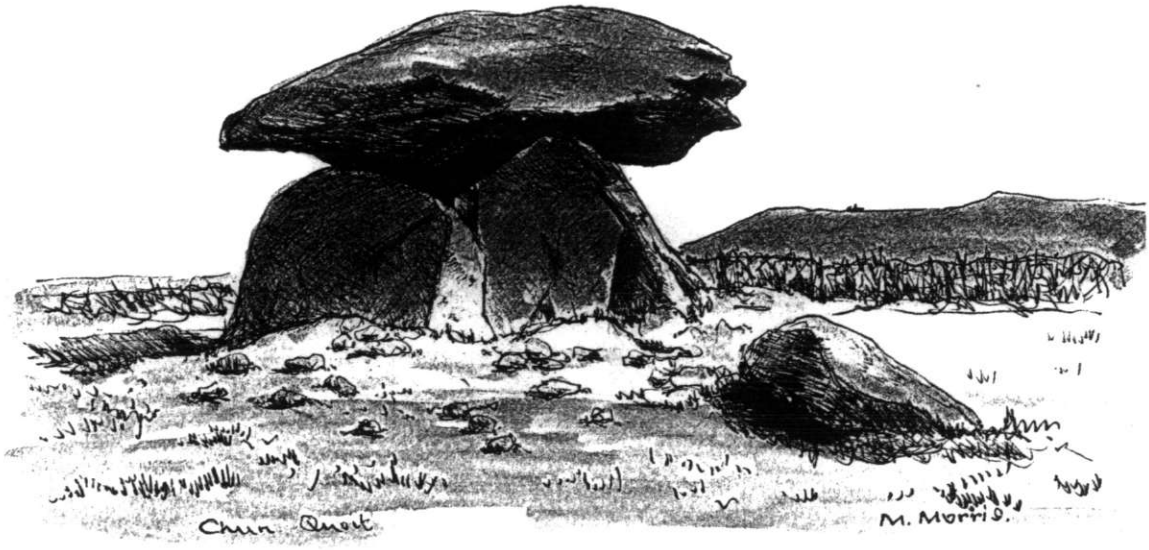
CORNISH ARCHAEOLOGY

Nos 37–8 1998–9



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EDITORS

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Contents

Editorial

This volume of *Cornish Archaeology* marks a short-term departure in the numbering and volume-dating of our journal. For the first time since its establishment in 1961, two volumes are being 'doubled up'. This volume and the following one are combined into one as Nos 37–38 for the years 1998–9, and Nos 39–40 for the years 2000–1. For the last six years *Cornish Archaeology* has not been produced on time, and the General Committee has taken this rather drastic action in order to reduce the backlog, with the intention that the following Volume, No 41, for the year 2002, will be published before the end of 2003. It will be noticed that the present volume and the previous one are both substantial and varied, the articles contributing significantly to our understanding of Cornwall's past. Material gathered or promised for Volume 39–40 indicates that we can also expect a third substantial and important document. It is therefore hoped that members will not feel short-changed by these necessary measures

There is one other matter that the editors wish to mention. Members will recall that in 1986 the Society published a Silver Jubilee Volume, surveying developments in the archaeology of Cornwall since the establishment of the Society in 1961. The articles in that volume contained a good deal on the history of the Society, including that of some of the fieldworkers involved. In the last issue of the journal there was the article by GF Walford and Norman Quinnell on CK Croft Andrew's excavations in Tavistock Woodlands in 1937-8. Since then, Croft Andrew's career has been studied more closely by Geoff Walford and Jacky Nowakowski, from whom it is hoped a further article will emerge. Reviews and obituaries by Professor Charles Thomas, Paul Ashbee, Sarnia Butcher and others have recounted and celebrated the careers and achievements of other important archaeologists working in Cornwall in the 1940s, 1950s and 1960s. Some were key members of the West Cornwall Field Club and the early Archaeological Society; others, like Rupert Bruce-Mitford, were important non-members invited to undertake particular tasks. This trend – of increasing interest in the work of our predecessors – is one we hope other contributors will encourage and continue. We need to look more precisely into our own history, and as part of this process, ensure the preservation of our own archives.

The editors would like to take the opportunity offered by this resurrection of the editorial, the first since Daphne Harris' last volume in 1991, to thank David Hooley for initiating the editing of the present volume and its predecessor.

Cornish Archaeology nos 37–8, 1998–9

The excavation of a Later Bronze Age Structure at Callestick

ANDY M JONES with contributions from HENRIETTA QUINNELL, ROGER TAYLOR, PIPPA BRADLEY, VANESSA STRAKER and PHILLIPPA GILBERT.

Summary

Archaeological investigations along the South West Water pipeline between Engelly and Sevenmilestone took place during the winter of 1995-1996. The results from a geophysical survey near to the Callestock Veor cider farm, led to the rescue excavation of a long-lived Later Bronze Age circular structure which dated between approximately 1100 and 700 BC. The Structure was situated within an artificial hollow approximately 8 metres in diameter, with a long porch extending from its southern side. The discovery of the Structure has added another type to the range of excavated Bronze Age buildings in lowland Cornwall. The Structure did not seem to have been used as a domestic dwelling, but instead appears to have fulfilled a 'ritualistic' function. Its excavation provided further evidence for the elaborate processes associated with the abandonment of Bronze Age buildings in Cornwall. In particular an important, though small, Later Bronze Age ceramic assemblage was uncovered during the excavation which appears to demonstrate evidence for the long term curation and structured deposition of artefacts.

1 Introduction

1.1 Background to the excavation

During the autumn of 1995 South West Water Services Limited began the construction of the Cornwall Spine Main water pipeline between Engelly and Sevenmilestone. The Cornwall Archaeological Unit (CAU) was commissioned by South West Water to carry out an archaeological assessment and fieldwork in advance of the pipeline.

The area at Callestick (SW 7694 5059) was selected for archaeological evaluation because of its close proximity to a known Iron Age or Romano-British round (an enclosed settlement dating between *c*400 BC and AD 500). Although the pipeline corridor did not directly affect the site of the round, it did seem probable that archaeological features could lie outside, as at Penhale Round (Nowakowski 1994). Geophysical survey confirmed the existence of archaeological features within the corridor which resulted in the archaeological excavation.

The landscape around Callestick has a wealth of prehistoric monuments dating from both the Bronze Age and the Iron Age/Romano-British periods. Bronze Age barrows are frequent, notably at Four Burrows (Jones 1995). Nearby enclosed Iron Age settlements can be found at Rees and at Callestick. In addition fieldwalking along the pipeline corridor during the fieldwork had uncovered lithic implements dating from the Mesolithic period through to the Bronze Age (Jones 1997).

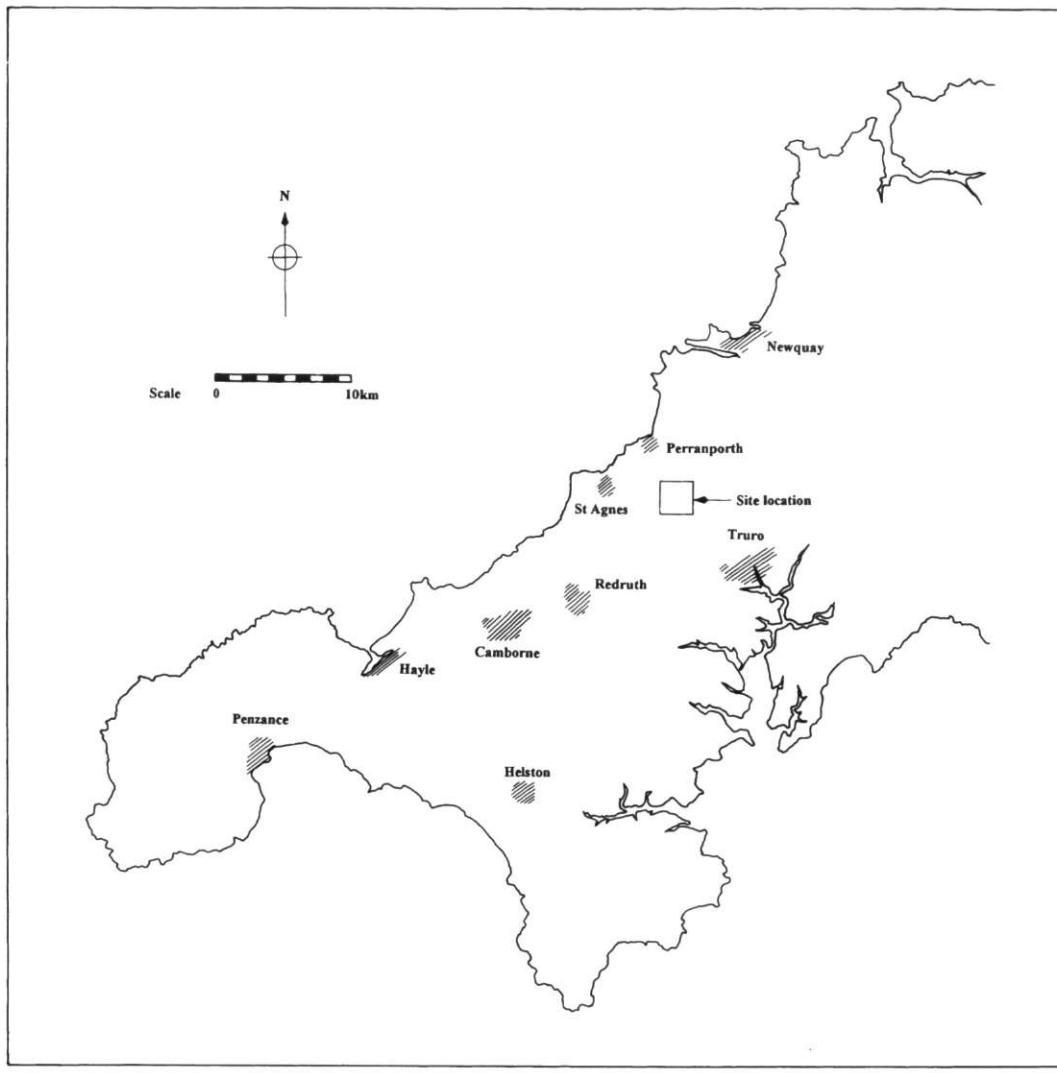

Fig 1 Location map

1.2 The topography of the site

The site at Callestick is located approximately 7 kilometres north-west of Truro in the parish of Perranzabuloe (Fig 1). It is situated just outside a tract of 'Anciently Enclosed Land', where the field patterns are predominantly medieval in origin (Cornwall County Council 1996), on the fringes of an area of 'Recently Enclosed Land', which until the nineteenth century had been open heathland. On Figure 2 the straight-sided nineteenth-century enclosures contrast with the more irregular field boundaries to the north-east, associated with Callestick, a hamlet of medieval origin.

The area of the excavation was sited on a well-drained slightly elevated position (approximately 106 metres OD) within an area of otherwise undulating plateaux, or uplands. The site has good

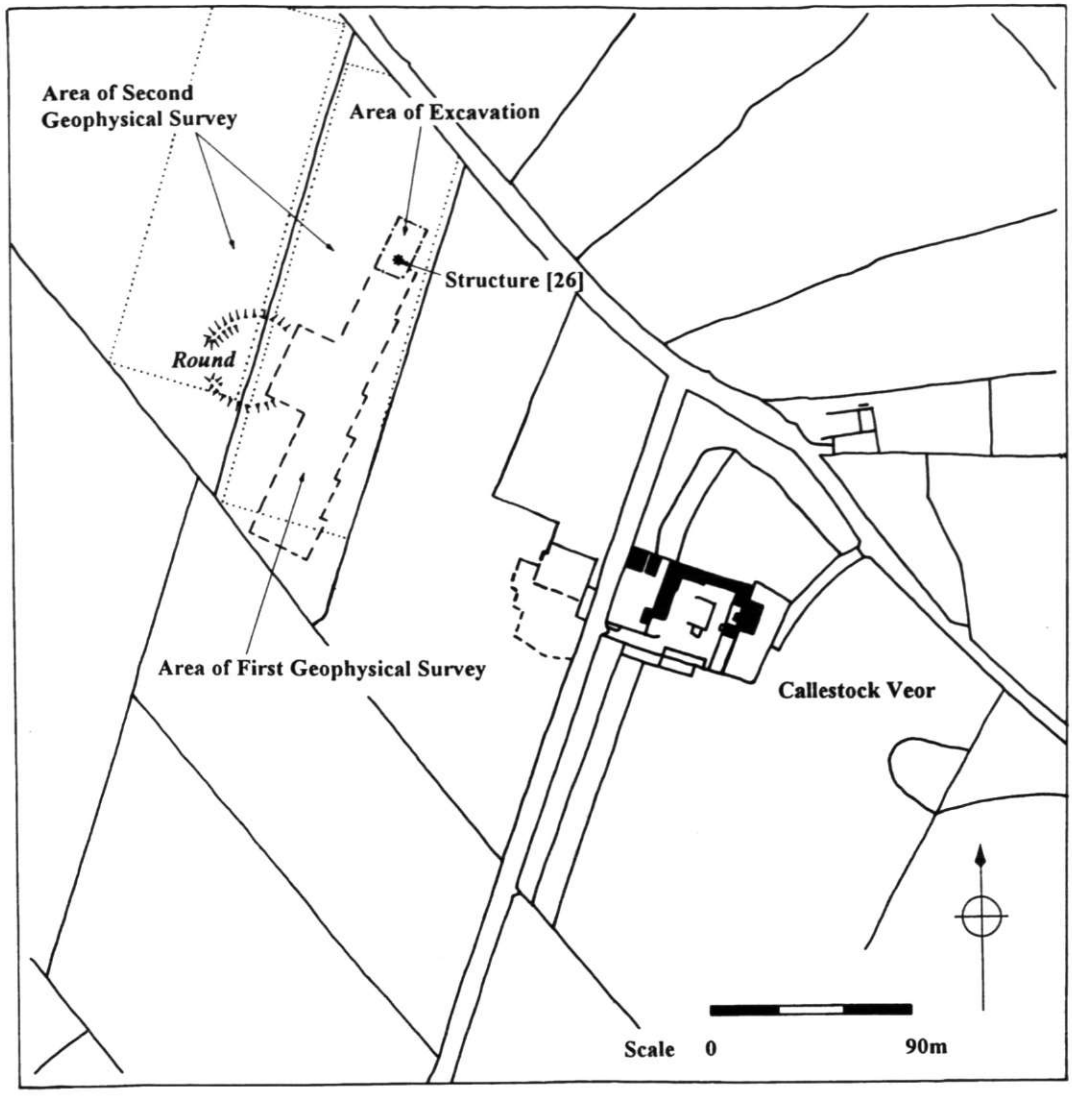

Fig 2 Site location plan showing the position of the Structure and the areas of the geophysical surveys. (© Crown Copyright all rights reserved. Cornwall County Council Licence number LA076538/99/03.)

views over the surrounding area. The Four Burrows barrow cemetery and St Agnes Beacon are clearly visible from the Structure.

The underlying geology consists of Grampound Grit, which results in subsoil rich in slates and quartz. The topsoil on the plateau is a quite thin, loamy clay, brown earth. Trees were largely restricted to the boundaries, or to the steep-sided valleys which dissect the plateaux. The lack of trees and its elevated position mean that the area is fairly exposed and windswept. The current landscape is characterised by a pattern of fields, which are mostly down to grass.

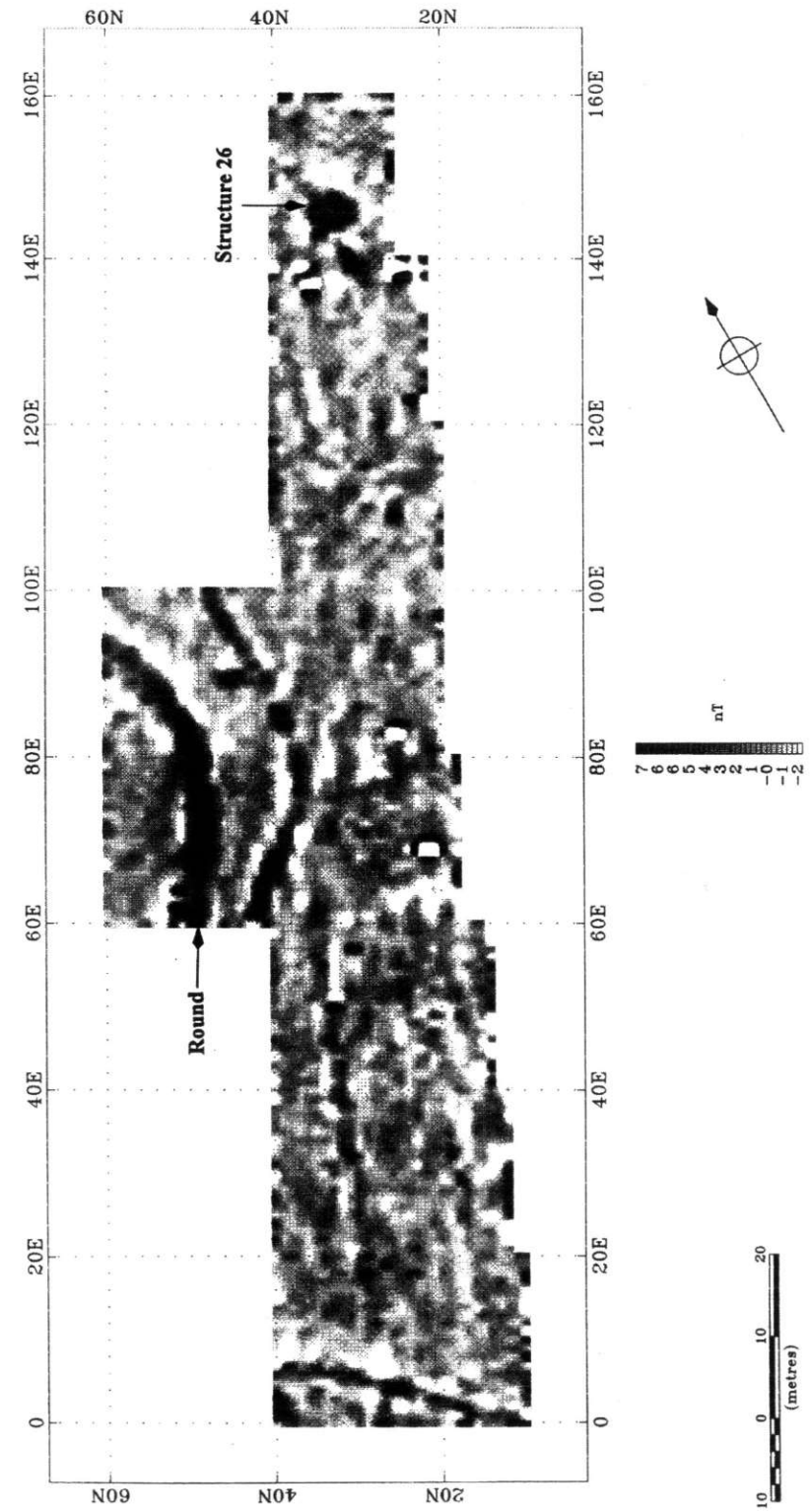

Fig 3 Results from the first magnetometer survey, showing the outer ditches of the round and Structure. Copyright Geophysical Surveys of Bradford

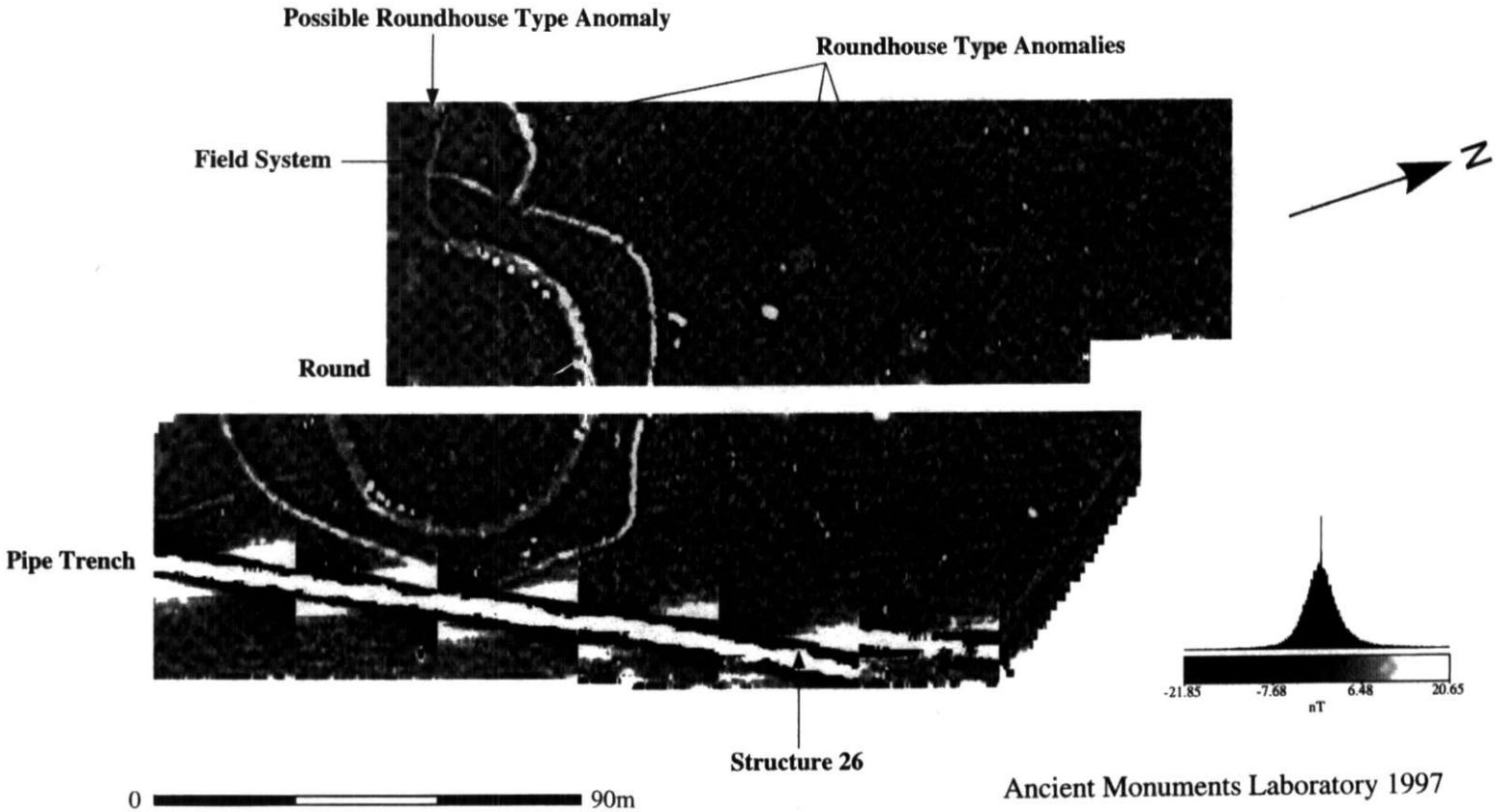

Fig 4 Results from the second magnetometer survey, showing the round and the roundhouse type anomalies. Copyright Ancient Monuments Lab, English Heritage.

1.3 The excavation methodology

The excavations at Callestick were conducted over a three week period during January 1996. The CAU team was aided by volunteers from the St Austell and Truro Colleges 'A' level archaeology classes and the Cornwall Archaeological Society, including the Caradon Archaeological Group. The area of the excavation was stripped by a mechanical swing shovel, closely monitored by CAU, through the topsoil, down to the level of the archaeological layers, then hand cleaned by trowels. The area was planned at a scale of 1:500. Subsequent plans were made at 1:50, and sections were drawn at 1:10 or 1:20 scales. It was decided that the best strategy for excavating the Structure was to divide it into four quadrants. With the exception of those unstratified, the majority of the finds recovered were recorded three-dimensionally so that their distribution could be plotted. Finds from postholes were not recorded in this manner as they were clearly associated by context. Soil samples were also taken from those features and layers considered to have the greatest potential for either palaeoenvironmental analysis or radiocarbon dating.

2 The Geophysical Survey

2.1 Introduction

Two geophysical surveys were conducted at Callestick (Fig 2). The first survey lay within the confines of the pipeline corridor, before the topsoil stripping. The second covered a much larger area and was carried out after the completion of the excavations.

2.2 The first geophysical survey (Fig 3)

CAU recommended magnetometer surveys at three locations along the corridor of the Engelly to Sevenmilestone pipeline. South West Water funded Geophysical Surveys of Bradford to conduct geophysical surveys at each of the locations (Jones 1997) which were carried out in November 1995 (Geophysical Surveys of Bradford report 95/138).

The survey at Callestick was located on the eastern side of the known round site (Fig 2), because there was potential for the survival of buried archaeological features either predating or associated with the round. The presence of a recent earthen embankment to the east of the pipeline corridor reduced the area available for survey. The origin of the material within this bank is uncertain but it may have been stripped from within the survey area.

The strongest anomalies were associated with the round, two concentric arcs representing inner and outer ditches. Other features were detected inside the arc of the inner ditch. Two linear ditches in the southern half of the survey area were thought to be part of a field system, possibly associated with the round. A large circular pit type anomaly eight metres in diameter was recorded in the northern half of the survey. This feature was potentially a prehistoric roundhouse, a waste dump, or alternatively a large natural boulder hole. The results from the geophysical survey led to the subsequent excavation of the Callestick Structure, which was located in the circular anomaly.

2.3 Discussion

As a consequence of the promising results from the geophysical survey CAU closely monitored the topsoil stripping of the Callestick site.

The survey at Callestick identified the outer ditch associated with the round, also confirmed on an aerial photograph. It was however unaffected by the pipeline and was not revealed by the topsoil stripping. The linear features in the southern half of the geophysical survey area were not visible within the area of the topsoil strip. They may have been very shallow, only just cutting the subsoil, in which case they may have been removed during the topsoil stripping. Alternatively they may have existed only within the ploughsoil horizon. During machine stripping the circular anomaly was revealed to be a roughly circular structure, with an extension to the south, with edges defined by a ring of quartz stones.

The geophysical survey was successful in picking up most of the features within the survey area and demonstrated the usefulness of this technique for targeting further archaeological work.

2.4 The second geophysical survey (Fig 4)

The second geophysical survey was carried out after the completion of the pipeline. CAU recommended a large-scale geophysical survey of the area in order to obtain more information about the setting and context of the Callestick Structure (Jones 1996). In July 1997 the Archaeometry Branch of the Ancient Monuments Laboratory surveyed a large area of land west of the excavated Structure (Fig 2) (Linford 1997).

The clearest anomalies were found in the southern part of the survey. These were related to the round. The survey revealed an outer ditch circuit, as well as several linear features that respected the round, which were interpreted as possible field boundaries associated with it (Linford 1997, 3).

However, the most significant results were the discovery of a number of large circular anomalies over 5 metres in diameter. The responses given by these features (Linford 1997, 3) were comparable with the results from other sites in Cornwall, which, when excavated have proved to be Bronze Age structures, for example Penhale Moor (Nowakowski 1994). Three probable, and a fourth possible structure were identified by the survey (Fig 4), arranged along a rough line running north-east to south-west. The spacing between the structures is uneven, the distances varying between approximately 15 and 55 metres. Their antiquity is suggested by the fact that at least one is probably cut through by one of the linear field system ditches.

Two further pit type features were identified by the survey in the area between the round and alignment of the roundhouse type features. These anomalies were interpreted as possibly associated with Bronze Age activity on the site, or alternatively as settlement, or possibly semi-industrial features, associated with a completely different phase of the site (Linford 1997, 3).

2.5 Discussion

The results of the second survey were successful in providing some contextual information about the wider landscape around the Callestick Structure. It tentatively indicates the existence of a Bronze Age type settlement predating the round, situated to the west of the Callestick Structure.

3 Stratigraphic summary of the excavated features

3.1 Introduction

The stripped area was approximately 160m long and 14m to 15m wide. The extent of the site was based upon anomalies revealed by the first geophysical survey. Attention was focused upon the

circular anomaly or hollow which was situated in the middle of the pipeline corridor. The circular feature was approximately 8 metres in diameter with a long extension located on its southern side. The perimeter of the feature was bounded by a ring of quartz stones (Fig 7).

The circular anomaly was found to be of a Bronze Age date and is subsequently referred to as the Structure. All the excavated features were part of this Structure.

3.2 Results from the excavation

The excavation revealed two identifiable phases of activity associated with the Structure. Phase one was associated with its construction and use, the second with practices linked with its abandonment.

3.3 Pre-Structure activity

No identifiable archaeological features predated the Structure. However several redeposited flints of Mesolithic and Early Bronze Age date were found in and around the Structure. In addition one of the radiocarbon dates from behind the wall of the Structure calibrated to 2280–1780 BC. This date is too early to have been associated with the use of the Structure (see Section 6 below). The evidence from the flints and from the radiocarbon date on redeposited material would indicate that the area had been cleared and at least visited by groups of people, for some considerable period of time prior to the building of the Structure.

3.4 Phase 1 Construction/occupation

Phase 1 was marked by the digging of a hollow [14] which was excavated into a well-drained, slightly elevated location. The hollow was almost circular except for the southern side where a porch measuring nearly 4 metres long and 1.10 metres wide extended out from the Structure (Fig 5). The diameter of the rest of the cut measured approximately 8 metres and was up to 0.7 metres deep. The sides of the hollow varied considerably. In places the edges were vertical, whereas in others they were quite sloping. The hollow's base was clean, fairly worn and uneven. In some parts the cut appeared scooped out, in others it was flat (Figs 5 and 6). The centre of the cut was slightly raised. The wall of the Structure [5], was set against the inner face of cut [14]. Because of the unevenness of the hollow cut, the thickness and height of the wall were also variable. The wall measured approximately 70 centimetres wide and was up to 30 centimetres high. It was made up of roughly coursed shillet stones, reused mullers, granite rubbing stones and stone quartz blocks (Fig 6). In places a brown silty matrix had formed between and behind the stones. The original height of the wall did not survive as it had been partially levelled during the abandonment phase of the Structure.

Several postholes and post settings were found inside. The preservation of the postholes varied across the site. However the majority were circular, with steep tapering sides and flat bottoms. The main ring of postholes appears to have been set into the wall; [12], [13], [19], and [20] (Fig 5). The subsequent demolition of much of the wall meant that postholes only survived in places where the wall was relatively well preserved. Within the interior of the Structure two groups of postholes were identified (Fig 5).

The first group was composed of three postholes, [16], [18], and [24]. This group was located in the centre of the Structure, situated around three sides of the raised central area. The postholes are likely to have been contemporary with one another; both [18] and [24] were fairly shallow and insubstantial. It is therefore unlikely that any single post would have been sufficient to support the

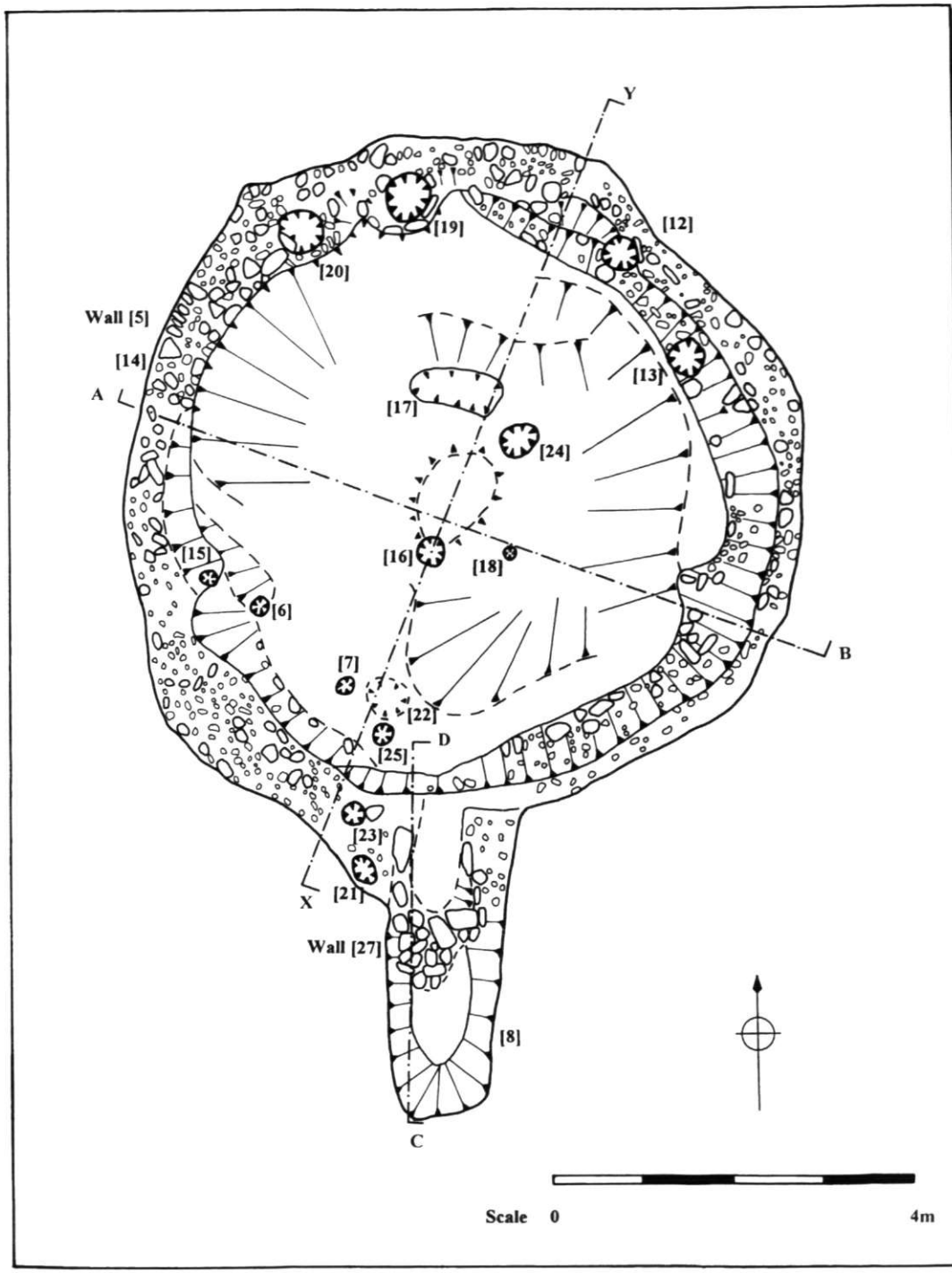

Fig 5 Plan of Structure 26 showing the walling and internal features

Table 1 Posthole dimensions and comments

Context	Width	Length	Depth	Diameter	Remarks
[6]	*	*	20cm	20cm	Posthole located in the arc to the left of the doorway. It contained pottery and charcoal.
[7]	*	*	26cm	20cm	Posthole located in the arc to the left of the doorway. The fill contained charcoal.
[12]	35cm	46cm	26cm	*	Posthole set within the wall of the structure.
[13]	31cm	36cm	21cm	*	Posthole set within the wall of the structure.
[15]	*	*	32cm	26cm	Posthole located in the arc to the left of the door. The fill contained charcoal.
[16]	*	*	26cm	30cm	Situated in the middle of the structure. The posthole was filled by charcoal, quartz, and it contained a polished stone object.
[18]	*	*	14cm	18cm	Posthole located in the centre of the structure. The fill contained charcoal.
[19]	*	*	30cm	50cm	Posthole set within the wall of the structure. It contained rare charcoal flecks.
[20]	*	*	20cm	30cm	Posthole set within the wall of the structure. It contained rare charcoal flecks.
[21]	*	*	65cm	36cm	Posthole located in the arc to the left of the door. The fill contained charcoal.
[23]	*	*	20cm	25cm	Posthole located in the arc to the left of the doorway. The fill contained charcoal.
[24]	25cm	50cm	18cm	*	Posthole situated in the centre of the structure. The fill contained charcoal.
[25]	*	*	9cm	20cm	Posthole situated in the centre of the structure. It contained a rubbing stone.

weight of the roof. In addition the arrangement of the posts around the raised area would also indicate that they were standing at the same time; none of the central postholes were intercutting or had been recut and they were evenly spaced around the central area.

The second group of six postholes was located within the south-western part of the Structure: [6], [7], [15], [21], [23], and [25]. These postholes formed an arc, which may have marked or screened off an area to the left (west) of the doorway (Fig 5). Once again these postholes are interpreted as being contemporary, as they formed a coherent pattern.

The final component within the Structure was the entranceway, cut [8] (Figs 5 and 6). This feature was located on the southern side of the building. It was just under 4 metres long and was fairly shallow, 0.35 metres deep, with an internal width of approximately 1.10 metres. The width of the entrance was further restricted by large upright stone slabs which lined the sides of the cut. There was no evidence for either a hearth or floors/activity areas.

The entranceway and the Structure were contemporary and during the later infilling of the Structure both parts were infilled with a similar material.

3.5 Phase 2 Abandonment

The majority of the information gathered from the excavation of the Structure came not from its construction or use, but from the complex process of decommissioning which preceded the final abandonment of the site.

The sequence probably began with the removal of the posts. Deposits of charcoal, pottery and rubbing stones were placed in the central postholes and the arc of postholes to the left of the entrance. Central posthole [16] was filled with a particularly elaborate infill which included charcoal, small quartz stones, and half a polished stone muller (**No 80**). The outer ring of postholes

did not appear to have structured deposits inside them. The majority of the postholes would have been simply destroyed or damaged along with much of the walling; this is demonstrated by the survival of postholes only in places where the walling was not so badly damaged.

Layers [17] and [22] (Fig 5) were probably contemporary with the dismantling of the postholes and the deposition of artefacts into some of them. The layers could represent the first of the infill in the Structure. It is, however, conceivable that these layers could have been associated with the occupation of the Structure, and were perhaps deposited during the lifetime of the building. Both deposits were very thin layers (0.02–0.03 metres thick) located on the bottom of the Structure. Neither layer was within a cut but they were firmly pressed or crushed into the natural subsoil. The deposits were greasy silty clay layers with a high charcoal content. Layer [22] also contained very abraded pottery. Neither layer seemed to have been burnt within the Structure, as there was no sign of *in situ* burning in either instance. This would indicate that both layers had been introduced into the Structure from elsewhere and were perhaps picked out from deposits which were associated with its earlier use.

Although the upper part of wall [5] was largely destroyed during the abandonment phase, sections of it survived up to the height of the cut, especially to the north (Fig 6). The wall was demolished by simply pushing it into the interior. Spreads of stones from the wall were visible beneath the main infilling layers ([2], [3], [10] and [11]), at the bottom of the hollow. The stones were particularly evident in the south-eastern part of the Structure.

During this abandonment stage wall [27] was built across the middle of the entrance passage (Figs 5 and 6). The wall was made up of large quartz blocks. It measured 0.25 metres high, 1 metre long, and was 0.90 metres wide. The wall blocked access, but it seems to have been a largely symbolic gesture as the Structure became infilled during the next phase of the abandonment process.

After the Structure had been dismantled and wall [27] built across the entrance, it was infilled with a homogeneous deposit which filled the hollow. This infill was given a different number in each of the quadrants and the entranceway ([2] in the north-east, [3] in the south-west, [10] in the north-west, [11] in the south-east and [9] in the entranceway). The deposit was a dark brown loamy clay, which contained shillet, charcoal, quartz, pottery, flint, and an inverted saddle quern (**No 35**). The origin and nature of the material is uncertain. It was almost certainly derived from a nearby source, as it contained natural inclusions which were similar to surrounding subsoils.

After the main infill layer had been deposited into the Structure, sherds of vessel **P5** were placed against the edge of the infilled cut. The pot was situated in the previously demarcated area to the left (west) of the doorway, above the pottery belonging to the construction/occupation phase of the Structure, vessels **P1** and **P2**. A last deposit of brown, silty clay earth [1] was then placed over the area of the Structure. This context covered the sherds of vessel **P5**. The layer was quite shallow (0.10 metres deep), but it may have been truncated by ploughing, or removed by construction of the modern earth embankment that lay to the east of the Structure. Layer [1] was uncontaminated by later artefacts. It contained Bronze Age pottery and flints. Finally a ring of quartz stones, context [4] was placed around the edge of the infilled Structure, and on to layer [1]. The deposition of the quartz ring marked the end of the abandonment process.

3.6 Post-Structure activity

Following its abandonment, the site was left untouched until the heathland on which it was situated was enclosed in the nineteenth century. Following this enclosure some damage to the site may have occurred through ploughing, or through the creation of the massive embankment to the east of the site. The immediate area around the site was inhabited during the Iron Age when the round was constructed to the east of the Structure (Jones 1997).

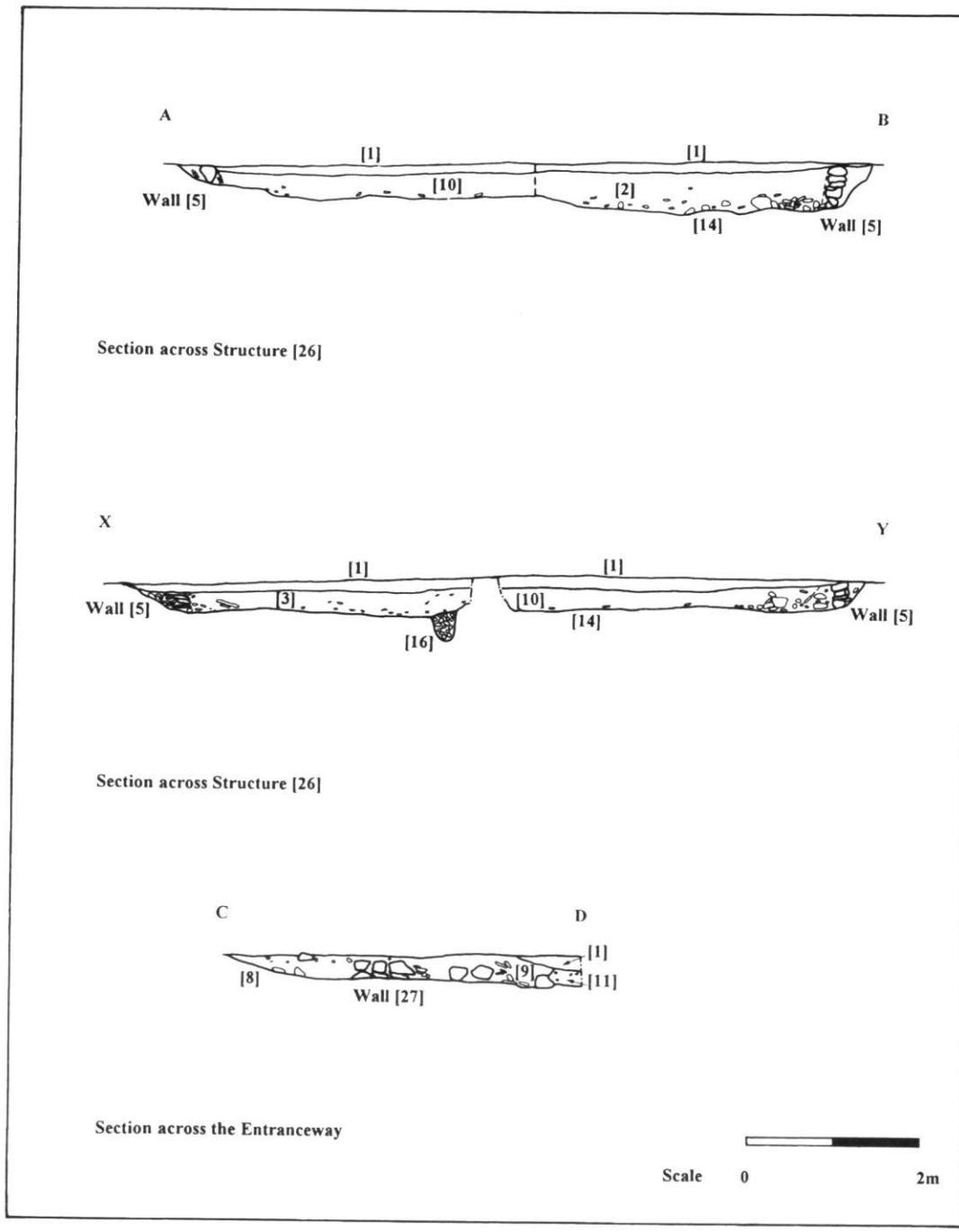

Fig 6 Sections through Structure 26.

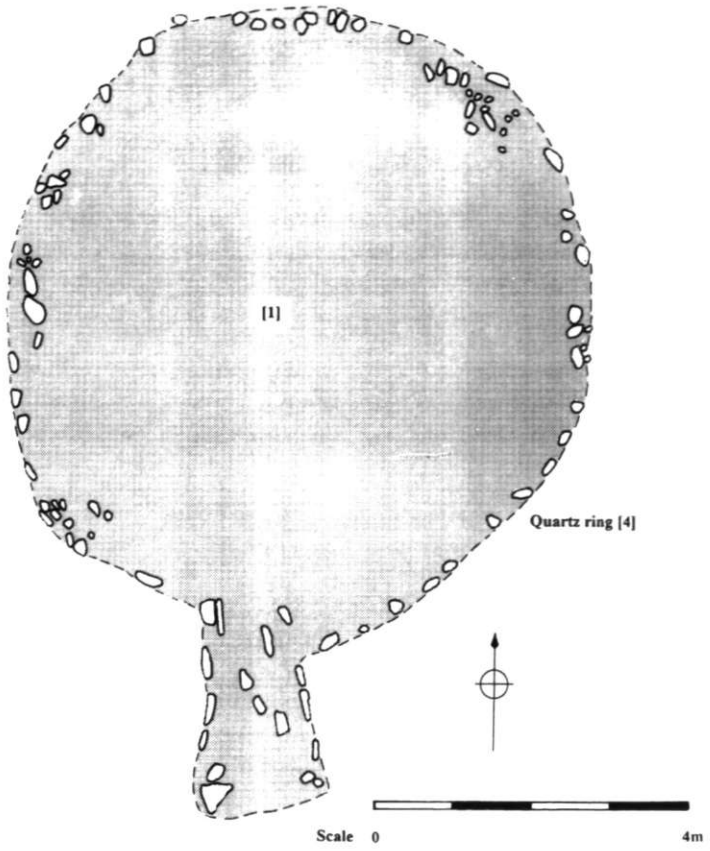

Fig 7 Plan of Structure 26, infilled and surrounded by the ring of quartz stones

3.7 Discussion of phasing and stratigraphy

The pre-Structure use of the site may have influenced the siting of the later Structure. The Structure may have been situated within an area that had been a focal point for previous generations of people. In functional terms an already cleared area may have been an ideal place to construct a building. Alternatively the later settlement may have been deliberately sited in a part of the landscape that had long been associated with death and burial, and which may already have had strong ancestral ties and memories (for examples, see Tilley 1995). This pattern would be consistent with other sites in Cornwall, where Bronze Age settlements and barrow sites are frequently preceded by earlier and usually more ephemeral activity (eg Stannon Down, Mercer 1970; Colliford, Griffiths 1984; and Penhale Round, Nowakowski 1994).

Phase 1 of the Structure witnessed the construction of a building upon a well-drained site. The building was circular in shape with a long porch or entrance passage attached to its southern side. It was set within a cut lined by stony wall material. The structural ring of postholes appears to have been set within the wall, although they only remained where the wall was relatively undisturbed.

The space within the Structure was comparatively undifferentiated. A raised central area was demarcated by three central posts. These posts may have marked out the centre of the Structure, which presumably could have acted as a focal point. An area to the left (west) of the doorway was

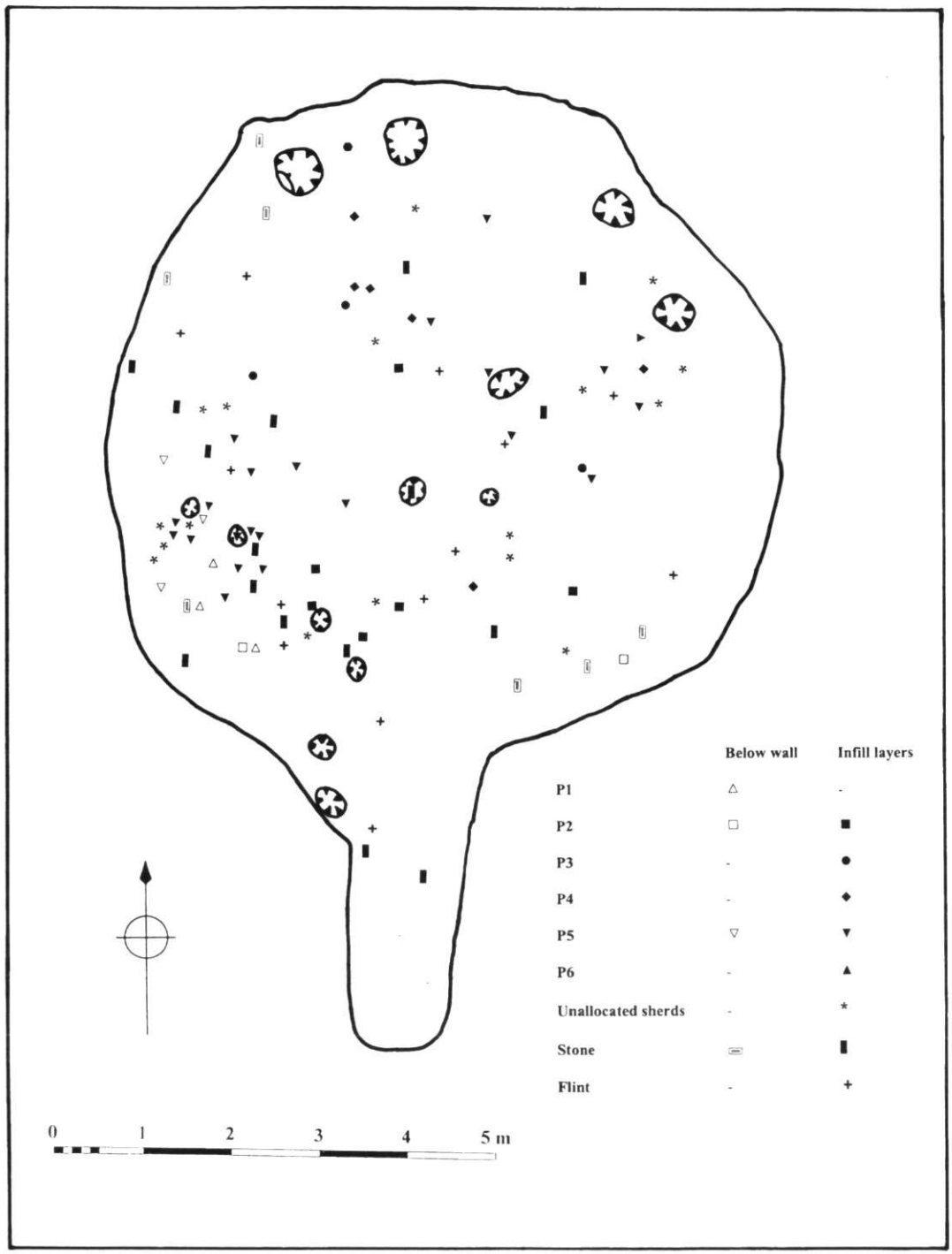

Fig 8 Plan of Structure [26] showing the distribution of the artefacts

separated off by an arc of posts. It was the only place to produce concentrations of intentionally placed artefacts during the use of the Structure (other than the reused rubbing stones etc within the wall). Large sherds of Later Bronze Age pottery were placed behind the wall, ie in the space between the cut and the wall (see Section 7 below).

