measured 21cm at its widest and reached a height of 66cm from the base of the pit. The *upper fill*, 31cm deep, consisted of brown earth with a mixture of boulder clay, shale, charcoal flecks and packing stones.

List of finds:

Pottery:
Vessel 23: rimsherd 6339 (Fig. 31), [UF], 4 basesherds 6340/6341, 6342, 6343/6344, 6345 [PS], base-angle sherd 6346 (Fig. 31), [PS], bodysherd 6347 [UF], (+ 1, 12, 19).

Flint:
3 *unutilised flakes*: 6792, 7051–2 [UF].

Irregular fragment: 7395 [UF].

Post-pit 14 measured 58cm by 50cm at the mouth and 89cm deep. The post-shaft, which was on the northern side of the pit, was cylindrical in shape, averages 26cm in diameter and could be observed to a height of 58cm above the base of the pit. The fill consisted of black charcoal-rich sticky earth and packing stones. The *outer fill* (not fully excavated) was confined to the south-western side of the pit and consisted of compacted shale. It measured 11cm at its widest and reached a height of 62cm from the base of the pit. The *upper fill*, 31cm deep, consisted of gritty brown earth containing boulder clay, shale, charcoal flecks and packing stones.

List of finds:

Pottery:
Vessel 1: 2 rimsherds 6153/6154, 6155 (Fig. 28; Pls. III and IV), [PS], 2 base-angle sherds 6156 (Fig. 28), 6157 [PS], 11 bodysherds 6158–68 [PS].

Vessel 4: rimsherd 6192 (Fig. 29), [PS], 3 basesherds 6193–5 (Fig. 29), [PS] 2 bodysherds 6196–7 [PS].

Vessel 5: rimsherd 6198 (Fig. 29; Pls. III and IV), [PS], 2 bodysherds 6199/6200 (Fig. 29), 6201, [PS].

Vessel 25: bodysherd 6370 [PS], (+ 5, 8, 9, 17, 18).

Vessel 75: rimsherd 3727 (Fig. 48), [UF] (this sherd was previously published see p. 213).

Flint:
13 *unutilised flakes*: 6793 (Fig. 32; Pl. X), 6794, 7053–63 [UF].

2 *utilised flakes*: 7230 (Fig. 33), 7254 [UF].

Worked stone: 7403 (Fig. 37), [UF].

Post-pit 15 measured 62cm by 53cm at the mouth and 97cm deep. The post-shaft, was on the eastern side of the pit; it tapered from 34cm at the mouth to 15cm at the base and could be observed to a height of 70cm above the base. The fill consisted of charcoal-rich, black sticky earth and packing stones. The *outer fill* (not fully excavated) virtually encircled the post-shaft and consisted of compacted shale. It measured 12cm at its widest and reached a height of 71cm from the base of the pit. The *upper fill*, 27cm deep, consisted of a rich brown earth which contained patches of boulder clay, shale, charcoal flecks and small stones.

List of finds:

Pottery:

Vessel 3: 2 rimsherds 6176/6177 (Fig. 29; Pls. III and IV), 6178 (Fig. 29; Pls. III and IV), [PS], lower body and base-angle 6179 (Fig. 29), [PS], 11 bodysherds 6180/6181 (Fig. 29), 6182–3, 6184/6185, 6186–8 [PS], 6189–90 [UF], (+ 12).

Vessel 11: 2 basesherds 6237 (Fig. 29), 6238 [PS], (+ 17, 25).

Vessel 13: bodysherd 6242 [UF], (+ 19).

Vessel 19: 7 bodysherds 6278–84 [PS], (+ 9).

Vessel 26: rimsherd 6381 (Fig. 31), [PS], 8 bodysherds 6382/6383, 6384–90 [PS], (+ 16, 18).

Vessel 42: basesherd 6592 (Fig. 31), [PS], (+ 3, 22, 23, 25, 27, 29/30).

Vessel 43: 3 basesherds 6644–6 (Fig. 31), [PS], bodysherd 6649 [UF], (+ 3, 17, 25, 33).

Flint:

3 *unutilised flakes*: 6795, 6796 (Fig. 32), 7064 [UF].

Utilised flake: 7255 [PS].

End scraper: Group 2: 7282 (Fig. 34), [UF].

2 *Side-and-end scrapers*: 7318 [PS], 7317 (Fig. 35; Pl. IX), [UF].

Chip: 7380b [PS].

Unburnt animal bones were found in the post-shaft and the upper fill (see Appendix 4 for details).

Post-pit 16 measured 64cm by 65cm at the mouth and 1.01m deep. The post-shaft, which was on the eastern side of the pit, was cylindrical in shape, averaged 38cm in diameter and could be observed to a height of 67cm above the base of the pit. Its fill consisted of black organic charcoal-rich earth, which became very sticky and darker in

colour towards the base. The *outer fill* was confined to the western side of the pit and consisted of compacted shale. It measured 18cm at its widest and reached a height of 69cm from the base of the pit. The *upper fill*, 34cm deep, consisted of a mixture of boulder clay and shale with some charcoal flecks. A date of 4130+35 BP (GrA–445) 2882–2585 cal BC, was obtained from the charred material from the interior of Grooved Ware sherds from this post-pit.

List of finds:

Pottery:

Vessel 8: 12 basesherds 6213, 6214 (Fig. 28; Pls. VII and VIII), 6215–16, 6217–24 [PS], fragment 6231 [PS], (+ 2, 4, 19).

Vessel 14: rimsherd 6251 [PS], bodysherd 6253 [PS], (+ 2).

Vessel 15: rimsherd 6255 (Fig. 30), [PS].

Vessel 26: 6 bodysherds 6391–5 [PS], 6396/6397 [UF], (+ 15, 18).

Vessel 32: bodysherd 6413 [PS] fragment 6416 [UF], (+ 2).

Vessel 33: bodysherd 6434 [PS], (+ 2).

Vessel 35: 3 bodysherds 6489–91 [PS].

Flint:

3 *cores*: (Type B1) 6671 [PS], (Type B2) 6670b (Fig. 32), 6672 (Fig. 32; Pl. X), [UF].

2 *trimming flakes*: 6713 [PS], 6712 [UF].

Unutilised blade: 6734 [PS].

18 *unutilised flakes*: 6798–6800, 7071–7 [PS], 6797, 7065–8a, b, 7069–70 [UF].

2 *end scrapers*: Group 2: 7283 (Fig. 34), [PS], Group 4: 7299 [PS].

Unworked chert: 7406 [UF].

Post-pit 17 measured 63cm by 59cm at the mouth and 83cm deep. The post-shaft was on the southern side of the pit; it tapered from 31cm at the top to 9cm at the base and could be observed to a height of 49cm above the base of the pit. The fill consisted of a charcoal-rich black earth, sticky in consistency, especially towards the base. The *outer fill* (not fully excavated) consisted of compacted shale which almost encircled the post-shaft. It measured 22cm at its widest and reached a height of 60cm from the base of the pit. The *upper fill*, 34cm deep, consisted of brown earth, with boulder clay, shale and charcoal inclusions, similar to the other pits described, except that it was wetter in consistency. Packing stones were found within the *upper fill*.

List of finds:

Pottery:

Vessel 2: rimsherd 6169 (Fig. 28; Pls. III and IV), [UF], 2 basesherds 6170 (Fig. 28; Pls. VII and VIII), 6171 [PS], 4 bodysherds 6172–3 [PS], 6175 [UF], (false rim), 6174 [UF].

Vessel 6: 2 rimsherds 6202 (Fig. 29), [PS], [UF], basesherd 6204 [PS], 2 bodysherds 6206 [PS], 6205 [UF].

Vessel 11: rimsherd 6236 (Fig. 29; Pls. V and VI), [UF], bodysherd 6239 [PS], (+ 15, 25).

Vessel 21: 18 bodysherds 6299–6306, 6308, 6311–12, 6316 [PS], 6307, 6309–10, 6313–15 [UF].

Vessel 25: bodysherd 6371 [PS], (+ 5, 8, 9, 14, 18).

Vessel 43: rimsherd 6642 (Fig. 31; Pls. V and VI), [UF], (+ 3, 15, 25, 33).

Flint:

Unutilised blade: 6735 [UF].

13 *unutilised flakes*: 6801–4, 6805 (Fig. 32), 7078–85 [UF].

2 *utilised flakes*: 7231 [PS], 7256 [UF].

Irregular fragment: 7396 [PS].

Unworked chert: 7407 [UF].

Unworked quartz: 7432 [UF].

Post-pit 18 measured 75cm by 69cm at the mouth and 1.08m deep. The post-shaft, which was on the south-eastern side of the pit, was cylindrical in shape. It averages 20cm in diameter and could be observed to a height of 64cm above the base of the pit. Its fill consisted of a black charcoal-rich earth, sticky in consistency, especially towards the base. The *outer fill* (not fully excavated) consisted of compacted shale with the odd boulder clay inclusion and was confined to the northern side of the pit. It measured 25cm at its widest and reached a height of 63cm from the base of the pit. The *upper fill*, 44cm deep, consisted almost exclusively of shale with an occasional patch of boulder clay.

List of finds:

Pottery:

Vessel 25: fragment 6380 [PS], (+ 5, 8, 9, 14, 17).

Vessel 26: bodysherd 6398 [PS], (+ 15, 16).

A single sherd of Earlier 'Western' Neolithic pottery, 6667, was also found within this post-pit, which had presumably been incorporated

when back-filling was taking place. It could have been derived from the earlier settlement in this area, Zone B (p. 20).

Flint:
2 *unutilised flakes*: 7087 [PS], 7086 [UF].

Rock crystal: 7443 [PS].

Quartzite pebble: 7444 [UF].

Post-pit 19 measured 70cm by 52cm at the mouth and 85cm deep. The post-shaft, which was on the eastern side was cylindrical in shape. It averages 34cm in diameter and could be discerned to a height of 48cm above the base of the pit. Its fill consisted of dark charcoal-rich earth becoming sticky and moist towards the base. The *outer fill* (not fully excavated) was confined to the northern side of the pit and consisted of compacted shale. It measured 23cm at its widest and reached a height of 51cm from the base of the pit. The *upper fill*, 37cm deep, consisted of boulder clay, brown earth and packing stones.

List of finds:

Pottery:
Vessel 7: bodysherd 6209 [UF], 2 fragments 6210–11 [UF], (+ 1, 8).

Vessel 8: bodysherd 6230 [UF], (+ 2, 4, 16).

Vessel 13: 5 bodysherds 6243, 6244 (Fig. 30), 6245–7, 3 fragments 6248–50 [UF], (+ 15).

Vessel 23: bodysherd 6349 [UF], (+ 1, 12, 13).

Vessel 24: bodysherd 6361 [UF], (+ 22).

Vessel 37: 2 bodysherds 6517–18 [UF], (+ 1, 2).

Flint:
9 *unutilised flakes*: 7094 [PS], 6806–7, 7088–93 [UF].

2 *end scrapers*: Group 4: 7297 (Fig. 34), [UF], Group 5: 7311 (Fig. 35), [UF].

Round scraper: 7336 (Fig. 36), [UF].

2 *unworked quartz pieces*: 7433–4 [UF].

Clay objects:
A clay object fragment 7472 [UF].

One unburnt cattle bone was found in the upper fill (see Appendix 4 for details).

Post-pit 20 measured 77cm by 71cm at the mouth and 66cm deep. The post-shaft occurs on the southern side of the pit; it tapered from 24cm at the top to 14cm at the base and could be observed to a height of 33cm above the base of the pit. Its fill consisted of black charcoal-rich moist earth. The *outer fill* (not fully excavated) was mainly confined to the northern side of the pit and consists of compacted shale. It measured 27cm at its widest and reached a height of 34cm from the base of the pit. The *upper fill*, 33cm deep, consisted of gritty brown earth with a mixture of boulder clay, shale and charcoal flecks.

List of finds:

Pottery:
Vessel 38: 4 basesherds 6519, 6520 (Fig. 31), 6521–22, 10 bodysherds 6523–31, 6535, 8 fragments 6536–43 [UF], (+ 3).

Flint:
2 *core rejuvenation flakes*: 6683, 6689 [UF].

7 *unutilised flakes*: 6808–10, 7095–8 [UF].

3 *utilised flakes*: 7232–3, 7257 [UF].

Round scraper: 7334 (Fig. 36; Pl. IX), [UF].

Unworked miscellaneous stone fragment 7457 [UF].

Clay objects:
A clay object fragment 7473 [UF].

Post-pit 21 measured 68cm by 59cm at the mouth and 73cm deep. The post-shaft was on the southern side of the pit; it tapered from 26cm at the mouth to 12cm at the base and could be observed to a height of 43cm above the base of the pit. Its fill consisted of black charcoal-rich sticky earth and some packing stones. The *outer fill* (partially excavated) was mainly confined to the northern side of the pit and consisted of compacted shale. It measured 32cm at its widest and reached a height of 43cm from the base of the pit. The *upper fill*, 30cm deep, consisted of brown earth with a boulder clay and shale mixture and packing stones.

List of finds:

Pottery:
Vessel 22: 4 bodysherds 6319–22 [PS], (+ 3, 22).

Vessel 40: bodysherd 6560 [PS], (+ 3, 5, 6, 22, 25, 29/30, 31/32, 33).

Flint:
Flint pebble: 6668 [UF].

Core rejuvenation flake: 6684 [UF].

6 *unutilised flakes*: 6811, 7099–7103 [UF].

Side-and-end scraper: 7319 (Fig. 35), [UF].

Side scraper: 7342 (Fig. 35), [UF].

Miscellaneous scraper: 7343 (Fig. 36), [UF].

Retouched flake: 7355 (Fig. 36), [UF].

Post-pit 22 measured 73cm by 63cm at the mouth and 1.04m deep. The post-shaft, which was on the southern side of the pit, tapered from 23cm at the top to 8cm at the base and could be observed to a height of 55cm above the base of the pit. Its fill consisted of black charcoal-rich sticky earth becoming very wet and sticky towards the base and included packing stones. The *outer fill* (not fully excavated) was confined to the northern side of the pit and consisted of compacted shale with boulder clay inclusions. It measured 15cm at its widest and reached a height of 53cm from the base of the pit. The *upper fill*, 49cm deep, consisted of gritty brown earth mixed with boulder clay, shale and charcoal flecks.

List of finds:

Pottery:
Vessel 16: 2 bodysherds 6262, 6264 (Fig. 30), [UF], (+ 5, 25).

Vessel 22: 2 rimsherds 6317–18 (Fig. 30; Pls. V and VI), [UF], 11 bodysherds 6323–33 [UF], 4 fragments 6335–8 [UF], (+ 3, 21).

Vessel 24: 4 bodysherds 6357–60 [UF], (+ 19).

Vessel 27: rimsherd 6399 [UF], (+ 1, 5, 8, 27).

Vessel 40: bodysherd 6561 [UF], (+ 3, 5, 6, 21, 25, 29/30, 31/32, 33).

Vessel 42: 28 bodysherds 6603–4, 6605 (Fig. 31), 6606-7, 6609, 6612, 6613 (Fig. 31), 6614, 6615a–b, 6616–20, 6627–9 [PS], 6608, 6610–11, 6621–6 [UF], 5 fragments, 6636–40 [UF], (+ 15, 23, 25, 27, 29/30).

Flint:
Core rejuvenation flake: 6685 [UF].

5 *trimming flakes*: 6696–7, 6714–16 [UF].

Unutilised blade: 6736 [UF].

13 *unutilised flakes*: 7111 [PS], 6812 (Fig. 32), 6813–16, 7104–10 [UF].

2 *utilised flakes*: 7234 (Fig. 33), 7258 [UF].

End scraper: Group 1: 7272 (Fig. 33), [UF].

Unburnt animal bones were found in the post-shaft and upper fill (see Appendix 4 for details).

Post-pit 23 measured 74cm by 64cm at the mouth and 1.14m deep. The post-shaft was on the south-western side of the pit; it tapered from 31cm at the top to 15cm at the base and could be observed to a height of 62cm above the base of the pit. The fill consisted of black charcoal-rich earth becoming wet and sticky towards the base. The *outer fill* (fully excavated), consisting of compacted shale, was confined to the north-eastern side of the pit. It measured 27cm at its widest and reached a height of 65cm from the base of the pit. The *upper fill*, 52cm deep, consisted of gritty brown earth, boulder clay, shale, charcoal flecks and packing stones.

List of finds:

Pottery:
Vessel 18: basesherd 6273/6274 (Fig. 30), [PS], 2 bodysherds 6275–6 [PS].

Vessel 42: 2 bodysherds 6630–1 [PS], (+ 3, 15, 22, 25, 27, 29/30).

Flint:
Core: (Type B2) 6673 (Fig. 32), [UF].

5 *unutilised flakes*: 7114 [PS], 6817–18, 7112–13 [UF].

Round scraper: 7335 (Fig. 36; Pl. IX), [UF].

Post-pit 24 measured 77cm by 71cm at the mouth and 1.10m deep. The post-shaft, which was on the western side of the pit, was cylindrical in shape. It averages 26cm in diameter and could be observed to a height of 91cm above the base of the pit. The fill consisted of black charcoal-rich sticky earth and packing stones. The *outer fill* (fully excavated) was confined to the east side of the pit and consisted of compacted shale. It measured 24cm at its widest and 88cm in height. The *upper fill*, 19cm deep, consisted of gritty dark brown earth with shale and charcoal inclusions.

List of finds:

Pottery:
Vessel 30: bodysherd 6411 [UF], (+ 26).

Flint:
Trimming flake: 6698 [PS].

8 *unutilised flakes*: 6819–20, 7118–19 [PS], 6821, 7115–17 [UF].

Chip: 7381 [UF].

2 *unworked chert pieces*: 7408–9 [UF].

Post-pit 25 measured 1.16m by 1.12m at the mouth and 1.14m deep. The post-shaft, which was on the western side of the pit, could be discerned to a height of 73cm above the base. It tapered from 56cm at the top down to 17cm at the base. Its fill consisted of dark brown to black organic earth, very rich in charcoal and sticky in consistency; the charcoal increased in density towards the base. Packing stones were also found. The *outer fill* (not fully excavated) encircled the post-shaft and consisted of compacted shale. It measured 29cm at its widest and reached a height of 83cm from the base of the pit. The *upper fill*, 37cm deep, consisted of a mixture of brown earth, boulder clay, shale, charcoal flecks and packing stones.

List of finds:

Pottery:
Vessel 11: bodysherd 6240 [PS], (+ 15, 17).

Vessel 16: basesherd 6256 (Fig. 30), [UF], 3 bodysherds 6257/6258 (Fig. 30), 6259, 6260/6261 [UF], (+ 5, 22).

Vessel 29: bodysherd 6407 [PS], (+ 28, 31/32).

Vessel 40: 11 bodysherds 6564, 6566, 6568, 6569, 6572 [PS], 6562–3, 6565, 6567, 6570–1 [UF], (+ 3, 5, 6, 21, 22, 29/30, 31/32).

Vessel 42: basesherd 6591 [UF], 8 bodysherds 6594–9 [PS], 6593, 6600, fragment 6641 [UF], (+ 3, 15, 22, 23, 27, 29/30).

Vessel 43: basesherd 6647 [PS], (+ 3, 15, 17, 33).

Flint:
Flint pebble: 6669 [PS].

Core rejuvenation flake: 6690 (Fig. 32), [UF].

Trimming flake: 6699 [UF].

3 *unutilised blades*: 6724 (Fig. 32), 6737–8 [PS].

32 *unutilised flakes*: 6826–28, 6829 (Fig. 32), 6830, 7132–4, 7135 (Fig. 33), 7136-42 [PS], 6822 (Fig. 32), 6823–5, 7120–31 [UF].

4 *utilised flakes*: 7236 (Fig. 33), 7260 (Fig. 33), [PS], 7235, 7259 (Fig. 33), [UF].

3 *end scrapers*: Group 2: 7284 (Fig. 34), [PS], Group 3: 7292 (Fig. 34; Pl. IX), [PS]), Group 4: 7298 (Fig. 34), [UF]

Round scraper: 7337 (Fig. 36), [UF].

Miscellaneous scraper: 7344 [PS].

Retouched flake: 7356 [PS].

Notched flake: 7361 (Fig. 36), [UF]).

Chip: 7382 [PS].

Polished stone axe fragment: 7400 [PS].

Unworked quartz: 7435 [UF].

Clay objects:
2 clay object fragments 7474–5 [PS] (Pl. XII).

Unburnt animal bones were found in the post-shaft and upper fill (see Appendix 4 for details).

Post-pit 26 measured 69cm by 62cm at the mouth and 67cm deep. The post-shaft, which occurs on the southern side of the pit, was cylindrical in shape. It averages 22cm in diameter and could be observed to a height of 33cm above the base of the pit. The fill consisted of black charcoal-rich, sticky earth becoming wet and sticky towards the base. The *outer fill* (fully excavated) consisted of compacted shale, and was confined to the northern side of the pit. It measured 23cm at its widest and reached a height of 35cm from the base of the pit. The *upper fill*, 34cm deep, consisted of brown earth with boulder clay, shale and charcoal flecks.

List of finds:

Pottery:
Vessel 30: bodysherd 6410 [UF], (+ 24).

Flint:
Core: (Type A2) 6674 [UF].

Trimming flake: 6717 [UF].

2 *unutilised flakes*: 7143–4 [UF].

Utilised flake: 7237 [UF].

Chip: 7383 [PS].

Clay objects:
A clay object fragment 7476 [UF].

Unburnt animal bones representing pig were found in the upper fill (see Appendix 4 for details).

Post-pit 27 measured 86cm by 65cm at the mouth and 82cm deep. The post-shaft was on the southern side of the pit and was cylindrical in shape. It averaged 25cm in diameter and could be observed to a height of 50cm above the base of the pit. The fill consisted of black, charcoal-rich, sticky earth becoming very wet towards the base. The *outer fill* (fully excavated) was confined to the north-eastern side of the pit and consisted of compacted shale. It measured 39cm at its widest and reached a height of 42cm from the base of the pit. The *upper fill*, 32cm deep, consisted of a boulder clay and shale mix with charcoal inclusions.

List of finds:

Pottery:

Vessel 9: rimsherd 6232 (Fig. 28; Pls. V and VI), [UF], bodysherd 6233 [UF], (+ 29/30).

Vessel 12: rimsherd 6241 (Fig. 29; Pls. V and VI), [UF].

Vessel 17: 2 bodysherds 6266–7 [UF], 4 fragments 6269–72 [UF], (+ 1, 29/30).

Vessel 27: 2 bodysherds 6400 (Fig. 31), 6404 [UF], (+ 1, 5, 8, 22).

Vessel 42: rimsherd 6590 (Fig. 31), [UF], 3 bodysherds 6632–4 [UF], (+ 3, 15, 22, 23, 25, 29/30).

Flint:

Core: (Type A2) 6675 (Fig. 32), [UF].

2 *core rejuvenation flakes*: 6686, 6691 [UF].

Trimming flake: 6718 (Fig. 36), [UF].

Unutilised blade: 6725 (Fig. 32), [UF].

23 *unutilised flakes*: 6831 (Fig. 33), 7145–66 [UF].

Utilised flake: 7261 [UF].

End scraper: Group 2: 7285 (Fig. 34), [UF].

Notched flake: 7365 [UF].

3 *chips*: 7384–6 [UF].

Fragment of a polished stone axe: 7401 [UF].

Clay objects (Pl. XII):

2 clay object fragments and a small chip 7477, 7478 (Fig. 37), 7479 [UF].

Animal bones representing cattle were found in the upper fill (see Appendix 4 for details).

Post-pit 28 measured 64cm by 58cm at the mouth and 72cm deep. The post-shaft, which was on the western side of the pit, was cylindrical in shape. It averages 30cm in diameter and could be observed 50cm above the base of the pit. Its fill consisted of rich organic black, charcoal-rich earth, which becomes wet and sticky towards the base. The *outer fill* (fully excavated) was confined to the east side of the pit and consisted of compacted shale. It measured 19cm at its widest and reached a height of 51cm above the base of the pit. The *upper fill*, 22cm deep, consisted of brown earth, boulder clay and shale.

List of finds:

Pottery:
Vessel 29: bodysherd 6408 [PS], (+ 25, 31/32).

Vessel 31: bodysherd 6412 [PS].

Flint:
6 *unutilised flakes*: 6832 (Fig. 33; Pl. X), 6833–4, 7168–9 [PS], 7167 [UF].

End scraper: Group 5: 7312 (Fig. 35), [PS].

Round scraper: 7338 (Fig. 36), [PS].

Notched flake: 7362 (Fig. 36), [UF].

Post-pit 29/30 contained two post-shafts within a large pit. The pit is 1.32m by 85cm at the mouth and 1.24m deep. The post-shafts, which were on the northern and southern sides of the pit, were cylindrical in shape and averaged 40cm in diameter; both could be observed to a height of 57cm from the base of the pit. The fill from both shafts consisted of charcoal-rich black earth, wet and sticky in consistency, especially towards the base. Packing stones were also found within both post-shafts. The *outer fill* (not fully excavated) was confined to the north-eastern side of the pit and consisted of densely compacted shale which completely encircled the northern post-shaft. It reached a height of 1.02m from the base of the pit. The *upper fill*, 67cm deep, consisted of redeposited boulder clay which contained the odd fleck of charcoal and patches of red ash. Below this, a depth of rich brown earth with a mixture of boulder clay, shale and charcoal flecks was found.

List of finds:

Pottery:
Vessel 9: bodysherd 6234 [UF], (+ 27).

Vessel 17: basesherd 6265 (Fig. 30), [UF], (+ 1, 27).

Vessel 40: 7 bodysherds 6573–6, 6577a–b, 6578 [UF], (+ 3, 5, 6, 21, 22, 25, 31/32, 33).

Vessel 42: bodysherds 6602 [northern PS], 6601 [UF], (+ 3, 15, 22, 23, 25, 27).

Flint:
Trimming flake: 6719 [UF].

2 *unutilised blades*: 6727 [southern PS], 6726, [UF].

31 *unutilised flakes*: 6835–7, 7188–9 [northern PS], 7187, 7190–2 [southern PS], 6838a, b, 7170–86, 7193–5 [UF].

4 *utilised flakes*: 7238, 7239 (Fig. 33), 7262 [PS], 7240 [southern PS].

Miscellaneous scraper: 7345 [UF].

2 *retouched flakes*: 7357 [southern PS], 7350 (Fig. 36), [UF].

Worked stone: 7404 (Fig. 37), [southern PS].

3 *unworked quartz*: 7436–8 [UF].

Clay objects:
4 clay object fragments 7480 [UF], 7481–3 [southern PS].

Unburnt animal bones were found in the north post-shaft and the upper fill (see Appendix 4 for details).

Post-pit 31/32 contained two post-shafts within a large pit. The pit measured 1.29m by 1.02m at the mouth and 1.25m deep. The post-shaft on the northern side of the pit was cylindrical in shape, measured 53cm in diameter and could be observed to a height of 18cm above the base. The post-shaft on the southern side was less distinct and could be observed to a height of 41cm above the base of the pit. The fill from both post-shafts consisted of dark organic, charcoal-rich earth which became very wet and sticky towards the base. The *outer fill* (not fully excavated), consisting of compacted shale, was confined to the eastern side. It measured 26cm at its widest and reached a height of 94cm from the base of the pit. The *upper fill*, 83cm deep, consisted of brown gritty earth with a boulder clay and shale content with some charcoal flecks. This layer also contained patches of red ash. The fill of the lower portion of the pit consisted of darker earth with a higher charcoal content, which was wet and sticky towards the base. The northern post-shaft contained a similar type of fill except that it had a higher charcoal content and was wet and sticky in consistency towards the base. A large quantity of packing stones was found within the upper fill.

List of finds:

Pottery:
Vessel 20: rimsherd 6286/6287 (Fig. 30; Pls. III and IV), [UF], 3 bodysherds 6292/6293 (Fig. 30), 6294–5 [UF], (+ 4, 5, 6, 7, 8, 11a).

Vessel 29: bodysherd 6409 [UF], (+ 25, 28).

Vessel 40: 2 bodysherds 6579–80 [UF], (+ 3, 5, 6, 21, 22, 25, 29/30, 33).

Flint:
Trimming flake: 6720 [UF].

Unutilised blade: 6739 [UF].

15 *unutilised flakes*: 6839–44, 7196–7204 [UF].

Utilised blade: 7214 [UF].

2 *utilised flakes*: 7241–2 [UF].

2 *end scrapers*: Group 5: 7313–14 (Fig. 35), [UF].

Side-and-end scraper: 7320 (Fig. 35), [UF].

Unworked quartz: 7439 [UF].

Clay objects:
A clay object fragment 7484 [UF].

Unburnt animal bones were found in the upper fill (see Appendix 4 for details).

Pit 33 measured 54cm by 44cm at the mouth and 78cm deep. The upper 22cm of the fill consisted of redeposited boulder clay with a concentration of charcoal within it. The lower portion of the pit consisted of a mixture of brown earth, boulder clay and shale; very few charcoal flecks were noted. Only a few stones averaging 8cm in length were found, mainly towards the surface of the pit.

List of finds:

Pottery:
Vessel 40: bodysherd 6581 [UF], (+ 3, 5, 6, 21, 22, 25, 29/30, 31/32).

Vessel 43: basesherd 6648 [UF], (+ 3, 15, 17, 25).

Flint:
Trimming flake: 6700 [UF].

4 *unutilised flakes*: 6845a-b, 7205–6 [UF].

2 *end scrapers*: Group 2: 7286–7 (Fig. 34), [UF].

Chip: 7387 [UF].

Unworked quartz: 7440 [UF].

Clay object:
3 clay object fragments 7485–6 [UF], 7487 (Fig. 37; Pl. XII), [PS].

Pit 34 measured 63cm by 58cm at the mouth and 46cm deep. The upper 12cm of the fill consisted of redeposited boulder clay; the lower portion is similar to pit 30, consisting of boulder clay and shale. Five stones averaging 10cm in length were found, mainly towards the surface of the pit.

List of finds:

Flint:
Core: (Type A1) 6676 (Pl. X), [UF], which conjoins with 7394 from the base of post-pit 8.

3 *unutilised flakes*: 6846, 7207–8 [UF].

2 *irregular fragments*: 7397 (Pl. X), 7398 [UF].

Pit 35 measured 40cm by 31cm at the mouth and 62cm deep. The fill consisted of a mixture of boulder clay and shale with some charcoal flecks. Seven packing stones were found within the pit, one example measured 27cm by 23cm, while the rest were mostly fist-size.

List of finds:

Flint:
3 *unutilised flakes*: 6847, 7209–10 [UF].

Notched flake: 7363 [UF].

Burnt bone was found in the upper fill (see Appendix 4 for details).

Finds: detailed description and catalogue

Introduction: **Pottery**
A total of 500 sherds of pottery, 33 rimsherds, 53 basesherds and 414 bodysherds representing a minimum of 45 vessels, was found within the post-pits. All of these except nos. 10, 11, 34 and 35 produced pottery, which was found in both post-shafts and *upper fill*.

In general, the fabric can be divided into two groups, fine thin-walled vessels, and coarser pottery derived from vessels with thicker walls. The assemblage consists exclusively of Grooved Ware. Sherds

are generally small and no complete vessels were found. There was adequate evidence to affirm that the vessels were flat-based with barrel-shaped or straight-sided bodies. The rim forms are similar, all being simple, unexpanded with rounded or flattened tops, the exception being vessel 33 which has an internal lip. The vessels were coil-built; rimsherd no. 6169 from vessel 2 has been broken along a building ring join. Vessels 33, 36 and 42 also have evidence for coil-breaks, and false rims were found in vessels 2, 33, 34 and 36. Grits incorporated into the fabric include olivine-dolerite, sandstone and quartz (Appendix 1).

The *fine Grooved Ware* represented by vessels 1–32 ranges in thickness between 4.3mm and 5.6mm, with the average vessel measuring 16cm in diameter across the mouth, 15cm across the base and 13cm high. The fabric is hard and compact. The exterior surfaces were smoothed, probably by hand, while the vessel was still wet, with few or no grits protruding through the surface. Vessels 1 and 4 were burnished to a high sheen. This variety has already been referred to as "Knowth Ware" (Eogan and Roche 1994, 326), but it is now considered that the term **"Knowth Style"** is more appropriate as "Ware" is already in use as a generic term for this class of pottery as a whole.

Decoration is limited and, when it occurs, it is in the form of grooved horizontal lines and twisted cord impressions, confined mainly to the area just below the rim on the internal surface. Vessel 1, the most highly decorated vessel in the assemblage, is one of the few examples where grooves are found on the exterior surface. In this case, three grooved lines and an applied pellet decorate the outer surface and two horizontal grooves are present on the interior surface below the rim. Vessels 6, 9, 10, 12, 14, 19, 20, 23, 26 and 27 are decorated with a single horizontal groove on the interior surface below the rim; the depth and width of the groove varies. Vessels 4, 5, 7 and 8 are decorated with two grooved lines and vessel 11 has three grooves, both on the interior surface. On vessel 3, just below the rim, there is a single line of twisted cord impression on the inner surface. Two lines of twisted cord occur in the same position on vessel 2. There are three examples where decoration occurs on the base of a vessel. The interior circumference of the base of vessel 2 is decorated with a twisted cord impression and the circumference of the exterior surface of the base of vessel 8 is decorated with twisted cord impressions. The exterior surface of the base of vessel 18 is decorated with an irregular, shallow grooved line. There are two examples of undecorated rims, vessels 22 and 24, although shallow circular depressions are present on the exterior surface below the rim of vessel 22 and may be a form of decoration. A perforation was present just below the rim of vessel 3.

The *coarse Grooved Ware* is represented by vessels 33–44; their walls are 6.6mm–16.5mm thick. There were not sufficient sherds to reconstruct a complete vessel and it is only possible to suggest an estimated rim diameter of 28cm for one vessel, no. 33. In contrast to "Knowth Style", the fabric is coarse, brittle and sometimes friable with

a high content of large dolerite and quartzite grits (see Appendix 1). The exterior surfaces have been roughly smoothed but grits sometimes protrude through the surface.

Most of the fine and coarse vessels had previously been used in a domestic context, as several sherds have thick encrusted carbonised matter on the interior surfaces. This carbonised matter is mainly found on the fine, better quality vessels; few of the coarse vessels show evidence for burning, indicating different functions for different vessels. The fine, hard wares may have been watertight and therefore more suitable for cooking, whereas the larger coarse vessels may have been used for storage. Many exterior surfaces show evidence for fire-blackening, which may have developed during firing, or possibly resulted from the vessels being used for cooking over an open fire. Vessel 15 is interesting as it continued in use after having been damaged; part of the interior surface just below the rim had broken off but, as this fracture is now sooted over, it is obvious that it served as a cooking pot after the break had occurred. This continued use of Grooved Ware vessels even after damage had occurred was discussed by Cleal (1988, 139-45), who suggested that the common occurrence of drill-holes on Grooved Ware implies that they were not always discarded when broken but repaired when possible, indicating their continued importance even when damaged. In general, the sherds show little evidence for weathering, which suggests that they were in use until they were broken, deliberately or otherwise, and placed within the post-pits.

Catalogue

FINE GROOVED WARE

Vessel 1 (Fig. 28; Pls. III and IV) 2 rimsherds 6153/6154, 6155 (post-pit 14), 2 sherds from the lower body and basal angle 6156, 6157 (not illustrated), (post-pit 14) and 11 bodysherds 6158–68 (post-pit 14). Hard, compact fabric with a moderate grit content (< = 2.0mm). The exterior surface has been smoothed and scorched black in places; encrusted carbonised matter is present on the interior base and lower body. Three grooved lines and an applied pellet occur on the exterior below the rim, and two grooves occur internally below the rim. Colour: buff-brown/black/black. Estimated rim diameter: 146mm. T. 4–5–5.0mm.

Vessel 2 (Fig. 28; Pls. III, IV, VII and VIII) rimsherd 6169 (post-pit 17), an almost complete base, 6170–1 (post-pit 17) and 4 small bodysherds 6172–4, 6175 (false rim), (post-pit 17). Hard fabric with a moderate to high grit content (< = 3.0mm). Traces of fire blackening is present on the exterior surface. Two lines of twisted cord impressions occur on the interior below the rim. The base, which measures about 14cm in interior diameter, is decorated with a single line of impressed twisted cord around the interior circumference of the base. Colour: orange-buff/grey/orange-buff. Estimated rim diameter: 162mm. T. 4.6–5.0mm.

Vessel 3 (Fig. 29; Pls. III and IV) 2 rimsherds representing a complete diameter 6176/6177, 6178 (post-pit 15), a sherd from the lower body and basal angle 6179/6180, 6181 (post-pit 15) and 9 bodysherds 6182–3, 6184/6185, 6186–90 (post-pit 15) and 6191 (post-pit 12). It would appear from the angle of the base that the body splayed outwards. Hard fabric with a moderate grit content (< = 2.5mm). The exterior surface has been smoothed to form a soapy texture and is fire blackened in places. The interior surface and core are reduced to a black colour, with encrusted carbonised material on the interior base and lower body. A single line of twisted cord impressions occurs on the interior surface below the rim; 6178 has a perforation and the exterior of 6176 has been pinched to form a slight ridge. Colour: orange-buff throughout. Estimated rim diameter: 173mm. T. 4.8–5.4mm.

Vessel 4 (Fig. 29) rimsherd 6192 (post-pit 14), 3 basesherds 6193–5 (post-pit 14) and 2 bodysherds 6196–7 (post-pit 14). Hard, compact fabric with a moderate to high grit content (< = 2.2mm). The exterior surface is smooth and fire blackened, encrusted carbonised material is present on the interior surface and around the edges of the base. Two grooves occur on the interior surface below the rim. Interior diameter of base: 95mm. Colour: orange-black throughout. T. 4.5–5.9mm.

Vessel 5 (Fig. 29; Pls. III and IV) rimsherd 6198 (post-pit 14), 2 bodysherds 6199/6200, 6201 (post-pit 14). Hard fabric with a moderate grit content (< = 2.4mm). The exterior surface is smooth, and all surfaces are fire blackened. 6199 is decorated with two grooved lines (the break is along one of the grooves) indicating that it is from close to the rim. Colour: orange black throughout. Estimated rim diameter: 180mm. T. 4.3–4.5mm.

Vessel 6 (Fig. 29) rimsherd 6202/6203 (post-pit 17), basesherd 6204 (post-pit 17) and 2 bodysherds 6205–6 (post-pit 17). Hard fabric with a moderate to high grit content (< = 2.6mm). The exterior surface is smooth and possibly burnished, considerably fire blackened with traces of sooting or encrusted matter on parts of the body and on the base. A shallow, narrow groove is present on the interior surface below the rim. Colour: black/dark brown/dark brown. T. 4.7–7.0mm.

Vessel 7 (Fig. 30) rimsherd 6207 (post-pit 8), 2 bodysherds 6208 (post-pit 1), 6209 (post-pit 19) and 2 fragments 6210–11 (post-pit 19). Hard but slightly friable fabric with a moderate grit content (< = 3.0mm). The exterior surface is fire blackened, and sooty accretions are also present. The interior surface is coarse and uneven where grits protrude. Two shallow grooves are present on the interior below the rim. Colour: black-orange/grey/orange–black. Estimated rim diameter: 167mm. T. 3.9–5.6mm.

Vessel 8 (Fig. 28; Pls. III, IV, VII and VIII) rimsherd 6212 (post-pit 2),

basesherds, representing a large portion of the base 6213–24 (post-pit 16), 6 bodysherds 6225 (post-pit 4), 6226–9, (post-pit 2), 6230 (post-pit 19) and a fragment 6231, (post-pit 16). Unexpanded, sharply rounded rim. Thin-walled fabric, hard and compact in texture with a moderate to high grit content (< = 2.5mm). The exterior surface has been roughly smoothed with grits protruding through the surface in places. Decoration consists of two horizontal grooved lines on the interior surface, just below the rim. Faint decoration is present around and within the circumference of the exterior surface of the base, and this appears to consist of broad twisted cord impressions. Colour: orange-brown/brown/brown. T. 4.2–10.32mm.

Vessel 9 (Fig. 28; Pls. V and VI) rimsherd 6232 (post-pit 27) and 2 small bodysherds 6233 (post-pit 27), 6234 (post-pit 29/30). Thin-walled, hard, compact fabric with a low to moderate grit content (< = 2.1mm). Burnt encrusted matter is present on the interior surface. A deep groove is present on the interior surface below the rim. Colour: black throughout. T. 4.4–4.7mm.

Vessel 10 (Fig. 28; Pls. V and VI) rimsherd 6235 (post-pit 8). Unexpanded and gently flattened on top. Hard compact fabric with a moderate grit content (< = 2.0mm). Smooth exterior surface, possibly burnished. A deep groove is present on the interior surface, just below the rim. Colour: black throughout. T. 3.8–5.6mm.

Vessel 11 (Fig. 29) rimsherd 6236 (post-pit 17), 2 basesherds 6237–8 (post-pit 15) and 2 bodysherds 6239 (post-pit 17), 6240 (post-pit 25). Hard fabric with a moderate grit content (< = 2.2mm). The exterior surface is smooth and fire blackened, and traces of burnt encrusted matter occur around the edges of the base. Three shallow grooves are present on the interior below the rim. Colour: black-orange/grey/dull orange. T. 4.6–5.5mm.

Vessel 12 (Fig. 29; Pls. V and VI) rimsherd 6241 (post-pit 27). The fabric is hard but slightly friable with a few large cavities on both surfaces; moderate grit content (< = 2mm). A deep groove is present on the interior surface directly below the rim. Colour: brown/black throughout. T. 5.0–5.6mm.

Vessel 13 (Fig. 30) 6 bodysherds 6242 (post-pit 15), 6243–7 and 3 fragments 6248–50 (post-pit 19), similar fabric but possibly 2 vessels are represented. Hard, compact fabric with a moderate grit content (< = 2.6mm). No. 6244 has a fire-blackened interior surface and is decorated with a single groove, indicating that it comes from just below the rim. Colour: orange/grey/orange. T. 3.9–55.1mm.

Vessel 14 (Fig. 30; Pls. V and VI) 2 rimsherds 6251 (post-pit 16), 6252 (post-pit 2), a bodysherd 6253 (post-pit 16) and a fragment 6254

(post-pit 2). The rim is unexpanded and gently rounded. Hard compact fabric with small cavities on the exterior and interior surfaces and a moderate to high grit content (< = 2.5mm). The exterior surface has been smoothed while the interior surface is irregular; burnt encrusted matter is present on the interior surface. A deep, irregularly-formed groove is present on the interior surface, just below the rim. Colour: brown throughout. T. 5.9–6.9mm.

Vessel 15 (Fig. 30) rimsherd 6255 (post-pit 16). Unexpanded and gently flattened on top. The interior surface, just below the rim, is missing. Hard compact fabric with a low to moderate grit content (< = 4.7mm). The exterior surface has been smoothed, and the surviving part of the interior surface is sooted. Colour: dark brown-black throughout. T. 4.7mm.

Vessel 16 (Fig. 30) basesherd 6256 (post-pit 25) and 6 bodysherds 6257/6258, 6259, 6260/6261 (post-pit 25), 6262 (post-pit 22), 6263 (post-pit 5), 6264 (post-pit 22). Hard fabric with a fairly high grit content (< = 3.0mm). All surfaces are coarse and appear slightly weathered. Two sherds (6257/6258, 6264) are probably from just below the rim as they are decorated with a single narrow groove. Colour: orange-buff throughout. T. 4.6–5.8mm.

Vessel 17 (Fig. 30) basesherd 6265 (post-pit 29/30), 3 small bodysherds 6266–7 (post-pit 27), 6268 (post-pit 1) and 4 fragments 6269-72 (post–pit 27). Hard but friable fabric with a high grit content (< = 3.2mm). The exterior surface is fire blackened and the interior surface is rough in texture. Colour: pale orange-black/orange-grey/orange. T. 5.8–6.7mm.

Vessel 18 (Fig. 30) basesherd 6273/6274 (post-pit 23), 2 bodysherds 6275–6 (post-pit 23). Hard compact fabric, moderate to high grit content (< = 2.0mm). The interior surface has traces of burnt encrusted matter. Although very little of the concave base survives, there is a broad groove around the exterior of its circumference. Colour: orange/black/black. T. 5.3–8.8mm.

Vessel 19 (Fig. 30) 8 bodysherds 6277 (post-pit 9), 6278–84 (post-pit 15). This vessel is thick–walled; the fabric is very hard and has a high, fine grit content (< = 1.8mm). The exterior surface is fairly smooth but some grits protrude through the surface, and there are patches of encrusted material on interior surface. No. 6277 has a shallow incised line on its exterior surface, probably from just below the rim. Colour: brown/dark grey/brown. T. 6.0–7mm.

Vessel 20 (Fig. 30; Pls. III, IV, VII and VIII) 2 rimsherds 6285 (post-pit 5), 6286/6287, (post-pit 31/32), basesherd 6288/6289 (post-pit 7) and 7 bodysherds 6290–1 (post-pit 4), 6292/6293, 6294/6295 (post-pit 31/32),

6296 (post-pit 8), 6297 (post-pit 11a), 6298 (post–pit 6). Very hard, compact fabric with a moderate grit content (< = 2.7mm). Traces of encrusted matter are present around the edges of the base. A deep groove is present on the interior surface below the rim, and a similar groove is found on 6296 which indicates it is from just below the rim. An irregular incised line is present on the exterior circumference of the base. Colour: black throughout. T. 5.0–5.5mm.

Vessel 21 18 bodysherds 6299–6316 (post-pit 17). Hard slightly friable fabric with a high grit content (< = 3.2mm). The exterior surface is smooth, and encrusted carbonised material is present on the interior surface. Colour: orange/orange-grey/black. T. 5.3–7.8mm.

Vessel 22 (Fig. 30; Pls. V and VI) 2 rimsherds 6317, 6318 (post-pit 22), 16 bodysherds 6319–22 (post-pit 21), 6323–33 (post-pit 22), 6334 (post-pit ?) and 4 fragments 6335–8 (post-pit 22). The rim is a simple type, somewhat flattened on top with a slight bevel on the exterior surface. Hard but friable fabric with several cavities on the exterior surfaces and a moderate grit content (< = 2.7mm). The exterior surface is a little rough and uneven, and burnt encrusted material is present on the interior surface. There are deliberate shallow depressions just below the rim. Colour: brown-pale orange/black/black. T. 6.7–7.6mm.

Vessel 23 (Fig. 31) rimsherd 6339 (post-pit 13), 4 basesherds 6340/6341, 6342, 6343/6344, 6345 (post-pit 13), a base–angle sherd 6346 (post-pit 13) and 10 bodysherds 6347 (post-pit 13), 6348 (post-pit 12), 6349 (post-pit 19), 6350–6 (post-pit 1). Hard, compact fabric with a high grit content (< = 2.8mm). The exterior surface is smooth and has a slight soapy texture; carbonised matter is present around the edges of the base. A deep groove occurs on the interior surface below the rim. Colour: orange-buff/black/black. T. 6.2–6.9mm.

Vessel 24 5 bodysherds 6357–60 (post-pit 22), 6361 (post-pit 19). Medium coarse, slightly friable fabric with a high grit content (< = 2.0mm). The exterior surface has been roughly smoothed. Colour: orange/grey/black– orange. T. 7.0–7.5mm.

Vessel 25 basesherd fragment 6362 (post-pit 8), 9 small bodysherds 6363 (post-pit 5), 6364–8 (post-pit 8), 6369 (post-pit 9), 6370 (post-pit 14), 6371 (post-pit 17), and 9 fragments 6372–3 (post-pit 5), 6374–9 (post-pit 8), 6380 (post-pit 18). It is possible that there is more than one vessel represented within this group. Weathered, porous fabric with a moderate grit content (< = 2.1mm). Colour: bright orange-buff/grey/bright orange-buff. T. 5.8–6.3mm.

Vessel 26 (Fig. 31) rimsherd 6381 (post-pit 15) and 15 bodysherds 6382/6383, 6384–90 (post-pit 15), 6391–5, 6396/6397 (post-pit 16), 6398 (post-pit 18). Slightly porous fabric, rough in texture, moderate to high

grit content (< = 2.1mm). Burnt encrusted matter is present on the interior surface. A wide, shallow groove occurs on the interior surface below the rim. A grooved line is also present on the exterior surface of 6396/6397. Colour: pale orange-brown/grey/pale orange-brown. T. 6.5–7.4mm.

Vessel 27 (Fig. 31) rimsherd 6399 (post-pit 22), 6 bodysherds 6400 (post-pit 27), 6401 (post-pit 5), 6402–3 (post-pit 8), 6404 (post-pit 27), 6405 (post-pit 1). Hard, compact fabric with a moderate grit content (< = 3.5mm). The exterior surface is smooth. No. 6400 has a groove on the interior surface which indicates that it comes from just below the rim. Colour: brown/black/black. T. 7.3–9.3mm.

Vessel 28 bodysherd 6406 (post-pit 3). Hard fabric with a very high grit content (< = 2.6mm). The exterior surface is rough and gritty in texture. Colour: orange-buff/grey/orange-brown. T. 6.0–6.4mm.

Vessel 29 3 bodysherds 6407 (post-pit 25), 6408 (post-pit 28), 6409 (post-pit 31/32). Very hard, compact fabric with a moderate grit content (< = 2.4mm). The exterior surface is smooth but a little rough in texture. Colour: pale orange throughout. T. 6.3–8.6mm.

Vessel 30 2 bodysherds 6410 (post-pit 26), 6411 (post-pit 24). Hard, compact fabric with a moderate grit content (< = 2.3mm). There is a possible faint groove on 6411. Colour: dark orange/brown-grey/brown-grey. T. 7.0–7.3mm.

Vessel 31 bodysherd 6412 (post-pit 28). Hard, good quality compact fabric with a moderate grit content (< = 2.6mm). The exterior surface has been smoothed. Colour: dull orange throughout. T. 5.7mm.

Vessel 32 bodysherd 6413 (post-pit 16) and 3 fragments 6414–15, (post-pit 2), 6416 (post-pit 16). Hard compact fabric with a moderate grit content (< = 1.4mm). The interior surface is fire–blackened. Colour: orange/grey/black. T. 4.7–7.4mm.

COARSE GROOVED WARE

Vessel 33 (Fig. 31; Pls. V–VI) 3 rimsherds 6417/6418/6419a, 6419b, 6420, (post-pit 2), 14 bodysherds 6421–2, 6423 (coil break), 6424–32, 6433 (false rim), (post-pit 2), 6434 (post-pit 16). The rim is gently rounded with a lip on the interior surface. Hard compact fabric with a high grit content (< = 7.4mm). Colour: buff-orange/grey-orange/buff-orange. T. 6.4–9.2mm.

Vessel 34 basesherd 6435 (post-pit 4), 3 false rims 6436–6438 (post-pit 4), 37 bodysherds 6439–42 (post-pit 2), 6443–4 (post-pit 3), 6445–74, (post-pit 4), 6475 (post-pit 8), and 13 fragments 6476 (post-pit 2),

6477–88 (post-pit 4). Porous, light-weight fabric with a low grit content (< = 7.0mm). Both surfaces appear to have been smoothed. Colour: orange/orange-grey/orange. T. 4.2–8.0mm.

Vessel 35 3 bodysherds 6489–91 (post-pit 16). Medium coarse fabric with small cavities on the interior surface and with a high grit content (< = 7.0mm). The exterior surface has been roughly smoothed but is abraded in places. The interior surface is sooted and has traces of burnt encrusted matter. Colour: orange/grey/orange-brown. T. 6.0–7.8mm.

Vessel 36 (Fig. 31) basesherd 6492 (post-pit 2), 3 false rims 6493, 6494 (coil break), 6495/6496 (post-pit 2), 8 bodysherds 6497/6498, 6499–6503, 6504 (false rim), (post-pit 2) and 3 fragments 6505 (post-pit 2), 6506–7 (post-pit 4). Coarse, hard fabric with a high grit content (< = 4.1mm). The exterior surface has been roughly smoothed, and the interior surface is fire blackened in places. Colour: orange/orange-grey/orange. T. 5.4–9.4mm.

Vessel 37 11 bodysherds 6508 (post-pit 1), 6509–16 (post-pit 2), 6517–18 (post-pit 19). Medium coarse, compact fabric with a moderate grit content (< = 2.3mm). The exterior surface has been smoothed, the interior surface is fire-blackened and has traces of burnt encrusted matter. Colour: orange/black/black. T. 5.4–9.5mm.

Vessel 38 (Fig. 31) 4 basesherds 6519–22 (post-pit 20), 13 bodysherds 6523–31, (post-pit 20), 6532–4 (post-pit 3), 6535 (post-pit 20), and 8 fragments 6536–43 (post-pit 20). Hard, coarse, uneven fabric with a high grit content (< = 3.2mm). The exterior surface is rough in texture, and parts of the interior are fire blackened. Colour: orange/grey/orange-black. T. 6.8–7.1mm.