The long porched entrance could have meant that access into the Structure would have been restricted to one person at a time. The length of the passage would also have meant that the interior of the Structure would have been exceptionally dark, especially since no hearth was found within the building.

The evidence from the construction/occupation phase would suggest that the Structure was single phase, devoid of contemporary occupation material or definitive evidence of use.

In contrast to the preceding construction/occupation phase, the abandonment phase of activity was complex in nature and provided the majority of the artefacts recovered.

The abandonment and transformation of the site followed a sequence which has some similarities with a number of the earlier Middle Bronze Age sites in Cornwall (eg Trethellan Farm, Nowakowski 1991; and Penhale Moor, Jones *et al* 1994). However each site seems to have its own unique variation within the general pattern. The major difference at Callestick was the use of the quartz stones in order to demarcate the edge of the site and to block off the entrance leading in to the Structure.

At Callestick, in common with the above sites, the posts were uprooted, deposits were placed into some of the postholes, and the site was then backfilled. There are several alternative theories which could explain what the infilling layer was derived from. The material may have been derived from a bank or earth wall associated with the Structure (Henrietta Quinnell, pers comm), though no traces of an earth bank, or walls were found. The material may have been collected from the surrounding fields and deposited within the Structure. However the analysis of the soil samples has revealed that the layer has very few plant seeds or pollens within it (see Section 5 below). A third possibility is that the infill material may have been taken from a type of midden deposit, where broken pottery had been discarded. Ethnographic analysis has revealed that middens can have highly sorted contents, which may be symbolic in nature (Moore 1984; 1988). For example as Moore has shown for the Marakwet of Kenya (1988), pottery may be associated with women and placed in one midden deposit, whilst bone may be associated with men and deposited in another. The Callestick Structure might have been filled with selected deposits. Although taphonomic processes may be responsible, this kind of selection process might account for the lack of plant remains recovered from the infilling deposits.

As a result of the abandonment phase the Structure was transformed from a building to an open hollow, and then into an infilled kerbed area, which may then have had the appearance of a modest mounded kerbed cairn.

4 Artefacts

4.1 Bronze Age pottery

by Henrietta Quinnell

4.1.1 Introduction

The assemblage consisted of 375 sherds weighing 2177g; of these 14 sherds, 51g, were of gabbroic fabric, and the remainder, 361 sherds, 2126g, were of the gabbroic fabric with added crushed rock described as 'gabbroic admixture'. All sherds are soft, as may be expected in a soil of moderate acidity (Allen 1991, 4). Petrological comment has been supplied by Dr R T Taylor from

Table 2 Distribution of sherds by context and fabric type

Context	Gabbro		Gabbro Admixture		Totals
Wall[5]	–	–	94 sherds	636 g	94 sherds
Ph [6]	–	–	3 sherds	8 g	3 sherds
Basal layer [22]	–	–	3 sherds	2 g	3 sherds
Infill [11]	3 sherds	17 g	14 sherds	16 g	17 sherds
Infill [10]	1 sherd	1 g	15 sherds	92 g	16 sherds
Infill [3]	2 sherds	1 g	203 sherds	1225 g	205 sherds
Infill [2]	1 sherd	4 g	6 sherds	55 g	7 sherds
Covering layer [1]	7 sherds	28 g	23 sherds	92 g	30 sherds
Totals	14 sherds	51 g	361 sherds	2126 g	375 sherds
Overall total	Sherds 375		Weight 2177 g		

Table 3 Location of vessels in Contexts by sherd (s) and weight (g)

	P1 Admix		P2 Admix		P3 Admix		P4 Gabbro		P5 Admix		P6 Gabbro		Uncertain	
Wall[5]	39s	170g	5s	39g	–	–	–	–	50s	439g	–	–	–	–
Ph [6]	–	–	–	–	–	–	–	–	3s	8g	–	–	–	–
Basal layer [22]	–	–	2s	1g	–	–	–	–	–	–	–	–	1s	1g
Infill [11]	–	–	13s	13g	–	–	2s	15g	–	–	–	–	2s	5g
Infill [10]	–	–	–	–	3s	32g	–	–	10s	59g	–	–	3s	6g
Infill [3]	–	–	8s	36g	–	–	–	–	190s	1161g	–	–	7s	24g
Infill [2]	–	–		–	–	–	–	–	5s	43g	–	–	2s	16g
[1]	–	–	1s	9g	2s	2g	6s	10g	2s	12g	1s	18g	18s	69g
Total	39s	170g	29s	98g	5s	34g	8s	25g	260s	1710g	1s	18g	33s	125g

examination with a x20 binocular microscope. All the material is Later Bronze Age; one vessel is Trevisker ware, but the others are later, of a type not previously distinguished in the south-west and here discussed as the Callestick group.

Parts of five distinctive vessels **P1-5** are present; only 34 sherds are on balance unlikely to belong to **P1-5**, and, such is the fabric variation within each vessel, that only one sherd **P6** can be stated with confidence to represent another vessel. The other 33 sherds, 5 gabbroic and 28 gabbroic admixture, *could* belong to the illustrated vessels **P1-5**.

4.1.2 Descriptions of Vessels (Fig 9)

P1 Upper part of necked jar, external rim diameter *c*130 mm, everted rim with interior bevel and slight external bevel; two rows of small fingernail impressions on shoulder; part of small rounded lug with horizontal perforation survives as does the stub of a second. Less than $\frac{1}{4}$ of the upper part of the vessel present. Generally oxidised surfaces, 5YR 4/3 reddish brown, with reduced core very dark grey 5 YR 3/2; patchy blackening on both interior and exterior with some soot deposits. Both surfaces smoothed. Size suggests individual serving/drinking vessel.

Fabric contains feldspar – white, altered, angular and translucent, cleaved; quartz – angular, clear, vitreous grains and larger opaque grains; amphibole – light-coloured, cleaved and fibrous grains; ilmenite/magnetite – scatter of black, glossy grains, 0.2–0.5mm; mica – some fine, white in clay body and scatter of larger flakes up to *c*0.2mm. Inclusions, moderate in quantity, are large, 2–4mm, angular pieces of serpentinite and of irregular composite medium to fine grained quartz-feldspar pieces from granitic gneiss.

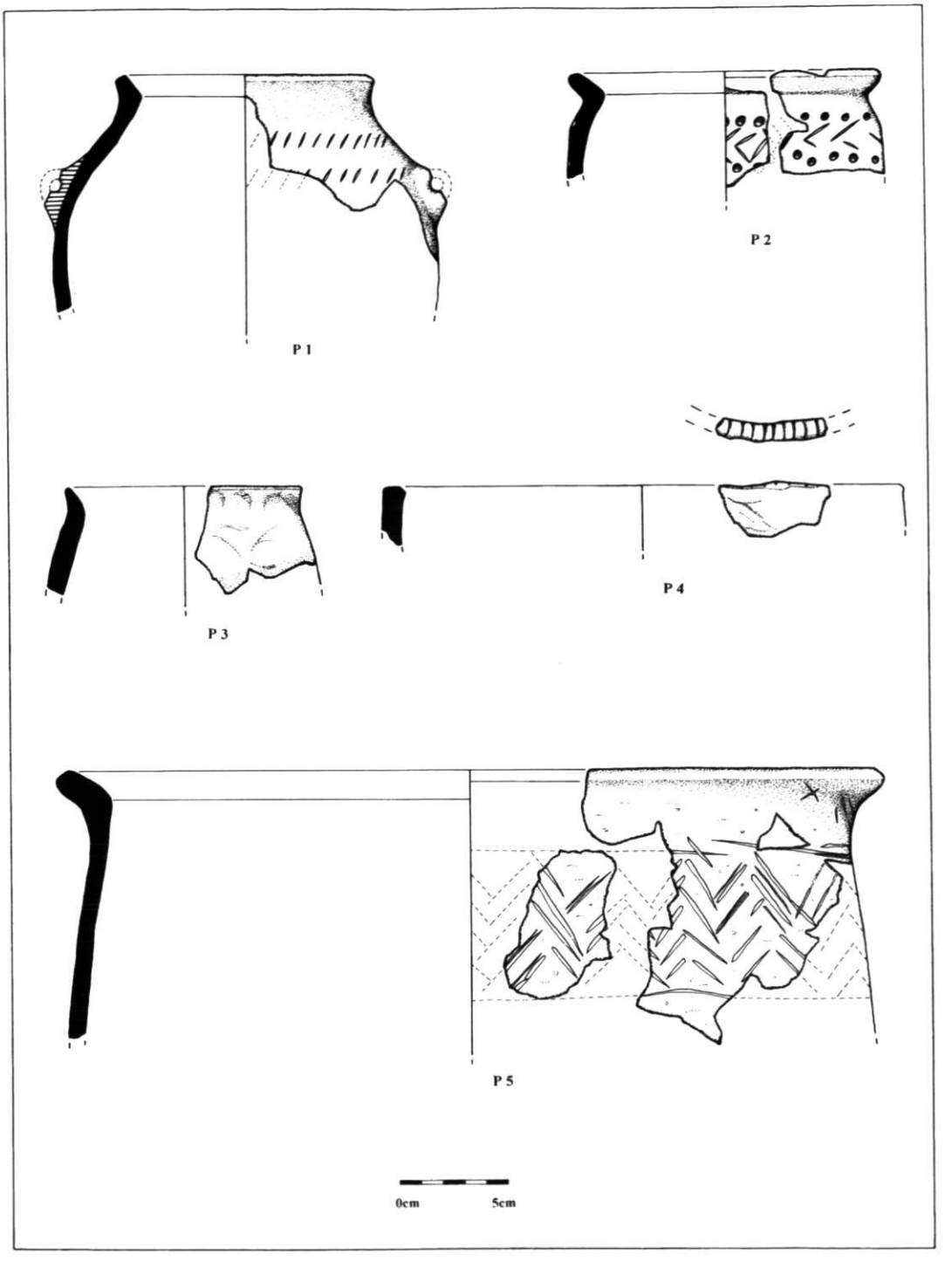

Fig 9 Later Bronze Age pottery from Structure 26. Scale ×3

All sherds of this vessel were deposited behind wall [5] immediately to the left (west) of the entrance.

No direct parallel for this vessel appears to have been so far recorded. The necked shape is not a recognised form in Trevisker ware, and, when fingernail decoration occurs on Trevisker vessels, it is combined with another method such as incisions. Paired rows of fingernail impressions occur at Trethellan Farm (eg Woodward and Cane 1991, No 16) but not on such a small vessel with a restricted neck and in combination with lugs; the same appears to be true for Trevisker (ApSimon and Greenfield 1972). Plain-necked forms are found in the assemblage from Dainton in Devon for which a post-Trevisker position in the Later Bronze Age is argued (Silvester 1980, Fig 9, 29), and also on Scilly (see **P3**).

P2 Upper part of necked jar, external rim diameter *c*145mm; everted rim with marked internal and slight external bevels; shoulder decorated with incised, very irregular, criss-cross pattern between single rows of stamped circular impressions 4mm across. Exterior oxidised, 5 YR 5/6 yellowish red but with reduced patches, core and interior very dark grey 5 YR 3/1 with some possible sooting. Both surfaces smoothed. Far less than $\frac{1}{4}$ of upper part of vessel present. Size suggests cooking or small storage vessel.

Fabric and inclusions similar to **P1** but inclusions common and up to 5mm in size.

The (joining) sherds from behind wall [5] preserve details of surface and decoration well, while those, including a joining group with rim and decorated shoulder, from infill layers are much more eroded. The two sherds from the thin basal layer [22] are too small for certainty about their relationship with their context; they are not decorated but assigned to **P2** because of its distinctive reddish appearance. The other findspots would be consistent with initial placement of all sherds behind the wall, with some finally collapsing into the infill when this was pulled down.

Circular impressions occur at Trethellan Farm (Woodward and Cane 1991, Nos 66, 69) but on much larger vessels, as is the situation at Trevisker (ApSimon and Greenfield 1972, No 70). There appears to be no comparable vessel recorded; this decorative motif was not found at Penhale Moor, Penhale Round or at Trelowthas. Patchett (1946) illustrates larger vessels of different shape with this motif, G5 from Gwallon Downs and G2 from Tregaseal III, the latter in conjunction with an incised herringbone design. A sherd, possibly from a funerary context, had a single surviving line of similar impressions at Craig-a-bella, Gunwalloe (Hartgroves and Harris 1985). The character of the decoration, with an incised criss-cross design bordered both sides by a single row of stamps, is appropriate to the Trevisker series, but the size and necked shape of the vessel is not, perhaps deriving from post-Trevisker assemblages (see below).

P3 Upper part of jar, external rim diameter *c*110mm; everted, slightly rounded, rim; distinct finger/thumb impressions beneath outer side. Exterior oxidised, 10 YR 6/3 pale brown, with core and interior very dark grey. Both surfaces smoothed. Far less than $\frac{1}{4}$ of upper part of vessel present. Size suggests individual serving/drinking vessel.

Fabric contains as main component feldspar – angular, white, altered, mainly <0.5mm with a few grains 1.5–2.0mm; amphibole/pyroxene, quite common; a few dark, lustrous grains of ilmenite/magnetite; two grains quartz seen; a few grains of dark rock, probably serpentinite, 1–2.5mm, visible in edge. The fabric has been included here as a fine version of gabbroic admixture. It is uncertain whether the small serpentinite grains have been added or were present in the clay matrix. The fabric is macroscopically very distinctive, and should now be easily recognisable elsewhere. It does not superficially appear to be gabbroic because the feldspar inclusions, usually a gabbroic signifier, are small and so not obvious.

Main sherds occur in infill [10] with a few scraps in covering layer [1].

This vessel probably does not belong to the Trevisker series. There is only one slightly similar vessel, No 23, from Trevisker, and none from Trethellan Farm, Penhale Round or Penhale Moor. The general parallels with the Later Bronze Age assemblage from Dainton (Silvester (1980), see **P1**, are relevant, but the closest similarities occur on Scilly with vessels such as Nos 1 and 4 from

Nornour (Butcher 1978, fig 24). There are difficulties with dating at Nornour, because of redeposition and of sparsity of dateable material other than ceramics, but the suggested start of the relevant Period, 6, is *c*1000 BC CAL. Confirmation may come from recent work at Porth Killier (Quinnell forthcoming (b)) where vessels similar to **P3** were found in Pit Complex 50 which is probably subsequent to the Middle Bronze Age Scillonian Trevisker equivalent material found elsewhere on the site.

P4 Scrap from rim of, apparently, simple jar with diameter of *c*240mm; rim flat-topped and decorated with close-spaced fingernail impressions. Vessel poorly made and irregular. Exterior oxidised, 10 YR 6/3 pale brown, with core and interior dark grey. Both surfaces smoothed. Size suggests storage jar.

Fabric contains abundant feldspar, white, altered, most grains <1mm but some up to 5mm long; sparse, angular grains of quartz some 3mm; common small black lustrous grains of ilmenite; amphibole – two grains seen; a little white mica/sericite. The only vessel in which serpentinite not present; the mineral suite is comparable with usual range for gabbroic fabrics.

Main sherd from infill [3]; given its irregularity, most, if not all, unallocated gabbroic sherds may belong to it.

Rim top fingernail decoration is unknown on the main Trevisker sites. It occurs in a funerary context at Ballowal (Patchett 1946, G10) on a large, straight-sided vessel. Away from Cornwall there are a number of occurrences at Brean Down in Unit 4, stratigraphically later than Unit 5b which contains incised Trevisker pottery and radiocarbon dates which appear to indicate occupation after *c*1000 BC CAL (Woodward 1990, fig 95)

P5 Parts of large jar with slightly curved side, internal rim diameter *c*340mm; externally expanded rim with bevels, marked internally, slight externally; base diameter *c*260mm; height likely to be *c*400mm; wall thickness only *c*5mm, very thin for a vessel of this size; surfaces smoothed; decorated zone below rim of irregular incised chevrons between horizontal lines; most incisions made by a thick point with parallel marks, sometimes barely discernible, made by a narrow one. Oxidised throughout, 5 YR 5/6 yellowish red. Size suggests a storage jar.

Fabric contains feldspar, both soft, white, altered and translucent, cleaved, some showing plagioclase twinning; sparse white quartz, mainly angular but occasionally well rounded; amphibole – light-coloured fibrous grains; scattered small, black, lustrous, often platy, ilmenite/magnetite; moderate quantity of crushed pinkish rock 2–5mm, almost certainly serpentinite, one grain composite with feldspar and? amphibole.

Both fabric and decoration of this vessel are distinctive. About a quarter of the rim and decorated zone was deposited on top of infill [3] to the left of the entrance above the position of **P1**; the group also contained plain body sherds and some base angle sherds. Small sherds with decoration were deposited in posthole [6] and occur, with rims, elsewhere in the infill. A group of plain body and base angle sherds, with slightly fresher breaks were placed behind wall [5] in the area of **P1**. Given the lack of conjoins, and of decorated sherds, it can not be absolutely certain that these are part of **P5**; if they are, the vessel may have been broken and part of the base and body positioned during building, and other sherds were retained elsewhere to be specially positioned during decommissioning. The distribution of sherds through the infill is widespread, and unlike **P2** appears unlikely to have resulted from the collapse of material behind the wall.

Simple storage jars with slightly curved sides and externally expanded bevelled rims are common among Trevisker assemblages; the decoration, a single bordered zone of chevrons, is executed in techniques which range from neat cord impressions to irregular incisions. The vessels most comparable in size, form and decorative method/design from Trethellan Farm, Nos 14 and 63, have walls *c*120mm thick (Woodward and Cane 1991); those from Trevisker, Nos 48 and 56, are 90–100mm thick (ApSimon and Greenfield 1972). Tredarvah (Pearce and Padley 1977) lacks this form with incised decoration. Broadly similar vessels with incised decoration occur among the infill of demolished structures both at Penhale Moor and Penhale Round (Quinnell in Nowakowski 1998;

Thorpe in Jones *et al*, 1994). The form does not occur in barrows (see Patchett 1946; 1950), even among the probable Middle Bronze Age ditch deposits at the Trelowthas barrow, Probus (H Quinnell in Nowakowski, forthcoming). Some vessels from Penhale Moor have notably thin walls, but, even taking this unpublished material into account, **P5** is the most slightly made large Trevisker jar on record. It would have held at least 20 litres but its fragility for this capacity would have necessitated considerable care in usage and would have been unsuited to repeated domestic activities.

P6 (not illustrated) Eroded base angle sherd, surfaces oxidised 5 YR 4/3 reddish brown, and core very dark grey. Fabric a finer version of **P4**. From covering layer [1].

4.1.3 Discussion

Gabbroic fabrics originating on the Lizard were first indicated by Peacock's work in the late 1960s; despite some critical comments, this sourcing is now generally accepted, although further work is needed to refine minor variations and illuminate the so-far absent manufacture sites (Quinnell 1987 and Peacock 1988, both with extensive references).

Their use in the Bronze Age, for Trevisker ware, was first established at Trevisker (note by D P S Peacock in ApSimon and Greenfield 1972, 333) and since has been widely recognised (summary in Parker-Pearson 1990). Admixture fabrics were first recognised at Trevisker but Peacock's brief published note on the petrology does not refer to these. Instead ApSimon and Greenfield (1972, 355) quote, presumably from discussions with Peacock and access to actual details of the thin sections now published by Parker-Pearson (1990, 29, 31), 'Dr Peacock's suggestion that the pottery was largely made of gabbroic clay from the Lizard peninsula, with some mixing of local clay, is of great interest'. This statement has given authority to the idea of clays being transported out of the Lizard before manufacture; no other data supporting transport of clays from the Lizard appears to have been published.

Admixture fabrics have since been widely recognised among Trevisker wares both from domestic and funerary contexts; Parker-Pearson's summary (1990, 19–20) makes it clear that all the added components in gabbroic fabrics could be found within two miles of the gabbro outcrop. Three explanations for the addition of rock to gabbroic clays have been advanced: (1) the 'eking out' of gabbroic clay when supplies were running low (Christie 1986, 98), assuming, and thus reinforcing, the concept that gabbroic clay was transported for manufacture in other areas; (2) accidental inclusions where pottery was made on areas adjacent to the gabbro (D F Williams in Woodward and Cane 1991, 133); (3) deliberate inclusion (D F Williams *op cit*). The first can be at present put on one side, unless or until positive data on manufacture away from source is forthcoming. The second appears inadequate for the amount of admixture that occurs and its angular nature, indicating deliberate crushing. The third is rejected, in favour of naturally occurring inclusions in Lizard areas of mixed lithology, by Parker-Pearson (1990, 20) who supports the concept of all non-gabbroic inclusions occurring naturally in the clay source on the grounds that gabbroic clays do not *need* filler to make good pots.

These approaches now appear too modern and pragmatic. Some kind of intentional behaviour in the manufacture of admixture ceramics is indicated. Are the inclusions symbolic of something meaningful to the makers or users as they are clearly visible in the vessels concerned? Do they indicate input by certain potting communities, for whom the localities of different rocks might have been significant? Such behaviour would reflect that suggested for the manufacture of some Neolithic ceramics, for example from Maiden Castle where locally occurring suitable clays were rejected in favour of a range from varying distances with distinctive inclusions (Cleal 1991). Given the pattern of structured deposition at Callestick, a concept more generally accepted for the Neolithic, such explanations for the admixture pottery appear appropriate.

Serpentinite is now in use as the lithologically correct term for serpentine. Consequently all references to serpentine as an admixture rock in the literature (Tables in Parker-Pearson 1990)

should be read as serpentinite. Dr R T Taylor is currently of the opinion that generally gabbroic and related fabrics fall into three groups: firstly those that have a fine clay matrix, some of which could derive from rocks of mixed origin: secondly those which have a fine clay matrix only of gabbroic origin and distinctive minerals of a size generally >2mm, mainly feldspar, the traditional gabbroic fabric; it is still unclear whether the larger minerals have been added as filler but the general monomineralic nature of the components has led to acceptance of their presence as a weathering component in the clays (Peacock 1969, 46): thirdly the admixture group. The problems will only now be resolved by thorough examination of a large range of Lizard clays.

It has been suggested, under the descriptions of individual Callestick vessels, that only **P5** and perhaps **P2** are Trevisker, and that the other three belong to a period post-dating its general production and use. It is relevant here to consider current knowledge of chronology for Trevisker material. Available radiocarbon dates assembled by Christie (1988) for material from barrows in Cornwall indicate a date range from perhaps the 20th until the 16th centuries BC, appropriate for the Early Bronze Age. The vessels concerned all have variations of cord impressed decoration. The only settlements so far with dates are Trethellan Farm, for which a large group of dates indicate a period between 1500 and 1200 BC (Nowakowski 1991, 102; Trevisker (ApSimon and Greenfield 1972, 356) with a single date probably from the end of occupation NPL-134 1520–1019 BC and Gwithian, again a single date, from Layer 5, NPL-21 1600–1014 BC (*ibid*, 356). All dates are presented at two sigma and those from Trevisker and Gwithian have been calibrated by the author using the CALIB 2 program. The Middle Bronze Age, 1500–1000 BC, range for these dates is supported by the general association of Trevisker pottery with Taunton Style, MBA 2, metalwork from Tredarvah (Pearce and Padley 1977); for this a date range of perhaps 1450–1200 BC might be appropriate. It is apparent therefore that there is a paucity of good dating for Trevisker pottery from domestic sites, but that the dates available support its occurrence on these as later than those from funerary contexts. ApSimon has presented a stylistic sequence in which cord impressed wares predate those with incised and other forms of decoration (1959; in ApSimon and Greenfield 1972, 326–333). While early dates for cord impressed styles are supported by the dates from barrows – leaving aside the question of deliberate selection of certain modes for this type of deposition – the sequence of plaited cord impressions, simple cord impressions and lastly incised and other modes of decoration argued elaborately for Trevisker itself is not upheld by the assemblage at Trethellan Farm where all these forms appear together within the date range 1500–1200 BC. Given the paucity of dated later sites, at present all settlements, the possibility that non-cord decorated forms survive later than those with cord-impressed decoration into the centuries after *c*1200 BC is still open. There is also the possibility that there may be some chronological difference between vessels with incised decoration or stamped decoration only and those on which incised motifs are mixed with stamped or fingernail impressions. Dates from Trelowthas with single modes of decoration (Quinnell in Nowakowski forthcoming) may be helpful, as will those from Penhale Round and Penhale Moor, both with mixed decorative techniques (Quinnell in Nowakowski 1998). Moving outside Cornwall a single date of 1111–896 BC is associated with a Trevisker vessel with both incised and fingernail decoration on Bratton Down, Exmoor (Quinnell forthcoming (a)). At Brean Down Trevisker pottery from Unit 5B, almost all incised, a little stamped and fingernail and a few simple cord impressions has dates of *c*1210–900 BC (J Walker in Bell 1990). Do the Brean and Bratton Down dates relate to local ceramic patterns or should they be considered along side the single dates from Trevisker and Gwithian? There would appear at present a *very* small amount of evidence to argue, as a platform for further work, that incised and fingernail impressed Trevisker vessels could be in use as late as the 11th or even 10th centuries BC.

The major ceramic group which succeeds Trevisker ware is that with shouldered and carinated forms identified by Barrett (1980) as the successor to Deverel-Rimbury wares further east in Britain from the 11th century BC; this is beginning to be referred to as Late Bronze Age Plain Ware (Raymond, 1994). In the south-west, sites with this Late Bronze Age Plain Ware are rare, and

sometimes, as at Bodrifty (Dudley 1956) and Mount Batten (Cunliffe 1988), without dates. On Scilly forms from the earlier part of this group occur at Nornour with a date which may calibrate to the 10th–9th centuries (Butcher 1978, 33) and others from the later part at West Porth, Samson (Quinnell 1995) with 8th to 5th century dates. If an intermediate group is present between Trevisker and Late Bronze Age Plain Ware in Cornwall and Devon, the sequence as at present understood would best allow it to centre on the 10th century BC. Sites quoted above for this intermediate group are Dainton, with metalwork-related dates of 11th to 9th century BC, Nornour with contexts after the 10th/9th centuries, and Brean Down with contexts stratified above those with dates 1200–900 BC CAL. South-west sites with any Late Bronze Age, post-Trevisker, ceramics have been notoriously difficult to distinguish in the past (Silvester 1979) and there has not been enough data to establish even an outline ceramic sequence for the period. As the intermediate ceramic phase has been highlighted by discussion of the Callestick material, it is suggested that it be referred to as the Callestick group, until it is either disproved as a separate ceramic unity or confirmed by a larger and more securely dated assemblage whose name can then be given to the group.

Sherds of **P5**, which is definitely Trevisker, and **P1** and **P2**, which have some Trevisker features but probably fit more comfortably in the suggested intermediate Callestick group, were all found deposited behind wall [5]. At present the latest date likely for the manufacture of Trevisker ware is the 10th century BC, the general period suggested for the intermediate group. Ceramic dating, based on what is known from other sites indicates the 10th century as the most likely date for construction. **P3** and **P4** are both of the intermediate group but are only found in the infill layers. The two radiocarbon dates for the basal layers in the Structure cover the 15th to 12th centuries BC CAL, earlier than the wall and any likely date for **P1** and **P2**. The dates can only be explained if material incorporating earlier carbonised remains was deposited on the floor. Some sherds of **P5**, and probably of **P2**, from the infill, had not been built into the wall. Sherds of these vessels must either have been deposited in a midden outside which was then used in the basal layer and the infill, or retained in use as artefacts in their own right, eventually to be deposited in the basal layer (**P2**) and the infill (**P5**). The final date for the Structure's infill must relate to the radiocarbon dates from the postholes, which give a 9th to 5th century BC range. A structure which was built around the 10th century could easily have lasted, if dry, clean and seldom used, for perhaps two centuries, indicating the 8th/7th centuries for infill. The radiocarbon date for infill, 1150–815 BC CAL, would then come from material in the periphery of the site, perhaps a midden; this date accommodates Callestick style vessels **P3** and **P4**. The most interesting aspect of this scenario is the conservation of Trevisker sherds from **P5** until the 8th/7th centuries, from which parts of the base and lower body had been broken off and placed in the structure of the building. The importance of these sherds is indicated by the careful deposition of a group in infill [3] and their inclusion in posthole [6]. Their importance is consistent with the unusual nature of **P5**, its size and fragility indicating some specialised function which did not involve frequent usage. The infill contained only Trevisker and intermediate, Callestick group, sherds, with no Late Bronze Age Plain Ware. This suggests that activities were stringently controlled by constraints connected to artefacts validated by centuries of meaningful usage and which excluded contemporary artefacts. Ceramics and dating together indicate a special, non-domestic use of the Callestick Structure as well as implying other earlier and contemporary foci in the adjacent landscape.

4.2 Stone Artefacts

by Henrietta Quinnell and Roger T Taylor

4.2.1 Introduction

Descriptions and probable usage are the responsibility of both authors, archaeological comparanda and interpretation of the first named, and geology of the second. Geological terminology is used for

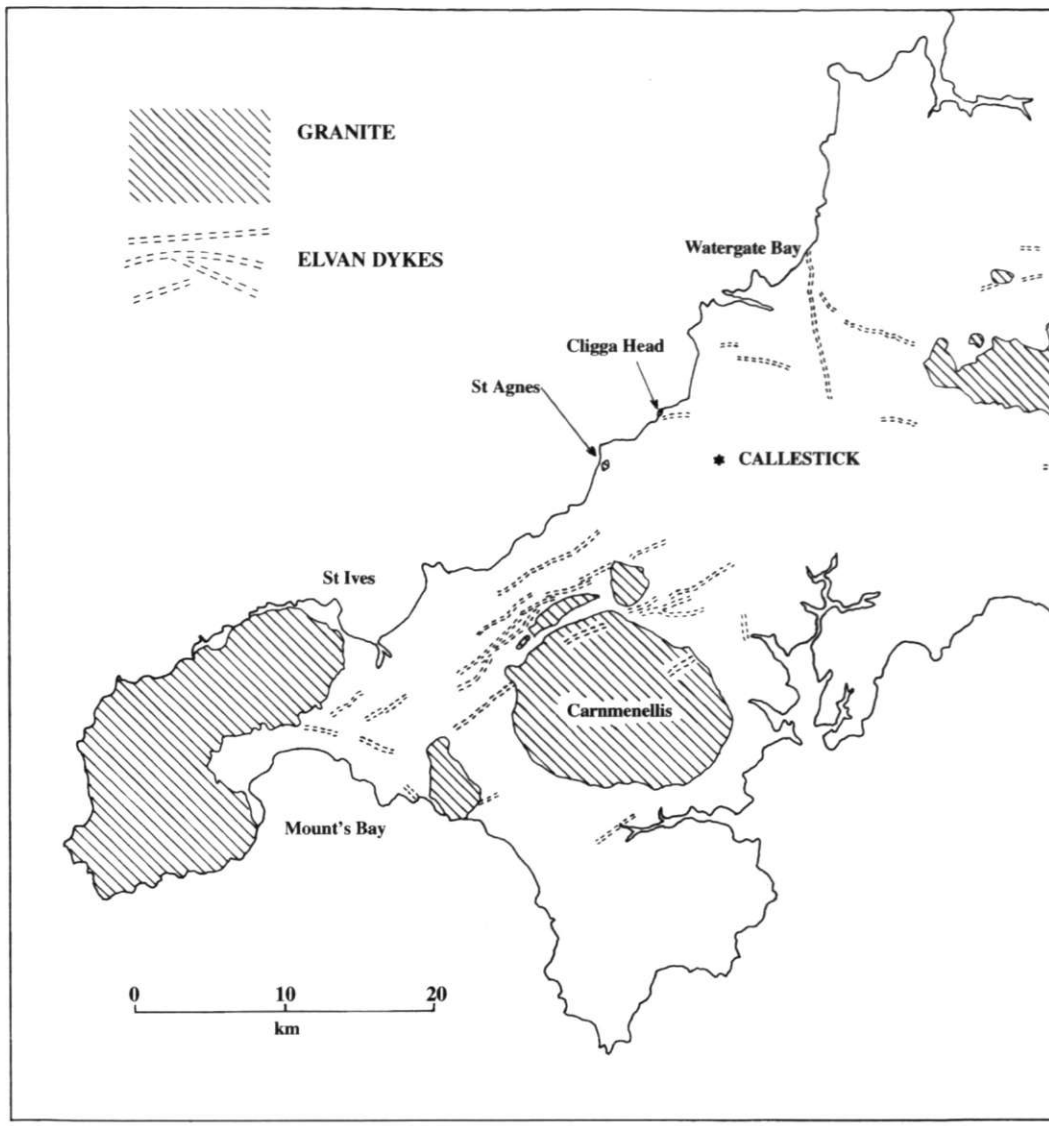

Fig 10 Simplified geological map of west Cornwall showing locations of probable sources of stone artefacts

size: pebble 4–64mm; cobble 64–256mm; boulder >256mm. Original small find numbers have been retained. Detailed geological reports are deposited in the archive. Under individual artefact notes, 'provenance' refers to the source of the stone and 'from' indicates where it was found on site.

4.2.2 Sources (Fig 10)

Twenty-two items had been brought to the site; of these 19 had traces of shaping and/or use. Of these three were of local Devonian slate, four from the coastal Cligga Head Granite (4 km), four from coastal elvan outcrops (4 km nearest), four from the St Agnes Granite (6 km), one with the nearest source in Holywell Bay (9 km), two from the Carnmenellis Granite (12 km) and one

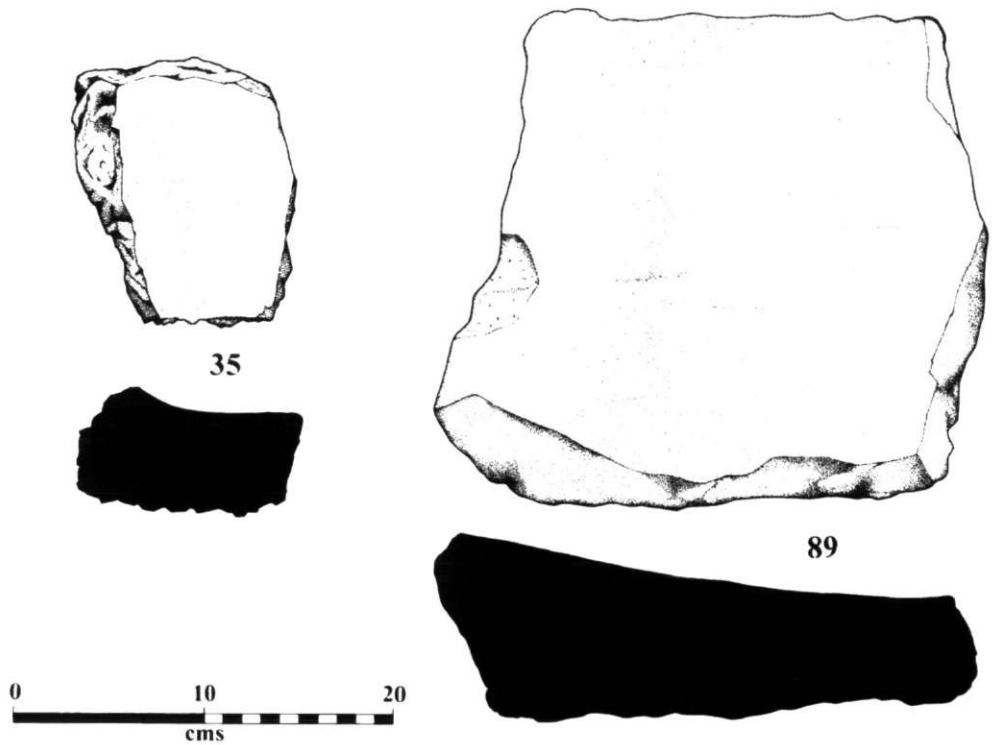

Fig 11 Saddle quern fragments: ***35*** *from infill [2],* ***89*** *with re-use from wall [5]*

possibly from its vicinity, one with the nearest source in Watergate Bay (15 km), and two from Mount's Bay or the St Ives area (25 km). Of these all but the Devonian slate and the Carnmenellis area were coastal, although the St Agnes Granite does not have a beach source (Fig 10).

4.2.3 SADDLE QUERNS (FIG 11)

No 89 Fragment from edge of granite saddle quern, surviving dimensions 105mm by 130mm by 45mm. Weight 1250g. Quern surface worn smooth, with steep curve up towards edge; wear thinning may have resulted in breakage. The very rough base could result from levering for removal from parent rock (see note). The dark colour, giving a 'burnt' appearance results from the abundance of greyish muscovite.

Provenance St Agnes Granite (see note), lithology matching **No 88**.

From [5], wall around house

No 35 Part of granite saddle quern; squarish chunk 240mm across, thinning from 90mm to 40mm. Surviving weight 9kg. The upper surface is worn, becoming smoother towards the thinner end; parallel grooves upon it result from natural mineral alignment in the granite. The lower surface is rough and suggests breakage along the length of the quern. The top is hollowed within the existing dimensions suggesting some re-use after breakage; re-use is also indicated by some wear on two of the corners and along the edges of the fractures. The original quern may have broken because of thinning from intensive use, causing the granite to crack along natural mineral alignment. A chip from one edge appears to post-date use.

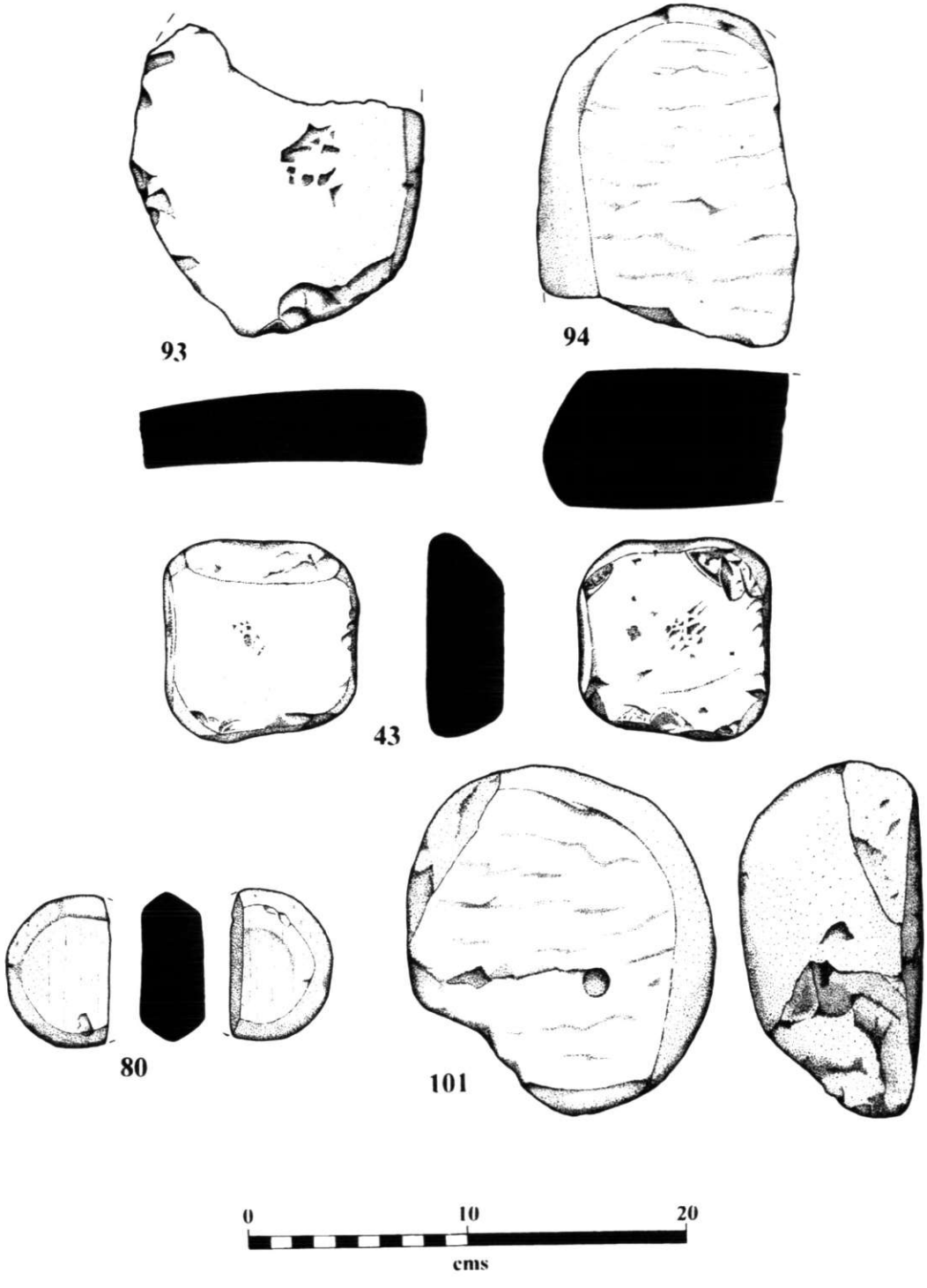

*Fig 12 Stone tools: mullers **93** and **94** from wall [5], rubbing stone **43** with re-use from infill [3], tiny mortar **80** with re-use from posthole 16, **101** grinding stone from infill [11]*

Provenance The texture corresponds with that of parts of the Carnmenellis granite, the nearest major outcrop 12 km to the south/south east.

From [2], central to house infill

4.2.4 Mullers and Related Grinding Stones (Figs 12 and 13)

No 93 Broken muller shaped to a pointed oval outline. Fine-grained granite. Width 132mm, surviving length 145mm, thickness 35–8mm. Weight 1090g. Made of a slab bounded by parallel joint surfaces, one of which is worn smooth and slightly convex. The right edge is naturally rounded; the remaining periphery is slightly worn over artificial trimming. One end has been broken away, probably by a deliberate blow. The uneven darkening of the surfaces has occurred after use but its nature and origin is unknown.

Provenance Possibly from the fine-grained areas in the north-west of the Carnmenellis Granite around Praze-an-Beeble.

From [5] wall around house

No 69 (not illustrated) Fragment of greisened granite cobble/boulder with small smoothed/abraded area produced by rubbing or grinding.

Provenance St Agnes Granite

From [5] wall around house

No 94 Corner, perhaps about a quarter, of a large oval greisen muller, burnt. Thickness 57–65mm, surviving other dimensions 105mm by 135mm. Weight 2260g. The artefact is abraded on two parallel surfaces which are slightly convex. The edge has the two distinct facets from use as a muller on a saddle quern; the wear may cover marks of shaping. The end is rough, possibly through use as hammer. One fracture appears to be planar, on a joint; both could have been accidental.

Provenance Cligga Head Granite with lithology very similar to **No 101**.

From [5] wall around house

No 88 (not illustrated) Fragment of large coarse granite cobble/boulder. Small area of worn/ground surface survives.

Provenance St Agnes Granite, lithology similar to **No 89**.

From [5] wall around house

No 92 (not illustrated) Part of elvan beach boulder originally weighing around 100kg, with ferruginous coating cf **No 104**. All surfaces either naturally worn or broken on joint planes. No signs of use; fragment brought in from beach but not used.

Provenance Local coastal elvan outcrops, St Agnes, Cligga Head or Perran Bay.

From [5] wall around house

No 80 Tiny mortar, broken. Micaceous quartzite with a planar fabric resulting from low-grade metamorphism and/or folding. Width 66mm, surviving length 40mm, thickness 27–8mm. Weight 160g. The two parallel surfaces derive from flat joint surfaces of the rock fragment used. The edges have been worked to an even bevel. The high polish on the parallel surfaces is appropriate to the natural fabric of the quartzite, and was present before breakage, which was accidental on a natural plane of weakness. Hollows on both polished surfaces centre in the area remaining after fracture, indicating continued use. This is commensurate with the considerable effort expended in shaping the object in the first instance. **No 80** is described as a mortar because the concave surfaces indicate that a substance was ground on them; the object was not a muller. The hard, fine-grained nature of

the rock and the high polish points to the grinding of a relatively hard substance yielding a very fine grained product, perhaps a mineral pigment such as ochre. No close parallels are known. Its elaborate manufacture and specialised use are consistent with its deposition in posthole [16] after the removal of the post.

Provenance A precise provenance is uncertain. Beds of quartzitic sandstone occur in parts of the Lower Devonian Staddon Grits/Meadfoot Beds and Dartmouth Beds which outcrop through southern Devon and central Cornwall. These beds have been subjected to folding and low-grade metamorphism. A red colour is not uncommon in parts of these formations and can also result from weathering. Such rocks are recorded in the cliffs to the north and South of Watergate Bay north of Newquay. Derived quartzite fragments do occur in some of the Permian breccias of Devon but the rock does not resemble the quartzites of the Budleigh Salterton Pebble Beds.

Context deliberate deposition in posthole [16] after post removed.

No 54 (not illustrated) Fragment of greisen beach cobble/boulder grinding stone. Part of flattened area survives on which quartz grains are smoothed, suggesting use with something harder than cereals cf **No 101**. Impact point and hardness of rock indicate deliberate breakage.

Provenance Cligga Head Granite

From [2] fill of house

No 103A (not illustrated) Fragment of tourmalinite. Surviving smoothed surface slightly concave suggesting use as a quern or mortar. Breakage accidental relating to weaknesses in the rock.

Provenance Anywhere in the vicinity of granite and mineral lodes but outside granite outcrops.

From [2] fill of house

No 103B (not illustrated) Fragment of greisen, no surfaces with use/manufacture surviving.

Provenance St Agnes Granite

From [2] fill of house

No 104 (not illustrated) Fragment of weathered lamprophyre cobble too weathered for any worn/worked surface to be distinguished. Ferruginous coating (cf **No 94**) acquired after use, if any, but before breakage.

Provenance Weathered cobble suggests beach provenance; lamprophyre occurs in numerous small dykes/intrusions, the nearest coastal outcrop in the Holywell Bay area 9 km north.

From [2] fill of house

No 58 (not illustrated) Part of elvan boulder, with surviving fragment of convex surface used as heavy duty rubber; probably fractured along lines of weakness during use.

Provenance Coastal elvan outcrops at St Agnes, Cligga Head or Perran Bay.

From [2] fill of house

No 43 Squarish rubbing stone of even thickness, 85mm by 85mm by 35mm. Porphyritic dolerite. Weight 700g. The parallel planar faces are probably originally natural joint planes. The roughly rounded edges suggest a limited amount of wave abrasion, although some attempt may have been made to round the edges. The parallel surfaces of this tough, relatively fine-grained, rock have been worked to smooth, slightly polished, surfaces. One surface, originally slightly convex, has a slight depression in the centre with a roughened area about 20mm across. The opposite surface is more convex but again with a 10mm area of roughening/pitting near the centre. There is a smoothed concave bevel on one side. A chip on one corner post-dates use. This artefact appears to have been

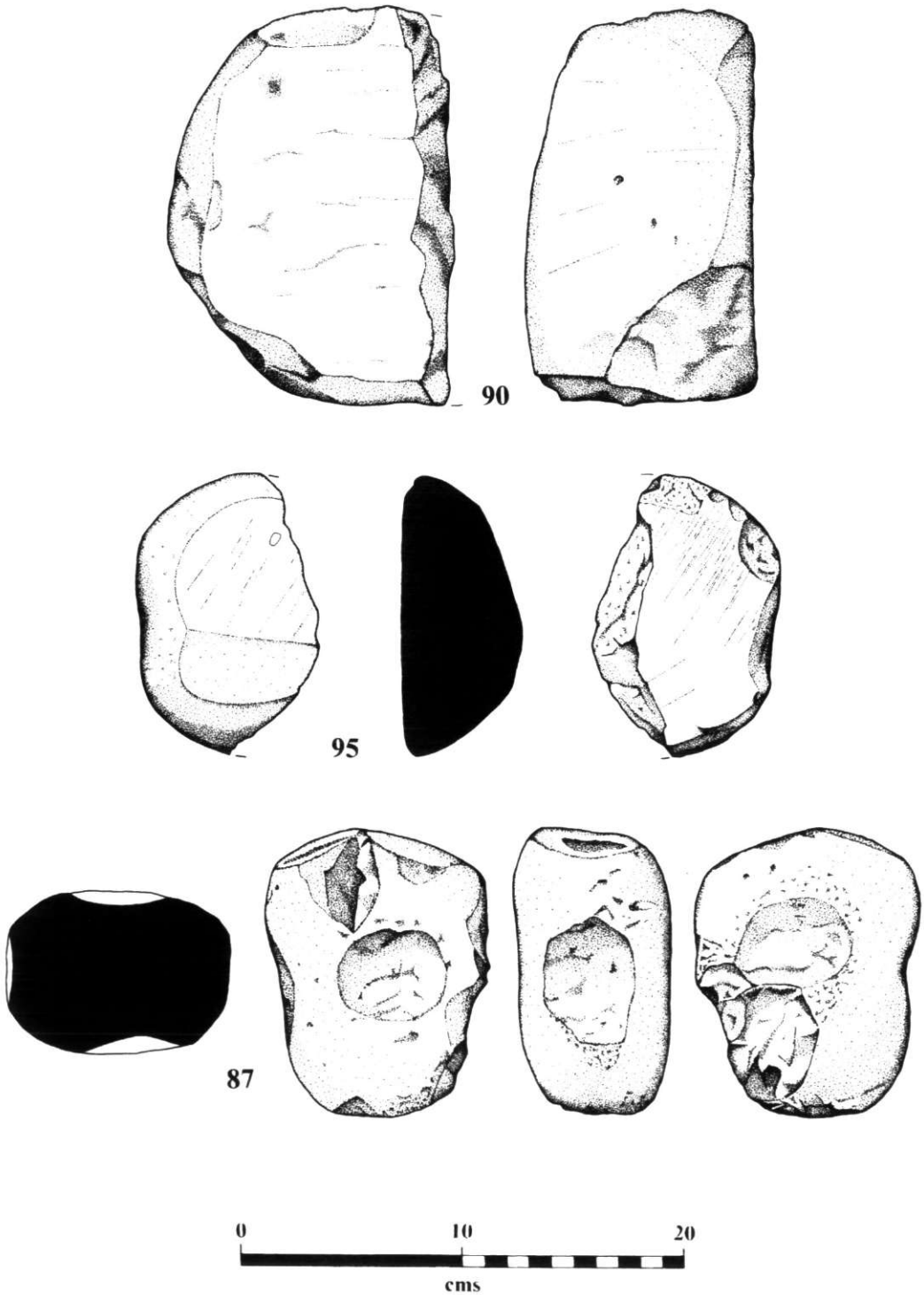

Fig 13 Stone tools: ***90*** *muller from infill [11],* ***95*** *muller (unstrat),* ***87*** *cupped pebble hammer from wall [5]*

used in several stages. Initial use as a rubbing stone produced the convex parallel surfaces, with the concave edge probably the result of a different activity. Subsequently the smoothed surfaces appear to have been used for crushing and grinding upon them in a similar manner to **No 80**. The product of grinding on this surface would, like that on **No 80**, have been fine-grained, perhaps pigment rather than cereals.

Provenance The possible nearest source for this intrusive basic igneous rock is the coast around Porthleven in Mount's Bay.

From [3] fill of house

No 36 (not illustrated) Part of well-rounded gabbroic beach cobble. Some facets possibly used for rubbing; more definite traces of use as a hammer stone on a hard object.

Provenance Coast around St Ives or Mousehole to Porthleven in Mount's Bay.

From [3] fill of house

No 101 Plano-convex quartz-muscovite tourmaline greisen cobble grinding stone. 150mm by 130mm by 80mm. Weight 2560g. Hard beach cobble with a marked flat surface produced by wear which has produced a polish on the larger quartz grains; such wear is more likely to be from grinding down rock fragments than something soft such as cereals. Irregular fragment broken from edge by a blow to the worn flattened surface, possibly because of use as a hammer stone.

Provenance Cligga head Granite.

From [11] fill of house

No 90 Part of plano-convex quartz-muscovite tourmaline greisen cobble grinding stone. 100mm thick, other surviving dimensions 175mm by 120mm. Weight 4030g. The flat, worn surface would take a long time to develop on this quartz rich rock, even on the original flat beach cobble surface. Although the worn surface is very slightly concave in one direction, the abraded edge suggests that it was used as a muller rather than as a small quern. The junction of the worn surface and the abraded edge appears to be slightly battered. A cobble of this size would require a very heavy blow for deliberate breakage, for which there appears to be no impact point along the fracture line. The fracture may have occurred accidentally along a pre-existing plane of weakness.

Provenance Probably Cligga Head.

From [11] fill of house

No 95 Broken plano-convex elvan cobble muller. Surviving dimensions 125mm by 75mm by 52mm. Weight 710g. One side is a single smoothed working surface with aligned scratches, the opposite has two smaller such surfaces. The larger of these shows parallel scratches at a different angle to those on the single surface. None of these scratches relate to the grain of the rock. The rock is quite hard and tough and would not break accidentally in use as a rubber, especially as wear is appropriate for soft materials such as cereals. One corner shows the chipping and crushing from a blow, which suggests that the cobble was fractured by impact on a hard surface. The reddish brown ferruginous coating has been acquired after use and probably after fracture. It is similar to ferruginous, ochre coatings acquired by immersion in stagnant water or embedding in marshy ground. cf **No 104.**

Provenance Nearby coastal elvan outcrops St Agnes, Cligga Head, Perran Bay.

Unstratified

4.2.5 Cupped Pebble Hammer Stone (Fig 13)

No 87 Elvan cobble with cup marks on opposed faces. Part broken away, because of use as hammer;

surviving dimensions 125mm by 90mm by 60mm. Cup marks 6 and 8mm deep respectively. Weight 475g. The distinctive hollows on the sides and one end of the cobble are positioned to give a comfortable and firm grip when it is held for hammering either with the battered end or with the chipped longer side. The hollows have quite rough surfaces and appear to have been produced by concentrated hammering at these points to improve the grip of the hand. The battering and flaking at one end and chipping on one side are consistent with use as a hammer stone on another hard object.

Pebbles/cobbles with opposed depressions are common finds on Early Bronze Age barrows in Cornwall but they do not occur at Trethellan Farm, unlike perforated discs and slabs with single cup marks in one side. A full discussion of the type is based by Roe (1985) on the example from the Lousey barrow, with reference to barrow finds from Carvinack, Otterham and probably Glendorgal. It is noticeable that none of the examples from the nationwide survey are from Middle Bronze Age or later sites. Roe suggests use as hammer stones but goes on to elaborate their possible uses as nutcrackers. If the hammer stone interpretation is maintained for Callestick, this must relate to the general activities of bashing and hammering reflected in the stone artefacts. But it is possible that this distinctive artefact was of earlier date and incorporated in the house wall.

Provenance Local coastal elvan outcrops St. Agnes, Cligga Head.

From [5] wall around house

4.2.6 Slate artefacts

No 71 (not illustrated) Slab with roundish shape, notch on one side, 140mm across and 20mm thick. Selected for its shape (?) as it might be described as 'lid', but not worked into shape. Weight 880g

Provenance Local Devonian slate

From [5] wall around house

No 65 (not illustrated) Small bladed stream pebble. 68mm by 13mm by 5mm. Possibly used as whetstone, but no characteristic wear traces observable. Weight 25g

Provenance Local Devonian slate

From [10] fill of house

No 13 (not illustrated) Fragment with, apparently, perforation subsequently broken across. Both 'perforation' and breakage on examination shown not to be result of human activity; fragment broken naturally with 'perforation' then produced by pressure in the ground against some hard object. This comment must call into question some of the numerous 'notched slates' thought to be anthropogenic.

Provenance Local Devonian slate

Unstratified

4.2.7 Discussion

Rock was being introduced from up to 25km away when similar material could have been found nearer at hand. Different outcrops may have had significance, in use or in symbolism, which we can not now establish. By contrast almost all of the largest Later Bronze Age collection from Trethellan Farm (Nowakowski 1991, 141) came from within a '2–3 mile radius'. Callestick is the first prehistoric site in the south-west for which a wide range of sources for ordinary but heavy objects such as querns and grinding stones has been indicated. This has been facilitated by detailed examination based on the most recent research into the relevant igneous rocks.

It may be that coastal sources resulted from contact by sea, either based on fishing or the transport of other materials such as pottery around the coast. Some of the pebbles may have been moved as

ballast. Possible stone ballast from the Isle of Wight has been found in a barrow at Puncknowle west of Dorchester (D Tomalin, in Greenfield 1984, 80), and further instances may be expected as more detailed geological examination is applied to Bronze Age sites.

While most pieces could have been collected from the beach or from the ground surface, the St Agnes Head material may have been quarried. The area of outcrop is small and recent reworking makes conditions in the Bronze Age impossible to reconstruct, but if any quantity of this source was used, extraction is likely. While no examples of Bronze Age rock quarries for artefacts are, as yet, known in the south-west, their existence would be unsurprising considering the extensive mining for copper ores in Wales and Ireland. Pre-industrial, just possibly prehistoric, extraction is now suggested for Wheal Coates on the St Agnes Granite (Budd and Gale 1994).

Eight pieces were found in wall [5] with a similar range in lithology, use and condition to the eleven from house fill contexts (with an additional two unstratified). This must raise the question of how far the stone artefacts in the fill derived from the collapsed, or demolished, wall and how far they related to activities connected with the Structure. Miniature mortar **No 80**, placed in posthole [16] and saddle quern **No 35** from infill [2] in the house centre were both deliberately positioned after the Structure was demolished, and the remaining nine from the infill may also have been. While objects placed in the infill retained significance and remained in circulation, it is unclear whether these would have been used for their original purposes in activities connected with the Structure or whether their function was purely ceremonial, akin to that of the sherds of **P2** and **P5**. Only **35**, **80** and **43**, all from infill, had clear re-use episodes as mortars or querns, the former two after breakage. Only **No 43** of those connected with the infill was unbroken. The proportion of artefacts built into the wall indicates a locus, presumably somewhere in the vicinity, from which material was brought for construction. Whether this was a convenient quarry for materials or whether artefacts were deliberately selected to provide links with an earlier site is a question which must be addressed in relation to the interpretation of the Structure's function. Unfortunately stone artefacts are not closely dateable; the assemblage would be appropriate for either the Middle or the Late Bronze Age.

The stone artefacts as a group include those used for the grinding of cereals, of rock (ore or pottery temper?) as with **No 101**, or of pigments as with **No 43** and **No 80**. Hammering or bashing are represented, as with the secondary use of **No 90** or the cupped pebble hammer **No 87**. There is also the naturally shaped Devonian slate 'lid' **No 71**, whether or not actually used for the implied purpose. Absent are whetstones and pebbles with areas of wear or gloss usually thought to derive from working leather (lapstones). This may be due to the small size of the collection. Only nine pieces are presented from Trevisker with no whetstones and lapstones (ApSimon and Greenfield 1972, 345). The large collection of 215 pieces from Trethellan Farm (Nowakowski 1991, 141) does include them. Where Callestick differs from these, the two most comparable collections published from Cornish sites, is in the presence of heavy cobbles or boulders with indications of grinding rocks and pigments. The grinding of rock is suggested both by size and weight of some and by the exceptional wear on pieces such as **No 101** which is unlikely to have been produced by cereals. In this connection the presence of clearly visible veins of cassiterite in the granite at Cligga Head is a reminder that the preparation of ore for tin smelting would have been feasible locally. Craddock and Craddock have recently (1997) summarised the potential for early metal production in the south-west, suggesting that the evidence for this may differ from that found elsewhere.

The terms 'grinder' and 'muller' tend to be used interchangeably, the assumption being that all are used in the preparation of cereals or foods. Here 'muller' is used only for those grinders which have a faceted, abraded edge as does **No 94** which is produced by regular use on large saddle querns. It should be possible, by study of surface trace materials, to confirm the material being ground in collections studied in the future, and it may be expected that more artefacts will be found used in the preparation of rocks and pigments. The term 'muller' could then be used with precision for those artefacts used for food preparation and 'grinder' for those for other materials.

The detailed geological examination has shown that it is possible to detect a sequence of different uses for some stone tools. This is not surprising, given that the rocks were imported from some distance. Long usage and re-use may not however just relate to the rarity of the material; there may have been traditions which valued objects in themselves and in which re-used artefacts were validated by their previous usage. Miniature mortar used for pigments **No 80**, placed in posthole [16] and saddle quern **No 35** from infill [2] in the house centre are the two stone artefacts most obviously deliberately positioned. It may not be coincidence that both have at least two distinctive episodes of use. As with the pottery, patterns of usage may not have been merely pragmatically or ergonomically determined. All in all the Callestick stone artefact collection presents numerous new important lines of study which can be applied in the future to prehistoric collections.

4.2.8 Note on the St Agnes Granite

The small outcrop of granite about 1.5 km south of St Agnes Head has a quite distinctive lithology. The rock is partially and irregularly greisenised with the remaining feldspar commonly being pink in colour while the altered biotite is greyish and resembles muscovite. This together with the presence of tourmaline gives a noticeably dark colour which initially lead to the erroneous interpretation of burning. Present day exposure is poor, except for Cameron Quarry and mine workings on the western edge. The texture of the rock seen there is quite different from that of the artefacts but the alteration is similar. The proximity to the site, 6km west, and the difficulty of matching the dark coloured greisenised and altered material to another of the Cornish granites leaves the St Agnes Granite as the most likely source for most of the granite. Given the limited surface exposure, the extensive use made of this rock suggests that it may have been dug out. This granite has no coastal outcrop and it is notable that none of the material of this suggested provenance shows any natural rounding. On the other hand many of the greisen artefacts suggested as being derived from the Cligga Head Granite, which has coastal outcrop, are rounded.

4.3 The Worked Flint

by Pippa Bradley

4.3.1 Introduction

A small assemblage of forty-three pieces of worked flint were recovered from the excavations at Callestick. Diagnostic retouched forms indicate limited Mesolithic activity whilst technological attributes suggest the majority of the assemblage is of Bronze Age date. The flint is summarised in the table below. Selected pieces are illustrated and described in the catalogue.

4.3.2 Description

The flint is grey to light brown in colour with a pale, abraded cortex. Cherty inclusions were noted and the flint is generally lightly corticated. The abraded nature of the cortex suggests derived sources for the flint, probably from local beach pebbles. A single flake of chert was identified.

Hard hammer flakes dominated the assemblage. The flakes tended to be small and squat. The cores have been well worked although they are quite unspecific types. However, the heavily rejuvenated platform core from context [11] (Fig 14) has some blade-like scars and may originally have been a blade core. The two microliths (Fig 14) recovered are probably later Mesolithic in date although these types do occur in early Mesolithic assemblages (Pitts and Jacobi 1979).

The small size of these pieces and the ancillary retouch on one example would suggest a later Mesolithic date (Pitts and Jacobi 1979). The scrapers (Fig 14) and the probable knife fragment (Fig 14) have been neatly retouched with slightly invasive retouch. Although these pieces are not particularly diagnostic they would not be out of place in an earlier Bronze Age context.

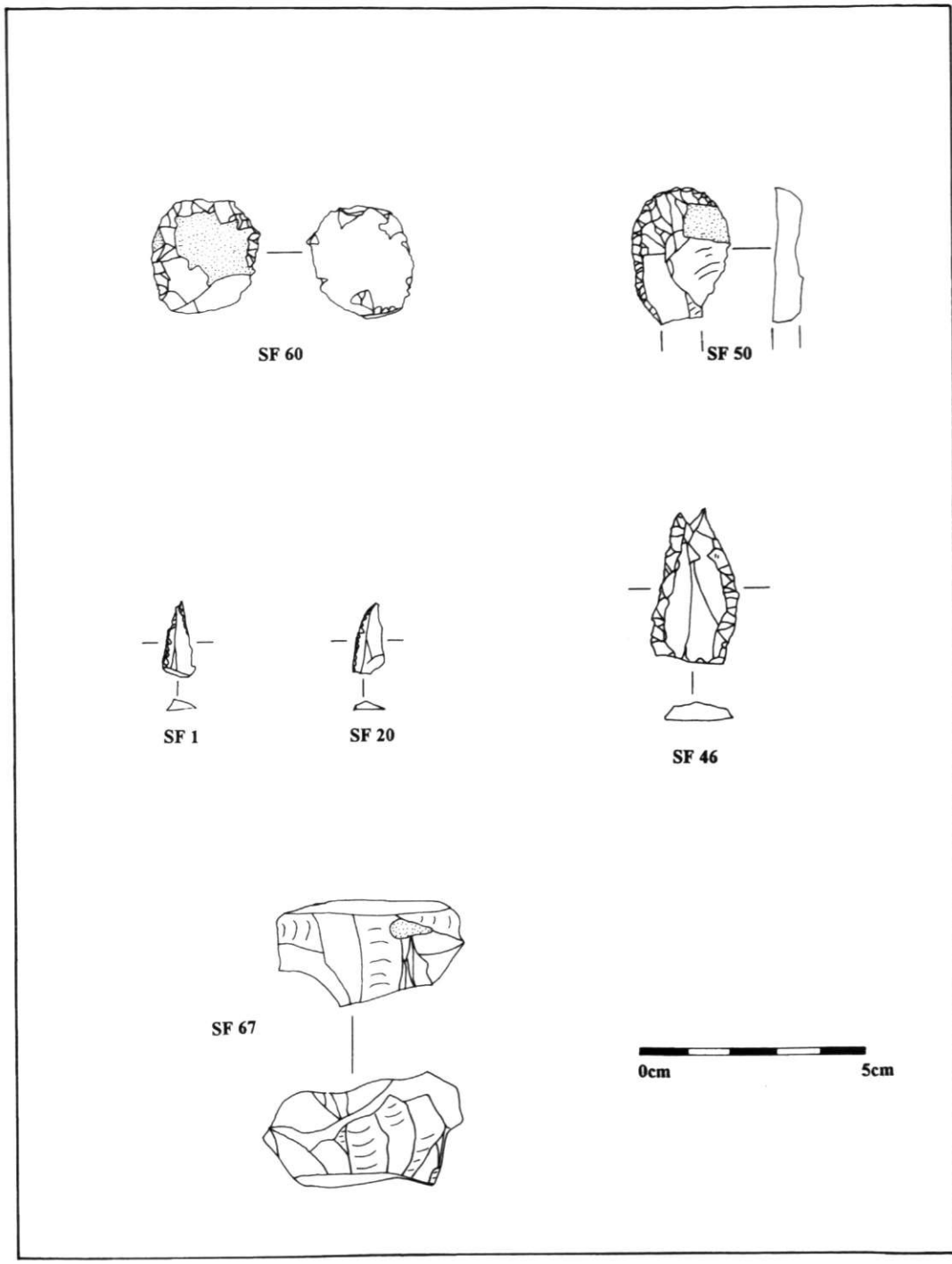

*Fig 14 Selection of flints from Structure 26: retouched scraper **60**, end and side scraper **50**, microliths **1** and **20**, probable knife fragment **46**, multi-platformed core **67***

Table 4 Showing summary composition of the flints

Flakes	Irregular waste	Chips	Cores/core fragments	Retouched Forms	Total
27	2	4	5 (1 multi-platform flake and blade core, 1 opposed platform flake core, 3 tested nodules)	5 (1 obliquely blunted point, 1 edge blunted point, end scraper 1 end and side scraper, 1 ? knife fragment)	43

5 Assessment of Charred Plant Macrofossils,

by Phillippa Gilbert and Vanessa Straker

5.1 Introduction

Following a site visit a sampling strategy was discussed for the recovery of charred macrofossils; the acid soils prevented the survival of animal bones. Bulk samples were taken by CAU and processed by flotation in the soils laboratory, Department of Geography, University of Bristol. Floats were retained on a 250 micron sieve and residues on a 1mm mesh. The residues were scanned for finds and charred plant remains. A detailed assessment of the floats was carried out and the results are presented in the Table 5, below. Nomenclature follows Stace (1991).

5.2 Comments

Charcoal was present in all the samples and particularly abundant in contexts [1] and [10] (layers) and the central posthole, context [16]. The charcoal from the central posthole consists of mature oak and so was of limited value for radiocarbon dating.

The remains of crops are scarce and are principally from layers [1] and [10], but occasional finds were also made from other layers and postholes. The assemblages are broadly similar and consist mainly of occasional finds of crop weeds such as field madder and vetches, with clover, ribwort plantain and heath grass which could have grown on grassland or grassy heath. Crop remains are very scarce and are confined to poorly preserved barley grains, a horsebean and a single glume base of hulled wheat. The latter is small and fragmentary but is probably emmer rather than spelt wheat. The crops are all typical of Bronze Age assemblages, but there is little evidence for crop processing and consumption and this supports the assumption that the site may not have had a primarily domestic function.

6 The Radiocarbon Dating

6.1 Introduction

The principal aim of the dating strategy was to obtain a series of precise dates from the Callestick Structure. The chronological significance of the Structure was that it appeared to have been built during a period of transition during the later part of the Bronze Age.

It was constructed at a time when burial mounds were no longer used (Quinnell 1994a, 60), and when settlements had long been established in the landscape. It was also a period when the Trevisker ceramic tradition was disappearing and was being replaced by new ceramic styles. The

Table 5 Bulk samples from Callestick: assessment of charred plant macrofossils

Sample	Context (Layer)	Sample Volume	Float volume	Crops	Weeds	Indet.	Charred fragments	Charcoal frags. >2mm	Charcoal frags. <2mm
	(Posthole)	(kg/l)	(ml)				(inc. roots)		
500	L3	14/11.5	2	–	1 *Danthonia decumbens*	(heath–grass)	3	*c*25	
501	L2	12.8/11.5	3	1 cereal, 1 frag indet	1 *Plantago lanceolata*	(ribwort plantain)	1	*c*30	
502	P7	6/5	1	–	–	–	*c*10		
503	P6	3.4/2	0.5	–	2 indet plant frags	–	*c*2		
504	L1	16.8/96	30	1 *Triticum* sp. (hulled wheat glume base)	2 *Brassica/Sinapis* (mustard/rape/turnip), 2 Chenopodiaceae, 8 *Danthonia decumbens* (heath–grass), 2 *Fallopia convolvulus* (black bindweed), 2 Gramineae indet, 1 bud (indet), 1 *Sherardia arvensis* (field madder), 1 *Trifolium sp.* (clover), 8 *Vicia* sp. vetches (2x2 – 1.5x1.5mm), 8 indet seeds	21	*c*250	many	
505	L10	112/89	40	1 *Hordeum* sp. (barley)	2 *Plantago lanceolata* (ribwort plantain). 4 *Danthonia decumbens* (heath–grass), 2 *Trifolium sp.* (clover), 1 *Ranuculus* sp. (buttercup), 1 *Polygonum lapathifolia* (pale persicaria), 0.5 Fabaceae, 1 bud (indet), *c*12 indet charred plant frags/ tissue	12	*c*200	many	
506	L5	13/10.5	1	–	–	–	*c*5		
507	L9	14.6/12	2	–	–	–	*c*5		
508	P15	6.3/5.0	0.5	–	–	1	*c*1		
509	P16	10.8/8.0	130	6 cereal frags, 1 cf *Hordeum* sp. (barley), 1 *Vicia faba* var *minor* (horsebean)	–	3	*c*1000	many	
511	L17	2.7/1.5	10	–	–	–	*c*100		
512	P18	1.3/0.5	2	–	–	–	*c*30		
513	P21	7.6/5.0	1	2 cereal frags	1 Cyperaceae (sedges etc.), 1 Galium cf aparine (cleavers), 1 *Fallopia convolvulus* (black bindweed), 1 Gramineae (grass), 1 *Sherardia arvensis* (field madder)	8	*c*3		
514	L22	4.8/3.0	70	–	–	1	*c*400	many	
515	P23	4.3/2.5	0.25	–	–	2	*c*1		
516	P24	6.4/4.5	9	1 cereal sp. 0.5	*Vicia* sp. (vetch)	–	*c*100		

dating of the Structure was important because both the old and new ceramic styles were found on the site and because there are few later Bronze Age structures in the south-west.

6.2 The Dating Strategy

Twelve samples for radiocarbon determinations were taken from sealed contexts throughout the deposits within the Structure. However, despite relatively large amounts of available charcoal for sampling, much of it was unsuitable. Most of the charcoal was inappropriate for radiocarbon dating because it was derived from oak wood. Only six samples produced enough non-oak material for radiocarbon dating. Because of the small amounts of material available the samples were sent to the University of Waikato in New Zealand for accelerator mass spectrometry dating (AMS). This method of dating can be carried out on very small amounts of material and gives a high precision date which is more accurate than conventional radiocarbon dating methods.

6.3 Results

Table 6 Results of the Radiocarbon Dating

Context	Lab.No	Age BP Years	Calendrical Years 95%	Calendrical Years 65%
[5]	NZA 7687	3669 ± 79 BP	2280 – 1780 BC	2139 – 1924 BC
[7]	NZA 7685	2484 ± 91 BP	812 – 384 BC	791 – 405 BC
[10]	NZA 7686	2811 ± 67 BP	1020 – 894 BC	878 – 849 BC
[17]	NZA 7688	3092 ± 67 BP	1510 – 1132 BC	1419 – 1262 BC
[21]	NZA 7612	2690 ± 110 BP	1112 – 752 BC plus 702 – 532 BC	922 – 792 BC
[22]	NZA 7689	3132 ± 81 BP	1526 – 1138	1498 – 1492 BC plus 1454 – 1305 BC

6.4 Discussion

At first glance the results from the radiocarbon dating provide a surprising set of data. They imply that the Structure could theoretically have been standing from the earliest part of the Bronze Age (2280 BC) through to the earlier Iron age (384 BC), a time span which covers the entirety of the Bronze Age (approximately 1900 years). It is unlikely that any wooden structure no matter how well maintained would have stood for such a long period of time.

Scrutiny of the dates provides a plausible explanation of events at Callestick. The earliest date from the site NZA 7687 (2280–1780 BC) can probably be disregarded as being residual. The date adds to the evidence for the early use of the site as Mesolithic and Early Bronze Age artefacts were recovered from the site.

The rest of the dates are derived from infilling episodes associated with the abandonment of the Structure. To clarify what the radiocarbon dates mean will involve some analysis of the nature of the deposits from which they were taken.

The two earliest dates within the hollow were from layers [17] and [22] (NZA 7688 and NZA 7689). They produced an overlapping sequence of dates which ranged between 1526 and 1132 BC. The earlier end of the date range probably predates the ceramics which were found behind the wall of the Structure; within layer [5] the earliest context. The dates from layers [17] and [22] are also earlier than all of the remaining radiocarbon dates. The question arises as to where these layers were derived from and whether they were actually contemporary with the use of the Structure.

We know that neither of the deposits was burnt *in situ* within the Structure; the floor showed no sign of scorching. Therefore the deposits must have been cold when they were placed inside the Structure. The evidence may suggest that the deposits had been stored elsewhere, perhaps for some considerable period of time, before finally being placed within the Structure. Evidence from the ceramic and stonework assemblage (see Section 4 above) does indicate that some of the other material on the site had possibly been curated for a long period of time before being deposited into the Structure. The pottery found within layer [22] could have been contemporary with the act of deposition into the Structure, but later than the radiocarbon date.

However if the layers actually date to the later part of their date range, towards 1132 BC then it is just possible that they were deposited during the occupation of the Structure, rather than during the infilling phase.

The radiocarbon dates obtained from postholes [7] and [21] (NZA 7685 and NZA 7612) range between 1112–752 BC for Posthole [21] and 812–384 BC for posthole [7]. Because of the irregular curvature of the radiocarbon calibration curve, a second date was also obtained from posthole [21]. This gave a date range of 702–532 BC. The later part of the date range is a little 'younger' than was expected as no Iron Age artefacts were recovered from the site. However the earlier part of the date range is consistent with the artefactual evidence from the site and may therefore be accepted.

The final radiocarbon date (NZA 7686) 1020–894 BC came from context [10] which was one of the infill deposits. The date just overlaps with the dates from the postholes, although it does tend towards being earlier than the material that filled the posthole. Logically, it should have given a date that was contemporary or later than the material within the postholes. Although there is an overlap, consideration should be given to why it is earlier. The answer may lie in the nature of the sampled material. If this infill deposit is, as supposed, derived from a stockpile or midden then any date from it will reflect the date when the deposit was formed rather than the date when it was placed into the Structure. The deposit might have developed during the occupation of the Structure. This may account for it giving a date which predated the postholes in the Structure.

In summary the radiocarbon dates obtained from the Structure present an unexpected, if less than precise, picture of the stratigraphical horizons at Callestick. If the first, very early, date from behind the wall is discounted and the two dates from layers [17] and [22] are treated with caution and the ceramic evidence is considered, then we can build up a model for the chronological sequence at Callestick. This could mean that the construction of the Structure may date from the 10th to late 11th century BC. The evidence from the postholes and from the main infill deposit indicates that the site of the Structure was infilled sometime between the 9th to 5th centuries BC. It is therefore suggested that the Structure was built around the end of the 11th century BC and given the lack of Iron Age ceramics, was abandoned by the 9th to 7th centuries BC.

7 Discussion: Context and Interpretation

7.1 Introduction

The excavation at Callestick was significant because it provided a considerable amount of information about the Later Bronze Age (circa 1100–700 BC). The site was particularly important because there are few known sites of this period in the South West. Although the Structure was to some extent seen in isolation from its surrounding landscape, the level of preservation was good and is comparable with other (though earlier) excavated Bronze Age structures.

7.2 The Wider Context

Before considering the interpretation of the Structure, it is worth placing it within the context of changes during the second millennium BC, as currently interpreted. During this period there was a trend for ritual monuments to become less obvious and for houses and fields to become more prominent. Prior to the middle of the second millennium BC the landscape was defined by communal centres and burial mounds (eg Bradley 1993). Groups had defined themselves through their ancestral ties and reaffirmed them through rituals performed at barrows and other centres. During the middle of the second millennium this system began to break down, a new ideology began to emerge which stressed personal lines of descent and controlled management of the landscape. The landscape became increasingly enclosed and cultivated. The open landscape became transformed into field systems, reaves, linear boundaries and paddocks (Barrett 1993; 1994). This process occurred in both the uplands and the lowlands of Britain. Group ties were now primarily based around the settlement, rather than around rituals played out at barrow sites. Ritual and communal activities associated with the agricultural season and other life crises may have been performed within the setting of the settlement (Barrett *et al* 1991, 239).

It has been argued (Barrett *et al* 1991, 238; Brück 1995) that during the Later Bronze Age the settlement was the main focus for social and agricultural reproduction. Political power within the group was grounded upon the control of the land, its fertility (Brück 1995, 262), and perhaps the control of biological reproduction. In addition to the incorporation of ritual within a settlement context, the Later Bronze Age also witnessed an increase of disarticulated human bone which is found in the ditches and pits within settlement sites (Brück 1995). Carr and Knüsel (1997, 167) have interpreted this increase of disarticulated bone as being indicative of excarnation and secondary burial practices in or off settlement sites.

By the end of the second millennium BC much of the landscape was enclosed and bounded by walls and field systems. Settlements extended onto the moors and uplands (eg Bodmin Moor; Johnson and Rose 1994). However around 1000 BC (when the Callestick Structure was occupied) there is a decrease in identified settlements in the south-west (in contrast with other regions of Britain; Needham 1993), which lasts until the early Iron Age (eg Burgess 1980, 213). The evidence appears to suggest that there was a contraction in settlement, especially in the uplands (Quinnell 1994b, 76), where environmental deterioration may have led to the abandonment of settlement on the moors.

The evidence from Cornwall indicates that there may have been some changes in the location of settlements (Quinnell 1994b, 76), especially in the more exposed upland areas where some settlements may have been deserted (eg Stannon; Mercer 1970). However, much of the evidence for abandonment may be due to a diminution in the use of ceramics, which makes it difficult to identify settlement activity. The settlement information from this period is scanty and problematic (see Christie 1986; Pearce 1983, 168).

There are some indications which suggest that several Late Bronze Age settlements may have been incorrectly assigned to either the Middle Bronze Age or to the Iron Age (Silvester 1979 176–8). Some of the Iron Age sites in Devon and Cornwall could in fact have Late Bronze Age origins; likely examples include the settlements of Kes Tor and Foales Arrishes (Todd 1987, 155). Excavations have also established that the morphological criteria for distinguishing Later Bronze Age settlements from Iron Age and Middle Bronze settlements can be poor (Silvester 1979, 178). For example, the settlement at Bodrifty (Dudley 1956) had an occupation which lasted from the Bronze Age into the Iron Age. In addition the number of Bronze Age artefacts recovered during the excavation of Iron Age sites would also indicate some degree of conservatism in the location of settlements (Johnson 1980, 149, 155).

As well as an apparent lack of settlements, there were also changes in the ceramic assemblages, with the long lived Trevisker series being replaced by localised ceramic styles (see Section 4). These

changes are still poorly understood and have complicated our understanding of the period.

Much of the evidence for the Late British Bronze Age is derived from metalwork (eg Barrett 1989; Darvill 1987). During this period, votive hoards of metalwork are found in lakes and rivers, etc (Bradley and Gordon 1988; Bradley 1990). Hoards of metalwork, characteristically consisting of weaponry, are known from the South West (Pearce 1983, 163). They have been found in a number of locations in Cornwall, including Carn Brea and Kenidjack Castle (see Mercer 1981, 55; Penhallurick 1986, 213). However, many of the Cornish metalwork finds have been chance discoveries, often made by miners (Penhallurick 1986, 173–224).

Apart from votive deposits of metalwork, the evidence for ritual centres or burial sites is quite limited. Large quantities of faunal remains possibly associated with ritual feasting, within settlements are known from a number of sites; for example the settlements at Mucking, Thwing, and the Navan Fort in Ireland have produced evidence of the large scale consumption of food (Bradley 1984, 120–121; Parker-Pearson 1993, 121–122). In addition middens (McOmish 1996), cooking sites (Bradley 1984, 121), and the production of large cauldrons (Darvill 1987, 132), all indicate the importance of social feasting during the Later Bronze Age. Late Bronze Age midden mounds and hollows are well documented (eg McOmish 1996). They have been identified with feasting and consumption as well as with the disposal of rubbish. Middens can also have symbolic connotations, as they can be produced by socially bonding activities. Repetitive social acts may have led to a symbolic heap, linked to fertility, affluence or success (Needham and Spence 1997, 85). The evidence would suggest that there was an extension of ritual practices which had began during Middle Bronze Age. In short, during the Late Bronze Age, settlements may have become increasingly important as arenas for political conflicts and ritual displays (Barrett *et al* 1990, 238–239).

However due to the lack of excavated Later Bronze Age sites this type of evidence is sadly lacking in Cornwall. Ritual hollows and a ritual structure were identified within the Middle Bronze Age settlement at Trethellan Farm (Nowakowski 1991), but there are no comparable Late Bronze Age midden mounds, or feasting sites.

It is against this background of long term social change that the Structure must be considered. In some ways the Structure was similar to excavated structures dating to the Middle Bronze Age; there are comparisons with the 'domestic' settlements of Trethellan Farm (Nowakowski 1991), Gwithian (Thomas 1958; Nowakowski 1989), Penhale Moor (Jones *et al* 1994), and Trevisker Round (Apsimon and Greenfield 1972). There are nonetheless differences in both the construction and the abandonment of the Structure which indicates that it may have been quite different in nature from the above examples.

7.3 Architecture

Architecturally the Structure at Callestick is broadly similar to some of the excavated Middle Bronze Age buildings in Cornwall. It was a stone and wood structure set into a hollow. This type of construction has been recorded in Cornwall at Trethellan Farm (Nowakowski 1991), Trevisker (Apsimon and Greenfield 1972), Penhale Round (Nowakowski 1998) and Penhale Moor (Jones *et al*, 1994). Structures set within hollows have also been found further afield at Heatree in Devon (Quinnell 1991), and at Brean Down in Somerset (Bell 1990).

Although most of the materials used in the building of the Structure have perished over time, the evidence from the surviving walling and the postholes does provide some clues to its appearance. The wall seems to have been made from stone and earth, and is perhaps analogous to the 'Cornish Hedge' in its construction. The walling at Callestick is comparable with the stone walls of the houses in the highland zones (eg Bodmin Moor and Dartmoor); however, the lack of suitable stone meant that earth was more of a component in the walling of the Callestick Structure. There was no

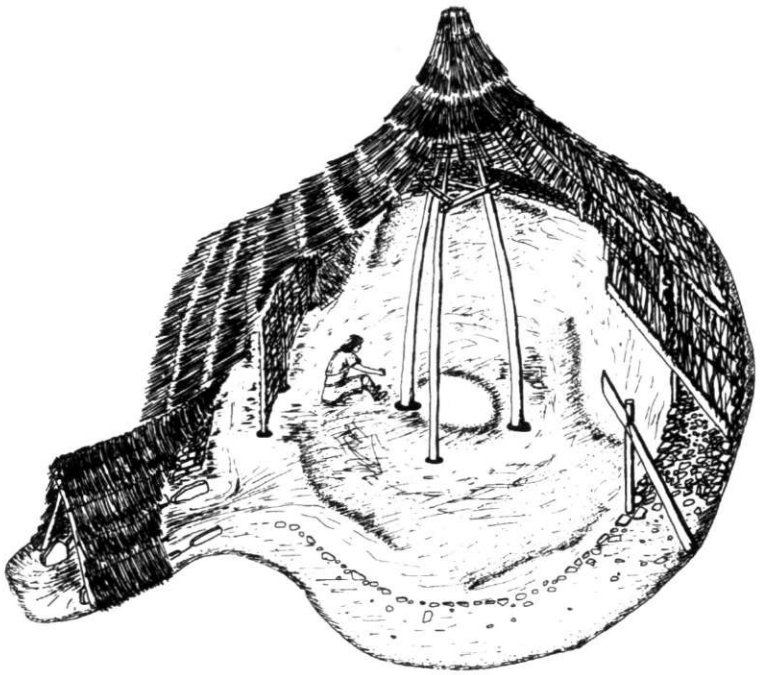

Fig 15 Reconstruction of Structure 26

trace of any daub fragments or wattle, so the walling around the Structure may have consisted of bare stone and earth. It is of course possible that the walls and timbers of the Structure were engraved, painted, or perhaps decorated in ways which have left no evidence in the archaeological record (eg Hodder 1982; Layton 1991; Denyer 1978).

The posts in the house could have been oak, as this is a strong wood which has successfully been used in reconstructed houses (Reynolds 1993, 96). The rafters in the roof may have been made from a wood which provides suitable poles, for example ash. A hazel 'basket like' frame may then have been secured to the rafters. The roof could then have been covered by straw, reeds, rushes, or turf. For the purposes of the reconstruction drawings (Figs 15 and 16) the roof is shown covered by reeds. This material was chosen as the most likely roof material because of its durability and because of the scarcity of cultigen evidence in the environmental samples.

In other aspects, however, the construction of the Callestick Structure differs from many of the excavated Bronze Age roundhouses in southern Britain.

The major structural element in the majority of Bronze Age roundhouses was the interior timber post-ring (or rings), designed to support the roof of the Structure. Within Cornwall single and double post-ring buildings have been identified. Single post-ring buildings were uncovered, for example at Stannon Down (Mercer 1970), whilst double post-ring structures were found at Trevisker (Apsimon and Greenfield 1972) and at Trethellan Farm (Nowakowski 1991). The Structure does not appear to have had a post-ring to support the weight of the roof. Instead of an interior post-ring, the roof was supported upon a ring of timber posts which were set in to the wall of the Structure and probably upon three posts in the centre of the building. The absence of an interior post-ring is not altogether unparalleled within the South West. Excavated structures at Brean Down (Bell 1990), Shaugh Moor (Wainwright and Smith 1980) and perhaps Heatree (Quinnell 1991), have all produced examples of

structures which lacked internal post-rings to support the roof. However internal, or indeed external, roof posts could have rested upon flat stones (post-pads), rather than being set into postholes. Such an arrangement would leave little trace in the archaeological record at Callestick, since the site had been 'tidied up' during an abandonment phase.

Unlike other recently excavated Middle Bronze Age structures in Cornwall (Trethellan Farm, or Penhale Moor) the Structure only had one identifiable phase of construction and use. Initially the Structure was interpreted as short-lived, perhaps constructed for a certain purpose and then demolished. The range of radiocarbon dates, however, provides evidence for a longer-lived building, which lasted for perhaps two centuries or longer than was first anticipated. Recent excavations have demonstrated the longevity of roundhouse structures; for example at Shaugh Moor roundhouses may have lasted for several centuries (Wainwright and Smith 1980, 109). On the basis of the Butser experimental work, Reynolds concluded that with proper maintenance a roundhouse could have lasted for many generations (Reynolds 1989, 37).

Porched roundhouses are scarce in lowland Cornwall (there was a porched structure at Gwithian; Thomas 1958); however, they are well documented in other parts of Britain (eg Thorny Down and Blackpatch; Ellison 1987; Drewett 1982). It has been argued that the aggrandised porch largely replaced the hearth as the main symbolic focus of the house from the Middle Bronze Age onwards (Parker-Pearson and Richards 1993). At Callestick the porch was certainly one of the most important elements within the Structure. Its importance was perhaps emphasised by the manner in which it was sealed when the Structure was abandoned.

7.4 The Layout, Orientation and Location

It has been suggested that the normal settlement pattern in southern Britain consisted of a small linear group of houses associated with ancillary buildings (Ellison 1981; 1987), as for example at Blackpatch (Drewett 1982). Ellison (1981, 417–420) has argued that in southern Britain Bronze Age settlements were based around a mixed economy which consisted of livestock management and cereal crops.

However, contrary to Ellison's model, recent excavations and landscape survey in Cornwall (eg Johnson and Rose 1994; Nowakowski 1991; Smith and Harris 1982, etc) have demonstrated that there was considerable diversity in the internal layout of settlements, and in house typology during the Bronze Age. Despite the variation in settlement arrangements, most evidence would support Ellison's suggestion that individual structures were formally spaced and the activities within them formally organised.

Due to the restricted nature of the area affected by the pipeline it was not possible to determine for certain whether the Callestick Structure was in a group as at Trethellan Farm, or whether it stood in isolation, as at Poldowrian (Smith and Harris 1982). However, the results from the second geophysical survey (Linford 1997) imply that the Callestick Structure may have been located near to a settlement of three or possibly four large circular features, situated approximately 70 metres to the west of the Structure. Although their contemporaniety with the excavated Structure is unclear, they are probably Bronze Age roundhouses.

The features shown on the geophysical survey appear to have been arranged in a line although the spacing between them was uneven; the Structure is detached from the linear arrangement but is near enough to have been a component in a single settlement. These roundhouse type anomalies seem to be free-standing and do not appear to have been associated with a field system (Linford 1997). Linear arrangements of roundhouses have been excavated in other areas of Britain for example Blackpatch in Sussex (Drewett 1987), as well as in Cornwall, where they have been found both within field systems as at Trewey Foage (Dudley 1941), and as free-standing units, for example Sperris Croft (Dudley 1957), where they were not located within associated fields. The Bronze Age

roundhouses at Trethellan Farm were also arranged along a terrace (Nowakowski 1991), and there was a high degree of functional or non-ritual use of space within the settlement.

A second possible area for contemporary settlement was discovered during the fieldwork along the pipeline. A Bronze Age pot sherd and flints were recovered from the 'Anciently Enclosed Land' 650m to the north-east of the Structure (SW 775 507) (Jones 1997). No structures were uncovered by the pipeline in this area, but it is possible that undetected structures lay outside the confines of the pipeline corridor.

The south-facing orientation conforms to a general trend in aspect of many Bronze Age structures. In southern Britain the majority of Bronze Age structures have doorways which face towards the south; examples include Lofts Farm in Essex (Brown 1988), Blackpatch in Sussex (Drewett 1987), Heatree (Quinnell 1991) and Shaugh Moor (Wainwright and Smith 1980) in Devon, Stannon Down (Mercer 1970) and Trethellan Farm (Nowakowski 1991) in Cornwall. In his discussion of the Bronze Age houses of Dartmoor, Hammond (1979, 150) suggested that the doors of many houses were oriented from the south-west to the south-east to provide protection from the wind, as well as maximising the amount of daylight entering the Structure. At Blackpatch it has been argued (Drewett 1982, 339) that the daylight was utilised for activities such as weaving, leather and bone working. These arguments are not altogether satisfactory as they do not explain why houses of the succeeding period are not all oriented to the south as well (for example Carn Euny; Christie 1978). Recent studies of the relationship between doorways and climatic conditions have found that whereas local wind patterns are extremely variable, roundhouse entrances are not (Oswald 1997, 90–91). It therefore seems unlikely that the direction of the prevailing wind played much part in the orientation of house entrances. In the context of Callestick, the porch would have reduced light entering the building rather than maximising it. It is perhaps worth considering that the orientation of Bronze Age structures may be derived from cultural influences rather than from functional practicalities.

Location should also be considered in the case of the orientation of the Callestick Structure. The Structure was situated on the edge of what has been termed 'Recently Enclosed Land' (see Section 1.2), marginal heathland which became enclosed a little over a hundred years ago. No archaeological features were found in the immediate vicinity of the Structure and very few artefacts were recovered during the closely monitored topsoil strip of the surrounding area. Indeed the only artefacts (flints or pottery) found in the 'Recently Enclosed Land' at Callestick were discovered within a few metres of the Structure. The results contrast strongly with the adjacent 'Anciently Enclosed Land' (which was not subjected to a controlled topsoil strip) to the north-east, where a number of prehistoric artefacts were recovered (Jones 1997).

The Callestick Structure may have been deliberately sited in a marginal, unused space. It was set between and apart from the potential settlement areas (to the west and north-east) and the heathland to the south, where the dead had traditionally been buried. The doorway of the Structure did not overlook the areas of probable habitation, but instead faced the open downland, where the most prominent features would have been the earlier round barrow monuments to the dead (including those that still survive).

7.5 The Function

Ellison (1981) identified three types of structures that were associated with Bronze Age settlements. The largest of these was the *Major residential structure*. These buildings ranged between 6 to over 15 metres in diameter. High concentrations of fine ware pottery and other artefacts are found inside them and they frequently had porches. The second category is the *Ancillary structure*. These structures contained coarsewares and internal storage features. They average approximately 4 to 8 metres in size. The last category of settlement structure is the *Animal shelter*. These buildings are characterised by the absence of domestic finds and extensive wear on the floor.

Unusually the Callestick Structure does not appear to conform to any of the categories defined by Ellison. The analysis of the evidence from the construction and abandonment of the Structure reveals that it is a seemingly unique example of a hitherto unrecognised class of building. The function of the Structure is interpreted as being 'ritual' in nature. It is argued that the Structure may have been constructed as a means of controlling the 'crisis' situations, which Barrett *et al* (1991) and Brück (1995) have suggested would have taken place within the settlement during the Later Bronze Age.

One of the major 'crisis' situations which all communities face is death. The period of time between the death of an individual and their final internment, is often regarded as a transitional or liminal phase where the individual is neither alive or deceased. Exposure of the dead, prior to burial, may have taken place in a variety of locations (see Barley 1995; Metcalf and Huntington 1991). Carr and Knüsel's study of human bone from Later Bronze Age and Iron Age sites (1997, 171) concluded that where excarnation occurred on settlement sites, it would have taken place in controlled, sheltered conditions. It is conceivable that the Structure may have functioned as a place where the dead were stored, prior to their assimilation into the ancestral community.

7.6 The Abandonment

The infilling or burial of Bronze Age settlements and houses has been noted on other Bronze and Iron Age settlements in Britain. At Potterne in Wiltshire, a Late Bronze Age settlement was discovered sealed beneath a midden deposit which covered at least 5 hectares and was up to approximately 1 metre deep (Gingell and Lawson 1983; 1984). At All Cannings Cross (also in Wiltshire) structures and floors were sealed beneath a similar deposit (Mark Corney, pers comm).

This form of abandonment is an increasingly recognisable feature of excavated lowland Bronze Age settlements in Cornwall, although the exact pattern varies between sites. The dismantling and infilling of structures seems to have occurred throughout the Bronze Age, on all types of settlement, regardless of whether they were small farmsteads as at Trevisker and Penhale Moor, or larger settlements, as at Trethellan Farm. The evidence from Callestick demonstrates that the process was still happening in the Later Bronze Age. This manner of destruction and abandonment has led some archaeologists to conclude that buildings were being ritually closed, and were perhaps being symbolically killed (Nowakowski 1991). As Nowakowski (1991, 209) has stated, the reasons behind this behaviour are 'embedded in now unfathomable social and cultural matters', which in the case of the wholesale abandonment of a fairly large settlement may have been linked to population pressures or a depletion of available resources, etc. However, the ubiquity of this practice suggests that the abandonment process was linked to the life cycle of the settlement and drew upon earlier traditions associated with the rituals and the disposal of the dead beneath round barrows.

7.7 The Evidence for Structured Deposition

In recent years there has been an increased interest in the way that artefacts enter the archaeological record and become incorporated within prehistoric sites (eg Hill 1995; Thomas 1991). Archaeologists are becoming aware that many everyday objects can contain meanings and have frequently been deliberately incorporated into archaeological contexts. Such incorporation is often referred to as structured deposition.

The deposition of many of the artefacts within the Structure was of an unusual nature and provides some evidence for structured deposition, although the majority of the artefacts within the general infilling material show no overall concentration and do not appear to have been deposited with any care. Apart from the deposits within the postholes (particularly the central posthole),

vessels **P1**, **P2**, and **P5**, and stone artefacts **No 69**, **No 71**, **No 87**, **No 88**, **No 89**, and **No 92**, within the wall, and perhaps the inverted saddle quern **No 35**, none can be argued to have been deliberately placed within the Structure.

The placing of artefacts within postholes is documented in association with the abandonment of prehistoric structures (see Pollard 1992; 1995). The central posthole was filled by a deposit of small quartz stones, charcoal, and polished stone object **No 80**, which may have been used for the grinding of a mineral pigment (see Section 4 above). The deposit was highly sorted and is unlikely to have entered the posthole by chance. Posthole [6] to the left of the entrance was the only posthole to contain pottery. The deposition of pottery within this posthole could be significant, as it was located in the only part of the house where large amounts of pottery had been deliberately placed behind the wall.

Sherds from vessels can be demonstrated to have been deliberately placed within the Structure. All three vessels were located to the left of the entrance (though one sherd of Vessel **P2** was found behind the wall to the right of the entrance) (Fig 8). The entranceway of a structure is an obvious focal point, as it marks the threshold between the inside of a building and the outside world. The structured deposition of artefacts near to the entrance would have emphasised the transition from one space to another (Oswald 1997, 94). Vessel **P1** was half of a globular jar. It was placed behind the wall of the Structure. This pot may have been positioned behind the wall as some form of foundation deposit. Sherds from Vessel **P2** were recovered from behind the wall of the Structure and from the general infilling layers. The evidence could indicate that after parts of the vessel had been incorporated behind the wall, some of the remaining sherds of vessel **P2** were possibly incorporated within a nearby midden, which was then used to backfill the Structure. The placing of sherds of Vessel **P5** was also significant. They were located to the left of the entrance, situated on top of the wall above the original pottery deposit. Further sherds were found within posthole [6] and from behind the wall. This vessel may have been deposited on the site in a fragmentary state (see section 4 above). The evidence indicates that **P5** may have been retained or curated in a fragmentary state during the life of the Structure, only to finally be buried at the end of the 'life' of the Structure. The ritual deposition of pottery is known from other earlier Bronze Age settlements in Cornwall. Ritual structure 2192 at Trethellan Farm contained two discrete depositions of pottery. One deposit was just inside the entranceway and the other was located at the back of the building (Nowakowski 1991, 99). The deposition of pottery within a restricted context is also reminiscent of some of the behaviour associated with Cornish round barrow sites. The recent excavations at the Trelowthas barrow revealed concentrations of curated pot sherds at particular locales in the ditch circuit (Nowakowski forthcoming). The deposition of broken pottery at a specific place in the Structure may indicate echoes of earlier traditions associated with barrow rituals.

Several stone mullers, rubbers and a quern were also incorporated within the Structure's walling. The deliberate incorporation of these artefacts is of interest as they could have been linked to agricultural tasks, food preparation, or the production of other materials (see Section 4). They may therefore have carried some symbolic associations. The inclusion of quern **No 35** within the matrix of the infill of the house may also have had symbolic connotations. Saddle querns have been found in association with the abandonment process at other Bronze Age sites in Cornwall. Three saddle querns were recovered from abandonment layers within two of the houses at Trethellan Farm (Nowakowski 1991, 25, 145). Two of the querns had been deliberately hidden within pits and a third was included within the infill deposits. Querns were used for the transformation of crops into food and they may have become symbols of agricultural fertility or of the process of transformation. The inclusion of a broken inverted quern within the Callestick Structure may have been a metaphor, perhaps for the end of the life of the Structure.

7.8 Discussion and Interpretation

The interpretation of the Structure has its difficulties, as it was not possible to investigate much of the surrounding landscape. However interpretations can be put forward as to its function and symbolism.

Buildings have varying functions; they give shelter, warmth, and can be allocated for different tasks, for example for food preparation, or storage. On another level they can provide an excellent expression of a group's cosmology or symbolism (eg Richards 1990). Ethnographic analysis has shown that buildings can be associated with many aspects of human life, as they provide a medium which can easily be subdivided (eg Kent 1990) into parts with differing functions and meanings. For example a building can be subdivided to represent cosmological ideas, or different genders (see Parker-Pearson and Richards 1993 for examples). Buildings can also act as a place of socialisation. Through the activities performed there, they may serve to consciously and, perhaps more importantly subconsciously (Gosden 1994), inculcate the people who use them with the norms, values, beliefs and myths of the group (Bourdieu 1977; Parker-Pearson and Richards 1993).

Despite the changes that had taken place since the Middle Bronze Age it is unlikely that ritual practices would have been totally abandoned in favour of purely pragmatic agriculturalism (eg Bradley 1998). Recent research suggests that there can be a link between the house and the dead. Richard Bradley (1996) has suggested that the 'lifespans' of the longhouses of Neolithic Europe were tied to the lifespan of the inhabitants of the house; when the occupants of the building died so did the house and the site was abandoned. It is argued that this process eventually led to the formation of long barrows that represented symbolic houses (Bradley 1996; Hodder 1990). It is possible that the changes which took place in the second millennium BC may have seen a reversal in this pattern. Bradley (1998, 152–158) has argued that that there are distinct similarities between the organisation of space and artefacts within Bronze Age round barrows and roundhouses. Within the South West, Butler (1997, 137–138) has suggested that some of the roundhouses on Dartmoor may have been converted into cairns at the end of their occupation.