Vessel 39 (Fig. 31) 4 basesherds 6544, 6545/6546, 6547/6548, 6549 (post-pit 2), 6 bodysherds 6550–5 (post-pit 2). Medium coarse friable fabric with a moderate to high grit content (< = 6.0mm). The exterior surface has been roughly smoothed. The exterior surface of the base is fire blackened and has traces of burnt encrusted matter. Colour: orange-brown throughout. T. 8.3–13.5mm.

Vessel 40 (Fig. 31) 27 bodysherds 6556–7 (post-pit 3), 6558 (post-pit 5), 6559 (post-pit 6), 6560 (post-pit 21), 6561 (post-pit 22), 6562–72 (post-pit 25), 6573–6, 6677a–b, 6678 (post-pit 29/30), 6579–80 (post-pit 31/32), 6581 (post-hole 33) and a fragment 6582 (post-pit 5). Hard, compact thick-walled fabric with a high grit content (< = 9.5mm). The exterior surface is generally smooth with traces of sooting. Colour: orange-buff/orange-grey/orange-black. T. 9.0–11.3mm.

Vessel 41 (Fig. 31) basesherd 6583/6584 (post-pit 2), 5 bodysherds 6585–9 (post-pit 2). Thick-walled coarse friable fabric, with a high grit

Fig. 28. Grooved Ware Complex, circular wooden structure: pottery finds from post-pits (vessels 1–2, 8–10).

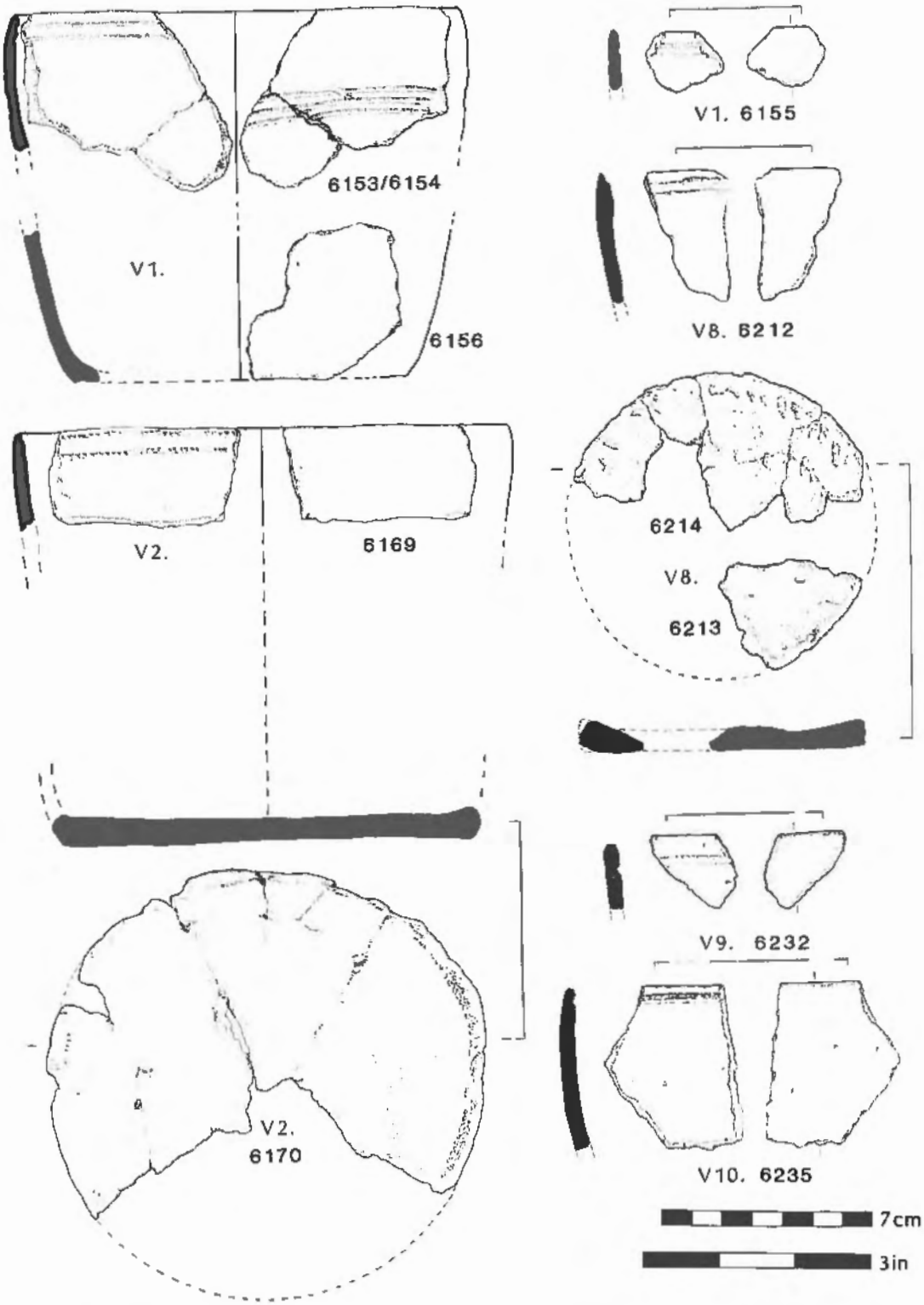


Fig. 29. Grooved Ware Complex, circular wooden structure: pottery finds from post-pits (vessels 3–6, 11–12).

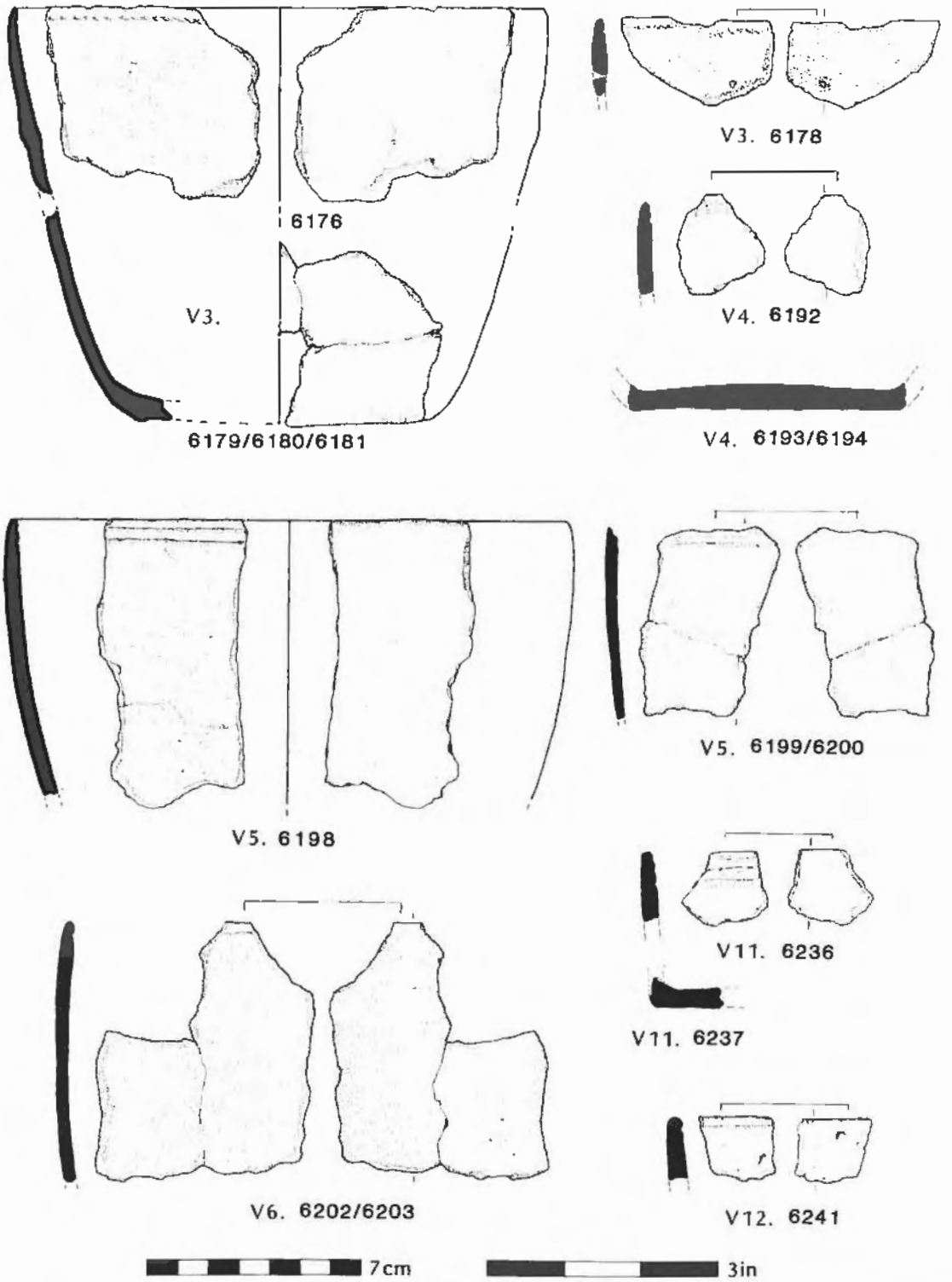


Fig. 30. Grooved Ware Complex, circular wooden structure: pottery finds from post-pits (vessels 7, 13–20, 22).

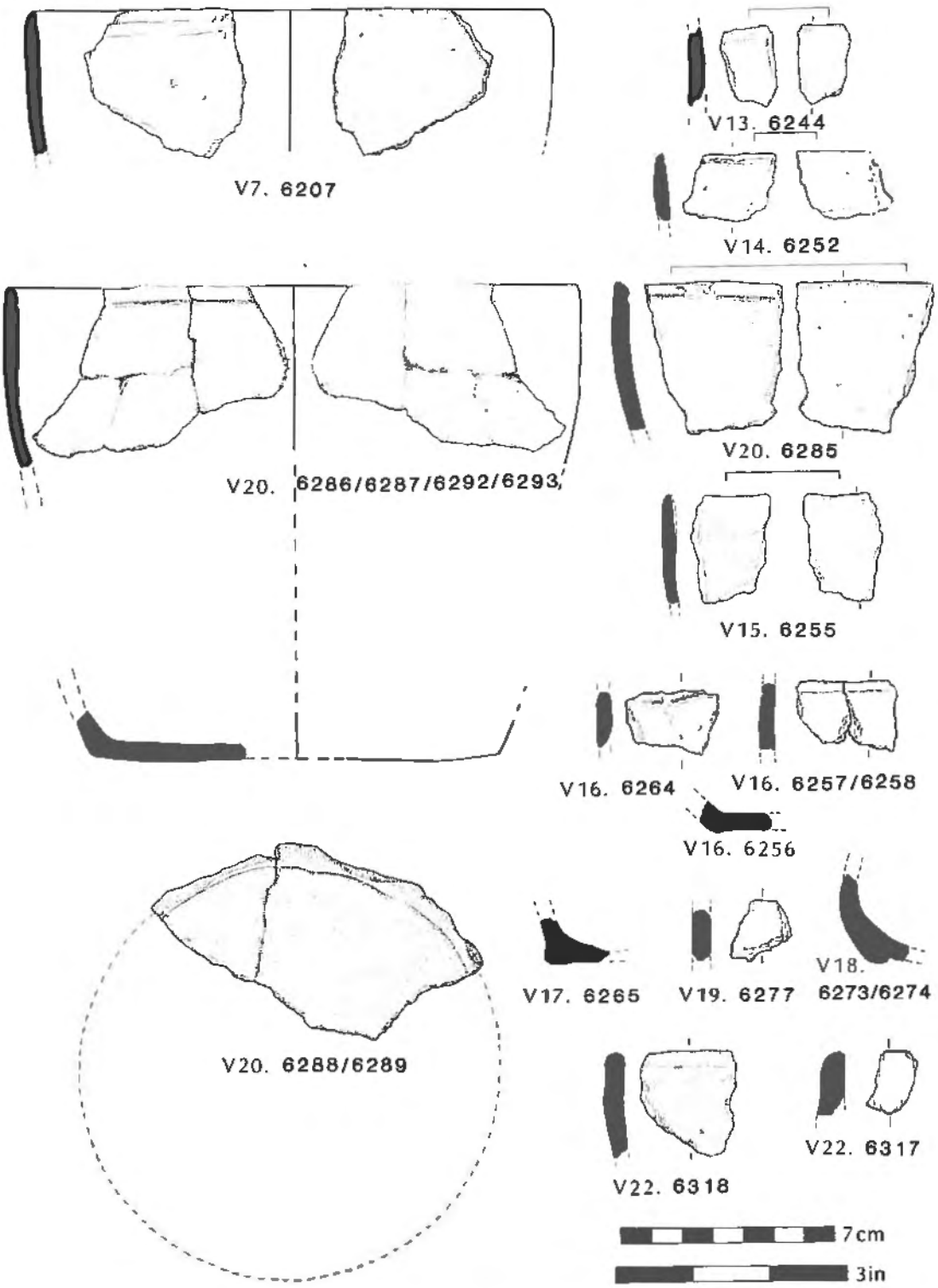
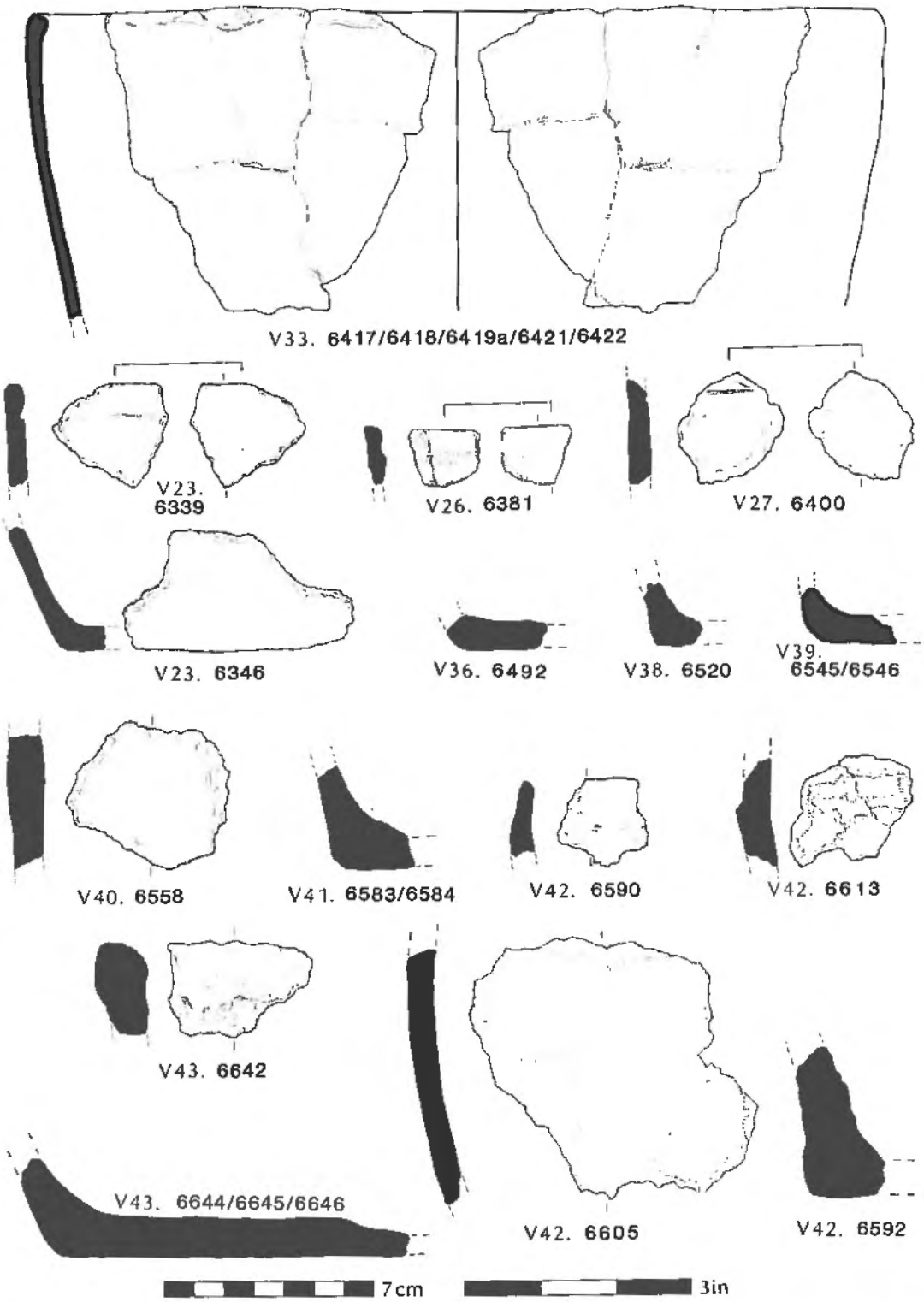


Fig. 31. Grooved Ware Complex, circular wooden structure: pottery finds from post-pits (vessels 23, 26–7, 33, 36, 38–43).



content (< = 4.0mm). The exterior surface has been roughly smoothed, is fire-blackened and has traces of burnt encrusted matter. The interior surface is uneven with grits protruding through the surface. Colour: black/orange-brown/orange-brown. T. 8.7–10.8mm.

Vessel 42 (Fig. 31) rim fragment 6590 (post-pit 27), 2 basesherds 6591 (post-pit 25), 6592 (post-pit 15), 43 bodysherds 6593–6600 (post-pit 25), 6601–2 (post-pit 29/30), 6603–12, 6613 (cordon), 6614 (coil break), 6615a–b, 6616–29, (post-pit 22), 6630–1 (post-pit 23), 6632–4 (post-pit 27), and 7 fragments 6635 (post-pit 3), 6636–40 (post-pit 22), 6641 (post-pit 25). The rim appears to represent part of this vessel, and is a simple unexpanded type, slightly flattened on top. Thick, coarse, friable fabric with a high grit content (< = 9.8mm). The exterior surface is uneven but has been roughly smoothed. The interior surface is fire blackened with traces of encrusted carbonised material. Sherd 6613 has a wide groove or cordon on the exterior surface. Colour: buff-orange/orange-grey/black. T 10.3–13.7mm.

Vessel 43 (Fig. 31; Pls. V and VI) rimsherd 6642 (post-pit 17), 6 basesherds 6643 (post-pit 3), 6644–6 (post-pit 15), 6647 (post-pit 25), 6648 (post-pit 33) and 11 bodysherds 6649 (post-pit 15), 6650–9 (post-pit 3). Thick-walled, coarse brick-like fabric with a high grit content (< = 8.9mm). The exterior surface has a rough, slightly uneven texture; the interior surface is extremely rough and uneven in texture. Colour: buff-orange/grey-brown/orange-brown. T. 11.5–18.2mm.

Vessel 44 2 basesherds 6660–1 (post-pit 3), 3 bodysherds 6662–4 (post-pit 3) and 2 fragments 6665–6 (post-pit 3). Thick–walled coarse fabric with a moderate to high grit content (< = 8.3mm); grits protrude through both exterior and interior surfaces. Colour: orange/grey/orange-brown. T. 10.5–20.5mm.

Lithic assemblage

Fiona Dillon

Introduction

The assemblage consists of 801 pieces. Amongst these are worked flint, worked and unworked chert, a polished stone axe and some fragments, unworked quartz, rock crystal, worked or shaped stones, some fragments of miscellaneous stones and rounded pebbles (Table 10, p. 180).

The Raw Material. Flint is the predominant raw material and, although some chert is present, few pieces showed evidence of knapping. The remaining lithics comprising quartz, mudstone and fragments of polished stone are unworked. Two types of flint are

present: pebble and chalk. The latter is characterised by a grey colour ranging from opaque to translucent, or a deep caramel colour with a white gritty cortex which is often slightly abraded. This abrasion indicates that it was derived from 'nodules' which could have originated as pieces that naturally became detached from the deposits, rather than mined flint. For instance, such nodules occur in abundance along the relevant areas of the Antrim coast. Pebble flint is available in the Knowth locality (p. 33). The range of cortex types – thick grey and a thinner brown cortex – indicates that more than one local source of pebble flint was exploited.

While there is near parity in numbers (Table 11, p. 181), the weight of the chalk flint, 3663g or 77% of the total weight, clearly shows its predominance. A small quantity of chalk flint is present in the preceding Decorated Pottery Complex (above p. 78); however the utilization of this flint in the Grooved Ware Complex increased significantly. It is possible that both nodules and 'blank' flakes could have been imported. There is evidence for the transportation of nodules at Ballyalton Court Tomb, Co. Down (Herity 1987, 206), while evidence for the production of blank flakes and scrapers for transportation is found at Mad Man's Window III (Woodman 1992, 86). In addition hoards of flint have been found (*cf.* Woodman 1992, 88–89) which include diagnostics from the Late Neolithic to the Beaker period, e.g. hollow scrapers to barbed-and-tanged arrowheads, and two hoards contain petit-tranchet-derivative arrowheads associated with hollow scrapers and retouched flakes – Three Towns hoard, Kilnacolpagh, Co. Antrim (Flanagan 1966, 82) and the hoard from Raheelin, Co. Leitrim (Woodman 1992, 89). However the grey flint from the Knowth wooden structure does not have the uniformity displayed in these hoards. In addition, the 'fresh' edges of the pieces seem to indicate that the flakes were knapped almost directly before deposition in the post-pits.

There are 12 pieces of poor quality chert of which seven were knapped (Table 11, p. 181). There are 31 unworked fragments of quartz forming 3.9% of the assemblage. Both chert and quartz are available locally (above p. 33). As quartz was not exploited as a raw material for tools, its inclusion in the pits is probably the result of the use of quartz packing stones. One polished stone axe and two small fragments were found. In addition there are three small fragments of un-worked rock crystal, six naturally-rounded pebbles and a quartzite pebble. Eight fragments of miscellaneous stones, including some mudstone, were also found, which appear to be chance inclusions.

Technology. There is little evidence for flint knapping or tool production; however information about technology can be derived from the cores and the struck pieces consisting of flakes, scrapers and retouched flakes. There are 8 cores of chalk flint, no. 6670a (post-pit 2), nos. 6670b, 6671-2 (post-pit 16), no. 6673 (post-pit 23), no. 6674 (post-pit 26), no. 6675 (post-pit 27) and no. 6676 (post-hole 34). All have prepared

platforms and are knapped around the circumference, ensuring a large measure of control of the flake shape. The single platform cores (nos. 6674, 6675) were fully exploited and then discarded. A feature of the reduction technique is the rotation of cores using two platforms (e.g. nos. 6671, 6670a, 6672, 6673). Overall, the evidence from the cores shows careful preparation; the platform was prepared by one or more blows and the cortex was removed. The small size of the cores, in contrast to the flakes, indicate that the cores were greatly reduced.

Two hundred and sixty-four struck pieces (37%) of flint and chert, including 45 scrapers, retained undamaged platforms (Table 12, p. 181). The predominance of prepared platforms is evident in both flake and scraper categories, and in flint from both the chalk deposits and pebble sources, as well as in the chert pieces. Cortical platforms accounted for 5%. The low number of cortical flakes (Table 13, p. 182), especially primary flakes, reflects the selective nature of the assemblage. The scrapers are almost equally divided between cortical (46%) and non-cortical flakes (54%), whereas non-cortical unmodified flakes predominate (68%), reflecting the preparation of the cores. Again the pattern is consistent in the examples fashioned from pebble flint and those derived from the chalk deposits. The size of the platforms (Table 14, p. 182) illustrates the use of two percussion techniques, hard and soft hammer. The largest group (68%) is composed of both pebble and chalk flint, and has a platform depth between 1–5mm and 38% with platforms between 2–4mm. The remaining flakes tend towards larger platforms produced by direct hard percussion. These include some large crude flakes (e.g. no. 6744, Fig. 32) of flint from the chalk deposits, which illustrate an extravagant use of such flint with no clear functional purpose, possibly produced specifically for deposition in the post-pits.

In short, the flint technology shows a range of reduction techniques producing a variety of flake shapes, large crude pieces and thin parallel-sided flakes. This is clearly reflected in the Groups 1–5 of the end scrapers (below pp. 166–68). The under representation of primary flakes and the flake:core ratio 154:1 show the absence of elements of the core reduction sequence. This confirms the selective nature of the deposition of the lithics in the post-pits, and makes it unlikely that 'midden' material containing knapping debris was deposited.

Catalogue

(Flint unless otherwise stated)

2 *flint pebbles*: 6668 (post-pit 21), 6669 (post-pit 25). A split pebble 6668 and a complete water rolled flint pebble 6669.

8 *cores*: (Table 15, p. 183). 6670a (post-pit 2), 6670b (Fig. 32), 6671 (Pl. X), 6672 ([Fig. 32; Pl. X] post-pit 16), 6673 ([Fig. 32] – post-pit 23), 6674 (post-pit 26), 6675 (post-pit 27), 6676 ([Pl. X] – post-hole 34).

Four have dual platforms and four have single platforms, and all have been reduced around the circumference of the core. In the following descriptions, the classification of Clark, Higgs and Longworth (1960, 216) is followed. No. 6670a is a core of Class B3 which appears to be slightly burnt. The cortex is chalky and indicates that fresh flint was used. No. 6671 is a Class B1 core. Nos. 6670b and 6672 are cores of fresh flint of Class B2. No. 6673 is a burnt fragment of a core, Class B2. Although there is no cortex, the size of the core (51mm by 35.4mm by 18.9mm) makes it likely that it is fresh flint. No. 6674 is a single platform core (24.2mm by 22mm by 9.7mm) of pebble flint, Class A2. There is cortex at the distal end, showing it to be worked around its circumference. No. 6675 is a single platform core Type A2 which is fully reduced around its circumference. No. 6676 is a fragment of a core of Class A1 type. Although still quite large (52mm by 55mm by 33mm), the natural flaws in the flint precluded the further reduction of the core. No. 6676 has been refitted with no. 7394 (irregular fragment) from the base of post-pit 8.

15 *core rejuvenation flakes*: (Tables 12 and 15, pp. 181, 183). **Complete:** 6677–8 (post-pit 1), 6679 (post-pit 2), 6680 (Pl. X), 6681 (post-pit 4), 6682 (post-pit 7), 6683 (post-pit 20), 6684 (post-pit 21), 6685 (post-pit 22), 6686 (post-pit 27). **Part:** 6687–8 (post-pit 4), 6689 (post-pit 20), 6690 ([Fig. 32] – post-pit 25), 6691 (post-pit 27). Nos. 6683, 6684 and 6687 are platform rejuvenation pieces which show the use of platformed and keeled cores. The remaining pieces were removed from the lateral part of the core to rejuvenate the flaking surface. Cortical analysis shows that there is one primary flake, four secondary flakes and ten tertiary flakes.

29 *trimming flakes*: (Table 12 and 19, pp. 181, 187). **Complete:** 6692 (post-pit 2), 6693 (post-pit 4), 6694 (post-pit 5), 6695 (post-pit 7), 6696–7, (post-pit 22), 6698 (post-pit 24), 6699 (post-pit 25), 6700 (post-hole 33). **Part:** 6701 (post-pit 2), 6702–4 (post-pit 3), 6705–9 (post-pit 4), 6710–11 (post-pit 8), 6712–13 (post-pit 16), 6714–16 (post-pit 22), 6717 (post-pit 26), 6718 ([Fig. 36] – post-pit 27), 6719 (post-pit 29/30), 6720 (post-pit 31/32). Cortical analysis shows there is one primary flake (3%), 5 secondary flakes (17%) and 24 tertiary flakes (80%).

19 *unutilised blades*: (Tables 12 and 16, p. 181, 184). **Complete:** 6721 (post-pit 1), 6722 (post-pit 2), 6723 (post-pit 3), 6724 ([Fig. 32] – post-pit 25), 6725 ([Fig. 32] – post-pit 27), 6726–7 (post-pit 29/30). **Part:** 6728 (post-pit 1), 6729 (post-pit 2), 6730–1 (post-pit 3), 6732–3 (post-pit 5), 6734 (post-pit 16), 6735 (post-pit 17), 6736 (post-pit 22), 6737–8 (post-pit 25), 6739 (post-pit 31/32). Cortical analysis shows there is one primary flake (5%), two secondary flakes (11%) and sixteen tertiary flakes (84%).

475 *unutilised flakes*: (Tables 12 and 16, p. 181, 184). **Complete:** 6740–1, 6742 (Fig. 32), 6743, 6744 (Fig. 32), 6745-8, 6749 ([Fig. 32] – chert),

(post-pit 1), 6750–6 (post-pit 2), 6757-61, 6762 (Pl. X), 6763, 6764 ([Pl. X] post–pit 3), 6765–73 (post-pit 4), 6774–81 (post-pit 5), 6782–3 (post-pit 6), 6784–5 (post-pit 7), 6786–9 (post-pit 8), 6790–1 (post-pit 11A), 6792 (post-pit 13), 6793 (Fig. 32; Pl. X), 6794 (post-pit 14), 6795, 6796 ([Fig. 32] – post-pit 15), 6797–6800 (post-pit 16), 6801–4, 6805 ([Fig. 32] – chert), (post-pit 17), 6806–7 (post-pit 19), 6808–10 (post-pit 20), 6811 (post-pit 21), 6812 (Fig. 32), 6813–16 (post-pit 22), 6817–18 (post-pit 23), 6819–21 (post-pit 24), 6822([Fig. 32] – chert), 6823–6828, 6829 (Fig. 32), 6830 (post-pit 25), 6831 ([Fig. 33] – post-pit 27), 6832 (Fig. 33; Pl. X), 6833–4 (post-pit 28), 6835–38a–b (post-pit 29/30), 6839–44 (post-pit 31/32), 6845a–b (post-hole 33), 6846 (post-hole 34), 6847 (post-hole 35). **Part:** 6848–74 (post-pit 1), 6875–6917 (post-pit 2), 6918–62 (post-pit 3), 6963–75a-b, 6976-93 (post-pit 4), 6994–7024 (post-pit 5), 7025–8 (post-pit 6), 7029–35 (post-pit 7), 7036–43, 7044 (Fig. 32), 7045, 7046 ([Fig. 32] – chert), (post-pit 8), 7047 (post-pit 9), 7048–50 (post-pit 11A), 7051–2 (post-pit 13), 7053–63 (post-pit 14), 7064 (post-pit 15), 7065–68a-b, 7069-77 (post-pit 16), 7078–85 (post-pit 17), 7086–7 (post-pit 18), 7088–94 (post-pit 19), 7095–8 (post-pit 20), 7099–7103 (post-pit 21), 7104–11 (post-pit 22), 7112–14 (post-pit 23), 7115–19 (post-pit 24), 7120–34, 7135 (Fig. 33), 7136-42 (post-pit 25), 7143–4 (post-pit 26), 7145–66 (post-pit 27), 7167–9 (post-pit 28), 7170–92, 7193(chert), 7194(chert), 7195(chert) (post-pit 29/30), 7196–7204 (post-pit 31/32), 7205–6 (post-hole 33), 7207–8 (post-hole 34), 7209–10 (post-hole 35). Only 110 ten are complete flakes, forming 23% of the group. There are seven non-flint examples (1%) seven chert flakes, of which three are complete. Cortical analysis shows that there are 27 primary flakes (6%), 131 secondary flakes (27%) and 311 tertiary flakes (28%).

4 *utilised blades*: (Tables 12 and 17, pp. 181, 185). **Complete:** 7211 (post-pit 3). **Part:** 7212 ([Fig. 33] – post-pit 1), 7213 ([Fig. 33] – post-pit 9), 7214 (post-pit 31/32). Four blades show evidence for use wear, one is complete and measures 53mm in length. Cortical analysis shows there is one secondary flake (25%) and three tertiary flakes (75%).

48 *utilised flakes:* (Table 12 and 17, pp. 181, 185). **Complete:** 7215 (Fig. 33), 7214–15, 7216 (Pl. X), 7217 (post-pit 1), 7218–21 (post-pit 2), 7222, 7223 ([Fig. 33] – post-pit 3), 7224 (post-pit 4), 7225-7, 7228 ([Fig. 33] – post-pit 6), 7229 (post-pit 8), 7230 ([Fig. 33] – post-pit 14), 7231 (post-pit 17), 7232–3 (post-pit 20), 7234 ([Fig. 33] – post-pit 22), 7235, 7236 ([Fig. 33] – post-pit 25), 7237 (post-pit 26), 7238, 7239 (Fig. 33), 7240 (post-pit 29/30), 7241–2 (post-pit 31/32). **Part:** 7243–6 (post-pit 3), 7247 (post-pit 4), 7248 (post-pit 5), 7249–50 (post-pit 6), 7251–2 (post-pit 8), 7253 (post-pit 12), 7254 (post-pit 14), 7255 (post-pit 15), 7256 (post-pit 17), 7257 (post-pit 20), 7258 (post-pit 22), 7259 (Fig. 33), 7260 ([Fig. 33] – post-pit 25), 7261 (post-pit 27), 7262 (post-pit 29/30). All have edge wear damage, of which 28 are complete. Cortical analysis shows that there is one primary flake (2%), 13 secondary flakes (27%) and 34 tertiary flakes (71%).

Scrapers: (Tables 20–1, pp. 188, 189).

52 end scrapers: These are characterised by secondary working at the distal end of the flake. Five groups were identified within this classification, four on the basis of the morphology of the flakes selected for modification. The fifth group consists of freshly broken scrapers.

Group 1. Complete: 7263 (Fig. 33; Pl. IX), 7264 ([Fig. 33] – post-pit 1), 7265–7 ([Fig. 33] – post-pit 2), 7268 ([Fig. 33; Pl. IX] – post-pit 3), 7269 ([Fig. 33] – post-pit 4), 7270 ([Fig. 33] – post-pit 5), 7271 ([Fig. 33] – post-pit 12), 7272 ([Fig. 33] – post-pit 22). These flakes from which the scrapers were fashioned tend to be large and non-cortical, and were knapped by indirect percussion producing a distinctive 'tear-drop' shape. No. 7263 has shallow regular secondary working at the distal end of a tertiary flake of fresh flint; the working edge is blunt. No. 7264 has secondary working at the distal end of a tertiary flake of fresh flint. The secondary working is confined to the distal end; it is even and forms a blunt edge. No. 7265 is formed on a tertiary flake with abrupt retouch at the distal end. No. 7266 is formed on a tertiary flake; secondary working is confined to the distal end forming a blunt working edge. No. 7267 is formed on a tertiary flake of translucent brown flint; secondary working consists of bold notching and is confined to the distal end, forming a sharp working edge. There is use wear in the form of fine notches on the lateral edges. No. 7268 has robust secondary working at the distal end forming the working edge and fashioned on a tertiary flake of fresh flint. No. 7269 is formed on a tertiary flake; secondary working is confined to the distal end forming a blunt working edge. Use wear is visible at the distal end. No. 7270 is formed on a primary flake, secondary working is confined to the distal edge, forming a blunt working edge, with evidence of use wear damage. No. 7271 is formed on a tertiary flake; with abrupt, even secondary working at the distal end of the flake forming a blunt working edge. No. 7272 is formed on a secondary flake with invasive retouch at the distal and part of the lateral edges.

Group 2. Complete: 7273 ([Fig. 33] – post-pit 1), 7274, 7275, 7276 ([Fig. 34] – post-pit 2), 7277–8 ([Fig. 34] – post-pit 4), 7279–80, ([Fig. 34] – post-pit 5), 7281 ([Fig. 34] – post-pit 10), 7282 ([Fig. 34] – post-pit 15), 7283 ([Fig. 34] – post-pit 16), 7284 ([Fig. 34] – post-pit 25), 7285 ([Fig. 34] – post-pit 27), 7286–7 ([Fig. 34] – post-hole 33). These scrapers are fashioned on parallel-sided flakes or blade flakes produced by indirect percussion. Four examples (nos. 7273, 7276, 7277, 7284) are secondary flakes, and eleven are non-cortical flakes. No. 7273 has secondary working at the distal end, the thickest part of a flake; the working edge is blunt and severe edge wear is visible. No. 7274 is a complete end of blade scraper, the secondary working is fine ripple retouch and is confined to the distal end; slight use wear is visible. No. 7275 is formed on a tertiary flake of brown translucent

flint; secondary working of fine notching is confined to the distal end forming a blunt working edge. No. 7276 is formed on a secondary flake of fresh flint; secondary working is confined to the distal end and consists of bold notching. Heavy use wear is visible at the distal edge. No. 7277 is formed on a secondary flake with secondary working at the distal end forming a sharp rather than blunt working edge. No. 7278 is formed on a secondary flake; secondary working is confined to the distal end where it forms a blunt working edge. Use wear is visible at the distal end. No. 7279 is formed on a tertiary flake of fresh flint; secondary working extends across the distal end forming a blunt working edge. No. 7280 is formed on a tertiary flake; secondary working extends over the lateral edges and the distal end. Use wear is heaviest at the distal end, showing it to be the main working edge; lighter use wear is present on the lateral edges. No. 7281 is formed on a tertiary flake (33 by 24 by 4.6mm), with the secondary working confined to the distal end, forming a sharp working edge. No. 7282 is formed on a tertiary flake with abrupt retouch at the distal end. No. 7283 has abrupt retouch on the distal end of the flake. No. 7284 is formed on a secondary flake with abrupt retouch at the distal end. No. 7285 is formed on a tertiary flake, with abrupt secondary working extending over the distal and lateral edges. Nos. 7286–7 are formed on tertiary flakes with abrupt secondary working at the distal end. No. 7287 is burnt.

Group 3. Complete: 7288 ([Fig. 34] – post-pit 3), 7289–91, ([Fig. 34; Pl. IX] – post-pit 4), 7292 ([Fig. 34; Pl. IX] – post-pit 25). These scrapers are fashioned from robust irregular-shaped flakes. Two examples (nos. 7288–9) are non-cortical core rejuvenation flakes. The remaining three examples (nos. 7290-2) are robust cortical flakes. No. 7288 is fashioned on a tertiary flake; the secondary working is shallow, forming a blunt working edge at the distal end of the flake. No. 7289 is fashioned on a tertiary flake with secondary working at the distal end, forming a blunt steep working edge. The dorsal flake scars are at ninety degrees to the concoidal fracture scars, showing the rotation of the core during the reduction process. No. 7290 is fashioned on a thick secondary flake fragment with invasive retouch at the distal end. No. 7291 is formed on a fragment of a secondary flake fragment with fine abrupt retouch at the distal end. No. 7292 is fashioned on a robust secondary flake with abrupt retouch at the distal end.

Group 4. Complete: 7293 ([Fig. 34] – post-pit 2), 7294–5 ([Fig. 34] – post-pit 4) 7296 (post-pit 11A), 7297 ([Fig. 34] – post-pit 19), 7298 ([Fig. 34] – post-pit 25). **Part:** 7299 (post-pit 16). These scrapers are fashioned on broad, short flakes. Two examples are cortical (nos. 7296, 7298). No. 7294 is fashioned on a secondary flake with secondary working at the distal end, forming a blunt working edge with heavy use wear. No. 7295 is formed on a tertiary flake, with secondary working extending across the distal end and the lower part of the lateral edges forming a

blunt working edge with visible use wear. No. 7293 has abrupt retouch at the distal end. No. 7296 is fashioned on a secondary flake; the retouch is confined to the distal end, forming a steep uneven working edge with visible use wear. No. 7299, a fragment of a flake, has abrupt secondary working on the lateral edge, while no. 7297 is formed on a tertiary flake and has abrupt retouch on the distal end. No. 7298 is formed on a secondary flake with invasive retouch at the distal end.

Group 5. **Part:** 7300–1 ([Fig. 34] – post-pit 1), 7302 (Fig. 34), 7303–4 ([Fig. 35] – post-pit 2), 7305–7 ([Fig. 35] – post-pit 4), 7308 ([Fig. 35] – post-pit 7), 7309 ([Fig. 35] – post-pit 8), 7310 (post-pit 12), 7311 ([Fig. 35] – post-pit 19), 7312 ([Fig. 35] – post-pit 28), 7313–14, ([Fig. 35] – post-pit 31/32). Distal fragments of end scrapers with 'fresh' unabraded breaks characterize this group. The scrapers must have been broken before deposition in the post-pits, as no refits were found. One example, no. 7303, is burnt. There is one primary flake, no. 7314, four secondary flakes, nos. 7300–2, 7311 and the remaining examples are tertiary flakes. Nos. 7300–1 are fragments which are fashioned on secondary flakes of caramel flint with white chalky cortex. The secondary working is shallow and regular, forming a blunt working edge and is confined to the distal end. No. 7302 is a fragment formed on a secondary flake; secondary working is confined to the distal end, forming a blunt working edge. No. 7303 is a distal fragment on a secondary flake; the retouch is regular and appears to be confined to the distal end, forming a blunt working edge. Use wear is visible at the distal end. No. 7304 is formed on a distal fragment of a tertiary flake with abrupt notching and edge damage at the distal end. No. 7305 is fashioned on a distal tertiary flake fragment, with secondary working at the distal end forming a blunt working edge. No. 7306 is a distal fragment formed on a tertiary flake with robust secondary working at the distal end; use wear is visible. No. 7307 is a fragment of a side-and-end scraper on a tertiary flake, with secondary working at the distal and lateral edges. No. 7308 is a fragment formed on a tertiary flake, with the secondary retouch at the distal end forming a blunt working edge, on which use wear is visible. No. 7309 is a fragment formed on a large tertiary flake; secondary working extends around the distal end of the flake forming a blunt working edge, with visible use wear. No. 7310 is a fragment with abrupt secondary working at the distal end. No. 7311 is fashioned on a secondary flake with abrupt retouch at the distal end. No. 7312 is fashioned on the distal fragment of a tertiary flake; regular secondary working is confined to the distal edge.

6 *side-and-end scrapers*: (Table 21, p. 189). **Complete:** 7315 ([Fig. 35; Pl. IX] – post-pit 1), 7316 ([Fig. 35; Pl. IX] – post-pit 11A), 7317 (Fig. 35), 7318 ([Pl. IX] – post-pit 15), 7319 ([Fig. 35] – post-pit 21). **Part:** 7320 ([Fig. 35] – post-pit 31/32). These are characterized by retouch on the

distal and lateral edges. No. 7315 is a large robust scraper on a secondary flake; the retouch is shallow and invasive, forming a blunt edge at the distal end and a sharp edge at the lateral edge. No. 7316 is fashioned on a secondary flake with a faceted platform; secondary working forms a blunt edge at the distal end and a sharp edge at the lateral end. No. 7317 is fashioned on a tertiary flake with invasive and crude retouch on the lateral and distal ends. No. 7318 is fashioned on a primary flake with invasive retouch at the distal and lateral edges. No. 7319 is fashioned on a tertiary flake, with abrupt retouch on the distal and lateral edge on the dorsal and bulbar faces. No. 7320 is fashioned on a tertiary flake, with abrupt secondary working on the distal and lower lateral edge.

2 *double-ended scrapers:* (Table 21, p. 189). **Complete:** 7321 (post-pit 2), 7322 ([Fig. 35] – post-pit 4). Both have retouch at the proximal and distal ends of the flake. No. 7322 is a complete double-ended scraper with the secondary working extending around the proximal and distal edges of a secondary flake. No. 7321 is fashioned on a robust tertiary flake of fresh flint; secondary working consists of bold notching and is on the dorsal face at the LHS lateral and on the bulbar face on the RHS lateral edge.

16 *round scrapers:* (Table 21, p. 189). **Complete:** 7323–4 (Fig. 35; Pl. IX), 7325 ([Fig. 36] – post-pit 1), 7326 ([Fig. 36] – post-pit 2), 7327–9 ([Fig. 36] – post-pit 3), 7330–1 ([Fig. 36; Pl. IX] – post-pit 4), 7332 ([Fig. 36] – post-pit 5), 7333 ([Fig. 36] – post-pit 11A), 7334 ([Fig. 36; Pl. IX] – post-pit 20), 7335 ([Fig. 36; Pl. IX] – post-pit 23). **Part:** 7336 ([Fig. 36] – post-pit 19), 7337 ([Fig. 36] – post-pit 25), 7338 ([Fig. 36] – post-pit 28). Round scrapers are fashioned from flakes or flake fragments, with the length almost equal to the breadth, and secondary working extending around at least two thirds of the circumference. No. 7323 has secondary working extending around the lateral and distal edge of the flake of pebble flint. The working edge is blunt at the distal end and sharp at the lateral edge. No. 7324 has retouch extending along the distal and part of the lateral edges of the secondary flake of fresh flint. No. 7325 is a crude piece on a tertiary flake, secondary working is irregular and use wear is visible. The working edge appears to be worn smooth. No. 7326 is formed on a secondary flake with abrupt retouch at the lower lateral and distal edges. No. 7327 is a primary flake with invasive retouch at the distal and lateral edges. No. 7328 has retouch extending around the circumference of the piece. A blunt edge is formed on the distal and bulbar edge, with a sharp working edge on the lateral edge. The heaviest use wear is at the distal end. No. 7329 is fashioned on a robust flake of fresh flint; the secondary working extends around two thirds of the flake circumference, leaving the cortical platform unworked. No. 7330 is fashioned on a tertiary flake fragment; robust secondary working extends around the flake forming a sharp working edge. No. 7331 is formed on a tertiary flake

fragment; secondary working extends over the distal and the lateral edges, forming blunt and sharp working edges. Secondary working also extends over the broken proximal edge. Heavy use wear is visible at the distal and lateral edge. No. 7332 is fashioned on a tertiary flake, with secondary working extending around the lateral edges and the distal end. The working edge is blunt and smooth, probably due to wear. Nos. 7333 and 7335 are fashioned on secondary flakes, with invasive retouch and uneven abrupt retouch respectively, on the lateral and distal edges. No. 7334 has invasive retouch on the lateral and distal edges. No. 7336 is fashioned on a secondary flake with invasive retouch on the edges. No. 7337 is fashioned on a secondary flake with abrupt retouch on the lateral and distal edges. No. 7338 is the lateral part of a scraper with invasive retouch and negative flake scars on both faces, showing a crude attempt at thinning the flake.

4 *side scrapers*: (Table 21, p. 189). **Complete:** 7339–40 ([Fig. 35; Pl. IX] – post-pit 1), 7341 ([Fig. 35] – post-pit 2). **Part:** 7342 ([Fig. 35] – post-pit 21). These scrapers are characterized by retouch on the lateral edges of the flakes. On no. 7339 the working edge is formed by a hinge fracture. The secondary working is on the bulbar face, is even and forms a sharp working edge. No. 7340 is fashioned on the proximal fragment of a large tertiary flake. The retouch is shallow, forming a blunt working edge and extending across the broken distal edge of the flake. No. 7341 is the proximal fragment of a scraper on a robust secondary flake. The secondary working is invasive and confined to the RHS lateral edge, forming a blunt working edge; some use wear is visible. No. 7342 is fashioned on a tertiary flake, with abrupt retouch on the lateral edge.

3 *miscellaneous scrapers*: (Table 21, p. 189). **Part:** 7343 ([Fig. 36] – post-pit 21), 7344 (post-pit 25), 7345 (post-pit 29/30). These are fragments of scrapers which do not fit into the above classifications. No. 7345 is a fragment formed on a tertiary flake, with abrupt secondary working at the flake edge. No. 7344 is a crude example with abrupt retouch on three sides of a tertiary flake fragment. No. 7343 is a small fragment with fine abrupt retouch on the distal and part of the lateral edge of a secondary flake.

Transverse arrowhead: **Part:** 7346 ([Fig. 36] – post-pit 7). There is one fragment of what Green (1980, 38, 102; Fig 38) has termed an "Irish oblique pointed arrowhead". It was fashioned from pebble flint.

Miscellaneous Retouched Pieces (Table 18, p. 186).

Retouched blade: **Complete:** 7347 (post-pit 5), a blade with retouch extending obliquely across the distal end.

10 *retouched flakes*: **Complete:** 7348 (post-pit 2), 7349 (post-pit 4), 7350

([Fig. 36] – post-pit 29/30). **Part:** 7351 (post-pit 1), 7352 (post-pit 2), 7353 (Fig. 36), 7354 (post-pit 4), 7355 ([Fig. 36] – post-pit 21), 7356 (post-pit 25), 7357 (post-pit 29/30). These flakes have abrupt, irregular retouch on the lateral and distal edges.

8 *notched flakes*: **Complete:** 7358–9 (post-pit 5), 7360 ([Fig. 36] – post-pit 11A), 7361 ([Fig. 36] – post-pit 25), 7362 ([Fig. 36] – post-pit 28), 7363 (post-hole 35). **Part:** 7364 (post-pit 11A), 7365 (post-pit 27). These are flakes with small notches or concavities formed by fine retouch, 2–3mm in diameter on the lateral and distal edges of the flakes. No. 7363 is a flake with two small notches at the lower lateral edge. Nos. 7358–7359 are two flakes each with a notch on the lateral edges. No. 7360 is a complete utilised flake produced by hinge fracture with a notch at the distal end. No. 7364 is a utilised flake fragment with small notches at the distal end. No. 7362 is a flake with a small notch, less than 2mm in diameter, worked into the lateral edge.

27 *chips*: 7366 (post-pit 2), 7367–73 (post-pit 3), 7374 (post-pit 4), 7375–7a–e (post-pit 5), 7378–80a (post-pit 8), 7380b (post-pit 15), 7381 (post-pit 24), 7382 (post-pit 25), 7383 (post-pit 26), 7384–6 (post-pit 27), 7387 (post-hole 33). Cortical analysis shows that twenty six are tertiary pieces and one is a secondary piece.

11 *irregular fragments*: 7388 (post-pit 1), 7389–92 (post-pit 2), 7393 (post-pit 4), 7394 (post-pit 8), 7395 (post-pit 13), 7396 (post-pit 17), 7397 (Pl. X), 7398 (post-hole 34). These are formed by concoidal and thermal fractures. No. 7394 conjoins with a core no. 6676 (post-hole 34).

Polished stone axe: (Table 22, p. 190). 7399 ([Fig. 37; Pl. XI] – post-pit 4), 7400 (post-pit 25), 7401 (post-pit 27). No. 7399 is made from porcellanite (88mm by 41.5mm by 21.5mm). The body is slightly convex, with one side virtually straight, the other more curved. There are facets on both sides, but they are more pronounced on the curved side. The profile is symmetrical, the section a flattened oval. Three areas of surface damage are visible, on the facet of the straight side and on each face. A chip is removed from the upper part of the facet on the straight side. The butt is damaged, truncating it obliquely. Discolouration of the stone is apparent in the lower portion of the blade. Horizontal scratches are present on one face of the lower portion of the blade. No. 7401 is a small fragment of a polished stone axe. No. 7400 is a small flake of a polished stone axe.

3 *worked stones*: (Table 22, p. 190), 7402 ([Fig. 37] – post-pit 4), 7403 ([Fig. 37] – post-pit 14), 7404 ([Fig. 37] – post-pit 29/30). 7403 is a sandstone (89mm by 78mm by 28mm), circular in shape with flattened upper and lower surfaces, which are smooth from rubbing or polishing, and slightly concave. This concavity is more pronounced on the upper surface, with some pocking in the concavity. The profile is

Fig. 32. Grooved Ware Complex, circular wooden structure: flint finds from post-pits.