Two excavated Cornish structures may provide evidence of 'ritual' usage analogous to the Callestick Structure. Structure 2192 at Trethellan Farm (Nowakowski 1991) was a small subrectangular building cut into a scarp at the back of the Middle Bronze Age settlement. The building was constructed from dry stone walling which revetted the sides of the building into the slope. The entrance was fairly narrow and was located on the southern side of the building but was offset to one side, possibly to reduce the amount of daylight entering the building (Nowakowski 1991, 99). The only features in the interior of structure 2192 were a central posthole and a shallow depression to the right (east) of the doorway. Although the shape of the building is very different from that of the Callestick Structure, its lack of usage, infilling and location appear to echo some of the features found at Callestick. The floor was kept in pristine condition, except for some sherds from two Bronze Age pots. One of the pots was deposited to the right of the doorway. The other pot was near to the rear wall of the building. When structure 2192 was abandoned it was filled with large blocks of stone some of which were rough blocks of quartz (Jacqueline Nowakowski, pers comm). The location of structure 2192 is also of interest, as it was situated 'off line', within the domestic settlement, in a place that had produced evidence for earlier Bronze Age activity (Nowakowski 1991, 96). The evidence from structure 2192 led the excavator to conclude that the building was 'ritual' in nature, was not lived in, and may have been entered infrequently.

However the site which perhaps provides the closest comparison with Callestick is the structure at Harlyn Bay, traditionally assigned to the Iron Age (Whimster 1977). The dating evidence from this building with no Iron Age finds, is tenuous and it was dated to the Iron Age because of its close proximity to an Iron Age cemetery which was excavated early in the 20th century (Bullen 1912). Iron Age settlements and cemeteries sometimes occur in close proximity to Bronze Age settlements (as at Trethellan Farm). If the Harlyn Bay building can be reassigned to the Bronze Age then there

are close parallels between the sites both in terms of the construction, abandonment and possibly usage. The Harlyn Bay structure consisted of a circular hollow lined by a stone wall; the entrance was not identified and the full diameter was not exposed as a museum building covered part of the building. In common with Callestick, the building had a clean floor and did not contain any occupation deposits; although there were two burnt patches on the floor, it apparently did not contain a hearth and was devoid of internal divisions. When it was abandoned, the posts were removed, the postholes infilled, and the hollow backfilled.

The Harlyn Bay building was interpreted as an Iron Age shrine or mortuary house associated with the adjacent cemetery (Whimster 1977). Other than the date this interpretation need not be entirely incorrect. It is possible that the circular building at Harlyn Bay, and the Callestick Structures belong to a specialised class of building which was perhaps associated with death or other 'rites of passage' rituals.

In Cornwall burials have been found within settlement sites (despite the usually acidic soil conditions). For example a burial was located under a hearth in one of the Trethellan Farm houses (Nowakowski 1991, 45). A child's skeleton was also recovered from under the wall of house 3 at Gwithian (Nowakowski 1989, 18). This suggests that in some contexts a 'domestic' building can incorporate funerary type behaviour.

No human remains were recovered from Callestick, but this is hardly surprising given that the acid soils would have destroyed any traces of bone. However some of the features and the related behaviour that took place at Callestick would perhaps have been more usually associated with activities at barrow sites.

The porch on the Callestick Structure may have had a symbolic purpose. The length of the porch would have ensured that it was impossible to see what was occurring inside the Structure from the outside. Conversely people inside the Structure would have been unable to see what was occurring in the outside world. Access into the Structure would also have been restricted, as the dimensions of the porch would have allowed only one person to pass along the passage at any one time. The passage may have served to separate the outside world from the events taking place within the Structure. When the Structure was abandoned great pains were taken to build a blocking wall across it out of quartz blocks. In functional terms this wall would have been totally unnecessary, as access to the Structure would no longer have been possible when the house was infilled. The wall may have been built to maintain the division between what had occurred inside the Structure from the outside world. Even after its abandonment, the interior of the Structure may have been considered taboo, or perhaps dangerous to the uninitiated. The blocking is analogous to the closure of Neolithic chambered tombs (eg Thomas 1991). The selection of quartz blocks for the wall also has parallels in the kerbs and associated structures of round barrows (Dudley 1964, Miles 1975). This again points to the usage of the Structure as being ritual which was blocked off with 'powerful stones' when it was finished with.

The interior of the Structure was filled by a Late Bronze Age deposit, but which also contained pottery of an earlier Bronze Age date. The inclusion of curated sherds of pottery (see Section 4) within this deposit suggests that they could have come from a stockpile, or perhaps a special deposit. The main infilling deposit could have gradually accumulated during the 'lifetime' of the Structure and may have been formed through activities associated with the use of the Structure. The pottery may have been deliberately held for a considerable period of time to be finally deposited into the interior of the Structure. This would explain why the fill was devoid of any artefacts contemporary with the dates suggested for the use of the Structure.

The final filling of the Structure probably resulted in the hollow being transformed into a low mound, which would have resembled a platform barrow (Fig 16). This interpretation is somewhat strengthened by the addition of the ring of quartz stones, which was placed around the edge of the infilled hollow. Once again there is an indication that earlier traditions associated with the creation of ring cairns or burial mounds (eg Miles 1975) were being drawn upon in the closure of the Structure.

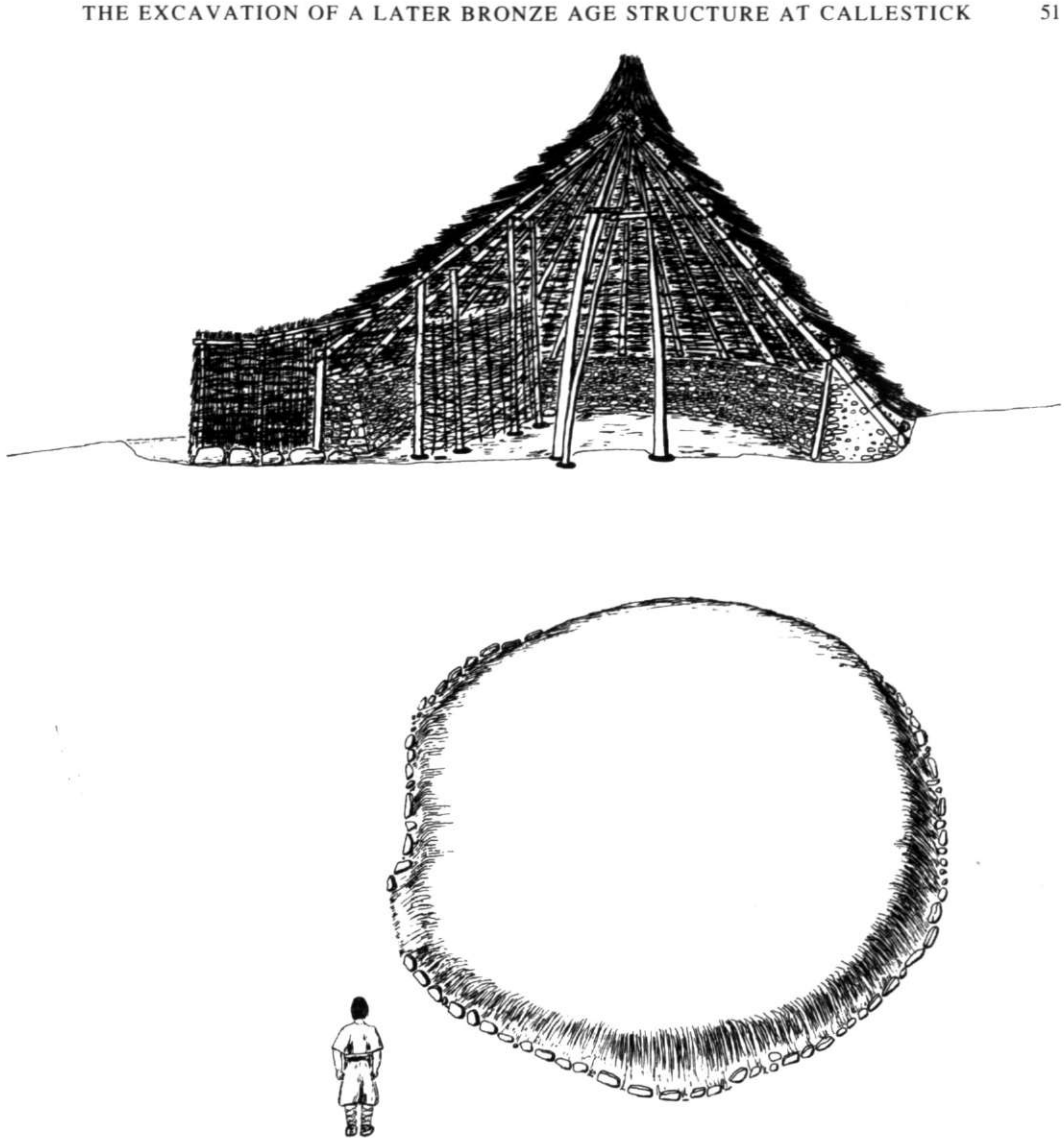

Fig 16 Reconstructions of Structure 26, cross-section (upper), after infilling (lower)

8 Conclusion

It is postulated that the Callestick Structure was a relatively long lived single phased building dating to the Later Bronze Age. The flint assemblage and the early radiocarbon date from context [5] indicate that the locality was already inhabited and that the area may have been a focal point for earlier groups of people. It is also argued that the Structure has affinities with other excavated earlier Bronze Age buildings in Cornwall, but it also had an unusual nature which distinguishes it from most of the Middle Bronze Age structures which have previously been investigated in Cornwall.

It is further suggested that the uniqueness of this building is related to activities that were performed there. It is possible that the Structure was associated with mortuary ritual, or perhaps with

other activities associated with rites of passage. It is also argued that many of the features associated with the closure or the 'death' of the Structure were drawn or borrowed from earlier traditions related to barrow construction. If these hypotheses are correct they may indicate that the Later Bronze Age in Cornwall contained elements of continuity, as well as those of profound change.

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The excavation of a Bronze Age enclosure at Liskeard Junior and Infant School

ANDY M JONES with contributions from SOPHIE LAMB, ANNA LAWSON JONES, HENRIETTA QUINNELL, VANESSA STRAKER and ROGER TAYLOR

Summary

The identification of a ditch during site works at Liskeard Junior and Infant School in July 1996 led to a brief archaeological excavation. However the site was badly truncated and only a single undiagnostic flint was recovered from the ditch. A subsequent geophysical survey of the playing field revealed that the circuit of the ditch was much larger than had been expected and that it probably encircled much of the hilltop.

In December 1996 the Transportation and Estates Department of Cornwall County Council funded a second stage of archaeological recording prior to the start of the Stage 2 construction work. Cornwall Archaeological Unit monitored the topsoil removal and recorded the exposed features over a five day period. The ditch was the earliest feature on the site. The majority of the other features were found to contain artefacts of medieval or later date. However the excavated ditch section produced several sherds of probable Middle Bronze Age pottery. The dating was confirmed by two radiocarbon dates with a range between 1396 and 840 BC. The results of the fieldwork at Liskeard are important because they indicate that the hilltop had been enclosed during the Bronze Age. Large enclosure sites dating to this period are generally rare in Britain, and none had previously been identified by scientific dating in Cornwall.

1 Introduction

1.1 Background

The excavations at Liskeard Junior and Infants School occurred in two stages during 1996. The initial investigations in the playing field revealed the existence of a ditch (Jones 1996), only discovered during the course of preliminary construction work, which resulted in sections of the ditch being truncated. These excavations established that the ditch was a substantial feature approximately 1 metre deep (after truncation), with sheer sides and a flat base. Only one undiagnostic flint was recovered from its fill. The size and profile of the ditch suggested that it was of the type that may have encircled a prehistoric round, a farming settlement typical of the Iron Age or the Romano-British periods (400 BC–AD 400). However, geophysical survey, carried out after the first phase fieldwork, revealed that the ditch enclosed a much larger area than would be expected

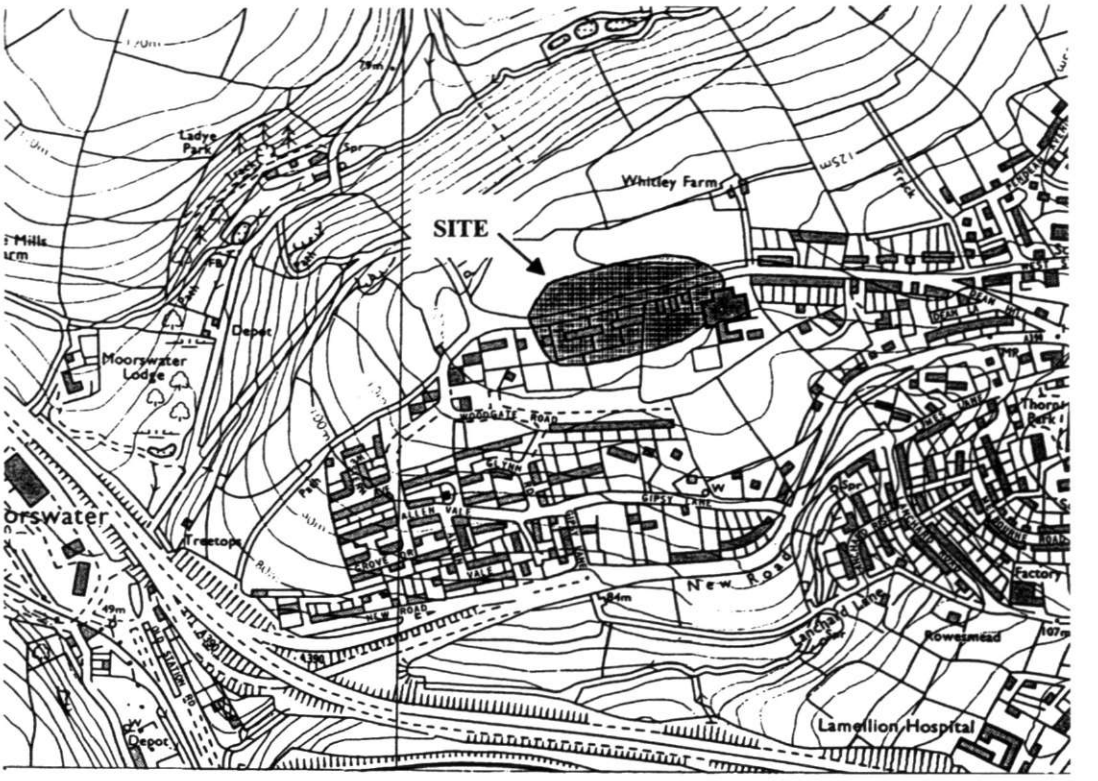

Fig 1 Site plan showing the conjectural extent of the site. (© Crown Copyright. All rights reserved. Cornwall County Council Licence number LA076538 99/01)

for a round, suggesting that it may have encircled much of the hilltop (Fig 1). In December 1996 the Transportation and Estates Department of Cornwall County Council funded a second phase of archaeological fieldwork at the school, prior to the start of the Stage 2 construction work (Jones 1997). The Stage 2 development consisted of a classroom block and a small carpark, situated in the middle of the playing field.

1.2 Topography

The Liskeard Junior School playing field (SX 243 647) is situated on the western fringes of Liskeard (Fig 1). The field is located in an elevated position (125m OD) fairly close to the western end of a broad, prominent spur, within what has been characterised as 'Anciently Enclosed Land' (Cornwall County Council 1996). 'Anciently Enclosed Land' is farmland thought to have its origins in the medieval period, if not earlier; at least some medieval activity is confirmed by the finds recovered during the excavations. One of the two Earldom and Duchy of Cornwall deer parks lies just 200m to the north and the medieval town of Liskeard is half a mile to the east. The field was used for sports and recreation, and was down to grass. Soils at this location belong to the Denbigh series. The topsoil was a dark brown loamy soil with shillet and quartz inclusions, between 0.20 and 0.60 metres deep. The bedrock was a mixture of shillet and clay, which in places, outcropped very close to the surface. Much of the area to the south and the east of the playing field has been redeveloped

for housing. However, despite this, it is still evident that the enclosure would have occupied a commanding position with extensive views over a large part of the surrounding landscape, though not to the north where the spur continues to rise slightly outside the enclosure.

1.3 The Excavation Methodology

The work carried out in 1996 was conducted by Cornwall Archaeological Unit (CAU), Cornwall County Council, with the assistance of many volunteers from Liskeard and St Austell colleges' 'A' level archaeology classes and from the Cornwall Archaeological Society. The area of the Stage 2 excavations was stripped of topsoil by a mechanical swing shovel, under the supervision of CAU, to the level at which archaeological features were visible.

The excavations were planned at scales of 1:100 and 1:200; subsequent sections were drawn at 1:10. Soil samples were taken from contexts which were considered to have the greatest potential for either palaeoenvironmental analysis or radiocarbon dating.

The initial results from each stage of the excavations were produced by CAU as separate archive reports (Jones 1996 and Jones 1997).

2 The Geophysical Survey

2.1 Introduction

Two geophysical surveys were carried out at Liskeard Junior School playing field (Fig 2). The first survey was recommended by CAU following the discovery of the enclosure ditch during the first stages of the development. A magnetometer survey was undertaken by Geophysical Surveys of Bradford (GSB report 96/82) in September 1996. The survey was divided into two areas, which were situated either side of the Stage 1 development. Area A was located to the west and covered the site of the Stage 2 development. Area B was located to the east and covered the site of Stage 3, which was to be developed for housing.

The second geophysical survey, using a resistivity meter, was carried out by Mike Peacock, a local amateur archaeologist, after the Stage 2 fieldwork. This survey was located at the western end of the playing field, outside the areas affected by the development. For the purposes of the report Mike Peacock's survey will be referred to as Area C.

2.2 Results

The geophysical survey of Area A revealed a number of linear and curvilinear features. The enclosure ditch (**C**) (Fig 2) was shown to continue as a segmented linear anomaly along the length of the site, rather than curving across it as had been anticipated.

The geophysical survey of Area A also revealed a number of other features, including a pair of parallel ditches (**D**) which were associated with a removed field boundary. Another linear anomaly (**E**) which adjoined the end of the parallel ditches was also identified as a removed field boundary. Other linear responses were revealed by the survey, but most of these were probably the result of recent disturbances. A semi-circular feature (**F**) was identified in the middle of the survey area. This feature had a diameter of approximately 26 metres, but its function and relationship with the enclosure remain uncertain, as it was not disturbed by the construction work. Figure 2 indicates that if Feature F had been a complete circle, it would have been wholly contained by the enclosure.

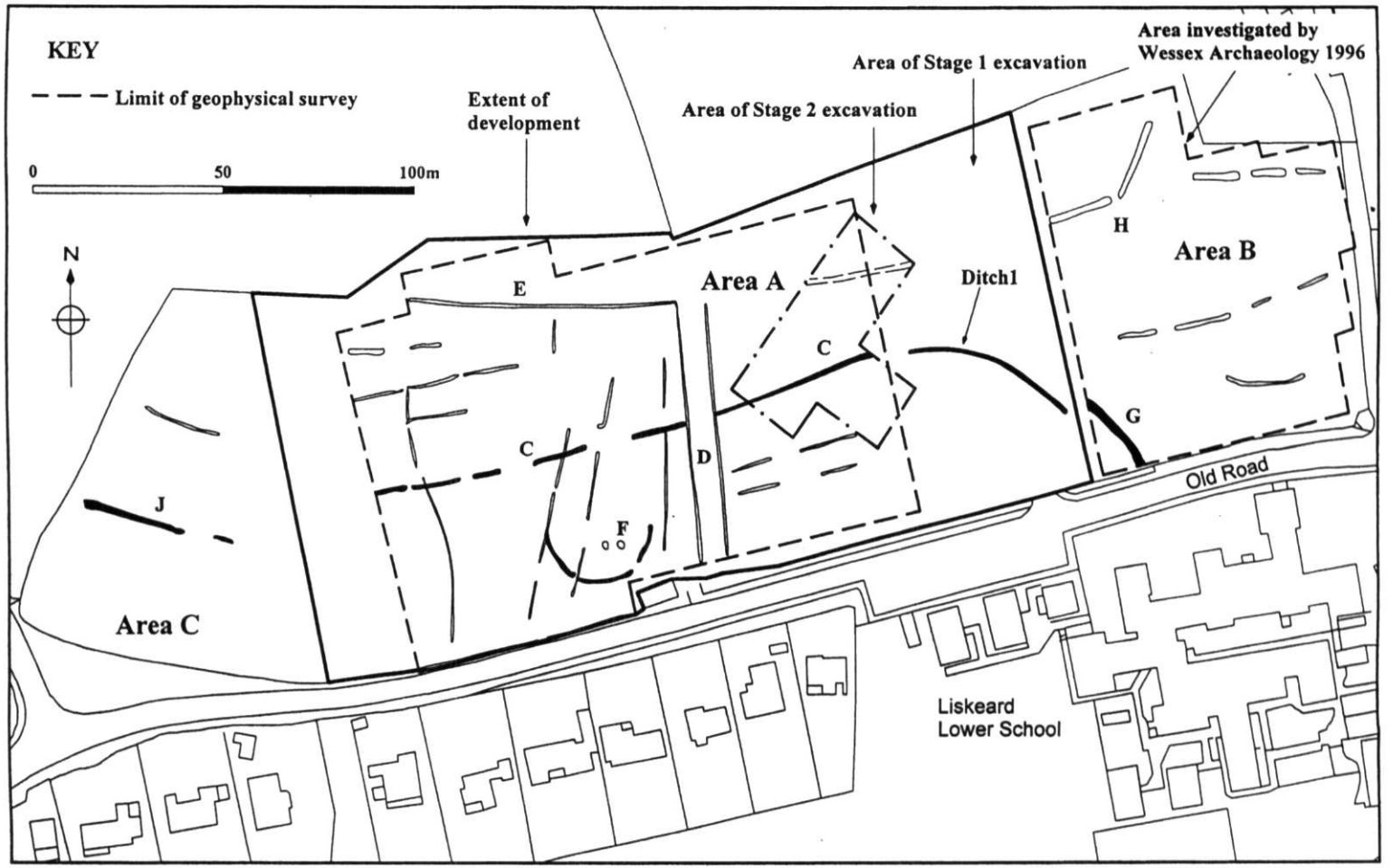

Fig 2 Site location plan showing Ditch [1] and the areas of the geophysical surveys. based upon a plan by Geophysical Surveys of Bradford. (© Crown Copyright. All rights reserved. Cornwall County Council Licence number LA076538 99/01)

Area B also contained a number of linear anomalies, including a possible enclosure in the northern part of the survey area (**H**). The enclosure ditch (labelled **G** in this area) was found to continue into the western corner of Area B, where it turned sharply and disappeared under the road.

The results from Area C show a large, segmented ditch (**J**) continuing for a further 45 metres beyond (**C**). However this ditch appears to be on a different alignment to (**C**), so their relationship is not obvious.

2.3 Discussion

The results from the geophysical surveys revealed a number of significant anomalies. The surveys clearly demonstrated that the ditch did not define, as had been expected, a small circular shape but a much larger area, which possibly enclosed a large part of the spur. They also suggested that the main enclosure ditch was segmented, rather than continuous.

The dislocation between the alignment of ditches in Areas A and C could suggest that the site is more complex than had been anticipated. The lack of a clear relationship between ditch **J** in Area C and the main enclosure ditch means that it is probable that the enclosure ditch turned towards the road in the unsurveyed space between survey Areas A and C. However only further archaeological investigation of the zone between Areas A and C will resolve this question.

3 A Stratigraphic Summary of the Excavated Features

3.1 Introduction

The uneven removal of topsoil during stripping within the Stage 1 (Fig 2) area truncated the majority of the archaeological features. This truncation was so severe that only deeply cut features remained; any ephemeral features will have been entirely removed.

Within the Stage 2 area the topsoil strip was confined to the extent of the outline of the proposed 'T' shaped building (Fig 3). The 'top' of the 'T' was 56 metres long and approximately 20 metres wide. The other arm measured approximately 19.5 metres by 19.5 metres. Many of the anomalies that had been identified by the geophysical survey fell outside the investigated area. However the enclosure ditch lay within it.

3.2 The Results

The main enclosure ditch (Ditch [1], Figs 2 and 3), was the only major archaeological feature to survive on the site. It ran through the centre of both stripped areas, with no breaks or causeways within the circuit of the ditch. It measured up to 2.20 metres wide and 1.20 metres deep, with almost vertical sides and a flat base.

Within the Stage 1 area Ditch [1] had become infilled by horizontal bands of shillet and clays. The fills of the ditch did not appear to have trickled in from the sides, perhaps indicating that the ditch was deliberately backfilled. There was no sign of any bank on the inside, southern face of the ditch, although a few large stone blocks were noted on its inside edge. These stones may have represented the last remnants of revetment for a bank. The bases of three postholes and a stakehole (features: [20], [21], [22] and [23] respectively) were picked up along the edges of the ditch (Fig 3). Even though approximately 50% of the ditch within the Stage 1 area was entirely emptied, it was almost totally devoid of finds (apart from 1 flint).

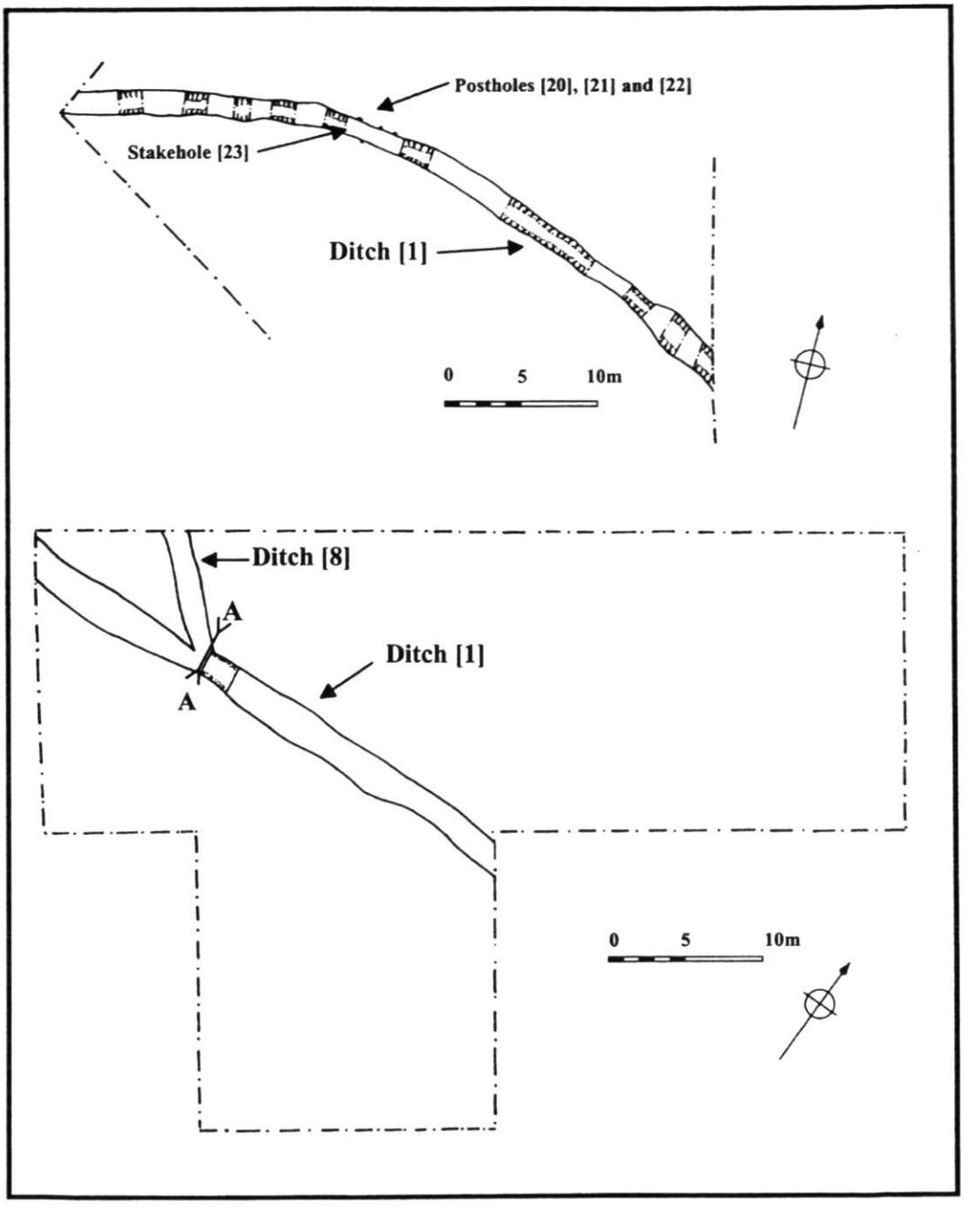

Fig 3 Post excavation plans showing Ditch [1], Stage 1 area (upper), Stage 2 area (lower)

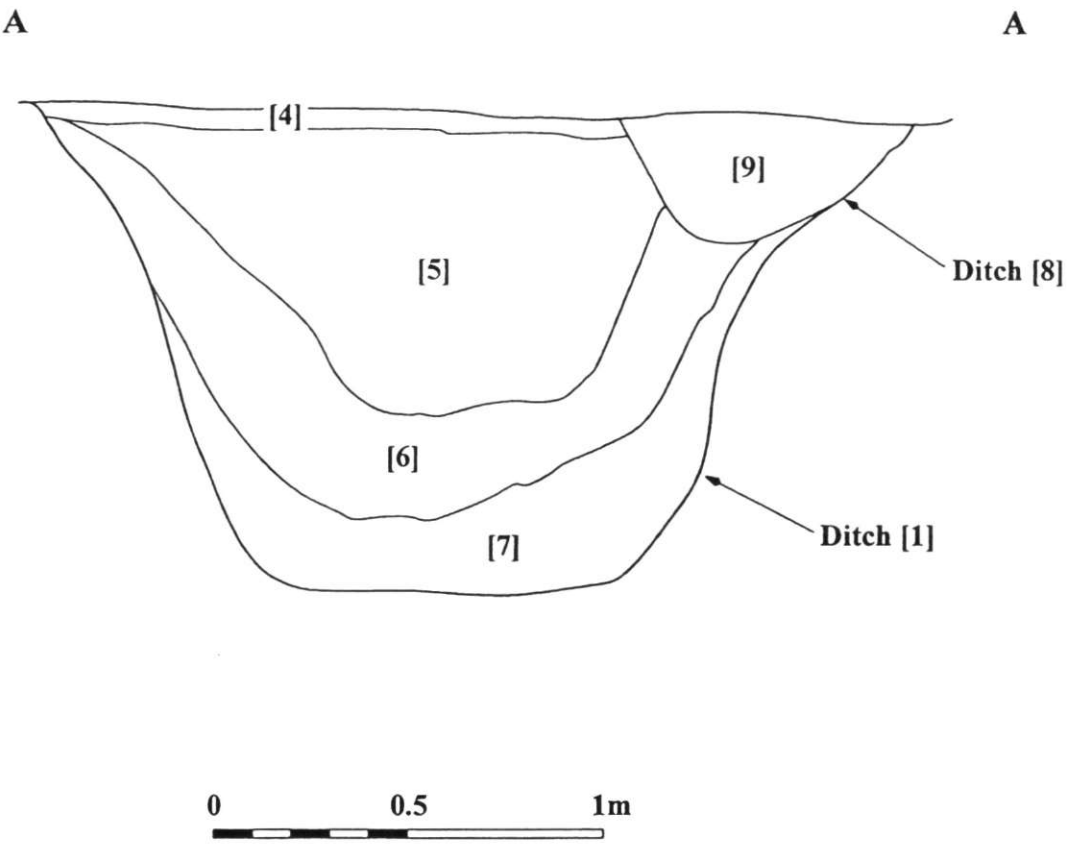

Fig 4 Section through Ditch [1]

Within the Stage 2 area Ditch [1] was filled by four deposits of clayey silty material (Fig 4), containing varying amounts of shillet. There were no traces of any associated bank, postholes or a stone revetment. The ditch did not show unequivocal signs of being recut, although it is possible that layer [5] might represent the fill of a shallower recut. The excavated section produced a single flint and several sherds of probable Bronze Age pottery (see Section 4).

Aside from Ditch [1] only a small number of other features were recorded in either of the excavation areas. Given the truncation in the first area and the results from the geophysical survey of the second, showing relatively few features (Fig 2), this was not surprising.

None of the other features recorded during Stage 1 was closely datable but they were probably modern in origin and few were intercutting (Jones 1996). Those features within the Stage 2 excavations were mostly proved, from the evidence of the stratigraphy or artefacts, to be later than Ditch [1] (Jones 1997). Ditch [8] (Figs 2 and 3) cut the eastern side of Ditch [1], but is not recorded on any of the later maps of the area; it may have run alongside a removed field boundary and was possibly medieval in origin.

3.3 Discussion

Only postholes [20], [21], [22], and stakehole [23] (Fig 3) could be argued to be contemporary with

Ditch [1]. These were situated along the outside edges of Ditch [1] and may represent the remnants of an exterior wooden palisade. Apart from a few stones which may have been the remains of a stone revetment there were no traces of a bank. It seems probable that the upcast from the cutting of Ditch [1] would have been deposited alongside it to form a bank.

There were no contemporary features within the interior of the enclosure, which, given the limited excavation and truncation is not unusual. Excavations of Later Neolithic (eg Wainwright 1988; Whittle 1997) and Bronze Age enclosures (eg Barrett *et al* 1990; Ellis 1989) have all revealed large empty spaces. A possible habitation feature within the enclosure is perhaps indicated by the large curvilinear anomaly (feature F) detected by the geophysical survey in Area A and by some un-excavated possible postholes uncovered during the earlier stage of the archaeological work (see Jones 1996).

4 The Finds Report

4.1 Introduction

A moderate quantity of finds was recovered from both areas of the excavation. However, these came almost entirely from the topsoil and were therefore residual. The majority were sherds of medieval pottery; these are briefly described in the archive reports (Jones 1996 and Jones 1997).

4.2 The Prehistoric Pottery

by Henrietta Quinnell

Five featureless body sherds weighing 50g, and crumbs came from [5] in Ditch [1]. The fabric is soft, reduced 5YR 4/1 dark grey lightening on the exterior to 5/1 grey with patches of oxidisation 5YR 4/3 reddish brown (classifications are from the Munsell chart). There are very common subangular rock inclusions within the fabric between 0.5 and 4mm which provide irregular fracture. The soft fabric has caused almost the complete removal of outer surface. The inner surface does survive but rock temper fragments project through rough smoothing. In visual appearance it is a rock-tempered fabric which looks dissimilar to the gabbro admixtures fabrics common in second millennium BC contexts in Cornwall (Parker-Pearson 1990, 19) and indeed to all other Cornish prehistoric fabrics, which is not surprising in view of their rarity in east Cornwall.

4.3 Petrological examination

by Dr Roger T Taylor

The sherds were examined under a ×20 binocular microscope. The matrix has a content of fine sand and silt which includes a fairly high proportion of angular quartz and fine yellowish buff grains which could be altered feldspar; the silty nature of the matrix probably accounts for the friability of the sherds. The temper appears to consist of rock fragments which contain altered white feldspar and dark grains of amphibole, probably hornblende. Most fragments are composite but some amphibole occurs as individual grains. This temper appears to be an altered basic igneous rock, of rather smaller grain size than the typical St Keverne gabbro and possibly weathered. In addition two angular composite quartz or sandstone fragments were identified.

4.4 Comment

The rock temper is of a feldspar-hornblende, altered basic or dioritic type but the absence of components such as magnetite, fine white mica and quartz sand grains, together with the distinctively silty matrix, distinguishes this pottery from typical gabbroic fabrics thought to derive from the Lizard.

A belt of basic rocks occurs (Geological Survey Map 348) 2 to 4 km south-south-east of Liskeard in the River Seaton valley and continues eastwards towards Plymouth. (West of Liskeard the nearest basic rocks are south of St Austell, some 25 km distant.) The weathering of the majority of Cornish rocks seldom produces plastic clays and the most likely source of the clay matrix is a river valley or estuarine deposit. The tidal estuaries west of Plymouth would provide an appropriate silty clay.

4.5 Discussion

The sherds are of a basic-rock tempered fabric, probably of local origin (made within 10 km or so of the find spot). The radiocarbon dates, AA-29745 1396–1020 BC and AA-29746 1257–840 BC at two sigma, indicate a Middle to Late Bronze Age date. The only recorded petrological analyses of prehistoric ceramics from East Cornwall are from vessels which, from their funerary contexts, probably belong to the Early Bronze Age. The Beaker from Harrowbarrow contains a range of inclusions derived locally from the metamorphic aureole around the Hingston Down granite (Williams in Thomas and Hartgroves 1990, 59). The cord impressed Trevisker urn with ribbon handles from Fore Down, St Cleer is of gabbroic fabric mixed with a quantity of subangular quartz grains (Williams 1988, 162); a similar vessel from Menheniot is gabbroic (Parker-Pearson 1990, 28, No 59). Finally, fragments of a cord-impressed Trevisker vessel from a cist at Trebartha, North Hill, contain, 'inclusions of a naturally weathering diabase rock' (Williams in King and Miles, 1976).

If the area for comparanda is extended into West Devon, there is more material available. Parker-Pearson (1990, 17 and fig 9) has drawn together thin-section work which demonstrates a group of Trevisker pottery, from settlement contexts presumed to be Middle Bronze Age, in which greenstone (altered basic igneous rock) has been added to a granite derived clay which has lost much of its micaceous component through fluvial sorting. This includes material from Yes Tor Bottom and Raddick Hill and is cognate with D F Williams' Group II fabric from Shaugh Moor (Williams 1980). A further Devon Trevisker group contains greenstone and rounded quartz grains includes material from Watern Oke and Whitten Ridge. (The Trebartha vessel described above falls into this group and the simple cist burial in which it was found could possibly be Middle Bronze Age.) The Trevisker Middle Bronze Age tradition in Devon is contrasted petrologically with the Biconical tradition which forms the bulk of the assemblage at Shaugh Moor and which contains volcanic inclusions which most probably originate east of Dartmoor. As Parker-Pearson (1990) comments, the post-Trevisker, Late Bronze Age, assemblage from Dainton has a much wider range of fabrics of which only one component contains greenstone additions (Howard 1980, 39). The only assemblage likely to be chronologically comparable to Dainton is that from Mount Batten and here all material likely to belong to the Late Bronze Age has a temper of coarse limestone fragments (Cunliffe 1988, 23 and fiche report by D F Williams). During the Middle Bronze Age there appear to have been a number of different ceramic groups which were distributed extensively; gabbroic fabrics for at least 50 km, and the Devon greenstone fabrics from South Devon up well onto Dartmoor. The picture from the Late Bronze Age differs in that most ceramics appear to have been locally produced.

While the examples quoted above are very limited, they are at least consistent with the suggestion that the Liskeard sherds may belong to a Trevisker, Middle Bronze Age tradition in which altered basic igneous rock (greenstone) fragments were added to fluvial clays largely deriving from the

granite moors. The terminal date for Trevisker pottery is not yet clearly established and may vary in different areas across the South West but may be placed somewhere around 1000 BC (Quinnell 1997).

4.6 The Flint

by Anna Lawson Jones

Two flints were recovered, one from the Stage 1 excavations and one from the Stage 2 excavations.

The single flint from Stage 1 represents the only stratified find for this phase of excavation work. It was found in segment G of Ditch [1], context [31]. The flint is a primary, nodular waste flake measuring 30mm by 21mm by 7mm thick. The ventral side shows a pronounced hinge fracture, while the distal end suggests bipolar flaking, ie the use of an anvil during knapping (see Edmonds 1995, 190).

This piece has not been modified for use which would suggest on-site knapping of raw material. It is, as a result, unlikely to have been brought in deliberately. It is chronologically undiagnostic, and was not found within an original, *in situ* context, ie it was redeposited within the ditch. It was made from imported flint which in Cornwall suggests a Neolithic date (Tingle 1998). The nearest surface outcrop of nodular chalk flint to Cornwall is Beer Head located on the south-eastern coast of Devon (*ibid*).

The other single flint was recovered from the upper fill of Ditch [1] during the Stage 2 excavations. This tertiary flint is of poor quality, faulted and probably of pebble flint origin. Pebble flint was the most commonly used flint raw material source for Cornwall throughout the prehistoric period. It may be found on most of the surrounding beaches.

The flint itself has a flared rectangular shape and is of variable thickness. It measures 20mm by 18mm by 6mm. The flint could perhaps be a poorly executed gunflint. The steep edges have the typical scale like removals associated gun flints although it lacks the uniformity one might expect. Alternatively it could be a very battered prehistoric scraper made on a snapped blade.

5 The Assessment of Charred Plant Macrofossils from a prehistoric enclosure at Liskeard, Cornwall, 1996

by Vanessa Straker and Sophie Lamb

5.1 Introduction

Bulk samples were taken during both stages of the excavations. Three bulk samples from the main enclosure were processed by flotation in the Soils Laboratory, Department of Geography, University of Bristol. Floats were retained on a 250 micron sieve and residues on a 1mm mesh. The residues were scanned for finds of charred plant remains. Small spot samples taken from the excavations were also sieved to examine their potential to provide material suitable for radiocarbon dating. Assessment of the floats was carried out and the results are presented in Table 1. Nomenclature follows Stace (1991).

5.2 The Results

Table 1 Liskeard School 1996: Assessment of Bulk and Spot samples

Sample number	Context number	Volume (l)/weight (kg)	Float volume (ml)	CHARCOAL (>2mm)
Phase 1 excavations				
208	[31] upper fill of Ditch [1]	0.25 / 0.550	15	++ (20 non-oak)
209	[25] fill of Ditch [1]	0.05 / 0.025	5	+ (10 non-oak)
210	[25] fill of Ditch [1]	0.01 / 0.05	15	+ (20 non-oak)
211	[29] fill of Ditch [1]	0.25 / 0.5	10	++ (15 non-oak)
212	[32] fill of Ditch [1]	0.2 / 0.225	20	+ (15-20 non-oak)
213	[30] fill of Ditch [1]	0.05 / 0.025	10	+
Phase 2 excavations				
300	[5] upper fill of Ditch [1]	10 / 11.5	7.5	+ (10 non-oak)
301	[6] lower fill of Ditch [1]	10 / 11.1	2	–
302	[7] basal fill of Ditch [1]	10 / 11.6	1	–

5.3 Discussion

Charcoal consisting of fragments of mature wood rather than twigs, was present in all the samples but was most frequent in sample 208. Non-oak charcoal was present in all contexts except [213], [301] and [302].

No other plant macrofossils were recovered and thus no light can be shed on agricultural processes, if any, taking place in the vicinity of this part of the late prehistoric enclosure.

6 The Radiocarbon Dating

6.1 Introduction

The aim of the dating strategy was to obtain a precise date from the enclosure ditch. The enclosure had produced a small amount of stratified pottery which appeared to be Bronze Age. However dateable prehistoric enclosure sites are extremely rare in east Cornwall which meant that any dating evidence would have been important.

6.2 The Dating Strategy

Nine samples for radiocarbon determinations were taken from deposits within the ditch. Most of the charcoal proved to be inappropriate for scientific dating because it was derived from mature oak wood. Only one context, layer [5], produced enough non-oak material (hazel) for radiocarbon dating, so it was decided to obtain two dates from this material. Because only small amounts of material were available the samples were sent to East Kilbride for accelerator mass spectrometry dating (AMS). This method of dating can be carried out on very small amounts of material and gives high precision dates which are more accurate than conventional radiocarbon dating methods.

6.3 Results

Table 2 Results of the Radiocarbon Dating

Context	Lab.No	Calendrical Years (65%)	Calendrical Years (95%)
[5]	AA-29745	1306–1103 BC	1396–1020 BC
[5]	AA-29746	1101–920 BC	1257–840 BC

6.4 Discussion

The results from the radiocarbon dating conformed with the data from the analysis of the pottery (see Section 5.0 above) which suggests that the pottery was of a Middle to Later Bronze Age date. Unfortunately the radiocarbon dates, AA-29745 1396–1020 BC and AA-29746 1257–840 BC at two sigma, were both obtained from the centre of the ditch section, which means that the radiocarbon determinations are actually dating the infilling of the ditch rather than its cutting. However as the subsoil is a fairly unstable mixture of loose shillet and clays the ditch may have become infilled relatively quickly, especially if there was an upstanding bank alongside it, or if it were deliberately infilled.

7 Concluding Discussion

The archaeological investigations were important because they revealed the presence of a large, hitherto unknown, enclosure on the western fringe of Liskeard. The discovery of this enclosure is highly significant to our knowledge of Cornish prehistory, because it is the first hilltop enclosure in Cornwall to be dated to the Middle to Late Bronze Age, and because non-moorland prehistoric sites are so rare in east Cornwall.

Ditch [1], the enclosure appears to be of unusual proportions, enclosing much of the spur upon which it is sited. The enclosure was not sub-circular as initially expected but proved to be large and probably elongated, being at least 220m long and perhaps, if more or less symmetrical along a line running along the ridge, at least 80m wide; this would make it a little under 2ha in extent. The siting of the enclosure is also of interest, as it was not located on the highest point of the spur, but was instead set back, on slightly lower ground. This may indicate that the primary function of the enclosure was not defensive. Another unusual aspect of the enclosure ditch is the apparent breaks or causeways which were indicated by both geophysical surveys. If these breaks are real they would again suggest that the site may not have been a defended hilltop enclosure.

The Middle to Late Bronze Age pottery, the charcoal obtained from the upper fills, and the absence of Iron Age or Romano-British artefacts, or medieval finds in the ditch (though plentiful in the topsoil) indicate that the ditch is unlikely to be later in date. The possibility does remain that the site is earlier than the Middle Bronze Age. The geophysical survey indicates that the ditch is segmented, which suggests the possibility that the site could have been a Neolithic causewayed enclosure. However, the site is thought most likely to be Middle to Late Bronze Age in date as no diagnostic Neolithic artefacts (especially flintwork) were recovered and the ditch is unlikely to have remained open for such a long period of time without periodic recutting; of which there were no signs. There were no traces of any causeways within either of the excavation areas.

The Middle to Late Bronze Age date (1396–840 BC) of the ditch infill is of interest because there are so few parallels in the South West in general and in Cornwall in particular. Large enclosures are of course part of a tradition of monument building throughout prehistory from the Neolithic through to the Iron Age (eg Gibson 1998; Bradley 1998), although their functions are likely to have changed over time and differed between regions.

Enclosures dating to the Middle and Later Bronze Age have been identified across Britain (Needham and Ambers 1994, 239–240). Small ringforts such as at Mucking have been identified in southern England (*ibid*, 240). However large Later Bronze Age enclosures are rare in Britain and only a few can be demonstrated to be forerunners of the Iron Age monumental enclosures termed 'hillforts' (eg The Breiddin; Musson 1991).

There are however the medium sized enclosures such as Rams Hill in Berkshire (Piggott and Piggott 1940, Bradley and Ellison 1975), or Norton Fitzwarren, Somerset (Ellis 1989) which may provide analogies with the Liskeard site. Both the Rams Hill and Norton Fitzwarren sites are situated upon hilltops, and were superseded by larger Iron Age enclosures. The Rams Hill ditch enclosed an area of 3.5 ha (Needham and Ambers 1994) and was a flat-bottomed, steep-sided ditch which is comparable in profile with the Liskeard enclosure ditch (Piggott and Piggott 1940). The Norton Fitzwarren site is smaller, perhaps around 2 ha (Burrow 1982, 89); but unlike the Liskeard site, the ditch lacked the flat bottomed profile.

Norton Fitzwarren in Somerset is probably geographically the nearest published Middle Bronze Age hilltop enclosure to Liskeard, although a smaller Middle to Late Bronze Age enclosure at Hayne Lane, Devon, has recently been excavated during improvements to the A30 between Honiton and Exeter. At this site two houses were found associated with Middle to Late Bronze Age pottery, at the eastern end of an elliptical enclosure measuring approximately 45 metres wide and 80 metres long (Dr Andrew Fitzpatrick, pers comm).

Neolithic enclosures and Iron Age hilltop enclosures have been identified in Cornwall. Most of the Neolithic enclosures are associated with rocky tors and prominent hilltops (eg Carn Brea; Mercer 1981). The nearest of these early hilltop enclosures to Liskeard is the undated site of Stowe's Pound on Bodmin Moor (Johnson and Rose 1994) and possibly the enclosure on Bury Down, Lanreath (Ray 1994).

However it is also possible that other hilltop enclosure sites in Cornwall assigned an Iron Age date may in fact have their origins in the Bronze Age. Adam Sharpe (1992) has recently raised this possibility in his discussion of Iron Age cliff castles in Cornwall, some of which he suggests may also have originated in the Bronze Age or the Neolithic periods. Unfortunately virtually none of the known hilltop enclosures in Cornwall has been sampled for scientific dating. However the radiocarbon determination of excavations at Killibury produced a Late Bronze Age date, as well as some possible Bronze Age pottery (Miles 1977, 111–112), though it must be stressed that these data did not relate to any enclosure feature. Other sites in the South West which became hillforts during the Iron Age have also produced Middle to Late Bronze Age finds. Pearce (1976, 21) has defined a group of later Bronze Age metalwork finds, recovered from hilltop sites across the South West which later became hillforts. However, the form of use made of most of these hilltops during the Bronze Age is unknown and in some cases, for example South Cadbury, it was probably as unenclosed settlements (*ibid*, 24).

It seems possible that the Middle to Later Bronze Age enclosures in south-western Britain (Cornwall, Devon and Somerset) show a regional distinctiveness and are not wholly derived from the small defended enclosures of south-eastern England.

The function of the medium-sized Bronze Age hilltop enclosures is uncertain. Norton Fitzwarren has been interpreted as non-defensive in nature as the site had an external bank (Ellis 1989, 66), which has obvious parallels with the earlier henge monuments. The evidence for the location of a bank at Liskeard is ambiguous. There were three postholes along the outer edges of Ditch [1] which may represent the remnant of an external wooden palisade and there were a few stones which may represent remains of a revetted internal bank, but there were no traces of a bank itself. The interpretation of Bronze Age enclosure sites as being intrinsically defensive in nature is certainly questionable. As Gibson has pointed out in his discussion of Neolithic palisaded sites, the enclosure of an area by a large ditch and bank may have been designed to restrict access to a privileged space rather than acting as a mechanism of defence (eg Gibson 1998, 77).

The present evidence would suggest that they may not have been permanently occupied places (Burrow 1982, Needham and Ambers 1994), although the labour involved in their creation indicates that they performed a special function, perhaps akin to the role of the earlier Neolithic enclosures (causewayed enclosures, henges and palisade enclosure monuments) which could have functioned as 'tribal' centres where groups of people would have gathered at certain times of the year, to perform rituals and exchange goods, etc (eg Mercer 1980). The absence of plant macrofossil remains from the Ditch [1] suggests that agricultural processes were not taking place within the excavated part of the enclosure. This may imply that the site was not permanently occupied or may have fulfilled a special role.

Ellison (1982) has suggested that enclosures such as Norton Fitzwarren in Somerset may have played a role in the exchange of artefacts and in other social interactions. Evidence associated with 'ritual' feasting, is known from a number of Later Bronze Age sites (see Bradley 1984, 120–121; Parker-Pearson 1993, 121–122), which indicate the importance of social feasting during the Later Bronze Age.

The archaeological fieldwork at Liskeard has led to the identification of a significant site. However the excavations have raised almost as many questions as they have answered. Only further geophysical survey of the surrounding area could establish the actual extent of the enclosure and only further targeted excavation can determine whether the causeways in the ditch are real and if there are any contemporary internal features.

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Addendum

Following the completion of the above report additional archaeological work has taken place within the vicinity of the site. In the winter of 1996 Wessex Archaeology carried out a programme of trial trenching to the east of the site (SX24406470) (Wessex Archaeology 1997). Two years later in the spring of 1999 Exeter Archaeology opened up a number of trenches in the opposite field on the southern side of Old Road (SX24356455) (Stead 1999; and see also Exeter Archaeology Cornish Projects elsewhere in this volume).

Neither of these evaluations produced evidence for the enclosure or for any prehistoric activity in the area. The only dateable archaeological features discovered were of medieval or post-medieval origin.

The lack of prehistoric features within the area investigated by Wessex Archaeology is not particularly problematic, since their trenches lay beyond the limit of the eastern end of the enclosure. However the area which was evaluated by Exeter Archaeology does require further comment because some of their trenches were situated within the area where the enclosure ditch was predicted to lie (see Fig 1 above).

The absence of the enclosure ditch within the southern area raises three possibilities. The first would suggest that the enclosure is very much larger than has been postulated above. However in view of the lack of occupation evidence on the southern side of the road, this interpretation is unlikely. A second interpretation put forward by Stead (Stead 1999, 6) suggests the possibility that Ditch [1] did not form one side of an enclosure, but was instead a large linear feature, which was part of a field system or territorial boundary feature. This theory deserves closer consideration because substantial linear ditch systems dating to the later prehistoric period are well documented, especially on the chalkland of southern England (eg Bradley 1978; 1984). However in contrast with Ditch [1], the Wessex linear ditch systems divide up extensive blocks of relatively flat land and usually terminate at, or cut off spurs and hills from the surrounding landscape. Given the relatively small size of the spur upon which the Liskeard site is situated it seems improbable that it would be subdivided along its axis by a large-scale territorial boundary. This position is also supported by the geophysical survey by Geophysical Surveys of Bradford (1996) which indicates that the ditch is not linear, but instead curves under the road (Fig 2). The third interpretation, which is favoured here is that the enclosure, is probably not as wide as predicted above, but instead turns more sharply and is possibly similar in size to the recently excavated Middle to Late Bronze Age enclosure at Hayne Layne in east Devon (Fitzpatrick *et al* 1999).

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Excavations at Penhale Round, Fraddon, Cornwall, 1995/1996

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Summary

Part of Penhale Round, near Indian Queens, Cornwall, was excavated during December 1995 and January 1996 in advance of commercial development. Three enclosure ditches were recognised. The inner ditch had been recut, but there were no other stratigraphic relationships between the ditches or with any other features. One large group of intercutting post-holes surrounded by a ring-gully was recognised in the interior, with a group of intercutting pits and a straight alignment of post-holes just to its north-east. Phasing was hampered by severe truncation. Artefactual and radiocarbon dating suggested occupation in at least the third and fourth centuries AD, with some evidence for earlier activity.

Introduction

Babtie Group carried out the excavation of part of Penhale Round in 1996 on behalf of Kingsley Developers Ltd, in response to a planning condition relating to the construction of a Travel Lodge and associated car park. The Round is a later prehistoric and Romano-Cornish enclosed settlement located near Fraddon, St Enoder, Cornwall (NGR SW 908573 centred; see Fig 1).

The site was discovered through cropmark evidence in the 1950s, and has been investigated several times in recent years. Geophysical surveys carried out in 1982 and 1990–1991 identified a more detailed layout of the site and surrounding area (Fig 2). Part of the site and areas to the south were excavated by the Cornwall Archaeological Unit (CAU) in 1993 in advance of construction of the A30 Fraddon/Indian Queens Bypass, and a watching brief took place in 1994 during construction of the road. Another small area was investigated by the CAU in 1996 (Cole and Thorpe 1996). Areas to the north and east of the round were investigated by an evaluation (AC Archaeology 1994) and a watching brief by Babtie Group during ground preparation in advance of commercial development. Only the work carried out by Babtie Group is covered by this report. A provisional summary of the results of the other investigations is presented for background, but these investigations have been or will be fully reported elsewhere.

The geophysical surveys (David 1982; Payne forthcoming) revealed a complex oval multivallate enclosure, approximately 65m long and 53m wide within the inner ditch (giving an area of roughly 0.25 hectares, or 0.66 acres). Two enclosure ditches were visible on the south, west and north sides,

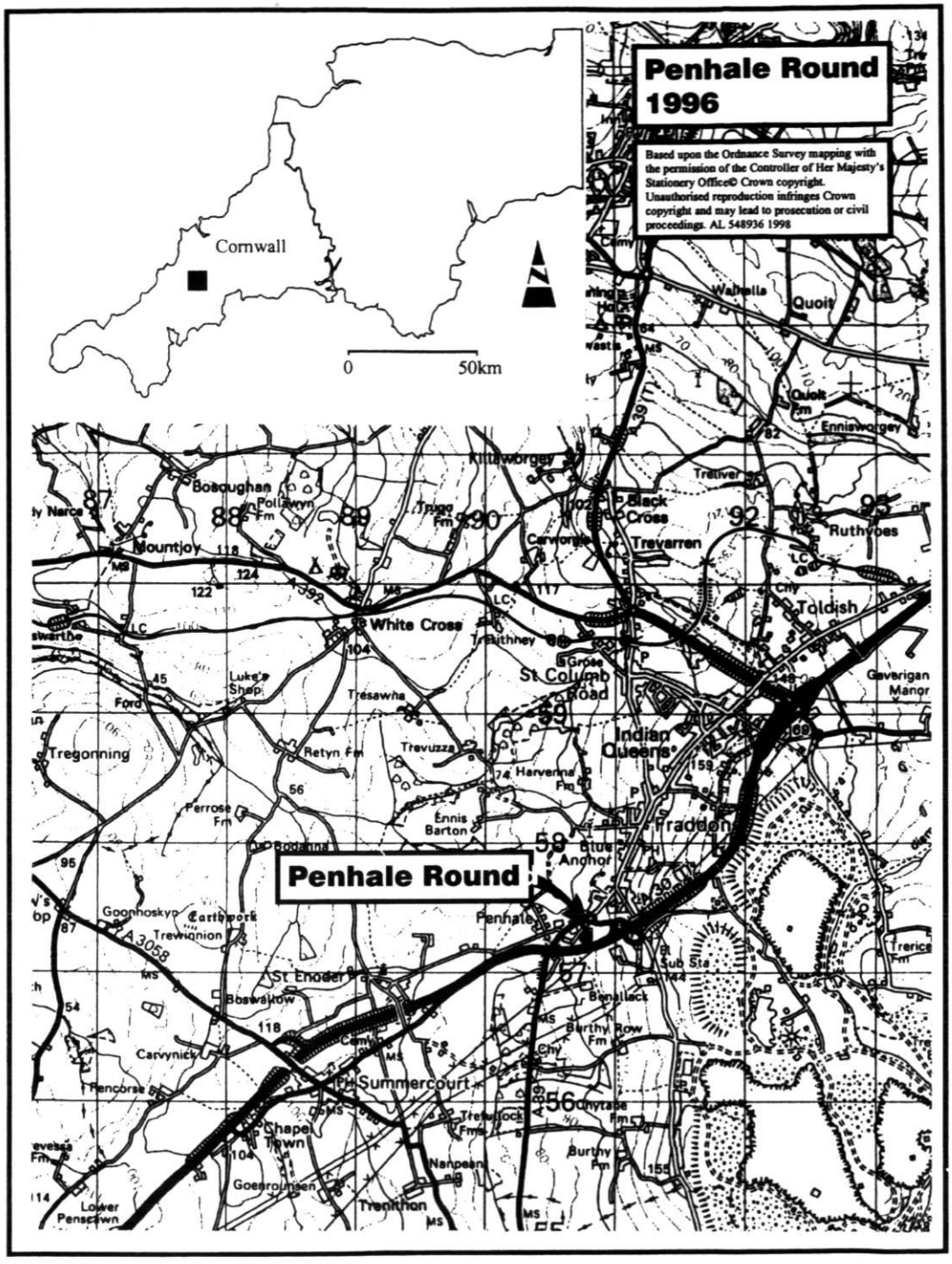

Fig 1 Penhale Round 1996. General location plan

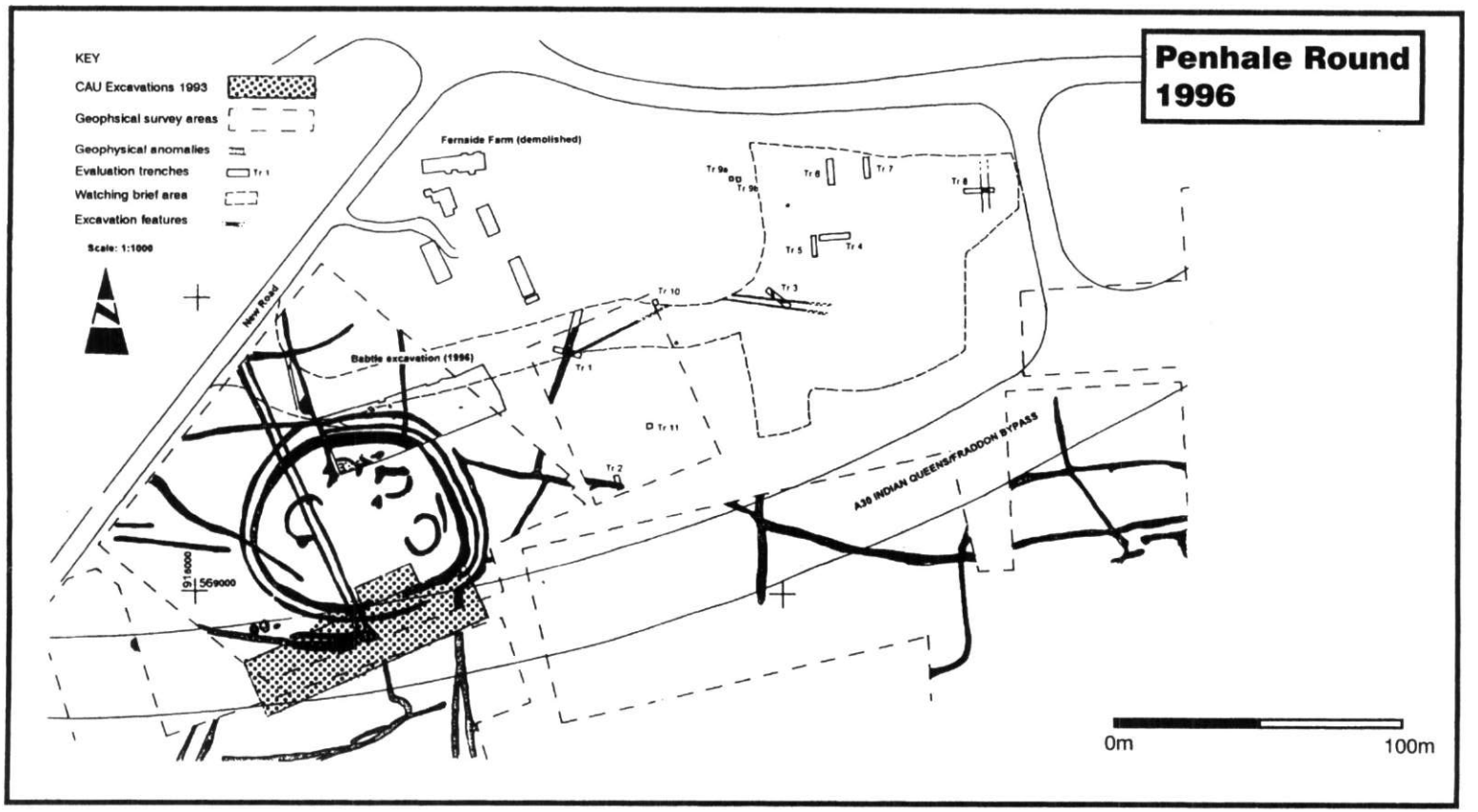

Fig 2 Penhale Round 1996. General plan showing round, geophysical survey, extent of 1993 excavations by Cornwall Archaeological Unit, watching brief by Babtie, and 1996 excavations by Babtie

but three on the east and north-east sides. The enclosure was surrounded by a landscape of ditched boundaries, some of which were potentially contemporary with the round, while others were clearly not contemporary. At least three possible houses were identified in the interior.

The CAU excavations (Nowakowski 1993; 1998; and Jacqueline Nowakowski pers comm) concentrated on the area near and outside the entrance, and identified several phases of pre-round activity. This work is summarised in the following paragraphs. A middle Bronze Age farming landscape comprised field ditches and one oval structure, while evidence for later Bronze Age activity was limited to small quantities of ceramics from residual or secondary contexts. Early Iron Age ceramics were also found in topsoil deposits and in a pit outside the round. Later pre-Roman Iron Age landscape features included ditches and one structure. The round itself developed from simple univallate beginnings through a series of ten phases of modifications to the entrance, enclosing ditches and ramparts. At the time of writing, the dating evidence for the round has not been fully resolved and is not entirely consistent with that from the 1995/96 excavations, but it appeared to have been constructed in the pre-Roman Iron Age, possibly around 100 BC, and used up to the fourth or fifth centuries AD. Planned radiocarbon dating of samples from 1993 may clarify this issue.

The primary (inner) ditch of the round was up to 3m wide and 1.8m to 2.2m deep, with sloping sides and flat rock-cut bases. An internal rampart between 3 and 4m wide may have incorporated a palisade, but the evidence for this is not clear. The ditch was later narrowed to little more than a gully, while the rampart was widened, and a cobbled surface laid in the entrance and interior. In the Roman period, the ditch was widened again and its inner face was revetted in places with stones. Further modifications to the enclosing features culminated in the fourth century AD with a complex bivallate enclosure, although by around AD 400 the inner ditch had been filled-in. Other well-preserved features included palisade trenches, cobbled roadways, drains and gateways, mostly associated with the entrance, while a single three-phased oval structure in the interior was associated with the last two phases of occupation (possibly in the late fourth and fifth centuries AD).

Artefacts from the pre-round features were concentrated in discrete features and structures. Pottery associated with the round tended to be clustered either in features or in discrete zones in the enclosure ditches, with a tendency for distribution to fall off at a distance from the entrance. Very little animal bone was found, but cattle, sheep and sheep/goat have been identified. A number of stone objects were recorded but only a few pieces of metal work were recovered. The results of the assessment of environmental samples is understood to be incomplete at present; however, charred plant remains have been identified from several contexts.

The 1995/96 excavations

Aims and objectives

The proposals for excavation, recording and post-excavation assessment were set out in a written scheme of investigation submitted in support of the planning application and agreed with the CAU. The aims of the recording action as set out in those proposals were:

> To elucidate the stratigraphy, sequence and chronology of the banks and ditches to provide comparative data to the sequence recorded by the south entrance. The archaeological action will also clarify the sequence and relationships of any internal or external archaeological remains within the footprint of the proposed development. It is anticipated that occupation areas and zones for different agricultural processes are located around the perimeter of the Round and thus the mitigation exercise may also provide data indicative of such activities. A programme for

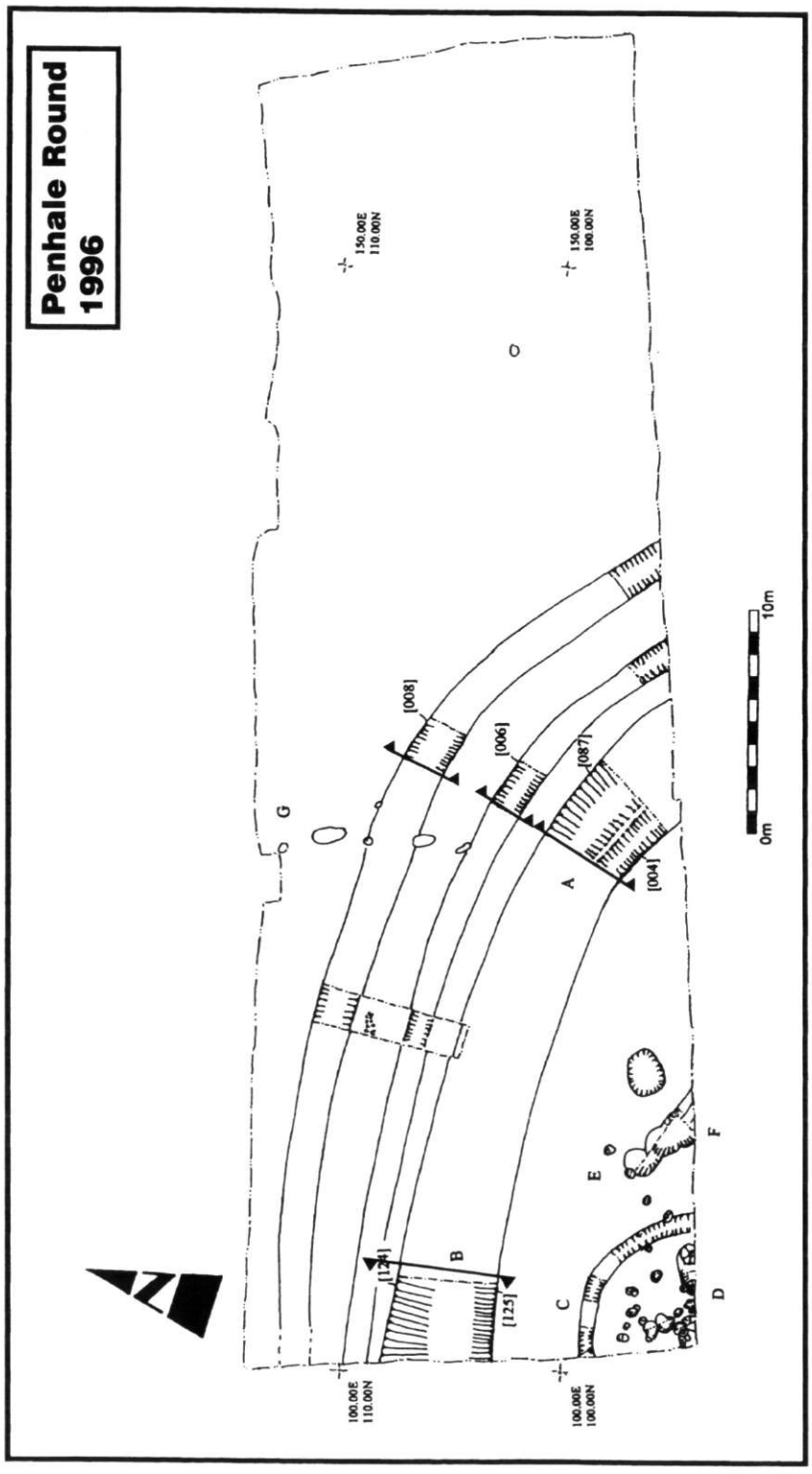

Fig 3 Penhale Round 1996. General plan of 1996 excavation

palaeo-environmental sampling may assist in elucidating agricultural activities such as crop and animal husbandry and crop processing.

Excavation methodology

An area of 60 × 20m was stripped under archaeological supervision using 360° and JCB-type excavators fitted with toothless ditching buckets, exposing up to 40m of the three enclosure ditches, together with internal structural features characterised by a house drainage gully and post-holes in the south-west corner of the site (Fig 3). The whole area was more severely truncated than the area excavated by the CAU in 1993, and it was subsequently learnt from the farmer that topsoil had been stripped from the field for sale in the past.

Areas of the site containing archaeological features were hand cleaned. Hand excavation and recording of features was carried out in accordance with the approved scheme, as modified by discussion with the CAU during monitoring visits. Sections were dug across the enclosure ditches, and all discrete features were excavated.

An environmental sampling programme was agreed during a monitoring visit, with the advice of Vanessa Straker of English Heritage. The programme provided for the retrieval of bulk samples of 40 litres target size from all cut features within the structure and the primary fills of the enclosure ditches. Bulk samples were floated and sieved to 1mm, with flots to be collected on 250 micron mesh. The samples were also examined for evidence of metal working or other activities. A pollen column was taken from the gully structure fills by Vanessa Straker.

Excavation results

Enclosure ditches

Three enclosure ditches were identified. The outer ditch extended for about 40m within the excavated area, the middle ditch for about 35m and the inner ditch for about 30m. Although the geophysical survey had suggested some complexity in this area, with possible ditch intersections, the excavation demonstrated a simple concentric plan. No relationships between the three enclosure ditches or between any of the ditches and any other feature were apparent within the excavated area, although the inner ditch had been recut.

The three enclosure ditches differed substantially from each other, with the middle and outer ditches being much narrower and shallower and with simpler depositional histories than the inner one (Fig 4). The outer ditch [context 008] had a shallow U-shaped profile 1.5m wide by 0.5m deep, with a single fill [027]. The middle ditch [006] was proportionately deeper (1m wide and 0.85m deep), with steep concave sides and a flat base; it had three separate fills [021–023]. The horizontal interfaces between the fills could suggest either that the base of the ditch had been deliberately levelled at stages during the process of silting up, or that its fills had been intentionally deposited. No dating evidence was recovered from any of the sections through the middle and outer ditches, although one small find (SF3, an unfinished shillet spindle whorl) was recovered from the middle ditch [006].

Two 4m wide sections were dug across the inner enclosure ditch (Fig 4, sections A & B). Severe weather curtailed excavation of the lower part of Section B, and it was not possible to bottom this section. The primary inner ditch [087/124] had a broad, slightly irregular U-shaped profile, excavated to a maximum depth of 1.26m but not bottomed in Section B; its width is unknown but could be up to 4.4m. It had been recut [004/125], slightly off-line, after it was completely full. The

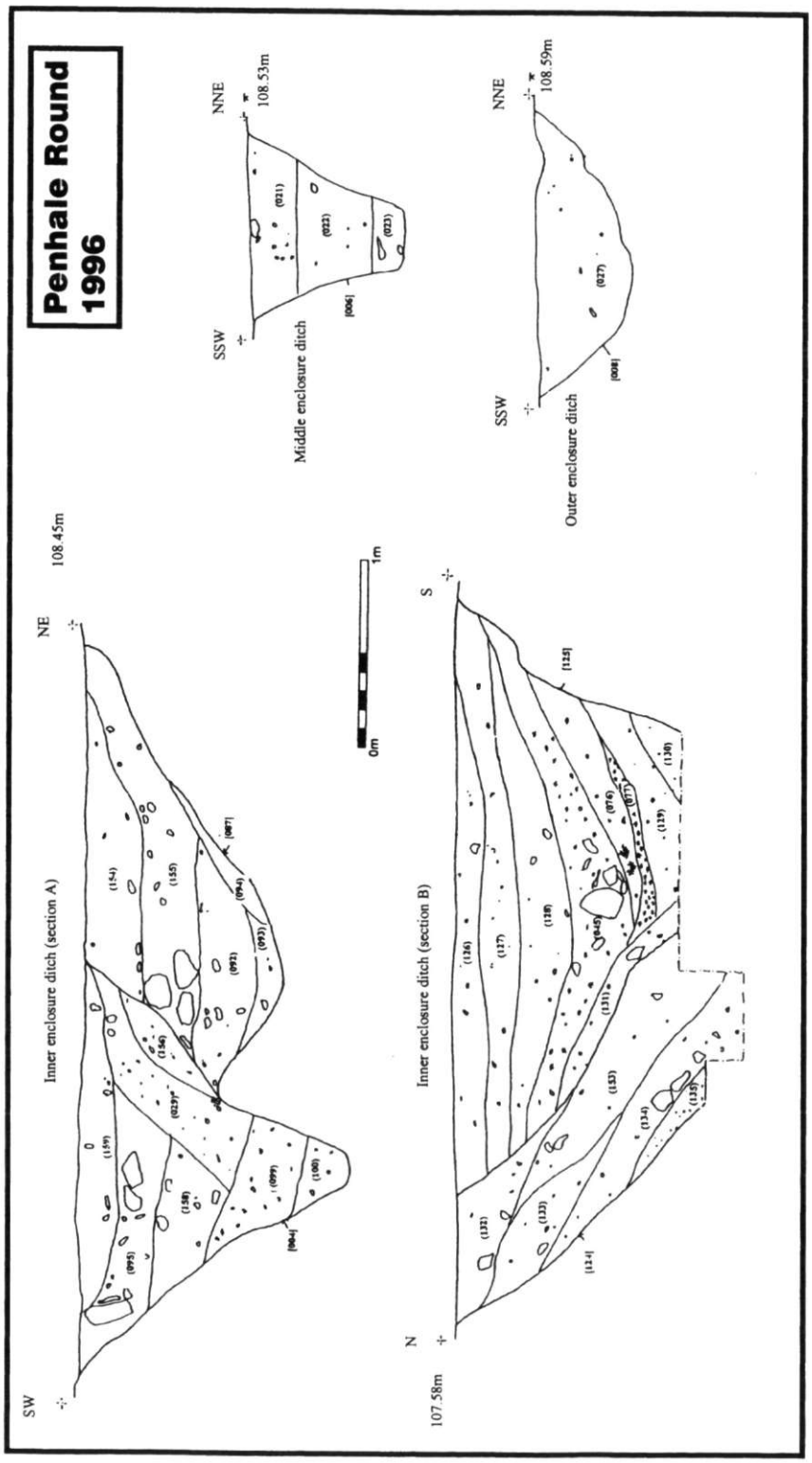

Fig 4 Penhale Round 1996. Sections of enclosure ditches

V-shaped recut was proportionately narrower and deeper (2.25m wide by 1.5m deep in Section A, and 3.3m wide by 1.25m deep in Section B, where it was not bottomed; projection of its profile suggests a total depth in the region of 1.8 to 2.0m). Both the primary ditch and its recut were substantially wider and deeper in Section B than in Section A; this difference probably arose from differential truncation.

The primary ditch shows some apparent differences in depositional history between the two sections. In Section B [cut 124] it contained a number of fills [057, 132–135, 153] dipping steeply from the outer edge of the ditch (the inner edge was cut away by the recut), whereas most of the fills of primary cut 087 in Section A [092, 093, 154, 155] are much more level in appearance; only one fill, the earliest [094], dipped steeply down the side, and this fill appeared to have been partly cut away by cleaning-out of the ditch. The near-horizontal interfaces in Section A imply either a very gradual silting process or a deliberate levelling of the base of the ditch at intervals as it filled, following a period in which it was kept cleaned-out (implied by the surviving fragment of fill 094). Large stones in fill 155 in Section A could represent decay of a stone-revetted rampart at a time when the ditch was disused and silting up. The steeply-sloping interfaces in Section B suggest that material came into this part of the primary ditch fairly quickly, much of it from the outside, possibly by dumping. While this could relate to the excavation and maintenance of the middle ditch, which lies closer to the inner ditch near Section B than near Section A, the dating evidence is not clear enough to resolve this question.

The lower and middle fills of the recut in both sections show interfaces at a variety of angles, with interleaving between fills sloping from opposite sides of the ditch. In addition, several of the fills appear on only one side of the relevant excavated section – for instance context 045, which produced the richest assemblage of pottery from this excavation, appears only in one face of Section B (not illustrated). These characteristics are consistent with a process of rapid filling by dumping, which appears to have originated mainly from activities inside the round, but with some material coming from outside. Some of these fills contained quantities of charcoal. The upper fills then represent a period of slow silting up of what must have been little more than a hollow.

Only small quantities of pottery were found in the fills of the primary ditch. Although they were not closely dateable, they were likely to be of generalised Romano-Cornish date (Quinnell below); sherds from one fill [057] indicated that the primary ditch was still silting up in the late third or fourth century, providing a *terminus post quem* for the recut. The lower excavated fills of the recut ditch from Section B produced quantities of charcoal, while one of the later fills [045] produced 105 sherds of later Romano-Cornish pottery, representing at least 15 domestic vessels. A fragment of a shale bracelet (SF4) was also recovered from [045]. The recovery of these finds from the inner enclosure ditch immediately adjacent to internal structures is of some interest. A shillet spindle whorl (SF1) was recovered from the later recut ditch at section A.

Upper fills of the recut inner enclosure ditch in both sections A and B contained quantities of large stones up to 300mm across. The spread of the stones within the fills was suggestive of the collapse or possibly demolition of a stone revetment, perhaps supporting an internal bank. Evidence of a revetted bank was recovered during the CAU excavations in 1993 at the entrance to the Round and 20m north-east of the entrance a substantial stone revetment had been built against the inner face of the primary ditch. Revetment stonework was particularly apparent in section A, where a distinct layer of large stones was concentrated in upper fill [095]. Comparison with section B and an allowance for greater truncation in section A suggests that 095 may be contemporary with 045, the stoniest fill in section B, suggesting that the ditch had been reduced to little more than a hollow but was still visible when the revetment collapsed.

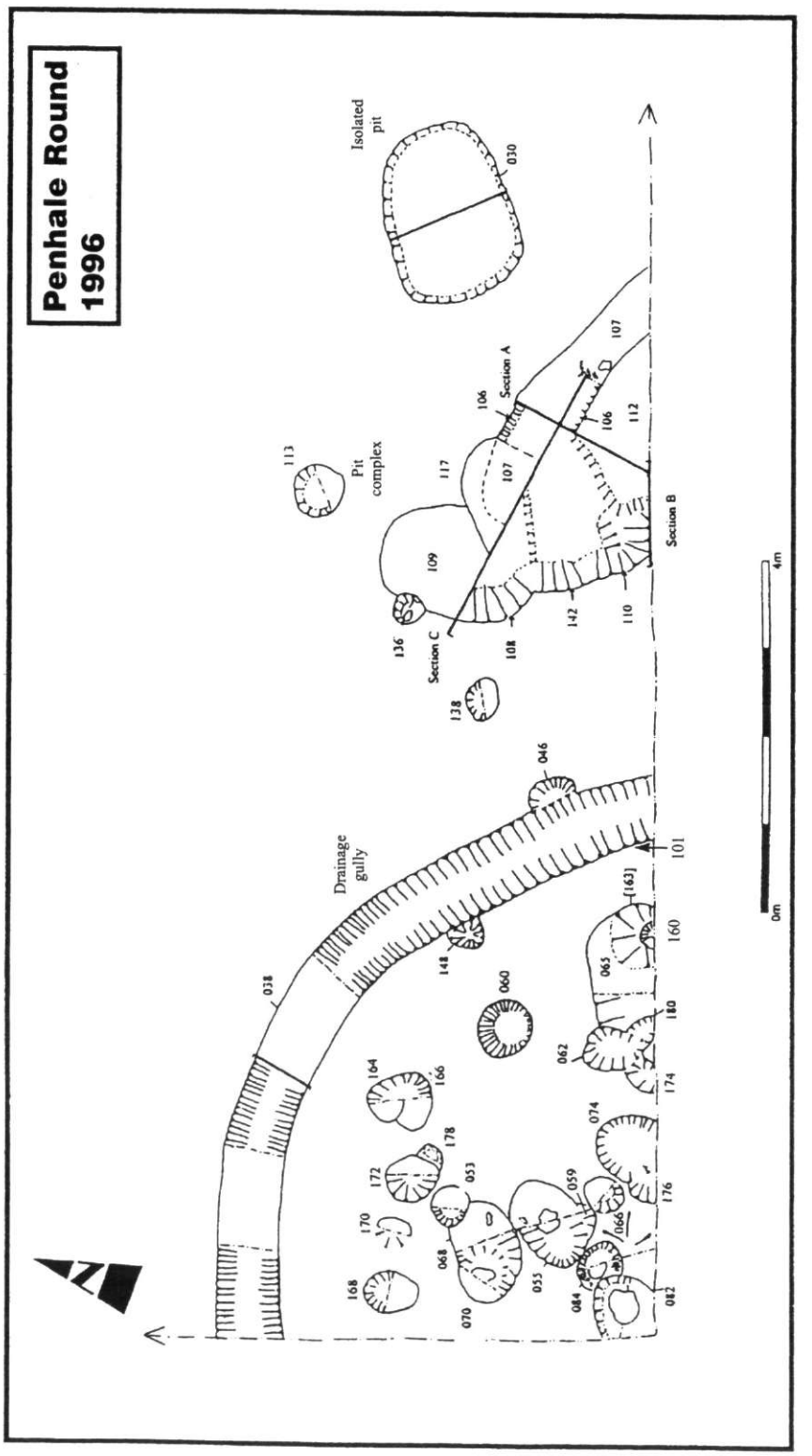

Fig 5 Penhale Round 1996. Detailed plan of part of the 1996 excavations

Internal structures

No evidence was identified for any structures lying outside the enclosure, while the presence of a strip devoid of features immediately within the inner enclosure ditch may reflect the former presence of a rampart, although no direct evidence for such a structure was apparent. A single house drainage gully and a group of post-holes were located at the south-western corner of the excavation. This group of features did not coincide with any of the possible houses identified by the geophysical survey, although with hindsight some amorphous geophysical anomalies lying outside the excavated area could represent a continuation of parts of this structural group. There was no evidence for partial stone construction, which had been present in the internal building excavated in 1993 but this may be a reflection of the truncated nature of this part of the site.

House drainage gully

The house drainage gully [cut 038] was located in the extreme south-western corner of the excavation (Fig 3, C; Figs 5 and 6). A length of approximately 7m of the feature was present in the excavated area, represented by a steep-sided curvilinear cut 0.3m wide and 0.23m deep, although obviously reduced by truncation. A total of 5m of the gully was excavated. Up to 3 fills were present, with quantities of charcoal being found in the middle and upper fills. The nature of the fills suggests that the feature was unlikely to have been structural, and it may have functioned as a drip gully. Five Romano-Cornish potsherds, none closely datable, were recovered from the feature. In addition to bulk environmental samples, a pollen column was taken from the hut gully. Analysis of the pollen has identified the presence of sphagnum moss on the site (Scaife below); this may have been used as roofing or flooring material within this or an adjacent structure.

Post-holes

A group of 27 post-holes, some intercutting, was excavated in the south-west corner of the excavated area, (Fig 3 D; Fig 5). Twenty-one of these formed a sub-group which lay entirely within the gully, with a minimum gap of 0.6m between the gully and the nearest post-hole. This could suggest that most (if not all) of this sub-group were contemporary with the gully, although this could not be proved on stratigraphic grounds. Three of the remaining six post-holes intersected with the gully; post-hole 148 was cut by it, while post-hole 048 was cut into the line of the gully after it was completely full (not shown on Fig 5, as it lay entirely within the width of the gully), and was in turn cut by post-hole 046. The last three post-holes [113, 136, 138] lay outside the gully, and formed a straight alignment which also included 046; this would suggest that the whole alignment post-dates the gully. The relationships between post-holes and the gully would suggest the presence of four structural phases, but little can be said about the nature of the structures represented by these post-holes.

The only clear structural pattern which could be identified among the post-holes was the straight alignment of post-holes outside and intersecting the hut gully, referred to above. Two other post-holes which intersect each other (163, which was cut by 160) and lie within the gully also lie on this line, but need not necessarily be related. Within the main group of intercutting post-holes inside the gully, a number of potential structural patterns could be tentatively picked out; however, an insufficient proportion of the area of the structure(s) was exposed to confirm any of them. One group of five post-holes [168, 170, 166, 060, 182] was appropriately positioned to form part of a post-ring roughly concentric with the gully and could all have been contemporary, but neither their contemporaneity nor their structural association could be confirmed.

Pottery, of second to fourth century AD date, was recovered from only one post-hole [062], which also contained a fragment of granite quernstone (SF5) and a fragment of vessel glass (SF6).

Although there was a general absence of artefactual material in the post-hole fills, many of the features contained stone fragments suggestive of post packing [136, 068] or post pads [055, 082,

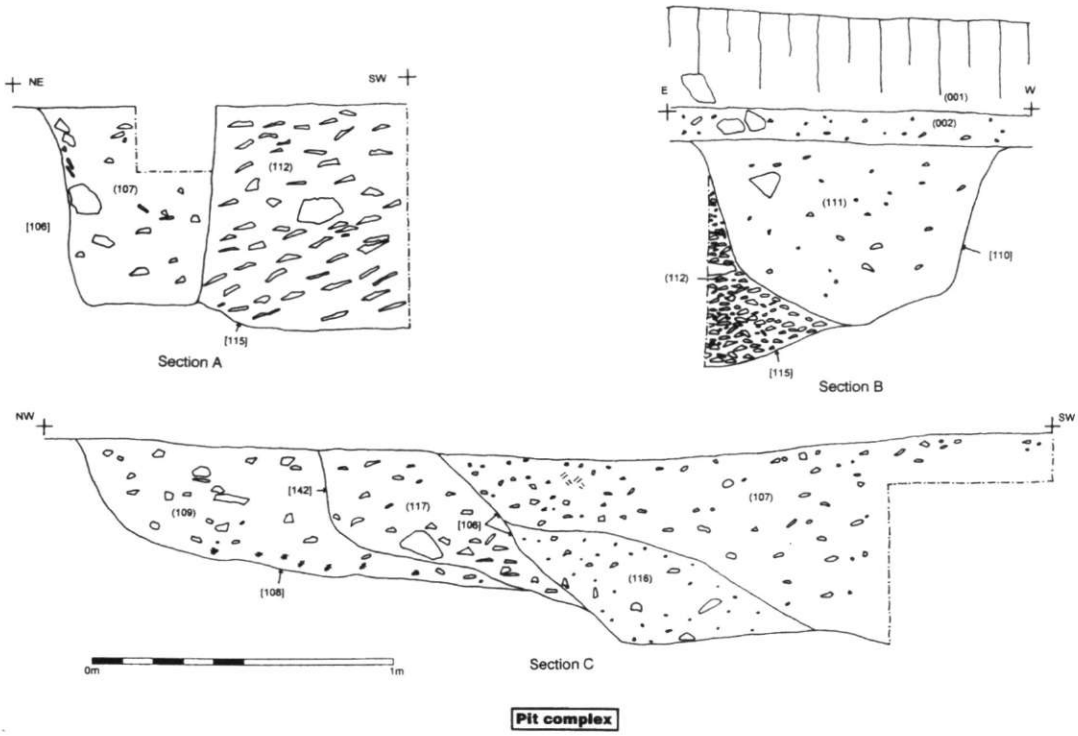

Fig 6 Penhale Round 1996. Sections of pit complex

070]. Clay post packing was present in 084. Charcoal was present in the majority of fills to varying degrees, being particularly apparent in 055 and 053. A patch of clay [065] and a patch of burnt stones [101] were present. The clay was directly above natural and was cut by post-holes 180 and scoop 163. The burnt stones appeared to represent burning of the natural ground surface, and pre-dated the hut gully.

PIT COMPLEX

A broadly linear complex of at least four intercutting pits and a gully lay to the east of the structural group (Fig 3, F; Figs 5 and 7), extending for approximately 5m north-westwards from the southern edge of excavation area. While these features represented several phases of activity, their fills were mostly very similar (largely redeposited natural) and not all the relationships could be determined. This feature group had not shown up as a geophysical anomaly.

The earliest excavated elements of the complex appeared to be the north-westernmost [108], and the south-easternmost [115] pits; the latter had been so much cut by other features that no part of its edge could be identified. Pit 108 was cut on its south-east side by pit 142, while the west side of pit 115 was cut away by pit 110. Pits 142 and 110 must have intersected, but they could not be distinguished in plan and the intersection did not appear in any of the recorded sections – they may in fact have been parts of the same feature, in which case it would have been part of a broad curvilinear ditch, with 142 as the terminal, rather than a pair of pits. The latest element of the complex was a deep vertical-sided slot [106], which cut away the north-east side of pit 115 and also cut pit 142.

No artefacts were recovered from these features except for a single undiagnostic Romano-Cornish

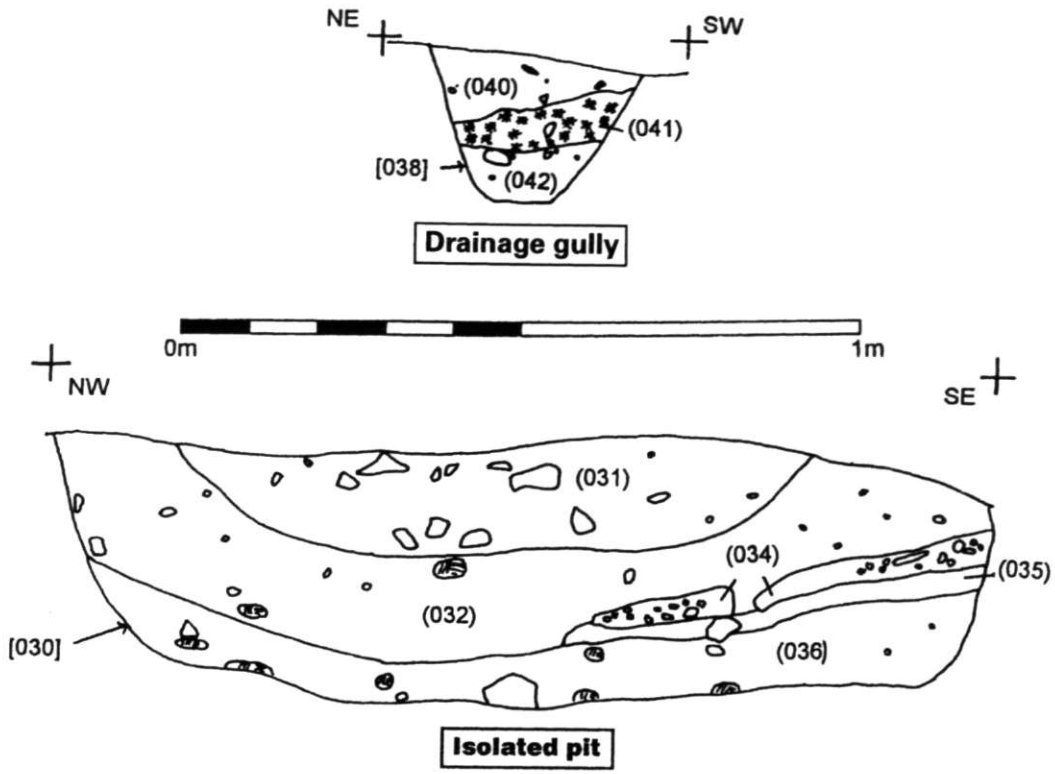

Fig 7 Penhale Round 1996. Sections of drainage gully and pit 30

potsherd from the upper fill of slot 106, probably the latest element of the complex. No charcoal or macroplant remains were recovered. Many of the fills were suggestive of deliberate backfilling, and most of the features had only a single homogenous fill. The function of the various elements of the complex remains enigmatic. While slot 106 was of a suitable shape to function as a large post-trench, there was no evidence in the form of post-pipes or post-packing to suggest that this was its purpose. There was even less evidence to suggest a function for the other features.

ISOLATED PIT

To the immediate east of the pit complex, an isolated sub-rectangular pit [030] of regular profile was identified, roughly coinciding with an amorphous geophysical anomaly (Fig 6). In contrast with the other pit group, it had five distinct fills [031, 032 and 034–6], which included dumps of clay and charcoal lenses, perhaps suggesting an industrial function; all of the fills also contained slag from iron smithing (Fitzpatrick 1998). Romano-Cornish pottery was recovered from three of the fills; in two cases the pottery is not closely dateable, but fill [032] contained two abraded sherds of first to second century AD date – the only pottery from the excavation necessarily of early Romano-British date (Quinnell below). This feature also produced the largest assemblage of carbonised plant remains from the site (Scaife below) and significant quantities of charcoal, including the only heather charcoal from the site. The latter may also have some industrial significance (Gale below).

Late features

Several features which appear to post-date the Round were recorded. A line of small tree holes (Fig 3, G) which coincided with a geophysical anomaly was recorded cutting the fills of the outer two enclosure ditches. A single post-hole was also observed to cut the fill of the outer enclosure ditch. Beyond the enclosure, an isolated small post-hole with a charcoal-rich fill was the sole feature recorded.

Stratigraphic phasing

The remains in this excavated area, which lay in the northern part of the site, were truncated to a substantially greater degree than those in the southern area excavated by the CAU in 1993, causing significant damage to the stratigraphy in the area and reducing the degree to which the remains could be satisfactorily phased. This truncation was due to previous stripping of topsoil for sale.

The enclosure ditches

The fact that the inner ditch had been recut and the lack of any relationship between the inner, middle and outer ditches means that there could be between two and four phases of ditched enclosure in this part of the site, depending on whether any of the ditches were excavated contemporaneously. Truncation of the site means that any evidence for a rampart has been destroyed, although one is known to exist from the 1993 excavations, and any phasing evidence associated with the rampart cannot therefore be identified. If some of the material filling the primary ditch in Section B derived from excavation of the middle ditch, a possibility tentatively suggested above, this would raise the minimum number of phases to three. However, the CAU excavations in the better-preserved area around the entrance identified seven separate phases of univallate enclosure before a second ditch was added, with an overall total of ten enclosure phases. This would tend to suggest that the maximum of four phases identifiable from the ditches excavated in 1995/96 underestimates the true number of phases present. While the recut of the inner ditch is stratigraphically the latest phase identified in 1995/96, it may actually correspond with the CAU's phase 7.5 or 7.6 (the fifth or sixth enclosure phase) in the entrance area (Jacqueline Nowakowski pers comm).

Internal features

Although stratigraphic relationships between individual features could be demonstrated, no association with the hut gully or clear phasing of the post-holes could be established on stratigraphic grounds. The 21 post-holes enclosed by the hut gully and apparently respecting it, clearly represented at least two structural phases, either or both of which could be contemporary with the gully. However, some of these features could also be contemporary with an earlier phase represented by post-hole 148 and the area of burnt natural which were cut by the gully, or with one of the later phases represented by two post-holes cutting the gully.

The straight post-hole alignment, which cut the gully, also post-dated pit 108 (the earliest element of the pit complex), while the pit complex itself demonstrated at least three phases. The isolated pit lying further to the west [030] was not stratigraphically linked to any other feature.

While each of the main groups of features within the excavated area (enclosure ditches, hut gully

and post-holes, post alignment and pit complex) demonstrated the presence of between two and four stratigraphic phases, in no case was it possible to confirm the total number of phases within any group. The only stratigraphic link between groups which could be demonstrated was the post alignment, which post-dated both the hut gully and the earliest element of the pit complex; this provides no information on the chronological relationship between the pit complex and the structural complex. None of the internal features could be stratigraphically linked to any phase of the enclosure ditches. Some of these issues can be clarified a little further through artefactual and radiocarbon dating, which are discussed below.

The Artefacts

Henrietta Quinnell

Glass (Fig 8)

A single fragment (**SF6**) was recovered from 063, the top fill of post-hole 064, and was submitted to the Wiltshire Conservation Laboratory for conservation. The fragment, 76 × 25 × 3mm, is of vessel glass in a blue/green metal with numerous oval bubbles, and most likely to be from a prismatic bottle. Such bottles were most common in the first and second centuries AD in Britain, but continued in used into the third century (Fitzpatrick 1998). No glass was found during the 1993/4 excavations (Nowakowski forthcoming).

The piece comes from the wall of a bottle, probably from a square as opposed to a hexagonal prismatic type. Such bottles formed a significant proportion of the glass assemblage from the Greyhound Yard Site at Dorchester (Cool & Price 1993, 153) and at Exeter (Allen 1991). Dated contexts at Exeter are rare and range from the later second to the later third/earlier fourth centuries; bottles may have continued in use there later than elsewhere, and there is in addition evidence for the reworking of broken glass. Glass is rare at Exeter after the second century (Allen 1991, 220), unlike Dorchester which reflects the national pattern with much fourth century material. In rural Devon glass occurs on those few sites with buildings in the Roman style, but is less common on enclosure sites without such buildings; compare its presence at Stoke Gabriel (D Harden in Masson Phillips 1966) to its absence at Hayes Farm (Simpson *et al* 1989). Glass occurs in small quantities on some Cornish enclosure sites, at Reawla (L & R Adkins in Appleton-Fox 1992), Trethurgy (J Price in Quinnell forthcoming), Carvossa (D Harden in Carlyon 1987), Grambla (Saunders 1972), Kilhallon (J Price in Carlyon 1982) but not at Trevisker, Shortlanesend or Carwathen (Carlyon 1995, 61–65); it is an occasional find at courtyard house sites (*ibid*) and on unenclosed coastal settlements (D Allen in Ratcliffe 1995). There is no overall summary for either county in which dates and quantities can be assessed against other factors such as site location or the size of excavation, but the published glass from Cornwall indicates that it occurs throughout the Roman period, and does not reflect the unusual early pattern of deposition and possible use at Exeter.

Ironwork

Four fragments were present: two, one each from 045 in the recut inner ditch fill and 064 in post-hole 062, were parts of hobnails; one, from 036 in pit 030, was from a nail; the final piece from 061 was not identifiable. Probable hobnails were found during the 1993/4 excavation (Quinnell in Nowakowski, forthcoming). Hobnails (cf Manning 1985, 136) are being increasingly recognised from Cornish sites as ironwork is more carefully studied. A total of 115 were found at Trethurgy (Quinnell forthcoming), two from Duckpool, Morwenstow (Quinnell 1995a, 131), and others at Grambla, Wendron (Saunders 1972, 52) and at Nor'nour (Dudley 1968, 25 & fig 10). These simple

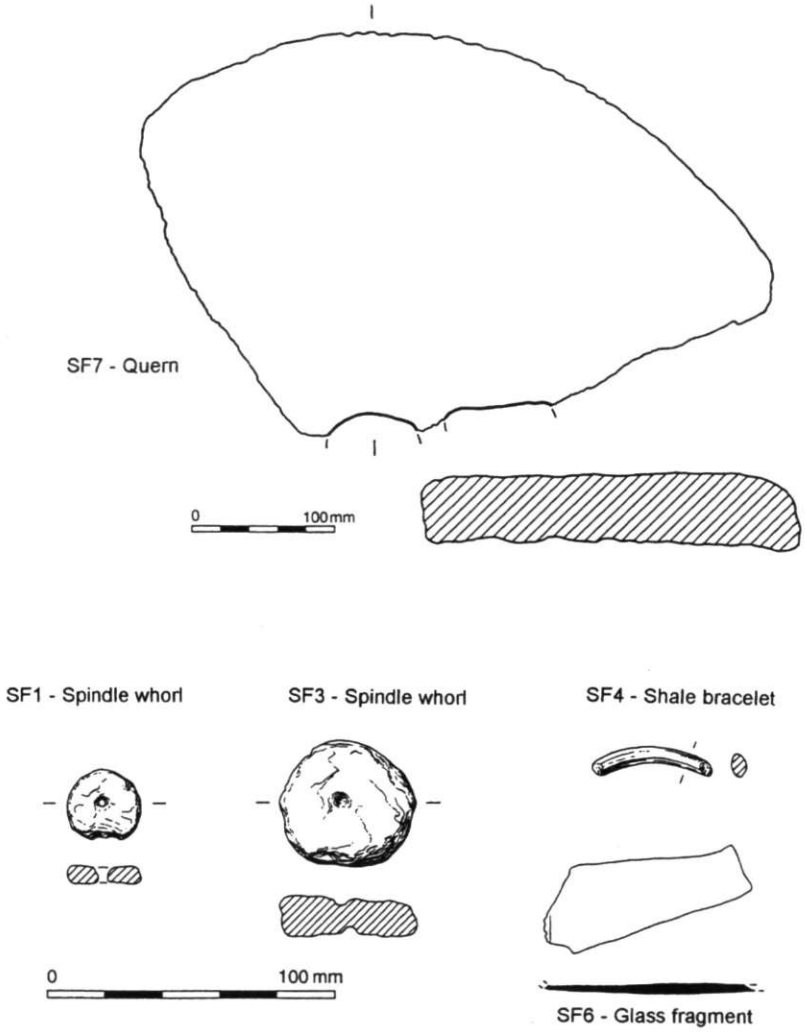

Fig 8 Penhale Round 1996. Finds of stone, shale and glass

objects indicate the spread of a trend in footwear based on Roman fashions and techniques, as hobnails did not occur in pre-Roman Britain.