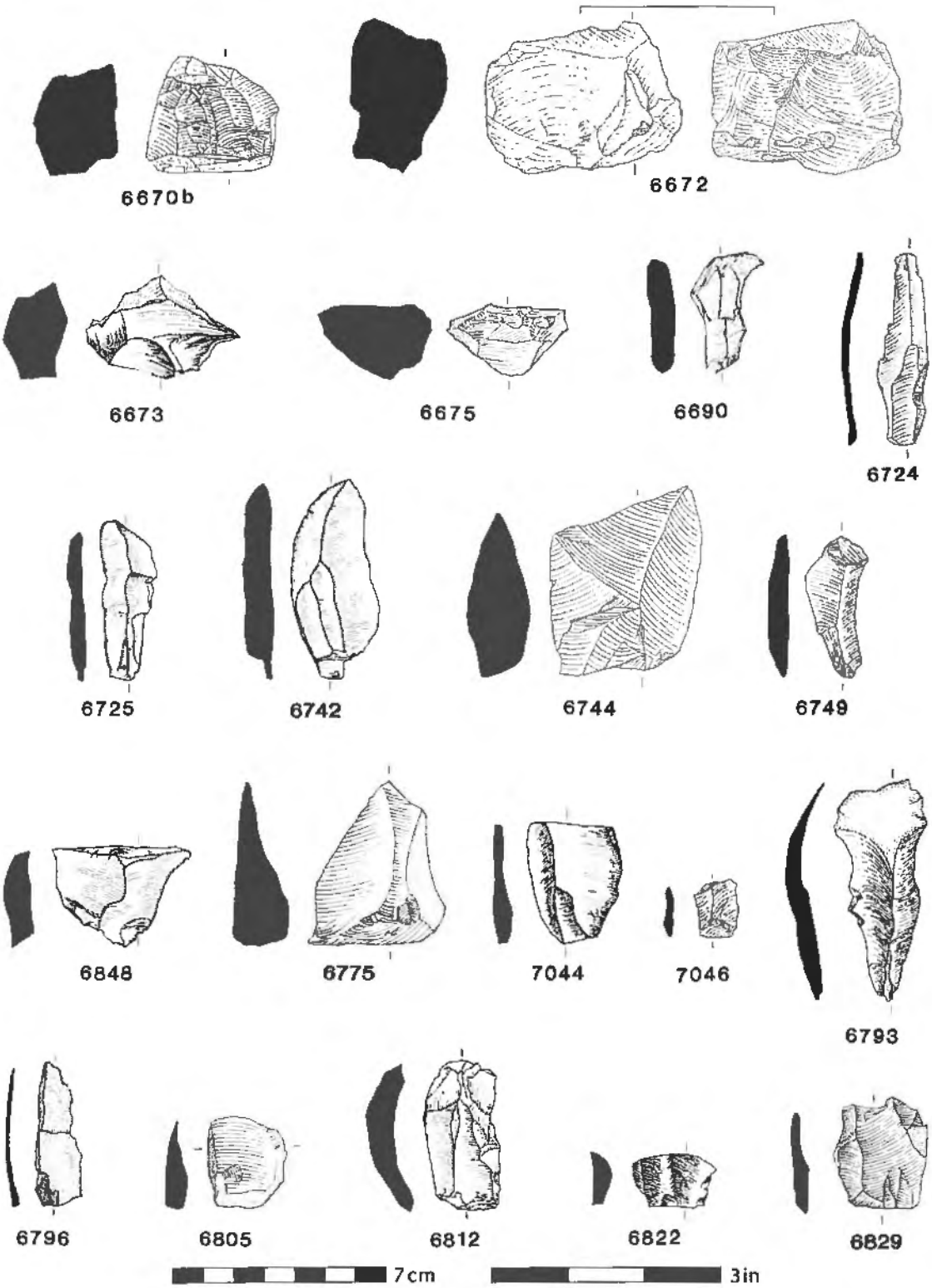


Fig. 33. Grooved Ware Complex, circular wooden structure: flint finds from post-pits.

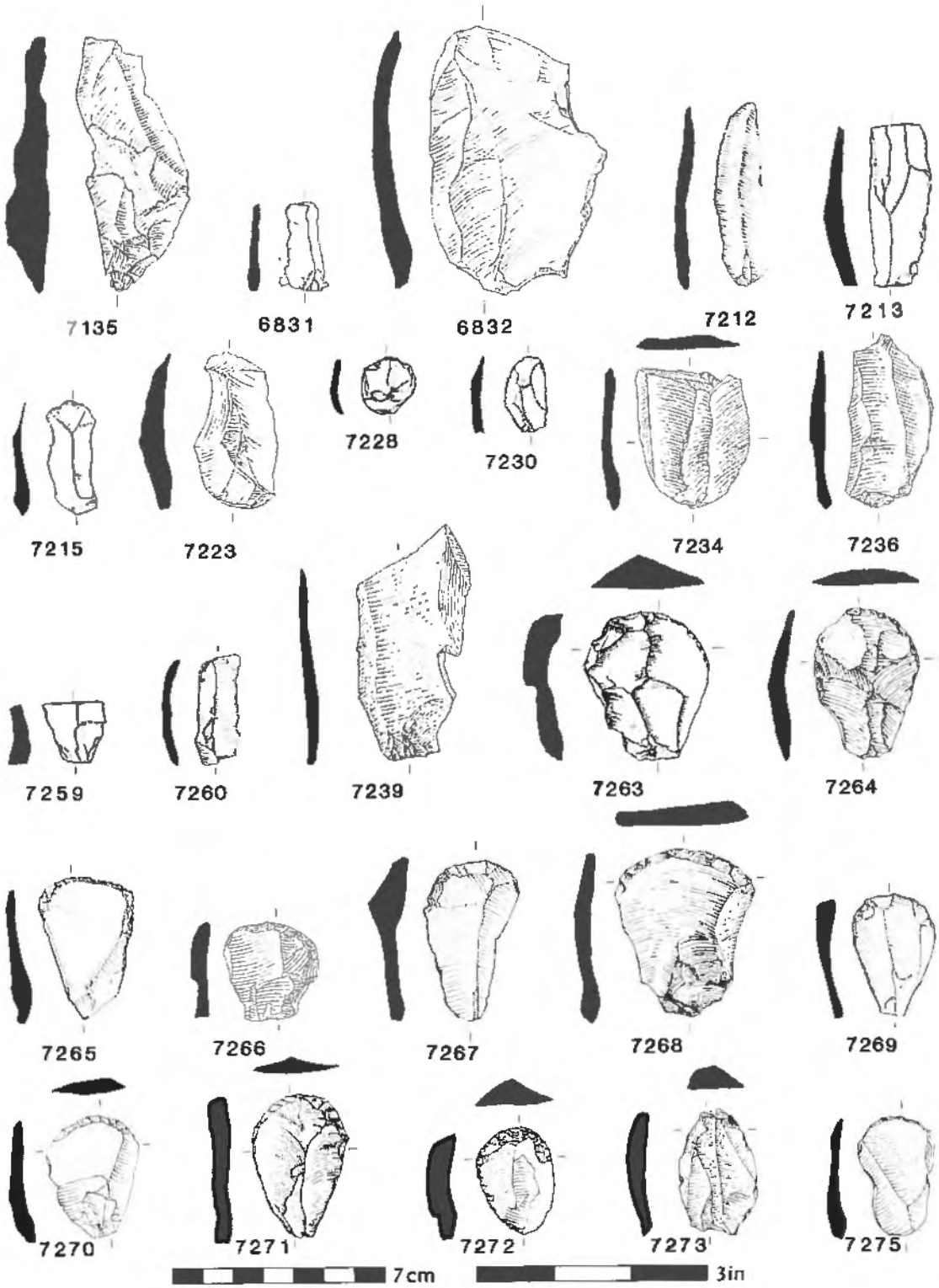


Fig. 34. Grooved Ware Complex, circular wooden structure: flint finds from post-pits.

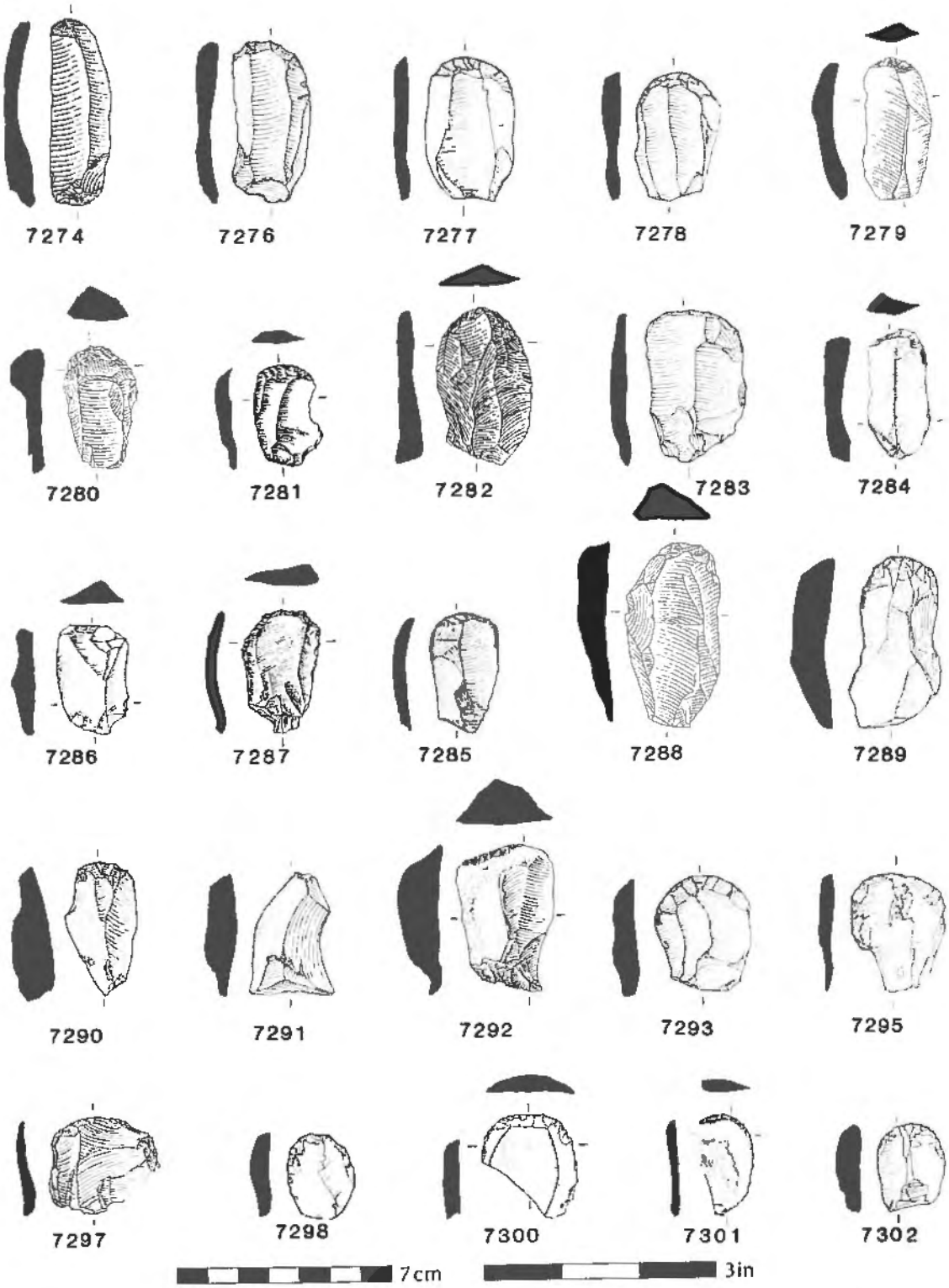


Fig. 35. Grooved Ware Complex, circular wooden structure: flint finds from post-pits.

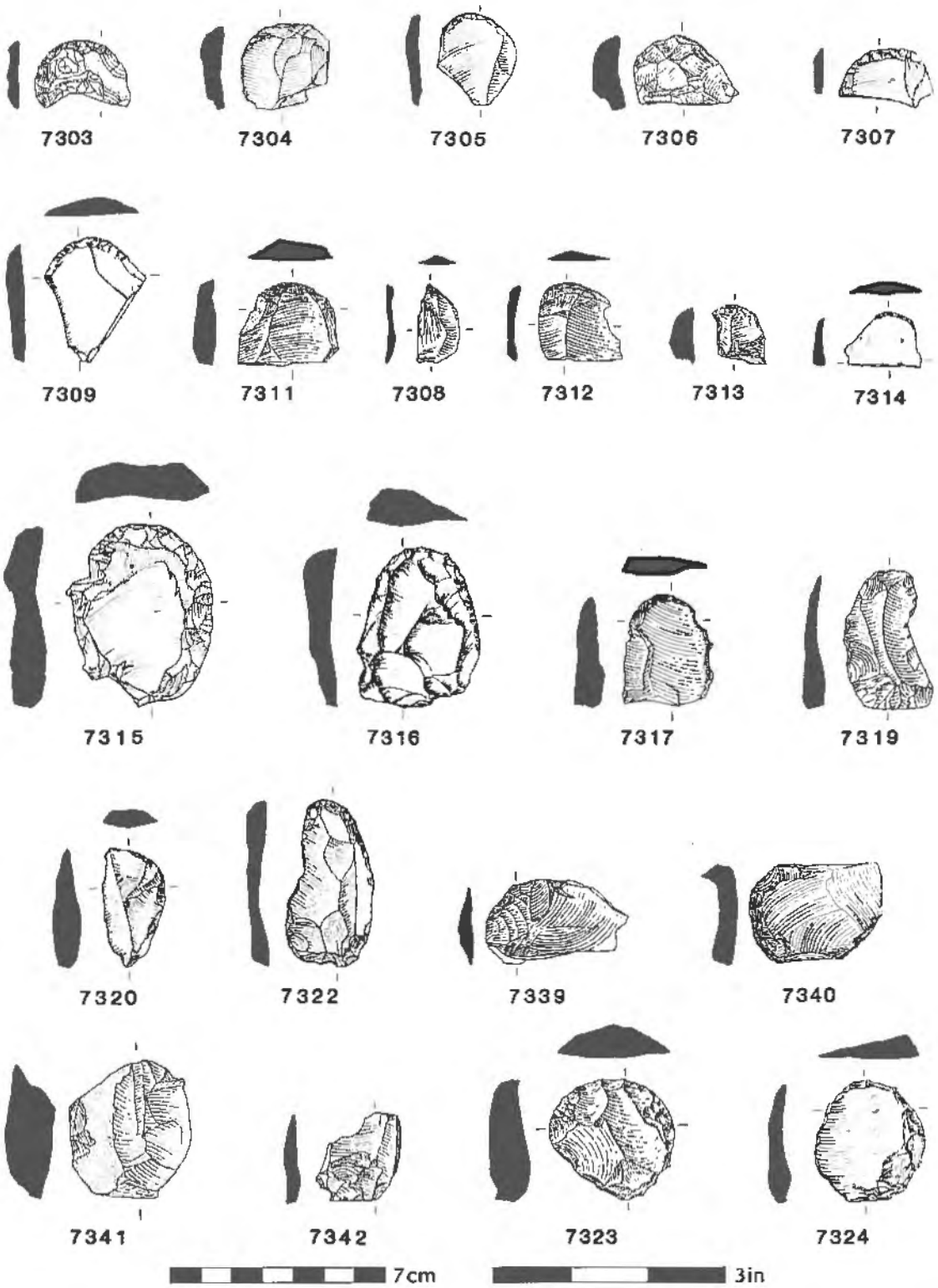


Fig. 36. Grooved Ware Complex. Circular wooden structure: flint finds from post-pits.

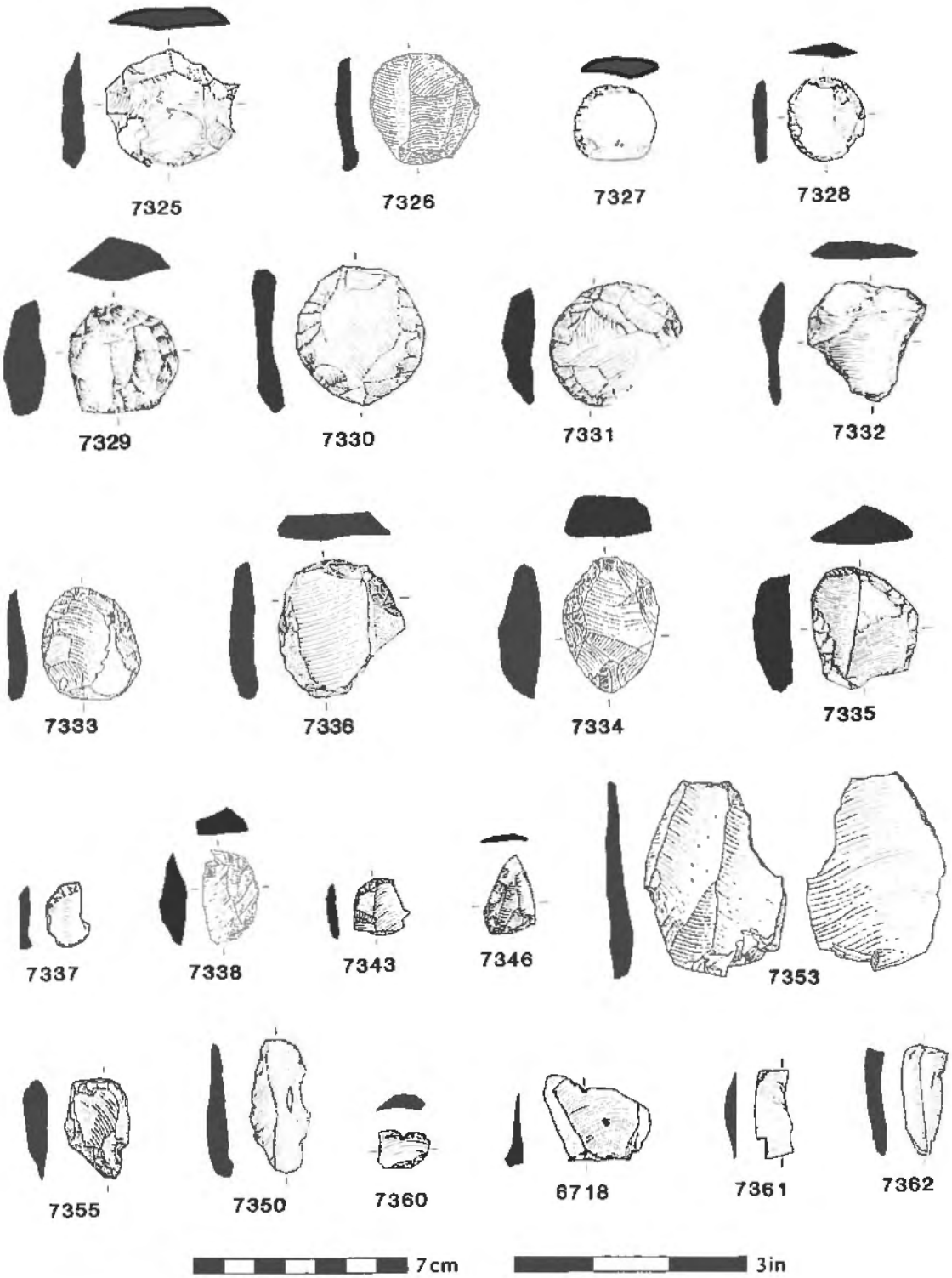
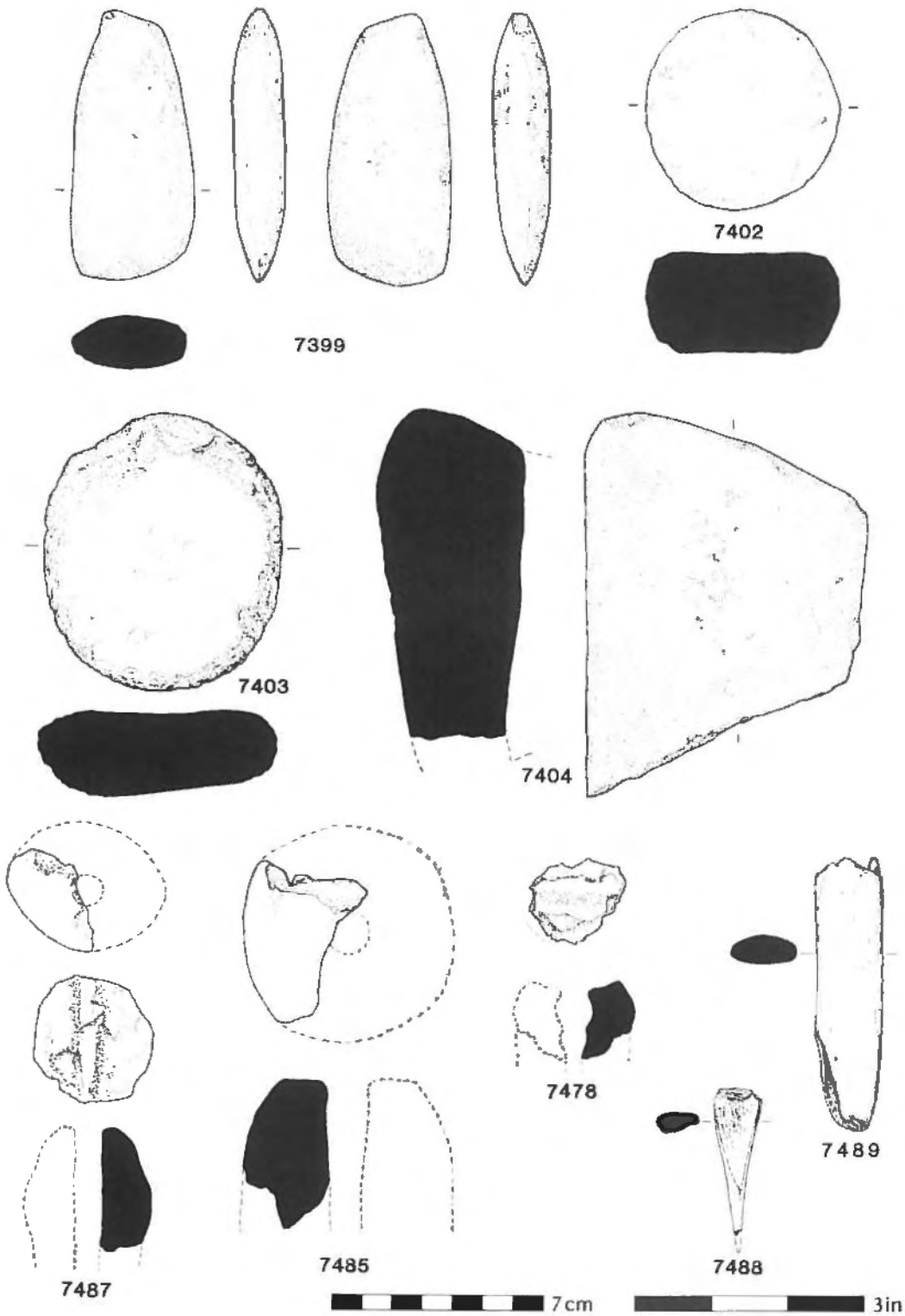


Fig. 37. Grooved Ware Complex, circular wooden structure: stone axe-head and other finds from post-pits.



symmetrical, the section sub-rectangular. The edge of the stone is crudely shaped and appears to be re-worked from an originally larger stone. Damage from the re-working is present on the lower side, which caused removal of a portion of the smooth surface. No. 7402 (post-pit 4) is a small circular stone (66mm by 65mm by 33mm) of a sandstone-type rock with smooth upper and lower surfaces from polishing or rubbing. Both surfaces are slightly concave, a feature more pronounced in the upper surface. The edge is crudely shaped by pocking or chipping, which damaged the upper and lower surfaces. It appears to be re-worked from a larger size. No. 7404 is a fragment of greengrit with part of the original weathered surface remaining; the fracture appears to be natural. Some pocking is present on an area, 44mm by 27mm, of the weathered surface.

5 *unworked chert fragments:* (Table 22, p. 190), 7405 (post-pit 3), 7406 (post-pit 16), 7407 (post-pit 17), 7408–9 (post-pit 24).

31 *unworked quartz fragments:* (Table 22, p. 190), 7410–11 (post-pit 2), 7412–27 (post-pit 3), 7428–9 (post-pit 4), 7430 (post-pit 5), 7431 (post-pit 7), 7432 (post-pit 17), 7433–4 (post-pit 19), 7435 (post-pit 25), 7436–8 (post-pit 29/30), 7439 (post-pit 31/32), 7440 (post-hole 33).

3 *unworked rock crystal fragments:* (Table 22, p. 190), 7441 (post-pit 2), 7442 (post-pit 3), 7443 (post-pit 18).

Quartzite pebble: 7444 (post-pit 18). A complete unworked pebble.

6 *rounded stones:* 7445 (post-pit 1), 7446–8 (post-pit 2), 7449–50 (post-pit 4). All are unworked.

8 *unworked fragments of miscellaneous stones:* 7451 (post-pit 1), 7452a–b, 7453–4 (post-pit 2), 7455–6 (post-pit 3), 7458 (post-pit 20). These appear to be accidental inclusions, fractured from the packing stones.

Comments

As noted (p. 36), lithic assemblages can provide information on the acquisition of raw materials, the technology used to knap the flint and the range of implements in use. In addition, this assemblage is believed to have been deposited (see below) in a structured and formalised manner.

The analysis of the raw material of worked or knapped pieces shows the predominance of flint; non-flint was rarely used. Almost 4kg of flint was imported from the chalk deposits. This could have been acquired as blank flakes or as nodules. The low number of cores, and the discrepancy in size (maximum core dimension 65mm and maximum flake dimension 98mm) between the five cores and the *mean* or *mode* of the complete flakes, tend to point to the importation

of blank flakes. However, due to the selective nature of the deposition, the cores present in the post-pits may not be fully representative. In addition, cortical flakes, which form one third of the group, indicate the use of some nodules of flint which could have been imported.

The largest group in the assemblage (Table 10, p. 180) consists of unmodified pieces which form 68.5%. As seen above, only a small percentage (6.5%) is knapping debris, the majority being unutilised flakes and blades (62%). The flakes range from parallel-sided examples with narrow-faceted butts to large crude pieces which contain flaws in the flint. As noted above, a feature of these flakes is their fresh, unabraded edges, which is not consistent with use or even forming part of a 'midden' before deposition in the pit. It is possible that they were knapped specifically to be deposited in the pits, and it must be considered that the flakes were deliberately broken before being placed in the post-pits. The high proportion of broken flakes then seems anomalous. The retouched assemblage consists almost exclusively of scrapers, predominantly end scrapers, but round, side, as well as side-and-end scrapers also feature. Irish parallels for these end scrapers are found at the Grange enclosure, Co. Limerick (Ó Ríordáin 1951, fig. 3; nos. 12–15, 25–6, 32, 36). These include examples of direct percussion producing robust end scrapers (Knowth Group 3) and end of blade-like flake scrapers (Knowth Group 2). A further example (Ó Ríordáin 1951; fig. 3 no. 32) is typical of the Knowth 'tear-drop' end scrapers (Knowth Group 1). At Newgrange, parallels are present for Group 2 end scrapers (O'Kelly et al 1983, fig. 52 E56:857, 1198), Group 1 end scrapers (O'Kelly et al 1983, fig. 55 E56:824, 34) and broken scrapers (Group 5) (O'Kelly et al 1983, fig. 57 E56:250, 820). It has, however, not been established if the Grooved Ware at Newgrange forms an autonomous assemblage, or if there is a mixture of Beaker elements. Some examples may also be paralleled at Dalkey Island, although their context is unclear (Liversage 1968, fig. 23, Sites II and V, Nos. 3149, 3148). As was the case with the flakes from Knowth, 'freshly' broken scrapers form a significant group (*cf.* end scrapers Group 5). Each of these sites also produced transverse arrowheads, but the closest parallel to the crude Knowth example (Fig. 36: 7346) is at the Grange enclosure, although more developed examples are also present (Ó Ríordáin 1951, fig. 3: 3, 4, 39, 40, 41).

At Knowth, a pattern of deposition (Fig. 41) is evident from the distribution of weight and frequency of the lithics in the pits. The pattern is symmetrical, with the numbers of flints on either side of the entrance being almost equal, then dropping for post-pits 6 and 24 and increasing for post-pits 23 and 8. A slight discrepancy is noted in post-pits 9, 10, 11, 11A and 12. The elaboration of the entrance of the monument, with the large double post-pits forming a porch feature and facade, is reflected in the lithic distribution, with 179 (22%) flints in the four entrance post-pits (post-pits 5, 25, 29/30, 31/32). In view of this relationship between the monument and the lithics, the concentration of finds in the central post–pits highlights their significance.

Table 10: Grooved Ware Complex, circular wooden structure lithic assemblage

No.	Artefact type	Frequency	Percentage
1.	*Selection of material*	(2)	0.25
	Split pebble	2	
2.	*Production of tools*	(52)	6.25
	Cores	8	
	Core rejuvenation flakes	15	
	Trimming flakes	29	
2a.	*Discarded pieces*	(494)	62
	Unutilised blades	19	
	Unutilised flakes	475	
3.	*Unmodified tools*	(52)	6.5
	Utilised blade	4	
	Utilised flakes	48	
3a.	*Modified tools*	(103)	13
	End scrapers	52	
	Side-and-end scrapers	6	
	Double-ended scrapers	2	
	Round scrapers	16	
	Side scrapers	4	
	Miscellaneous scrapers	3	
	Transverse arrowhead	1	
	Retouched blades	1	
	Retouched flakes	10	
	Notched flakes	8	
	Miscellanea	(98)	12
	Flint chips	27	
	Irregular fragments	11	
	Polished stone axe	1	
	Polished stone axe fragments	2	
	Worked stones	3	
	Unworked chert	5	
	Unworked quartz	31	
	Rock crystal	3	
	Quartzite pebble	1	
	Rounded stones	6	
	Unworked fragments of misc. stones	8	
Total		801	100%

Table 11: Grooved Ware Complex, circular wooden structure lithic assemblage. Raw material analysis (Sample 801)

Raw Material	Frequency	Percentage
Flint	(734)	(91.6)
Chalk	350	43.69
Pebble	303	37.8
Other	27	3.37
Burnt	54	6.74
Chert	(12)	(1.5)
Worked	7	.87
Unworked	5	.63
Polished stone axe	1	.12
Polished stone axe fragments	2	.25
Worked stones	3	.38
Quartz	31	3.9
Rock crystal	3	.38
Quartzite pebble	1	.12
Rounded stones	6	.75
Miscellaneous stones	8	1
Total	801	100%

Table 12: Grooved Ware Complex, circular wooden structure lithic assemblage. Analysis of cortex on lithic assemblage (Sample 722)

Cortex	Flakes	Scrapers	Total	Percentage
Primary	(33)	(3)	(36)	5
Chalk	15	2	17	
Pebble	16	1	17	
Caramel	2	0	2	
Burnt	0	0	0	
Secondary	(169)	(32)	(201)	28
Chalk	87	19	106	
Pebble	70	9	79	
Caramel	5	2	7	
Burnt	7	2	9	
Tertiary	(437)	(48)	(485)	67
Chalk	190	27	217	
Pebble	189	17	206	
Caramel	14	4	18	
Burnt	44	0	44	
Total	639	83	722	100%

Table 13: Grooved Ware Complex, circular wooden structure lithic assemblage. Platform types (Sample 264)

Platform type	Flakes	Scrapers	Other	Total	Percentage
Cortical	8	3	2	13	5
Prepared	170	31	2	203	77
Faceted	8	9	1	18	7
Punch	26	2	2	30	11
Total	212	45	7	264	100%

Table 14: Grooved Ware Complex, circular wooden structure lithic assemblage. Depths of complete platforms (Sample 264)

Intervals in mm	Flakes	Scrapers	Total	Percentage
0–0.9mm	6	0	6	2.25
1–1.9mm	40	1	41	15
2–2.9mm	41	9	50	19
3–3.9mm	43	6	49	19
4–4.9mm	29	10	39	15
5–5.9mm	17	4	21	8
6–6.9mm	12	3	15	6
7–7.9mm	11	2	13	5
8–8.9mm	5	4	9	3
9–9.9mm	4	0	4	1.5
10–10.9mm	1	1	2	.75
11–11.9mm	4	4	8	3
12–12.9mm	2	1	3	1
> 13mm	4	0	4	1.5
Total	219	45	264	100%

There are 326 (41%) flints in the central post-pits (post–pits 1-4). This focus is further emphasised by the distribution of the scrapers, which are almost the sole implement type, with 43 (54%) scrapers found in the central post-pits (post-pits 1–4). The weight of flint produces a similar pattern, with 2659g (56%) of flint in the central pits (post-pits 1–4). However the weight of flint in the four entrance post-pits drops to 496g (10%). The occurrence of burnt flints concentrates around the entrance post-pits (nos. 5, 25, 29/30, 31/32) and the post-pits of the facade (nos. 26, 27, 28, 33, 34, 35). Within the post-pits, the burnt flints were found in the upper fill (post-pits 3, 5, 6, 7, 23, 25, 27, 29/30, 31/32, 33, 34) and in the post-shaft (post-pits 3, 24). The flints were burnt before being placed in the pits.

In short the assemblage was carefully deposited in the post-pits following an overall pattern. This is seen in the distribution of flints and their weight, as well as in the dominant implement type, scrapers. The pattern of deposition focuses on the central pits and the entrance, with an almost symmetrical deposition around the rest of the circle.

Table 15: Grooved Ware Complex, circular wooden structure lithic assemblage. Cores and core rejuvenation flakes

Post-pit	Cores	Core rejuvenation flakes	Pebbles
1	0	2	0
2	1	1	0
3	0	0	0
4	0	4	0
7	0	1	0
16	3	0	0
20	0	2	0
21	0	1	1
22	0	1	0
23	1	0	0
25	0	1	1
26	1	0	0
27	1	0	0
33	0	2	0
34	1	0	0
Total	8	15	2

Table 16: Grooved Ware Complex, circular wooden structure lithic assemblage. Unutilised blades and flakes

Post-pit	Complete blades	Complete flakes	Part blades	Part flakes
1	1	10	1	27
2	1	7	1	43
3	1	8	2	45
4	0	9	0	31
5	0	8	2	31
6	0	2	0	4
7	0	2	0	7
8	0	4	0	11
9	0	0	0	1
11A	0	2	0	3
13	0	1	0	2
14	0	2	0	11
15	0	2	0	1
16	0	4	1	13
17	0	5	1	8
18	0	0	0	2
19	0	2	0	7
20	0	3	0	4
21	0	1	0	5
22	0	5	1	8
23	0	2	0	3
24	0	3	0	5
25	1	9	2	23
26	0	0	0	2
27	1	1	0	22
28	0	3	0	3
29/30	2	5	0	26
31/32	0	6	1	9
33	0	2	0	2
34	0	1	0	2
35	0	1	0	2
Total	7	110	12	363

Clay and Stone objects from post-pits (Pl. XII)

Clay objects: A total of 31 fragments of hard-baked clay was found in 16 of the post-pits (nos. 2–6, 8, 9, 12, 19, 20, 25–7, 29/30, 31/32 and 33). The objects are roughly-shaped and contain a low content of mainly fine grits, although no. 7484 contains a large stone grit measuring 9mm across. No complete objects were found. They are baked to a very hard consistency. From the larger fragments, it seems that they may originally have been barrel-shaped, with a rounded body, flattened ends and a central perforation. Some, nos. 7478, 7485, and 7487 (Fig. 37), show evidence for a perforation, though all of these are broken across the middle.

Table 17: Grooved Ware Complex, circular wooden structure lithic assemblage. Utilised blades and flakes

Post-pit	Complete blades	Complete flakes	Part blades	Part flakes
1	0	3	1	0
2	0	4	0	0
3	1	2	0	4
4	0	1	0	1
5	0	0	0	1
6	0	4	0	2
8	0	1	0	2
9	0	0	1	0
12	0	0	0	1
14	0	1	0	1
15	0	0	0	1
17	0	1	0	1
20	0	2	0	1
22	0	1	0	1
25	0	2	0	2
26	0	1	0	0
27	0	0	0	1
29/30	0	3	0	1
31/32	0	2	1	0
34	0	0	0	0
Total	1	28	3	20

It is difficult to explain the function of these objects, but they resemble loom weights. It is not certain whether they represent broken discarded pieces or were broken deliberately. Similar objects have been found on British Grooved Ware sites. A baked clay spindle-whorl was found in post-hole 95 of the Southern Circle at Durrington Walls (Wainwright and Longworth 1971, 189: fig. 82). A broken circular clay object with traces of a central perforation was found at Carnaby Top Site 20, which may be comparable to the Knowth clay objects (Manby 1974, fig. 11; 13).

No. 7485 (Fig. 37) is a large fragment; part of the outer wall and the perforation survive. The fabric is hard and dense, orange in colour, with a smoothed-shaped exterior surface and few visible grits. No. 7487 is broken across the perforation. A twig was possibly used to create the perforation, as there are wood-like impressions on the clay. The exterior surface has been roughly smoothened. Two large stone grits (< = 5.0mm) are visible protruding through the surface. The exterior surface is orange in colour with a grey/black core. No. 7478 (Fig. 37) consists of part of a central core and perforation, grey/black in colour and with few visible grits. No. 7475 consists of a fragment with part of the outer wall intact; it is roughly-shaped and smoothened, orange in colour throughout and with few visible grits. No. 7474 is a fragment with part of the outer wall intact, and a slight trace of the perforation

Table 18: Grooved Ware Complex, circular wooden structure lithic assemblage. Retouched pieces

Post-pit	Retouched blades	Retouched flakes	Notched flakes
1	0	1	0
2	0	2	0
4	0	3	0
5	1	0	2
11A	0	0	2
21	0	1	0
25	0	1	1
27	0	0	1
28	0	0	1
29/30	0	2	0
35	0	0	1
Total	1	10	8

survives; the exterior and interior surfaces are orange in colour, with a black core. The remaining examples nos. 7459–73, 7476–7, 7479–83 and 7486 are small fragments of the same sort of fabric, and are obviously parts of the same type of object.

Bone objects (Fig. 37) Two bone objects were found within the post-shaft of post-pit 1. No. 7488 is a small tapered and pointed object, 40.8mm long and 10.6mm wide, where it then tapers to a point; the tip is missing. The surface is smooth and appears to have been polished. No. 7489 is broken, but the area which survives measures 80.9mm in

Table 19: Grooved Ware Complex, circular wooden structure lithic assemblage. Trimming flakes, chips and irregular fragments

Post-pit	Trimming flakes	Chips	Irregular fragments
1	0	0	1
2	2	1	4
3	3	7	0
4	6	1	1
5	1	7	0
7	1	0	0
8	2	3	1
13	0	0	1
15	0	1	1
16	2	0	0
17	0	0	1
22	5	0	0
24	1	1	0
25	1	1	0
26	1	1	0
27	1	4	0
29/30	1	0	0
31/32	1	0	0
33	1	0	0
34	0	0	2
Total	29	27	11

length. The damaged end is 20.2mm wide; it tapers gradually from here to form a rounded end. This object is also smooth and appears to have been polished.

Finds of Grooved Ware pottery and flint from the brown layer within the Timber Circle

A thin brown, fairly sterile layer, which was associated with the use of the timber circle, produced a number of finds. All finds of pottery consisted of Grooved Ware, and at least some of the chalk flint and large scrapers (nos. 7532, 7541, 7542, 7550, 7559, 7561, 7572, 7574, 7580,

Table 20: Grooved Ware Complex, circular wooden structure lithic assemblage. End scrapers

Post-pit	Group 1	Group 2	Group 3	Group 4	Group 5
1	2	1	0	0	2
2	3	3	0	1	3
3	1	0	1	0	0
4	1	2	3	2	3
5	1	2	0	0	0
7	0	0	0	0	1
8	0	0	0	0	1
10	0	1	0	0	0
11A	0	0	0	1	0
12	1	0	0	0	1
15	0	1	0	0	0
16	0	1	0	1	0
19	0	0	0	1	1
22	1	0	0	0	0
25	0	1	1	1	0
27	0	1	0	0	0
28	0	0	0	0	1
31/32	0	0	0	0	2
33	0	2	0	0	0
Total	10	15	5	7	15

7585, 7586, 7590, 7591, 7593, 7594, 7596–7601, 7605) belong to the Grooved Ware Complex (Fig. 38). However, some of the smaller flint pieces might well belong to the preceding layer, which most likely represents the Earlier 'Western' Neolithic Complex, as the dark layer which is a defining feature of the Decorated Pottery Complex is not found here.

A total of 60 sherds of Grooved Ware was found; most consist of fragments and it was only possible to identify 6 vessels with any degree of confidence, sherds nos. 7490–7509d, 7690–7703 (see catalogue below). The remaining sherds (nos. 7510–22, 7525–8) were too small to be assigned to vessels, but they could be divided into two groups consisting of fine and coarse ware. The *fine Grooved ware* consists of bodysherd fragments, nos. 7510–20, and probably represents up to three vessels. All are from thin-walled vessels, consisting mainly of good quality, hard fabric with a high content of fine grits (< = 2.5mm). The exterior surfaces are generally orange in colour with black interior surfaces and cores. The *coarse Grooved ware*

Table 21: Grooved Ware Complex, circular wooden structure lithic assemblage. Other scraper types

Post-pit	Double ended	Side-and -end	Round	Side	Misc.
1	0	1	3	2	0
2	1	0	1	1	0
3	0	0	3	0	0
4	1	0	2	0	0
5	0	0	1	0	0
11A	0	1	1	0	0
15	0	2	0	0	0
19	0	0	1	0	0
20	0	0	1	0	0
21	0	1	0	1	1
23	0	0	1	0	0
25	0	0	1	0	1
28	0	0	1	0	0
29/30	0	0	0	0	1
31/32	0	1	0	0	0
Total	2	6	16	4	3

sherds consist of two bodysherds nos. 7521–2 and six fragments nos. 7523–8, and represent up to two vessels. They are generally orange in colour with black interior surfaces, and orange or black cores. Five fragments of baked clay, similar to those found within the post-pits, were also found in this layer, nos. 7523, 7524a–d.

Catalogue

Vessel 45 11 bodysherd fragments 7490–8, 7690, 7690a. Hard, compact fabric with a high grit content (< = 5.0mm). Colour: black throughout. T. 5.0–7.3mm.

Table 22: Grooved Ware Complex, circular wooden structure lithic assemblage. Non-flint lithics

Post-pit	Polished stone axe	Worked stones	Unworked chert	Unworked quartz	Rock crystal
1	0	0	0	0	0
2	0	0	0	2	1
3	0	0	1	16	1
4	1	1	0	2	0
5	0	0	0	1	0
7	0	0	0	1	0
14	0	1	0	0	0
16	0	0	1	0	0
17	0	0	1	1	0
18	0	0	0	0	1
19	0	0	0	2	0
20	0	0	0	0	0
24	0	0	2	0	0
25	1	0	0	1	0
27	1	0	0	0	0
29/30	0	0	0	3	0
31/32	0	0	0	1	0
33	0	0	0	1	0
Total	3	3	5	31	3

Table 23: Grooved Ware Complex, circular wooden structure. Table showing find totals

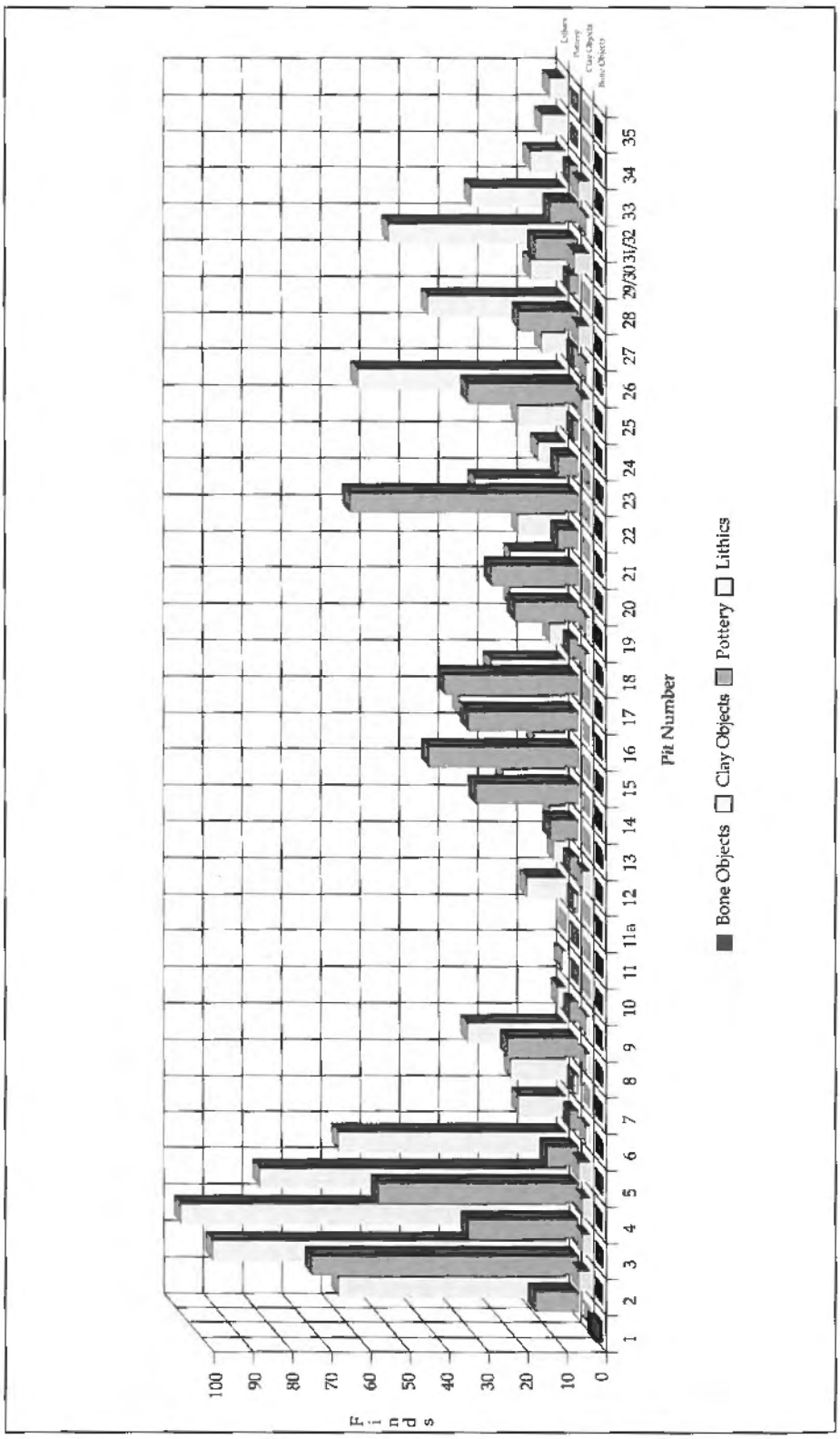
KNOWTH TIMBER STRUCTURE

PIT	GROOVED WARE Post Shaft: Rim	Base	Body	Total	Upper Fill: Rim	Base	Body	Total	Annexe Rim	Base	Body	Total	CLAY OBJECTS P.S.	U.F	A.	Total	LITHICS P.S.	U.F.	A.	Total	BONE OBJECTS P.S.	U.F.	A.	Total	TOTALS Pottery	Finds	Total
1	0	0	8	8	0	0	1	1	0	0	2	2	0	0	0	0	1	17	40	58	2	0	0	2	11	60	71
2	0	0	6	6	2	1	20	23	5	5	29	39	1	2	0	3	6	65	19	90	0	0	0	0	68	93	161
3	0	0	1	1	0	3	24	27	0	0	0	0	2	0	0	2	20	78	0	98	0	0	0	0	28	100	128
4	0	0	10	10	0	1	6	7	0	0	34	34	0	1	1	2	13	26	39	78	0	0	0	0	51	80	131
5	1	0	7	8	0	0	0	0	0	0	0	0	3	0	0	3	11	47	0	58	0	0	0	0	8	61	69
6	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	1	3	9	0	12	0	0	0	0	2	13	15
7	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	14	0	0	0	0	1	14	15
8	2	1	9	12	0	0	6	6	0	0	0	0	0	1	0	1	17	8	0	25	0	0	0	0	18	26	44
9	0	0	1	1	0	0	1	1	0	0	0	0	0	1	0	1	0	2	0	2	0	0	0	0	2	3	5
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11a	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	0	1	10	11
12	0	0	2	2	0	0	0	0	0	0	0	0	1	1	0	2	1	2	0	3	0	0	0	0	2	5	7
13	0	5	0	5	1	0	1	2	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	7	4	11
14	4	5	16	25	1	0	0	1	0	0	0	0	0	0	0	0	0	16	0	16	0	0	0	0	26	16	42
15	3	7	24	34	0	0	4	4	0	0	0	0	0	0	0	0	3	5	0	8	0	0	0	0	38	8	46
16	2	12	12	26	0	0	2	2	0	0	0	0	0	0	0	0	15	12	0	27	0	0	0	0	28	27	55
17	1	3	17	21	4	0	9	13	0	0	0	0	0	0	0	0	2	17	0	19	0	0	0	0	34	19	53
18	0	0	2	2	0	0	0	0	0	0	0	0	0	1	0	1	2	2	0	4	0	0	0	0	2	5	7
19	0	0	0	0	0	0	16	16	0	0	0	0	0	1	0	1	1	13	0	14	0	0	0	0	16	15	31
20	0	0	0	0	0	4	18	22	0	0	0	0	0	0	0	0	0	14	0	14	0	0	0	0	22	14	36
21	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	12	0	0	0	0	5	12	17
22	0	0	19	19	3	0	36	39	0	0	0	0	0	0	0	0	1	22	0	23	0	0	0	0	58	23	81
23	0	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0	1	6	0	7	0	0	0	0	5	7	12
24	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	5	7	0	12	0	0	0	0	1	12	13
25	0	1	13	14	0	2	12	14	0	0	0	0	2	0	0	2	29	24	0	53	0	0	0	0	28	55	83
26	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	1	5	0	6	0	0	0	0	1	7	8
27	0	0	0	0	3	0	12	15	0	0	0	0	0	3	0	3	0	35	0	35	0	0	0	0	15	38	53
28	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	9	0	0	0	0	2	9	11
29/30	0	0	1	1	0	1	9	10	0	0	0	0	3	1	0	4	16	29	0	45	0	0	0	0	11	49	60
31/32	0	0	0	0	1	0	6	7	0	0	0	0	0	1	0	1	0	24	0	24	0	0	0	0	7	25	32
33	0	0	0	0	0	1	1	2	0	0	0	0	1	2	0	3	0	9	0	9	0	0	0	0	2	12	14
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	0	0	0	0	0	6	6
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	4	4
Total	13	36	159	208	15	13	189	217	5	5	65	75	13	17	1	31	155	547	98	800	2	0	0	2	500	833	1333
Average	0.382	1.0588	4.6765	6.1176	0.44	0.3824	5.5588	6.3824	0.15	0.1471	1.9118	2.2059	0.38	0.5	0.03	0.912	4.56	16.1	2.88	23.5	0.06	0	0	0.06	14.7059	24.5	39.2059

Abbreviations:

P.S.= Post Shaft
U.F.= Upper fill
A.= Annexe

Table 24: Grooved Ware Complex, circular wooden structure. Bar-chart showing total number of finds



Vessel 46 13 bodysherd fragments 7499–7505, 7691–6. Hard good quality fabric with a moderate to high grit content (< = 4.0mm). Nos. 7500, 7501, and 7503 have encrusted matter on the interior surface. Colour: orange/black/black. T. 5.0–7.9mm.

Vessel 47 13 bodysherds 7506–7, 7695, 7697–7701, 7703. Coarse fabric with a high grit content (< = 5.0mm). Colour: orange/grey/orange. T. 8.0–10.5mm.

Vessel 48 2 bodysherds 7508–9, probably from the same vessel. Coarse fabric, but the exterior surface has been roughly smoothened, and sooting occurs on the interior surface. High grit content (< = 5.4mm). Colour: orange/orange/black. T. 8.0–12.1mm.

Vessel 49 3 bodysherds 7509a–c and a fragment 7509d. Coarse hard fabric with a high grit content (< = 2.1mm). Colour: orange throughout. T. 6.9–8.5mm.

Vessel 50 Poorly preserved rimsherd 7509e, unexpanded and rounded. Coarse fabric with a high grit content (< = 4.2mm). Most of the exterior surface is missing and the interior surface is sooted. Colour: orange/brown/black. T. 10.9mm.

Lithic assemblage

Fiona Dillon

Introduction. There are 110 lithics in the assemblage (Table 26, p. 198). There were 89 flint artefacts, 4 chert pieces and 17 quartz fragments.

Raw Material. (Table 26, p. 198). Two groups of flint were identified, chalk flint and glacially-deposited pebble flint (see above p. 33). Thirteen pieces of chalk flint were found forming 15% of the assemblage. These included retouched pieces, core rejuvenation flakes and unutilised flakes. There are sixty four pieces (56%) of pebble flint, which include retouched and un-retouched flakes. Twelve pieces (13%) of flint are burnt, but the cortex on three flakes is consistent with pebble flint. Local resources of pebble flint were predominantly exploited, but these were supplemented by the importation of chalk flint. The low level of exploitation of non-flint materials, such as chert and quartz, indicate that there was access to sufficient flint resources.

Technology. As noted above, the main sources of information on the lithic technology are the by-products of knapping, which include core rejuvenation flakes. There are no flint cores or nodules present,

indicating that the initial selection and knapping took place elsewhere. This is confirmed by the low number of unretouched primary flakes. The presence of five core rejuvenation flakes shows that limited knapping took place. These are lateral core rejuvenation flakes removed to provide a fresh flaking surface. Four of the flakes are chalk flint. It is also possible that the rejuvenation flakes may have been used as temporary tools, as they are not associated with knapping debris.

There are 89 struck pieces of flint. Cortical analysis (Table 27, p. 197) shows *c.* 5% are primary flakes, one of which is a scraper (no. 7599), and *c.* 16% are secondary flakes. The remaining 79% are tertiary flakes, which confirms that the testing and preparation of cores was done elsewhere. Twenty-two had intact platforms which, when examined, showed a predominance of prepared platforms. As there are only three retouched pieces with intact platforms, it is not possible to associate a particular platform type with implements. There is little consistency in the knapping methods, with examples of both percussive and bi-polar reduction present. Two examples of bipolar reduction indicate that pebbles of reasonable size and quality were exploited. Indirect hard and soft hammer percussion is present in the knapped assemblage. There is no clear association between the reduction techniques and the end product, the implement. This may be due to the size of the assemblage but, from the scrapers, hard and soft hammers were used to produce flakes of different sizes, which were then modified into scrapers. Four trimming flakes indicate that only a small amount of secondary working took place. The modified tools provide examples of both abrupt (no. 7599, a round scraper) and fine invasive secondary working (no. 7593, a transverse arrowhead). The technology lacks an overall consistency with cortical, prepared and uniform platforms present, and the use of different reduction techniques. This does not appear to be related to either the type of flint or the artefact, but appears to be a characteristic of the technology. Fourteen pieces or 16% of the assemblage, including two scrapers and a knife, are complete. Metrical analysis shows a tendency towards a blade form in five of the pieces. The preferred lengths are between 10–20mm and 20–30mm, the preferred breadth being between 10–20mm (60%).

Catalogue (Table 25, p. 197)

(Flint unless otherwise stated)

5 *core rejuvenation flakes*: **Complete:** 7529–30. **Part:** 7531–3. Nos. 7529–30 are examples from Type A2 cores (Clark, Higgs and Longworth 1960, 216). Nos. 7531–2 are fragments from the lateral part of the core to provide a fresh flaking surface. No. 7533 is a complete example from the lateral part of the core.

4 *trimming flakes*: **Complete:** 7534–6. **Part:** 7537. Cortical analysis shows that there are two secondary flakes and two tertiary flakes.

51 *unutilised flakes*: **Complete:** 7538–41. **Part:** 7542–88. Cortical analysis shows that there are four primary flakes, six secondary flakes and forty one tertiary flakes. Four flakes are burnt.

4 *utilised flakes*: **Complete:** 7589, 7590 (Fig. 38), 7591. **Part:** 7592. These examples have damage on the lateral edges. Three are secondary flakes and one is a tertiary flake.

Transverse arrowhead: 7593 (Fig. 38). One fragment of the Irish oblique Type i (Green 1980, 102–3).

Knife: 7594 (Fig. 38). A flake with abrupt retouch along a lateral edge.

3 *end scrapers*: **Part:** 7595, 7596, 7597 (Fig. 38). No. 7595 is a fragment with use wear and abrupt retouch at the distal end of a tertiary flake. Nos. 7596–7 are fragments with abrupt retouch at the distal end of tertiary flakes.

3 *round scrapers*: **Complete:** 7598 (Fig. 38), 7599a (Fig. 38). **Part:** 7600 (Fig. 38). No. 7598 is a complete example with abrupt retouch on the edges of a tertiary flake and use wear on the working edge. No. 7599 is a burnt complete example with shallow invasive retouch around the edge of a primary flake. No. 7600 is a fragment with abrupt retouch forming the working edge.

Miscellaneous scraper: **Part:** 7601 (Fig. 38). A fragment with abrupt retouch on the intact edge.

2 *retouched flakes*: **Part:** 7602–3. No. 7602 is a burnt fragment of a tertiary flake with irregular fine abrupt retouch on the lateral edge. No. 7603 is a tertiary flake with irregular abrupt retouch on the lateral edge.

3 *notched flakes*: **Part:** 7604–6. No. 7604 is a secondary flake fragment with a shallow notch retouched on the lateral edge. No. 7605 is a fragment of a secondary flake with a shallow notch on the lateral edge. No. 7606 is a fragment of a tertiary flake with a shallow notch on the lateral edge.

10 *chips*: 7607–16.

Irregular fragment: 7617. A fragment of pebble flint.

4 *unworked chert fragments*: 7618–21.

Worked quartz fragment: **Part:** 7622. There is retouch on the intact edge.

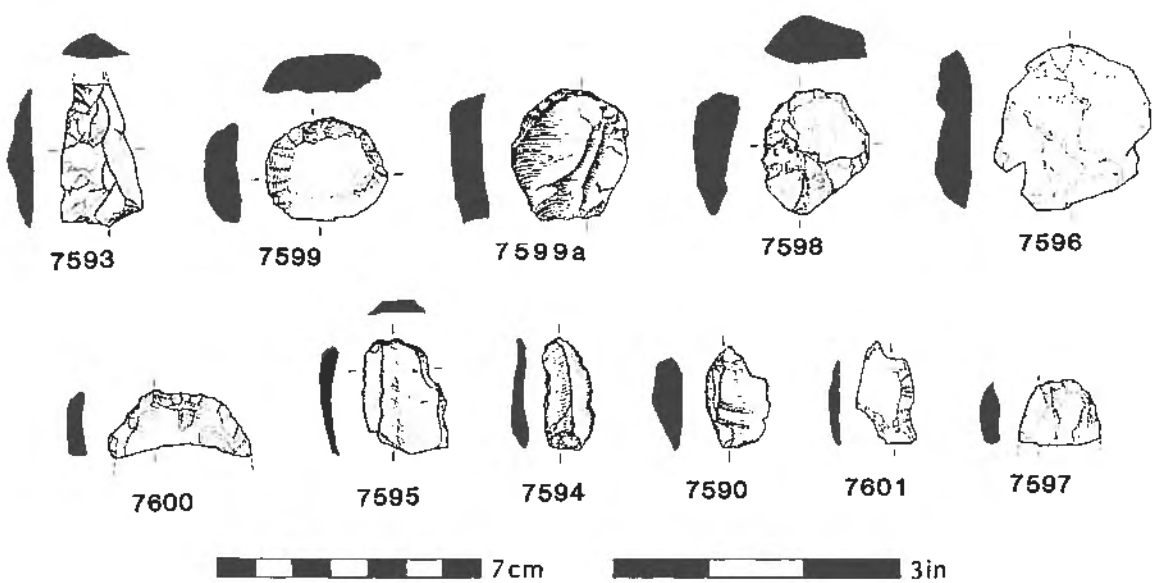
15 *unworked quartz fragments:* 7623–37.

Quartzite pebble: **Part:** 7636.

Comments. The raw material analysis (Table 26, p. 198) shows that most (64%) of the flint was acquired locally, although it was supplemented by chalk flint (13%). These resources provided sufficient flint, as non-flint materials such as chert were not exploited – with the exception of one piece of worked quartz. Although the amount of chalk flint imported was not large, access to this flint source was established during this phase, leading to the acquisition of almost 4kg of chalk flint which was deposited in the Grooved Ware structure.

There is no evidence of the selection and preparation of flint pebbles. Although there are no cores, some elements of the knapping stage of the production of tools are present. There are five core rejuvenation flakes and four unretouched primary flakes. These indicate careful core preparation, which is confirmed by the large number of tertiary flakes. Although these could have been re-used as temporary tools, it is unlikely that they were transported any distance. Unutilised flakes form the largest group in the assemblage. There is a high incidence (92%) of broken flakes, with only four complete examples. A higher percentage of complete flakes would represent discarded knapping debris. It is likely that these are the result of knapping activity in the Knowth area, and not the by-product of *in situ* knapping. The range of tool types, forming 12.8% of the assemblage, includes round and end scrapers, a knife and a transverse arrowhead as well as less conventional tools such as retouched and notched flakes. Unmodified tools consisting of utilised flakes (3.6%) bring the number of tools to over 16% of the assemblage. Scrapers are the most common artefact with round and end scrapers present.

Fig. 38. Grooved Ware Complex, circular wooden structure: finds (flint artefacts) from interior of circle.



Other finds of Grooved Ware

Grooved Ware is also present in two areas of domestic activity – at what has already been termed Beaker Concentration A, and a slight presence at Beaker Concentration C. In order to indicate the location, the terms Concentration A and C are being retained, but this does not imply that Grooved Ware and Beaker are contemporary. There are also two isolated finds, which may have been ritually deposited in Passage Tombs 6 and 18.

Domestic Sites

'Beaker Concentration A' (Figs. 42 and 43)
When this site was published, it was considered to be an area consisting solely of Beaker activity (Eogan 1984, 245–260). Subsequent

Table 25: 'Brown layer' lithic assemblage.

No.	Artefact type	Frequency	Percentage
1.	*Selection of material*	0	0
2.	*Production of tools*	(9)	8.2
	Core rejuvenation flakes	5	
	Trimming flakes	4	
2a.	*Discarded pieces*	(51)	46.4
	Unutilised flakes	51	
3.	*Unmodified tools*	(4)	3.6
	Utilised flakes	4	
3a.	*Modified tools*	(14)	12.8
	Transverse arrowhead	1	
	Knives	1	
	End scraper	3	
	Round scraper	3	
	Miscellaneous scraper	1	
	Retouched flake	2	
	Notched flake	3	
4.	*Miscellanea*	(32)	29
	Chips	10	
	Irregular fragment	1	
	Chert	4	
	Worked quartz	1	
	Unworked quartz	15	
	Quartzte pebble	1	
Total		110	100%

Table 26: 'Brown layer' lithic assemblage.
Raw material analysis (Sample 110)

Raw material	Frequency	Percentage
Flint	(89)	81
Chalk	13	
Pebble	64	
Burnt	12	
Chert	(4)	3.6
Unworked	4	
Worked quartz	1	.9
Unworked quartz	15	13.6
Quartzite pebble	1	.9
Total	110	100%

Table 27: 'Brown layer' lithic assemblage.
Analysis of cortex on lithic assemblage (Sample 89)

Cortex	Un-retouched struck flint	Retouched struck flint	Total	Percentage
Primary	4	1	5	5.6
Secondary	11	3	14	15.7
Tertiary	60	10	70	78.7
Total	75	14	89	100%

Table 28: 'Brown layer' lithic assemblage.
Platform types (Sample 22)

Platform type	Un-retouched struck flint	Retouched struck flint	Total	Percentage
Cortical	5	1	6	27
Prepared	9	2	12	50
Punch	5	0	5	23
Total	19	3	22	100%

Fig. 39. Diagrams showing percentages of types of lithics used in artefact manufacture.

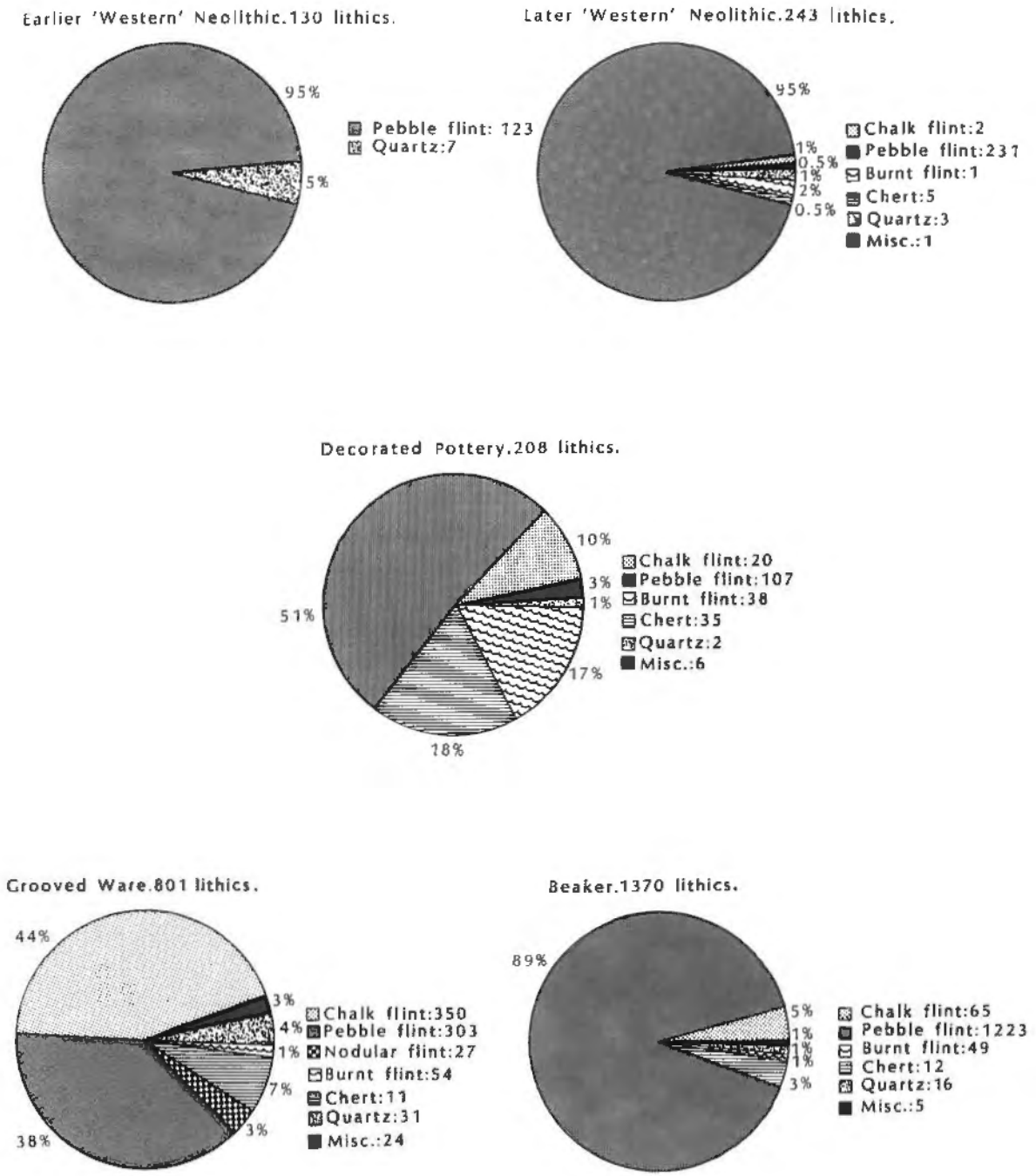


Fig. 40. Grooved Ware Complex, circular wooden structure: location of pottery finds in post-pits –

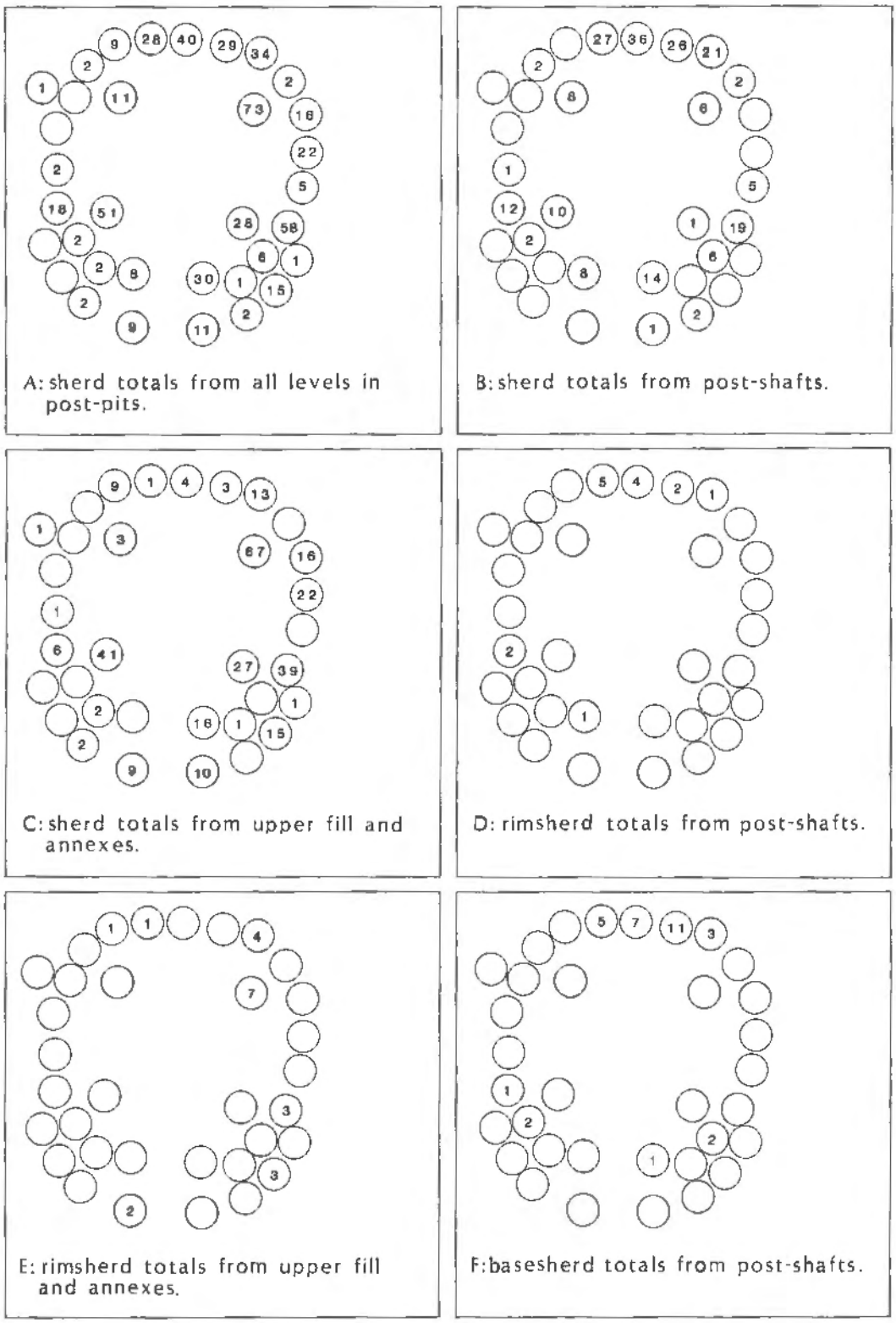
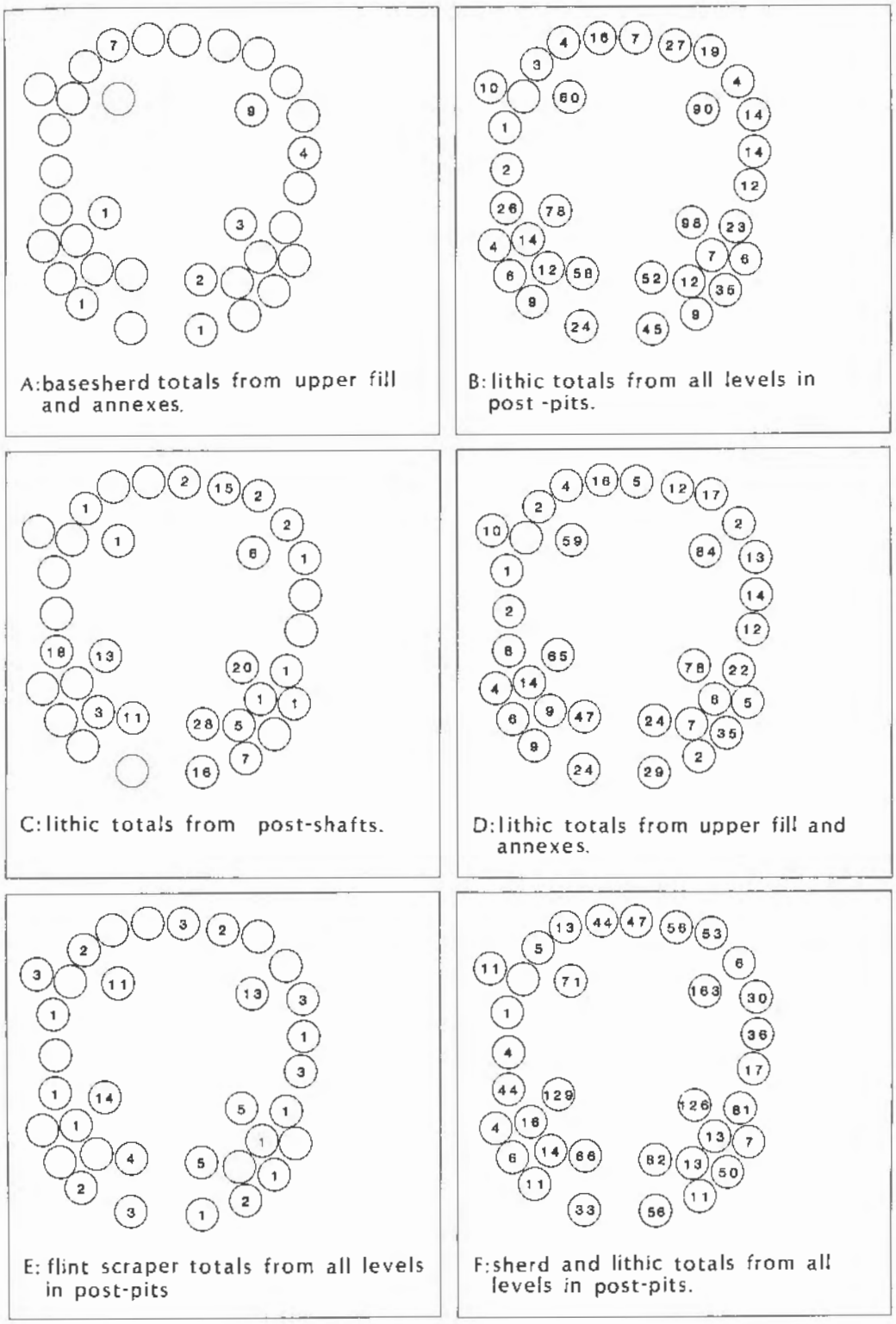


Fig. 41. Grooved Ware Complex, circular wooden structure: location of pottery and lithic finds in post-pits –



reconsiderations clearly demonstrate that, amongst the pottery, there is an apparent Grooved Ware element. The finds come from a layer of soft dark earth containing charcoal flecks and small stones. The layer averaged 24cm thick and covered an area 19m by 14m. It tended to be D-shaped but, due to subsequent disturbance, an undetermined area was removed on the north-eastern end. The slight concavity along the northern edge is due to the presence of Passage Tomb 15, which prohibited extension in that area. This dark layer overlay sticky grey-brown material, about 5cm thick, which represents Early 'Western' Neolithic activity (Zone C extension). In turn the dark layer was sealed by a layer of yellowish clay, the source of which has not been determined, but it might represent the levelled mound of the nearby Passage Tomb 15. However, it may be noted that a natural sod layer did not occur over the dark layer.

C14 determinations from the dark layer yielded a date of 3118±48 BP (BM–1077) 1513–1269 cal BC, indicating a Middle or Late Bronze Age date. Another date from a charcoal sample between kerbstones 16 and 17 of Passage Tomb 2, in which two sherds of Beaker pottery were lying, yielded a date of 3185±255 BP (BM–786) 2132–830 cal BC. As previously argued (Eogan 1984, 321), it must be considered that both of these samples may have been contaminated, as it is certain that neither Grooved Ware nor Beaker pottery survived into the Middle/Late Bronze Age.

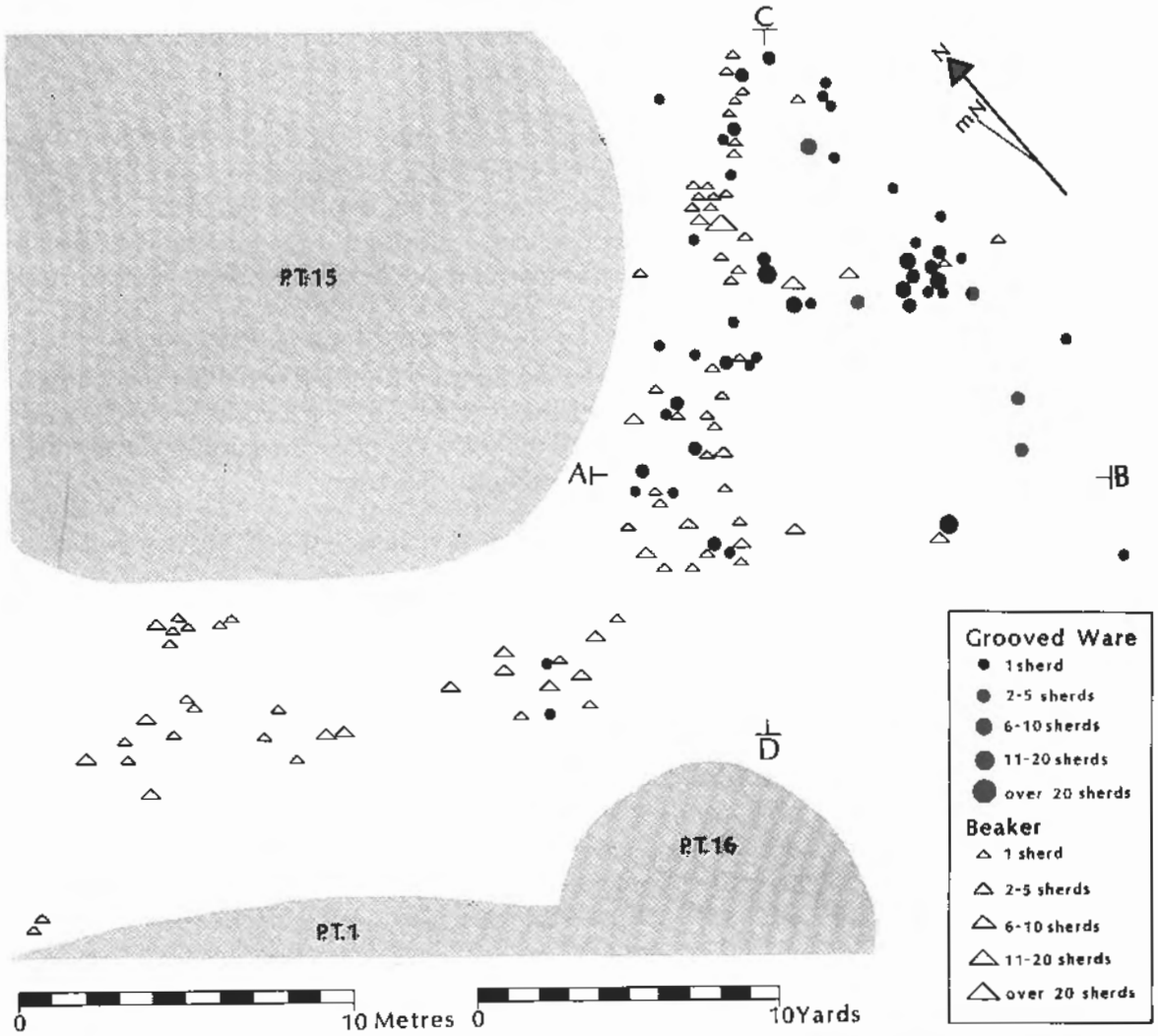
Two hearths and a series of pits were the only structural features found in the habitation layer. One pit (no. 2) contained sherds of Grooved Ware, 1419a–d (Vessel 60), and part of a large slightly barrel-shaped vessel, but otherwise the general area is devoid of finds; in fact, the bulk of the finds, both pottery and flint, occurred in a band along the northern side, but there was also a concentration to the north-east.

Due to the soft and, therefore, homogeneous nature of the material, it has not been possible to establish if its accumulation is due to one main event or successive events. Both Grooved Ware and Beaker pottery have a similar horizontal distribution and were found throughout the dark layer, thus suggesting an overlap in use. However, the distribution of the two wares may be significant. The Beaker pottery has a mainly north-western distribution, while Grooved Ware is only found in the north-eastern area (Fig. 42). Although both types of pottery overlap in the northern area, the fact that Grooved Ware does not occur in the western area may indicate that they are not contemporary.

Sherds that represent Grooved Ware vessels are present, consisting mainly of coarse, straight-sided and barrel-shaped vessels. Most are undecorated, but vessel 51 is elaborately decorated with comb impressions, oblique grooves and filled triangles. Similar decoration is found on Grooved Ware at Carnaby Top Site 18, Yorkshire (Manby 1974, fig. 9: 33). Vessel 59 is decorated with broad channels on the exterior surface. Perforations occur just below the rim

on two vessels (nos. 65 and 66), that on vessel 65 being incomplete. Five vessels of finer ware are represented, nos. 51, 52, 53, 56 and 57, and are decorated with grooves and incised lines. Most of the sherds derived from vessels of coarse ware have parallels in finds from the post-pits of the wooden structure. They are alike in form and fabric, especially in the use of distinctive dolerite grits to temper the fabric in both assemblages (Appendix 1). A significant detail of this assemblage is the weathered and abraded nature of the sherds, which contrasts with the fresh unabraded appearance of those from the post-pits. This implies that the pottery from 'Concentration A' had been lying on the surface for some time, which suggests a domestic site rather than one of ritual. With the exception of vessels 52, 53 and 57 the other vessels were previously published (Eogan 1984, figs. 89, 91).

Fig. 42. 'Beaker Concentration A': distribution of Grooved Ware and Beaker pottery.



Catalogue

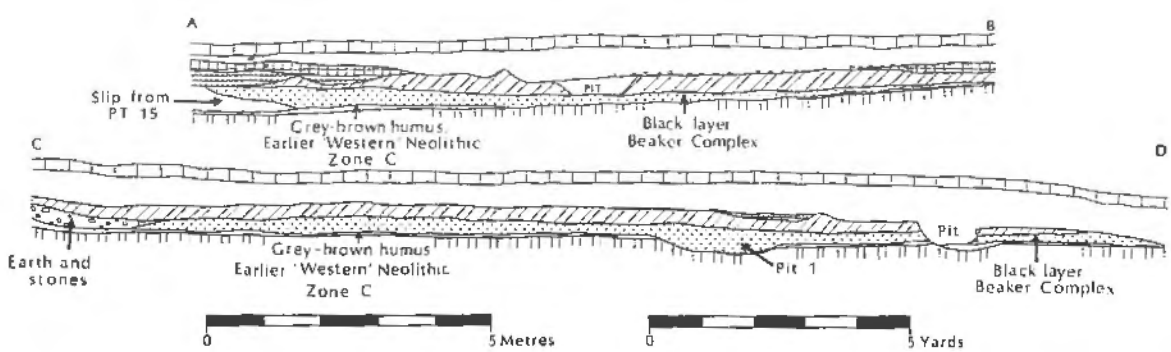
Vessel 51 (Fig. 44) rimsherd 1399 and 7 bodysherds 1400–4, 1404a, 1499. Hard fabric with a moderate grit content (< = 7.0mm). The flat-topped rim is decorated on its upper surface with a row of comb impressions. Externally there are horizontal lines of comb impressions and a row of oblique grooves; filled triangle motifs are also present. Three circular impressions are found on the interior surface, together with a basket pattern based on triangles and executed in narrow even grooves. Colour: buff-brown/grey-black/black. T. 6.3–10.3mm.

Vessel 52 (Fig. 44) 28 bodysherds 7637–63 plus 3728 which has already been published (Eogan 1984, 306, fig. 116), and 13 fragments 7664–76. From the surviving sherds it appears that the vessel would have been flat-based with fairly straight sides and a low cordon at a distance below the rim. The fabric is hard, well-fired and with a high grit content (< = 5.4mm). The grits protrude through the interior and exterior surfaces. Decoration occurs in the form of incised chevron motifs on the exterior surface. Colour: buff-orange/pale orange-black/brown-black. T. 5.3–9.1mm.

Vessel 53 (Fig. 45) rimsherd 7677 and 10 bodysherds 7678–87. The rim is simple and rounded. The fabric is hard and well-fired with a high grit content (< = 4.8mm). The exterior surface has been smoothened, but grits protrude through the surface. Decoration occurs in the form of vertical and horizontal grooves. Colour: pale orange throughout. T. 5.1–9.3mm.

Vessel 54 rimsherd 7688, a simple rounded rim with a shallow internal bevel. The fabric is hard with a high grit content (< = 3.0mm). The exterior has been smoothened with grits protruding through the surface. Colour: orange throughout. T. 9.1mm.

Fig. 43. Grooved Ware Complex, 'Beaker Concentration A': cross-sections A–B and C–D.



Vessel 55 (Fig. 45) rimsherd fragment 1310, of simple rounded form. The fabric is coarse but thin-walled and contains a high grit content (< = 3.0mm). Colour: pale orange/grey/pale orange. T. 7.3mm.

Vessel 56 (Fig. 45) 3 bodysherds 1409a, 1409b, 1411 and 2 fragments 1359 and 1409c. Hard fabric with a moderate grit content (< = 7.8mm). Decoration consists of horizontal grooves and a possible boss or cordon. Colour: orange throughout. T. 10.3–14.2mm.

Vessel 57 (Fig. 45) bodysherd 7689 – the fabric is hard and fairly compact with a high grit content (< = 3.8mm). Decorated on the exterior surface with a wide shallow groove, below which are two narrow grooves which form an inverted V-shape. Colour: buff-orange/dark grey/buff-brown. T. 11.2mm.

Vessel 58 2 rimsherds 1405–6, rimsherd fragment 1407 and a bodysherd 1408. The rim is unexpanded and flat-topped. The fabric is coarse with a high grit content (< = 2.9mm). The exterior surface of the vessel is decorated with horizontal rows of twisted cord impressions. Colour: orange/grey/orange. T. 13.9–16.1mm.

Vessel 59 (Fig. 46) 5 rimsherds 1418a, 1418c–e, 1418f, basesherd 1418r, 28 bodysherds 1418b, 1418g–m, 1418o–q, 1418s–t, 1418u (15 sherds), 1443, 55 fragments and 44 crumbs 1418v. The rim is flat-topped, sometimes concave in shape and expands slightly inwards and outwards. The hard fabric has a high grit content (< = 8.8mm). The exterior surface is smooth, shows evidence for burnishing and is weathered in places. Decoration occurs in the form of a series of broad, shallow, horizontal channels on the exterior surface of the vessel. These channels are more definite and closely spaced on the upper portion of the vessel. Colour: brown/grey/orange-buff. T. 5.1–16.3mm.

Vessel 60 (Fig. 46) a large portion of an undecorated vessel, 1419a–d, including part of the rim which is flat-topped with a slight inward slope. The fabric is coarse and friable with a high grit content (< = 6.9mm). The exterior surface is uneven and weathered, and burnt encrusted matter covers the interior surface of the vessel. Colour: orange-brown/grey-orange/black. T. 9.5–14.6mm.

Vessel 61 (Fig. 45) a rimsherd 1420a, 3 bodysherds 1420b and 11 crumbs 1420. The rim is simple with a slightly flattened top. The weathered fabric is hard but friable with a high grit content (< = 5.8mm), which is visible on the surface of the vessel. The exterior surface is uneven, but has been roughly smoothed. The interior surface is fire blackened and contains burnt encrusted matter. Colour: orange-brown/grey-brown/black. T. 9.7–11.45mm.

Vessel 62 7 bodysherds 1419d–e, 1448, 1489, 1498a–c, 3738h, and

7 crumbs 1419c and 1507. Sherds from a coarse thick-walled vessel, with a friable texture, containing a high grit content (< = 10.2). The exterior surface is weathered but, in places, evidence for smoothing is visible; the interior surface is uneven. Colour: orange/grey/orange-black. T. 8.1–14.3mm.

Vessel 63 (Fig. 45) rimsherd 3738a, base-angle sherd 3738b, 12 bodysherds 1434, 1488b, 1494, 1496a–b, 1501, 1505, 3738c, 3738d, 3738e, 3738f, 3738i, and 9 fragments 1412a–d, 1496c-d, 3738b, 3738j, 3738l. The rim is of unexpanded, simple type with a slightly flattened top. The fabric is coarse and brittle, with a high grit content (< = 14.5mm). The exterior surface is uneven, with grits protruding through the surface. The interior surface contains burnt encrusted matter, especially towards the base. Colour: buff-orange/orange-grey/black. T. 6.9–12.9mm.

Vessel 64 10 bodysherds 1477, 1492a-c, 1482, 1486, 1497, 1500 (3 sherds), and 3 fragments 1358, 1492d, 1500. Coarse friable fabric with a high grit content (< = 7.0mm). The surface of the vessel is weathered, but patches of a smooth surface are visible. Colour: orange-brown/grey/grey-brown. T. 6.6–11.4mm.

Vessel 65 (Fig. 45) rimsherd 1421a, base-angle sherd 1425 and 68 bodysherds 1356a–c, 1419b, 1421b–e, 1423a–c, 1424, 1426–1430, 1431a–b, 1432, 1433a–c, 1434-5, 1438–9, 1445–7, 1449–51, 1454–7, 1459–67, 1469–70, 1480a–g, 1488a–g, 1504, 3738d, 3738g, and 22 fragments 1353, 1354a–b, 1447, 1468, 1472a–c, 1480h–j, 1485, 1490a–b, 1495a–h. Simple rounded rim with a possible depression on the interior surface, just below the rim. An incomplete perforation is present 21mm below the rim on the exterior surface. The fabric is coarse and friable with a high grit content (< = 8.8mm). Traces of burnt encrusted matter are visible on the interior surface. Colour: buff-orange/grey/buff-brown. T. 6.2–15.6mm.

Vessel 66 (Fig. 45) rimsherd 1422, with an internal bevel and a perforation 17mm below the rim. Coarse friable fabric with a high grit content (< = 5.0mm). Burnt encrusted matter is present on the interior surface. Colour: orange/grey/black. T. 12.0mm.

'Beaker Concentration C'

This area was also previously published. The finds come from a layer of dark grey soil, 17cm deep, which occurred in an irregular area of 51 square metres on the south-western side of Passage Tomb 1 (Eogan 1984, 270). No definite evidence for structures emerged but, a short distance to the north of the concentration, features were found which may be contemporary. These consisted of an L-shaped area of rough cobbling, 1.80m by 1.30m, an oval pit measuring 20cm by 15cm by 10cm deep, two small oval holes and a rectangular area of burning 60cm by 1m.

Fig. 44. Grooved Ware Complex, 'Beaker Concentration A': Grooved Ware pottery (vessels 51–2).

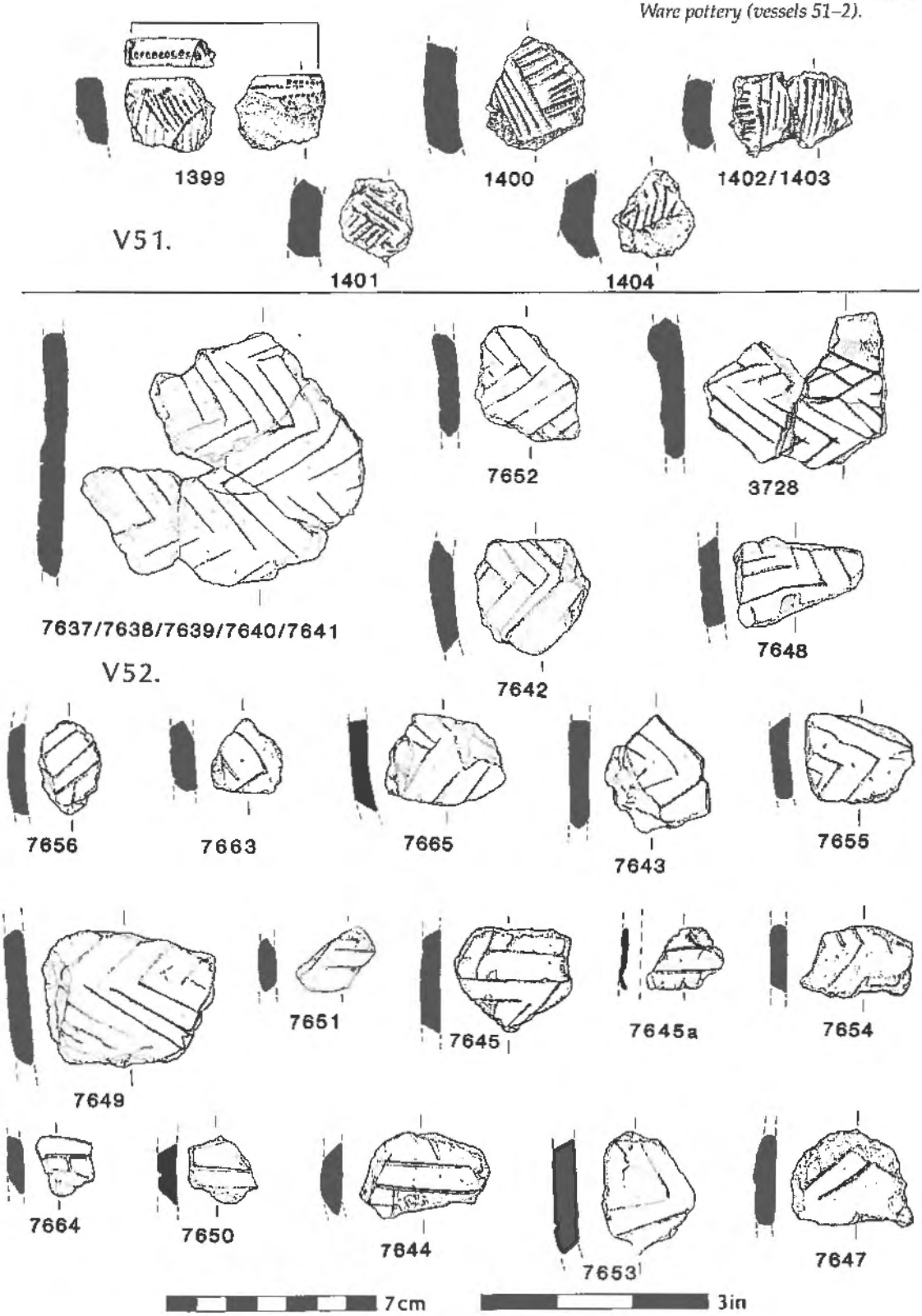


Fig. 45. Grooved Ware Complex, 'Beaker Concentration A (upper) and C' (lower): Grooved Ware pottery (Upper, vessels 53, 55–7, 61, 63, 65–6. Lower: vessels 67–71).

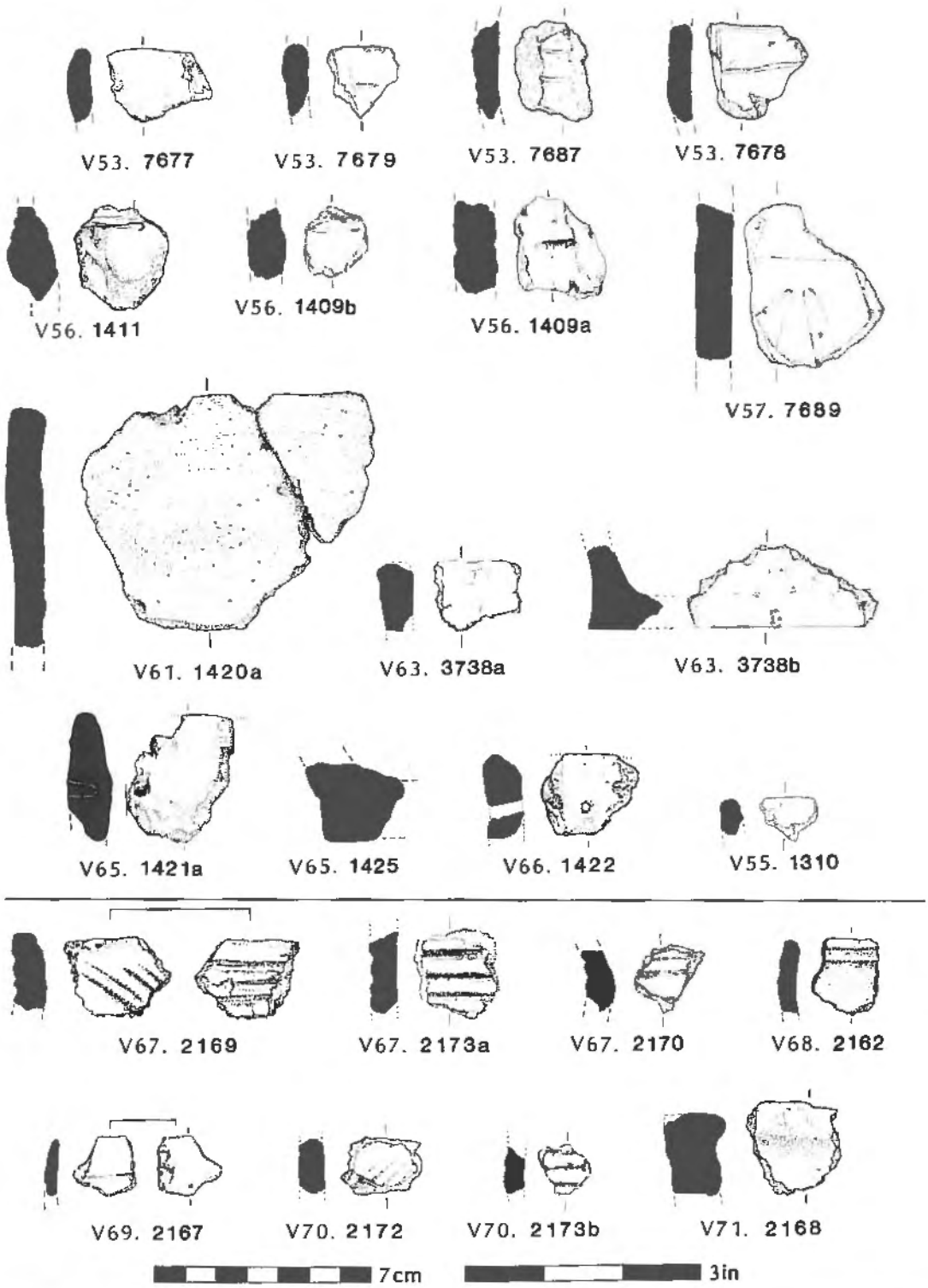
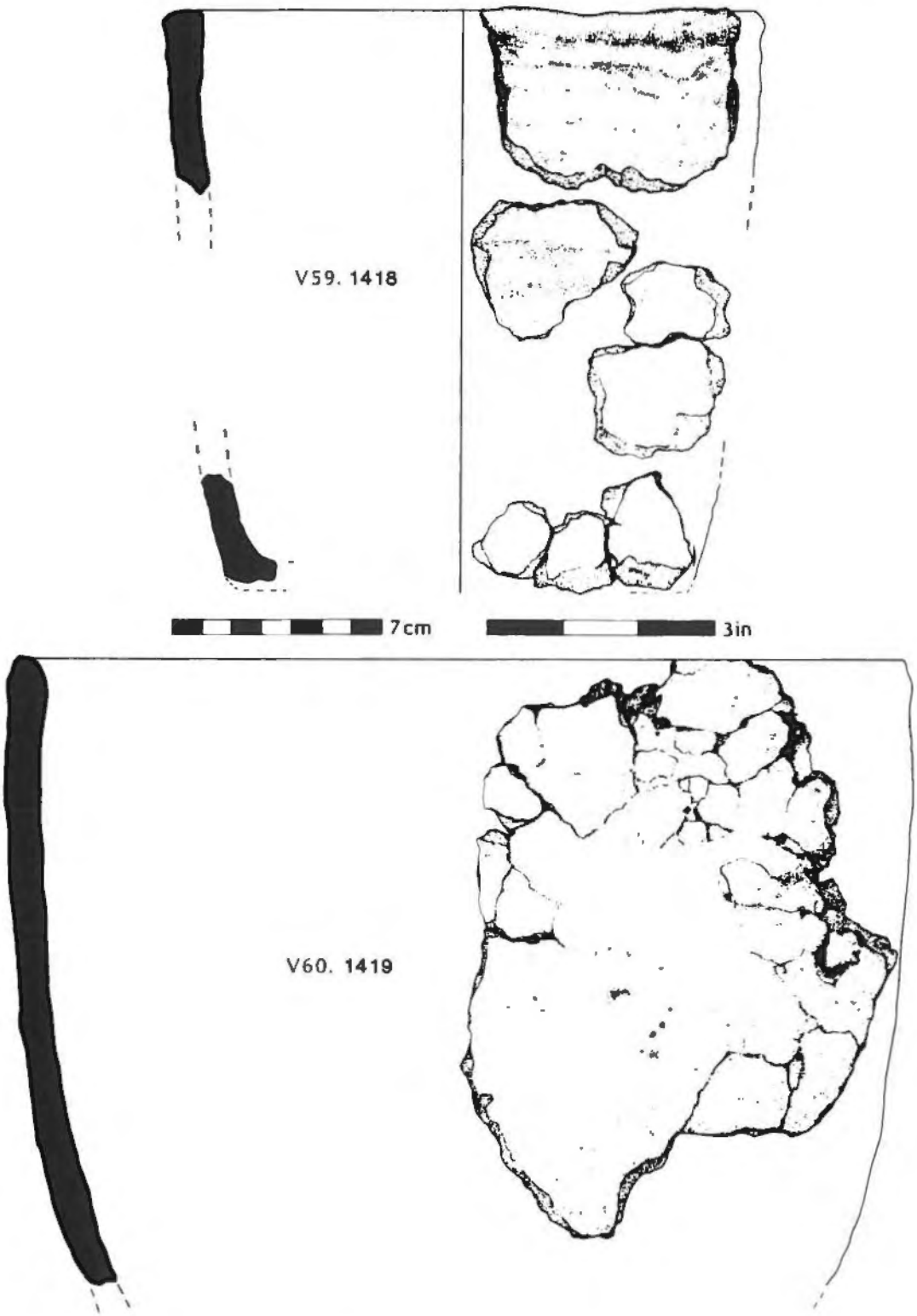


Fig. 46. Grooved Ware Complex, 'Beaker Concentration A': Grooved Ware pottery (vessels 59–60).



Beaker pottery represents the predominant assemblage; in all, an estimated 75 vessels were present. However, a re-examination of the pottery revealed a small quantity of Grooved Ware sherds, representing 6 vessels, consisting of fine and coarse ware. The sherds are too fragmented to suggest a shape, however, as the fabric is very similar to that found in other Grooved Ware areas on the site; it can be presumed that they are straight-sided or barrel-shaped with flat bases. Decoration occurs on both fine and coarse ware, consisting of horizontal grooves on the interior and exterior surfaces of the vessels.

Because of the small amount of Grooved Ware sherds, it is difficult to say whether both assemblages are contemporary, or if the Grooved Ware belongs to a preceding phase.

Catalogue

Vessel 67 (Fig. 45) Rimsherd 2169, 2 bodysherds 2170, 2173a. Friable fabric with a moderate grit content (< = 4.3mm). Flat-topped rim, decorated on the exterior surface with horizontal grooves and, on the interior surface, with a row of oblique grooves. Colour: orange/black/black. T. 9.3–9.9mm.

Vessel 68 (Fig. 45) Rimsherd 2162, of simple unexpanded form. Hard, good quality fabric, slightly rough in texture and with a high grit content (< = 1.7mm). Two broad grooves are present on the exterior surface. Colour: dark grey/brown-orange/brown-orange. T. 6.0mm.

Vessel 69 (Fig. 45) Rimsherd 2167, of simple unexpanded form. Thin-walled fabric but with a rough texture and a moderate grit content (< = 2.4mm). A horizontal groove is present on the interior surface. Colour: orange throughout. T. 5.5mm.

Vessel 70 (Fig. 45) 2 bodysherds 2172–73b, probably from the same vessel. Friable fabric with a high grit content (< = 4.6mm). Traces of burnt encrusted matter are present on the interior surface. Decoration consists of horizontal grooves on the exterior surface. Colour: orange/black/black. T. 6.3–8.12mm.

Vessel 71 (Fig. 45) Rimsherd 2168 and a bodysherd 2495. Flat-topped rim with a slight outward expansion on both sides. This very coarse friable fabric has a high grit content (< = 3.9mm). Externally the surface has been roughly smoothened, and sooting is present on both surfaces. Decoration consists of a broad horizontal groove on the interior surface, just below the rim. Colour: orange throughout. T. 10.9–16.6mm.

Vessel 72 8 small undecorated bodysherds 2293–4, 2295 (2 bodysherds), 2296, 2451, 2482, 2772. Although the fabric is very similar, there is a possibility that more than one vessel is represented, but the frag-

mented nature of the sherds does not allow positive identification. The fabric is coarse and friable with a high grit content (< = 6.0mm). Burnt encrusted matter is present on the interior surface. Colour: The orange/orange-grey/orange. T. 7.7–12.2mm.

Miscellaneous finds of Grooved Ware

Grooved Ware (vessel 73) from Passage Tomb 6 (Fig. 47)
Vessel 73 (no. 3773), has already been published (Eogan 1984, 312, fig. 118); it came from the right-hand (north-eastern) recess of the badly damaged Passage Tomb 6. It is coarse in texture, but with a well smoothed exterior surface. The sides are slightly barrel-shaped and the flat base is about 20cm in diameter; the height is in the region of 33cm. Most of the outer surface is decorated with incised lines, which appear to form a pattern of horizontal and oblique grooves. Two horizontal grooves are present on the interior surface, just below the rim.

The sherds were mainly around the edge of a cremation deposit which appears to have been primary. It is not possible to explain the occurrence of the pottery but, as the vessel was incomplete, perhaps some sherds were deposited in the tomb for ritual reasons. Alternatively, due to the brittle nature of the vessel, perhaps portions disintegrated, and it might have been that a complete vessel, possibly even containing a cremation, was placed in the tomb and that it was broken and dispersed at the time of the tomb destruction.