Stone artefacts

A single fragment of a shale bracelet (**SF4**, Figure 8) was found in 045, the Inner Ditch recut infill containing a third/fourth century pottery dump; this was submitted to the Wiltshire Conservation Laboratory for conservation. The fragment represented approximately 15% of an oval-sectioned bracelet, internal diameter 70mm. It is of Greyhound Yard, Dorchester, Type 2, manufactured from the Iron Age throughout the Romano-British period (Mills & Woodward 1993). The most likely source of the shale is Kimmeridge, Dorset and it is likely that the bracelet was made in the Isle of Purbeck (Fitzpatrick 1998). No shale was found during the 1993/4 excavations.

Shale bracelets are not common in Roman Cornwall. They have otherwise been recorded from Trethurgy (Quinnell forthcoming), Grambla (Saunders 1972), Carvossa (M Irwin in Carlyon 1987) and Chysauster (Hencken 1933, 259), where they continue a sparse tradition of import from the Iron Age as at Castle Dore (Radford 1951, 70). A shale spindle whorl was also found at Trethurgy. Unlike glass there may be a connection with Exeter where the quantity of shale artefacts, mainly but not entirely bracelets, is commented upon as being unusually high (Allason-Jones 1991, 271), and probably connected to Exeter's coastal import of Dorset BB1 pottery (Holbrook & Bidwell 1991, 21). Shale has also been found at Mount Batten, Plymouth, a bracelet, part of a possible vessel and a rough-out suggesting that objects were made on the site; these finds are consistent with the role of Mount Batten as a port during the Roman period (Cunliffe 1988, 72). However a brief scan of the literature indicates that on rural sites in Devon shale objects are uncommon, even given the comparatively small amount of investigation carried out.

Two spindle whorls were recovered from Penhale (Fig 8). **SF1** came from 015, top level of infill in recut Inner Ditch Section A. Of local Devonian shale, roughly circular, 25mm diameter and 5mm thick, the hourglass type perforation is not central. Weight 6g, but part of edge chipped. Has probably been little used.

SF3 From 022, from the infill of the Middle Ditch. Of local Devonian shale, unfinished, 42mm in diameter and *c*12 mm thick; 41g weight. A start at boring the hole has been made on both sides.

Spindle whorls are almost ubiquitous on Roman period sites in Cornwall, and the widely outcropping Devonian shale, which breaks into thin even slabs along bedding planes, was very commonly used; several whorls of shale were found in the 1993/4 excavations. **SF1** is at the smallest end of the size range, **SF3** at the largest. The most sizeable group is that of 20 from Carvossa (M Irwin in Carlyon 1987).

One quern (**SF7**, Fig 8) was recovered from 064. About a quarter of an upper rotary quern of granite, *c*600mm diameter, 45mm thick, with the eye100 mm across; variation in diameter suggests the original shape was oval rather than round. The underside is very worn with several pronounced grooves, and the eye shows wear. The nature of the wear indicates that the quern was turned in a clockwise direction. Even allowing for considerable loss of thickness during use, this quern is unusually thin and flat-topped. One break preserves one side of a slot. (The other break shows a regular, very fresh, chamfer, which could have been produced by machine damage on such soft granite.) The slot may have been designed to hold a wooden or iron fixture (rynd) to support the central spindle or could have been a feed hole. Macroscopic examination shows an absence of large feldspar crystals and the presence of pale mica, probably muscovite, which would best fit a source in the Tregonning Granite (Dr R T Taylor, pers comm). Tregonning is about 35 km to the south-west; greisen from the area was much used for objects such as mortaria (Quinnell 1993). Both rotary and saddle querns were in use in Cornwall throughout the Roman period (Quinnell 1986, 117). Pottery from this post-hole is probably third to fourth centuries but could just be as early as the second.

All rotary querns so far recorded for Roman Devon and Cornwall are thick with conical or hemispherical grinding surfaces (eg Castle Gotha, M Irwin in Saunders & Harris 1982), which are closely related to those in use during the Iron Age. **SF7** is of Curwen's (1937) disc type with almost flat grinding surfaces, considered to have developed from Roman querns with more sophisticated features. Curwen (*ibid*, 146) considered this type to date late in the Roman period but more recent work show them to be common from at least the second century, as at Catsgore, Somerset, the nearest rural site in the South West to have produced querns in any quantity (Leech 1982, 129). The disc variant may well have developed from the forms in use by the Roman army: see the presentation by Welfare (1995) of the range from Usk in South Wales. There appears however no close parallel for the slot, set radially to the eye. Settings for a rynd are normally cut as extensions to the eye (eg Chew Valley Lake Nos 10 & 11 (Rahtz & Greenfield, 1977, 202 and fig 96)). Separate cuts or slots tend to be interpreted as feed holes; the best comparanda are on flat querns from

Voreda, Cumberland (North, 1936, fig opposite p132), Bromham, Beds (Tilson, 1973, fig 31) and Bramley, Surrey (Rawnsley, 1927, 242); all except Bramley are smaller and all are set tangentially rather than radially. The unusual nature of this quern is appropriate for its suggested source in the Tregonning Granite, an area which produced a variety of innovative and sophisticated artefacts for exchange within Roman Cornwall. (The report on the quern is largely based on discussions with Sue Watts of Cullompton, to whom I am much indebted.)

Flint

Five flints were identified, an unworked piece from 121 in the middle ditch, two scraps from post-hole 049, and a core-trimming piece and a serrated blade, both of pebble flint, from inner ditch fill 045. The blade, 15mm wide and surviving 37mm long with both ends broken off, has deliberate serrations along both edges. Such serrated blades or flakes are generally regarded as one of the more distinctive forms in Earlier Neolithic assemblages, though not well represented in Cornwall (see discussion by Saville 1981, 144). Flints of Neolithic, as well as Mesolithic and Bronze Age date were found at Penhale in the 1993/4 excavations as was Earlier Neolithic pottery (Quinnell in Nowakowski, forthcoming).

Bronze Age pottery

Two sherds from 077 in the Inner Ditch have rock inclusions, probably serpentinite, and are typical of a Bronze Age fabric known as gabbroic admixture (Parker-Pearson 1990, 19). Considerable quantities of this fabric was found during the1993/4 excavations, in Trevisker forms which should be of Middle Bronze Age date, in contexts just outside the South of the Round.

Roman period pottery (Fig 9)

Introduction

The assemblage consisted of 174 sherds; fabrics are described below. Minimum vessel numbers have been estimated very simply on variations in surviving pieces with distinctive aspects in form or fabric; they should be regarded as only a very rough guide.

Fabric	Sherds	Weight (g)	Minimum vessel numbers
Well-made gabbroic	1	1	1
Standard gabbroic	88	1188	13
Coarse gabbroic	5	280	2
Gabbroic LV	76	1824	12
SE Dorset BB1	3	52	2
Exeter Sandy Grey ware	1	16	1
Totals	174	3361	31

The fabrics

Gabbroic fabrics have most recently been described in the report on the round at Reawla (Quinnell 1992b). *Well-made* is compact, with most inclusions <2mm and carefully burnished surfaces; it was used during the Later Iron Age into the second century AD. *Standard* is less carefully made, grits may be up to 5mm and burnish is more sporadic; it is the fabric most frequently used during the second and third centuries. *Coarse* is a thick oxidised fabric with grits often >5mm used for storage

vessels. *Gabbroic Late Variant (LV)* was first recognised during examinations of the ceramics from the 1993/4 excavations at Penhale carried out by the author (Quinnell in Nowakowski, forthcoming); this contains rounded as well as angular inclusions in a fabric which tends to be more open than *standard* and is used for a wide range of bowls and jars during the later third and fourth centuries. A number of petrological studies have been carried out by Dr DF Williams (see Quinnell 1992b) which both confirm the likely source for gabbroic fabrics as the St Keverne area of the Lizard, and also the Dorset origin of BB1 material. Petrological work on the *gabbroic LV* fabrics has not yet been carried out but macroscopic examination of later Roman period collections suggests its use is widespread. Gabbroic fabrics generally account for around 90% of Roman pottery in Cornwall. The next most common fabric, *South East Dorset BB1*, while present throughout the period, increases in the third and fourth centuries (Quinnell 1986). The chronology and typology of *South East Dorset BB1* in the South West are fully discussed by Holbrook and Bidwell (1991) in their report on Roman finds from Exeter, which also covers *Exeter Sandy Grey ware* (*ibid* 154–5). The latter, Exeter fabric 151, was probably made somewhere in the vicinity of Exeter from *c*AD 60 to the late second century. The only other Cornish site at which it has been recognised is Carvossa (P Bidwell in Carlyon, 1987) where there were sherds of at least 20 vessels.

The present report makes use of the Cornish site by site summaries, prepared during the 1980s by Carlyon (1995), detailed work on the ceramics from Trethurgy Round (Quinnell, forthcoming), and the assessment of the ceramics from the 1993/4 excavations at Penhale (Quinnell in Nowakowski, forthcoming). Analysis of these excavations is expected to provide a range of radiocarbon dates which will have relevance to the material published here.

Details of ceramics by context and description of illustrated vessels

INNER ENCLOSURE DITCH – SECTION A

The fills of the initial cut in Section A produced single gabbroic sherds from contexts 092 and 017. Neither was closely datable.

Larger quantities of pottery were recovered from the fills of the recut of the inner ditch. Single well-made *gabbroic* sherd [015], four *gabbroic* sherds [029, 005] including **P1**, ten *gabbroic LV* [095, 015, 005], one *BB1*, **P2.** A minimum of five vessels are represented by **P1, P2** and other sherds with distinctive forms or fabric.

P1 (029): Small lug with vertical perforation; no known parallels but similarities in both gabbroic fabric and condition suggest that it is part of the site's Roman period assemblage.

P2 (095; not illus, see **P6**): Rim/wall sherd from plain-rimmed dish in *South East Dorset BB1*; possible remnant of arcade decoration. Plain-rimmed dishes in *South East Dorset BB1* occur at Exeter from the mid-second century and then are found throughout the Roman period; arcading or intersecting arc decoration occur throughout (Holbrook & Bidwell, 1991, 99–100). These dishes are common among fourth century *BB1* material in Cornwall; there were eight at Trethurgy (Quinnell, forthcoming).

INNER ENCLOSURE DITCH – SECTION B

In the initial ditch cut, only 057, high in the fill, contained pottery: seven *gabbroic* sherds including **P3**, twelve *gabbroic LV* including **P4, P5**; single *BB1* sherd **P6**. A minimum of six vessels are represented by **P3-6** and other distinctive pieces.

P3 (057): Jar with simple rim, gabbroic, external black coating, incised line around girth. Such small jars tend to be earlier, rather than later, cf No 41 from Reawla (Quinnell 1992b, fig 16, and discussion 96).

P4 (057): Base angle of jar with cordons, *gabbroic LV*. No immediate parallels but generally bases do not survive well in gabbroic assemblages (Quinnell forthcoming). However, the survival

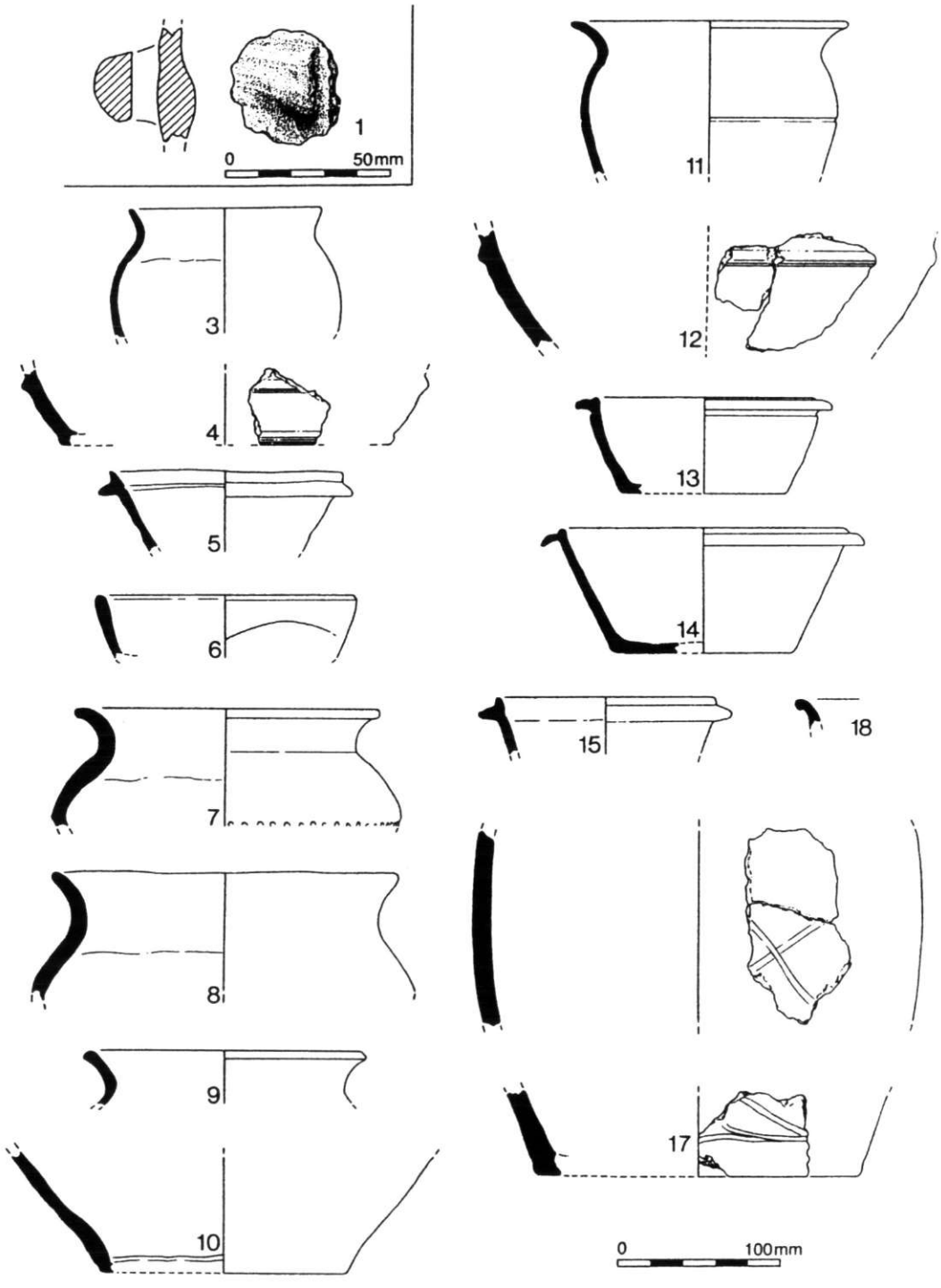

Fig 9 Penhale Round 1996. Pottery

of cordoned forms into the fourth century and beyond, consistent with the *LV* fabric variant, is now well established (Quinnell 1986, 120).

P5 (057): Bowl with conical flange in *gabbroic LV*; exterior black coating and burnish. Such bowls are thought to be copies of similar forms in *BB1*, which occur at Exeter from *c*AD 270 throughout the fourth century (Holbrook and Bidwell, 1991, 98). This date range for gabbroic copies works well for all relevant Cornish sites and the form remains the most reliable chronological indicator for the later Roman period.

P6 (057): Rim/wall sherd from plain-rimmed dish in *Dorset BB1* with possible arcading; this joins with a sherd from recut infill 045; see **P2** for comments on date.

The fills of the recut of the ditch in Section B were much more productive. Contexts 076 and 077 in the middle fill contain six *gabbroic* and two *gabbroic LV* sherds. A minimum of three vessels represented, including two different rims from jars as **P7**.

Context 045 contains 105 sherds, many of them substantial, the largest assemblage on the site, weighing 2336g of the 3361g total weight of Roman period sherds. Forty-seven are *gabbroic*, including **P7, P13, P16,** 52 *gabbroic LV* including **P8, P9, P11, P12, P14, P15**; there are single sherds from a *coarse gabbroic* storage jar, of BB1 **P6**, and of *Exeter Sandy Grey ware*, from a large vessel, either a bowl or a lid. A minimum of 15 vessels are represented, and include one similar to **P18**. Because of the ditch sampling strategy, only part of this assemblage was retrieved. A number of base sherds from jars could not be linked definitely to enumerated vessels. What is unusual about the assemblage as retrieved is the lack of sherds from jar girths. Generally gabbroic jars used as cooking pots and continually reheated gradually crumble in their bottom halves. The condition of all sherds, rims, girths, bases, suggest that the pottery had not been extensively used before breakage, though sooting is present, showing that vessels had been used for cooking. This contributes to the comment about the tight nature of the assemblage as discussed below.

P7 (045): Jar with slight neck and simple out-turned rim; marks below groove around girth suggest a zone of hatching or other decoration (cf Quinnell forthcoming No 56). Roughly finished, with sooting. Jars of this type are generally considered to be early rather than late in the Roman period (Carlyon 1995, 8), for example P6 at Shortlanesend (Harris 1980, Figure 30) where occupation is assigned to the second to third centuries.

P8 (045): Jar with simple out-turned rim, *gabbroic LV* but, unusually, with a burnished finish. Rim profile lacks neck and would generally be considered a third to fourth century form (Carlyon 1995, 8).

P9 (045): Rim from jar with out-turned rim, *gabbroic LV*; a large version of **P11**.

P10 (045): Part of base of large ?jar with angle suggesting an unusually globular body, *gabbroic LV*, sooting. Study of published illustrations show that there is generally little information about the form of lower parts of jars.

P11 (045): Jar with out-turned rim and groove around girth, *gabbroic LV*. Such jars may be influenced by late third to fourth century versions of *BB1* jars (Holbrook & Bidwell 1991, 95; Carlyon 1995, 8).

P12 (045): Body sherd with cordon, *gabbroic LV*; sooting. Cordons on a variety of forms persist as long as the Roman gabbroic industries were active (Quinnell 1986, 120).

P13 (045): Bowl with flat grooved rim; sooting. If these bowls, as other distinctive types, copy *South West Dorset BB1* forms and their chronology relates to that of that fabric at Exeter (Holbrook & Bidwell 1991, 98), a date range from the late second to the late third centuries would be probable. This date fits Cornish data for the introduction of the form, but it appears to have continued in use in gabbroic fabric alongside the later type with the conical flanged rim (cf occurrence in third to fourth century contexts at Goldherring (Guthrie 1996, fig 13); discussion in Quinnell forthcoming).

P14 (045): Bowl similar to but larger than **P13**, *gabbroic LV*; sooting.

P15, P16 (P16 not illus) (045): Bowls with conical flanged rims, similar to **P5** but different vessels.

DISCUSSION OF POTTERY IN THE INNER DITCH

The presence of conical flanged **P5** in the fill of the initial cut indicates that this had not silted up before the late third century. The quantity of *LV* sherds suggests a late third or fourth century date. 045 could be the equivalent of 015 in separate Sections, but no sherds from the same vessel could be identified in both, or indeed between any contexts whether in the same Section or not except for **P6**. The nature of the breaks in 045, many vessels with large sherds that join which most likely broke when thrown in, suggests dumping of the deposit was a single episode. The clear indications of post-breakage firing indicates this may have following an episode of general tidying up of rubbish from the interior. The 045 group appears to be, even if small, one of the best closed contexts at present available in Roman Cornwall. The date of 045, as with all other material from the recut, is late third or fourth century. The sherd of *Exeter Sandy Grey ware*, which is unlikely to have been made after the second century, has abraded edges and is probably redeposited. There is medieval material in the top of the Ditch (see below).

AREA OF HUT GULLY (038)

Gully fill 041 contained two *gabbroic* sherds, 050 four; none had distinctive features. 064 in post-hole 062 contained four sherds from a *coarse gabbroic* jar **P17,** 063 two *gabbroic* sherds. Other contexts within the gully contained only non-distinctive gabbroic sherds, one from 061, three from 075, two from 086.

P17 (064): Base angle and body sherds from storage jar in coarse gabbro, possibly not the same vessel. Criss-cross decoration incised on wet clay; decoration survives close to base, cf PM124 from Porthmeor (Carlyon 1995, Hirst 1937). Large storage jars tend to survive only in small fragments and in the past have usually not been recognised. The discussion on the type in the report on Trethurgy (Quinnell forthcoming) brings together what is now known about them. Generally in the South West the type is regarded as third and fourth centuries. Storage jars occur at Exeter in *Gritty Grey ware* fabrics from the Antonine period until the fourth century (Holbrook and Bidwell 1991, 175). In gabbroic fabrics large storage jars in *Cordoned ware* probably continued to be made throughout the Roman period, thus influencing South Devon wares in which they also have a long life (Quinnell 1995b). While the type undoubtedly becomes more common in the third and fourth centuries a second century date is not impossible.

FEATURES BETWEEN THE HUT GULLY [038] AND THE INNER DITCH

Context 107 contained one *gabbroic* sherd; in isolated pit 030; fill 036 contained one *gabbroic* sherd, 035 a chunk of *gabbroic* base, and 032 two sherds including **P18**. A minimum of one vessel is represented.

P18 (032): Fragment from small jar with upright neck below out-turned rim. Such rims are commonly considered no later than second century (compare examples in Group 3 from Castle Gotha where occupation probably ceased in the second century (Saunders & Harris 1982)).

DISCUSSION OF ROMAN PERIOD POTTERY

Only the single well-made sherd from the inner ditch could be of pre-Roman date. The 1993/4 excavations indicated several phases of enclosure activity before the Roman period, although finds from ditch infills were sparse, and little pre-Roman or early Roman material was found in the interior. A little of the material published here from the interior could be of second century date; further data is needed to refine the chronology of both storage jars and vessels with upright rims. Certainly the material associated with the ring Gully 038 would fit well into the later third and fourth centuries as Cornish ceramics are currently understood.

The majority of sherds come from dumps high in the latest identified phase of the enclosure ditches. This matches the data from the 1993/4 excavations in which a dump of probable fourth century date was found high in the latest ditch fill. Both excavations therefore have produced

ceramic assemblages in which the majority of material belongs late in the Roman period; it should be stressed that, on present evidence, 4th century forms may well have continued in production into the 5th century (Quinnell forthcoming; 1986, 129). Given the difference between the chronological emphasis of the ceramic assemblages and the long range of activity at the Round as currently understood, differences in the quantity of pottery in use at different dates and in strategies for disposal of broken sherds must be taken into account. It is salutary to stress that, but for the 1993/4 excavations, Penhale Round would almost certainly have been ascribed in its entirety to the later Roman period.

The assemblage from 045 provides one of the most useful contexts so far identified in Roman Cornwall. Its minimum of 15 vessels show features which suggest dumping of broken pottery which had not in general had a great deal of use. Given the fact that 045 is high up in the recut inner ditch, and that the initial cut was not infilled until at least the late third century, a date sometime during the fourth century seems reasonable. If the types present in 045 were in use together, the group provides two important strands of information. In regard to jars, those with upright necks and slightly out-turned rims were still in use together with the later types with definite out-turned rims. In regard to dishes and bowls, those with flat grooved rims, first introduced during the second century AD, were still in use, and presumably in production, along side the conical flanged bowls of the late third and fourth centuries. New bowl and jar types appear at much the same dates as do the proposed prototypes in *BB1*, but earlier types, contrary to *BB1*, remain in production or at least in use, alongside later ones. There is no ready explanation for this situation, which implies a gradually increasing repertoire for gabbroic pottery production centres. However if it is substantiated by other closed finds, it provides helpful guidelines for the interpretation of other assemblages. Due account needs to be taken in future of the long-lived potential of forms which start in the second century and continue into the fourth, especially on sites where only small quantities of material are found.

Medieval and Post-Medieval pottery

Three sherds, from 005 cleaning over ditch fills and 031 top of pit 030, are from local medieval cooking pots, twelfth to fourteenth centuries in date. Four from topsoil 001 and 071 in the top of pit 070, are *North Devon ware* of probable late seventeenth century date. Both medieval fabrics and the *North Devon ware* were found in larger quantities in the 1993/4 excavations where they were ascribed to scattering with manuring around Trewheela Farm (Nowakowski, forthcoming).

Daub

Fills 031, 032 and 034 in pit 107 contained *c*10 small pieces of daub totalling 60g, and 064 in post-hole 062 contained one piece of 10g. These contain pieces of local shale. All are soft and friable and appear more likely to have come from a structural feature such as a wall or hearth, which has become burnt, than from an artefact such as a loom weight.

Acknowledgements

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The Charred Seed Remains

Robert G Scaife

Introduction

It has been suggested that rounds were foci of agricultural activity with buildings within the enclosure and surrounded by field systems presumed to have been for arable cultivation. However, until recently such rounds have not previously been studied in detail in terms of their environment and agricultural function.

Methodology

A detailed sampling strategy was carried out on site to ensure that any available plant macrofossils would be recovered. A total of 40 bulk samples were taken from all of the principal contexts with particular attention being paid to the fills of the primary ditch and associated pits. These samples were processed 'off-site' in the Babtie Laboratory (Reading) by C Chisham. A standard Siraf flotation tank was used for extraction with the flots collected on sieves of 1mm and 0.25mm mesh size. The resulting material was air dried. Initially, an assessment of the seed and charcoal content was made, high-lighting those samples which contained useful quantities of charred remains. On the basis of this examination, a total of 8 samples appeared to be rich in charred seed, largely the remains of cereal grain and chaff. Subsequently the flot was examined for its wood (charcoal) taxa by Rowena Gale. Sorting, identification and counting were carried out under a low power microscope (Wild M3c). Taxonomy follows that of Stace (1991).

The data

The greatest numbers of identifiable plant remains are present in the fills of the pits. Samples 27 and 28 [context 031], and 29 and 30 [context 032] from pit 030 being most prolific. Samples from post-hole 26 [062] and other features such as the inner ditch generally contained charcoal but few cereal remains and weed seeds.

PIT 030

Contexts [031,032,035,036] within this pit contained substantial numbers of charred remains comprising charcoal, cereals and weed seeds. In some cases, the flot was rich enough to necessitate sub-sampling for analysis. Data from this analysis form the basis for reconstruction of the agriculture associated with occupation of the round. Dating of this feature is unclear; one abraded sherd of pottery suggested a second century date (Quinnell above), but it could have been anything up to fourth century (see below). Small quantities of iron slag have been recovered during the processing of the bulk macrofossil samples from all of the contexts noted above. It has, therefore been suggested that iron smithing took place locally (Fitzpatrick 1998). It seems plausible, that the wood/shrub charcoal plus cereal and cereal chaff remains may have been fuel associated with this activity. Alternatively, the remains may simply be domestic waste from within the round. Whichever origin, the charred remains provide a clear insight into both the available woodland/fuel resource (see R Gale) and evidence of the cultivated crops at this time.

A number of crops have been identified which include the wheats *Triticum spelta* L. (spelt), *T. dicoccum* Schubl. (emmer), *Triticum aestivum* type (hexaploid bread/club wheats), *Avena* (oats) and *Hordeum* (barley). The only other obvious food product identified was *Pisum sativum* (pea). Of

these crops, the grain of spelt wheat and oats are the most frequent. Grain of these types has been identified as *Triticum spelta* type and *Avena/Bromus* type since there is morphological overlap with emmer in the former and *Bromus secalinus/mollis* in the latter. Chaff remains (especially glume bases) are the most diagnostic/identifiable remains and suggest the predominance of spelt wheat and oat grain. Emmer wheat chaff was also identified, so some of the grain within the spelt group is likely to be emmer; a small number of grains in the inner ditch recut (125) and post-hole 058 had the typical tear drop shape. *Hordeum* sp. (barley) is present but in relatively small numbers compared with spelt and oats. In pit 030, however, there are numerous chaff remains (rachis internodes) and the importance of barley as a crop is indicated. The available grain and chaff have all been determined as two row, ie the grain is not twisted.

Glume bases and spikelet forks of spelt are abundant, with rare rachis internodes also present. A substantial number of unidentified glume bases and spikelet forks and *Triticum* indet. grain may also be attributable to spelt. A smaller number of glume bases of emmer (*T. dicoccum* Schubl.) were recovered, indicating presence but not necessarily significance as a crop. In spite of the good preservation of most of the material, palaea and lemma fragments are notable by their absence, as were the small quantities only of straw fragments and awns. It is possible that the lighter chaff elements may have been blown away/removed during winnowing. Of particular note, however, are the culm bases (especially in context 32) and some culm nodes. These may suggest harvesting by uprooting (Hillman 1981).

Due to the exigencies of human behaviour, the requirements of different crop processing activities and taphonomy in general, the relative importance of some crops cannot be gauged. The lesser numbers of emmer wheat, free threshing bread wheat and peas do not necessarily imply lesser importance than spelt, oats or barley. The former (emmer) being a glume wheat like spelt requires parching to release the grain from the ear. Thus, it is likely that this wheat would be more frequently represented since accidental charring was more likely to occur. It is suggested, therefore, that emmer was possibly a weed of other crops. Bread wheat (*T. aestivum* type) does not require parching and thus is less likely to be found be found charred unless waste was deliberately thrown on a fire. Bread wheat was present here and was, therefore, possibly of greater importance than indicated by numbers of grain alone. The same argument applies to *Pisum sativum* L. (pea).

The numbers and taxonomic diversity of charred weed seeds is small. However, of specific importance are large numbers of *Raphanus raphanistrum* L. (wild radish). Other weeds typical of arable habitats comprise *Vicia/Lathyrus, Viola* sp., *Polygonum aviculare, Rumex* spp., *Valerianella locusta/dentata* and *Tripleurospermum inodorum* (scentless mayweed).

The Post-hole Contexts

Post-holes 058 (sample 23), 062 (sample 26) and 136 (sample 54) produced useful remains and information which are comparable with that of pit 030 but with some notable differences.

Post-hole 058 (Context 059, Sample 23):
Small quantities of cereal remains were present, but possible caryopses and a glume base of *Triticum dicoccum* Schubl. are of note.

Post-hole 062 (Context 064, Sample 26):
Fortuitously, this post-hole was one of the few dated contexts. Pottery of third/fourth century AD and a quernstone provide a valuable date for the assemblage. Here, *Avena* grain predominates and some glume bases were adhering, in some cases to the grain, confirming that the grain is oat. *Triticum spelta* L. and *T. aestivum* type (bread/club wheat) are also present, the former identified by a small number of spelt glume bases and absence of emmer chaff. In contrast to assemblages from pit 030, is the absence of *Hordeum* (barley) and the infrequent numbers of weed seeds and cereal chaff debris.

Post-hole 136 (Context 077, sample 57):
This post-hole forms part of an alignment of post-holes, one of which cut the hut gully [038]. It thus appears to be later than the main structural complex. Although this places the post-hole in a stratigraphic context, absence of artefactual material precluded accurate dating. It appears, however, to be of late Romano-Cornish date.

This context produced substantial numbers of *T. spelta* glumes (80), some spikelet forks (nine) and grain of spelt/emmer type. Although some emmer glumes (no grain) were also identified (four) it is most probable that the grain can be referred to spelt wheat. Other crops present comprise *Triticum aestivum* tupe (four) and *Avena/Bromus* (35) grain and a small number of *Hordeum* rachis fragments (eight). The latter are few in comparison with numbers obtained from the pit contexts. Wild Poaceae and *Polygonum aviculare* L. were the only weed seeds recovered from this post-hole.

Archaeobotanically, the recorded assemblages from these post-holes were not as rich as that of pit 030. However, they provide useful data which corroborate data from the other contexts discussed. Grain/caryopses are relatively fewer in number with *Avena/Bromus* (35) and *Triticum spelta* type (27) again the most important with small numbers of *T. aestivum* type and absence of *Hordeum*. There are, however, relatively greater numbers of chaff fragments in the fill of 062, *Triticum spelta* L. and spikelet forks and a small number of *Hordeum* rachis fragments. Weed seeds were almost absent except for *Polygonum aviculare* L. (knotgrass) and wild *Poaceae* (grasses).

THE INNER DITCH
Two contexts from the inner ditch recut produced quantities of charred remains. Of these, sample 052 [context 76] was the most productive. Preservation of the grain was rather poor with a substantial number of indeterminable grain fragments. Identifiable caryopses comprised *Triticum spelta* type (spelt) and *Avena/Bromus* type. Chaff remains were also present and are also largely attributed to spelt although a few emmer caryopses with emmer type characteristics and some emmer glumes were present. *Hordeum* chaff was not present and only occasional grain was found.

Discussion of the crops

One of the principal environmental aims was to establish the nature of agricultural activity associated with the round. Absence of faunal remains due to soil acidity precluded one means of establishing whether mixed economy was practised. The charred cereal remains and pollen analysis (Scaife below) suggest that the environment was at least locally open as indicated by substantial herb pollen frequencies. Wood charcoal (Gale below), however, indicates the utilisation of wood/scrub as a fuel. Given the lack of pollen evidence for locally dominant woodland, this was presumably at some distance from and transported on to the round. The importance of arable cultivation in the landscape is established for the Romano- British period. There appears to be no late prehistoric or Iron Age material similar to that from earlier excavations at the round (Nowakowski 1998).

Overall, the crop assemblages recovered are typical of the Romano-British period with hulled spelt wheat (*T. spelta* L.) being especially diagnostic. Oats sp. (*Avena*), barley (*Hordeum* sp.), free threshing bread/club wheats (*Triticum aestivum* type) and emmer wheat (*T. dicoccum* Schubl.) are also in evidence, as are a small number of cultivated peas (*Pisum sativum* type). The most important crops are discussed in more detail below.

Triticum spelta L.
There are now a number of sites which have late prehistoric records of spelt wheat. However, a major expansion in growth and importance of this winter hardy wheat is evidenced from the Iron Age and especially the Romano British period (Helbaek 1952). Its representation on sites of this age

is in part due to the fact that this is a glume wheat. That is, it requires parching on a heated floor or corn drying oven to release grain from the ear whilst threshing. It has also been suggested that drying of green/unripe grain or for pre-storage drying must be considered (Monk and Fasham 1980). The opportunity for accidental burning/charring is much increased by this process (Murphy 1977). There are now many records from southern Britain illustrating the predilection for spelt wheat during the Roman period (Helbaek 1952; Murphy 1977; Robinson in Lambrick and Robinson 1979; Monk and Fasham 1980; Scaife 1995; 1996).

Avena sp.

Some difficulties exist in differentiating *Avena* (oats) from *Bromus secalinus/mollis* (bromes) and also from primary, secondary and tertiary crops and wild oats. Here, there is some size variation with the majority of grains of larger size. This, plus the adhering glumes, suggests cultivated oat (*Avena sativa* L.). Substantial numbers from all contexts examined suggests that this was an important local crop. There is some evidence from southern Britain that oats became important from the first century onwards (Murphy 1977).

Hordeum sp.

Barley was present both as grain and chaff, the latter being the more numerous rachis internodes and internode fragments. There were no twisted grains present which might indicate six row, so two row barley seems to have been predominant. The relatively small number of caryopses relative to rachis internodes suggests that the latter were the waste products of successful grain processing which were subsequently burnt on available fires. Where grain was recovered there may have been the odd few caryopses left in the processing waste or from accidental burning during pre-storage drying. The importance of barley here is in accord with the generally accepted view that hulled barley increased at the expense of naked barley from the late Bronze Age onwards in southern England. That barley was an important crop may be of interest here, since it has been suggested that this crop is more suited to calcareous soils such as occur on chalk and limestone (Murphy 1977) whereas soils here are predominantly acidic. Carruthers (1989) points out that *Tripleurospermum maritimum* (scentless mayweed) occurs frequently in samples with barley due to preference of disturbed and friable soils. This appears to be the case here.

THE LESSER CROP ELEMENTS

It can be noted that no *Secale cereale* L. grain or chaff was found at this site. Other crops recorded include *Triticum aestivum* type (bread/club wheat) and *T. dicoccum* Schubl. (emmer). Free threshing bread or club wheat (*T. aestivum* type) with typical rounded/ plump caryopses was present in small quantities in all samples but with little evidence of chaff debris. It is likely that bread wheat is markedly under-represented in the assemblages since parching is not required in processing, and the possibility of charring is thus greatly reduced. The small quantities of grain present possibly represent deliberately burned waste. It does, however, clearly indicate its presence as a crop although its relative importance cannot be determined. *Triticum dicoccum* Schubl. (emmer) was present in most contexts which contained spelt. Identification and evidence of presence are based largely on glume and spikelet morphology although some grain with the typical emmer 'tear drop' shape (Jacomet 1987-JRG Greig translation) was occasionally noted (eg post-hole 058 and inner ditch 125). However, the problems of distinguishing possible tail grain of spelt from emmer precluded any real attempt at separation of the *Triticum spelta/T. dicoccum* grain. Emmer, like spelt, is a hulled wheat and requires parching to release grain from the ear, increasing the possibility of accidental charring. The small quantities found here therefore suggest that emmer wheat, although definitely present, was subordinate to spelt and was perhaps a weed of other crops.

Crop processing

The charred remains of crop plants which are found are not necessarily a true indication of the importance of a dietary component (Dennell 1972; Green 1981). Many chance variables may be involved in the preservation of such crop remains. These range from the vagaries of human nature as to what rubbish is burnt and where, to purely accidental burning in ovens and grain stores. Furthermore, the overall taphonomy of material once charred can be complex with variable representation in different contexts and preserving conditions (Monk in Fasham and Whinney 1991). At the basic level, the 'presence' of a type, whether a single caryopsis or a cache, is evidence of its presence or growth at some level of importance (assuming contemporaneity). However, absence of a taxon does not necessarily imply that the crop was not being grown or consumed. Within such a multiplicity of variables, however, is the underlying requirement of cereal/crop production and processing for domestic consumption.

A variety of crops is present at this site with spelt and oats being the predominant grain and with strong evidence of barley from the abundant rachis internodes and smaller numbers of caryopses. The possibility of bread wheat being a more important crop than indicated by numbers of grain has been discussed. Abundant chaff and grain of spelt wheat and the relative paucity of light chaff and small weed seeds suggest that the grain had been partially cleaned before parching which was most likely responsible for the charring process. It is interesting to note that a substantial number of culm bases with adventitious roots were found in pit 030. It is possible that harvesting by uprooting may have been practised (Hillman 1981). This would account for the paucity of seeds from small weeds which were left behind and also for the very substantial quantities of seeds of the larger plant, *Raphanus raphanistrum*. The relatively small numbers of culm bases may also suggest occasional accidental incorporation of cereal culms in later stages of grain processing along with heavier *Raphanus* seeds. Whether or not spelt grain was harvested and then transported as whole ears (Jones 1981) cannot be ascertained. However, cropping of the fields surrounding the round and local crop processing for consumption seems most plausible. If consideration is given to overall food requirements, the amount of grain found is small and cannot provide any real idea of the importance and extent of such arable cultivation, although presence and variety of crop types is clear evidence for the importance of cereals in the diet.

Conclusion

Post-hole and pit contexts dated to the middle to late Romano-Cornish phases of the round have yielded significant quantities of charred cereal grain and chaff remains. The macro-remains suggest that spelt wheat was the predominant crop with barley and oats. The possible importance of bread/club wheat, also found, cannot be underestimated. Emmer wheat was also present but may have been a weed of the spelt crop. A small quantity of peas was the only other crop variety recorded. Notable by their absence were rye and celtic bean both of which might have been expected. This does not, however, preclude their growth during this period. Chaff debris and paucity of weed seeds indicate that the spelt had been partially cleaned and was accidentally charred perhaps during parching to release the grain. The presence of cereal culm bases (cf spelt) may suggest harvesting by uprooting. Although it has been suggested that spelt may have been transported to the point of consumption as whole ears (Jones 1981), it seems more plausible to suggest that the crops noted were grown in the extensive field systems which surround the round.

Table 1 Macroplant remains in Pit 030

gb = glume bases; **sf** = spikelet forks; **int** = internodes; **ra** = rachis fragments

Sample number	**27**	**28**	**29**	**30**	**31**	**33**	**34**
Context	031	031	032	032	032	035	036
Flot weight (grammes)	23	28	36	14	25	10	10
Total sample size (litres)	20	20	20	10	10	1	20
Feature pit 030	Pit	Pit	Pit	Pit	Pit	Pit	Pit
GRAIN							
Triticum aestivum type	11	3	15	14	5	2	4
Triticum cf *aestivum* type	1		1		4		2
Triticum spelta type	75	59	156	69	56	8	41
Triticum cf *spelta* type	4	3	8	11	21		11
Triticum indet	26	32	25	11	39	7	24
Hordeum sp.	14	12	21	2	17	16	7
Avena/Bromus	157	61	225	149	113	14	88
Bromus mollis/secalinus	5		1	3	4		
Indeterminate fragments	234	180	305	211	310	34	155
CHAFF							
gb *Triticum spelta*	138	107	100	176	213	68	229
gb *Triticum dicoccum*	6	6	14	10	3	10	5
gb *Avena*		1	4	4		1	1
gb Indeterminate fragments	43	46	127	26	76	26	30
sf *Triticum spelta*	12	23	61	31	22	3	15
sf *Triticum dicoccum*		1	2				
sf *Triticum* indet.	28	20	57	32	49	9	24
int *Triticum* spelta	5	1	7	3	10		7
ra *Hordeum* sp.	56	96	279	54	152	5	57
Indet basal internode		1		1			
Internode Brittle Wheat						6	
Culms	7		21	3	10		4
Culm nodes	3	2	17	3	1		1
Awns			2	3		1	
Straw frags	2	1	18	8	1	8	1
Radicles	2		6	2		1	
OTHER CROPS							
Pisum sativum			1	3			
SEEDS							
Raphanus raphanistrum	37	49	126	52	74		27
Vicia/Lathyrus	1		4	8			3
cf. *Melilotus*							1
Viola sp.		2		1	1		1
Rubus sp.	1						
Corylus avellana (nut frag.)							3
Polygonum aviculare	3	10	5	2			3
Rumex sp.		1	1	1			5
Plantago lanceolata	1	2	1		2		2
Galium cf *aparine*		1	1	1			1
Valerianella sp.				1			2
Valerianella dentata		1					
Tripleurospermum cf *inodorum*		1	3		1		
Poaceae (wild)	3		2	7	1	2	1
MISCELLANEOUS							
Arrhenatherum elatius (tuber)	1		9				
Rosa (thorn)					1	1	

Table 2: Macroplant remains in other contexts

gb=glume bases; **sf**=spikelet forks; **int.**=internodes; **ra**= rachis fragments

Sample	**23**	**26**	**53**	**51**	**52**
Context	059	064	077	045	076
Flot Weight (grammes)	9	58	26	73	40
Total Sample Size (litres)	10	6	6	20	20
Feature	Post-hole 58	Post-hole 62	Post-hole 136	Inner ditch recut 125	Inner ditch recut 125
GRAIN					
Triticum aestivum type		1	4	1	
Triticum cf *aestivum* type			1	1	1
Triticum spelta type		21	27	10	20
Triticum cf *spelta* type		5		1	4
Triticum cf *dicoccum*	2			1	1
Triticum indet		11	16		13
Hordeum sp.				2	2
Avena/Bromus	4	145	35	12	26
Bromus mollis/secalinus		1			
Indet. Frags.	3	81	48	6	101
CHAFF					
gb *Triticum spelta*	3	8	80	2	19
gb *Triticum dicoccum*	1		4	1	1
gb *Triticum* cf *dicoccum*					2
gb *Avena*			3	2	
gb Indet frags.		4	16		7
sf *Triticum spelta*		1	9	1	3
sf *Triticum* indet.		1	8		17
int *Triticum spelta*					2
ra *Hordeum* sp.			8		
Culm bases					2
Culm nodes					1
Awns 1					
SEEDS					
Vicia/Lathyrus		1			1
Corylus avellana (nut frag.)	1				
Polygonum aviculare			3		
Poaceae (wild)		3	5		2
MISC.					
Prunus thorn					1
Slag fragments	*				

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I am grateful to C Chisham of Babtie Group for the extraction of the charred plant remains and for her assistance with this aspect of the project. I am particularly grateful to Alan Clapham for his advice on this work, on certain of the crop elements (esp. *Hordeum*), and for help with identification of seeds.

Pollen analysis of the house drainage gully fills

Robert G Scaife

Introduction

Pollen analysis has been carried out on the sediment fills of the house drainage gully in the interior of the Round. Analysis of such contexts has rarely been undertaken because of the problems of interpretation and apparent scepticism that such studies can produce useful information. It has, however, been shown that useful data on the use of adjacent fields can be obtained (Scaife forthcoming). Furthermore, the regional pollen data which exist and which might provide useful comparative information are scarce and have concentrated on the analysis of deeper peat and lacustrine sequences.

The regional vegetation development was established initially by Conolly *et al* (1950) at Hawks Tor and subsequently by Brown (1977) at Dozmary Pool on Bodmin Moor. However, these studies concentrated on early and middle Holocene vegetation development with little consideration given to changes occurring during the later Holocene. Brown (1977) did, however, establish that Bronze Age and Iron Age agriculture appeared to be largely pastoral, with some evidence of cereal cropping. Bell (1984, 53) recognised the need for archaeological, site-based studies which might establish the extent to which upland banked enclosures were used for pastoral and/or arable agriculture. Such information can only be gained by pollen analysis of buried soils and ditch fills. A small number of studies have been carried out but these relate solely to earlier, Bronze Age monuments (Dimbleby 1971; Bayley 1975) and not to later structures such as Iron Age and Romano-British rounds and associated field systems.

Many studies discuss the deforestation and depopulation of upland areas in relation to climatic changes in the late Holocene. However, no pollen data are available which provide direct evidence for the status of woodland and nature of land use after the Bronze Age. Whilst this study cannot bridge such a large gap in our knowledge, the analyses of pollen, plant macrofossils and charcoal (Rowena Gale, below) provide a useful insight into the local environment of this site at least. It was anticipated that if pollen and spores were preserved, useful information on the local vegetation and environment during the period of occupation might be obtained. In the event, pollen has been satisfactorily extracted and results of an analysis of the fills of the gully are presented here.

Methodology

Sequential samples were taken from the fills of the round house gully by Vanessa Straker (Department of Geography Bristol University). A sampling interval of alternate 2cm was adopted. Pollen was extracted using standard techniques (Moore and Webb 1978; Moore *et al* 1991) in the Department of Geography, University of Southampton. Further details of these procedures are given in Appendix 1. A sum of 400 pollen grains plus extant spores, unidentifiable/degraded pollen and marsh herbs was counted for each level where possible. Data are calculated as a percentage of this sum with spores of ferns and *Sphagnum* moss and wetland herbs as a percentage of this sum plus the respective sub-group. Absolute pollen frequencies were calculated using a known number of exotic markers (Stockmarr *Lycopodium*) to given volumes of sediment. These data are presented in pollen diagram form (Fig 10).

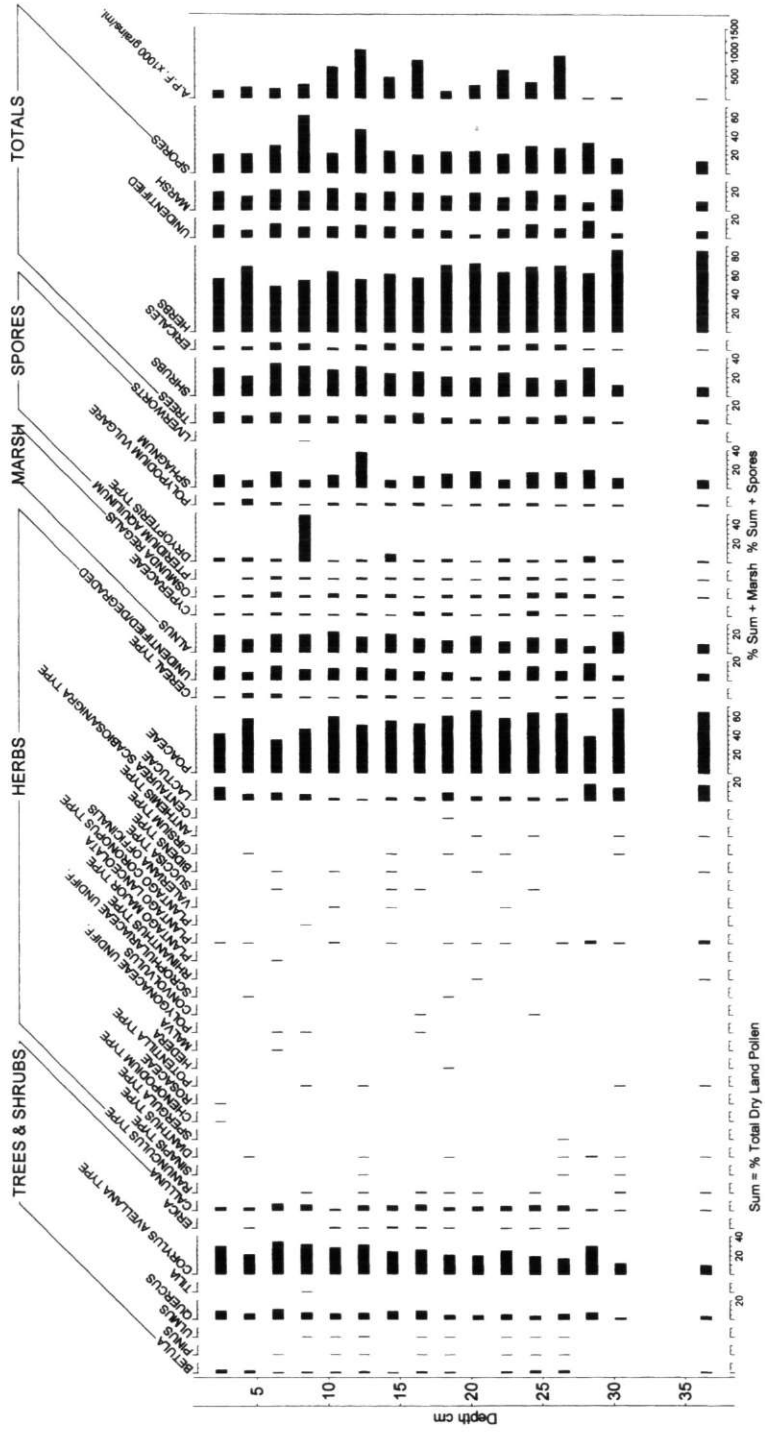

Fig 10 Penhale Round 1996. Pollen diagram from hut gully

The pollen data (Fig 10)

Abundant pollen was found in the lower part of context 040 and in 041 but was more sparse in the lowest ditch fill [context 042]. Pollen was absent in some levels of the latter. Absolute pollen frequencies (APF) were calculated and ranged from as low as 14000 grains per ml in the poor basal levels (36–37cm) to 1,040,000 grains per ml at 12–13cm. Although abundant, there are a substantial number of degraded pollen grains and spores. These appear to have been microbially etched, thus making identification difficult and in some cases not possible with only the inner pollen exine wall remaining. This is attributed to preservation of pollen due to acid soil conditions, but in conditions where differing taphonomic processes were operating on the pollen assemblages. The very high APF values, however, resulted in many pollen grains and spores which were identifiable to normal pollen taxonomic groups and the data retrieved are summarised as follows.

The sixteen pollen levels and spectra examined are dominated throughout the profile by herbs (to 90% t.d.l.p.). Trees (<20%) and shrubs (to 35%) become progressively more important in the upper levels and contexts but remain subordinate to herbs throughout. There is a consistent presence of the spores of ferns and *Sphagnum* moss. Whilst there appears to be some variations in the pollen assemblages throughout the profile, these changes are minor and may be due to purely taphonomic/preservation processes rather than 'real' changes in vegetation ecology. Zonation of the diagram has not, therefore, been carried out and the characteristics of the pollen diagrams are described as a whole.

THE HERB FLORA

Poaceae (grasses) are dominant and average 60–70% of total pollen. In addition to the *Poaceae*, other herbs include *Lactucae* (dandelion types) which are more abundant in the upper and lower levels of the profile. This is, however, a reflection of the poor pollen preserving conditions and over-representation of this robust taxon. Of note is the consistent presence of cereal type (<5%) and sporadic occurrences of herbs which may be indicative of disturbed and arable ground – *Sinapis* type, *Spergula* type, *Convolvulus, Malva*, and *Plantago major* type. Other herbs include *Ranunculus* type, *Plantago lanceolata* (ribwort plantain), *Polygonum* sp. and *Asteracea* types which may be more typical of pasture.

THE WOODLAND ELEMENTS

Quercus (oak; to 15%) is the main tree but with relatively small percentages (to 10%) and with minor expansion in upper levels/contexts. *Alnus* is also relatively important (to 15% t.d.l.p. + marsh). Also present consistently but in only small numbers are *Betula* (birch), *Pinus* (pine; of long distant origin) and *Ulmus* (elm). A single grain of *Tilia* (lime/linden) was recorded at 8–9cm. Shrubs comprise *Corylus avellana* type (to 40%). *Corylus avellana* type is dominant but the group may include *Myrica gale*. Separation was not possible due to poor pollen preservation. Dwarf shrubs include *Calluna* (ling) which is present throughout (to 5%)and more sporadic *Erica* (heather).

WETLAND ELEMENTS

This group is somewhat enigmatic given the character of the sample site (ie a ring gully ditch). Taxa include *Alnus* (alder) noted above. *Cyperaceae* (sedges) are consistent but in small numbers (<5%). Spores of the fern *Osmunda regalis* (royal fern) and *Sphagnum* moss are of importance.

SPORES OF FERNS

These comprise largely monolete *Dryopteris* type (ferns), *Pteridium aquilinum* (bracken), *Polypodium* (polypody fern) and *Osmunda regalis*, a wetland element also noted above.

The vegetation environment

Given the small spatial extent of this archaeological feature, the majority of pollen contained in the sediment fills is likely to have derived from on or very near the site. Exceptions to this are wind pollinated taxa (anemophilous) which produce relatively large numbers of pollen grains which are dispersed over large distances and those taxa which relate directly to human activity such as crop processing, human waste and from building structure. The former group includes the trees *Betula, Alnus* and *Corylus avellana*. *Pinus* and *Betula* occur only sporadically and are of little significance. *Alnus* and *Corylus* are, however, of greater importance and were probably growing as stands of woodland in suitable habitats, the former being especially characteristic of valley mires and fringing streams. The latter may have formed local scrub or growth in hedgerows. It is relevant that hazel charcoal was identified by Rowena Gale (below) as one of the principal charcoal elements.

Quercus is the only tree which is represented in any quantity and even so appears subordinate to *Corylus* and the herbaceous flora. It is possible that the real importance of *Quercus* (and other trees) may be masked by the dominance of local/on-site *Poaceae* statistically 'swamping' the pollen spectra. Oak charcoal has similarly been identified by Rowena Gale (below) who suggests that it may not have been carried any great distance. Charcoal of *Fraxinus* was also recorded but was not present in the pollen assemblages. This is not unexpected given the relatively poor representation of trees in general and the typical under-representation of ash in pollen spectra (Andersen 1970; 1973). From the pollen data and charcoal it may be suggested that woodland was not growing immediately on, or adjacent to the site but was, however, within easy walking distance, allowing its utilisation as a fuel resource. The extent of such woodland remains enigmatic and a near wetland/peat pollen profile would be invaluable as a comparison to the on-site data presented here.

Calluna (ling) and *Erica* (heather) are present consistently. These ericales are largely under-represented in pollen spectra and thus, the percentages recorded here imply that heathland was, perhaps, an important local community. This is not unexpected given the acidity of local soils. These data similarly correspond closely with the charcoal evidence for such plant communities which were also being utilised for fuel. Gorse was apparently an important fuel (Gale below) but was not represented in the pollen spectra. Again, this is not unexpected since both gorse and broom produce little pollen and are seldom found even in the pollen analysis of heathland podzolic soils.

Despite the pollen and charcoal evidence for trees and shrubs, herbs are clearly dominant in the pollen spectra. *Poaceae* (grasses) attain high values throughout and along with other characteristic herbs of grassland such as *Plantago lanceolata* (ribwort plantain), *Asteraceae* types (daisy family) and including *Lactucae* (eg dandelions, sow-thistles, hawkbits). This provides strong evidence for areas of open pasture/grassland in the proximity of the round. Given the harsh conditions for the preservation of pollen in this feature (even though pollen was extremely abundant), it is possible that less robust taxa may have been differentially destroyed.

A further factor which should be considered is the possibilty that a proportion of this herbaceous pollen may be derived from secondary sources, that is, introduced with floor coverings and roofing and wall material for the adjacent hut. This may be especially pertinent since run-off from the roof of the hut (turf or thatch?) might be expected to contribute significantly to the pollen spectra. Such a taphonomic problem may also be relevant to the records here of *Osmunda regalis* (royal fern) and the substantial quantities of *Sphagnum* spores. The most obvious explanation for their presence is their growth in the wet ditch(es) on this acid soil. However, Professor G.W. Dimbleby (pers comm) has noted Royal Fern growing next to a domestic sink soakaway and it is possible that such a damp habitat may have caused a fringe of *Osmunda* around the hut. Given that the depositional context of the pollen is a soak-away gully around a hut, this seems a rather unlikely habitat. It seems more plausible that the spores of *Osmunda regalis*, *Sphagnum* and pollen of *Cyperaceae* derive from the building roof and/or floor materials brought onto the site from a local mire community. Certainly, the representation of *Osmunda regalis* here is unusual.

Analysis of the charred plant remains (Scaife above) indicates that cereals (spelt wheat, barley and oats) were important on the site. One of the questions posed by this palaeoenvironmental study was to determine if fields adjacent to the round were being used for arable or pastoral use, or mixed economy. Faunal remains were not preserved due to soil acidity and thus interpretation relies solely on botanical evidence. Only small numbers of cereal pollen and pollen of weeds of disturbed ground are recorded. This is, however, typical of the under-representation of arable activity in normal pollen spectra; that is, from local or regional growth as opposed to direct input of cereals into sediments in waste products such as animal dung. Thus, these percentages although relatively small compared with those pastoral elements noted, may indicate local arable cultivation. However, analysis of the plant macrofossil (charred seed remains) also shows that arable crop processing was taking place on site. It must therefore be considered that cereal pollen and associated weed types may derive from these secondary cereal sources with pollen trapped in the cereal ears being liberated during threshing and winnowing (Robinson and Hubbard 1977; Robinson 1979). The combined pollen and macrofossil evidence suggests that arable agriculture was important. This, plus strong evidence for open grassland/pasture implies a mixed agricultural economy

Summary and Conclusions

Pollen analysis has rarely been carried out on such archaeological contexts, and although the taphonomical problems are complex compared with typical peat mire situations, they are outweighed by the value of information gained from analysis of on-site archaeological contexts. Despite the highly minerogenic sediment and an environment apparently unsuitable for the preservation of pollen, abundant pollen was recovered. A background vegetation of localised woodland copses and heathland has been suggested. This is in accord with evidence of wood and scrub which was gathered and burnt as fuel (see Rowena Gale, below). The dominance of herbs and especially grasses and grassland taxa suggests locally open grassland which is likely to have been used as pasture. However, the abundant charred cereal remains (Rob Scaife above) and the cereal pollen and weeds recorded also indicate local arable agriculture. On top of this basic interpretation is the possibility of pollen derived from secondary sources as roof and/or floor covering which was washed into the ring gully. These might include Royal fern (*Osmunda*), *Sphagnum* moss and also elements of the pasture group (grasses) noted above.

Appendix 1: Pollen Methodology

All samples were of an inorganic/minerogenic character and of acidic nature, being derived from granite. Given the minerogenic character of the samples, rigorous pollen extraction procedures were required. Extraction procedures followed those outlined by Moore *et al* (1991) but with the addition of micro-mesh sieving (10u) for removal of the clay fraction. Samples were deflocculated with 8% KOH. Coarse debris was removed through sieving at 150u and clay by micro-mesh (10u). Remaining silica was digested with boiling 40% hydrofluoric acid. Erdtman's acetolysis was carried out for removal of cellulose. The concentrated pollen and spores were stained with safranin and mounted in glycerol jelly. Absolute pollen frequencies were calculated using Stockmarr *Lycopodium* tablets; that is the addition of a known number of exotic grains (*Lycopodium*) to a known sediment volume (Stockmarr 1971). In this case the volume was 3ml. Pollen was identified and counted with an Olympus biological research microscope with phase contrast facility at magnifications of x400 and x1000. These extraction techniques were successful and a preliminary pollen diagram based on a pollen sum of 100 pollen grains plus extant spores has been constructed using *Tilia* graph and *Tilia* Plot in the Quaternary Environmental Change Research Centre of the

Department of Geography, University of Southampton. Pollen is calculated as a percentage of total pollen and spores as a percentage of total pollen plus spores. Pollen taxonomy follows that of Moore and Webb (1978) modified according to Bennett *et al* (1994).

Charcoal

Rowena Gale

Introduction

Forty bulk soil samples from post-holes and the hut gully from within the round, and from associated layers and ditch fills from the outer enclosure ditches, were processed by flotation at the Babtie Group laboratory to isolate organic plant remains. Charcoal was present in most samples, sometimes abundantly (eg in pit 030), and was separated from the charred seeds and macrofossils. Some features were dated by pottery to the early and late Roman period. Pollen analysis (by Rob Scaife) suggests that grassland dominated the landscape at this time, with only a small contingent of woodland taxa. The identification of the charcoal provided the opportunity to assess the character of the woodland and the use of woodland resources during the occupation of the Romano-Cornish round. Three samples were selected for Carbon14 dating.

Materials and methods

Thirty-seven samples were examined. The charcoal was generally fairly well preserved, although some fragments were friable or vitrified (the latter characteristic of burning at high temperatures). Many samples contained narrow roundwood (ie diameter <20mm). Large samples of material were subsampled as follows: sample 26 [context 064] – 50%; sample 29 [context 032] – 50%; sample 34 [context 036] – 50%; sample 51 [context 045] – 25%.

The charcoal was prepared for examination using standard methods. The fragments from each sample were fractured to expose fresh transverse surfaces and sorted into groups based on the anatomical features observed using a X20 hand lens. Representative fragments from each group were selected for further examination under high magnification. Freshly fractured surfaces were prepared in the transverse, tangential and radial planes. The fragments were supported in sand and examined using a Nikon Labophot incident-light microscope at magnifications of up to X400. The anatomical structure was matched to reference material.

Where appropriate the maturity (ie sapwood/heartwood) of the wood was assessed. It should be noted that the measurements of stem diameters are from charred material; when living, these stems may have been up to 40% wider.

Results: overall taxonomical summary

The anatomical structure of the charcoal was consistent with the taxa (or groups of taxa) listed below. It was not usually possible to identify to species level. The anatomical similarity of some related species and/or genera made it difficult to distinguish between them with any certainty, eg members of the *Ericaceae*, *Leguminosae*, *Pomoideae* and *Salicaceae*. Classification is according to *Flora Europaea* (Tutin, Heywood *et al* 1964–80). The results are set out in full in Table 3, and the taxa present can be summarised as follows:

Betulaceae	*Alnus* sp., alder
	Betula sp., birch
Caprifoliaceae	*Sambucus* sp., elder
Corylaceae	*Corylus* sp., hazel
Ericaceae	*Calluna* sp., ling;
	Erica sp., heather.

Many species of *Erica* are anatomically indistinguishable from *Calluna*.

Fagaceae	*Quercus* sp., oak
Leguminosae	*Ulex* sp. gorse and/or *Cytisus* sp., broom

These genera are anatomically similar.

Oleaceae	*Fraxinus* sp., ash
Rosaceae	
Pomoideae	*Crataegus* sp., hawthorn

Malus sp., apple
Pyrus sp., pear
Sorbus spp., rowan, service tree and whitebeam
These genera are anatomically similar.

Prunoideae	*Prunus* spp., which includes *P. avium*, wild cherry; *P. padus*, bird cherry; *P. spinosa*, blackthorn. The anatomical features of these genera are overlapping and it is sometimes difficult or impossible to differentiate between the species.
Salicaceae	*Salix* sp., willow
Populus sp.,	poplar.

These genera are anatomically similar.

Enclosure ditches 006, 008 and 125

Charcoal was examined from each enclosure ditch. Although sparse in the two outer ditches, oak (*Quercus*) heartwood was identified from 008; and from 006, gorse/broom (*Ulex/Cytisus*) and roundwood (diameter 10mm) from a member of the hawthorn group (*Pomoideae*).

Three samples (51, 52 and 53) were examined from the lower fills of the inner ditch 125. Charcoal was abundant and included a large quantity of narrow stem and twiggy material. The upper layers (contexts 045, sample 51 and 076, sample 52) were fairly similar in content – predominantly oak (mostly fast-grown roundwood up to about 20mm in diameter but also some heartwood); also gorse/broom (roundwood up to 10mm in diameter), blackthorn/cherry (*Prunus*) roundwood, hazel (*Corylus*), willow/poplar (*Salicaceae*) and member/s of the hawthorn group (Table 3). The underlying layer (context 077, sample 53) contained a narrower range of species – predominantly oak and gorse/broom with a very small quantity of willow/poplar.

Features within the enclosure: structures

HUT GULLY 038

The hut gully, interpreted as a drip gully, contained relatively large quantities of rather comminuted charcoal, particularly in the upper fills. Samples 42 and 43 included a wide range of taxa: alder (*Alnus*), birch (*Betula*), hazel (*Corylus*), hawthorn group (*Pomoideae*), blackthorn/cherry (*Prunus*), oak (*Quercus*) sapwood, willow/poplar (*Salicaceae*), and gorse/broom (*Ulex/Cytisus*). Sample 44, from the lower fill, included a narrower range of taxa (Table 3).

Post-holes

A group of post-holes lay close to, or enclosed by, the hut gully. Although many contained charcoal, dateable artefacts were rarely present and apart from post-hole 048, which appeared to be later than the gully, and post-hole 062, from which third to fourth century pottery was recovered, it was difficult establish temporal relationships between the post-holes. Charcoal from 048 included hazel (*Corylus*), and oak (*Quercus*) sapwood. Charcoal was extremely abundant in post-hole 062 and was mainly composed of oak (both sapwood and heartwood); gorse/broom, blackthorn and willow/poplar were sparsely present.

Post-holes from within the enclosure from which charcoal was identified included 012, 040, 058, 060, 062, 066, 070, 074, 084, 104, 113, 147, 160, 164 and 168. The charcoal from these features was composed of small fragments and, with the exception of post-holes 012 and 041, most samples included narrow roundwood, often from a range of taxa (see Table 3). Oak was common to almost every sample; taxa more sporadically present included alder (*Alnus*), hazel (*Corylus*), ash (*Fraxinus*), *Pomoideae*, blackthorn/cherry (*Prunus*), willow/poplar (*Salicaceae*), gorse/broom (*Ulex/Cytisus*). *Prunus* in post-hole 60 was almost certainly blackthorn, and *Prunus* root occurred in post-hole 058.

Post-hole 012 contained oak sapwood and heartwood and some unidentified bark. Post-hole 41 contained a very large quantity of narrow slivers of charcoal. These had burnt at temperatures high enough to distort the cellular structure and cause a glassy appearance (vitrification). A large proportion of the fragments were too narrow to examine but of those identified all were oak (sapwood/heartwood), and the remainder appeared superficially similar. The form and consistency of the charcoal suggested a common source from a stem/trunk mature enough to have formed heartwood. This would imply a possible origin from the remains of the post, burnt *in situ* in the post-hole.

Charcoal associated with a patch of burnt stones [101] on the natural ground surface prior to the construction of the hut included oak sapwood and gorse/ broom (*Ulex/Cytisus*). A small scoop 163] also included oak and gorse/ broom.

Features within the enclosure: Pits

A sub-rectangular pit [030] was sited to the east of the hut gully. The fill of the pit included dumps of clay and charcoal-rich lenses which, on excavation, were interpreted as industrial waste. Dating is unclear, but it could be second century AD or later. Eight samples of charcoal (samples 27 to 34) were examined and mostly consisted of narrow stems and roundwood from hazel (*Corylus*), heather (*Ericaceae*), gorse/broom (*Ulex/Cytisus*), and oak (*Quercus*); oak heartwood was also present. Ash (*Fraxinus*), hawthorn type (*Pomoideae*), blackthorn (*Prunus spinosa*) and elder (*Sambucus*) were less frequent.

It may be significant that this pit, interpreted as an industrial dump, was the only feature from which heather was identified. Apart from its value as a fuel, heather has traditionally been used as a packing material and to make ropes (Mabey 1996). Similar uses may have been employed at Penhale. The scope of industrial activities at Penhale is unknown but if it included, for example, pottery-making, heather could have been used for supporting or binding pots during firing or transportation.

Discussion

Origin of the charcoal

The features (post-holes, pits, the hut gully and ditches) from which charcoal was identified were mostly dated to the early centuries of the first millennium AD. The origin of the charcoal is unknown

Table 3: Charcoal - taxa identified

Key: Samp: sample; Cont: context; *Al: Alnus; Bet: Betula*; *Cor: Corylus*; *Er*: *Ericaceae*; *Frax: Fraxinus*; *Pom*: *Pomoideae*; *Prun*: *Prunus*; *Querc*: *Quercus*; *Sal*: *Salicaceae*; *Sam*: *Sambucus*; *U/C*: *Ulex/Cytisus*. r: roundwood (diameter <20mm); s: sapwood; h: heartwood; rt: root; p-h: post-hole.
The number of fragments identified is indicated.

	Samp	Cont	Description	*Al*	*Bet*	*Cor*	*Er*	*Frax*	*Pom*	*Prun*	*Querc*	*Sal*	*Sam*	*U/C*
1	011	p–h 012	fill	–	–	–	–	–	–	–	41sh	–	–	–
23	059	p–h 058	fill	–	–	–	–	–	–	3rt	13rsh	–	–	2r
24	061	p–h 060	fill	?1	–	2	–	–	–	2	8rsh	3r	–	17r
25	063	p–h 063	fill	–	–	2	–	–	–	–	48s	3	–	16r
26	064	p–h 062	fill	–	–	–	–	–	–	2	79sh	18	–	3r
27	031	pit 030	fill	–	–	24	10r	6	–	10	83rh	–	–	26r
28	031	pit 030	fill	–	–	10	6r	6	1	4	13sh	–	1	18r
29	032	pit 030	fill	–	–	2	2r	–	1	–	2sh	–	–	29r
30	032	pit 030	fill	–	–	15r	6r	–	–	1	1s	–	–	21r
31	032	pit 030	fill	–	–	23	2r	1	–	?1	9sh	–	–	34r
32	034	pit 030	fill	–	–	–	–	–	–	–	7h	–	–	?1r
33	035	pit 030	fill	–	1	3	–	–	–	–	2r	–	–	3r
34	036	pit 030	fill	–	–	3r	?1	–	–	1	10sh	–	–	34r
35	067	p–h 066	fill	–	–	1	–	–	–	?1	–	–	–	4
36	071	p–h 070	fill	–	–	1	–	–	–	–	1	2	–	1
37	075	p–h 074	fill	?1	–	?1	–	–	–	–	1h	–	–	16r
39	085	p–h 084	fill	–	–	–	–	–	–	1	4	–	–	1
41	105	p–h 104	fill	–	–	–	–	–	–	–	133sh	–	–	–
42	050	ditch fill 038		1	–	2	–	–	1	1	3	1	–	5
43	051	ditch fill 038		–	2	–	–	–	1	3	8rs	–	–	3
44	052	ditch fill 038		–	–	?1	–	–	1	–	3s	–	–	3
45	049	p–h 048	fill	–	–	1	–	–	–	–	4s	–	–	–
46	101	layer		–	–	–	–	–	–	–	1s	–	–	2
47	041	p–h 040	fill	–	–	8	–	–	–	12	3s	–	–	10
48	114	p–h 113	fill	–	–	–	–	–	?1	–	1s	–	–	–
49	118	ditch 008	fill	–	–	–	–	–	–	–	1h	–	–	–

Table 3: Charcoal - taxa identified *(Continued)*

	Samp	Cont	Description	*Al*	*Bet*	*Cor*	*Er*	*Frax*	*Pom*	*Prun*	*Querc*	*Sal*	*Sam*	*U/C*
50	121	ditch 006	fill	–	–	–	–	–	2r	–	–	–	–	1
51	045	layer 125	–	–	–	12	–	–	3	5r	70rs	–	–	18r
52	076	layer 125	–	–	–	8	–	–	4	6	49rh	2	–	29r
53	077	layer 125	–	–	–	–	–	–	–	–	56rs	1r	–	45r
54	137	p–h 136	fill	–	–	–	–	–	–	–	3s	–	–	–
55	139	p–h 138	fill	–	–	–	–	–	–	1	1	1	–	1
56	148	p–h 147	fill	–	–	1	–	–	2	12	4sh	1	–	–
57	169	p–h 168	fill	–	–	–	–	–	–	?1	2	–	–	–
58	165	p–h 164	fill	–	–	–	–	–	–	2	1s	–	–	1
60	163	layer/ stream	–	–	–	–	–	–	–		7s	–	–	1
61	161	p–h 160	fill	–	–	–	–	1	–	–	16s	–	–	1

but most of it was probably domestic fuel debris either deposited in, or accumulated in, local hollows and depressions. There was some evidence to suggest that the charcoal from post-hole 104 may have resulted from an oak (*Quercus*) post burnt *in situ*. A large pit [030], sited between the hut and the inner boundary ditch, was dated by pottery to the first/second century and interpreted as a possible dump from (unknown) industrial waste. Its fill was rich in charcoal and pottery. The charcoal was predominantly oak (*Quercus*), gorse/broom (*Ulex/Cytisus*), hazel (*Corylus*) and heather (*Ericaceae*). It is tempting to attribute the heather in this feature to a specific use (eg fuel, packing or cordage) since it was not identified from any other context, and the pit's possible association with industrial use tends to support this suggestion.

ENVIRONMENT

Pollen analysis (Scaife above) of a sediment core taken from the hut gully indicates that grasses (70%) and heathland were dominant in the landscape. The arboreal components of the pollen comprised mostly of hazel (*Corylus*) and oak (*Quercus*) but also included ling (*Calluna*), heather (*Erica*), alder (*Alnus*), elm (*Ulmus*), birch (*Betula*), lime (*Tilia*), ivy (*Hedera*) and pine (*Pinus*). The charcoal deposits which almost certainly derived mostly from fuel gathered from trees and shrubs growing reasonably close to the site included many of those named above (from the pollen) and, in addition, ash (*Fraxinus*), hawthorn and/or other members of the *Pomoideae*, willow/poplar (*Salicaceae*), elder (*Sambucus*) and gorse/broom (*Ulex/Cytisus*). The evidence suggests that woodland and/or scrub was relatively common but probably grew in discrete areas or specific ecological zones, for example in heathland, open woodland or boggy patches.

Oak (*Quercus*) and gorse (or broom) (*Ulex/Cytisus*) were most frequently represented in the charcoal. Hazel and blackthorn (*Prunus spinosa*) were also common (cherry is unlikely to have grown in this environment). Other taxa were less frequent and although their absence/presence in the charcoal would have been influenced by species selection, the paucity of some taxa may also reflect their poor distribution in the area.

Isolated trees or stands of oak (*Quercus*) may have formed open woodland perhaps with hazel (*Corylus*), birch (*Betula*) and ash (*Fraxinus*). Gorse and broom are ubiquitous but are generally considered to be indicative of acid soils and heathland. Gorse is probably more likely to have been used but broom cannot be ruled out. Gorse grows in dense thickets on open land or heath, or in smaller clumps in marginal woodland. In western Britain gorse was often planted on top of earth banks to make an effective barrier against livestock (Mabey 1996). Its frequency in the charcoal deposits suggests that gorse was common at the site. Ericaceous species made a significant contribution to the pollen record, although less so to the charcoal, and heathland supporting gorse and hazel scrub was probably common. Hawthorn (*Crataegus*) and blackthorn (*Prunus spinosa*) may also have formed thickets. Elder grows in a range of habitats since the seeds are distributed by birds but it flourishes particularly in nitrogen-rich areas around human habitation. Areas of damp or wet soils were indicated by alder (*Alnus*) and willow/poplar (*Salix/Populus*); birch also colonises damp soil providing it is not waterlogged.

Wide growth rings indicative of fast growth were noted in some fragments of oak but the evidence was too slight to confirm the use of coppiced wood.

Use of woodland resources

The settlement appears to have been well supplied with wood, both for building (indicated by post-holes) and for fuel (as demonstrated by the rich charcoal deposits which almost certainly mostly derived mainly from domestic fuel debris).

Apart from post-hole 104 which may have contained the burnt remains of an oak (*Quercus*) post (see above), the timber used for construction is unknown. With the exception of oak and ash (*Fraxinus*), few of the taxa identified from the charcoal would have produced timber of sufficient size or strength. Elm (*Ulmus*) (represented by pollen) is strong and durable and although difficult to work (Edlin 1949) it may have been used, but lime (*Tilia*), also in the pollen record, is soft and perishable and unsuited to building work.

Fuel

The fuel residues consisted of charcoal and, in many contexts, cereal-processing waste. Wood fuel mostly consisted of young stems of shrubs such as gorse (and possibly broom) (*Ulex* and *Cytisus*), hazel (*Corylus*), blackthorn (*Prunus spinosa*), hawthorn type (*Pomoideae*) and oak (*Quercus*). Oak heartwood was also present in many samples. The age at which heartwood forms in oak is variable; it can occur in trees as young as twenty years or less. Wood was occasionally collected from alder (*Alnus*), birch (*Betula*), willow/poplar (*Salicaceae*), elder (*Sambucus*), ash (*Fraxinus*) and heather/ling (*Ericaceae*). The comparative paucity of these taxa in the charcoal could indicate either that they were relatively rare in the environment (eg ash and birch), or that preferential selection excluded the use of some taxa, eg alder and willow which provide low-energy firewood.

Dense woods, eg, oak, ash, gorse, blackthorn, hazel, and elder produce high-energy firewood (Edlin 1949; Porter 1990). Oak heartwood provides particularly efficient long-lasting fuel, and gorse, which has traditionally been used to fire kilns and bread ovens (Mabey 1996), burns with a fierce heat. Lightweight woods, eg alder, willow and poplar burn slowly emitting less heat than those above, whereas birch and heather burn away quickly but produce great heat. The latter has been valued particularly in areas devoid of other fuels (eg moorlands) (Mabey 1996).

Conclusions

Charcoal from the fills of numerous features associated with the Romano-Cornish round and its enclosure ditches probably originated mostly from domestic fuel debris. The taxa identified indicate that fuel was gathered from a wide range of trees and shrubs but predominantly from oak (*Quercus*),

gorse (*Ulex*), and hazel (*Corylus*). When combined, the results of the charcoal and pollen analyses demonstrate that the environment supported a considerable diversity of trees and shrubs, which represent specific ecological habitats. The pollen study (Scaife above) suggests that grassland was probably the dominant feature in the landscape with areas of heather (*Calluna* and *Erica*) and woodland, composed mainly of hazel and oak. Although a common shrub of heathland, gorse pollen often degenerates in soil sediments and, as in this instance, it fails to appear in pollen records.

Many of the features were dated by pottery to the early first millennium AD and, although yet to be dated using suitable charcoal samples, the remaining features may have been contemporary. It appears that despite the widespread grassland/moorland, sufficient woodland and scrub existed to provide good quality wood fuel for use by the local community. This may have been managed to some extent, eg regular cropping of the gorse bushes, or oak/hazel coppicing, but evidence of this could not be substantiated from the charcoal.

Dating evidence

Radiocarbon dates

Three charcoal samples were submitted to the Scottish Universities Research and Reactor Centre for radiocarbon dating, with the following results:

AA-27530: Context 045, Sample 51 (*Corylus*) – fill of inner ditch recut

Uncalibrated age range:	1σ	1715 ± 55 bp ($\delta^{13}C = -27.5\%$)
Calibrated age ranges:	1σ	cal AD 243–399, cal BP 1707–1551
	2σ	cal AD 147–430, cal BP 1803–1520

AA-27531: Context 064 Sample 26 (*salicaceae*) – fill of post-hole

Uncalibrated age range:	1σ	1755 ± 55 bp ($\delta^{13}C = -26.7\%$)
Calibrated age ranges:	1σ	cal AD 220–343, cal BP 1730–1607
	2σ	cal AD 120–410, cal BP 1830–1540

AA-27532: Context 032 Sample 29 (*Corylus*) – fill of isolated pit

Uncalibrated age range:	1σ	1850 ± 55 bp ($\delta^{13}C = -28.0\%$)
Calibrated age ranges:	1σ	cal AD 84–231, cal BP 1866–1719
	2σ	cal AD 30–322, cal BP 1920–1628

The uncalibrated radiocarbon ages given above are quoted in conventional years BP (before AD 1950). The errors are expressed at the one sigma level of confidence. The calibrated age ranges are determined from the University of Washington Quaternary Isotope Laboratory, Radiocarbon Dating Programme, 1987. The 20-year atmospheric calibration curve is used throughout and the calendar age ranges, obtained from the intercepts (method A) are expressed at both the one and two sigma levels of confidence. All the samples were measured at the University of Arizona AMS Facility.

While the radiocarbon dates support the overall Romano-British date indicated by the pottery for the occupation in this part of the site, the 2σ ranges (ie a 95% probability that the date falls within the quoted range) overlap too much and are too broad to be of much further help. The 1σ ranges, which provide a lower level of confidence, do provide a clear separation between contexts 045 (AD 243–399) and 032 (AD 84–231), while there is only a minimal overlap between the latter and context 064 (AD 220–343). The uncalibrated dates for contexts 045 and 064 are very comparable, but in the absence of closely dateable artefactual evidence from 064 this need not mean that 064 is necessarily roughly contemporary with 045. In every case both ranges are consistent with the artefactual dating. The pottery and 1σ radiocarbon age range in combination would suggest a

probable second century date for context 032, making it the earliest dated context. However, this date hangs on a single potsherd; if this was residual, and the 2σ radiocarbon age range is used, the feature could be of any date up to the early fourth century.

Artefactual dating

The 1993 excavations (Nowakowski 1998) identified artefacts and/or features in the vicinity of Penhale Round dating to the Mesolithic, Neolithic and Bronze Ages, the middle to later Iron Age and the Romano-British and medieval periods, with the Round itself being occupied probably from the first century BC to the third century AD. The features directly associated with the Round, however, were relatively sparse in dateable material (Quinnell above). The stratigraphic evidence indicated the development of the Round from simple univallate beginnings into a double-ditched enclosure, with ten phases of alteration to the ditches and entranceway, although the excavator suggests that the double-ditched arrangement may be more to do with drainage than defence (Jacqueline Nowakowski, pers comm).

By contrast, while some prehistoric material (flint, bronze age pottery, one sherd of potentially late iron age pottery) was found in the 1996 excavations, all of it was in residual contexts and every feature which contained artefacts was clearly Romano-British in date. Much of the Romano-British pottery was of long-lived types which are hard to date, but among the more precisely dateable material, the great majority was of the third to fourth centuries, including some types which could have remained current into the fifth century. The only earlier material which was not demonstrably residual was the single sherd from isolated pit 030. Every other feature which could be dated from artefactual evidence was of third to fourth century date (including the fills of both the inner ditch and its recut). Although the number of intercutting features could be taken to suggest a long occupation, no features could be chronologically separated on the basis of their artefactual content.

Given the strong assumption that the primary cut of the inner ditch was the earliest enclosure feature, it is notable that the pottery suggests that it remained open at least into the late third century (Quinnell above). Unfortunately, the pottery comes from one of the later fills (057), and there is no evidence to suggest a date for its original excavation. Pottery from an upper fill of the recut (context 045, described by Quinnell (above) as 'one of the best closed contexts in Roman Cornwall') was also of late third to fourth century date, suggesting that the recut had a relatively short life.

If the origins of the round are really as early as suggested by the 1993 excavations (it is hoped that radiocarbon dates to be obtained for some of the 1993 features will clarify this issue; Jacqueline Nowakowski pers comm), the inner ditch must have silted up very slowly for several centuries, with very few artefacts finding their way into the lower fills. It then silted up, was recut and silted up again much more quickly, at least partly due to deliberate dumping of rubbish in the ditch, within the late third to fourth centuries. The paucity of earlier artefactual material ties in with evidence from the interior, where virtually all the datable artefacts were of a similar date-range to the material in the inner ditch (although again including long-lived types which could be earlier). This apparent bias in the artefactual dating evidence (the results of the 1996 excavations, taken in isolation, would clearly imply that the site was of third century origin) implies a change in the habits of the occupants of the round in the late Romano-British period, which affected the way in which rubbish was either produced, disposed of, or both. Unfortunately, the evidence is inadequate to determine the nature of the change, as the range of possible causes is vast, including changes associated with the identity of the occupants, their social status, the agricultural or other economic activities taking place, the prevalence of manuring from domestic middens, or social attitudes to refuse.

Interpretation and discussion

The enclosure

The part of the enclosure investigated in 1996 was defined by three closely-spaced concentric ditches, between which there were no stratigraphic links in the excavated area. Although there was sufficient space (2.6m) between the inner ditch and the nearest internal features for a small rampart to have been present, no evidence for such a feature survived in this area. The results of the 1993 excavations (Nowakowski 1998) would suggest that a rampart probably was originally present; it is likely that it was removed by truncation, which was certainly greater in the area excavated by Babtie than in the areas examined by the Cornwall Archaeological Unit (CAU).

The middle and outer ditches were simple one-phase features, while the inner ditch was substantially larger and had been recut after being completely filled. The geophysical surveys and the 1993 excavations by the CAU indicated that the outer ditch extends around only the east side of the enclosure, and appears to tie-in with at least one contemporary external boundary ditch, presumably part of a field system. Unfortunately, it was impossible to determine the chronological relationships between the ditches. The surviving stratigraphic evidence could represent as few as two phases of enclosure (if more than one ditch was open simultaneously) or as many as four phases (if only one ditch was open at a time). While the inner ditch recut is the latest identified phase, this is simply because there is no evidence to demonstrate its relationship with the middle and outer ditches.

Penhale is unusual amongst rounds in the complexity of the development of its enclosing ditches. Rounds are normally simple, univallate enclosures. Where there are two ditches, as at Reawla (Appleton-Fox 1992) and Trevisker (ApSimon and Greenfield 1972), they are usually widely separated, the outer ditch representing a replacement of the inner when the enclosure was enlarged. Closely-spaced multiple ditches are rare. However, excavation at Threemilestone (Schwieso 1976) identified a small outer ditch (although the chronological relationship between the two ditches is unknown), and other multivallate rounds are known from cropmarks (Johnson and Rose 1982). It remains possible, therefore, that other unexcavated but apparently univallate rounds may have additional, undetected ditches, and Penhale's multivallate character may be less unusual than it at first appears.

If the Penhale ditches were a sequence of replacements, with only one being open at any time, this would be consistent with the commonly recognised univallate pattern of rounds. However, this was not the conclusion of the 1993 excavations, while the lack of identifiable intersections tends to suggest that the ditches were in use simultaneously. All three ditches have very different profiles, which tends to suggest that none of them were excavated at the same time, but this could just as easily represent a series of additions as a sequence of replacements. While the question of the enclosure sequence cannot be definitively resolved here (pending full publication of the 1993 excavations), it seems likely that the inner ditch was original, and that the middle and outer ditches were added at a later stage (or stages). Whether this was before, after or contemporary with the recut of the inner ditch remains unclear.

While the inner ditch (both the primary ditch and the recut) was large enough to form a significant obstacle and performed the function of defining the enclosure, the purpose of the middle and outer ditches is obscure. Because the ditches were closely-spaced, there would have been no benefit in terms of an increased enclosed area. Schwieso (1976) suggested that the small outer ditch at Threemilestone may have been intended to prevent stock from falling into the much larger inner ditch. However, the shallow U-shaped outer ditch at Penhale seems unlikely to have formed a significant obstacle to stock, while although the middle ditch was so narrow (1m) that it could be easily crossed it was also so steep-sided that it could have posed a risk of injury to stock. These ditches do not therefore seem to represent an efficient means of stock control. However, while it is very unlikely that any of the ditches were intended for defence in the military sense, they could have

been intended as a defence or deterrent against thieves or bandits. While the middle and outer ditches would have made only a limited contribution as real obstacles, they would have given the visual impression of a more strongly defended site, encouraging at least some potential attackers to go elsewhere. It is also possible that the increased depth of the 'defences' functioned at least partly as a status-symbol, making the site seem more impressive and implying that the wealth of the occupants was sufficient to require enhanced security measures. The CAU have argued that the outer ditches excavated in 1993 were excavated for a combination of display and drainage (Jacqueline Nowakowski, pers comm).

Structural features

The ring-gully, although not a structural feature itself, defined the edge of a dense concentration of intercutting post-holes. It is therefore probable, although not certain, that it surrounded a house or other structure, which must have had at least two phases of construction. The gully has been interpreted as a drip-gully positioned under the eaves of this structure. Unfortunately, less than a quarter of the gully lay within the excavation, and although it appeared to be an arc of a circle, it could just as easily have been oval.

No structural pattern could be confidently discerned among the internal post-holes. Although five of them were positioned in roughly the right place to form part of an outer ring (or polygonal arrangement), some of these five could also fit alternative structural patterns, and they need not all be contemporary. Attempts to divide the post-holes into groups by size, shape, other physical characteristics and the limited stratigraphic phasing which was possible did not clarify matters. The nature, size and shape of the structures represented must therefore remain a matter of speculation. The only other excavated internal structure in the round was a small, stone-walled oval building near the entrance, excavated in 1993 (Nowakowski 1998), while the two unexcavated possible buildings shown on the geophysical survey plot also look more oval than circular. While the features under consideration did not show up as a geophysical anomaly, if the curve of the gully were projected as an oval it would enclose an amorphous anomaly and partly define its limits, suggesting that the anomaly represents features internal to the building. It therefore seems most likely that the ring-gully formed an oval enclosure surrounding post-built structures of more than one phase, at least one of which may have been an oval building, together with associated non-structural features.

This group of features clearly represents a structure or structures of very different construction from the stone-walled building found inside the entranceway of the round and excavated by the CAU, which may explain why it did not appear as a clear geophysical anomaly whereas the other excavated house did. However, structural techniques used for buildings inside rounds appear to have varied considerably, often within individual settlements. Walls at least partly of stone are one of the most common features, often but not always accompanied by amorphous groupings of post-holes or post-holes set very close to or in the inner wall faces (eg Trethurgy, Castle Gotha and Grambla; Quinnell 1986, 126). Gullies are also very common, appearing as structural features, drip-gullies or drains. The Iron Age House 3 complex at Trevisker (ApSimon and Greenfield 1972) consisted of a group of post-holes with no discernible pattern, associated with internal drainage gullies, hearths and an oven, while House 1 at the same site, which could have been contemporary, was a classic double-ring round-house with an inner ring of posts, outer wall at least partly of stone, and entrance post-holes.

The apparent arrangement of the buildings at Penhale (positioned around the edges of the enclosure, facing into the interior) also seems to be a common pattern, fitting in (among others) with Trethurgy (Miles and Miles 1973; Quinnell forthcoming), Trevisker (ApSimon and Greenfield 1972) and Threemilestone (Schwieso 1976). However, it has to be said that very few sites have been subjected to large-scale excavation of the interior, and in some cases this has concentrated near the

periphery. At Penhale, while the position of the structural group excavated in 1996 is consistent with the general layout suggested by the previous excavated and geophysical evidence, this group did not show on the geophysical survey; other, centrally-positioned buildings not identified by geophysical survey could therefore theoretically be present in the unexcavated areas. At Reawla (Appleton-Fox 1992), the phase 1 house was in a peripheral location, but the phase 2 houses and working areas were located close to the centre of the enlarged enclosure, while the only building identified at Shortlanesend (Harris 1980) was just off-centre in the enclosure.

A single straight alignment of four post-holes was identified outside the ring-gully. One of these [046] cut an earlier post-hole [048] which itself cut the gully; another pair in the interior of the ring-gully [182, cut by 160] could also be part of the alignment. The nature of the structure represented remains obscure, although it could have been a screen, windbreak or frame associated with an open-air working area, perhaps including pit 030 or other features outside the excavation.

The pits

The nature and purpose of the main group of intercutting pits lying east of the ring-gully remain very obscure. The fills were primarily composed of redeposited clay and shillet derived from the natural subsoil, while there was almost nothing in terms of artefacts, charcoal, macroplant material, industrial waste or other cultural debris to provide a basis for dating or interpretation. Whatever activity required the excavation of a large hole, followed fairly rapidly by its backfilling with the excavated material, it seems to have occurred several times at the same location. The slot 106 which formed the latest element of the complex seemed to be different in form, and could have been either a drain or a structural feature. Its fill, however, was similar to those of the pits, and there was no sign of silting in the base, as would be expected in a drain, or post-pipes or packing, which would be expected in a structural feature. It did have a lower fill, but this appeared to represent simply slumping of the sides before the feature was backfilled.

Pit 030 was very different in character. It was an isolated feature, with several fills, again poor in artefactual material but containing the richest charcoal, carbonised macroplant and industrial waste assemblages recovered in this excavation. None of this material appeared to have been burnt *in situ*, however; it all appeared to have reached the pit as parts of dumps of material from elsewhere. The pit therefore appears to have been used for the periodic disposal of rubbish, although whether this was the original reason for its excavation remains unknown.

Economy and environment

The presence of arable agriculture is strongly suggested by the charred plant remains (Scaife above), which indicated local cultivation and on-site processing of a range of crops, dominated by spelt wheat, oats and barley. Although emmer and bread/club wheat were both present only in small quantities, a consideration of taphonomic processes suggests that the latter may be significantly under-represented, whereas this is unlikely for emmer, which may have been a weed of other crops rather than a crop in its own right. The presence of culm nodes casts some light on agricultural methods, suggesting that harvesting may have been by uprooting. The only non-grain crop identified was peas, in small quantities only.

The pollen evidence from the hut gully fill (Scaife above) tended to confirm that cereal cultivation had taken place locally, while there was also pollen evidence for mixed woodland and heathland species. However, herb pollen (particularly from grass species) was dominant, suggesting the presence of grassland, although it is unclear whether the pollen came from grassland adjacent to the site or from herbaceous material brought onto the site, possibly for roofing or flooring materials.

Areas of grassland may have represented pasture, indicative of stock-raising, but in the absence of faunal remains (which could not survive the local soil conditions) this cannot be confirmed. The pollen from wetland species (including sphagnum moss and royal fern) was somewhat ambiguous. While there is some possibility that these plants had grown on-site, perhaps in the gully itself, it was more likely that they had been brought to the site from a local mire.

The charcoal evidence (Gale above) indicated the use of oak for structural timbers, with fuels dominated by gorse, hazel, blackthorn, hawthorn and oak. Smaller quantities of alder, birch, willow/poplar, ash and heather/ling were also used for fuel. This mix tends to confirm that although the occupants of the site had access to woodland resources, heathland was at least as important as a component of the local landscape and as a source of fuel.

The evidence for non-agricultural aspects of the site's economy is very limited. While some of the cereals identified (particularly spelt) could have been imports, Scaife (above) concludes that they are more likely to be locally grown. Small quantities of ironworking slag were recovered from redeposited contexts, primarily from pit 030, but no furnaces or forges were identified, and the only conclusion possible is that blacksmithing took place during the lifetime of the site (Fitzpatrick 1998). The scale of this operation and its economic significance could not be determined. The only other 'craft' activity identified on site was spinning, which was implied by the presence of two spindle whorls (one of them unfinished). Such finds are very common in Cornwall, and could be taken to support the tentative conclusion that the presence of grassland suggests stock-rearing, most likely sheep for wool production.

There is no evidence for local manufacture of pottery. The great bulk of the ceramic material was of gabbroic fabrics from the Lizard peninsula; this is a common feature of Cornish sites of the Roman period (Quinnell above). Three sherds of BB1 ware from South-East Dorset and a single sherd of Exeter Sandy Grey ware were the only pottery finds from further afield. Other artefacts imported from outside Cornwall include single fragments from a glass bottle and a shale bracelet, both rare but not unknown in Cornish enclosure sites (Quinnell above). A disc-shaped rotary quern (Quinnell above) was of an unusual form for Roman Cornwall, but its probable source was nevertheless the Tregonning Granite, within Cornwall. Hobnails, of which two were found, are a characteristically Roman period innovation (Quinnell above), but there is nothing to indicate that they were imported.

Conclusions

Both the 1993 and 1996 excavations suggested that the site began as a typical univallate round, while evidence from 1993 suggests a date of foundation between the first century BC and the second century AD. While the inner ditch remained the main enclosure barrier, at some stage or stages during its occupation the enclosure was elaborated by the addition of two much smaller ditches, for reasons about which we can only speculate. The character of the occupation seems to have changed in some respects in the later Roman period, in ways that led to the more frequent deposition of artefactual material both inside the enclosure and in the inner ditch. The inner ditch silted up rapidly in this period and was recut; it is possible that some of the other alterations to the enclosure itself are also associated with this change. Structural features in the interior indicate the presence of a probable building, with more than one phase of construction, which was built using different techniques and materials from the building excavated in 1993 but may have been similar in plan form (ie oval). This building was succeeded in part by a straight alignment of posts of unknown purpose. A complex of intercutting pits and related features with sterile fills of redeposited natural remain enigmatic in date and function, while a separate isolated pit was used for disposal of rubbish which included both crop-processing and industrial waste.

Although soil conditions precluded the survival of faunal remains, the combined macroplant, pollen and charcoal evidence has enabled some tentative reconstruction of the surrounding landscape and of some agricultural activities of the site's occupants. The site appears to have been surrounded by a predominantly open landscape, containing areas of grassland but also arable land in which a range of mainly cereal crops were grown. The balance of arable and grassland cannot be determined, but it is probable that mixed agriculture was practised. The occupants of the site had access to woodland resources within walking distance, but given the frequent use of gorse/broom as a fuel, and the smaller-scale use of heather/ling, heath may have been a more important component of the landscape than woodland. There was also at least one wetland site sufficiently close for its resources to be exploited.

The impression given by the combined environmental and artefactual evidence is of a settlement which either produced most of its own agricultural produce or obtained it very locally and processed it on site, while almost all non-agricultural products were obtained from within Cornwall. Although there was some evidence for the use of 'luxury' items from elsewhere, they were tiny in number and entirely from within the south-west peninsula. The only real sign of change in the round from pre-Roman times was a severely practical item, the introduction of hobnailed footwear. While there are signs of change in the later Roman period, they do not appear to constitute any increase in 'Romanisation'. The round therefore appears to represent an element of an extremely stable regional society, very little affected in the fundamentals of its way of life by the Roman occupation of Britain.

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White Vein Quartz tools in West Cornwall and the Isles of Scilly

WILLIAM SKELLINGTON

In 1994 whilst walking along the coastal footpath by the lighthouse at Trevose Head, I picked up a flake of white vein quartz (WVQ) at SW 853 764. This piece (No 10) had most of the characteristics of a hand struck flake, ie striking platform, conchoidal fracture, and previous flake scars. The flake had been buried under peat and was close to the Mesolithic site (for which see Johnson and David 1982).

Since then I have found more of these flakes and a number of what, I believe, are WVQ artefacts in the form of finished tools. These tools have been seen by Dr D Roe at Oxford, along with other archaeologists. They are convinced that the objects are certainly artefacts, and probably Mesolithic. I had a feeling that two of the tools (Nos 1 and 2) might be Mousterian handaxes, though Professor Charles Thomas, who saw the drawings, thought, 'possibly Mesolithic'. However, the pieces have been examined by Witold Migal, Director of Lithic Studies, Penstwowe Museum, Warsaw, Poland, who has a collection of Eastern European WVQ artefacts at the Museum, and has conducted experiments in WVQ working; he said 'The two pieces (Nos 1 and 2) are certainly Mousterian'.

Be that as it may, I merely draw attention to the fact that, in the past in Cornwall, WVQ has been used as a lithic source for tool making, and this has been overlooked by archaeologists. The tools are, of course, difficult to identify – but not too difficult – they are different.

I have conducted a series of experiments myself at working WVQ, and have come to the conclusion that, because of the nature of the material, the resultant tool forms may not have exact analogues in flint, but good heavy tools can be made quite easily.

The paucity of heavy flint tool forms in the Mesolithic assemblages of West Cornwall has often been remarked upon (*Vide* Palmer 1977; Wymer 1977; and Johnson and David 1982 and others). For whilst flint in the form of small pebbles is common around the coast, there is a shortage of good tabular material. However, WVQ is ubiquitous in West Cornwall, and WVQ has been used as a lithic material of 'choice' in some parts of the world, eg China, Africa and Eastern Europe. It was used during the Mesolithic period in Denmark. If an alternative source of lithic material was freely available, it seems reasonable to assume that it was identified and exploited by Prehistoric Man.

It also seems to me that the use of WVQ should continue (like flint) through the Neolithic period and into the Bronze Age. So I would expect to find large numbers of WVQ tools, with tool forms spanning the whole period of prehistory in Cornwall.

The milieu that was responsible for the production and use of WVQ tools over such a long period was essentially the shortage of good quality flint (the lithic material of choice), but once the technique for working WVQ had been acquired it became the lithic material of 'choice' in West Cornwall, especially for heavy tools. Its ubiquity alone would ensure that.