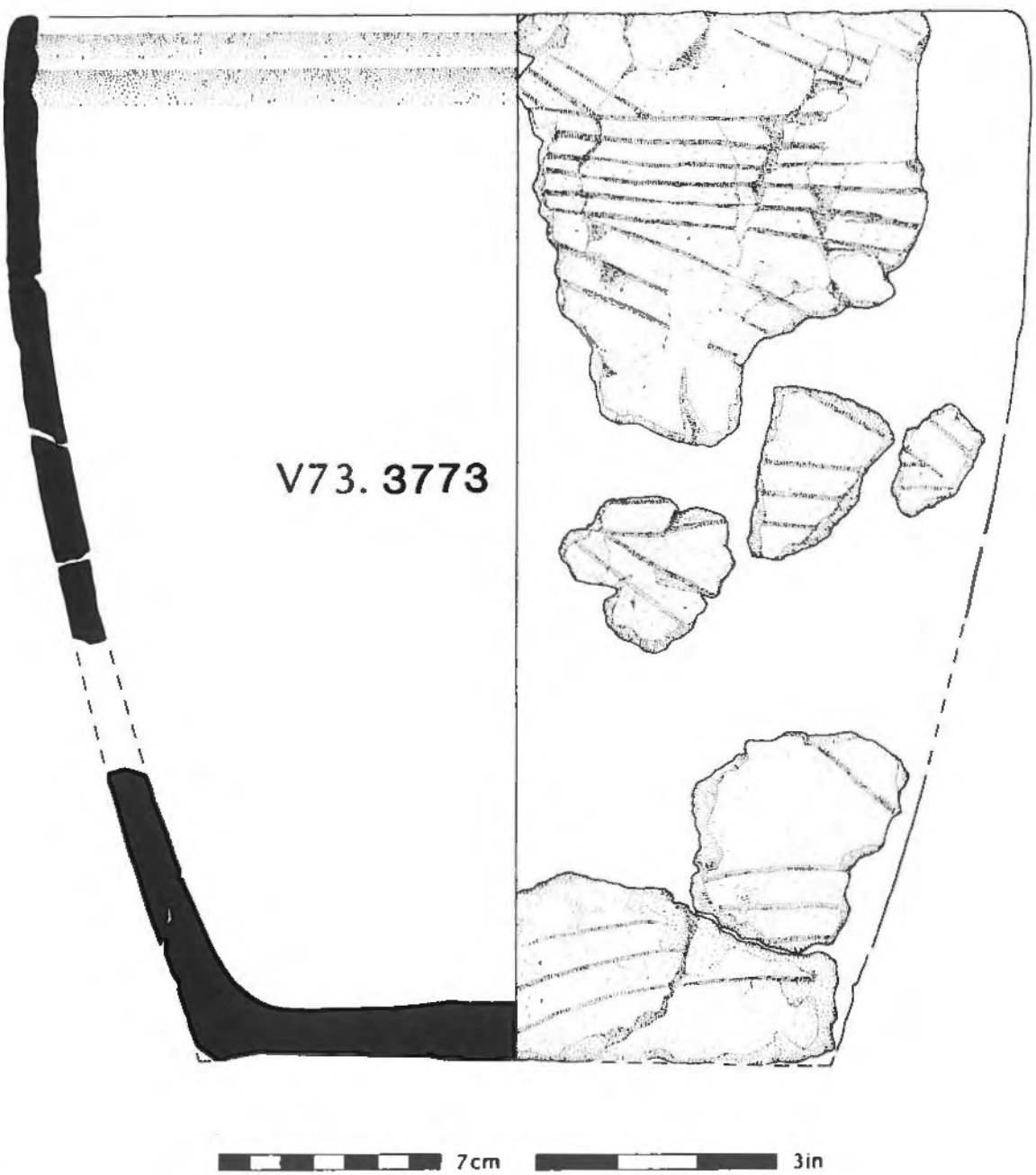
Exact parallels for this vessel are not known from Ireland, but comparisons exist in Britain, as at Marden, Wiltshire (Longworth in Wainwright 1971, 210, fig. 14: P35); Quanterness, Orkney (Henshall in Renfrew 1979, fig. 33: 2), Balfarg/Balbirnie, Fife (Barclay and Russell-White 1993, Illus. 31: 64) and Flanborough, Yorkshire (Manby 1974, fig. 30; 11).

Grooved Ware (vessel 74) from Passage Tomb 18 (Fig. 48)
Sherds representing vessel 74 (no. 3774) were found overlying the flagstone in the left-hand recess within a deposit which included charcoal, animal bones, part of a human skull and pieces of flint, one of which was a rounded scraper (Eogan 1984, 312–3). The barrel-sided, flat-based vessel is identical to the fine-ware vessels ("Knowth Style") found within the post-pits of the Grooved Ware circular structure. The fabric is hard, with a high content of mainly quartzite grits and buff/brown in colour throughout. Decoration occurs in the form of two horizontal grooved lines on the interior surface, just below the rim.

The deposit appears to be homogeneous, which is surprising in view of the fact that the chamber of the tomb had been badly damaged. This involved the removal of the roof and all the orthostats, apart from three stubs. It is not possible to determine the nature of the deposit, but perhaps it was another form of ritual deposit that was placed in the recess and which, in some unexplained manner, survived the destruction. Dates for the destruction of the smaller

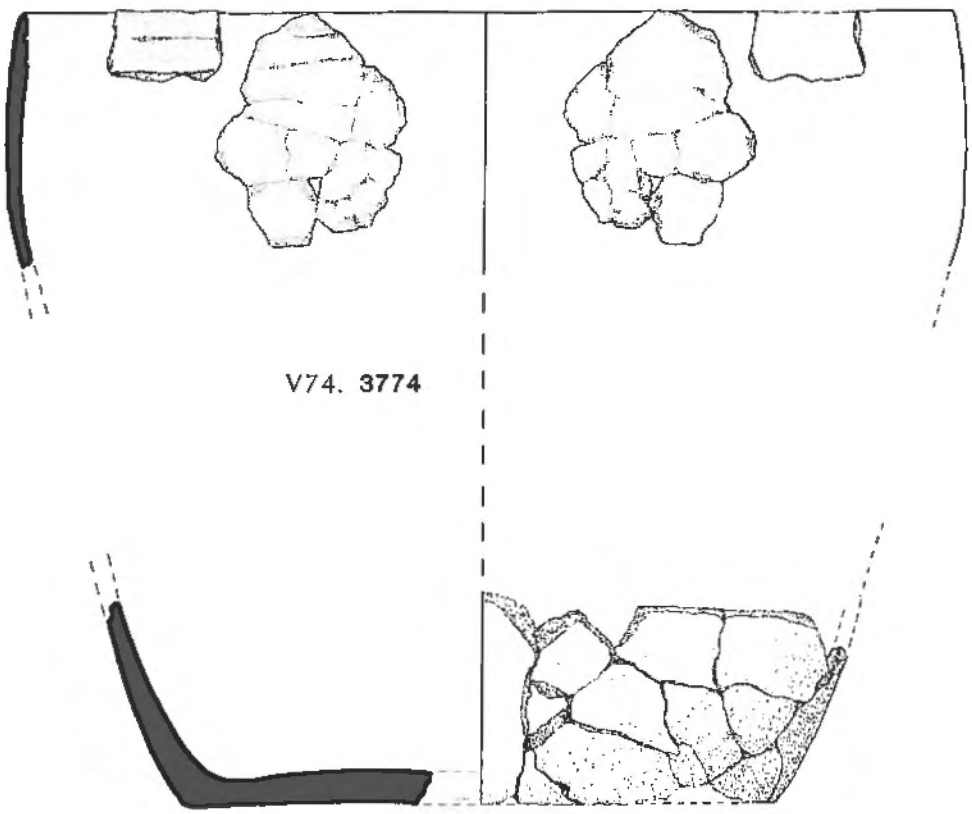
tombs, either individually or as a group, cannot be determined but, in view of the large number of megalithic stones of green grit used in souterrains (*cf.* Eogan 1968, 357–8; 1974, 89–91), the main period of destruction is likely to have been during the later Early Christian Period (*c.* 9th–10th Centuries AD), when there was an extensive settlement on the site.

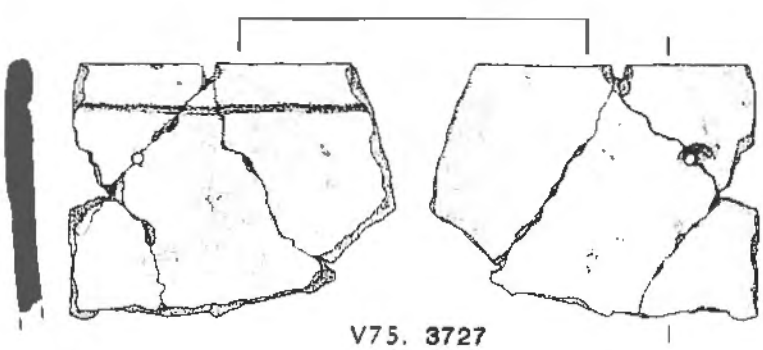
Fig. 47. Suggested reconstruction of Grooved Ware vessel 73 (no. 3773), Passage Tomb 6.



Grooved Ware (vessel 75) from post-pit 14 (Fig. 48)
This "Knowth Style" rimsherd, no. 3727, with its internal horizontal groove and perforation on the body, was previously published, as part of the Beaker 'Concentration D' assemblage (Eogan 1984, 303–04,

Fig. 48. Suggested reconstruction of Grooved Ware vessel 74 (no. 3774), Passage Tomb 18 and Grooved Ware sherd (3727) from post-pit 14 circular wooden structure (see p. 134).





7cm 3in

fig. 15). However, in reviewing the location of the finds previously published, it was discovered that this sherd was originally found almost at the surface of the fill of what subsequently emerged as post-pit 14 (see p. 134), and should therefore be included with the assemblage from the *upper fill* of that post-pit.

Discussion of Grooved Ware Complex

As has been shown, the circular wooden structure has yielded a closed assemblage of finds. The large fresh flint scrapers and the pottery, especially the fine ware ("Knowth Style"), are distinctive, and forerunners do not exist for them amongst the preceding Decorated Pottery Complex. Therefore, external prototypes have to be considered. One area that possesses fine ware with line decoration at an earlier stage is western Iberia. Sherd No. 6153/6154 from Knowth and a sherd from the walled structure with bastions at Leceia on the northern shore of the Tagus estuary, Portugal (Cardoso 1994, fig. 116, top right), have a close resemblance. However, the context of such ware in Portugal is Chalcolithic and is too early to be relevant. Fine wares are known from Grooved Ware contexts in Britain, as examples from Quanterness, Orkney show (Henshall in Renfrew 1979, 75–9, 84–6, especially pots, 3, 6, and 7). Similar, but thicker pottery comes from Balfarg henge, Fife (Mercer 1981b, 136-137, figs. 43:8; 44:23). Parallels for the coarser ware can also be cited in Britain. The large coarse Grooved ware vessel, no. 73 (Fig. 47), which was found in Passage Tomb 6 (Eogan 1984, 312), has close parallels in such British vessels as that from Marden henge, Wiltshire (Longworth in Wainwright 1971, 210, fig. 14: P35) and Quanterness, Orkney (Henshall in Renfrew 1979, fig. 33:2). Gibson described this vessel as being "virtually 'classic' Grooved Ware in the Clacton style" (1982, 182). Parallels for the ridged-corrugated vessel (no. 59) from 'Beaker Concentration A' (Fig. 46) also occur in Britain, a good example being at Manham Hill, Yorkshire (Gibson 1982, 197, fig. M.H. 2:34, 39–42). The large rounded scrapers were also utilised by Grooved Ware users, while a further characteristic feature of that complex is the circular wooden structure itself, which served for ritual functions.

In attempting to evaluate the Grooved Ware stage at Knowth there are three sets of evidence, commercial/technological, domestic and ritual. Pottery manufacture would have taken place locally, but evidence for stone manufacture is limited. Trading of flint from the chalk deposits was a feature. At this time, there was a much greater demand for good quality flint than previously. This was also the case in Britain where flint-mining became a feature (p. 222). The evidence for domestic activity is slight, and though no evidence for a house emerged, it seems that the material found at 'Beaker Concentration A and C' came from a domestic context. If there were an autonomous Grooved Ware phase at Newgrange, it is likely that at least the

remains of some of the structures discovered there would have been occupied at that stage (O'Kelly, Cleary and Lehane 1983, *cf.* figs. 4, 8, 10, 12). Further, but indirect, evidence for domestic activity could be provided by the Grooved Ware assemblage from the Beaker 'Concentration A' at Knowth, and the burnt encrusted material on several sherds from the Knowth wooden structure, which indicate that they were derived from vessels that were previously used for cooking. Of course, this need not have been for ordinary family meals, but rather for ceremonial feasts, after which vessels were broken and the sherds committed to the post-pits. As has already been pointed out, the circular wooden structure could have served as a temple or at least some form of ritual site. A new form of ritual activity can then be considered as part of the Grooved Ware Complex.

Regarding parallels and origin for features and finds, it has been shown already that circular stake-formed structures existed at Knowth during the Decorated Pottery Complex (p. 52). The presence of hearths, and a scatter of occupation debris over the floors and in the neighbourhood, indicates that those buildings were homesteads; however, it is unlikely that they served as prototypes for the structure now under review. It has been established that, in the course of the period during which passage tombs were in use at Knowth and elsewhere at Brugh na Bóinne, ritual developments and modifications took place. A good example of this is the obliteration of existing megalithic art motifs or their subsequent overlaying by added motifs (*cf.* O'Kelly 1982, pls. 75–6). Perhaps more wide-ranging ritual developments were also taking place, amongst which could have been the transmutation of a domestic house type into a building that was used for non-secular activity? But this may be too simple an explanation. Apart from a difference in usage, there is further evidence for contrast. The Grooved Ware structure is much more substantial and much more elaborate structurally. In addition, as already mentioned, the finds do not have forerunners amongst the wares that constitute the Decorated Pottery Complex, nor can one cite earlier evidence for the manner in which the finds were deposited. Taken as a whole, the structure and its finds lack clear-cut native forerunners; in brief they constitute a typical Grooved Ware assemblage of sealed deposits, an assemblage that must have its ultimate forerunners externally. As will again be noted, the Grooved Ware complex constitutes a defined assemblage in Britain, whereas in Ireland evidence has hitherto been limited. At present there is no precise parallel for the structure in Ireland. However, there is a pit circle and other monuments at Brugh na Bóinne, and the recently excavated site at Ballynahatty, Co. Down is also relevant (Hartwell 1994, 10-13).

Close to the large mound at Newgrange there was an open-air enclosure consisting of a multi-circle of up to six rows of pits and post–holes, and about 80m in overall diameter (O'Kelly *et. al.* 1983, 16–21; Sweetman 1985, 195–217). O'Kelly suggested that the finds from the pits, which consisted of animal bones, pottery sherds and charcoal, should be considered as rubbish apparently thrown in. In contrast,

Sweetman proposed that the cremated animal bones that he found in the three inner rows were votive deposits (Sweetman 1985, 214). Mount also argues that the animal bones from the Late Neolithic and Beaker periods at Newgrange were deposited as part of ritual activity (1994, 442). Because of its much larger size, it is not exactly comparable to the Knowth structure; however, the concept of a circular pit structure is the same. Over 30 sherds of Grooved Ware, or what O'Kelly (in O'Kelly, Lynch and O'Kelly 1978, 311–313) has termed "rilled ware" came from a disturbed area on the outside of the southern arc of the kerb of an earlier passage tomb (Site Z), between stones 2 and 7. While unassociated with other features, it may be noted that they came from within the previously mentioned pit circle. Further sherds of this type of ware also came to light during excavations carried out by Sweetman on portions of the pit circle. The largest and most diagnostic sherd was part of undisturbed material in Cutting 4. Other sherds were associated with stake-holes, and possibly domestic occupation debris in Cutting 2 (Sweetman 1985, 209). The largest amount of Grooved Ware came from the settlement in the entrance area of the large tomb (Clery in O'Kelly et. al. 1983, 84–100, 115). The most relevant parallels are provided by the fine ware ("Knowth Style"), which may possibly comprise about forty vessels. This settlement also had evidence for extensive Beaker activity. It was, however, not possible to distinguish stratigraphically between both materials, so perhaps the dwellers used both Grooved Ware and Beaker simultaneously, as might have been the case on a smaller scale at Knowth, 'Beaker Concentration A and C'. In contrast, the large amount of Grooved Ware and flint artefacts that could be contemporary at Newgrange, such as petit-tranchet-derivative arrowheads and discoidal knives, suggests an autonomous cultural assemblage. It is, therefore, possible that the Grooved Ware and the Beaker represent two separate horizons. As already noted, there may also have been an earlier Decorated Pottery horizon, as is suggested by a sherd of a Broad-rimmed vessel (p. 90). Such an interpretation has a bearing on the study of the animal bones (Van Wijngaarden-Bakker 1974; 1986). They were considered to have been derived from a single Beaker horizon and, therefore, of contemporary date, but the possibility must now be considered that the Beaker settlement was only one phase of a longer occupation period.

In view of some similarities between the banked earthen enclosures of Brugh na Bóinne and elsewhere in Meath (Eogan 1984, 320–321; Stout 1991, 252–255), and the Class 1 henges in Britain, it is even possible that the initial construction of enclosures may have begun during the Grooved Ware stage, even if their use continued into the Beaker stage (Sweetman 1985, 211–216). The cremation burial of a child in a Carrowkeel pot, placed in a shallow depression at Monknewtown, was probably placed there 'close to the tail of the bank' (Sweetman 1976, 28-9, pls. Vb, VI) by people who were using the enclosure, thereby indicating some overlap between the passage tomb builders and enclosure builders.

At Ballynahatty, County Down, a large timber circle complex has been found associated with Grooved Ware identical to a type found at Knowth ("Knowth Style"), (Hartwell 1994, 10–13). In scale, this structure compares more favourably to the large pit circle at Newgrange and, similarly, Grooved Ware was not found within the pits but in a nearby spread of habitation. However, it seems obvious that all three sites have a common origin and relationship.

The evidence from Knowth and Newgrange indicates a definite Grooved Ware presence at Brugh na Bóinne, but the chronological relationship between the passage tombs and the Grooved Ware is not as clear as one would wish. However, at Knowth the evidence available suggests that the Grooved Ware complex is later than the passage tombs. There were no finds of Carrowkeel Ware or Broad-rimmed Ware associated with the Grooved Ware timber circle, and Grooved Ware was not found in a sealed primary position in any tomb or in association with the Decorated Pottery Complex habitation layers. The flint artefacts from the circle are distinct in form and in material, and no such pieces came from the tombs or habitation layers. One important point is that the source for the flint used during the preceding stages was local, while the Grooved Ware associated flint was imported. The clay objects discussed on p. 185 were also a distinct artefact of the Grooved Ware timber circle and, again, were not found in association with passage tombs or habitation material. This assessment of the finds from the Decorated Pottery Complex and the Grooved Ware Complex shows that they represented two separate complexes with their own distinctive range of artefacts.

While stratigraphy shows that the timber circle pre-dated the Beaker settlement in that area ('Concentration D'), there is no definite stratigraphical evidence that it post-dated the habitation or ritual activities of the Decorated Pottery Complex. However, evidence from the area of Passage Tomb 15 shows that the layer which contained Grooved Ware accumulated when that tomb had already been in position. Also, the secondary use of quartz and striped stones as packing stones in the post-pits of the timber circle, indicates that the circle was chronologically later than the tomb building. These stones would have been acquired from the close-by spread of exotic stones outside the entrance to the eastern tomb. It is unlikely that parts of that spread, which were obviously of significance to the tomb users, would have been permanently removed from a spread that was intended to be seen. The position of the timber circle in the area in front of the entrance to the eastern tomb is also significant, as it suggests a succession or acceptance of a new ritual tradition.

The evidence from Newgrange also suggests that the Grooved Ware Complex was chronologically later than the use of the passage tomb, as the Late Neolithic/Beaker settlement developed after slip had come down from the large cairn. The foregoing evidence implies that in Ireland, as well as in Britain, Grooved Ware represents a chronological stage.

Apart from Ballynahatty, Grooved Ware is also known from other Irish sites outside Brugh na Bóinne; however, pending detailed examination, the precise extent and range of the material is difficult to ascertain. Grooved Ware is known from the Lough Gur region, Co. Limerick. In his report on the excavations of the Grange enclosure, Ó Riórdáin (1951, 62–63, 69) noted the presence of Grooved Ware, the majority of sherds coming from the dark layer below the bank on the western side of the site. These may have been deliberately deposited in the area opposite the entrance; at least a corresponding area in the Knowth wooden structure was significant, as the larger number of finds in the post-pits indicate. However, Beaker pottery was also found at Grange, but it was mainly in the interior of the circle and a chronological relationship has not been established between the two varieties of pottery. It is also difficult to estimate the percentage of Grooved Ware on the site. Sherds of Grooved Ware have also been found on Geroid Island (Liversage 1958, fig. 4), and on habitation sites on Knockadoon, especially Site H, where, according to Ó Ríordáin, sherds were found on the original ground surface and also within the upper levels (1954, 451). From the point of view of both ware and channel decoration, sherds from Site C (Ó Ríordáin 1954, fig. 17:1) are very close to sherds from vessel 59, Concentration A, Knowth (p. 205). It is possible, as Gibson highlighted (1982, 191), that a significant amount of what Ó Ríordáin termed Class II pottery from Knockadoon, and also from Grange, is Grooved Ware. Other sites which have produced Grooved Ware are Longstone, County Tipperary (information from Mr. Peter Danaher), a recently excavated area west of Site III at Fourknocks, County Meath (information from Mrs. Heather King), the Dundrum Sandhills sites, County Down (Collins 1952, fig. 6: 27–31; 1959, fig. 2: 1), and possibly Sliabh na Cailligh, County Meath (Herity 1974, fig. 139: 3 and 4). The identification of Grooved Ware in Ireland, so far, provides a very dispersed distribution, with an obvious clustering in Brugh na Bóinne and in the Lough Gur area, both important multi-period, archaeological landscapes. No doubt further research will show that Grooved Ware has a much wider distribution.

Parallels for all aspects of the Knowth structure can be cited from Grooved Ware sites in Britain. There, evidence for a Grooved Ware Complex is almost exclusively associated with circular ditch and bank enclosures with one entrance – henge monuments. Wooden structures consisting of a framework of spaced posts are known from several sites. These usually have more than one ring of posts; some are multi-ringed and are of more than one period of construction. The best parallels for Knowth are provided by the single circle structures as at the Wiltshire sites of Durrington Walls (Wainwright and Longworth 1971, 41–4) and Marden (Wainwright 1971, fig. 7). These structures are larger than Knowth; Durrington Walls Northern Circle is about 14.5m in diameter and may have consisted of twenty posts with four in the interior. At Marden, twenty-one post-holes formed the circle, with three internal

post-holes. In Arran (Scotland), Site II Machrie Moor consisted of ten widely-spaced post-holes forming a circular structure measuring up to 14.7m in diameter. This site resembles the Knowth structure, but it does not contain Grooved Ware. However, Grooved Ware was found in the more complex neighbouring timber circle, Site 1 (Haggarty 1991, 64–65).

As yet a range of dates has not been published for Grooved Ware sites in Ireland. Only two dates have so far been obtained from the Knowth structure: 4130±35 BP (GrA–445) 2882–2585 cal BC and 3985±35 BP (GrA–448) 2588–2459 cal BC. In Britain C14 dates range from a period of about 3500 cal BC in the Orkney Islands and *c.* 2800 cal BC in southern Britain. Britain also has important stratigraphical evidence. At Durrington Walls, such evidence shows that Grooved Ware predates Beaker. An extensive quantity of Grooved Ware was found in the primary silts of the ditch of the main enclosure, but the Beaker sherds were at a higher level. At the Southern Circle, Grooved Ware was found in Phase 1, whereas Beaker sherds only began to emerge in Phase 2 (Wainwright and Longworth 1971, 207). Sherds of Grooved Ware were found in the primary chalk rubble of the ditch at Woodhenge, and from under the bank on the old ground level (Wainwright and Longworth 1971, 207–209). At Balfarg in Scotland, where Grooved Ware and Beaker pottery was found, Mercer states that the Grooved Ware belongs to the first phase of activity on the site (1981b, 129). Formal and patterned deposition of finds are known from other Grooved Ware or contemporary sites (Richards and Thomas 1984).

In Ireland, at the Grange enclosure, County Limerick, sherds of probable Grooved Ware were found beneath the bank, as already mentioned, but also a short distance in from one of the facing stones to the bank in Square 19 of the south-western Quadrant (Ó Ríordáin 1951, 62–3, 73–4). In England, sherds were found in post-holes of the previously mentioned wooden circular structures at Durrington Walls. At that site, it is also possible that pottery sherds, flints and animal bones were placed around the timber uprights, possibly as offerings (Wainwright and Longworth 1971, 25, 232). Sherds were also found in the post-holes of the 'Sanctuary' on Overton Hill in the same county (Cunnington 1931, 315). Parallels also exist in Scotland. Pottery came from the post-holes of the previously mentioned wooden structure at Machrie Moor. A feature at the Balfarg henge monument, Fife, was the ramming of large stones into sockets so as to lock the uprights in position, but what is interesting is that these stones were carefully selected and they were usually of greenish basalt. In addition, pottery and lithic material was deposited in the sockets as part of the back-filling process. However, the vast bulk of the material, over 90%, was deposited within two sockets, A 11 and F A7 (Mercer 1981, Barclay and Russell-White 1993, 187–92, , 97).

At the henge of Maumbury Rings, Dorset, while finds such as antler tools, animal bones, chalk objects and pot sherds were distributed throughout the pits, the majority were confined to higher levels. Furthermore, the pits on the western side had a greater number of finds than those on the eastern side (Bradley 1976, 19, 21–22). On

the west side, the shafts had a limited deposit of archaeological material in the base, and this was covered by a thick deposit of chalk which had hardly any finds. It is also relevant to recall that at the Wyke Down henge, Dorset (Barrett, Bradley and Green 1991, 96) the greatest number of finds came from the secondary recuts of the pits. From the way in which the finds had been packed into the pits, it is clear that they had been placed there deliberately. Another feature of henge monuments of the Grooved Ware Complex in Britain is the apparent deliberate placing of finds in the entrance area; it was also in that area that pottery with the most complex decoration was found (Cleal in Barrett, Bradley and Hall 1991, 141–142). In view of this, the cultural context of the decorated flint macehead found at Knowth, in the eastern chamber of Passage Tomb 1 at the *entrance* to the right recess may now have to be reconsidered (Eogan and Richardson 1982).

The circular wooden structure at Knowth was probably erected for specific ritual purposes. In comparison to the great post-built structures and circles in England, it is much smaller, yet the post-pits which were dug to hold the upright posts appear to be much larger than necessary to hold the size of posts which would have fitted the post-shafts. It is as if the people who built it based their plan on a well known method of construction which was used for larger circles. Yet, they built it within the same rules, as though constricted by ritual, memories or tradition. It is possible that the actual construction of the structure, and the method of digging and back-filling of the post-pits, was as important and vital a part of the ritual activities as those which would be held within the structure after its completion.

Certainly when looking at the finds within the post-pits, their variety, number, position and their segregation within the post-pits, it is obvious that they were not just thrown in, in a disorganised manner, but were placed carefully in different areas and levels within the post-pits (Tables 23 and 24, pp. 191, 192). For example, sherds from an individual vessel were sometimes placed in one post-pit or they may have been placed in different post-pits. Many scrapers were snapped, probably deliberately, and a fragment of flint 7394, from post-pit 8, conjoins with a core 6676, from pit 34. The fresh nature of the flints and the lack of positive evidence for use suggests that they may have been deliberately knapped and fashioned solely for deposition. Obviously every action carried out during the building of the structure and the deposition of votive deposits were carried out in a deliberate fashion where accepted and prerequisite traditional rules were carefully observed.

The majority of the pottery, 295 sherds, comes from the upper fill and annexes; 206 sherds come from the post-shafts. The majority of the flint also comes from upper fill, a substantial number of 547 pieces in contrast to a low number of 155 pieces from the post-shafts. However, the most logical explanation for this difference in numbers is the actual amount of space available within the post-pits. After the post and packing stones had been placed in the post-shaft, a limited

amount of space would have remained for the deposition of finds in contrast to the space available in the upper fill area of the post-shaft. Although flint was found in all post-pits, and pottery in all except post-pits 10, 11, 34 and 35, there are areas where both dominate. The highest number of flint occurs within the four central post-pits and those at the entrance. Pottery sherds are also dominant within the four central post-pits and the post-pits in the entrance area but, interestingly, also in the post-pits on the western side, which are those opposite the entrance (Fig. 40). The entrance always appears to have been important, a feature which has also been observed on British henges, for example at Durrington Walls.

If the deposits within the post-shafts and the upper fill are considered separately, interesting patterns emerge (Fig. 40). As already mentioned, the largest numbers of flints were found in the central post-pits and at the entrance. High number of pottery sherds were found within the post-pits on the western side of the structure. Regarding the finds in the upper fill, the highest number of flints are in the central four post-pits and around the entrance, becoming fairly consistent around the main wall of the structure, with perhaps slightly higher numbers within the post-pits opposite the entrance. High numbers of pottery sherds were also found in the central post-pits, with a very high number occurring in post-pit 22 which, for some reason, consistently contains a high quantity of flint and pottery in both post-shaft and upper fill. The post-pits on the southern side contain the smallest number of finds.

Regarding featured sherds, rimsherds are mainly concentrated in post-pits around the entrance, in the western post-pits and in one central post-pit (No. 2), with fifteen rimsherds coming from the post-shafts and twenty from the upper fill and annexes. Base sherds have a very similar distribution to the rimsherds, with concentrations in post-pits around the entrance, in those on the western side and in the central post-pits (Fig. 40).

As already discussed, it is considered that the background to the Knowth structure and, in fact, to the Brugh na Bóinne Grooved Ware Complex, is in Britain, but where cannot be established. It is logical to consider those regions that are closest geographically to be the most likely area, but definite comparisons cannot as yet be cited from Wales or north-western England. The nearest site that is most relevant is Machrie Moor on the Scottish Isle of Arran. However, it may also be noted that a variety of Grooved Ware comes from the Ronaldsway settlement site in the Isle of Man (Bruce and Megaw 1947).

In Ireland, both finds and monuments indicate that the new archaeological complex which emerged was not something that resulted from indigenous development. Perhaps the passage tomb builders, of their own accord, introduced change but, if that were the case, one would expect greater evidence for overlap. In view of this, at least it may be suggested that a diminution of the Passage Tomb (Decorated Pottery) complex, possibly even its replacement, took

place. However, this need not have occurred before it contributed to the Grooved Ware complex; at least it is possible, as has previously been stated (Wainwright and Longworth 1971, 246–247), that the curvilinear decorated pottery from Skara Brae and Durrington Walls might have been inspired by the art of the Boyne Passage tombs.

The British Grooved Ware complex is usually attributed to native innovation. However, it should be noted that, in different parts of Europe during the 3rd millennium B.C., new and distinctive complexes emerged. One feature of these was a flat-based pottery vessel as found, for example, in the Peu Richard-Moulin de Vent complexes in France (Burnez 1976, 151–99) or the Seine-Oise-Marne pottery. Changes need not have taken place simultaneously in the various regions, neither need they have been part of coordinated and integrated pan-European development. Nevertheless, one such development could have been the emergence of the insular Grooved Ware complex in Britain. This complex went on to play a significant role in the prehistory of Britain. As Colin Renfrew (in Wainwright 1989, 7) states, the Grooved Ware complex was 'one of the most remarkable episodes of British archaeology'. Apparently its emergence took place at a time of dramatic social development, as is testified by its novel range of ceremonial and industrial monuments. Some of the ceremonial monuments especially the great Wessex henges of Durrington, Avebury, Marden and Mount Pleasant, are conspicuous and dominate the landscape, while their building was a major effort that involved social commitment. It has been estimated that the digging of the ditch and the throwing up of the bank at Durrington alone could have involved 900,000 man hours. The enclosed area of thirty acres is 500m in diameter, while the bank is 30m broad and 3m high. In addition, there was the building of internal structures and the acquisition of materials such as timber or stones. All of this required planning, co-ordination and technical skills of a high order. Industrially there was an expansion of flint mining. Exploitation of the Grimes Graves, Norfolk, deposits may have been necessary to meet the needs of Grooved Ware society; at least the creation of the deep shafts can be solely attributed to Grooved Ware miners (Longworth, Ellison and Rigby 1988, 13). There was also a new range of artefact types, the most distinctive being the pottery, but also varieties of stone artefacts, such as transverse arrowheads, polished discoidal knives, plano-convex knives, incised chalk plaques and a range of bone pins and needles. Wheat and barley were grown and domestic animals, especially pig, were kept. As Wainwright (1989, 41) has succinctly stated, Grooved Ware society 'was strongly weighted towards a vast expenditure of human effort on the construction of public monuments related to ceremony, industry and the veneration of the dead'. In Ireland the phase was likewise a significant one. It was at that time the established ritual, and possibly other practices, changed or were replaced and the newly emerging society represented novelty, yet it too, before long was replaced by the Beaker Complex.

CHAPTER V

BEAKER COMPLEX

Introduction

This was another significant phase not only at Knowth, but at Brugh na Bóinne generally. Apparently it was a time of intense activity, both domestic and ritual or ceremonial. Some of the already mentioned enclosures may have been constructed during Beaker times, and at least the Monknewtown example was used by Beaker people (Sweetman, 1976). However, as stated in the previous chapter, there is the possibility of Grooved Ware origins for some of these sites. At Knowth, the bulk of Beaker activity appears to have been domestic. That available up to 1984, Concentrations A–D, a burial and isolated finds have already been fully published, with a petrological study of the pottery by James Brindley (Eogan 1984, 245–322; 331–46). This report will deal with material that came to light since 1984. This includes finds from further excavations at Concentrations A, C, D, and from a new Concentration, E. To assist with the overall interpretation, a summary account of the previously published concentrations will be provided and they will also be considered in the overall evaluation at the end of the chapter.

The concentrations have been defined by a spread of dark earth which had developed from occupation refuse, although animal bones were virtually non-existent. Finds are common and consist of sherds of pottery and flints, both artefacts and scrap. The only structural evidence that emerged were fire-places, shallow pits and a few post-holes. The remains of houses were not identified, nor is there any evidence at any of the concentrations for formal edging or enclosing. Nevertheless, it appears that the Concentrations were the result of domestic settlement. The relevant areas are marked A–E (Fig. 1: 6).

Concentration A (Figs. 42 and 43)

Further work was carried out in this area during 1989 and 1990 (p. 202). An additional area was excavated to the west, measuring 14m by 12m. The dark earth layer which defines the previously excavated area of Concentration A did not extend into the new area of excavation. In its place, but on the same stratigraphical level, a brown layer containing charcoal flecks, large and small stones, sherds of Beaker pottery and flint were found. The only feature discovered was a spread of 6 flat stones measuring 84cm by 59cm (Pl. 10, top). It was at a low level within the brown layer. When the stones were removed, a pit,

1.05m by 90cm by 14cm deep, containing a fill of gritty brown earth and stones, was found. The pit did not contain finds, but Beaker sherds were found on the flat stones and around the circumference of the feature. The brown layer in this area was beneath a cobbled spread, which is similar to cobbles found above Beaker 'Concentration D' (see below pp. 232–34).

As has already been pointed out there is a Grooved Ware element present in this Concentration (see above pp. 202–06), but it has not been possible to determine if initially there was a settlement by users of Grooved Ware subsequently followed by Beaker settlement, or if there was an overlap. If there were a succession of settlements, the extent of either cannot be fully determined; however, as already discussed, Grooved Ware is mainly confined to the north-eastern portion of the Concentration.

Finds: description and catalogue

Pottery

A total of 46 sherds of Beaker pottery was found during recent excavations. They represent about 12 vessels and are similar in form to the Bell-Beaker sherds already published from this Concentration. In general the fabric consists of smooth fine ware containing small grits, and is usually orange/buff in colour. The sherds are small, but many have evidence for decoration, including horizontal and vertical incised lines, finger-nail impressions and comb impressions. Vessels 1 and 6–11 appear to be undecorated. Vessel 12 is decorated with whipped-cord impressions and possibly represents a food vessel; however, because of the small size of the sherds, it is difficult to make a positive identification.

Catalogue

Vessel 1 (Fig. 49) rimsherd 7705 and a bodysherd fragment 7706. The rim is simple. Good quality hard fabric with a high grit content (< = 1.0mm). No evidence for decoration. Colour: buff-orange/grey/buff-orange. T. 7.0–8.3mm.

Vessel 2 6 small bodysherds 7707–12. Hard fabric with a high grit content (< = 4.0mm). Decorated with both vertical and horizontal incised lines, but it is not possible to work out the exact pattern. Colour: buff-orange/orange-black/buff-orange. T. 6.3–8.1mm.

Vessel 3 (Fig. 49) 2 small bodysherds 7713–14. The fabric is hard with a high grit content (< = 2.0mm). The exterior surface is smooth. 7713 has finger-nail impressions and 7714 is decorated with an incised line. Colour: orange/black/black. T. 8.5–8.7mm.

Vessel 4 (Fig. 49) 3 small bodysherds 7715–17. The fabric is hard with a high grit content (< = 3.0mm). 7715 is decorated with finger-nail impressions. Colour: buff/black/black. T. 5.7–8.0mm.

Vessel 5 (Fig. 49) 4 bodysherds 7718–21. The fabric is hard and slightly coarse in texture with a high grit content (< = 2.0mm). No. 7718 is decorated with a horizontal incised line; 7719 has faint traces of a comb impression. Colour: dark orange/black/buff-black. T. 7.2–8.8mm.

Vessel 6 4 bodysherds 7722–5. Hard, well fired fabric with a high grit content (< = 3.0mm). No evidence for decoration. Colour: orange/black/black. T. 6.5–7.8mm.

Vessel 7 4 small bodysherds 7726–9. Hard fabric with a high grit content (< = 2.0mm). The exterior and interior surfaces are relatively smooth. No evidence for decoration. Colour: buff/black/buff. T. 8.0–9.1mm.

Vessel 8 4 bodysherd fragments 7730–3. The fabric is abraded and rough in texture, with a high grit content (< = 3.0mm). No evidence for decoration. Colour: orange/orange/black. T. 6.9–8.1mm.

Vessel 9 2 bodysherds 7734–5. Hard well fired fabric with a high grit content (< = 3.0mm). No evidence for decoration. Colour: orange throughout. T. 7.7–8.7mm.

Vessel 10 2 bodysherds 7736–7. Friable, porous fabric with a moderate grit content (< = 2.0mm). No evidence for decoration. Colour: buff throughout. T. 6.4–6.8mm.

Vessel 11 bodysherd 7738. Hard fabric with a high grit content (< = 3.0mm). The exterior surface is smooth, although some grits protrude through the surface. No evidence for decoration. Colour: brown/grey/orange. T. 6.2mm.

Vessel 12 (Fig. 49) 2 rimsherds 7739–40 and ten bodysherds 7741/7742, 7743, 7744/7745/7746, 7747–50. The fabric is hard and well fired with a high grit content (< = 2.0mm). The rim is simple and rounded, and decorated on both surfaces. Externally, just below the rim is a row of oblique lines, below which is a horizontal line of whipped cord. The internal surface of the rim is decorated with a herringbone pattern which is divided into panels by horizontal incised lines. The bodysherds appear to come from the upper portion of the vessel, as most are broken at the angle of the shoulder or cordon. All are decorated with an overall pattern of horizontal lines of whipped cord. This form of decoration is more usual on food vessels; however, the fabric is consistent with Beaker pottery. Colour: orange/grey/orange. T. 6.9–9.4mm.

Vessel 13 (Fig. 49) bodysherd 7750a, the fabric is hard and compact, with a moderate grit content (< = 1.0mm). The exterior surface is decorated with rounded comb impressions. Colour: orange/grey/ orange. T. 6.0mm.

Lithic assemblage

Fiona Dillon

Introduction
A total of 38 flints was found in the western extension of Beaker Concentration A. The finds include modified and unmodified tools.

Raw material. Flint is the sole raw material in the assemblage. 3 pieces (8%) of chalk deposit flint were identified; 2 are grey, the third is caramel in colour with a gritty cortex. The cortex on each of the pieces is slightly abraded, indicating that they are from flint nodules rather than from the chalk deposits. Pebble flint dominates the assemblage, accounting for 74% (25 pieces). The majority of the pebbles are small with a very smooth, water-rolled brown cortex. A small group are larger, grey brown in colour with a more robust cortex.

Technology. Evidence for the production of tools is limited, accounting for 13% of the assemblage. There are no tested pebbles or cores present. The flake evidence shows diversity in the technology, with bi-polar and percussive reduction present. Cortical and prepared platforms were present. The technology appears to vary to suit the raw material; with bi-polar reduction used on the small brown water-rolled pebbles and percussive reduction on the larger pebbles and on the chalk derived pieces. Both abrupt and invasive retouch is present on the modified tools but, in both cases, producing a blunt working edge. There are no knives or 'cutting' implements. An examination of the technology shows that there was no standardised reduction technique, or even the use of diverse techniques, to produce standardised end products.

Catalogue

(flint unless otherwise stated)

Core rejuvenation flake: 7751. A complete example was found which rejuvenated the platform edge. It was struck at a 90 degree angle to the core flaking axis.

Trimming flake: 7752. A complete example which is burnt and non-cortical.

Unutilised blade: 7753. A fragment.

17 *unutilised flakes*: **Complete:** 7754–9. **Part:** 7760–70. Cortical analysis shows that there are three (18%) primary flakes, five secondary (29%) flakes and nine tertiary (53%) flakes.

3 *utilised flakes*: **Complete:** 7771–2. **Part:** 7773. All have use wear damage on their lateral edges. There is one primary, one secondary and one tertiary flake.

3 *end scrapers*: **Complete:** 7774 (Fig. 49). **Part:** 7775–6 (Fig. 49). 7774 is a complete example on a tertiary flake with invasive retouch forming the working edge at the bulbar end. Edge damage is present on the distal end. No. 7776 is formed on the distal fragment of a primary flake, with invasive retouch at the distal end. No. 7775 is a fragment of an end scraper on a tertiary flake, with abrupt retouch at the distal end.

4 *round scrapers*: **Complete:** 7777–8 (Fig. 49). **Part:** 7779 (Fig. 49), 7780. No. 7777 is a small "thumbnail" scraper which is particular to Beaker contexts. It is formed on a tertiary flake, with invasive retouch extending around the circumference. No. 7779 is a larger burnt round scraper formed on a tertiary flake, with abrupt retouch extending around the circumference of the flake. No. 7778 is a round scraper formed on a thick tertiary flake, with invasive retouch extending around the lateral and distal edges. No. 7780 is a fragment of a round scraper formed on a tertiary flake. Abrupt retouch extends around the intact edge.

2 *miscellaneous scrapers*: 7781–2 (Fig. 49). As a result of their fragmentary state they cannot be classified. Both have regular abrupt retouch and edge damage on their intact edges.

Point: 7783 (Fig. 49). This is a tertiary flake with abrupt retouch extending down both lateral edges, forming a point at the distal end. The retouch is confined to the dorsal face, but becomes invasive at the distal point.

Edge-trimmed blade: 7784 (Fig. 49). An example with abrupt retouch on the lateral edge of a proximal fragment of a secondary flake. Unusually, the retouch is on the dorsal surface on the proximal part of the blade and on the bulbar face on the distal part of the blade. The retouch is regular and even forming a blunt working edge.

2 *retouched flakes*: **Complete:** 7785. **Part:** 7786. Both have intermittent abrupt retouch on their lateral edges.

Chip: 7787.

Irregular flint fragment: 7788. One fragment with fracture scars.

Comments

Modified and unmodified tools form over 40% of the finds excavated since the 1984 report. The other large group is comprised of unutilised flakes which are not part of *in situ* debitage. It is likely that these pieces were used, then discarded, especially after breakage. The modified tools are dominated by scrapers. The end scrapers are quite large and could fit comfortably into the preceding assemblage (Grooved Ware Complex). However the round scrapers are typically Beaker and include a distinctive 'thumbnail' scraper, no. 7777 (above p. 227). Close parallels for these scrapers were previously found in the eastern portion of this concentration (Eogan 1984, fig. 87: nos. 1074–6, 1086). A new tool type is the point, a piercing implement which is finely worked to a robust point. Retouched flakes are present, as well as an unusual edge-trimmed blade with retouch on both bulbar and dorsal faces.

Concentration B

This Concentration, defined by a thin layer of dark earth, 7cm thick, covered an irregular-shaped area 15m in maximum length and covering about 18m metres square. The only structural feature was a depression near the northern end. The lithics consisted of 4 struck pieces of shale and flint, 58 pieces of scrap and 29 artefacts, principally rounded scrapers and blades. Both pebble and chalk deposit flint were used. The 300 pottery sherds represent about 30 vessels. Bell-beakers with elongated S-profiles appear to be the predominant variety. The area was completely excavated in 1967–68 (Eogan 1984, 260–269).

Concentration C

This Concentration was defined by a dark layer, 17cm thick, which was spread over an irregular area of 34 square metres. Most of the area was overlain by a deposit of sterile brown soil, and the southern portion was beneath a layer of soft dark earth. Except for an area of rough cobbling, a few pits and an area of burning, there was no definite evidence for structures (Eogan 1984, 270–286). A portion of this area, which had previously been underneath a dump of excavation earth, was excavated during 1993 and 1994. No further features were discovered, but sherds of Beaker pottery and flint were found.

Finds: Description and catalogue

Introduction: **Pottery**

A small group of 43 sherds of Beaker pottery was found during recent excavations. These represent about 7 vessels, and are similar to those described as Bell-Beakers from the earlier excavation of this concentration. The fabric is fine in texture and generally orange in colour. The sherds are small, but horizontal incised lines and thumb-nail impressions are visible on some sherds. Vessels 5–7 appear to be undecorated.

Plate 10, top. Beaker Complex, Concentration A: flat stones overlying pit, area 4, square 3A.
Plate 10, bottom. Beaker Complex, Concentration E: pits and post-holes. Kerbstones 31–33 (right to left) of Passage Tomb 1 are visible on the right-hand side.

Catalogue

Vessel 14 basesherd 7789 and 3 bodysherds 7790–2. Hard, compact fabric with a moderate to high grit content (< = 1.6mm). The exterior surface is weathered. The exterior surface of no. 7790 is decorated with horizontal incised lines. Colour: pale orange/grey/pale orange. T. 5.0–6.3mm.

Vessel 15 basesherd fragment 7793 and a bodysherd 7794. The fabric is hard and compact, with a moderate grit content (< = 1.4mm). No. 7794 is decorated with horizontal incised lines. Colour: orange/grey/orange. T. 6.8–8.2mm.

Vessel 16 bodysherd 7795, consists of hard, slightly chalky fabric, with a moderate to high grit content (< = 2.0mm). The exterior surface is weathered and is decorated with horizontal incised lines. Colour: orange/grey/pale orange. T. 5.7mm.

Vessel 17 (Fig. 49) bodysherd 7796, hard fabric, slightly weathered, with a moderate to high grit content (< = 1.0mm). The exterior surface is decorated with vertical rows of incised impressions, probably applied with a thumb-nail; these rows are situated between two horizontal incised lines. Colour: orange/grey/orange. T. 6.8mm.

Vessel 18 2 basesherds 7797–8, 9 bodysherds 7799–7807 and a fragment 7808. Hard, well-fired fabric with a moderate to high grit content (< = 3.0mm). No evidence for decoration. Colour: pale orange/black/pale orange. T. 6.0–8.0mm.

Vessel 19 3 bodysherds 7809–11 and 3 fragments 7812–14. Hard, compact fabric with a high grit content (< = 2.5mm). No evidence for decoration. Colour: orange/grey/buff-orange. T. 4.8–6.5mm.

Vessel 20 rimsherd fragment 7815, a bodysherd 7816 and 2 fragments 7817–18. The rim is simple and is gently out-turned. The fabric is hard and very fine, with a moderate to high grit content (< = .8.0mm). Both surfaces are weathered. No evidence for decoration. Colour: orange/grey/orange. T. 3.6–4mm.

4 bodysherds 7819–22 and 10 fragments 7823–32 were also found, but were too fragmented to be assigned with confidence to vessels. However, it can be suggested from the fabric that up to 5 vessels may be represented. The fabric in all cases is hard with a moderate to high grit content. All sherds show evidence for weathering. Traces of an impression are on the exterior surface of 7824.

Fig. 49. Beaker Complex, 'Concentrations A–C': new finds of Beaker pottery and flint. (Concentration A, vessels 1, 3–5, 12–13, and flint nos. 7774–9, 7782–4; Concentration C, vessels 17, 21–2, 24).

Lithic assemblage: Catalogue

(flint unless otherwise stated)

2 *utilised blades:* **Complete:** 7833 (56mm in length), 7844 (36mm in length).

9 *utilised flakes:* **Complete:** 7834–7, 7848–52. **Part:** 7838.

End scraper: 7839, an incomplete example with secondary working on the distal end of the flake and a 'fresh' unabraded break on one side. Fresh cortex is present.

Round scraper: 7840, an incomplete, burnt example.

2 *side scrapers:* 7841, 7845 are complete examples with retouch on the lateral edges of the flakes. Cortex is present on no. 7845.

Notched flake: 7842, a complete example. Cortex is present on this flake.

3 *chips:* 7843, 7846–7.

Stone object: 7844, portion of a smooth flat stone, now D-shaped, but originally it was probably rounded. The edges are shaped and are slightly bevelled. Abrasions are present on one side of the stone, which indicates that it may have been used as a smoothing stone. Diam. 79mm. T. 8.8mm.

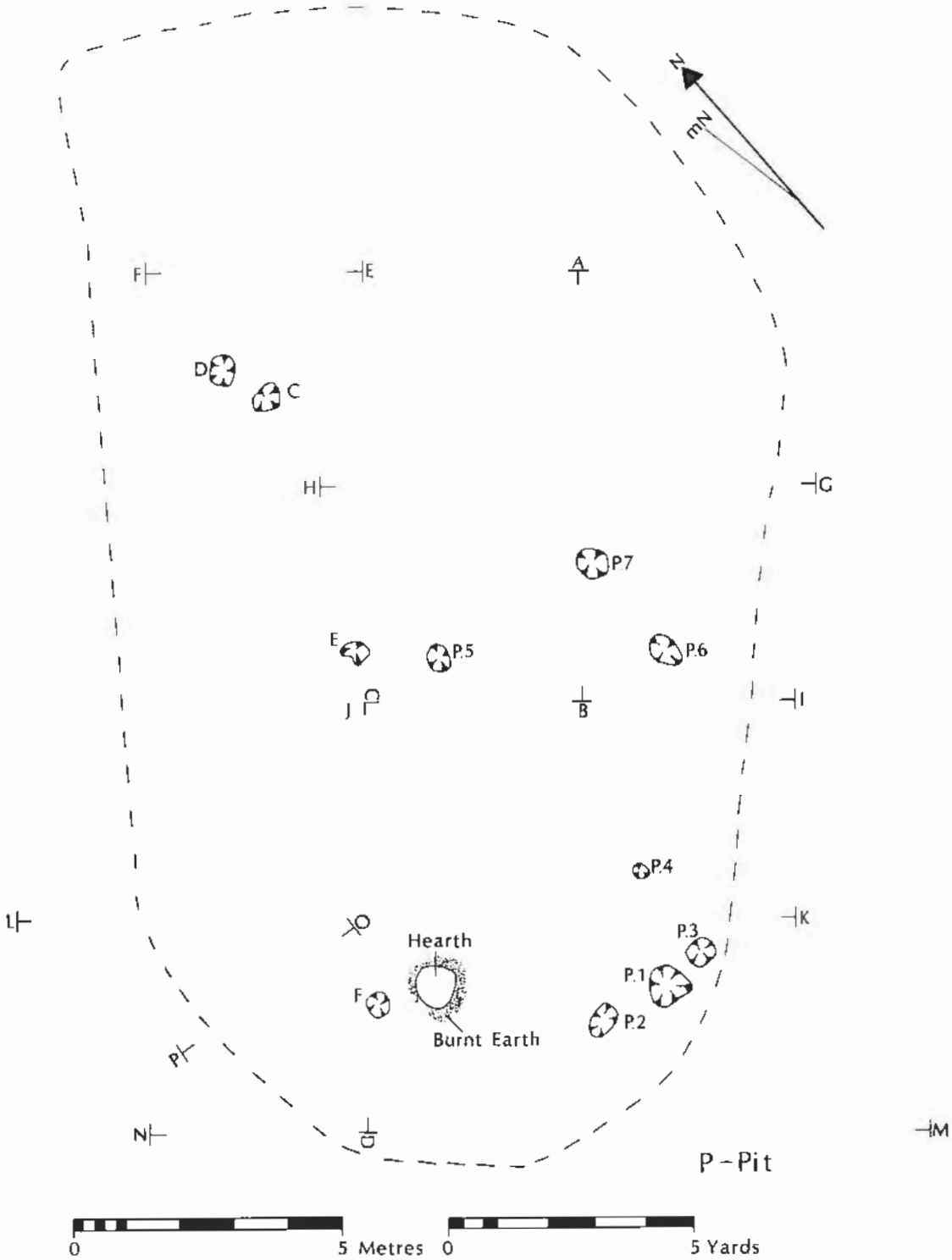
Two flint pieces, a round scraper no. 7853 and a utilised flake no. 7854 which were found in spoil material from Concentration C, should be included with the above assemblage.

Concentration D (Fig. 50)

The substantial portion which was excavated in 1978 has been published (Eogan 1984, 286–304). That area was defined by a layer consisting of dark gritty earth with a mixture of pebbles and containing finds; it was somewhat trapezoidal-shaped in plan and measured 17.2m in length and 11.4m in maximum width. On a limited area along the north-west, a portion of the occupation layer overlay a stoney spread which has been interpreted as slip from the large mound (Passage Tomb 1). The Beaker horizon was overlain by a spread of cobbles which extended across the south-eastern area of the concentration. The only positive structural feature that came to light was a hearth, which was situated near the north-western end.

In the north-eastern portion, due to overlying material, the Beaker layer was not investigated; this work was completed during the 1991–93 seasons. These additional investigations have shown that the area of settlement was more extensive, measuring 21m by 12.5m in

Fig. 50. Beaker Complex, 'Concentration D': ground-plan showing full extent of concentration. A ground-plan and cross-sections of previous excavation of the area is published in Eogan 1984, figs. 106–7.



overall dimensions, and in part overlay the circular wooden building of the Grooved Ware Complex (p. 101). In addition to further finds of Beaker pottery and flint, seven small pits, 1–7, were found (Fig. 50). Pit 1, measuring 81cm by 77cm, was the largest. Dark earth filled half of this shallow pit, while the other half consisted of red ash and small stones. It did not represent *in situ* burning, as sherds found within the ash did not display signs of burning. The other pits averaged 22cm by 23cm by 13cm deep. In all examples, the fill consists of brown stoney earth with charcoal flecks. These pits did not form a recognisable pattern.

Finds: Description and catalogue

Introduction: **Pottery**
A total of 72 Beaker sherds was found during recent excavations, representing an estimated 24 vessels. All represented fine ware Beaker vessels, similar to the previously published assemblage from this concentration. Decoration consists of horizontal, vertical and oblique incised lines, comb impressions and finger nail impressions.

Catalogue

Vessel 21 (Fig. 49) rimsherd 7856, bodysherd 7856a and a fragment 7856b. The flattened rim expands slightly on the exterior surface. Hard, compact fabric with a moderate grit content (< = 1.0mm). No. 7856a is decorated with horizontal rows of comb impressions. Colour: buff-orange/grey/buff-orange. T. 6.2–6.5mm.

Vessel 22 (Fig. 49) 2 bodysherds 7857/7858/7859a, 7859b. The fabric is hard, well made and appears to have been burnished. There is a high grit content (< = 2.0mm) and mica flecks are visible. Decoration consists of horizontal incised lines above a panel of oblique lines, which are bounded at the bottom by a horizontal line separating it from another panel of oblique lines running in the opposite direction. Colour: dark orange/dark orange/brown. T. 5.3–6.3mm.

Vessel 23 rimsherd 7860, 4 bodysherds 7861–4. The sherds are small but appear to represent a single vessel. The rim is simple and rounded, and expands slightly on the exterior surface. The fabric is hard but rough in texture, which may have been caused by weathering. There is a high grit content (< = 1.0mm). The bodysherds are decorated with horizontal incised lines. Colour: orange/brown/orange. T. 4.6–7.0mm.

Vessel 24 (Fig. 49) 2 bodysherds 7865–6. The fabric is hard and the surfaces are smooth, with a high grit content (< = 0.5mm). Decoration

consists of horizontal and oblique incised lines. Colour: buff-orange/black/buff-orange. T. 6.1–6.3mm.

Vessel 25 (Fig. 51) rimsherd 7867 and a bodysherd 7868. The slightly out-turned rim is simple and rounded in form. Hard, well-fired fabric with a high grit content (< = 2.0mm) which protrudes through the surface, giving the vessel a rough texture. The bodysherd is decorated with closely-spaced horizontal incised lines. Colour: pale orange/brown/pale orange. T. 5.3–5.7mm.

Vessel 26 bodysherd 7869, the hard fabric is slightly rough in texture with a high grit content (< = 1.0mm). Decoration consists of a horizontal incised line. Colour: orange/black/orange. T. 5.9mm.

Vessel 27 small bodysherd 7870, well-fired fabric with a high grit content (< = 0.5mm). Decoration consists of a horizontal incised line. Colour: orange throughout. T. 4.6mm.

Vessel 28 (Fig. 51) rimsherd 7871, bodysherd 7872 (probably from the same vessel). Well-made, well-fired fabric with a moderate to high grit content (< = 2.0mm). The simple rim is decorated on the interior surface with oblique lines and cord impressions. The bodysherd is decorated with horizontal rows of irregular incised lines. Colour: orange throughout. T. 4.3–4.5mm.

Vessel 29 bodysherd 7873, hard fabric, well fired with a high grit content (< = 0.5mm). Decoration consists of a horizontal incised line. Colour: dark orange throughout. T. 5.4mm.

Vessel 30 (Fig. 51) rimsherd fragment 7874 and a bodysherd 7875, probably from the same vessel. The rim is poorly preserved, the exterior surface is missing but appears to be of simple form. Very hard, well-fired fabric with a high grit content (< = 2.0mm). The bodysherd is decorated with merging horizontal incised lines. Colour: orange/grey/orange. T. 6.4–7.5mm.

Vessel 31 (Fig. 51) bodysherd 7876/7877, hard, friable fabric with a moderate grit content (< = 2.0mm). Sooting is present on the interior surface. Decorated with oblique rows of very fine comb impressions. Colour: pale orange/black/pale orange. T. 5.6mm.

Vessel 32 (Fig. 51) basesherd fragment 7878. It contains a moderate grit content (< = 1.0mm). Finger-nail impressions are present near the base. Colour: pale orange/black/black. T. 11.9mm.

Vessel 33 (Fig. 51) rimsherd 7879, 3 bodysherds 7880–2 and a fragment 7883. Simple rim, slightly out-turned. 7880 is possibly a cordon fragment. Hard, good quality fabric with a high grit content (< = 3.0mm). Colour: orange/dark grey/orange. T. 4.6–8.1mm.

Vessel 34 3 bodysherds 7884–6. Good quality fabric with a high grit content (< = 2.0mm). No evidence for decoration. Colour: orange/grey-brown/orange. T. 3.7–5.8mm.

Vessel 35 5 bodysherds 7887–7891 (all probably from the same vessel). The chalky fabric has a moderate grit content (< = 2.0mm). No evidence for decoration. Colour: orange/black/orange. T. 5.3–7.8mm.

Vessel 36 (Fig. 51) 3 bodysherds 7892–4. Hard, well fired fabric with a high grit content (< = 1.0mm). No. 7892 and 7893 are decorated with a horizontal line of comb impressions. Colour: orange throughout. T. 6.1–6.9mm.

Vessel 37 2 bodysherds 7895–6. Hard, well fired fabric with a moderate to high grit content (< = 0.5mm). No. 7895 is decorated with a horizontal incised line. Colour: orange/grey/orange. T. 6.3–6.4mm.

Vessel 38 2 bodysherds 7897–8. Coarse textured fabric with a high grit content (< = 3.0mm) which protrudes through the surface. No evidence for decoration. Colour: orange/grey/orange. T. 6.7–7.4mm.

Vessel 39 basesherd fragment 7899. Hard fabric with a low to moderate grit content (< = 4.0mm). No evidence for decoration. Colour: brown/black/black. T. 12.3mm.

Vessel 40 basesherd fragment 7900. Very coarse fabric with a high grit content (< = 5.0mm). No evidence for decoration. Colour: orange/grey-brown/orange. T. 18. 2mm.

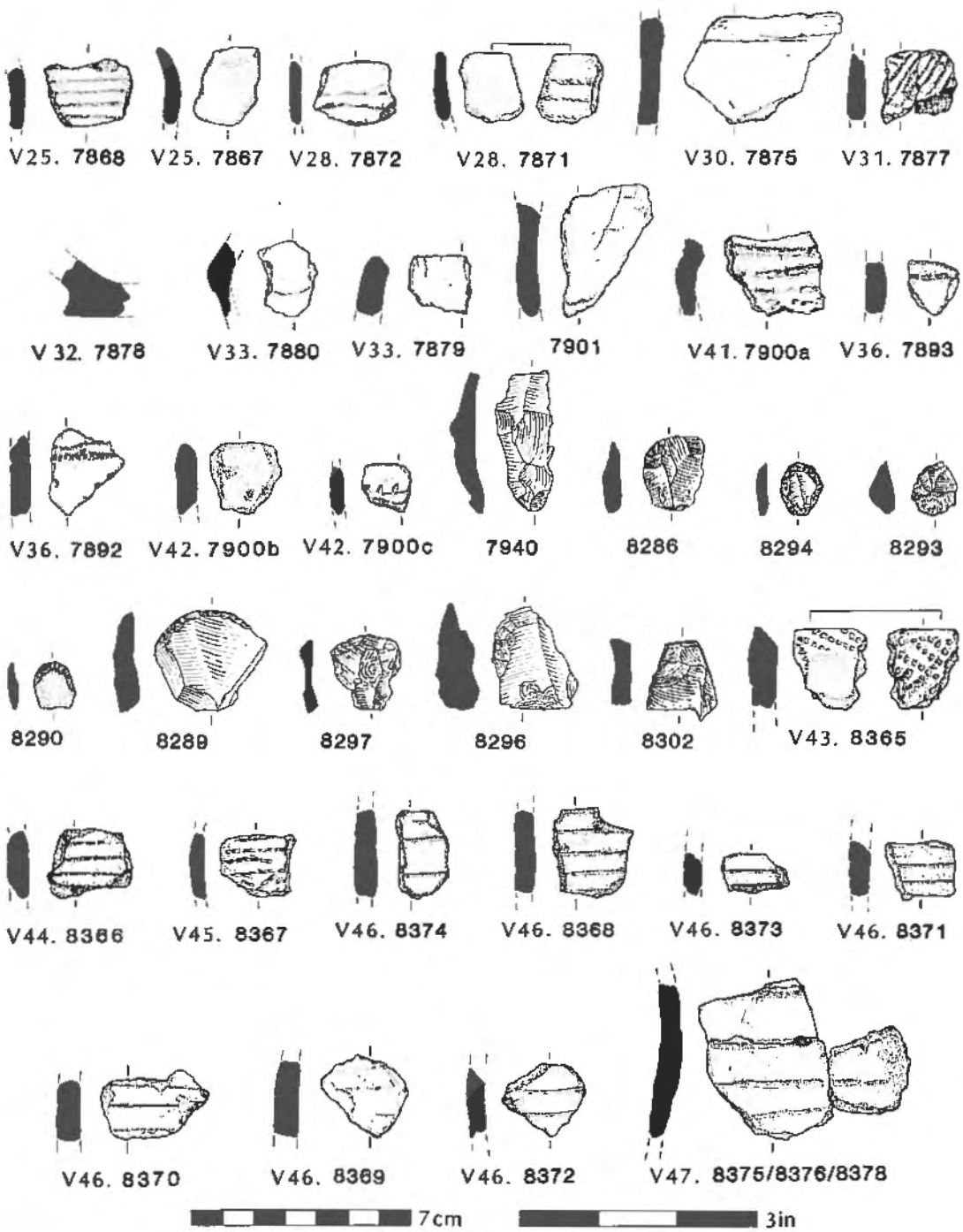
Vessel 41 (Fig. 51) Bodysherd 7900a. Hard fabric with a moderate grit content (< = 2.0mm). Decoration consists of curved groove. This sherd is possibly from a food vessel. Colour: brown throughout. T. 8.2mm.

Vessel 42 (Fig. 51) rimsherd 7900b and a bodysherd 7900c. The rim is of simple, rounded form. The fabric is hard and compact, with a moderate grit content (< = 1.0mm). No. 7900c is decorated with finger-nail impressions. Colour: orange throughout. T. 4.0–6.0mm.

Also found were 27 undecorated bodysherds 7901 (Fig. 51) 7902–6, 7911–18, 7919a–c, 7920–9 and 5 crumbs 7907 (one is decorated with an incised line), 7908–10, which are too small to be assigned with confidence to vessels. No. 7901 is of good quality and was possibly burnished. The other sherds have orange exterior and interior surfaces, and mainly grey cores. There are possibly up to 4 vessels represented.

3 fragments of baked clay 7930–2 were also found in this concentration.

Fig. 51. Beaker Complex, 'Concentration D–E': new finds of Beaker pottery and flint discovered after the 1984 publication. ('Concentration D': vessels 25, 28, 30–1, 33, 36, 41–2, 50, and flint nos. 7940, 8286, 8293–4, 8289–90, 8296–7, 8302; 'Concentration E', vessels 43–7).



Lithic assemblage

Fiona Dillon

Introduction. In the extended area which the subsequent excavations revealed, 434 lithics were found. The finds include flint, worked and unworked chert and unworked quartz.

Raw material. Flint is the dominant raw material, with 417 pieces (96%); in addition there were 9 pieces of chert and 8 of quartz. Two types of flint were identified, chalk and pebble flint. The latter is the main flint resource, forming *c.* 85% of the new finds. This proportion is higher if the burnt flint is taken into account, because 10 flakes are identifiable as pebble flint from their cortex. There are 48 (11%) pieces of chalk deposit flint. The cortex tends to be slightly abraded, indicating that they were derived from nodules rather than from fresh 'mined flint'. Two of the three cores were of chalk flint, but the retouched pieces are of pebble flint. Chert forms 2% of the new finds, with only 2 of the 9 pieces knapped into unutilised flakes, while the remaining 7 are unworked. The exploitation of chert is very limited and cannot be seen as an indicator of flint resource stress. Unworked quartz is present but, as it is not knapped, its inclusion may be fortuitous.

Technology. The initial selection of flint pebbles is represented by 2 examples, nos. 7934 and 7935. Knapping is represented by 4 cores nos. 7936–9; both single and dual platform cores were exploited. The core platforms were prepared. There are 10 core rejuvenation flakes, indicating the preparation of the flaking surfaces. No. 7940 (Fig. 51) shows the use of keeled cores, as well as platformed cores, in the reduction process. The remaining pieces are lateral core trimming pieces to rejuvenate the flaking surface. Cortical analysis shows 15 unretouched primary flakes which are the by-product of initial core preparation. The flake evidence also shows a predominance of prepared platforms with only 5 (7%) cortical examples. The analysis of the platform types shows almost a parity between prepared, 30 (45%) examples and punch platforms, 32 (48%) examples. However, the retouched pieces have predominantly prepared platforms, with the high incidence of uniform platforms due to the presence of trimming flakes in the assemblage. An analysis of platform depths shows that indirect percussion predominated. The retouched pieces form two groups, one with platforms representing indirect percussion and the second group with platforms greater than 5.0mm, which represent direct percussion. The predominance of tertiary flakes indicates a careful preparation of the flaking surface as well as the platforms. Evidence of secondary working is provided by trimming flakes and the modified implements. There are 52 trimming flakes which indicate *in situ* secondary working. The modified implements include

examples of abrupt retouch e.g. no. 8288 and invasive retouch e.g. No. 8293 (Fig. 51). Shallow invasive retouch is confined to scrapers, while the abrupt retouch is present on scrapers, retouched and edge-trimmed flakes and notched flakes.

Catalogue

(flint unless otherwise stated)

2 *flint pebbles:* **Complete:** 7934. **Part:** 7935 (burnt).

4 *cores:* **Complete:** 7936–8. **Part:** 7939. No. 7936 is a Class A1 (Clark, Higgs and Longworth 1960, 216) core of chalk flint. No. 7939 is a fragment of pebble flint which was not possible to classify. No. 7937 is a small example of Class B2 type. No. 7938 is of B2 type which is fully exploited around its circumference.

10 *core rejuvenation flakes:* **Complete:** 7940 (Fig. 51), 7941–4. **Part:** 7945–9. These include one keeled example, No. 7940, and nine lateral rejuvenation flakes.

57 *trimming flakes:* **Complete:** 7950–79. **Part:** 7980–8006. These include one primary (2%), seven secondary (12%) and forty nine tertiary (86%) flakes.

2 *unutilised blades:* **Complete:** 8007. **Part:** 8008.

256 *unutilised flakes:* **Complete:** 8009–32. **Part:** 8033–8219, 8200a–d, 8221–42, 8243 (chert), 8244–61. 13 examples (5%) are primary, 52 (20%) are secondary and 191 (75%) are tertiary flakes.

2 *utilised blades:* **Complete:** 8262. **Part:** 8263. Both have use wear on their lateral edges.

24 *utilised flakes:* **Complete:** 8264–71. **Part:** 8272–85, 8286 (Fig. 51), 8287. 24 examples with use wear damage, of which eight are complete; 8283 is a chert piece. Four are burnt Nos. 8265, 8277, 8282 and 8286. There are 2 primary (8%), 6 secondary (25%) and 16 (67%) tertiary flakes.

5 *end scrapers:* **Complete:** 8288, 8289–8290 (Fig. 51). Nos. 8288–9 are fashioned on tertiary flakes with abrupt retouch at the distal end; no. 8290 is on a small primary flake with shallow abrupt retouch at the distal end and no. 8292 is on a tertiary flake with shallow invasive retouch at the distal end, forming a sharp working edge which subsequently was broken. No. 8291 is fashioned on a tertiary flake with a cortical platform, with steep abrupt retouch at the distal end.

2 *small round scrapers:* **Complete:** 8292, 8293, 8294 (Fig. 51). No. 8293 is a fragment fashioned on a secondary flake. The retouch is steep and invasive, giving a convex cross-section. No. 8294 is a small round scraper (maximum dimension 16mm) on a secondary flake with steep abrupt retouch around its circumference.

Concave scraper: 8295. A small, complete, secondary flake with the abrupt retouch forming a shallow concavity on the lateral edge.

4 *miscellaneous scrapers:* 8296–8297 (Fig. 51), 8298–8299. All are incomplete, 8297 is a burnt fragment on a tertiary flake with abrupt retouch on the intact edge. No. 8296 is another burnt fragment on a tertiary flake, with shallow invasive retouch on the intact edge. No. 8298 is a fragment on a secondary flake with abrupt even retouch on the intact edge. No. 8299 is a fragment on a tertiary flake with abrupt retouch on the intact edge.

Edge-trimmed blade: 8300. A fragment, with fine abrupt retouch on a lateral edge and use wear on the other lateral edge.

7 *edge-trimmed flakes:* **Complete:** 8301. **Part:** 8302 (Fig. 51), 8303–8307. These flakes have abrupt retouch on the lateral edge. There are two secondary and five tertiary flakes.

8 *retouched flakes:* **Complete:** 8308–9. **Part:** 8310–15. These flakes have irregular abrupt retouch on the lateral edges. There are 3 secondary and 6 tertiary flakes.

8 *notched flakes:* **Complete:** 8316–17. **Part:** 8318–23. All have small concavities on the lower lateral edges.

11 *chips:* 8324–34.

15 *fragments:* 8335–49. Irregular pieces of flint which have concoidal and thermal fracture scars.

8 *unworked fragments, quartz:* 8350–7.

7 *unworked fragments, chert:* 8358–64.

Comments. The exploitation of raw material is primarily locally based. The small percentage of chalk deposit flint indicates that it was not extensively used.

Each stage of the lithic tool production is present. A flint pebble and a split pebble are indicators of the limited selection of the raw material. The preparation and knapping of cores are represented by 4 cores, 10 core rejuvenation flakes and 15 un-retouched primary flakes. Secondary modification of flakes is represented by 57 trimming flakes.

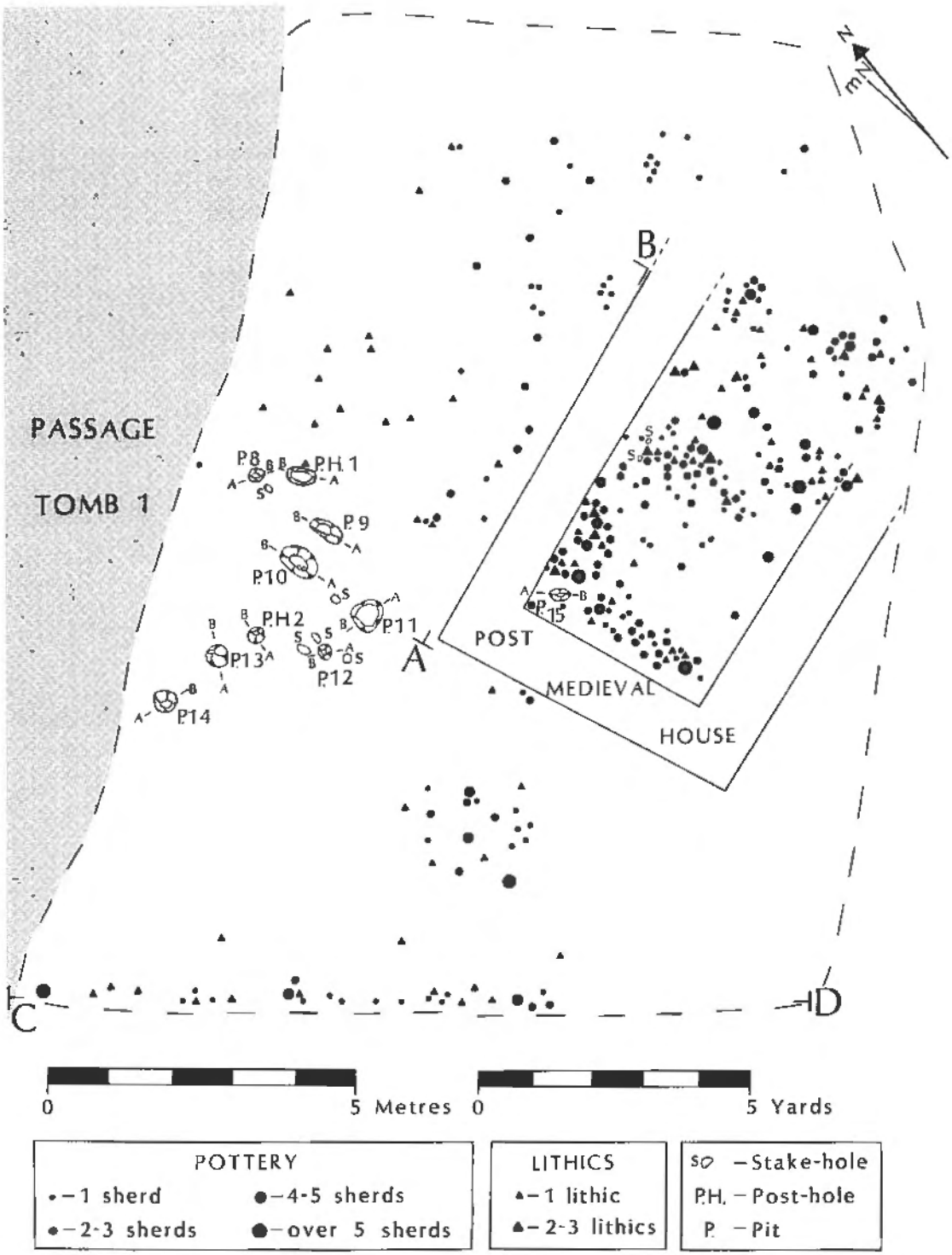
The largest group in the assemblage are the unutilised flakes and blades which form 59%. Tools include round, concave and end scrapers, edge-trimmed flakes and blades, retouched flakes and notched flakes. The scrapers range in form and size, varying from large robust end scrapers (no. 8292), to smaller rounded scrapers (nos. 8290, 8294), and a concave scraper (no. 8295). The shape of the small scrapers must be related to a particular function or perhaps a method of hafting, as the size makes them difficult to work with for any length of time. The less conventional implements, the retouched, notched and edge-trimmed flakes, form the largest group (24 pieces). The most consistent factor about these pieces is the high incidence of broken flakes (87%), with only 3 complete examples. Both invasive (nos. 8309, 8312) and abrupt (nos. 8311, 8314) retouch were used to modify the flakes. Suitable flakes appear to have been selected and slightly modified to suit a particular function. Twenty-three flakes have been modified, with 16 on their lateral edges and 7 examples with small notches. All except 5 are tertiary flakes. The assemblage includes examples from all the stages of tool production, and a relatively high incidence of tools indicating a broad range of activities within one area.

Concentration E (Figs. 52 and 53)

This new area of Beaker occupation is located on the south-eastern part of the hill, and is defined by a layer of black organic earth containing stones which directly overlay the natural boulder clay. It extended over a rectangular area 10m by 16.5m by 14cm deep. This layer extended to the base of the kerbstones of Site 1, which suggests that there was no mound slip in this particular area of the large mound. This contrasts with the area of Beaker Concentration D where material presumed to be mound slip was found beneath the Beaker occupation layer (Eogan 1984, 286).

Structural features were limited and consisted of 8 small pits (P.8–15), 2 post-holes (P.H.1–2) and 7 stake-holes (marked s on plan, fig. 52). Pit 8 measured 21cm by 22cm by 13cm deep; pit 9 – 50cm by 26cm by 34cm; pit 10 – 62cm by 42cm by 25cm; pit 11 – 51cm by 47cm by 34cm; pit 12 – 24cm by 23cm by 10cm; pit 13 – 36cm by 31cm by 27cm; pit 14 – 37cm by 28cm by 22cm; pit 15–36cm by 22cm by 13cm; post-hole 1 was 46cm by 28cm by 12cm and post-hole 2 was 28cm by 25 by 19cm deep. Most of the pits and post-holes were centred in an area near the north-western edge, and were grouped close to the kerbs of Passage Tomb 1. The only resemblance of a shape was a line of 4 pits (P.9, 10, 13 and 14) and one post-hole (P.H.2), which were placed in an approximate east-west line diverging out from the line of the kerb. At the eastern end, a pit (P.8) and a post-hole (P.H.1) formed a straight line. The area defined was triangular in shape, and approximately 4.5m in maximum external length and 2.7m in width. Perhaps it represents the remains of a small structure that used the kerb of the tomb as a northern wall. If so, because of its small size, it

Fig. 52. Beaker Complex, 'Concentration E': ground-plan and distribution of pottery and lithic finds.



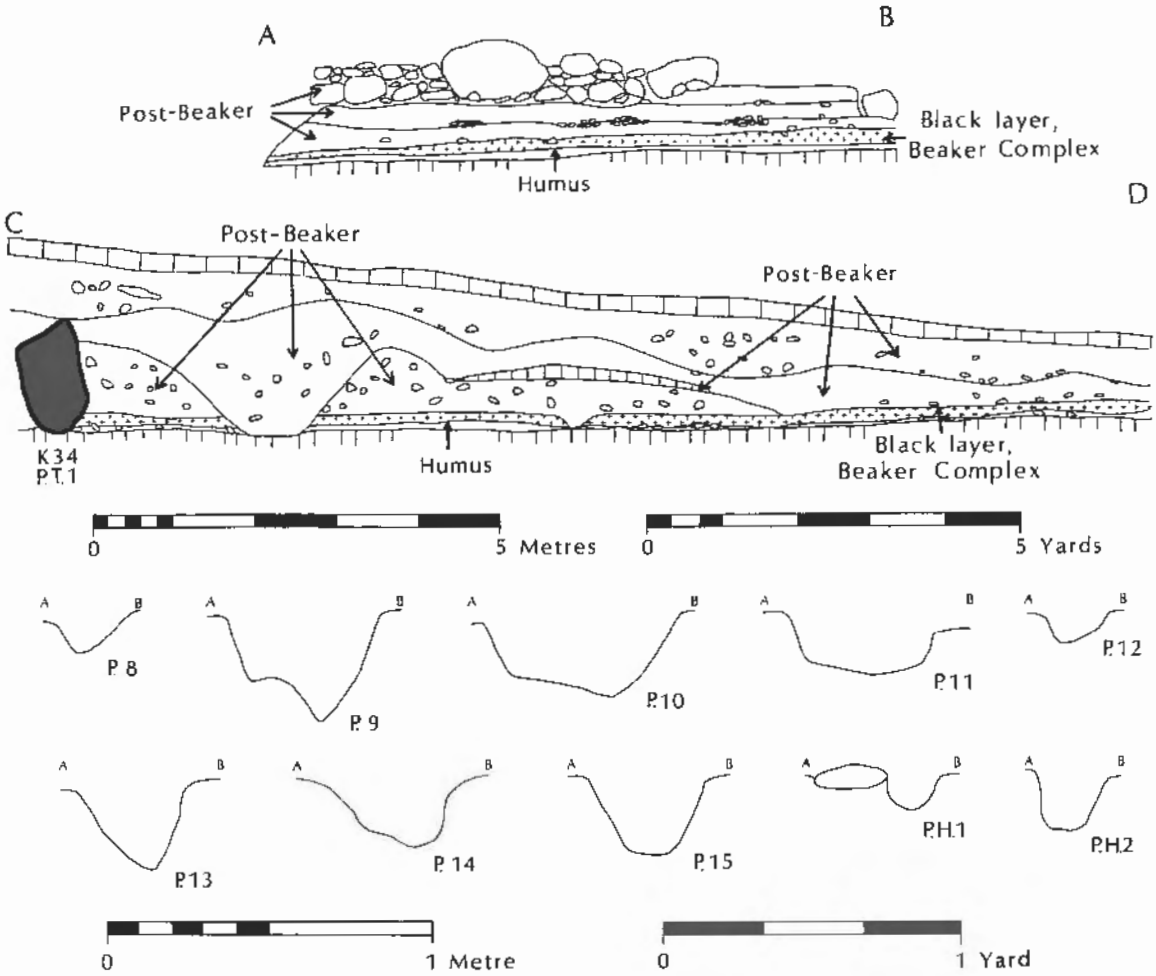
could only have served as some form of rough shelter. However, it is unlikely that it could have been practical even for that purpose, as its western end is very narrow.

A 17th century AD rectangular house overlies part of the concentration, but all areas were excavated, except for those beneath the walls of the house.

Finds: description and catalogue

A total of 446 sherds of Beaker pottery was found within the black layer, representing an estimated 38 vessels. It consisted of fine ware, very similar in form and colour to the assemblages from Concentrations A–D. Both decorated and plain varieties were represented. The

Fig. 53. Beaker Complex, 'Concentration E': cross-sections A–B; C–D. Profiles of pits and post-holes. All layers above the Beaker horizon are later and are not relevant to this report.



decorative motifs are quite extensive, including horizontal, vertical and oblique incised lines, comb impressions, chevron and criss-cross patterns, as well as circular, dot and finger-nail impressions.

Catalogue

Vessel 43 (Fig. 51) rimsherd 8365, unexpanded with an internal bevel. Fine compact fabric with a high grit content (< = 3.0mm). Decorated on the interior and exterior surfaces with oblique rows of circular comb-tooth impressions. Colour: orange/dark grey/orange. T. 8.5mm.

Vessel 44 (Fig. 51) 2 bodysherds 8366, 16328. Hard, good quality fabric with a high grit content (< = 2.0mm). Decorated with evenly-spaced horizontal rows of comb impressions. Colour: orange/grey/brown. T. 6.9–7.5mm.

Vessel 45 (Fig. 51) 2 bodysherds 8367, 16329 and a fragment 16330. Hard, well-fired fabric with a moderate to high grit content (< = 3mm). Decorated with horizontal lines of comb impressions. The bottom row appears to be comb impressions forming a chevron pattern. Colour: orange throughout. T. 5.7mm.

Vessel 46 (Fig. 51) a base-angle sherd 16170, 15 bodysherds 8368–74, 16163–9, 16331 and a fragment 16332, possibly representing more than one vessel. Hard, slightly porous fabric with a high grit content (< = 2.0mm). Decoration consists of horizontal bands of incised and oblique lines. Colour: orange/orange-dark grey/brown. T. 6.4–7.4mm.

Vessel 47 (Figs. 51 and 54) 5 bodysherds 8375/8376/8378, 8377, 8379–81. The fabric is hard and well-fired, with a moderate to high grit content (< = 2.0mm). All, except nos. 8380 and 8381 are decorated with horizontal, interrupted shallow scores or grooves. The grooves on no. 8379 are narrower and deeper than the others; there is also a groove on the interior surface. Colour: orange throughout. T. 4.6–7.3mm.

Vessel 48 (Fig. 54) 6 bodysherds 8382, 16333–7 and 5 fragments 16338–42, possibly representing more than one vessel. The hard fabric is rough in texture and has a high grit content (< = 1.0mm). Decorated with irregularly spaced horizontal incised lines. Colour: orange/grey/dark grey-black. T. 6.2mm.

Vessel 49 (Fig. 54) weathered bodysherd 8383. Hard, compact fabric with a high grit content (< = 1.0mm). Decorated with evenly-spaced horizontal incised lines. Colour: orange/black/black. T. 5.9mm.

Vessel 50 (Fig. 54) rimsherd 8384 and 3 bodysherds 8385–6, 16343. Possibly more than one vessel represented. Hard, compact fabric with

a high grit content (< = 3.0mm). The weathered exterior surface appears to be decorated with irregularly-spaced horizontal and oblique lines of very fine comb impressions. No. 8385 is decorated with irregularly-spaced horizontal incised lines and bands of oblique lines. No. 8386 is decorated with a band of incised criss-crosses. Colour: orange/dark grey/orange. T. 6.2–8mm.

Vessel 51 (Fig. 54) 2 rimsherds 16145-6, a base–angle sherd 16150 and 8 bodysherds 8387, 16147–9, 16344–7. The fabric is hard and well fired, with a high grit content (< = 1.0mm). Decoration consists of alternating bands of incised lines on either side of a band of criss–crosses and fringes. Colour: orange/dark grey/orange. T. 4.0–5.7mm.

Vessel 52 (Fig. 54) 6 bodysherds 8388–92, 16348 and a fragment 8393. The compact fabric is chalky in texture, with a low to moderate grit content (< = 0.4mm). Nos. 8388 and 16348 are decorated with bands of irregular horizontal incised lines. Colour: orange/buff-grey/buff-orange. T. 4.9–6.8mm.

Vessel 53 (Fig. 54) 3 bodysherds 8394–5, 16349. Compact fabric containing some cavities, with a moderate grit content (< = 1.0mm). Both sherds are decorated with bands of horizontal incised lines and, in addition, 8394 has three circular impressions. Colour: orange/grey/brown. T. 5.6–6.3mm.

Vessel 54 (Fig. 54) 14 bodysherds 8396–8404, 16350–4 and 6 fragments 16355–60. Hard fabric with a high grit content (< = 1.0mm). Decorated with incised lines, finger-nail impressions and circular impressions. Colour: orange/orange-black/orange-black. T. 5.1–9.7mm.

Vessel 55 (Fig. 54) 2 bodysherds 8405–6, the weathered fabric is hard and coarse in texture, with a high grit content (< = 1.0mm). Both sherds are decorated with incised lines and horizontal rows of finger-nail impressions. Colour: orange throughout. T. 6.3–8mm.

Vessel 56 (Fig. 54) 6 bodysherds 8407–9, 16361–3 and 6 fragments 16364–9, possibly from more than one vessel. The fabric is hard but rough in texture, with a high grit content (< = 2.0mm). Decoration consists of horizontal incised lines and finger-nail impressions. Colour: orange/grey/orange. T. 4.7–6.2mm.

Vessel 57 a base–angle sherd 16370, 8 bodysherds 8410–11, 16371–6 and a fragment 16377. Smooth fabric with a moderate to high grit content (< = 1.0mm). Nos. 8410 and 16371 are decorated with shallow circular impressions. Colour: buff throughout. T. 6.1–7.5mm.

Vessel 58 (Fig. 54) rimsherd 8412, a base-angle sherd 8413, 11 bodysherds 8414–19, 16378–82 and 10 fragments 8420–2, 16383–9.

Possibly not all from the same vessel, but the fabric is similar in all examples. The rim is simple and unexpanded. Many sherds are abraded but, in general, the fabric is of good quality, with a high grit content (< = 2.0mm). Faint horizontal grooves are present on no. 8416. Colour: orange/orange-grey/orange-black. T. 5.4–9.6mm.

Vessel 59 (Fig. 54) rimsherd 8423 and 13 bodysherds 8424–7, 16390, 16394–401 and 6 fragments 16391–3, 16402–4. The rim is simple, rounded and slightly out-turned. The fabric is hard and well-fired, with a high grit content (< = 2.0mm). No evidence for decoration. Colour: orange/grey/orange. T. 4.6–6.5mm.

Vessel 60 (Fig. 54) rimsherd 8428 and 4 bodysherds 8441–2, 16220, 16405. The rim is simple, rounded and slightly out-turned. Hard, well-fired fabric with a high grit content (< = 2.0mm). No. 16220 is decorated with tooth-comb impressions. Colour: orange throughout. T. 3.8–4.5mm.

Vessel 61 (Fig. 54) basesherd 8429, hard, compact fabric with small cavities on the surface and a high grit content (< = 1.0mm). No evidence for decoration. Colour: orange/black/orange. T. 9.1mm.

Vessel 62 (Fig. 54) rimsherd 16112, 2 basesherds 8430 and 16130, 13 bodysherds 16113–25 and 4 fragments 16126–9. The fabric is hard and compact, with a rough texture and a high grit content (< = 1.0mm). Decoration consists of horizontal comb impressions on either side of bands of oblique lines. Colour: orange/dark grey/dark grey. T. 10.1mm.

Vessel 63 2 base-angle sherds 8431, 16406. Slightly friable fabric with a moderate grit content (< = 3.0mm). No evidence for decoration. Colour: orange/black/buff. T. 11.8mm.

Vessel 64 rimsherd 8432, simple, rounded slightly out-turned rim. Friable fabric with a high grit content (< = 3.0mm). No evidence for decoration. Colour: orange/black/orange. T. 7.9mm.

Vessel 65 rimsherd 16194, a base-angle sherd 16196 and 9 bodysherds 8433–40, 16195. Hard fabric, rough in texture with a high grit content (< = 2.0mm). No evidence for decoration. Colour: orange-brown throughout. T. 5.5–8.4mm.

Vessel 66 rimsherd 16221, a base–angle sherd 16407 and 3 bodysherds 16408–10. Flat-topped and slightly out-turned rim. Hard compact fabric with a moderate grit content (< = 1.1mm). Decoration consists of rounded and elongated impressions. Colour: orange/grey/orange. T. 4.9mm.

Vessel 67 (Fig. 54) rimsherd 16095, 11 bodysherds 16096–103, 16411–3

and 12 fragments 16104–11, 16414–7, possibly representing more than one vessel. The rim is simple, rounded and slightly out-turned. The fabric is hard with a moderate grit content (< = 1.5mm). Decoration consists of bands of incised lines and oblique comb impressions. No. 16097 is decorated with a horizontal incised line above a fringe pattern. Colour: orange/grey/orange-grey. T. 5.5–6.3mm.

Vessel 68 rimsherd 16131, a base-angle sherd 16144, 9 bodysherds 16132–40 and 5 fragments 16141–3, 16418–9. The rim appears to be simple and straight-sided. The fabric is hard and compact with a moderate grit content (< = 3mm). Decoration consists of horizontal incised lines, which merge in some areas. Colour: orange/grey-orange/orange. T. 4.2–7.2mm.

Vessel 69 (Fig. 54) rimsherd 16151, a base-angle fragment 16159, 6 bodysherds 16152–6, 16420 and 3 fragments 16157–8, 16421. Simple rim and slightly out-turned. The fabric is hard and compact with a moderate grit content (< = 1.3mm). Decoration consists of irregularly-spaced horizontal rows of comb impressions. Colour: orange/grey/orange. T. 4.5–5.8mm.

Vessel 70 (Fig. 54) rimsherd 16160, a basesherd 16161 and a bodysherd 16162. The rim is flat-topped with an internal bevel. Hard fabric with a moderate grit content (< = 6.7mm). Decoration consists of oblique incised lines on the top of the rim, and deep zig-zag incised lines forming a herring-bone pattern on the interior surface. Colour: orange/grey/grey-brown. T. 8.0–9.9mm.

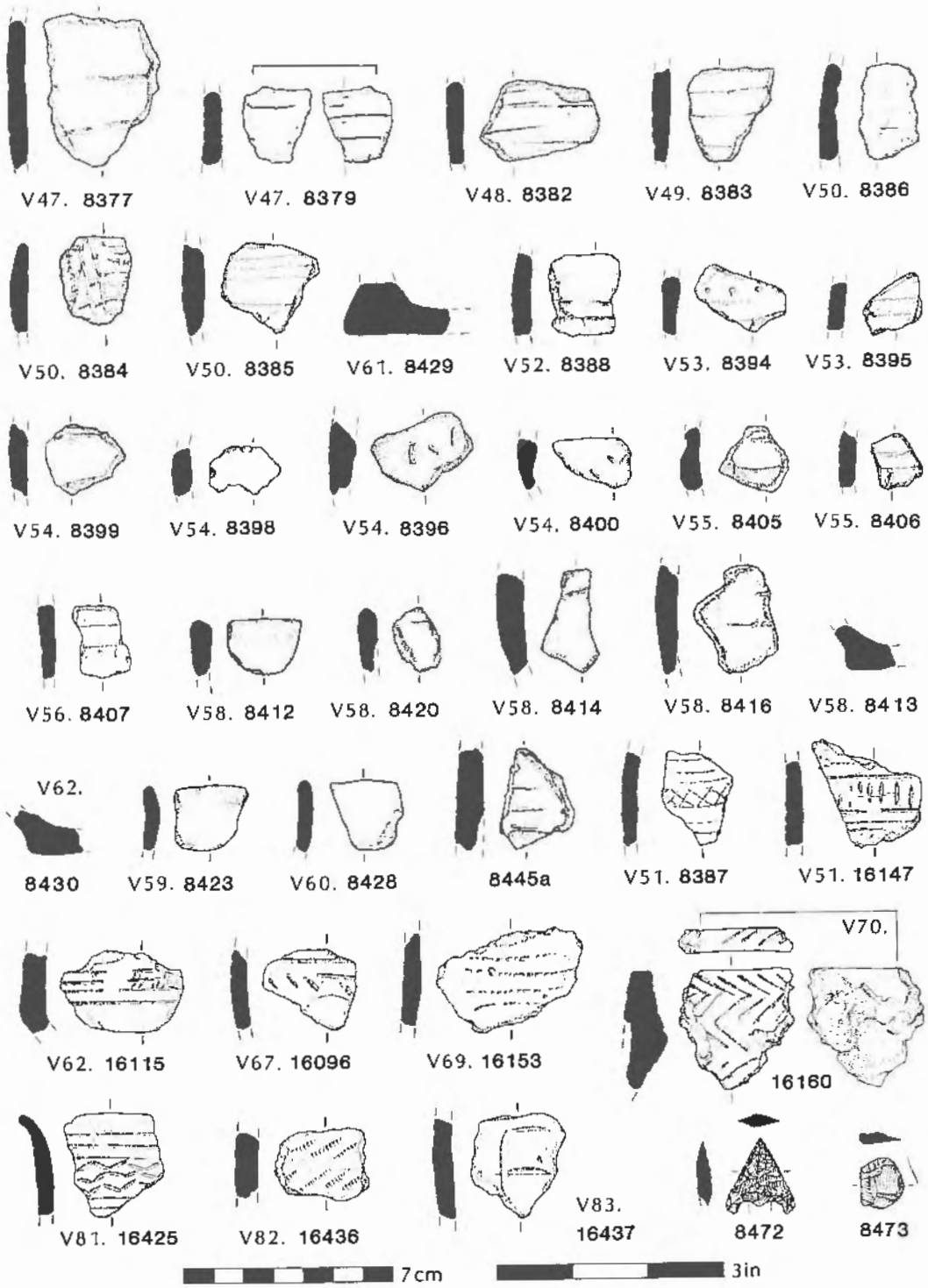
Vessel 71 rimsherd 16171 and 3 bodysherds 16172–4. Simple rim, slightly out-turned. The fabric is hard and compact with a low grit content (< = 1.4mm). Decoration consists of a series of panels with horizontal and oblique incised lines and comb impressions. Colour: orange/grey/orange. T. 4.0–6.5mm.

Vessel 72 a base-angle sherd 16178 and 3 bodysherds 16175–7. Hard fabric, chalky texture with small cavities on both surfaces. There is a low grit content (> = 1.2mm). Decoration is faint but appears to consist of bands of fine horizontal and oblique incised lines. Colour: orange throughout. T. 5.5–7.1mm.

Vessel 73 a base-angle sherd 16191, 10 bodysherds 16179–87, 16422 and 3 fragments 16188–90. Hard fabric with a slightly chalky texture and a high grit content (< = 2.0mm). Decoration consists of horizontal incised lines. Colour: orange/grey/orange. T. 4.6–6.6mm.

Vessel 74 bodysherd 16192. Hard compact fabric with a high grit content (< = 2.0mm). Decoration consists of oblique grooves forming a rough herring-bone pattern. Colour: orange/grey/orange. T. 6.9mm.

Fig. 54. Beaker Complex, 'Concentration E': pottery and flint (vessels 47–56, 58–62, 67, 69–70, 81–3, and flint nos 8472–3).



Vessel 75 2 bodysherds 16193, 16423. Hard compact fabric with a high grit content (< = 1.4mm). Decoration consists of merging horizontal incised lines. Colour: orange/dark grey/dark grey. T. 6.4mm.

Vessel 76 2 rimsherds 16197–8, a base-angle sherd 16424, 8 bodysherds 16199–206 and 3 fragments 16207–9. Hard compact fabric with a moderate grit content (< = 1.4mm). No evidence for decoration. Colour: orange/grey/orange. T. 3.8–5.2mm.

Vessel 77 rimsherd 16210, a base-angle sherd 16213 and 2 bodysherds 16211–2. Hard fabric with a high grit content (< = 1.3mm). The surfaces are weathered. No evidence for decoration. Colour: orange/grey/orange. T. 5.1–7.2mm.

Vessel 78 3 bodysherds 16214–6 and 3 fragments 16217–9. Hard compact fabric with a high grit content (< = 1.3mm). No evidence for decoration. Colour: orange/dark grey/dark grey. T. 6.0–6.4mm.

Vessel 79 rimsherd 16222, unexpanded and slightly out-turned. Hard compact fabric with a moderate grit content (< = 1.1mm). No evidence for decoration. Colour: orange/grey/grey. T. 4.4mm.

Vessel 80 possibly part of a basesherd 16224. Coarse fabric with a high grit content (< = 1.4mm). No evidence for decoration. Colour: orange/grey/orange. T. 16.8mm.

Vessel 81 (Fig. 54) rimsherd 16425, 2 bodysherds 16426–7 and 4 fragments 16428–31. Possibly more than one vessel represented. Rounded, out-turned rim. Hard compact fabric with a moderate to low grit content (< = 1.5mm). Decoration consists of bands of incised lines, chevron patterns and opposing oblique lines. Colour: orange/black/orange. T. 4.8–8.1mm.

Vessel 82 (Fig. 54) bodysherd 16436. Hard fabric with a high grit content (< = 3.3mm). Decorated with bands of oblique whipped cord impressions on either side of a slightly hollowed undecorated panel. Colour: orange throughout. T. 7.6mm.

Vessel 83 (Fig. 54) bodysherd 16437. Hard fabric with a moderate to low grit content (< = 2.1mm). Decorated with horizontal and vertical incised lines forming a lattice pattern. Colour: orange/orange/grey. T. 6.7mm.

Vessel 84 6 bodysherds 16438–43 and 7 fragments 16444–50. Hard fabric with a high grit content (< = 2.0mm). No evidence for decoration. Colour: orange/grey/orange. T. 3.3–7.0mm.

Vessel 85 rimsherd 16451, 4 bodysherds 16452a-b, 16453-4 and a fragment 16455. Simple rounded rim, slightly out-turned. Hard fabric, somewhat rough in texture with a high grit content (< = 3.5mm). Both

surfaces are weathered. No evidence for decoration. Colour: orange/grey/orange. T. 5.0–7.6m.

Vessel 86 rimsherd fragment 16456 and a fragment 16457. Rounded, out-turned rim. Hard, slightly chalky fabric with a low grit content (< = 0.8mm). No evidence for decoration. Colour: orange/grey/orange. T. 4.8–5.2mm.

Vessel 87 rimsherd 16458, 3 base-angle sherds 16459–61, a basesherd fragment 16487, 9 bodysherds 16462–70 and 17 fragments 16471–86, 16488. Rounded, out-turned rim. Hard, slightly coarse fabric with a high grit content (< = 1.5mm). Burnt encrusted matter present on some areas of the interior surface. No evidence for decoration. Colour: orange-brown/grey-black/orange-black. T. 4.8–6.3mm.

Fragments:
Seventy-eight fragments which were too small to be assigned to particular vessels were also found, nos. 8443–54 and 16225–58, 16300–7, 16309–435. The fabric varies in quality but is mainly hard but slightly friable, and no. 8447 has small cavities on the surface. Most show no evidence for decoration, but no. 8445 is decorated with faint finger-nail and dot impressions. No. 8445a (Fig. 54) is decorated with horizontal and oblique rows of comb impressions, and no. 16233 has horizontal comb impressions.

Lithic assemblage

Fiona Dillon

Introduction. This assemblage consists of 100 lithics, which include flint (91%), worked chert (1%) and unworked quartz (8%) (Table 30, p. 252). Pebble flint predominates, and one example of chalk flint is present. No. 8481 is from a core which was patinated after preliminary preparation. The six core rejuvenation flakes and an unretouched primary flake are related to the production of tools. There is a high incidence of broken pieces (26).

The modified tools include a barbed-and-tanged arrowhead, small rounded scrapers, edge-trimmed, retouched and notched flakes (Table 29, p. 252).

Catalogue

(flint unless otherwise stated)

8 *core rejuvenation flakes:* **Complete:** 16259–63, 16489–90. **Part:** 8455.

28 *unutilised flakes:* **Complete:** 8456–9, 16264–6, 16268–9 and 16274,

16493, 16497. **Part:** 8460–9, 16267 and 16270–3, 16491. Cortical analysis shows one primary flake, six secondary flakes and seven tertiary flakes. Nos. 16266 and 16272–3 are burnt.

Utilised blade: 8470. This fragment has edge use wear.

6 *utilised flakes:* **Complete:** 16275, 16495. **Part:** 8471, 16276, 16494, 16496. No. 8471 is a fragment of a tertiary flake with edge damage on the lateral edge.

Barbed-and-tanged arrowhead: 8472 (Fig. 54). The tang is missing as a result of burning. Fine invasive retouch extends over both faces and the well defined barbs. On grounds of size and shape this arrowhead can be assigned to Green's Low Type j (Green 1980, 123; fig. 46).

6 *small rounded scrapers:* **Complete:** 16277–80. **Part:** 8473 (Fig. 54), and 16281. No. 8473 has abrupt retouch in the intact edge of a tertiary flake. No. 16281 is burnt.

End scraper: **Complete:** 16498.

Side-and-end scraper: **Complete:** 16282.

2 *edge-trimmed flakes:* **Complete:** 8477. **Part:** 16284. No. 8477 has abrupt retouch extending along the distal part of the flake. The retouch is uneven, forming a 'serrated' edge. Part of the lateral edge is lightly patinated, indicating that the core was patinated before knapping. As the soils at Knowth do not produce patinated flint, the core must have been abandoned for a period of time in another location.

13 *retouched flakes:* **Complete:** 8478–9, 16285–9, 16291-2. **Part:** 8480–2 and 16290. All have intermittent abrupt edge retouch.

6 *notched flakes:* **Complete:** 16499. **Part:** 8474–5, 8476a, 8476b and 16283. These fragments have small retouched notches on tertiary flakes.

17 *chips:* 8483–8 and 16292–7, 16500–4.

Worked chert: 8489, a fragment of poor quality chert with fracture scars on three faces.

8 unworked quartz: 8490, 16298-9, 16505–9.

Water-rolled flint fragment: 8491, a small fragment of water-rolled pebble flint with a brown patina on the fracture scars.

Table 29: Beaker Concentration E lithic assemblage.

No.	Artefact type	Frequency	Percentage
1.	*Selection of material*	0	0
2.	*Production of tools*	(8)	8
	Core rejuvenation flakes	8	
2a.	*Discarded pieces*	(28)	28
	Unutilised flakes	28	
3.	*Unmodified tools*	(7)	7
	Utilised blade	1	
	Utilised flakes	6	
3a.	*Modified tools*	(30)	30
	Barbed and tanged arrowhead	1	
	Small rounded scraper	6	
	End scraper	1	
	Side-and-end scraper	1	
	Edge trimmed blade	2	
	Retouched flakes	13	
	Notched flakes	6	
4.	*Miscellanea*	(27)	27
	Chips	17	
	Worked chert fragments	1	
	Unworked quartz fragment	8	
	Water rolled fragment	1	
Total		100	100%

Table 30: Beaker Concentration E lithic assemblage.
Raw material analysis (Sample 100)

Raw Material	Frequency	Percentage
Flint	(91)	
Chalk	1	1
Pebble	85	85
Burnt	5	5
Chert	1	1
Quartz	8	8
Total	100	100%

General discussion on finds from the Beaker Concentrations

Pottery Over 3000 sherds of pottery have been found in the five concentrations. It was only possible to reconstruct one vessel (*cf.* Eogan 1984, fig. 112) and, because of the small size of the sherds from the other vessels, it was difficult to estimate rim or base diameters to any degree of accuracy. It was also difficult to determine the number of vessels represented. However, by examining the rim sherds, fabric and decorative motifs, it is possible to suggest up to 200 vessels in all.

The sherds are similar in ware and form throughout. In general the ware is manufactured to a high standard, being compact and hard. In Concentration B the ware has a tendency to be orange-coloured whereas, in the other Concentrations, buff-coloured ware predominates, and it is less smooth. The grits are fine, mainly consisting of quartz, granite, sandstone, shale and grog, all of which could have been obtained locally. The sherds range in thickness between 3.0mm and

Table 31: Beaker Concentration E lithic assemblage. Analysis of cortex on lithic assemblage (Sample 36)

Cortex	Un-retouched struck flint	Retouched struck flint	Total	Percentage
Primary	14	5	19	21
Secondary	6	4	10	11
Tertiary	42	20	61	68
Total	61	29	90	100%

Table 32: Beaker Concentration E lithic assemblage. Platform types (Sample 10)

Platform type	Un-retouched	Retouched pieces	Total	Percentage
Cortical	0	0	0	0
Prepared	5	4	9	90
Uniform	1	0	1	10
Total	6	4	10	100%

11.0mm. Bell-Beakers with elongated S-shaped profiles appear to be the main form of vessel represented, although bowls have been identified (Eogan 1984, fig. 114, nos. 3282, 3283).

Decorated and plain vessels are represented. Those from Concentration A are mainly decorated with incised lines, while a more extensive array of decorative motifs is found in the other concentrations. These include comb, finger-nail, dot and occasionally cord impressions; decoration is also organised in zones or panels creating zig-zag and chevron patterns.

Lithic Assemblage

Fiona Dillon

The Beaker assemblages from Concentrations A, B, C and D produced over 1000 lithics (Eogan 1984, 248–252, 261–3, 271–4, 289); in addition 450 flints came from recent work in Concentrations A, C, D, and E.

The raw material is primarily pebble flint, which is available locally. The range of cortex types, thick, thin, water-rolled and textured, indicates that more than one source was exploited. In addition a small amount of chalk flint is present, and this accounts for less than 10% of all Beaker assemblages. Chert had a limited use; there were some unmodified pieces and a small rounded scraper (no. 1086), from Concentration A (Eogan 1984, fig. 87). This contrasts with the neighbouring site of Monknewtown (Sweetman 1976, 68), where a substantial chert industry is present. Quartz was not knapped during the Beaker stage at Knowth.

Evidence for the knapping of flint and tool production is present. Flint pebbles, some cores and a large quantity of debris, are present. The preparation and knapping of cores are represented by single and dual platformed cores, core rejuvenation flakes and un-retouched primary flakes. Indirect percussion predominates, with some bi-polar reduction on the smaller pebbles. Secondary modification of flakes is represented by trimming flakes. The largest group in the assemblages are unutilised flakes and fragments which tend to form *c.* 70%. Modified and unmodified tools are present, accounting for *c.* 15% of the assemblages. The modified tools include concave, round and end scrapers, edge-trimmed flakes and blades, retouched flakes and notched flakes. Scrapers are common but large examples, which are typical in Grooved Ware contexts, do not occur. However, a small rounded form (maximum dimension 20–30mm), with a symmetrical cross-section, is a feature. The Beaker Concentrations A–D produced examples of this type (Eogan 1984, Concentration A; p. 251, fig. 87; 1074–6, 1079, 1086, 1102; Concentration B; p. 262, fig. 93; 1534, 1536–9; Concentration C; p. 273, fig. 99; 1719–28; Concentration D; p. 291, fig. 108; 2843, 2873–4). In addition to Knowth, such scrapers have been

found nearby at Newgrange (Lehane, in O'Kelly et al 1983, fig. 54; E56:50: fig. 56; E56:705) and at Monknewtown, Co. Meath (Sweetman 1976, fig. 18; 541, 531b: fig. 22; chert; 215, 258, 253; flint 256, 211, 208). They have also been found in the Lough Gur region , at the enclosure at Grange (Ó Ríordáin 1951, fig. 3; nos. 17–22), and on Knockadoon, from Circle K and Site 10 (Grogan and Eogan 1987, fig. 18; nos. 2137–9: Circle L, fig. 56; nos. 1798–808: fig. 64; 19–36a) and Site C (Ó Ríordáin 1954, fig. 25; nos. 21, 22, 25, 31–39). It is unlikely that the size of these scrapers is a reflection of an economic use of flint, as scrapers are the only implements which are reduced in size. Therefore, the shape appears to be related to a particular function or perhaps a method of hafting, as the size makes them difficult to work with for any length of time. The less conventional implements, the retouched, notched and edge-trimmed flakes, form the largest group. The most consistent factor about these pieces is the high incidence of broken flakes. Both invasive and abrupt retouch are used to modify the flakes.

Isolated finds

In addition, there were a number of isolated finds of Beaker pottery, the majority being found on the south-western area of the site (Eogan 1984, 305–8). These probably represent about 15 vessels; in all cases the ware is fine and well-fired, and has parallels amongst the finds from the Concentrations.

It is also possible that some isolated finds of flint artefacts date to the Beaker stage but, apart from a barbed-and-tanged arrowhead, the other artefacts are not sufficiently diagnostic to allow them to be assigned to a particular phase. They do, however, tend to be small in size and were made from pebble flint. Rounded scrapers were the predominant artefact, but side and end scrapers were occasionally used.

Burial

Only one burial was found. This was placed in the corner of a segment of the passage of Tomb 15, close to Concentration A. There was no evidence for contemporary protection. The vessel, which accompanied the cremated bones of an adult and child, was an undecorated bell-beaker (Eogan 1984, 308–12).

Discussion of Beaker Complex

A further Beaker concentration (E) can now be added to the four already published (Eogan 1984, 245–322). However, it can also be shown that Concentration A and, to a very limited extent, Concentration C are not exclusively Beaker, but that there was activity by Grooved Ware people at the same place.

Taking the five Concentrations, the range of finds indicates considerable activity but, as has already been pointed out (Eogan 1984, 313), it is not possible to offer clear-cut explanations for the presence of the Concentrations. Neither have the recent investigations thrown any further light on the nature of the activity, or whether it was permanent or temporary. Structural features are virtually non-existent and, where such are present, they consist of pits; no evidence for houses or protective features came to light. The consistent feature is a layer of dark earth containing artefacts, but animal bones are not present; perhaps their absence is due to poor preservation. The amount of scrap flint at all of the Concentrations shows that it was knapped, with glacial drift flint being the main source, while rounded scrapers were the predominant tool. Kneaded clay indicates pottery manufacture. Although there is a lack of evidence for houses, the best explanation seems to be that the Concentrations represent the remains of homesteads.

Despite the fact that it is not at present possible to disentangle the Grooved Ware/Beaker complexes at Newgrange, some of the houses, either rectangular or circular, as well as open-air hearths and other features, must have been used by Beaker people. The nearby circular wooden structure, in its two phases, has also been assigned to the Beaker Complex, but this may have been a ritual, and not a domestic structure (Sweetman 1987, 294–296). It is difficult to establish satisfactorily whether the large pit circle at Newgrange is a monument of the Beaker or Grooved Ware Complex, or if it was used by both, see p. 216 (Sweetman 1985, 211–216). Regardless of when the earthen enclosure at Monknewtown was constructed, it was at least used during the Beaker phase (Sweetman 1976, 25–73).

While it is clear that there was intensive and varied Beaker activity at Brugh na Bóinne, both domestic and ritual, our knowledge of wider domestic issues as well as the nature of their economic, industrial and possibly ritual practices is limited. Furthermore, the recent discovery of the wooden circular building at Knowth, and the consequential reconsideration of the Grooved Ware component at Brugh na Bóinne and elsewhere, has changed the role and significance of the activities of the Beaker people. A new era of re-evaluation and interpretation must be initiated; in the interim the respective roles of both complexes cannot be fully understood. Certainly it now appears that the Passage Tomb Complex was not succeeded by Beaker, but by a Grooved Ware Complex. It was also the latter that initiated a major ritual change. This was the replacement of ritual practices based on the enclosed tomb, access to the chamber of which may have been confined to a small number of people, to a circular temple or open air area that could accommodate large crowds. Even if the building of large enclosures had been initiated by the Grooved Ware people, it appears that they were used by Beaker people. At least aspects of the ritual practices of the Beaker people followed closely that of the Grooved Ware people.

Like the Grooved Ware Complex, there is no evidence that the Beaker Complex emerged within Ireland. It represents an introduction, but this may have been part of a complex story. For instance, the western part of Ireland might have received contacts directly from the Breton area, part of which might have been the practice of wedge-tomb building and early metallurgy (O'Brien 1993; 1994, 207–28). By comparison the east of Ireland may have been influenced from Britain, but the area where the earliest eastern Irish settlement took place cannot be determined. In combination Knowth, Newgrange and Monknewtown, have produced a range of Beaker pottery forms, but the greatest range both in the form of pottery and in chronological succession came from Newgrange. As far as can be determined, the pottery forms can be assigned to the earlier stages of development. It is difficult to know how valid the chronological succession established by Clarke (1970) is for Britain, and whether it is relevant to Ireland. However, the presence of All-Over-Cord beaker at Newgrange (Cleary, in O'Kelly *et al* 1983, 62–117) hints that settlement could have commenced at a time coinciding with the early phase of Beaker settlement in Britain, and continued on especially in the use of Bell-Beakers and the Wessex/Middle Rhine varieties. The pottery evidence, bearing in mind its limitations, suggests that the Knowth and Monknewtown settlement could have commenced during the time that Bell-Beakers were current. It is, therefore, possible that at Brugh na Bóinne, Beaker settlement extended over some centuries, as Grogan's work indicates (in Eogan 1991, 126–32). The use of C14 dates from Newgrange has to be treated with caution due to the possibility of successive settlement by Grooved Ware and Beaker people at that site. The material from the house at Monknewtown may be a contemporary assemblage, but the dates vary considerably, which would suggest activity during the Late Bronze Age (2445±40 BP (UB–729) 777–402 cal BC), Early Christian and Medieval times (1130±70 BP (UB–731) 714–1020 cal AD), as well as from the Beaker period (3810±45 BP (UB–728) 2458–2137 cal BC and 3465±80 BP (UB–734) 2024–1548 cal BC). A spread of charcoal in an area from which a kerbstone had been removed at Passage Tomb 2 at Knowth produced a date of 3185+255 BP (B.M. 78) 2132–830 cal BC. On the general dating trend, that determination is much later than the others and, therefore, it must be treated with suspicion. Perhaps, as a result of subsequent activities, later material intruded (p. 202).

The Brugh na Bóinne Beaker settlement could be amongst the earliest in eastern Ireland. On the eastern side of the Irish Sea, All-Over-Cord is found in the areas bordering the northern and southern portions. For Bell-Beakers, the nearest British group occurs in south-west Scotland. The "Middle Rhine" Beakers come mainly from the Wessex region, and there is only a thin scatter elsewhere. At least the first two mentioned varieties have a north Irish Sea occurrence in Britain, and it may have been some place in that area from which the eastern Irish Beaker Complex emerged.

How Beaker people succeeded in establishing themselves at Brugh na Bóinne cannot be satisfactorily explained. At least it is clear that a Beaker complex expanded throughout Britain and initiated a post-Grooved Ware stage. The use of metals gave them technological superiority and equipped them with weapons, principally the tanged dagger (Gerloff 1975, 27–41). As part of its expanding nature, an expansion to the east of Ireland need not occasion surprise. Aspects, such as open-air ceremonial sites, could have had their forerunners in the Grooved Ware Complex in Ireland. It cannot be established if there was a development in the rural economy; evidence for the continued use of agricultural practices is provided by cereal grains and, despite the stratigraphical problems at Newgrange, at least some of the animal bones may have been derived from livestock kept by Beaker people. Comparative evidence shows that broad-butted flat copper axes could have been present and, consequently, that the capacity to manufacture metal objects was mastered. If that were so, it indicates technological superiority over Grooved Ware society. Archer's equipment represented by barbed-and-tanged flint arrowheads and tanged copper blades (the latter not known from Brugh na Bóinne but occurring in other places in the northern part of the country (Harbison 1969a, 7–8)) may indicate that hunting was significant. On the other hand this equipment could equally have served as weapons. In this region it should be noted that Ireland, with its dozen or so tanged daggers, has, area-wise, many more examples than are known from Britain, where Gerloff (1975, 27–41) recorded about twenty examples. Taking this into account, plus the assumed technological superiority, it could be postulated that, not only did a new society emerge in Brugh na Bóinne, but one that was alien and well equipped to dominate and supersede or incorporate Grooved Ware society.

Beaker aftermath and the beginning of the Bronze Age

Apart from a bowl food vessel burial at Monknewtown (Waddell 1970, 127; 1990, 128), a few possible sherds from Knowth as well as sherds of similar type vessels and a thin-butted flat axe of Killaha type from Newgrange (O'Kelly and Shell 1978), there is otherwise practically no evidence for successors to the Beaker Complex at Brugh na Bóinne. Perhaps the complex lingered on, so that the previous C14 dates from Passage Tomb 2 at Knowth may be significant (p. 202). On the other hand changes were taking place, especially in the eastern part of Ireland, and it is unlikely that what would amount to a tiny pocket of Beaker people would have survived, as relics of a bygone complex, in cultural isolation.

Around or perhaps shortly before *c.* 2000 cal BC, yet another new complex with regional variations emerged in Britain and Ireland, the Early Bronze Age. In Britain, its foundations lie in the Beaker complexes, but with some continental influence. While the problems of the origin and development of the Irish Early Bronze Age have not

yet been fully resolved, it is at least clear that it developed at a time when Bronze Age complexes were emerging in other parts of Europe, a feature of which was the borrowing of ideas and interchange of knowledge. In Ireland, evidence for direct continuity from Beaker complexes is probably less marked than in Britain. However, the use of embanked enclosures continued, e.g. at Grange, Co. Limerick (Ó Ríordáin 1951, 58–62), but the main evidence is provided by aspects of ritual. It is with the emergence of the Bronze Age that the 'classical' British type of Beaker burial emerges in Ireland, the crouched inhumation in a cist, but accompanied by bowl food vessels and sometimes by a rivetted dagger or an awl (Waddell 1990; Ó Ríordáin and Waddell 1993). Such burials do not represent continuity in Ireland, but influence from Britain which may also have included technological contributions in metal working. This new stimulus was a factor that led to the emergence of the Early Bronze Age, which became one of Europe's most vigorous and creative stages.

As yet there is very little evidence in any part of Ireland for domestic activity, such as settlement sites or even for farming practices, although a grain impression on a bowl food vessel from Fourknocks 1, Co. Meath (Hartnett 1957, 254, 258–9, pl. 81), shows that wheat was grown. If bowl food vessels were part of the male ritual accompaniment, perhaps lunulae (despite their lack of association in Ireland with other objects) were female accoutrements, as were the related north British spacer-plate jet necklaces. But unlike the necklaces, lunulae did not accompany their wearers to the grave. The ritual of the time must have proclaimed that they should be divorced from their suggested female users and independently committed to the earth.

In addition to gold, the large-scale manufacture of objects from copper or bronze was a feature, as the presence of at least 1600 flat axes of the Ballybeg, Killaha and Ballyvalley types shows, as well as up to two hundred halberds (Harbison 1969a and b). The only positive evidence for manufacture is provided by the open stone moulds which were mainly for casting flat axes of the Killaha type (Eogan 1993, 93–4, 105–6). There may have been a change in costume. Although conical V-perforated buttons of jet were a feature of the Beaker Complexes of Britain from an early stage, their use survived into the later Beaker stages in southern Britain, and the equivalent vase food vessel stage in northern Britain (Gerloff 1975, 54, pl. 43b [East Kennet, Wiltshire]; Kinnes and Longworth 1985, 139, No.UN. 47 [Wooler, Northumberland]). Associations with bowl food vessel inhumation burials at the Mound of the Hostages, Tara (Harbison 1976, 34) indicates that the type was also current in Ireland during the Early Bronze Age.

The Irish Early Bronze Age, while succeeding the Beaker Complex, was not an outgrowth of it. This was a time of considerable cultural growth, and its emergence inaugurated a new and autonomous phase in Irish prehistory that was soon to influence areas externally. Its formation seems to owe a great deal to the contemporary British Early Bronze Age complexes. For instance, the background to the flat rivetted daggers of

Corkey type is to be found amongst the Milston (mainly southern English), Butterwick (mainly northern English) and Masterton (mainly Scottish) type daggers (Gerloff 1975, 42–57, 58–63). Axes of Killaha and Migdale types at least represent contemporary developments. In this connection, it should be recalled that in northern Britain, or at least a small region of it in north-east Scotland, had another feature in common with Ireland. That was the use of open stone moulds for casting those type of axes. The vase food vessel and its burial rite represents a developed form (or a modification of) Late Beaker practices in northern England and Scotland. Perhaps influences were reaching Ireland from different parts of Britain as part of a wider process of change and interchange, but it may have been northern Britain that was the source of the strongest influence. At least a key component, the previously mentioned bowl food vessel, can be considered as an Irish development, possibly in conjunction with south-west Scotland. As it is not possible to give chronological priority to either area, the initiation of the craft of casting in stone moulds could be attributed to the arrival of a Scottish smith in Ireland or, conversely, an Irish smith in Scotland.

Eastern Ireland became an active province of the Early Bronze Age. At Oldbridge, which is across the River Boyne from the eastern end of Brugh na Bóinne, there were two cist burials. One was a complex burial underneath a round mound and consisted of a double cist, with apparent inhumation burials in each compartment. One compartment contained the remains of two males accompanied by a bowl food vessel. The other chamber contained remains of a young adult female, accompanied by a jet necklace of fusiform jet beads. Another cist contained the remains of an elderly adult male, but no grave goods were noted (Waddell 1990, 128; Ó Ríordáin and Waddell 1993, 126). A few miles upstream, at Donaghmore, there was a flat cist cemetery with bowl food vessels associated with inhumations and cremations (currently being excavated by Helen Roche). The ritual richness of the Meath area is clear not only from these sites, but from the great cemeteries at the Mound of the Hostages, Tara (Ó Ríordáin 1955, 164), Fourknocks I and II (Hartnett 1957, 1971) and Keenoge (Mount 1997). Despite the definite evidence for an Early Bronze Age population in the region, it is therefore all the more puzzling that the area of Brugh na Bóinne was virtually excluded. But this need not be as a result of negative attitudes by the newly-emerging Early Bronze Age people. Perhaps as a result of the significant events that previously took place at Brugh na Bóinne, a perceived aura surrounded it and, as a result, it could have been decided not to use it and consequently not to violate it. As a result, this area, which was such a focal point for activity since the beginning of the Neolithic, was left virtually untouched. But that need not mean that it was devoid of significance. It could have assumed a new role, that of exclusiveness, perhaps a role that it fulfilled for the entire Bronze and Early Iron Ages. It was only after a lapse of about 2000 years that Brugh na Bóinne once more assumed a visible role in contemporary society. By then the culture of Ireland was late Iron Age.

CHAPTER VI

RETROSPECT

During two main periods – Neolithic to Beaker and late Iron Age to the present day, Knowth and – by extension – Brugh na Bóinne was a place where a succession of heterogeneous complexes developed, flourished and functioned (Eogan 1991). During the prehistoric stage, there were six successive complexes (five cultural stages) and four during the historic stage. Each complex represents transformation and change while, in human terms, they constitute a succession of social groups, each of which was dynamic and vibrant. Throughout this period, which may have extended over a couple of thousand years, stable systems, characterised by economic and ritual developments, prospered. Variations may have taken place within the systems such as, at one stage, tombs replacing settlement, but there is no positive evidence for the nature of the decline of any of the complexes. On the contrary, replacement seems to have been rapid. Apart from a possible gap between the Earlier and Later 'Western' Neolithic stages, the other complexes may have been part of a continuous evolving system, with the next stage following on that of its predecessor. But this does not mean that one evolved directly out of the other. Even the Later 'Western' Neolithic need not have emerged locally out of the Earlier 'Western' Neolithic. Its origin could have been due to outside influence although the background need not have been far afield. For instance, conditions could possibly have existed in north-east Leinster or south-west Ulster, perhaps even closer, although clear evidence is not available at present. Influence from, or the territorial expansion of, naturalised farming families may also explain the beginning of settlement, but the possibility of a wider external background, such as the Irish Sea area, must be kept in mind.

Regardless of its precise geographical background, the initiation of settlement can, on present evidence, be attributed to pioneering agriculturalists moving into a humanly empty landscape. Initially, in addition to agriculture, forest and river resources could have been exploited. For this stage, the evidence for architecture is confined to remains of domestic houses. These were basic wooden-framed structures, rectangular in plan and possibly single-roomed. New cultural groups followed, which brought about consolidation of settlement and expansion of farming populations; no doubt this was due to the utilization of their productive capacity to the fullest. Each

stage was part of a wider national and international assemblage, but acculturations, mutations and indigenous developments took place. For all stages, innovations were a feature and for some their ending can be attributed to the spread into the area of new ideas, artefacts, monuments and possibly new people. Large public centres distinguished some stages, and it may have been that, at such times, society was characterised by the presence of leaders. Despite its long periods of use, at a time coinciding with the beginning of the Bronze Age, Knowth (and Brugh na Bóinne as a whole) lost its significance and remained virtually untouched for the following two thousand years.

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Abbreviations

Ant.	*Antiquity*
Ant.J.	*Antiquaries Journal*
Arch.	*Archaeologia*
Arch.J.	*Archaeological Journal*
BAR	*British Archaeological Reports*
JIA	*Journal of Irish Archaeology*
JRSAI	*Journal of the Royal Society of Antiquaries of Ireland.*
PPS	*Proceedings of the Prehistoric Society*
PRIA	*Proceedings of the Royal Irish Academy*
PSAS	*Proceedings of the Society of Antiquaries of Scotland*
UJA	*Ulster Journal of Archaeology*

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APPENDIX 1

PETROLOGICAL EXAMINATION OF EARLIER 'WESTERN' NEOLITHIC, AND ALSO DECORATED POTTERY COMPLEX AND GROOVED WARE POTTERY

Professor J. Brindley

Earlier 'Western' Neolithic

In contrast to the Knowth Beaker pottery, which is remarkable in the variety of its grits (Brindley in Eogan 1984, 330–42), the grits of the oldest Neolithic ware at this site are relatively uniform. Moreover, the latter mostly comprise sedimentary rocks, which are scarcely specific as a precise origin. The most striking features of their sherds arise from the primitive manufacturing techniques and resulting poor quality of the products. Because of this uniformity, it is convenient to describe the petrography of a typical sherd, and then to discuss general features of (a) the clay and (b) the additives – grits and grog – followed by a discussion of the possible source of these raw materials.

Twelve representative sherds of this pottery, from five different localities at the excavation, were chosen for microscopic study and were sectioned parallel to the maximum curvature of the sherd, where this was recognisable. They were impregnated under vacuum with Araldite AY18.HZ18 before grinding, but it has often proved difficult to obtain good sections with this medium, perhaps because of the fragility of the material and its tendency to disintegrate in the impregnating fluid.

Petrological description of Sherd 5700

A typical sherd, from the occupation debris south of trench 3, Zone A, is 8mm thick and evenly curved. Internally the clay matrix is a uniform, dark-brown colour, apparently stained by organic matter; at each side this passes out to a thin surface layer of normal, mud-coloured clay from which the organic material was presumably burnt during firing. Both surfaces are carefully smoothed, and on the inside are traces of a dark, rather flaky coating, which was probably deposited during subsequent use of the pot.

Under the microscope, the matrix of the sherd is a uniform, dense clay, abundantly scattered with grit fragments of sizes up to about 3mm. The large pieces of grit vary in amount from place to place but the multitude of smaller grains, most of which have angular, fragmented shapes, are scattered rather evenly and range in seriate fashion down to minute dimensions (0.02mm).

An alignment of these particles parallel to the walls of the sherd is clearly recognisable and this is paralleled in the clay matrix by series of long, open, parallel cracks, which undulate and flow smoothly

round – enclosing augen-like – the larger pieces of grit. (Augen structure [German *Auge* – an eye] of this type is a well-known feature of deformed metamorphic rocks). This very emphatic orientated fabric implies a high degree of plastic kneading during shaping of the pot.

The larger grit fragments are, with few exceptions, a pebbly felspathic sandstone – technically quartz-arenite – with conspicuous felspar grains and minor, though varying, amounts of limonitic clay material distributed in its interstices; smaller grains are mostly monomineralic quartzes, which represent fragmented material similarly produced by artificial crushing of larger pieces of the same. Within the sandstone, primary grain shape varies – angular, sub-angular, sub-rounded – and in different examples diagenetic recrystallisation ranges from slight to advanced, the latter producing fully-interlocking boundaries. Grain size is of the order of 0.5mm and most monomineralic grains are unstrained quartz, with rare potash-felspar and large plates of shredded muscovite. Sorting is poor, however, and rounded pebbles up to 3mm in diameter and composed of strained, sutured vein-quartz mosaic are scattered through the rock. All of the grit fragments – large and small – are artificially-crushed material, and the occasional rounded clasts of quartz which appear through the sherd are evidently grains which were released, unbroken, from the rock during its crushing.

Discussion of the sherds

(a). The clay and its features

The ground-mass of the pottery ranges from pure clay, dense and dark-brown in colour, with sparse grains of silt, to a lighter silty clay : the detrital material is mostly well-graded clear quartz of about 0.05mm diameter. The latter variety is notably less plastic and characterises the poorer quality sherds, but both occur interbanded, indicating a very imperfect degree of homogenisation of the clay in working. Except in the firmer, silty clays, working has generally produced a strongly orientated fabric which is reflected in the alignment of grit inclusions parallel to the walls of the sherd and, more particularly, in the delicate banding which smoothly envelopes the larger pieces of grit producing an augen effect, the intensity of which implies a high degree of plastic modelling. It may perhaps be an indication that pots were made from the lump rather than built-up from coils.

Smoothing of the outside and, perhaps, also of the inside of the pot with water is often seen, and produces even surfaces on which the grit fragments protrude slightly. A fine surface streaking is sometimes developed in the same way, in line with the curvature of the pot and, probably too, with its base. Except in the very silty sherds, series of narrow, undulating parallel cracks are a very constant feature, often exceeding one cm in length and paralleling the general flow structure. Inspection of the sherd with a binocular microscope shows that these are narrow, open cavities and they seem to represent shrinkage during

drying-out of the clay. They have the effect of increasing the fragility of the product.

In Neolithic times firing is believed to have been conducted in an open fire rather than in a specially built kiln. Much of the present ware failed to reach an adequate temperature in the process, and some sherds are little more than friable, baked clay. A fine pattern of anastomosing shrinkage cracks is developed perpendicular to the surface of some sherds (e.g. 5699).

Oxidising conditions prevailed during firing of some of the pots at their outer – and also in some cases – their inner surfaces. This has caused a surface reddening which sometimes extends right through the sherd, though usually a core of unoxidised clay remains. Reducing conditions which produce a sooty-grey colour were less frequent. An adherent dark deposit inside one sherd (5700) seems to be a carbonised organic coating deposited during use.

(b). The additives

For tempering purposes, broken-up rock material – Grit – was invariably added to the clay. In this pottery fragmented pot sherds – Grog – which serves the same need, was positively identified only once (5702). Shale, and some related fine greywacke, is present generally as flakes, pellets and rounded-off clasts, i.e. natural fragments, but usually in minor amounts. Felspathic sandstone, vein-quartz, and igneous pegmatite-aplite types are the major grits, but they are found only as artificially-crushed fragments. Most of these are tiny – single mineral grains – but some exceed 6mm, approaching the full thickness of the sherd. Hypabyssal rock types of more distant origin occur rarely in minute clasts : they might be expected as erratics in the local boulder and its soils.

The general microscopic petrography of the grits is as follows:–

1. Felspathic sandstone

(See below p. 274 for full description). It occurs in fragmented pieces, reddish or yellowish in colour, reaching 5 mms in maximum dimension. The constituent grains are clear, scarcely strained quartz averaging 0.5mm and angular sub-angular sub-rounded in shape in different examples. These form the bulk of the rock: rarer constituents are rather fresh grains of potash-felspar, and large frayed plates of muscovite. Scattered subrounded pebbles, up to 5mm diameter, are of sutured and strained vein-quartz mosaic. Authigenic recrystallisation varies in different examples of the sandstone from slight to thorough-going, in the latter case with interlocking grain boundaries.

2. Shales, siltstones, fine-grained sandstones

Shales and siltstones are present generally in this pottery as a minor constituent of the grits in which they take the form of natural clasts

(i.e. not artificially-crushed fragments). No sign of slaty cleavage was seen in the shales, which seem to fall into two categories (a) black shales and siltstones attributable to the Carboniferous and (b) medium brown-coloured shales which are classed with the Silurian. Silty varieties of the latter have sparse to plentiful quartz detritus. Rectangular clasts with rounded corners, which are composed of a fine-grained sandstone, also occur, and are interpreted as Silurian greywacke. This is a well-graded sediment composed of angular quartzes with minor amounts of interstitial clay material: there are faint traces of a discontinuous fracture cleavage.

3. Vein-quartz, pegmatite-aplite and related plutonic types

Five slides are dominated by fragments of mosaic quartz or by quartz-felspar aggregate with grain size averaging around 1mm. Most of the former represents vein-quartz, such as is widespread through the Silurian formations of the Longford-Down massif, and is prominent as pebbles in the glacial drift. Its characteristic texture of elaborately-sutured grains, with larger individuals developed by integration, is distinctive. The quartz-felspar aggregates have clear quartz with plain to sutured boundaries, felspar fresh and largely untwinned, and rare plates of altered biotite. Simple and microline-type twinning are occasionally seen. In small grit fragments, it is not always possible to distinguish positively between vein-quartz and pegmatitic quartz.

Occasional fragments are pure felspar aggregate – technically syenite – but these are perhaps no more than clusters of this mineral in a normal granite pegmatite. A local Caledonian suite of alkaline minor intrusions could supply syenite, but its representatives (e.g. the Kilberry occurrence) are conspicuously altered and bear little resemblance to the present type. Probably all of this material derives from glacial transport from a northern Irish granitic centre.

4. Lower Palaeozoic dyke rocks

These originated in the great Caledonian dyke swarm of minor intrusions, which is found over all of eastern and northern Ireland. Occasionally small clasts appear among the grits. Since the Lower Palaeozoic massif through which these rocks occur reaches almost as far south as Knowth, they would be present in the local boulder clay and are not necessarily of far-travelled origin. A fragment of altered fine-grained dolerite appears in 5701. Other aphanitic clasts dominated by altered ferromagnesian minerals appear in 5699 and 5702. In all of these occurrences, the small size of the clasts (< 0.2mm) makes identification difficult.

5. Grog

The artificial tempering agent most likely represents reject pottery

material which – now inert after firing – serves equally well the need filled by natural rock fragments. In the earliest Neolithic pottery of Knowth, it is rare to the extent that its incorporation is likely to be casual. Such pieces of fired clay may have little to distinguish them from natural shale or silt – to which they are essentially similar in constitution – and it may be difficult to separate the two. The following criteria were found to help:–

(a). Shale clasts are natural detritus and consequently show pellet-like or rounded-off angular outlines: grog fragments have sharply-broken edges.
(b). Grog fragments may themselves contain pieces of artificially comminuted grits.
(c). On occasion, grog fragments are themselves composite and re-use pieces of older grog.

There is only one clear instance of grog in this pottery – a single large fragment nearly 6 by 4mm. Sherd 5701 also has some discrete patches of silty clay material which carry angular fragments and quartz grains. The sharp outlines of these patches identify them as inclusions in the general clay matrix of the sherd but, in shape, they are clearly deformed, and it is more likely that they are lumps of silty clay which were incorporated in the body of the material during pottery manufacture, and which did not completely homogenise with it.

The widely present shales and their associates (2) appear in the form of natural clasts or pebbles, and this applies also to the rare and more minute pieces of hypabyssal igneous rocks (4). They are thus considered to have come directly from their raw material source. In contrast to this, the dominant grit types – the felspathic sandstone (1) and the vein-quartz and pegmatite-aplite types (3) have not been found as naturally-shaped pieces in the grits, but always have the character of artificially-crushed fragments. These are sharply angular except where, as is often the case in the sandstone, the rounded outline of one of the larger grains in the rock forms a part of the boundary to the fragment.

The greater part of the grit material, however, is in smaller (< 1mm), usually monomineralic pieces. These comprise single grains of quartz, more rarely potash-felspar and frayed muscovite, plates of which typically display sharply angular outlines. Many, in fact, are obvious splinters and they range in seriate fashion down to the smallest sizes observable (*c.* 0.05mm). Similar fragmental features are present in those sherds dominated by grits of pegmatite-aplite and vein-quartz origin (3). In marked contrast to these, however, some larger (< 2mm) well-rounded grains of vein-quartz are prominently scattered through the ground-mass of sherds containing the felspathic sandstone. These are seen to be identical with the large (vein-quartz) clasts of the sandstone itself and they obviously represent such grains released, undamaged, during the crushing. Excepting these released grains, and the clasts of shale, etc. (2 and 4) no other grit fragments

can be identified as having the form of natural pebbles or grains. Rather, the bulk of the grit was produced by crushing larger pieces of rock prior to its incorporation in the clay.

Local Soils as possible source material

In the light of the foregoing, three samples of soil/subsoil from the Knowth excavations were examined and have produced interesting results. Two samples were from the soil directly above the disintegrating bedrock of Carboniferous shales to the south of the main mound and the third was from a conspicuous dark soil layer close to the entrance to the Eastern tomb (Decorated Pottery Complex). After mixing with water, the suspended material, if poured off immediately, contained the clay and finest sand (0.05mm) fractions and these separate from one another rather readily in settling. The fine sand is composed of quartz grains to a large extent, along with a major amount of shale particles, and some grains of clouded felspar. Except for the Carboniferous shale content, which obviously derives from the rock beneath, these materials correspond closely to the two components of the pottery clay which sometimes appear separately in sherds due to imperfect mixing techniques.

The coarser residue of these samples contains single mineral grains as above, rounded to angular in shape, and rock fragments of various sizes. Prominent rock types (a) felspathic sandstone – pebbly with poor to moderate sorting – probably from the Carboniferous of the region, (b) medium grained leucocratic aplite (Tertiary of northern Ireland), (c) dark grey to black Carboniferous shales and cherty shales representing the local formation and (d) olive-green shale, silts and fine sandstones of the Silurian. These are the same types as characterise the pottery grits and both Carboniferous and Silurian shales are in the form of rounded-off flakes or pellets similar to those seen in the pottery.

The results of this examination suggest that the clay for all of the ceramic material here discussed may well have been produced by treatment of soil materials derived from a local source.

Conclusions

The raw material for this pottery derived either from a primary boulder-clay or soil – suitably treated to secure its homogeneity – or from a re-sedimented alluvial deposit of similar lithology. The latter is not known to exist in the district though, in the absence of any regional survey of the superficial deposits, it cannot be ruled out as a source. However, the facts that (a) clay raw material similar to that in the earliest Knowth pottery can be produced simply from the local boulder-clay soil/subsoil and (b), that the added grits are made up of crushed rock types which are most conspicuous pebbles in this material, strongly supports a local boulder-clay origin.

A common rock in the grits is a felspathic sandstone of a type characteristic of the basal Upper Palaeozoic formations which

immediately overly the Lower Palaeozoic massifs and, while this sandstone is not recorded in the local rock formations of the district, there is nowhere, locally, any exposure of the Lower Palaeozoic/ Carboniferous boundary. However, the frequency of this type of sandstone in the Knowth drifts must imply a source not very far off. Aplitic rocks and related types are conspicuous in the grits and are also common in the local glacial drift: they are attributed, tentatively, to a northern Ireland origin. Another common grit component – vein-quartz – is likewise ubiquitous in the boulder-clay, and may derive from the common quartz veins in the Longford-Down Lower Palaeozoic massif.

Although these grits are present invariably as crushed fragments prepared from larger pieces of the rocks concerned, the various shales and related sediments which may also be present in the sherds appear as natural clasts and would also seem to have been added before shaping of the clay. No explanation for this difference in treatment of the additives is at present forthcoming.

Sherd 5707 has many clasts of black Carboniferous shale similar to those which dominate the Knowth soil, and derive from rock of the same type as outcrops here – a feature which suggests that the clay for this sherd may come from this actual location. In all other slides where they occur, shale clasts are occasional – perhaps accidental – additions to the clay. They are brownish-green in colour and, with associated siltstones and fine greywacke-type sandstones, belong to the Silurian formations occurring not far to the north. Due to southerly glacial movements, they are plentifully present in the drift soils in the belt extending eastwards from Slane, via Knowth, to the sea. Any locality here or further north, wherever the bedrock Carboniferous formations are too deeply buried to influence the surface soils, could provide such material. Grog is only very rarely present and is most likely an accidental ingredient. The evidence thus suggests that both raw materials and manufacture of this pottery was local, and the crude techniques involved throughout the process are reflected in the coarse and poor-quality product.

Plate l: Descriptions of photomicrographs A to F

(A). Sherd 5700 – pebbly sandstone clast with large grain of surtured, strained vein-quartz, and smaller sub-angular quartzes in clay cement. The enclosing ground-mass of the sherd has fragmented quartzes as well as some rounded detrital grains: flow alignment of the fragments.

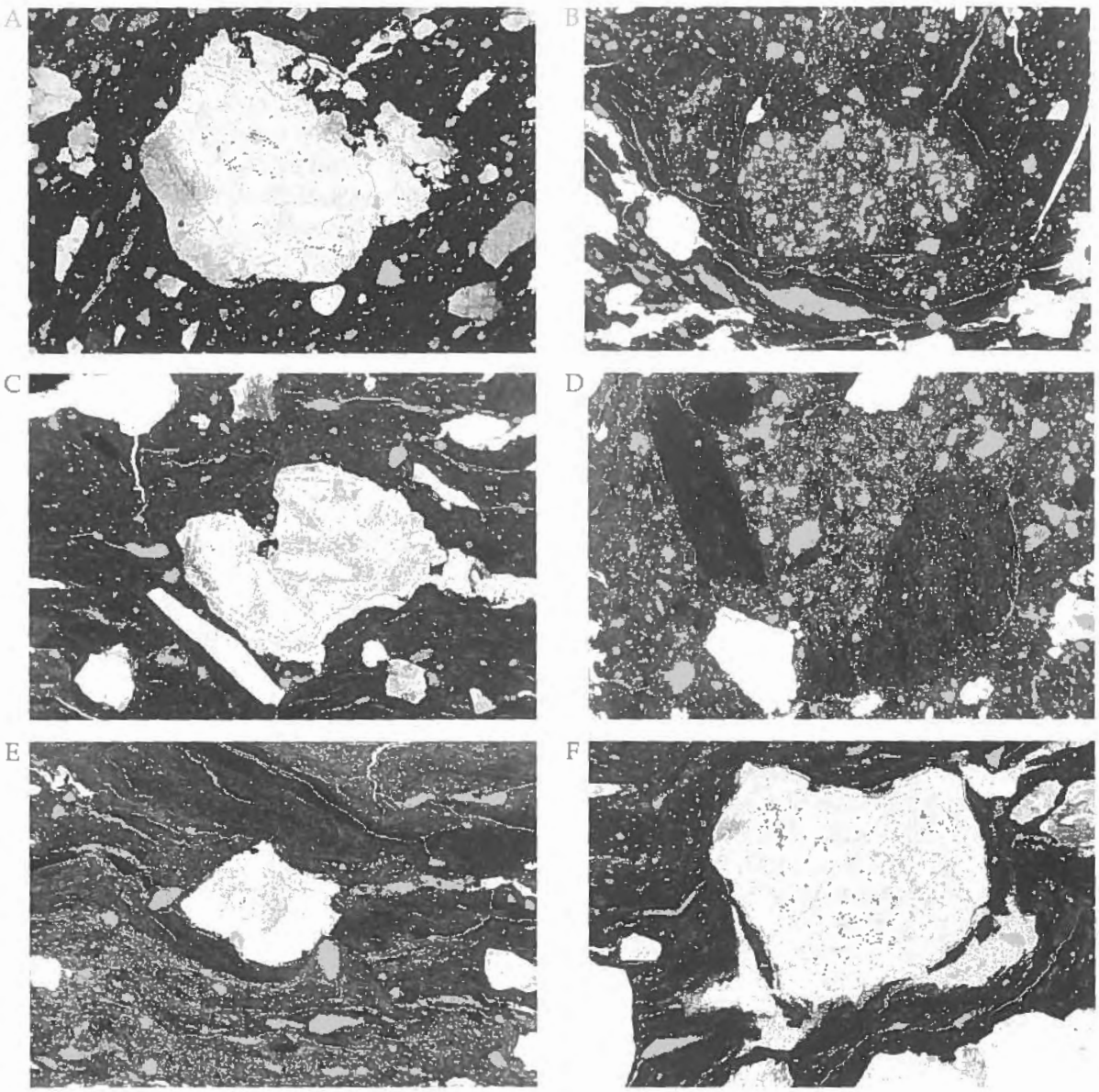
(B). Sherd 5702 – a very large, roundish and composite fragment of grog forms the entire centre and upper field, typified by unaligned texture in its clay matrix and by clear, fragmented quartz grains. It encloses smaller grog fragments – one in the centre field – conspicuous by more dense quartz aggregates. The sherd ground

mass of pure clay with strong flow structures and varied quartz detritus forms bottom and sides of field.

(C). Sherd 5701 – angular syenitic fragment composed of slightly altered, untwinned potash-felspar aggregate with detached splinters of same, set in aligned clay matrix of sherd with undulose shrinkage cracks.

(D). Sherd 5707 – clasts of brown greywacke and black shale; some of the latter are pellet-shaped.

Appendix 1, Plate 1: Photomicrographs of pottery sherds, A–F.



All photomicrographs in ordinary light. Magnification in each case X36, excepting (E) which is X18.

(E). Sherd 5701 – interlayered sandy-clay and clay ground-mass of sherd. Clear undulating areas are shrinkage cracks, paralleling the flow direction. Scattered small quartz fragments.

(F). Sherd 5699 – strongly developed flow structure in clay ground mass around large, subangular clast of vein quartz: fragmented, as well as small detrital grains of similar quartz are scattered around: similar fragments of part-altered felspar at upper-right margin.

Later 'Western' Neolithic

Sherd 811 (Eogan 1984, 218, fig. 76) – sparsely scattered holes represent large grit fragments plucked out during preparation. Small single-mineral grains in the ground-mass are mostly angular quartzes; there are one or two large plates of altered biotite.

Sherd 907a (Eogan 1984, 228, fig. 81) – contained large angular grit fragments now represented by cavities. Some traces in these of quartzite sandstone – with recrystallised and sutured quartz mosaic – suggests that this was the predominant grit material. A few mineral grains in the ground-mass of the slide, among which large (1.0mm) unstrained quartzes are conspicuous.

It seems likely that the grit in this and the preceding section was a pure quartzite sandstone.

Sherd 768 (Eogan 1984, 217, fig. 76) – contains holes representing the large grit fragments. 2 – 3 of the latter remain – angular fragments of fine quartzite sandstone to 3.5mm maximum, showing microscopically a fine-grained well-sorted quartz aggregate, mostly with angular outlines but partly sutured. One large simply-twinned felspar was seen. A good deal of brownish clay matrix is present in the sandstone. Monomineralic angular to sub-angular quartzes are spread through the slide. This grit is likely to be Carboniferous sandstone; the preceding sherds may be similar.

Sherd 757 (Eogan 1984, 217, fig. 76) – many of the large grit fragments are now represented by cavities. Those that remain are fine-grained quartzite (or felsite?) showing strain effects. Many small angular to sub-angular quartz grains are scattered through the ground-mass of the sherd.

Decorated Pottery Complex

Sherd 5928a – Broad-rimmed Ware (vessel 17) – grit of angular pegmatite fragments to 4mm maximum – composed of coarse quartz –

fresh acid plagioclase – potash felspar aggregate; also conspicuous are scattered lath-shaped muscovite and altered biotite plates to 4mm long in the ground-mass of the sherd. Single mineral fragments are quartz and strained plagioclase. This grit is granite-pegmatite.

Sherd 5906 – Broad-rimmed Ware (vessel 13) – only 2–3 angular grit fragments of sandstone up to 5mm across and some detached, angular to rounded, quartzes remain in the small amount of slide available. It represents a poorly–sorted quartz-sandstone with angular to sub-angular grains up to 2mm in a copious brownish clay matrix. Scattered similar grains along with similar felspar and felsite in the sherd ground-mass. This grit is Carboniferous (or old Red?) sandstone.

Sherd 5890 – Carrowkeel Ware (vessel 10) – angular grit fragments of relatively fresh dolerite with minor olivine, plagioclase laths to 2mm, pale brown ophitic pyroxene and platy ilmenite – a Tertiary dolerite. Other fragments are of comparable, but finer grained rock. Smaller fragments in the ground-mass of the sherd show the same minerals, and also some fine greywacke fragments.

Grooved Ware Complex

Sherd 6167 (vessel 1) – grit fragments, mostly angular and seriate, up to 2mm maximum. All are typical Tertiary olivine-dolerite with ophitic structure – plagioclase laths set in pyroxene and clear granular olivine, with platy ilmenite.

Sherd 6183 (vessel 3) – angular grit fragments ranging down in seriate fashion to single mineral grains. All are from fresh olivine-dolerite with abundant plagioclase laths, granular olivine, and less abundant ophitic pyroxene; some large ore grains. This is Tertiary olivine-dolerite. One sub-angular fragment of dense brown shale – probably a natural clast – was seen.

Sherd 6284 (vessel 19) – angular to sub–angular fragments (to 2mm) ranging in seriate manner to monomineralic grains. All are fresh ophitic olivine-dolerite with granular olivines, sometimes aggregated, plagioclase laths often abundant, pale ophitic pyroxene and ilmenite. Typical Tertiary olivine-dolerite.

Sherd 6577b (vessel 40) – coarse angular fragments to 4mm maximum – a few partly rounded – range in seriate fashion down to monomineralic grains of the same type. All are fresh ophitic dolerite (Tertiary) with large (up to 3mm) dolerite pyroxenes embedding plagioclase laths: lesser amounts of granular olivine and platy ilmenite.

Sherd 6615b (vessel 42) – plentiful angular to sub-rounded fragments

(to maximum 5mm), more or less seriate and all of the same dolerite composition. Fresh Tertiary olivine-basalt with traces of ophitic structure: the mineral composition is granular olivine, plagioclase laths, and lesser amounts brown pyroxene and platy ilmenite.

Sherd 6652 (vessel 43) – coarse grit fragments to 4mm maximum packed together in the sherd. These are coarse altered dolerite with sericitised plagioclase laths in ophitic pyroxene (now entirely chloritised), with large square-outlined magnetites. It is probably a Lower Palaeozoic type but could, perhaps, be a very altered Tertiary dolerite. A single large fragment of siltstone is present, probably a natural clast, and the ground-mass carries angular quartz fragments.

Sherd 7646 (vessel 52) – grit fragments to 2mm scattered sparsely through the sherd. These are of porphyrite (acid plagioclase and pyroxene phenocrysts along with tiny felspar laths in a felsitic ground-mass) and poorly-sorted quartz-sandstone with much brown clay matrix. The former is a Lower Palaeozoic hypabyssal rock type, the latter probably Carboniferous Sandstone, the presence of two components in the grit suggesting that it may arise from a gravel source.

Sherd 1418 (vessel 59) – angular grit fragments to 6mm, ranging down to single mineral grains of the same rock. A poorly sorted quartz-sandstone with angular to partly recrystallised strained quartzes, sericitised plagioclase and indefinite sericitic aggregate in a matrix of brown clayey material. Probably Carboniferous sandstone.

Sherd 3773 (vessel 73) – large (upwards of 4mm) angular fragments packed densely in clay ground-mass of sherd with less amount of monomineralic grains of the same material – typical fresh olivine-dolerite of Tertiary age. The micro-sections show plagioclase laths set in ophitic pale brown pyroxene, along with granular olivine showing pale brownish alteration along cracks: opaque grains with traces of lath shape are probably ilmenite.

Sherd 3774 (vessel 74) – angular fragments in seriate fashion packed abundantly in the sherd. These are a poorly sorted sandstone with angular quartzes, altered felsite, and less plagioclase (both fresh and sericitised) in an abundant brown clayey ground-mass. Carboniferous Sandstone (or Old Red ?).

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Table 1: Distribution of additives in the "Earlier Western Neolithic" Sherds.

	Sandstone	Carboniferous Shale Assts.	Pegmatite-Aplite	Palaeozoic dyke rocks	Grog
Zone A					
5696	◆ ?	◆	●	◆	
5698	●	◆			
5699	●		◆		
5700		◆	●		
5700	●	◆			
5701		◆	●	◆	◆
5701	●	■			
5702	●	■	■	◆	■
5707	◆ ?	■	● ?		
5707	●				
Zone B					
5704	■	●	◆		
Zone C					
5706a	●	■		◆ ?	

Abundant: ● Several: ■ Rare: ◆

? Based on mineral fragments only – no polycrystalline grains

APPENDIX 2

TOWARDS A RECONSTRUCTION OF THE GROOVED WARE CIRCULAR WOODEN STRUCTURE

Edward Bourke

Introduction

Any attempt at reconstructing a prehistoric structure on paper from post holes and stratigraphy is fraught with difficulty and contains much that is subjective. Little is known of the construction techniques favoured by individual cultures, and almost nothing about the reasons and motivations behind the builders of any prehistoric ritual structure. It is often difficult to determine whether boundaries were intended to enclose or exclude, to obscure or to draw attention to activities, to provide shelter from, or open up to the elements. In this context the interpretation of timber circles owes more in some circumstances to prevailing archaeological fashion than to the quality and quantity of the available evidence.

In an attempt to overcome some of these problems, several reconstructions are offered here. These range from simply erecting vertical posts in the post-pits, to porched buildings with conical roofs. All fit the evidence available, and the merits and limitations of the various reconstructions are discussed.

The surviving evidence:

The structure as excavated consisted of a series of thirty three post-pits, which represented a roughly circular building measuring 9.11 x 8.10m externally and 6.70 x 6.28m internally. The evidence suggests that a thirty fourth pit (11a) did not hold a post. No evidence for walling or internal subdivisions survived. Twenty one pits defined the circle with two slightly larger pits defining an east-facing entrance. The entrance was also distinguished from the rest of the circle by the fact that the entrance jambs and the posts that flanked them form a straight line, giving the front of the structure a short flat facade. The entrance was further emphasized by an arc of eight pits outside the circle at the eastern side. This included a pair of large pits, each containing two post-shafts, further defining the entrance. It has been suggested by the excavators that these pits, particularly the four large pits at the entrance, formed a porch feature (Eogan and Roche 1994, 322). There were four posts inside the circle aligned on the entrance, and placed to form a regular square.

The internal four post-pits measured up to 1.32m in diameter and up to 1.34m in depth, and would have held posts up to 200mm in diameter. They range in depth from 0.94m to 1.34m, and the post-

shafts from 0.24m to 0.34m in diameter (Fig. 21, p. 103). The circle itself is defined by 21 post-pits which range in depth from 1.16m to 0.46m, and the post shafts from 0.66m to 0.16m in diameter.

For the purposes of these reconstructions, the diameters of the post shafts are assumed, in most cases, to have accommodated posts of smaller diameter than the shafts themselves, as the stones in the post shafts are interpreted as packing stones (p. 104). Posts of this size range would have been adequate to support a roofed structure, and the reconstructions do not depend on the thickness of the posts. Depth of post shaft is probably a better indicator of the potential structural importance of individual posts (Fig 3. f).

THE STRUCTURE: (Frame only)

In order to analyse the structure, the framework of the structure will be dealt with first, and the arguments in favour of or against each frame will be presented in purely structural terms, and in relationship to the measurements of the post-pits.

Reconstruction 1: (Fig. 1)
This is the most minimal reconstruction possible; in this, the only interpretative decision made is the height of the posts. In order to do this, the height of the post is relative to the depth of the post pit. This is a rough guide, as the deepest of the posts of the outer wall (Pit 23) is 1.16m in depth, deeper than Pit 1 which, along with the other internal posts, is reconstructed higher. A height of 2.2 metres is used for the outer posts and a height of 3 metres for the internal posts. The paired posts which flank the entrance and the posts which define it are also reconstructed higher than the posts of the outer wall, as they range in depth between 0.94m and 1.25m, which is deeper than the expected range for the ordinary posts of the outer wall, and the diameter of their post shafts ranges from 0.30m to 0.56m.

The site is quite level, so that the situation at Sarn-y-bryn-Caled, where the excavator suggests that pre-cut timbers were used and that different pit depths compensated for rises or falls in ground level (Gibson 1992b, 89), or to a similar situation in the case of the South circle at Durrington walls (Mercer 1981, 156), need not be taken into account. The argument used by Barclay at North Mains, Perthshire (1983, 181), where the post-pits were dug to different depths to allow for different sizes of timber cannot be so easily dismissed. However, for the purposes of this reconstruction, it is assumed that deeper post pits with larger diameter posts generally indicate higher vertical posts. It is interesting to note, however, that the posts of the outer wall are not markedly different in diameter from the internal posts or the posts of the entrance, showing that no selection was made on the basis of thickness of timber.

Reconstruction 2: (Fig. 1)
This reconstruction is exactly the same as Reconstruction 1, except that it takes into account the problem posed by Gibson in his reconstruction of the site at Sarn-y-bryn-caled, Powys, Wales (1992b, 90-91). Gibson pointed out that, if no circular horizontal ring-beam is included, the circularity of the site is not obvious to a person approaching it, and it seems to be only a forest of upright timbers. He points out that, given the effort put into creating a symmetrical structure, it is unlikely that the superstructure would not emphasise this symmetry, and his solution, a ring beam joining the tops of the outer timber posts is a simple and elegant answer to this problem, which has also been taken into account in the recent reconstruction of Ballynahatty, County Down (Hartwell, 1994, 11-13). This reconstruction, though unroofed, goes some way towards producing "something rather more convincing than the forests of naked posts in which we have all so dismally wandered." (Piggott, 1939, 221).

Reconstruction 3: (Fig. 1)
This reconstruction employs a conical roof, the four internal posts acting as vertical roof supports, as do the posts of the outer wall. The internal roof supports are braced by horizontal tie-beams at the point where they meet the rafters. The drawing shows a porch feature incorporating the paired pits of the outer posts. This is not necessary from a structural point of view, but is feasible and consistent with the evidence. The roof slope is shown at an angle of 45 degrees. A slope of not less than 45 degrees is the preferred pitch of traditional thatched roofs in Ireland and Britain (Wallace 1992, 57), although other roof pitches are entirely feasible and have been postulated for sites such as The Sanctuary and Woodhenge (Musson, 1971, Figs. 114 & 115). The structure of roof supports and outer walling is quite strong enough to support either a roof of thatch "scolloped" into a "scraw", or sod underthatch, or a thrust thatch roof where the thatch is tied onto a wattle underthatch, attached to the roof purlins and rafters.

One problem with this reconstructed roof is that only four of the rafters, those supported by posts 7, 12, 18 and 23, are also supported by the central four posts. These four rafters would be supported at a point just over 1 metre in from the outer wall and there is a span of 2.5 metres to the apex of the roof. The other wall posts would support their rafters without intervening roof supports so that the span would be increased to *c.* 3.75 metres. This span can be reduced by the use of a ring beam or beams to equalise the load, such as those postulated in the reconstruction of House 2222 at Trethellan Farm (Parker-Pearson, 1993, Fig. 102). If, however, a ring-beam was the preferred option, an arrangement of posts similar to those of Piggott's Phase II at the Sanctuary would seem more logical (Piggott, 1939, 198-210).

In this reconstruction, it is assumed that the outer arcs of posts do not form part of the load-bearing element of the structure. The reasons for this are that the area between the arcs of posts and the main part of

the structure would not form a particularly useful space, and that the rest of the structure forms a coherent unit and is entirely adequate to support a roof. It should also be noted (Fig 3, D) that an extension of the rafters to the outer posts does not lead to a situation where the posts of the outer arcs would coincide with the rafters, so if the posts of the outer arcs are treated as load-bearing, the posts of the inner facade would have no structural purpose. This seems unlikely as they are deeper than the posts of the outer arcs.

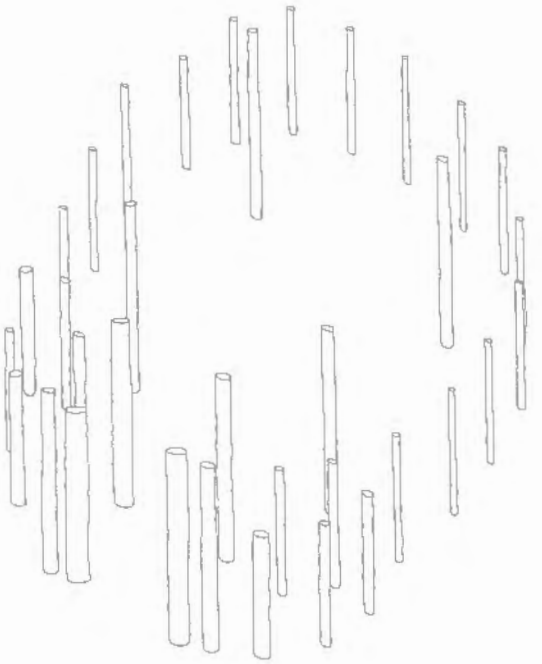
Reconstruction 4: (Fig. 2)
This reconstruction differs from Reconstruction 3 in that the four internal roof supports form the base of a pair of A-frames, with a ridge-pole between them. This system, which is more often found in rectangular buildings, is as structurally strong as the non A-frame structure. The front and rear of the buildings are roofed by a pair of lean-to type roofs, which are supported at one end by the tie-beams of the central A-frames and at the other by the outer wall.

The advantage of this system is that the unsupported spans of the rafters are reduced to 2 m or less on the horizontal, and there is no need for a ring-beam or beams to spread the load. The tie beams from post 1-4 and 2-3 would support the rafters running from the ridge-pole to pits 9, 10, 20 and 21, and the internal posts would support those running from the ridge pole to pits 8, 11, 19 and 22. This would halve the unsupported spans in the central area of the building from up to 4 to less than 2 metres. The support given by the tie beam running from pit 1 to 2 and pit 3 to 4 would mean that the unsupported spans at the front and rear of the building would also be of the order of 1.5 to 2 metres, suggesting that this would be a stronger and more economical structure.

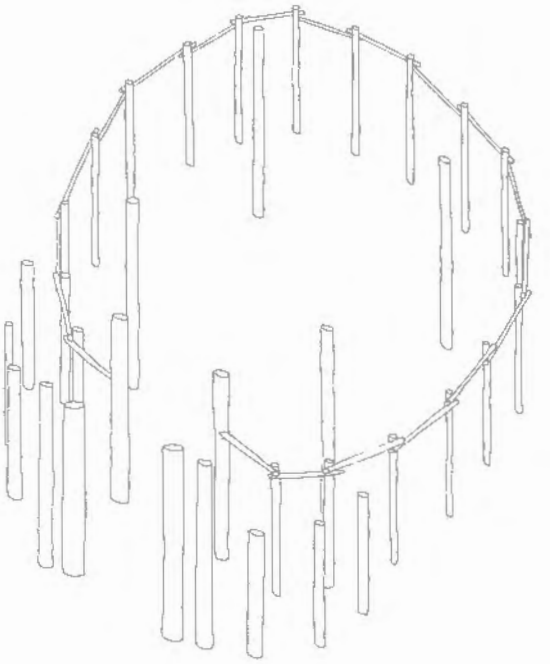
It is also assumed that the outer arcs of posts on either side of the entrance are not integral to the structure, for the same reasons stated in Reconstruction 3.

Walling:
No evidence for walling survived. The posts which formed the circle could have been linked by wattle or panels of wattle, but would have been of sufficient size to either support a roof unaided or, in an unroofed structure, would have formed a sizeable element. If a wall did exist, it was almost certainly not daubed with clay, as clay would have survived on site. The possibility of daubing with dung and wood chips cannot be eliminated, as such daub would probably leave no trace in the archaeological record. This problem has occurred on urban sites such as Dublin and Wexford, where organic preservation was perfect and even bracken insulation between double post and wattle walls was preserved, but no trace of an inner or outer layer of daub survived. This may suggest that the daub was sufficiently similar to the surrounding material as to leave no trace. There was no suggestion of plank walling, as at Ballynahatty (Hartwell, 1994, 13; figs. 5 & 6).

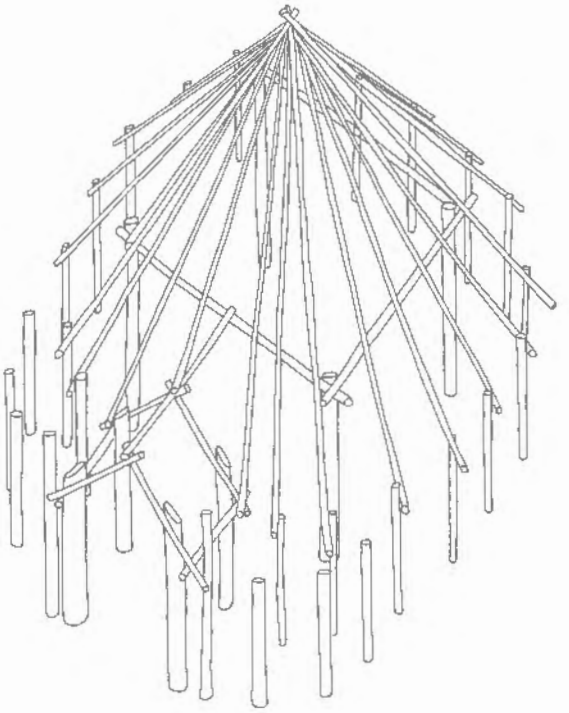
Appendix 2 Fig. 1. Grooved Ware Complex Circular Wooden Structure. Suggested reconstructions 1-3 (Frame only).



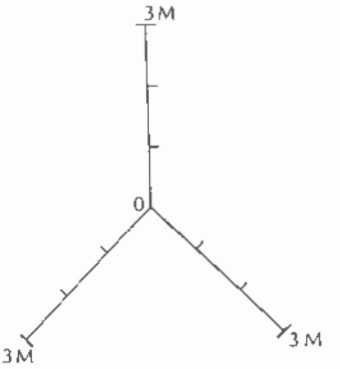
Reconstruction 1



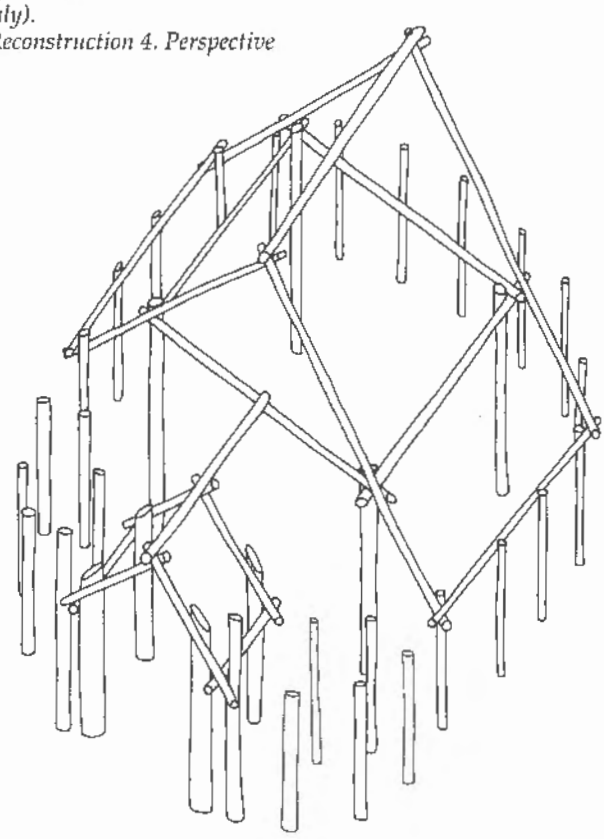
Reconstruction 2

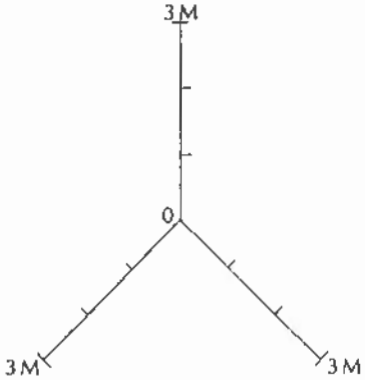


Reconstruction 3

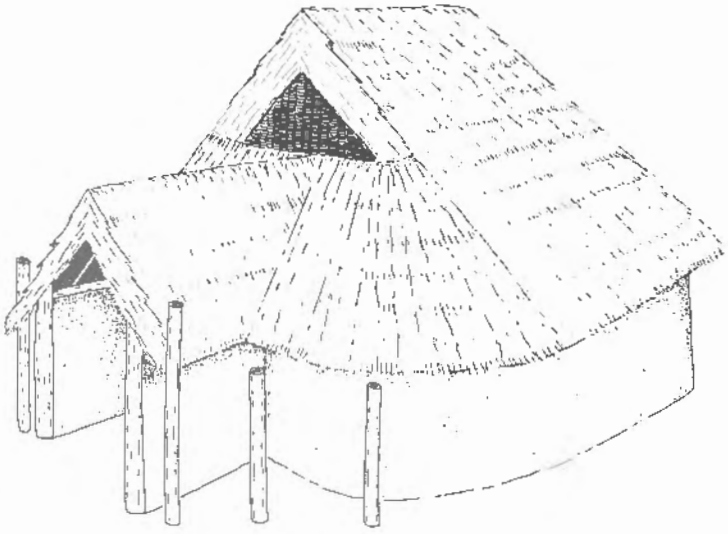


Appendix 2 Fig. 2. Grooved Ware Complex Circular Wooden Structure. Top: Suggested reconstructions 4 (Frame only). Bottom: Reconstruction 4. Perspective drawing.



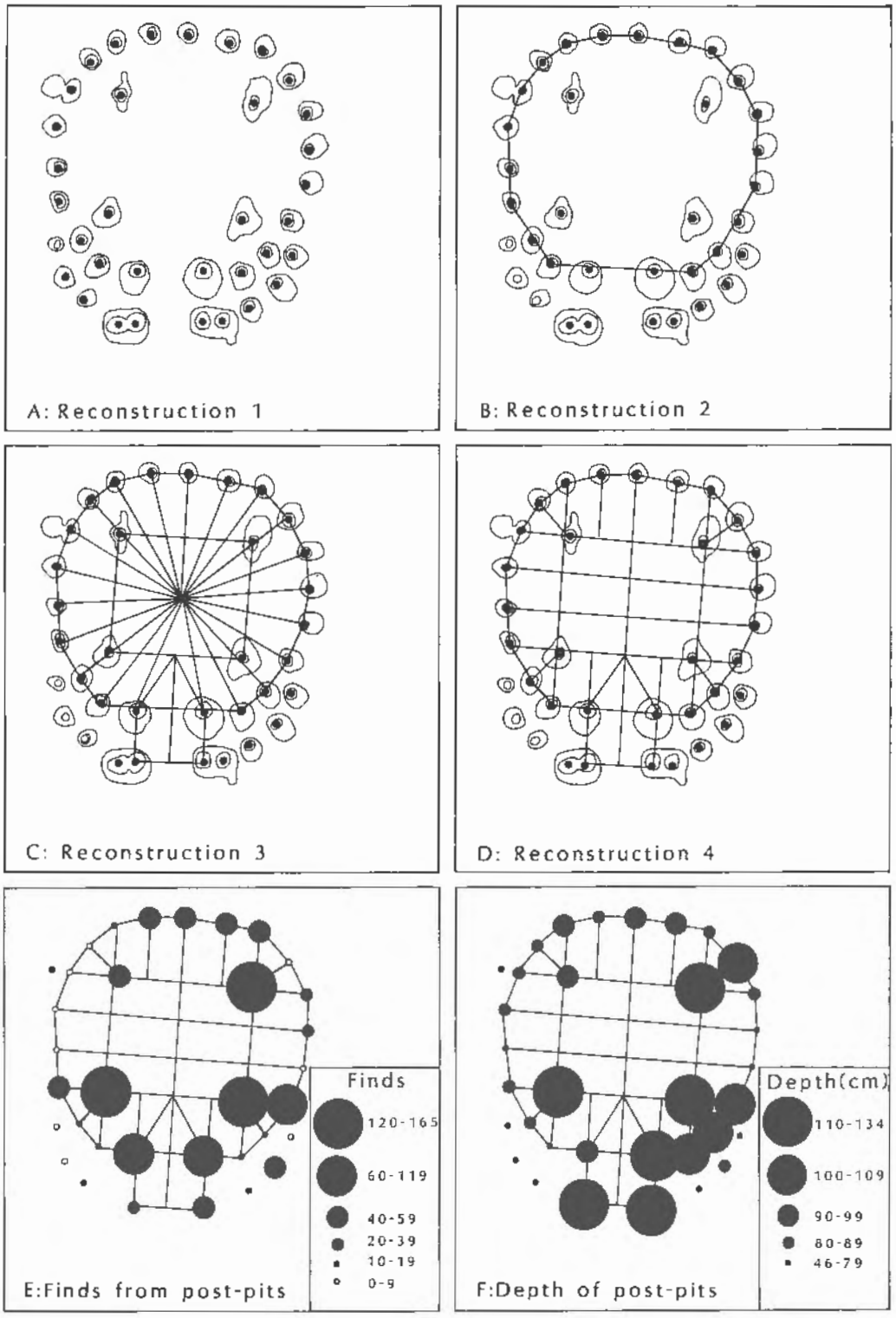


Reconstruction 4



Reconstruction 4
Perspective Drawing

Appendix 2 Fig. 3. A–D: Plan views of alternative reconstructions.
E–F: Finds per post-pit and depths of post-pits.



Roofing:
No direct evidence survives for roofing, though the four internal posts are located in positions which would be logical if a roof had been intended. The heavier and deeper posts at the entrance could have supported a porch and the diameter of the structure poses no technical problems as regards size of timbers and distances to be spanned. None of this proves that a roof existed, but indicates that a number of possible roof designs could have been supported by the structure excavated. One thing which does seem almost certain is that the structure excavated was laid out by people who came from a tradition that included roofed circular wooden structures, and that this structure, roofed or unroofed, in some way represented a roofed wooden building.

Carpentry:
No sizeable pieces of timber survived in the post-shafts, and the stony nature of the packing around the posts does not allow any inferences to be made about the way the timbers may have been worked. Although the surviving evidence suggests that the timbers were rounded (Fig. 21) it is not possible to say how they were worked, or whether the timbers were sub-rectangular or tending towards being squared. Nothing survived above ground, and therefore no evidence exists on how timbers may have been attached to one another. There is no evidence in Ireland for carpentered wooden buildings in prehistoric contexts (C. McDermott pers. comm.). Although the mortice and tenon arrangement which is represented in stone at Stonehenge seems to indicate borrowing from carpentered structures (Gibson 1992b, 88), and there is evidence for carpentry being used in Bronze Age structures in Italy and Switzerland (A. O'Sullivan pers. comm.), neither the sizes of the timbers, nor the probable circular and sub-circular nature of the posts of the Knowth circle, tend to suggest carpentry.

On the basis that the reconstruction should not imply a level of craftsmanship for which there is no evidence, all the reconstructions use rounded timbers with no carpentered joints. For the purposes of the reconstructions any structural joints are shown juxtaposed, as though tied together, although these ties are not drawn.

Interpretation:
Having examined the structural options and the alternatives available for materials and techniques which leave no trace in the archaeological record, an attempt will be made here to analyse which, if any, of the suggested reconstructions is more likely, based on a combination of the structural and archaeological evidence though, as Piggott pointed out, "... in archaeology there are always several correct explanations for any set of observed phenomena" (1939, 215).

An examination of the ground plan of the circle makes it clear that the structure is an integrated, one period, symmetrical wooden edifice, whether it was roofed or not (Fig. 3A). If there had been habitation material or a hearth in it, there would be no problem in deciding that

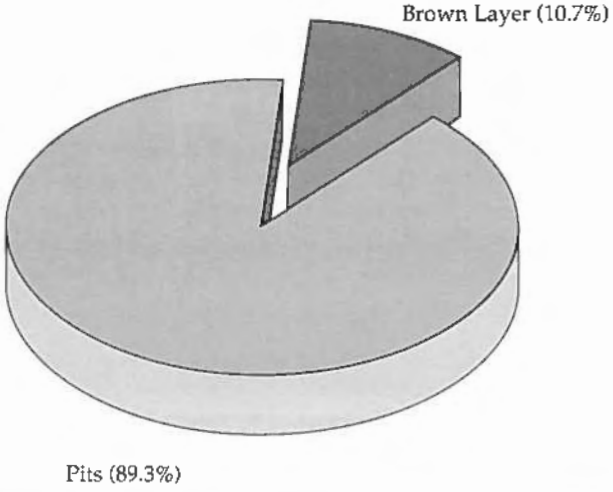
the balance of probabilities favoured a roofed building as the most logical reconstruction. Its size at 9.11m by 8.10m fits well within the range of circular prehistoric houses known from Britain and Ireland.

The regularity of the plan, its symmetry about an axis running through the entrance, and its four internal posts placed in logical positions to act as roof supports, argue that the structure either functioned as a circular roofed building or represented a roofed building in some symbolic way.

The relative depth and diameter of internal posts and entrance posts would imply that they were taller and stronger vertical members more capable of supporting a roof. This relationship between depth of posts and their logical position as structural supports is not absolute, but does follow in most cases (Fig. 3F). The posts of the outer wall vary in depth from 0.55m 1.08m, whereas the shallowest of the internal and porch posts was 0.94m, with all but two being over 1.23m. Unfortunately, the pattern of depths of posts in the outer wall does not indicate anything except that there is a group of three deeper posts north of the entrance; otherwise the distribution of depth seems random and not related to relative structural importance.

The arguments against a roofed structure are largely based on comparing the circle with domestic structures. The absence of a hearth, the lack of any trace of internal sub-divisions, coupled with the fact that it is impossible to establish differences in stratigraphy between interior and exterior of structure, can be used to argue that the structure was not roofed. This argument, coupled with the evidence of other timber circles where the structures are either so large, irregular, or complex that they either were completely incapable of supporting a roof, or require complex, technically difficult or unlikely structures to form the base of a roofed building (Gibson, 1992b, 88-90) has been used to argue that none of the timber circles were roofed. These problems do not exist in relation to the Knowth circle.

Table 1: Pottery Contexts (Total = 560)

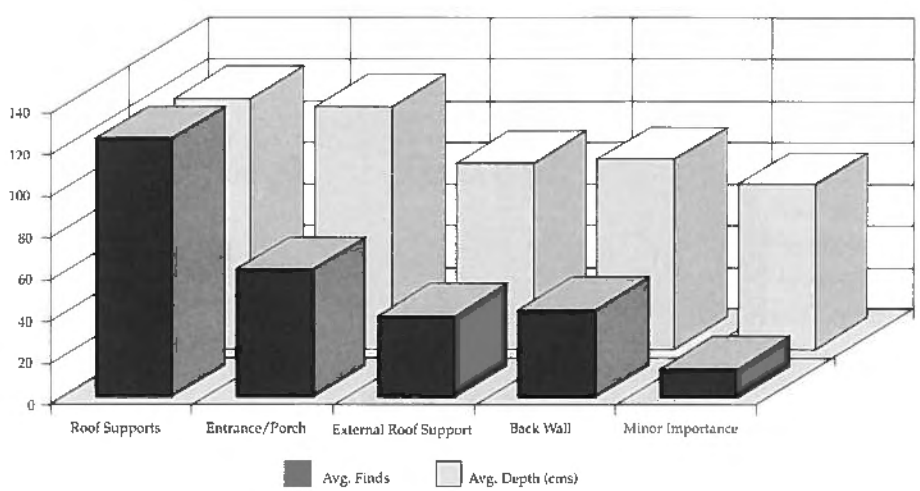


There is one other way of examining the evidence from the circle to give an indication as to what kind of structure it represents. There are only 60 sherds of pottery and few other small finds from the interior of the circle, but 1333 from the post-pits. The careful and ritualised nature of the deposits in the pits is discussed in the main body of the report, but it seems reasonable to look to this evidence for indications as to which of the pits had most significance for the builders (Fig. 3E).

If either of the unroofed reconstructions are being pointed to by the evidence, then the internal posts and the posts of the porch should have a large number of finds, and the outer wall posts should have smaller but similar numbers of finds. It is, of course, possible that the deposition, in a ritual context, of large numbers of finds in the post pits of a structure, has nothing to do with the importance of the posts to the structure. It is equally possible that parts of the edifice were more significant for ritual purposes, which had nothing to do with their structural significance.

The plan showing the relative amounts of pottery from the different pits (Fig. 3E) complements and reinforces the evidence of depths of post-pits. The internal pits have 73 (Pit 1), 166 (Pit 2), 128 (Pit 3) and 131 finds (Pit 4) from them, compared to an average of 39.71 for the structure as a whole. The situation in relation to the porch-like structure is complicated by the fact that the paired posts 29/30 and 31/32 are in single pits, which for the purposes of this analysis, are treated as single posts. All but pit 31/32 (34 finds) have greater than average numbers of finds from them, Pit 5 (69), Pit 25 (84) and Pit 29/30 (59). Another element which can be identified in this analysis is that, with the exception of Pit 11 (no finds), the posts which might have supported the A-Frame posited in Reconstruction 4 have close to or above average numbers of finds (Table 2). The four internal pits have already been mentioned; Pit 19 (31 finds), Pit 22 (80 finds),

Table 2: Reconstruction 4



and Pit 8 (45 finds) are the remaining timbers of the A-Frame arrangement. This impression is reinforced if the posts at the back wall of the structure (Pits 13-17) are taken into account; these posts, although ranging from 13-55 finds per pit, are about average. In comparison, the timbers which would have had only minor importance in the structure posited in Reconstruction 4 are all well below average, with the exception of Pit 27 (53 finds).

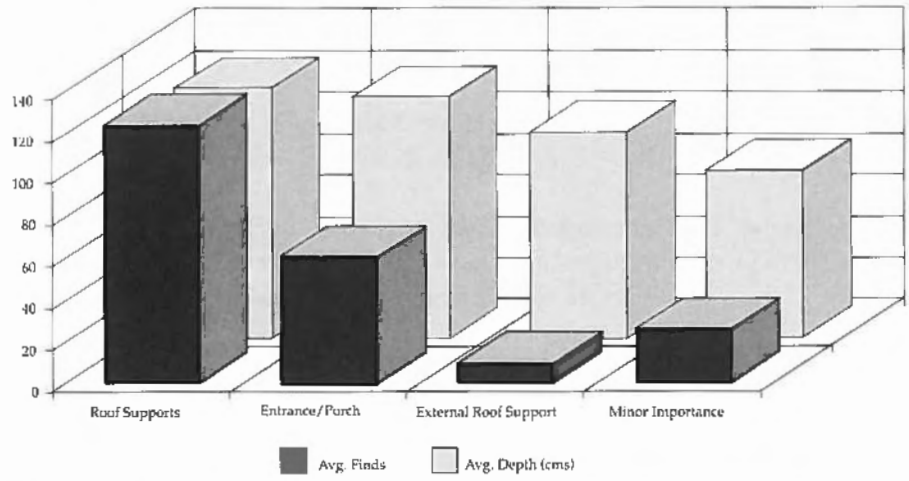
This contrasts with the situation where a relationship is much harder to establish between number of finds and structural importance for Reconstruction 3 (Table 3) as, without exception, the main outer wall roof supports of this reconstruction have less than 16 finds from their fill. As both reconstructions make use of the four internal posts and the posts of the porch, this lack of finds from the outer wall roof-supports of Reconstruction 3 seems significant.

Conclusions:

The evidence reviewed above does not prove that the structure represented by the pit circle was a roofed building; it does however indicate that, roofed or unroofed, the circle was a structure erected by people with a tradition of circular roofed buildings. The structural factors which show that Reconstruction 4 produces the shortest unsupported rafter spans, coupled with the distribution of finds, seems to indicate that the type of building represented, physically or symbolically, was more likely to resemble Reconstruction 4 than any of the other reconstructions.

The plan is strongly indicative of a building, the size is appropriate and, unlike many of the other timber circles, it does not require either complex or far-fetched structural schemes to roof it. It seems likely, therefore, that the Knowth structure was roofed and that a structure similar to Reconstruction 4 may be envisaged.

Table 3: Reconstruction 3



Acknowledgements:
I would like to thank Dr. P. F. Wallace (National Museum) for his comments on the reconstructions proposed in this paper, Ms. Aighleann O'Shaughnessy (O.P.W.) for her comments on the relative strengths of the structures described and to Conor McDermot (Wetland Unit) and Aidan O'Sullivan (Discovery Programme) for their advice and comments on carpentry.

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APPENDIX 3

PLANT REMAINS

Brenda Collins

Samples

Samples taken during the course of the 1989–1992 excavations were examined for macrofossil plant remains. The samples related to:–

1. Earlier 'Western' Neolithic Complex.
2. Decorated Pottery Complex.
3. Grooved Ware Structure.
4. Beaker Complex.

Method

Two litre subsamples from the 1989 and 1990 samples, and all of the soil from the 1991 and 1992 samples, were processed and analysed with a view to the retrieval of macrofossil plant remains and the extraction of charcoal for C14 dating. When disaggregated, the samples were washed over stacked Endecotts sieves (2mm, 1mm, 0.5mm, 0.3mm). The retent from each sieve was examined, using a binocular microscope. The term seed is used in a general sense to mean the fruiting bodies of plants.

Results

The samples were essentially mineral deposits. All of the plant remains were charred. Cereal grains, many of which were corroded and unidentifiable, were present. Evidence for chaff and straw was absent. Charcoal, which is largely mineral and survives in aerobic deposits (Evans 1978), was present in large quantities in some of the samples. Hazelnut shell fragments were abundant.

1. Earlier 'Western' Neolithic Complex

1.1 From Foundation Trench 1 (Samples 1 and 3) and Post-pit 3 (Sample 2), Area A.

Charcoal, charred hazelnut shell fragments and wheat grains were present. One wheat grain was unidentifiable to species. Nine grains of emmer wheat were present (Table 1).

Table 1

Sample 1.	*Triticum* sp. (wheat)	1 grain
Sample 2.	*Triticum dicoccum* L. (emmer wheat)	4 grains
Sample 3.	*Triticum dicoccum* L. (emmer wheat)	5 grains

1.2 Foundation Trenches 4 (Samples 4 and 5) and 7 (Sample 6), Area D. Charcoal and charred hazelnut shell fragments were present. Charred cereal grains are given in Table 2.

Table 2

Sample 4.	*Hordeum* sp. (barley)	1 grain
	cf. *Avena* sp. (? oat)	1 grain
Sample 5.	Degraded unidentifiable charred cereal	2 grains
Sample 6.	*Triticum dicoccum* L. (emmer wheat)	1 grain
	cf. *Triticum* sp. (? wheat)	1 grain

Remarks

Charcoal, charred hazelnut shell fragments and charred cereals, are all evidence for human activity and could represent hearth material. Emmer wheat was identified in samples 2, 3 and 6. In Ireland, emmer wheat has been primarily identified from prehistoric contexts (Monk 1986), particularly those of neolithic date (Monk 1988). It was also an important cereal in prehistoric Britain (Godwin 1975 and Greig 1983). Emmer is a glume wheat and was replaced by the more convenient free-threshing bread wheat certainly by the early historic period.

One barley grain, indeterminate to species, came from sample 4. Barley has been recorded in the Neolithic period in Ireland, although to a lesser extent than wheat (Monk 1986, 1988).

The presence of one grain, characteristic of oat but indeterminate to species, in sample 4, was unexpected. A second opinion (pers. comm. Mick Monk) concurred with the identification. The context was secure and was undisturbed by later activity. Evidence for cultivated oat (*Avena sativa*) comes from Early Christian contexts (Monk 1986), although wild oat (*Avena fatua*) would have been a weed of wheat and barley crops before this. Wild oat, barley and rye were recorded at Carrowmore, Site 27 (C14 date on the grain of 530±55 b.c.), (Monk 1986). Wild oat is not a native plant and was introduced by man into this country (Scannell and Synnott 1987). The identification is however tentative and only one grain was present.

2. Decorated Pottery Complex

From dark habitation layer (Samples 7–10), Pit 9 (Sample 11) and stake-holes (Samples 12a–e), Area E. Charcoal and charred hazelnut shell fragments were present in most of the samples. Wheat grains, unidentifiable to species, were also present (Table 3).

Table 3

Sample 7.	*Triticum* sp. (wheat)	1 grain
Sample 8.	*Triticum* sp. (wheat)	3 grains
	Degraded unidentifiable charred cereal	2 grains
Sample 9.	cf. *Triticum* sp. (? wheat)	3 grains
	Degraded unidentifiable charred cereal	1 grain

Sample 10.	Degraded unidentifiable charred cereal	1 grain
Sample 11.	Degraded unidentifiable charred cereal	3 grains
	Cirsium/Carduus sp. (thistle)	2 seeds

Samples 12a–e are represented by a series of stake-holes. Charcoal and charred hazelnut shell fragments were present. Charred cereal grains came from four post-holes (Table 4).

Table 4

Sample 12a.	*Galium aparine* L. (cleavers)	1 seed
Sample 12b.	*Triticum* sp. (wheat)	1 grain
Sample 12c.	*Triticum* sp. (wheat)	1 grain
Sample 12d.	*Triticum* sp. (wheat)	1 grain
Sample 12e.	Degraded unidentifiable charred cereal	1 grain

3. Grooved Ware Structure

Charred hazelnut shell fragments and charcoal were present. Cereal grains are given in Table 5.

Table 5

Sample 14.	(Post-pit 13).	Degraded unidentifiable charred cereal	3 grains
Sample 15.	(Post-pit 22).	*Triticum* sp. (wheat)	2 grains
		Degraded unidentifiable charred cereal	1 grain
Sample 16.	(Post-pit 23)	*Triticum* sp. (wheat)	2 grains
		cf. *Triticum* sp. (? wheat)	1 grain
		Hordeum sp. (barley)	2 grains
		Degraded unidentifiable charred cereal	2 grains
Sample 17.	(Post-pit 23)	Degraded unidentifiable charred cereal	2 grains
Sample 18.	(Post-pit 3)	*Triticum* sp. (wheat)	2 grains
		Degraded unidentifiable charred cereal	1 grain
Sample 19.	(Post-pit 27)	*Triticum* sp. (wheat)	4 grains
		cf. *Triticum* sp. (? wheat)	1 grain
		Hordeum sp. (barley)	1 grain
		cf. *Hordeum* sp. (? barley)	1 grain
Sample 20.	(Post-pit 27)	*Triticum* sp. (wheat)	1 grain
		cf. *Triticum* sp. (? wheat)	1 grain
Sample 21.	(Post-pit 12)	Degraded unidentifiable charred cereal	1 grain

Sample 22.	(Post-pit 14)	*Polygonum aviculare* L. (knotgrass)	1 seed
		Hyoscyamus niger L. (henbane)	1 seed
		Cirsium/Carduus sp. (thistle)	3 seeds
		Triticum dicoccum L. (emmer wheat)	1 grain
		Hordeum sp. (barley)	1 grain
		Degraded unidentifiable charred cereal	1 grain
Sample 23.	(Post-pit 9)	*Triticum* sp. (wheat)	1 grain
Sample 24.	(Post-pit 8)	*Raphanus raphanistrum* L. (radish)	1 pod fragment
		Triticum cf. *aestivum* type (? bread wheat)	1 grain
		Triticum sp. (wheat)	3 grains
		cf. *Triticum* sp. (? wheat)	1 grain
		Degraded unidentifiable charred cereal	5 grains
Sample 25.	(Post-pit 6)	*Hordeum* sp. (barley)	1 grain
		Degraded unidentifiable charred cereal	3 grains
Sample 26.	(Post-pit 5)	*Rubus fruticosus* agg. (bramble/blackberry)	3 seeds
		Sambucus nigra L. (elder)	1 seed
		Triticum sp. (wheat)	6 grains
		cf. *Triticum* sp. (? wheat)	3 grains
		cf. *Hordeum* sp. (? barley)	1 grain
		Avena sp. (oat)	1 grain
		Degraded unidentifiable charred cereal	9 grains
Sample 27.	(Post-pit 20)	*Triticum* sp. (wheat)	1 grain

Remarks on samples from Grooved Ware Structure

All of the samples came from the post-pits. Pals (1987) summarises and discusses the processes involved in the deposition of charred material in post-holes. When analysed from houses which had been burnt down, they have been useful in pin-pointing activity areas within the dwelling. However, they can also be collecting grounds for material from a variety of places, reflecting a range of activities including later occupation unassociated with the use of the structure.

In this instance, the post-pits had been carefully and deliberately back-filled (Eogan and Roche 1994), and the cereals in the back-fill material could have originated from several sources. Given the ritualistic nature of the structure, the cereals could have been

purposely deposited or, quite simply, were incorporated inadvertently into the back-fill material.

Wheat grains, indeterminate to species, except for one grain of emmer (Sample 22) and barley, also indeterminate to species, were present. Limited evidence for barley comes from the neolithic period in Ireland (Monk 1986). Naked barley was identified by Groenman and Pals (1984) in Beaker contexts at Knowth. Sites in Britain where Grooved Ware was found yielded evidence for wheat (including *Triticum aestivo–compactum* and *Triticum dicoccum*) and naked six-row barley (Jones 1980; 1991 in Barrett, Bradley and Hall, 49-53).

The oat grain, indeterminate to species, from Sample 26, was from an undisturbed context. As pointed out above, evidence for cultivated oat does not appear until the Early Christian period, although wild oat was almost certainly a weed of other cereal crops before this. As wild oat is a species that was introduced in to Ireland, the presence of *Avena* sp. in such an early context is interesting. Although it is important to record its presence, it would be misleading, and inappropriate on the basis of a single grain, to place any emphasis on it.

4. Beaker Complex

From Concentration D dark habitation material.

Sample 28.	*Ranunculus acris* L./*repens* L. (buttercup)	1 seed
	Rubus fruticosus agg.(bramble)	3 seeds
	Cirsium/Carduus sp. (thistle)	2 seeds
	Triticum sp. (wheat)	2 grains

Conclusion

Although cereals were present in Earlier 'Western' Neolithic, Decorated Pottery, Grooved Ware and Beaker contexts, the nature of the remains give us little detail in terms of prehistoric crop husbandry at this time, or the extent to which cereals were significant in the economy. The remains were limited to a small number of grains, often indeterminate to species and with no evidence of chaff or cereal weeds.

Hazelnut shell fragments were well represented in the samples, although not in large quantities. Blackberry and elderberry seeds were also present. The exploitation of wild plants in prehistory is not surprising, given the extent to which man in medieval times depended on natural resources, not only for food but for use in the home (flooring, insulation, bedding and medicine) (Collins 1994).

Despite the large quantities of soil analysed, particularly from contexts excavated during the 1991 and 1992 seasons (for example 34kg of material was processed from Sample 8), there were very few cereals in the samples, and those present were to a great extent poorly preserved and indeterminate to species.

The absence of significant crop remains may be attributed to factors of preservation. Carbonised material deteriorates with age and

is damaged if exposed for long periods prior to burial (Jones 1980; Hillman 1981). To ensure preservation, the charring process itself would have been important (Hillman 1981).

Neither should the absence of cereal waste lead us to conclude that crop processing was not carried out at Knowth. It could have been confined to specific areas, so that chaff from pounding and parching, and debris from ovens and hearths, could have been dumped discreetly and away from habitation areas.

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APPENDIX 4

ANIMAL BONE ANALYSIS FROM NEOLITHIC AND BEAKER COMPLEXES

Finbar McCormick

Introduction

The present bone report deals with a series of small bone samples from the late Neolithic and Beaker periods. Most of the bone fragments were calcified. The identification of the individual bones from the different contexts is presented in an Appendix at the end of the report, while the data from the different phases is summarised in Table 1.

Results

Only a very small sample of material was present, so the information provided is extremely limited. It is clear, however, that hunting and the keeping of sheep/goat was of negligible importance in the diet. The predominance of cattle over pig mirrors the relative proportion of the two species from a much larger sample from the Beaker levels at Newgrange. In that case, cattle accounted for 58% of the domesticates, compared with 35% in the case of pig (van Wijngaarden-Bakker 1986, 22). The remaining 7% at Newgrange consisted of domestic sheep/goat, dog and horse, with 1% being accounted for by wild species. In general, smaller animals are underestimated when quantifying animal bones. In the Beaker levels at Newgrange, pigs, though less numerous than cattle in terms of fragment totals, outnumbered cattle on a ratio of 2:1 on the basis of minimum numbers of individuals (MNI) values. It is quite possible that pig also are the more numerous in terms of MNI at Knowth, but the samples were too small and disparate to allow meaningful evaluation of the MNI values.

TABLE 1: Distribution of animal bones from different phases.

Phase	Cattle	Pig	Frag. Total
Earlier 'Western' Neolithic (EWN)	8	2	10
Decorated Pottery Complex (DPC)	12	4	16
Grooved Ware Complex – Circular Wooden Structure (CWS)	22	16	38
Beaker (B)	3	2	5

Animal type:

Cattle

Little is known about animal type in Neolithic Ireland. Studied animal bones are confined to small groups of material from funerary contexts, such as Ashleypark, Co. Tipperary, or from settlement sites where the material is either mixed with later material, e.g. Lough Gur, Co. Limerick, or survives only as calcified material, such as Tankardstown, Co. Limerick (McCormick 1988). The data from such sites (Table 2) shows that, while there was some overlapping cattle size between the Neolithic and Beaker period, the cattle at Ashleypark and the Neolithic/Beaker levels at Lough Gur were generally of a smaller size than those noted in the Beaker levels at Newgrange, Co. Meath. This implies that there is either regional variation in the cattle size – with those from north Leinster being larger than those found in the Limerick/Tipperary area – or that the Beaker inhabitants of Newgrange developed, or imported, a large type of cattle.

Unfortunately no complete metapodia were present amongst the present samples from Knowth. A metatarsal distal width (Bd) of 61.0

TABLE 2: Complete Irish Neolithic and Beaker period cattle metapodials (mm) after McCormick (1985, 92–93), van Wijngaarden-Bakker (1974, 335–6, 372; ibid. 1986, 43).

Site	Bone	GL	Bp	Bd	Sd
Ashleypark	Metacarpal	192	52.5	55.0	31.1
		195	51.8	55.2	28.0
Lough Gur	Metacarpal	177	51.4	50.5	28.2
		179	50.0	52.8	29.6
		180.1	59.5	61.6	35.0
		186	53.4	55.7	29.1
	Metatarsal	204.7	43.5	48.8	24.0
		209.1	39.8	46.5	23.0
Newgrange	Metacarpal	190	61.0	67.3	35.8
		191	60.0	62.3	33.3
		198		70.2	39.2
		212		57.0	30.4
	Metatarsal	233	48.5	60.0	
		236	50.0	60.3	27.8
		236	49.7		28.0
		238	47.8	58.0	30.5
		241	52.2	62.8	30.1

from the Late Neolithic wooden structure, however, falls within the range of metatarsals from Beaker Newgrange, and is higher than the upper value for Lough Gur, the only comparative material available. On the basis of the very tenuous data, it might be suggested that large cattle were already present in the Boyne valley before the Beaker period. The only other cattle metrical data provided by the present sample was a scapula which had a neck width (SLC) of 55.4mm. This falls within the Newgrange range of 49.5–70.5mm, but is below the Newgrange mean of 59.4mm. Unfortunately, there is no other Irish Neolithic material with which to compare this measurement. The sample is clearly too small to solve the question of cattle size in the Late Neolithic-Beaker period.

Pig

A small sample of pig bones provided metrical data and, again, the only available comparable material is from the Beaker levels at Newgrange. Van Wijngaarden-Bakker (1974, 338) found that the Newgrange pigs were 'among the largest domestic breeds of prehistoric Europe', and elsewhere (ibid. 1986, 71) noted that 'the largest Newgrange domestic pigs would ... approach in height the smallest wild boars living in the same parts'. Large domesticated pigs remained a feature of Irish agriculture until at least the late Bronze Age, but smaller pigs were present in the Iron Age levels at Navan fort (McCormick forthcoming).

Most of the Knowth measurements fell within the range of the measurements of the Beaker-period Newgrange pigs. At Knowth, a Neolithic tibia, for instance, had a distal width (Bd) of 32.5mm, which compares with a Newgrange range of 27.8–36.5mm, with a mean of 30.7mm, while a Neolithic humerus with a distal breadth (BD) of 37.9mm falls within the Newgrange range of 35.9–44.6mm (van Wijngaarden-Bakker 1986, 70). An astragalus from the Grooved Ware, circular wooden structure, however, is larger than any of those noted in the Beaker levels at Newgrange. It has a greatest lateral length (GLL) of 47.1, while the Newgrange range is 39.6–44.9mm, with a mean of 42.6mm (sample = 25). It seems likely that this represents a wild pig.

Age at slaughter

Little can be said of the age at which the animals were killed. The fusion and tooth eruption and wear data are contained in the Appendix. The general impression for cattle is that most were mature or old animals when slaughtered, a pattern similar to that noted at Newgrange. It seems likely that they were bred primarily for their meat.

TABLE 3: List of animal bones from different contexts.

The measurement abbreviations are those of von den Driesch (1976), while the tooth eruption wear stages are based on Grant (1982). The phase abbreviations are as follows (measurements are in mm.):

EWN = Earlier 'Western' Neolithic,
DPC = Decorated Pottery Complex,
CWS = Grooved Ware Complex. Circular Wooden Structure,
P = Post–pit, UF = Upper Fill, PS = Post Shaft,
A = Annex
B = Beaker.
Unid = Unidentifiable

Sample 1	EWN	Cattle: 1 mandible hinge
Sample 2	EWN	Cattle: 1 shattered tooth
Sample 3	EWN	Pig: 1 tooth
Sample 4	EWN	6 unid
Sample 5	EWN	Cattle: 1 tooth, 2 unid
Sample 6	EWN	2 unid
Sample 7	EWN	Cattle: 1 tooth, 1 distal femur, 1 large vert?, 1 skull frag? Pig: 1 tibia (Bd 32.5)
Sample 8	EWN	Cattle: 1 tooth (M3 stage G), 2 humerus
Sample 9	EWN	7 unid
Sample 10	DPC	Several unid
Sample 11	DPC	1 unid
Sample 12	DPC	1 unid
Sample 13	DPC	Cattle: 1 Tooth
Sample 14	DPC	1 unid
Sample 15	DPC	Unid frag
Sample 16	DPC	4 unid
Sample 17	DPC	15 unid
Sample 18	DPC	Cattle: 1 humerus Pig: 2 teeth
Sample 19	DPC	Cattle: 3 teeth
Sample 20	DPC	1 unid
Sample 21	DPC	Cattle: 1 tooth
Sample 22	DPC	Cattle: 1 tooth, approx. 40 unid
Sample 23	DPC	Cattle: 1 tibia (Bd 50.0)
Sample 24	DPC	Cattle: 3 teeth, 1 scapula, 2 unid (burnt)
Sample 25	DPC	Pig: 1 humerus (Bd 37.9; Bt 31.0+\–)
Sample 26	DPC	Pig: 1 Metacarpal
Sample 27	DPC	2 unid
Sample 28	DPC	1 unid
Sample 29	DPC	2 unid
Sample 30	DPC	6 unid
Sample 31	DPC	2 unid
Sample 32: P 29\30(UF)	CWS	Cattle: 1 tooth, 1 phalanx 2, 13 unid frags
Sample 33: P 19 (UF)	CWS	Cattle: 1 femur

Sample 34:	P 25 (PS)	CWS	Cattle: 1 metatarsal, Bd 61.0, 1 tooth + 4 unid
Sample 35:	P 31\32(UF)	CWS	Cattle: 1 tooth + 11 the inner anterior vertical ramus immediately below the articulation, 1 phalanx fused
Sample 36:	P 3 (PS)	CWS	Pig: 1 tooth
Sample 37:	P 5 (PS)	CWS	1 unid frag
Sample 38:	P 22 (PS)	CWS	Cattle: 1 Tooth Pig: 1 Tooth
Sample 39:	P 5 (PS)	CWS	1 bird bone but the diagnostic epiphyses are missing.
Sample 40:	P 3 (UF)	CWS	Cattle: 1 phalanx (dist fused), 32 unid burnt frags
Sample 41:	P 25 (PS)	CWS	Pig: 1 Astragalus gl1 47.1 Bd 28.0
Sample 42:	P 12 (PS)	CWS	5 unid burnt frags.
Sample 43:	P 25 (PS)	CWS	Pig: 4 metatarsal (fused)
Sample 44:	P 14 (PS)	CWS	Cattle?: 1 vert, Pig?: 1 vert, 9 unid
Sample 45:	P 1 (PS)	CWS	Large mammal rib:polished but not worked
Sample 46:	P 1 (PS)	CWS	Small peg, worked and polished
Sample 47:	P 26 (PS)	CWS	Pig: 5 teeth, 1 Metapodial 2 unid (1 burnt)
Sample 48:	P 5 (PS)	CWS	Cattle: 1 thoracic vert
Sample 49:	P 3 (PS)	CWS	1 unid frag.
Sample 50:	P 3 (PS)	CWS	1 unid cremated frag.
Sample 51:	P 29\30(PS)	CWS	Cattle: 1 tooth, 1 phalanx 3, 1 large rib
Sample 52:	P 22 (PS)	CWS	1 unid
Sample 53:	P 3 (UF)	CWS	2 unid
Sample 54:	P 3 (PS)	CWS	Cattle: 1 tooth, 1 unid
Sample 55:	P 3 (UF)	CWS	Cattle: 1 tooth
Sample 56:	P 29\30(PS)	CWS	Cattle: 1 laft calcaneus (unfused\broken) 1 large rib
Sample 57:	P 31\32(PS)	CWS	Cattle: 1 mandible, 1 scapula GLP 71.2 SLC 55.4 Pig: 1 ulna
Sample 58:	P 22 (PS)	CWS	7 unid
Sample 59:	P 5 (PS)	CWS	9 unid
Sample 60:	P 27 (PS)	CWS	Cattle: 1 scapula
Sample 61:	P 19 (PS)	CWS	1 unid
Sample 62:	P 16 (PS)	CWS	1 unid
Sample 63:	P 16 (PS)	CWS	4 unid
Sample 64:	P 16 (PS)	CWS	1 unid
Sample 65:	P 16 (PS)	CWS	Pig: 1 tooth, 1 unid
Sample 66:	P 2 (UF)	CWS	1 unid

Sample 67:	P 4 (PS)	CWS	Pig: 1 calcaneus, 1 large rib, 4 unid
Sample 68:	P 2 (PS)	CWS	Pig: 1 tibia, 1 unid
Sample 69:	P 4 (UF)	CWS	3 unid
Sample 70:	P 4 (A)	CWS	14 unid
Sample 71:	P 2 (UF)	CWS	1 unid
Sample 72:	P 35 (UF)	CWS	4 unid
Sample 73:	P 2 (UF)	CWS	3 unid
Sample 74:	P 4 (UF)	CWS	5 unid
Sample 75:	P 2 (UF)	CWS	2 unid
Sample 76:	P 4 (A)	CWS	2 unid
Sample 77:	P 4 (UF)	CWS	1 unid
Sample 78:	P 4 (PS)	CWS	3 unid
Sample 79:	P 2 (PS)	CWS	1 unid
Sample 80:	P 2 (PS)	CWS	1 unid
Sample 81:	P 2 (PS)	CWS	6 unid
Sample 82:	P 4 (UF)	CWS	8 unid
Sample 83:	P 2 (A)	CWS	4 unid
Sample 84:	P 16 (PS)	CWS	Pig: 1 tooth, 7 unid
Sample 85:	P 4 (PS)	CWS	Cattle: 3 metapodials, 9 unid
Sample 86:	P 4 (A)	CWS	19 unid
Sample 87		B	Cattle: 2 teeth
			Pig: 2 teeth
Sample 88		B	Cattle: 1 tooth
Sample 89		B	8 unid
Sample 90		B	Cattle: 1 patella? (very worn)

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