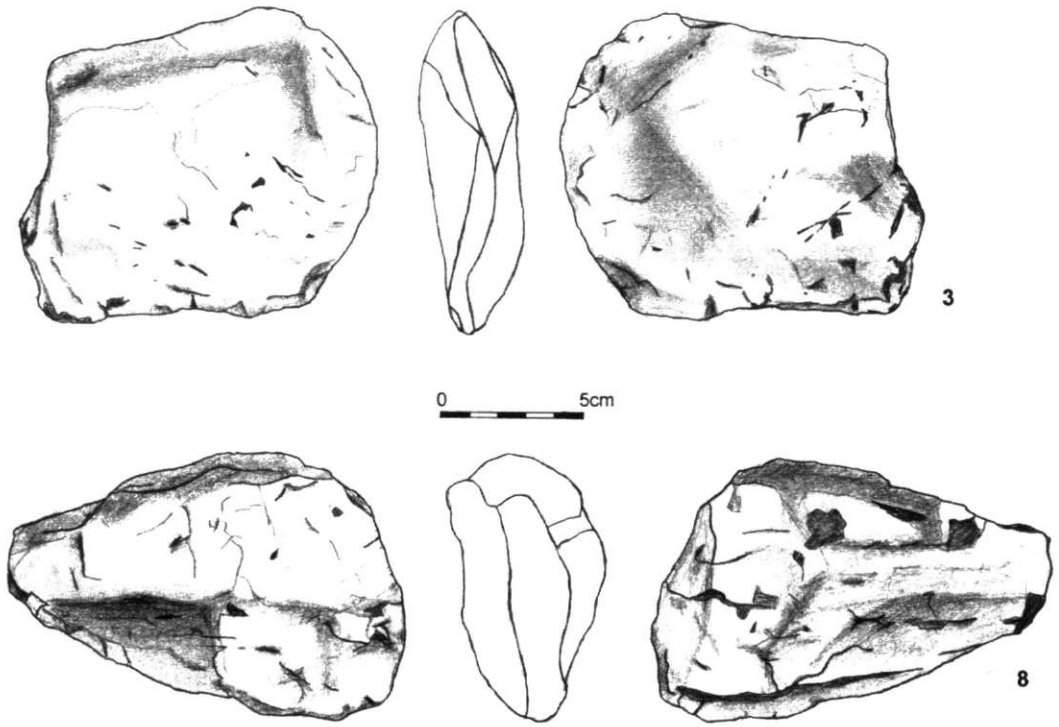

Fig 1 White Vein Quartz objects, numbers 3 and 8

The WVQ Finds

1 Gwithian On the beach (SW 576 413). A large (11.5 × 9cm) cordiform tool, originally from the top of the cliff. Somewhat rolled on the beach by tidal action. The nearest flint analogues being Mousterian cordiform hand axes.

2 Godrevy From subsoil below sand dunes (National Trust car park) (SW 585 423). A discoidal tool 8 × 6.5cm. Undamaged and again suspiciously Mousterian as no parallel exists in flint for any other period.

3 Gwithian From beach below cliffs (SW 576 413) Large axe/chopper. Some rolling due to wave action. A typical late Neolithic or EBA flat axe, with analogues in flint/bronze/copper. Originally eroded from cliff top.

4 Gugh, Isles of Scilly A typical struck flake embedded in cliff section 29cm from surface. Facing St Mary's. A small cordiform tool of Bout Coupe shape 6.5 × 5.5cm.

5 St Agnes, Isles of Scilly Warna's Cove. A typical struck flake embedded in cliff section, about 19cm from surface. This flake has a conchoidal fracture profile, with remains of the striking platform, incipient bulb of percussion, and previous flake scars. There are other WVQ flakes on the beach below. The cliff here is quite low, 2m at most.

6 St Agnes, Isles of Scilly Near Carn of Cove in cliff section about 25cm from surface. Small trimmed flake with striking platform and bulb of percussion. It looks like a petit tranchet derivative arrowhead.

7 St Mary's, Isles of Scilly Cliff section near Giants Castle at SV 924 103. A pick-like tool with curved leading edge 7 × 4cm. The cliff section here has a distinct mass of broken quartz and flakes,

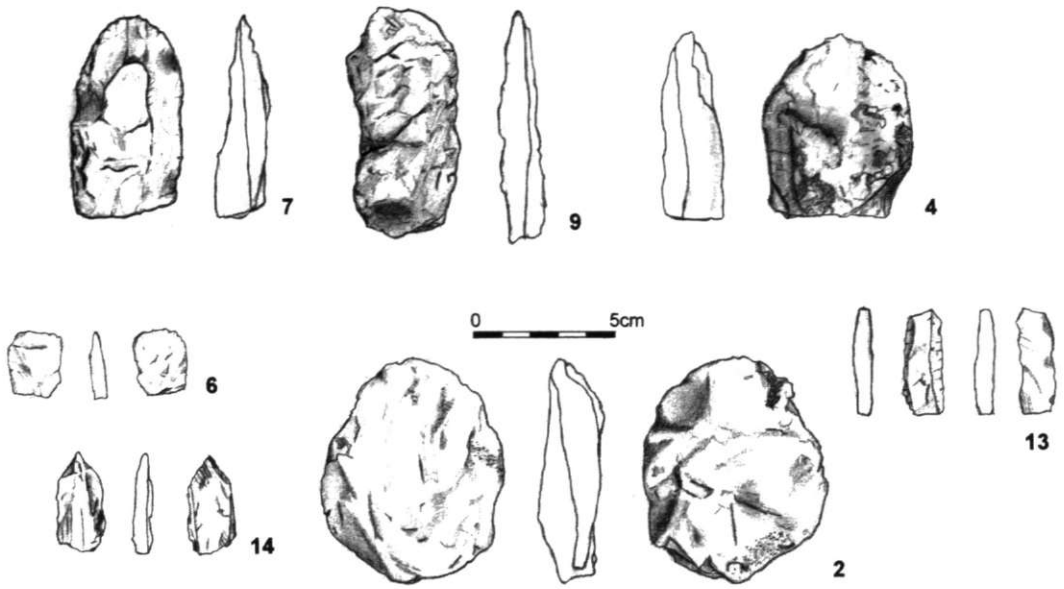

Fig 2 White Vein Quartz objects, numbers 2, 4, 6, 7, 9, 13 and 14

and is an obvious flaking site. Now falling into the sea. A friend of mine, Mr P Pearman, removed from site; 3 Hammer Stones (rounded quartz pebbles); one of these heavily bruised at one end, and weighing 385 grammes. Also a number of WVQ flakes (all in my collection). The material is embedded in a matrix of degraded granite/sand, with the peat-turf line above undisturbed.

8 Tehidy Park Woods (SW 646 435) Surface find. Late Mesolithic tranchet axe, or Neolithic adze. An excellent tool in very good condition; 14.5 × 9cm, weighing 535 grammes.

9 Near Godolphin Woods Surface find on the bank of Hayle River, at SW 600 325. A tool of indeterminate use, with one long sharp edge, and curved leading edge. Pick, axe, chisel, or knife? 8 x 4cm. Some polish on leading edge.

10 Trevose Head Near Lighthouse at SW 853 764 on footpath and 'kicked' out of the peat. A good struck flake with conchoidal fracture, bulb of percussion and previous flake scars. Close to the Mesolithic site (Johnson and David1982).

11 Phillack In garden topsoil, SW 568 384. A hand struck flake with striking platform and bulb of percussion. This is a neat, thin leaf-shaped piece, trimmed to a point, and might well have been a Neolithic arrowhead, 3.5 × 2cm.

12 Near Mousehole On the coastal footpath at SW 465 264. A struck flake, 3.5 × 2cm.

13 Near Perranuthnoe At SW 535 294 in a field on the coastal path, at site of Neolithic axe factory (Group III). A very nicely made blade segment with parallel sides and one long, straight and sharp edge.

14 Hayle From a garden at SW 568 384. A leaf shaped flake from the cleavage of a single quartz crystal. The point has been trimmed. This would have made a nice arrowhead?

15 Gwithian *In situ* in cliff face, above the raised beach and about 1 metre from the surface near the steps at SW 583 415. A pointed tool, 6.5 x 6cm.

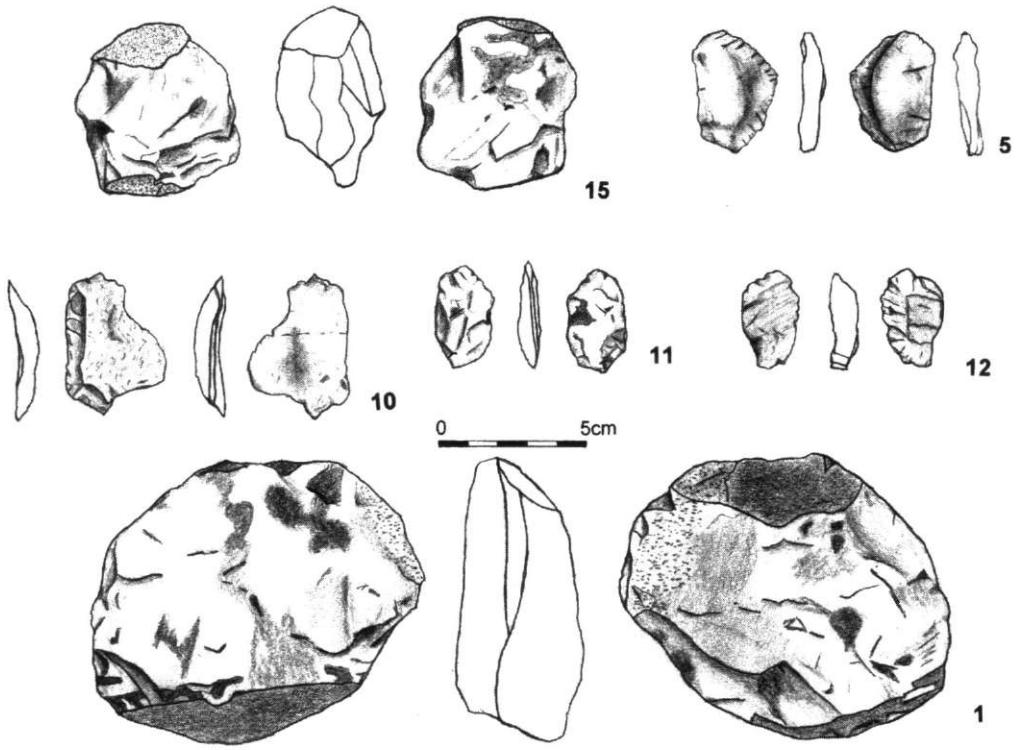

Fig 3 White Vein Quartz objects, numbers 1, 5, 10, 11, 12 and 15

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Addendum *(based on notes made by Steve Hartgroves)*

Steve Hartgroves, Principal Archaeologist of the Historic Environment Section (HES) of Cornwall County Council, took the fifteen objects to a meeting in London of the Lithic Studies Society on 8th May 2002. He showed them all to Torben Ballen, a specialist in quartz tools based in Scotland, and showed the larger pieces to John Wymer. The following is a summary of Steve's report, lodged with the Historic Environment Record of the HES.

Torben was looking for evidence of manufacture – prepared striking platform, bulb of percussion, concave section, flake scars etc. He considered that three small flakes demonstrated these features and could be described as 'probable artefacts' (nos 5, 10 and 12); a further five were described as 'possible artefacts' (nos 2, 9, 11, 14 and 15), and the remaining seven as either doubtful or very doubtful. John Wymer, who has a particular interest in Palaeolithic artefacts, was more interested in the overall morphology of the pieces, and the possibility that some of the larger ones might be core tools (hand axes etc). He considered three of the larger pieces (1, 2 and 8) to be probably palaeolithic

in origin. The following are summaries of the opinions of Torben Ballen (TB) and John Wymer (JW). (Numbering as above.)

1 A large fragment across the thickness of a quartz vein with country rock on opposing faces. Little indication of flake removal; not an artefact (TB). JW, however, considered it likely to have been a palaeolithic axe-type artefact.

2 Medium-sized discoidal piece with indistinct traces of flaking and shaping, but nevertheless a possible artefact (TB). JW considered this to be a definite Palaeolithic artefact.

3 Not an artefact (TB).

4 Roughly ovoid flake with veins and faults running across it, making it unsuitable for use as a tool, though there are some indications of flaking and shaping. A possible but unlikely artefact (TB).

5 Small flake with a striking platform, bulb of percussion and convex shape – a classic flake and so a probable artefact (TB).

6 Small thin flake with some indications of a striking platform but no bulb and no concavity; not an artefact (TB).

7 Rod-shaped piece with what appear to be natural flake surfaces and little evidence for flaking. Doubtful artefact (TB).

8 Some evidence for flaking and the shape is very suggestive of a handaxe, but since the stone is cut through with veins and faults, this is a doubtful artefact (TB). JW, however, considered it to be a definite acheulian-type handaxe, which would be quite at home in, for example, an African assemblage he is dealing with.

9 Better quality piece of stone with only minor internal faults. Indications of flaking at the flat end may indicate preparation and use as a core, but smoothing of edges (by rolling in a stream?) makes these features indistinct. A possible artefact (TB).

10 Iregular shaped flake with bulb of percussion and convex shape. A probable artefact (TB).

11 Small flake but with less well developed flake characteristics than 5 and 10. A possible artefact (TB).

12 Small ungainly thick flake, but a flake nevertheless and so ought to be a probable artefact (TB)

13 Rod-shaped flake; faces appear to be natural crystal facets, not an artefact (TB).

14 Flat flake with point at one end. Flat sides are 'natural crystal faces though the point seems to be 'man-made'. The piece may have been flaked and split along the crystal faces and then given a point to make a borer. A possible artefact (TB).

15 Roughly spherical pieces with traces of country rock on opposing sides and a point to one side. This unusual piece is a possible artefact (TB).

Steve, who has seen numerous collections of flint, chert and other stone artefacts during his time as Sites and Monuments Officer, and now Historic Environment Record Officer, tends to side more with TB, and would question JW's interpretations on the grounds that the raw material used in the suggested Palaeolithic artefacts would not have been effective for tool use, having numerous flaws. Steve stresses, however, that the views expressed in this addendum, like those of William Skellington and the other experts William consulted when writing the original article, are interpretations, and it is not possible to be absolutely sure, especially when rejecting individual items. It seems very likely that at least three of the fifteen pieces are artefacts, and that possibly several more could also be thus described. As such, this justifies the presentation of the material in the journal and should ensure that archaeologists working in Cornwall and elsewhere do indeed take William Skellington's advice and give more serious consideration to the possibility that white vein quartz might have been fairly widely used for tool making in early prehistory.

The accompanying drawings have been prepared by Carmelo Grasso of Porthleven while a student at Truro College. Carmelo's use of pencil shading to show the softer edges of the flaking scars, much less pronounced than those found on flints, captures the form of the pieces well. There remain, however, difficulties in the representation of natural flaws.

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The potential for a rapid, minimally-destructive method for the identification of archaeological ceramics – the results of a pilot study on Gabbroic Ware

Jo Roberts and Henrietta Quinnell

Summary

Gabbroic ware from Cornwall has been analysed, using X-Ray Diffraction, in order to provide data for a new approach to characterising archaeological ceramics. The approach depends, not on the identification of distinctive or diagnostic components, but on the relationship of the gross mineral components, expressed as a mineralogical index. A pilot study has shown that the technique shows consistency of results after repeat analysis. It has also been shown that the statistically grouped indices indicate the identification of sub-sets within the main classification. This sensitivity allows the potential for the development of a rapid, minimally-destructive method for the identification of archaeological ceramics.

Introduction

Characterisation and provenance of archaeological ceramics often depends upon the identification of a particularly diagnostic component in a sample which can be matched to the source of the raw material. Petrographic analysis of thin-sectioned samples serves this purpose well. However, it can be time-consuming, expensive and destructive, thereby severely limiting the amount of material that the archaeologist will offer for analysis. X-Ray Diffraction (XRD), like petrographic analysis, is a geological technique which analyses for and identifies the mineral component of a sample.

The flexibility of XRD in the study of archaeological ceramics is becoming increasingly recognised and has been used recently to analyse for the presence or absence of minerals in ceramic temper (Simms and Bright 1997, 786). This study, although using a new technique, still relies on the traditional approach of identifying diagnostic components that can be matched to a source.

The approach described here differs in that it relies on the relationships, that is the relative proportions as determined by XRD, of the major mineral components rather than the detection of a single diagnostic one. It is this determination of the mineralogical relationships which will allow samples to be characterised and a ceramic *'index'* to be developed for each ware. This approach to characterisation is not new. It was developed and has been successfully utilised in the identification and provenance of airborne particulates from surface mineral workings (Merefield *et al* 1995a; 1995b; and Roberts *et al* 1996) but the present study represents the first application of this approach to ceramics.

A pilot study was conducted using Gabbroic ware of Romano-British date from Trethurgy, Cornwall (see Miles and Miles 1973). This was designed to see if the ratio index of one mineral component to another, sampled from different sherds of the same ware, is in fact consistent. Consistency is expected, firstly in terms of the gross mineral components and secondly in terms of the indices calculated from these components. This ware (Quinnell 1987) was selected for this study because of its frequency in South West Britain. Gabbroic ware has been the subject of thin-section analysis (Peacock 1969; 1988) which indicates an origin in the St Keverne area of the Lizard. A good understanding of the petrology of the ware was already available for comparison with the pilot study results.

Sampling

Random samples, of approximately 5 mg (sample size is not important for this study, only that the sample is *representative*), were extracted with an engraving tool from the interior of the sherds, after scraping away the immediate surface. Eight samples were taken from a coarse grained sherd (sherd 'b') and eight from a fine grained sherd (sherd 'h').

Analysis

The samples were crushed and homogenised with a pestle and mortar and smeared onto a glass slide. Analysis was achieved using a Philips PW1830 XRD with APD software, using 40kV 40mA CuKα radiation from a long fine-focus tube, 1°, 0.1°,1° divergence, receiving and scatter slits and the goniometer scanning from 4° to 40° 2θ, at a 0.2° 2θ step size employing a 1 second count time. Analysis was conducted to identify the main crystalline phases as revealed by XRD and then to calculate the ratio of the peak intensities from the 100I/I_1 peak of appropriate phases against others.

Results

The results of the XRD analysis are presented in two tables listing the peak intensities from the eight samples extracted from sherds 'b' and 'h'. These values are then variously divided to reveal the mineralogical indices of the gross mineral components.

Table 1: Peak intensities for the gross mineral components revealed by XRD in a sherd 'b' with mineralogical indices

Where P_{002} = 3.19 Å (100 I/I_1 peak intensity) - plagioclase
T_{310} = 3.12 Å (100 I/I_1 peak intensity) - tremolite
Q_{101} = 3.34 Å (100 I/I_1 peak intensity) - quartz

	peak intensities			mineralogical indices		
sample number	P_{002} plagioclase	T_{310} tremolite	Q_{101} quartz	P_{002}/Q_{101}	T_{310}/Q_{101}	P_{002}/T_{310}
b1	259	357	697	0.37	0.51	0.73
b2	392	216	961	0.41	0.22	1.81
b3	369	282	767	0.48	0.37	1.31
b4	269	428	562	0.48	0.76	0.63
b5	256	219	506	0.51	0.43	1.17
b6	493	190	484	1.02	0.39	2.59
b7	266	237	562	0.47	0.42	1.12
b8	246	286	581	0.42	0.49	0.86

Table 2: Peak intensities for the gross mineral components revealed by XRD in sherd 'h' with mineralogical indices

Where P_{002} = 3.19 Å (100 I/I_1 peak intensity) - plagioclase
T_{310} = 3.12 Å (100 I/I_1 peak intensity) - tremolite
Q_{101} = 3.34 Å (100 I/I_1 peak intensity) - quartz

	peak intensities			mineralogical indices		
sample number	P_{002} plagioclase	T_{310} tremolite	Q_{101} quartz	P_{002}/Q_{101}	T_{310}/Q_{101}	P_{002}/T_{310}
h1	262	180	1122	0.23	0.16	1.46
h2	282	159	1076	0.26	0.15	1.77
h3	313	128	1204	0.26	0.11	2.45
h4	250	292	449	0.56	0.65	0.86
h5	324	193	807	0.40	0.24	1.68
h6	331	110	635	0.52	0.17	3.01
h7	361	204	790	0.46	0.26	1.77
h8	303	199	734	0.41	0.27	1.52

Statistical Testing

The results from the two sherds were compared in order to reveal statistical groupings. Owing to the necessarily small sample, a non-parametric test, the Mann-Whitney U-test, was selected as it offers the simplest and most efficient means of comparing results from the two sherds. The small sample procedure (for sample sizes <8) was used.

Table 3: Results of the statistical testing of the mineralogical indices where number of samples n_1 = 'b' = 8; n_2 = 'h' = 8

	Values of Mann-Whitney **U**	and	**Probability (p)**
P_{002}/Q_{101}	19		0.194
T_{310}/Q_{101}	10		0.020
P_{002}/T_{310}	17		0.130

Values to P_{002}/Q_{101} and P_{002}/T_{310} clearly exceed p = 0.05: for these, the Null Hypothesis is accepted and we conclude that the samples come from the same population. However, the value for T_{310}/Q_{101} has a p-value < 0.05, so that we must conclude that, as far as this index is concerned, the 'b' and 'h'

samples come from different populations, i.e. we reject the Null Hypothesis that they come from the same population.

This apparent disparity becomes tenable if the plagioclase/quartz index range is taken to represent the broad group of 'Gabbroic ware' and the tremolite/quartz index range is used to define a sub-set within that group. Further sampling and testing is recommended in order to verify this.

Conclusions

This pilot study has revealed consistency as predicted; firstly in terms of the gross mineral components of the Gabbroic ware tested, that is quartz, tremolite and plagioclase, and secondly in terms of the relationships between these components. Furthermore it has shown that the technique is sensitive to slight variations in wares; in this case grain-size. This is an indication that the mineralogical indices can be used to create sub-sets within the main classification that can be statistically matched to known variations in fabrics. Current macroscopic work currently conducted by Quinnell is identifying considerable diachronic variations within gabbroic fabrics.

While recognising that this testing represents a very small sample and that experimentation needs to be conducted to iron out any concerns regarding sampling fabrics with large inclusions, it is suggested that this technique could be used to devise a reference database of mineralogical indices. This database would provide the basis of a rapid, minimally destructive means of identifying archaeological ceramics.

Acknowledgements

The authors would like to acknowledge the contribution of Dr Maurice Stone for his advice on matters geological and statistical and Dr Roger Taylor for sharing his experience in thin-section work and mineralogical understanding of gabbroic ware. Analyses were carried out by kind permission of the Earth Resources Centre, University of Exeter.

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Some thoughts on early enclosures in southeast Cornwall

G F WALFORD

These thoughts were generated by reading in a recent paper by Dr Keith Ray on Neolithic enclosures in southeast Cornwall the phrase, 'the results of this fieldwork....do suggest there are more early enclosures to be discovered in the region' (Ray 2001, 50). This short essay, in following up this suggestion, makes no attempt to describe the archaeology in detail but merely floats a few ideas which others may in time like to study. As Dr Ray says, 'there are large areas of Cornwall that have been subject only to the most limited study.' Southeast Cornwall is one of them. Bodmin Moor which is well recorded is not included here.

Some of the aspects to be considered when identifying possible early enclosures are: landscape, artefacts, barrows, field features, maps, aerial photographs, excavation reports, antiquarian writings, even hunches.

Two sites with the strongest claims are Castlepark in Greystone Wood, Lezant parish (NGR SX 363 795) and Clicker Tor, Menheniot parish (NGR SX 284 613). The former is a large, elevated, contoured feature, currently in woodland which in a treeless landscape would have enjoyed extensive views particularly to east and west. It consists of an enclosure bank and on the east side has a steep drop to the River Tamar. In 1938 Croft Andrew spent a few days trenching the enclosure bank on the northwest side and concluded there were two enclosures, one superimposed on the other. This writer can confirm this from his own observations at the southern end where there is also a well-preserved entrance (Walford 1997). The site lies in managed woodland and permission should be obtained to visit.

Clicker Tor is another elevated site with substantial views, especially to the west. It has been heavily quarried and nothing remains of the summit, though the name indicates that there were outcropping rocks. Field walking in 1994–5 produced a considerable amount of flint from a field on the west-facing slope (Walford forthcoming). A broken stone axe was recorded by Croft Andrew (Clough and Cummins 1988, 146); a round barrow was excavated in the nineteenth century; and a broken pot was found, part of which is in Plymouth Museum and part in the Royal Cornwall Museum in Truro. Other finds from the locality are recorded as being probably from the Clicker Tor area but without precise location. Not enough research has been done for an enclosure to be located but the probability seems high.

A third candidate is Viverdon Down (NGR SX3767) which was the subject of a limited excavation in 1995 in advance of road construction (Jones *et al* 1995). Viverdon Down is a strong candidate lying at the southern edge of a prehistoric landscape which includes a henge (Castlewich), possible axe quarry, a long barrow (Kit Hill), numerous round barrows, at least two probable Rounds, flint scatters and the Iron Age fort of Cadsonbury, itself a candidate for earlier use.

There are more which must fall into the category of 'possibles' and await serious systematic investigation. Most are on private land and permission must be obtained to visit. Further information about most of these sites is available from the Cornwall Archaeological Unit in Truro or in *Cornish Archaeology*.

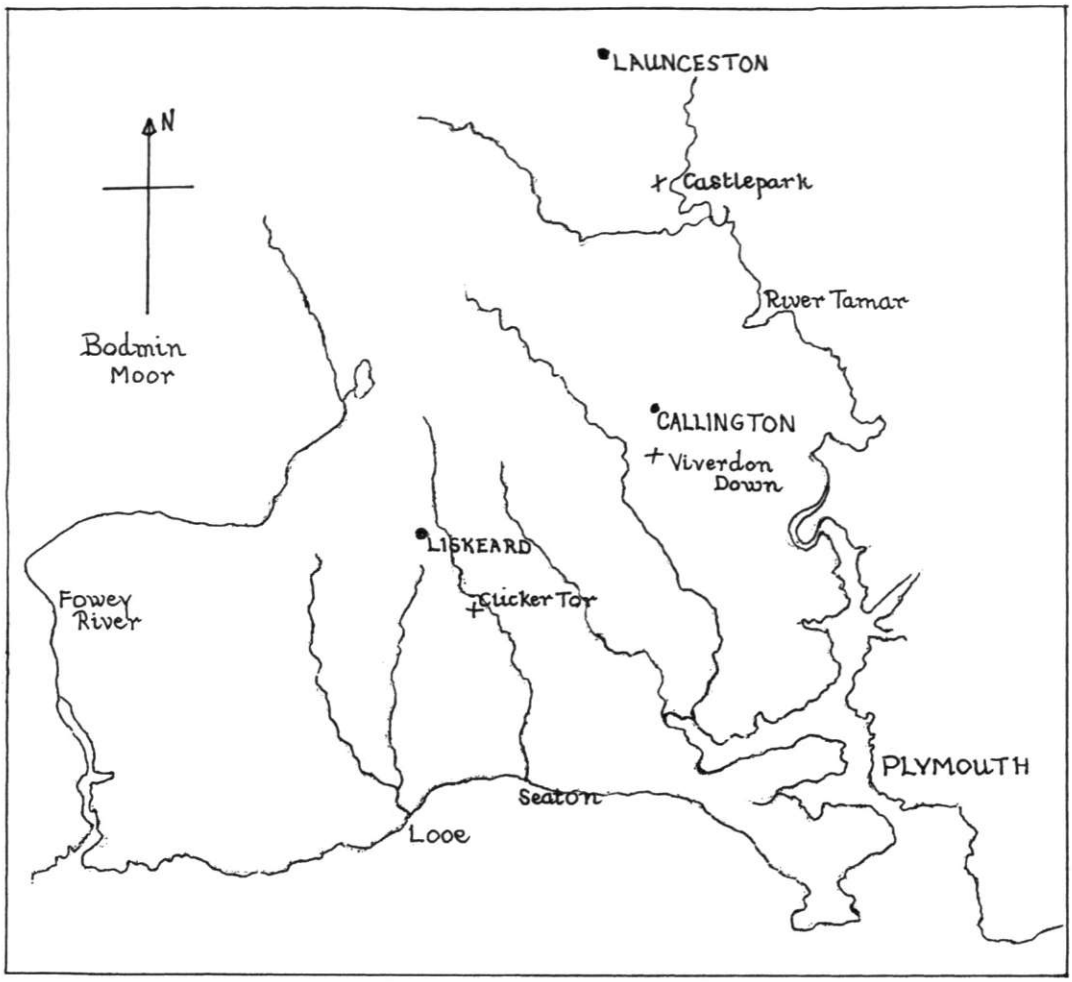

Fig 1 Sketch map showing location of sites

Acknowledgements

Brian Shaw, Tavistock Woodlands, Tilhill Economic Forestry, Cullompton and Messrs Snead, Coldrenick, Menheniot for permissions to walk their lands; my wife Valerie for help with the map.

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Kilhallon – an update

PM CARLYON

The site at Kilhallon, Tywardreath, SX 072 549 (Fig 1) was discovered in 1975 when the Kittow family had some landscaping done in a new garden (Fig 2). While it was being levelled a pile of shells was discovered in one corner and closer inspection revealed that among the shells were some spindle whorls and bits of pottery. Their curiosity as to what this was led the Kittows to contact the Museum of the Royal Institution of Cornwall at Truro, and an excavation was laid on. This revealed that the shells were contained in a ditch. Investigation of the rest of the considerable area which had been stripped only produced some modern agricultural features. The ditch was the width (1.75m) and depth (1.3m) of that of a small round or later prehistoric or Roman-British enclosed settlement, which it was assumed lay to the east across the lane. This could not be demonstrated then, owing to the topography and lack of time.

The finds were of considerable interest. Rounds in Cornwall normally produce some local pottery with possibly the odd sherd of imported wares, but here at Kilhallon were sherds of Samian ware, colour-coated beakers, mortaria, glass, a bronze shoe-sole brooch and other items. A full report of this excavation appeared in *Cornish Archaeology* **21** (Carlyon 1982).

Extension of the slaughterhouse in the neighbouring field (Fig 2, not shown on the plan but just off it, in the bottom right-hand corner) resulted in another small excavation in December 1983. This was about 100 metres south-east of the original site but nothing was found except the ditch of a destroyed field hedge.

In 1985 the farmer, Mr Kittow, built a barn in this field (Fig 2). The construction necessitated the sinking of nine sturdy posts and in one of the post holes numbers of cockle shells were found. This suggested a continuation of the 1975 ditch, and an excavation was arranged by the Cornwall Archaeological Society in order to ascertain the shape of the enclosure and if possible to investigate the occupation within it.

Before the excavation started, a magnetometer survey was carried out by Professor Keith Atkinson of the Camborne School of Mines and a resistivity survey by Peter Brierley. These were not very successful as there was too much general 'background noise'. When the excavation started a long trench was laid out and excavated by machine to find the return of the ditch at the top of the field (Fig 2, Trench B – F). This was successful and now that the type of anomaly was visible, it was possible to use the resistivity survey to show where much of the rest of the ditch ran, except on the eastern side where there has been buildings and the old hedge mentioned above.

Excavation took place in successive summers of 1985 and 1986, mainly in the slaughterhouse field, though a small extension was made to the original ditch in the garden of the bungalow (Fig 2, Trench P). The result was somewhat disappointing, as the field had been very heavily ploughed.

The ditch was sampled in six places (Fig 2): Trench P across the lane next to the 1975 excavation, Trenches E and EE at the top end or northern end of the field, and Trenches R, A and Q at the lower end. Trench EE was opened to verify the resistivity results. This made it possible to ascertain that

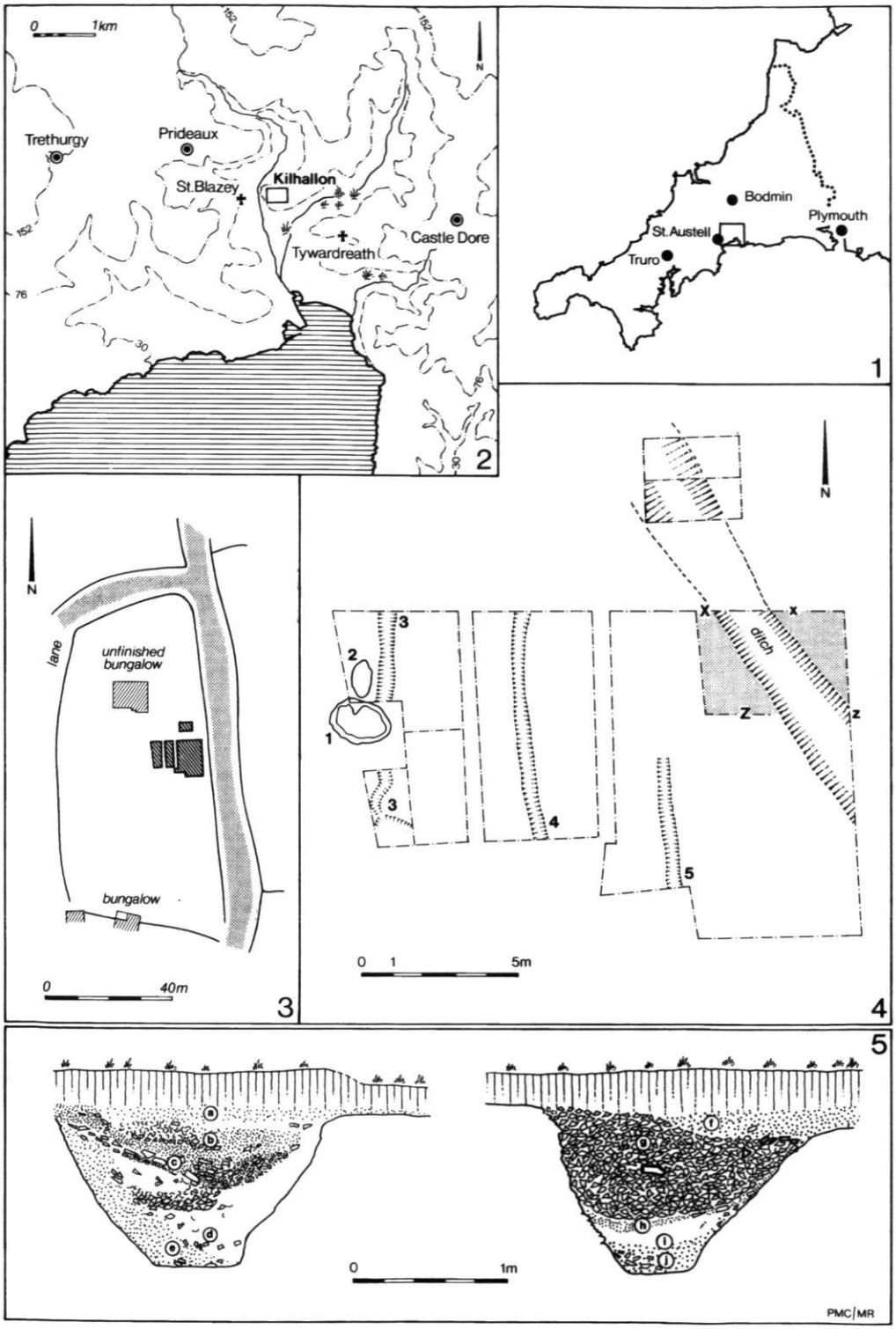

Fig 1 Kilhallon; locations of site and 1975 excavations

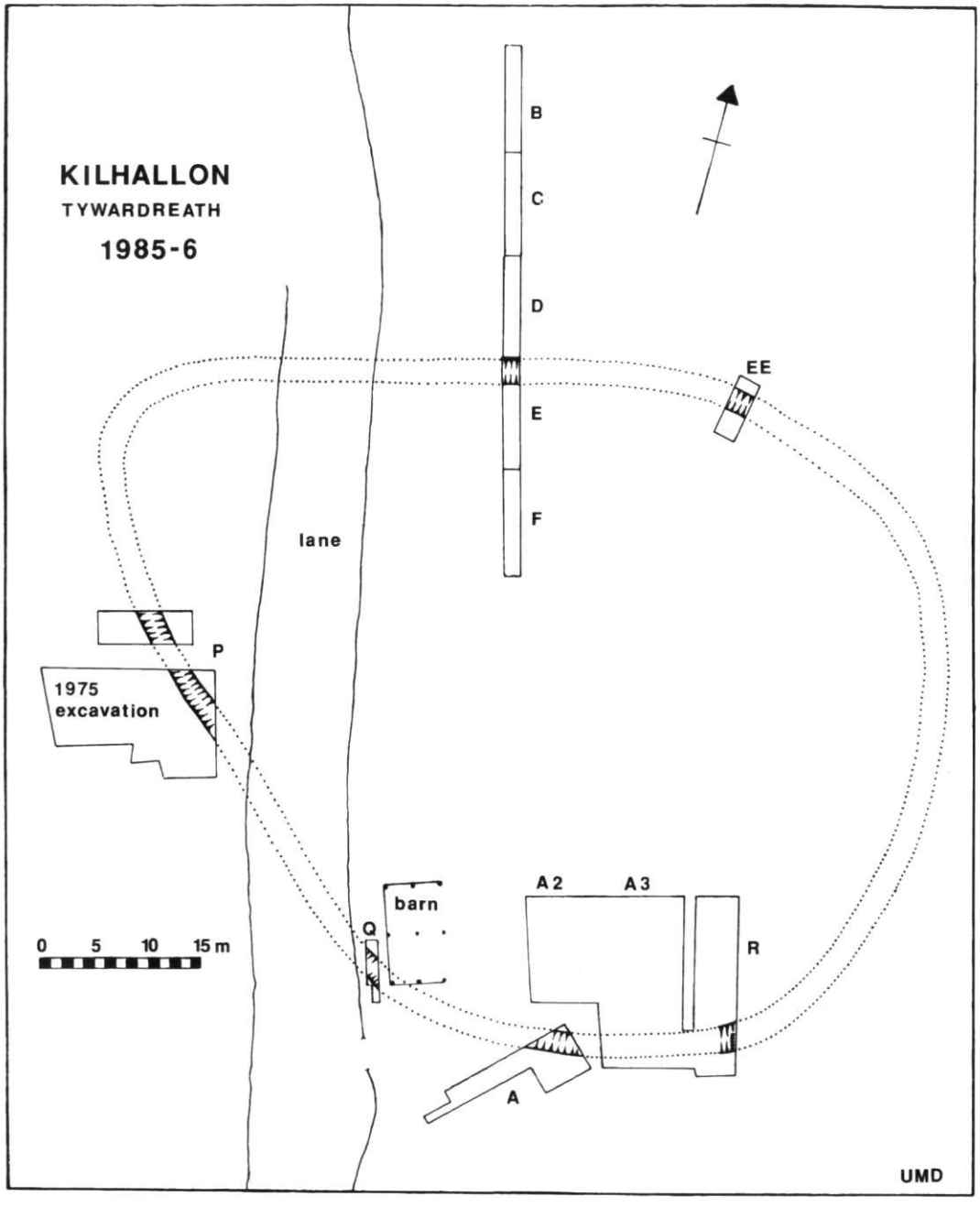

Fig 2 Kilhallon; extent of enclosure and locations of 1985–6 excavations (drawn by Ursula Davey)

Fig 3 Kilhallon; stone bowl, exterior

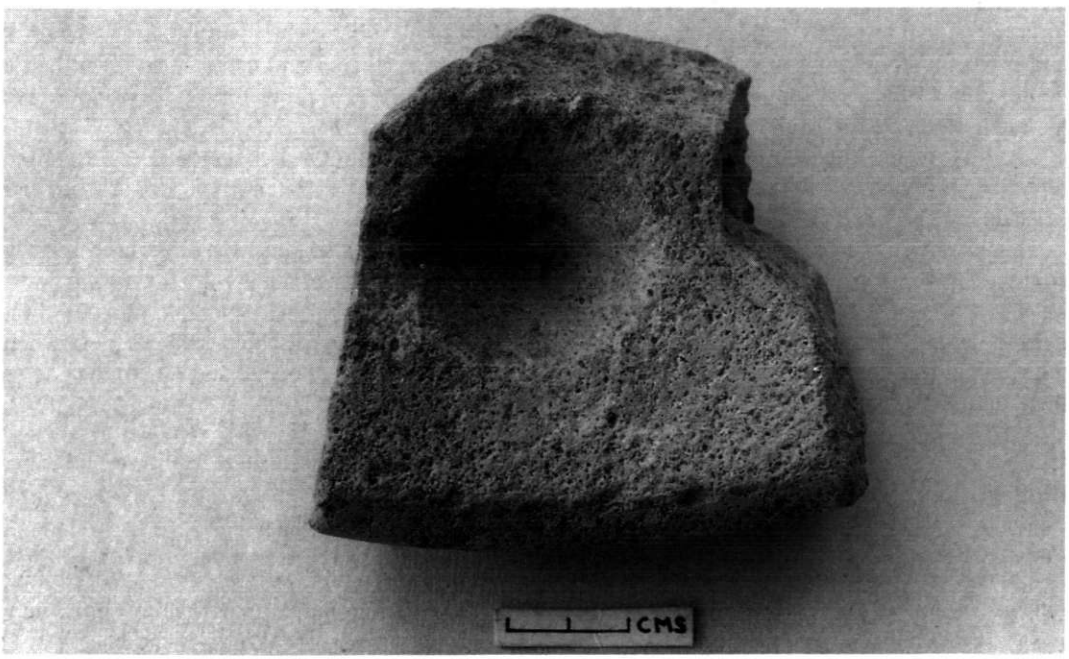

Fig 4 Kilhallon; stone bowl, interior showing secondary depression, probably a pivot hole for a gate or door

the site was a fairly typical small round (*c*80m east-west by *c*60m north-south). It was sited just below the crest of the hill, typical of the locations of such fortified agricultural settlements (see Johnson and Rose 1982), and the Kilhallon entrance was found also in the typical position on the downhill side, in Trench R. This was discovered at the very end of the dig, as so often happens, and only revetment walling was found partly destroyed by something, possibly the roots of a tree, on the eastern side of the trench.

Shells, the hallmark of Killhallon, were found in most of the ditch trenches, though there were hardly any in trench R, which was full of large rocks, presumably the tumbled bank of the entrance. Very little evidence of the bank survived anywhere. Trench A was complicated by a later track that ran through it, appearing also in the upper layers of Trench R heading for either the old farm buildings or the mining area to the north-east. Lostwithiel wares and other post-medieval pottery suggest a date for the track, and as it did not respect the old earthwork; the latter had almost certainly been more or less obliterated by the time it was in use. This track in turn was disused when the slaughterhouse became the main focal point of the area.

Considering the area investigated, finds were sparse. The tougher post-medieval Lostwithiel and other wares were common, but presumably the earlier wares had succumbed to the ploughing and only survived mainly in the ditches and in the deeper deposits at the lower end of the site.

The earliest finds were from Trench R: three small sherds of SWB (South Western Decorated ware). One was a rim with the characteristic internal rim groove and a slashed neck cordon; the others were two joining body sherds with the slashed neck cordon decorated below with lines too small to determine the pattern. (See Murray Threipland 1956, 54, fig 14 for some examples with the slashed neck cordons.) Finds of SWB ware on sites where the main assemblage dates to the Romano-British period are usual. The end-date of these Iron Age wares is still not demonstrated.

The rest of the finds fit in well with those from 1975; nothing from the first part of the first century, the rim of a Samian bowl, Dr 27, dated to the end of the first century, Trajan/Hadrian, and an Antonine sherd, also several undateable scraps, two Black Burnished sherds, one with a glimpse of lattice, and a few coarse gabbroic jars and bowls. Part of a shale bracelet was found in Trench P and part of a stone bowl in A2. The bowl or Cornish mortar (Figs 3 and 4) made of elvan had a depression drilled in it suggesting that it might have been used as a pivot for a gate or door (see Quinnell 1993, 42 for a full discussion of these bowls).

The lack of information obtained from the interior (due to plough damage) makes a detailed report unnecessary but the records and finds from the site will be deposited in the Royal Cornwall Museum in Truro.

Thanks should go to the members of Cornwall Archaeological Society without whom the dig could not have happened and to Henrietta Quinnell for general advice and identification of the finds, but the most sincere thanks go to the Kittow family who made everyone welcome, allowed their field to be dug up, and provided bales of straw to make the barn comfortable for the diggers when the weather did not co-operate. They also allowed the director, draughtsman and others the use of their sumptuous caravan.

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A supplement to Corpus of Early Christian Inscribed Stones of South-west Britain

ELISABETH OKASHA

Introduction

Since the *Corpus* was published in 1993 (Okasha 1993), five more inscribed stones have come to my attention. In addition, two stones, Penzance and Rialton, have been moved to more convenient locations and their texts are now considerably more easily read. Finally, one stone, Hayle, has been carefully photographed under better light conditions; with the aid of these photographs, a little more of the text can be made out than was previously possible. This paper brings the *Corpus* up to date by including a full entry for each of the new stones and giving revised readings for the other three texts.

Each of the five new stones is given an entry which corresponds in format to the entries in the *Corpus*. The stones are numbered in their appropriate alphabetical sequence with the addition of the letter 'a' or 'b'. The five stones are:

17a Kenidjack
17b Kerris
52a Sampford Spiney
64a Tintagel II
69a Trevalgan.

In the case of the other three stones, a completely new entry is not required. Instead each is given a revised discussion under Text, to replace the Text in the *Corpus* entry, and an emended interpretation under Discussion.

Since the publication of the *Corpus* in 1993, a number of works mentioning the inscribed stones of south-west Britain have appeared. In addition, a few works have come to my attention which should have been included in the *Corpus* but were not. These works are listed in the Bibliography at the end of this paper, along with works referred to in this paper which did not appear in the bibliography of the *Corpus*.

Entries

17a Kenidjack (Fig 1)

The stone is now in a scatter of loose stones beside a track leading from Boscean to Wheal Drea, near Kenidjack Farm, St Just. National Grid Reference SW 3652 3236. Examined October 1994.

HISTORY

The stone was found in 1990 by a boy from Tolcarne Primary School while on a field trip led by Peter Herring. It was lying by the side of the track near its present position.

Fig 1 17a, Kenidjack (Ann Preston-Jones)

DESCRIPTION

The stone is a block of surface granite which had been used as a building stone: it has been trimmed on all sides and contains remnants of whitewash. It measures 51cm in height, 47cm in width and 40.5cm in thickness. The text is incised without framing-lines or panels towards the lower right corner of one face of the stone. The text is legible but incomplete. There is insufficient remaining both of the stone and of the text to tell whether or not the text is primary. The text is incised in one line in a predominantly capital script with a maximum letter height of 14.5 cm. Since it is not clear which was originally the top of the stone, it is uncertain whether the letters were set horizontally, or downwards facing left.

TEXT

S[E]C[-]

DISCUSSION

The text appears to read, S[F]C[-], with the first letter being larger than the others and more deeply cut. It is possible that these letters are the remains of a longer text, the rest having been lost when the stone was re-cut for building. No letters appear to be lost before the S so contextually the next letter should presumably be read as [E] not [F]. The text is too fragmentary to be interpreted.

If the stone is genuine, it could have been a pillar-stone, that is a Category 1 stone, dating from the fifth or sixth to the eleventh century. It is, however, possible that the stone is not in fact an early Christian one at all and that the text is modern. This would explain why the first letter, S, looks so freshly cut. The letters could then be read as S[E]C or S[F]C and could be someone's initials.

Fig 2 17b, Kerris (Ann Preston-Jones)

BIBLIOGRAPHY
Thomas 1994, 289
Sharpe, 1997, 42–3 and fig.

17b Kerris (Fig 2)

The stone is now built into the side of a fireplace at Bosanscryfa, Kerris. National Grid Reference SW 4428 2718. Examined May 1999.

HISTORY
The stone was found by Barry Taylor and Trudy Gurling during restoration work on their cottage, now named 'Bosanscryfa', at Kerris. In January 1997 Craig Weatherhill identified the stone as early Christian. The stone remains in the position in which it was found, built into the left-hand side of one of the fireplaces in the cottage.

DESCRIPTION
The stone was originally a pillar-stone. It is uncarved and is probably incomplete, having apparently

been cut to fit the fireplace. It now measures 124cm in height, between 33 and 40cm in width and 20cm in thickness. The text is incised in two lines, without framing-lines or panels, on the visible face of the stone. It is likely to have been a primary text. The lower line of text is complete and only slightly deteriorated. The upper line, however, has lost the tops of some letters and may also be incomplete at one or both ends. The text uses a capital script, of maximum letter height 11.5cm, and is set downwards facing left.

TEXT
[-...]A[.] [.-]
CAR[A]SI[V/N]I[A]US

DISCUSSION
The lower line of text is much clearer than the upper line and appears to read, CAR[A]SI[VN]I[A]US. The second A is damaged and it is possible that it should be read as an upside down U, like the penultimate letter. The letters reading [V/N] could alternatively be [I/M], although this seems less likely. This line of text is probably a Celtic personal name in the nominative with *-i[a]us* for later *-ios*. A similar name CARAVSIVS occurs on a stone from Penmachno in Wales (Macalister 1945, no 393, pp 369–70 and fig; Nash-Williams 1950, no 101, p 92 and figs).

The upper line of text is not easy to make out since the first few letters have been cut away, as have the tops of all the remaining letters except for the A. In addition, it seems likely that text is lost from the end of the line and further text may also have been lost from the beginning. Preceding the letter A are traces of one or two letters, followed by a group of letters which could be read MI or VNI. The letter following the A is either C or L. There then follows a space which seems to have been left blank but which could possibly have contained two or three letters now completely vanished. After this there is the lower part of a letter which could have been C, L or T. The text may have begun with [-..MI]A[C] followed by a space and then further letters, but this line of text is not now fully recoverable.

The stone belongs to Category 1a, pillar-stones with a simple memorial text. Category 1 stones date from the fifth or sixth centuries to the eleventh century but this stone cannot be more closely dated.

BIBLIOGRAPHY
Thomas 1998, 63 and fig 23.

52a Sampford Spiney (Fig 3)

The stone is now in use as a gatepost in a gate-way beside an unclassified road in Sampford Spiney, near Tavistock. National Grid Reference SX 5298 7168. Examined October 1997.

HISTORY
The stone was discovered by Tom Greeves in February 1997. The landowner has known the gate-way in its present form since around 1960, but nothing is known of the stone's history prior to this.

DESCRIPTION
The stone is an uncarved pillar-stone, apparently set up inverted. It is uncertain whether or not the stone is complete, nor how much of it is now buried beneath ground level. The stone's present maximum measurements are 158cm in height, 36cm in width and 39cm in thickness. The text is incised without framing-lines or panels on one face of the stone. It is likely to be primary but is now incomplete. The letters are in one, rather irregular, line and read upwards facing right. If, however,

Fig 3 52a, Sampford Spiney (Tom Greeves)

the stone is upside down, they would originally have read downwards facing left; the latter is more likely (see Okasha 1993, 28–9). The text uses a predominantly capital script. The letters are legible and have a maximum height of around 12cm.

TEXT
[-]IRENR[-]

DISCUSSION
The text reads, [-]IRENR[-] where the I is horizontal. It is unclear whether or not letters are lost from either end of the text. It is possible that the text contained one name, beginning either with I or with a preceding letter or letters now lost. It could then be interpreted as '[the stone] of X', with the form of the name uncertain. Alternatively, the text could contain parts of two names with the division coming after the letter I. Horizontal I frequently occurs at the end of words for the Latin, or latinised, inflexion *-i* indicating the genitive (Okasha 1993, 26–7). In this case the text could be interpreted as '[the stone of] -us, [of] Renr-'. Such a name is not recorded, though names starting *Rin-* are; for example RINACI probably occurs on a stone from St David's in Wales (Macalister 1945, no 448, pp 425–6 and fig; Nash-Williams 1950, no 370, p 205 and fig).

Following the last letter, R, there is a large gap and then some marks which could be further letters now badly deteriorated. These could be read, [S.C]. Alternatively, and probably more likely, these marks could have been some sort of simple decoration such as is found, for example, on 32 Madron II or 49 St Hilary.

The stone probably belongs to Category 1a, pillar-stones with a simple memorial text. Category 1 stones date from the fifth or sixth centuries to the eleventh century. The use of horizontal I might suggest a sixth- to eighth-century date for this stone.

BIBLIOGRAPHY
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64a Tintagel II (Fig 4)

The stone is now on loan from the Duchy of Cornwall to the Museum of the Royal Institution of Cornwall, Truro. Examined July 1998.

HISTORY
The stone was found by Kevin Brady in July 1998 during excavation at Tintagel. It was inside an undisturbed drain which is dated to the sixth or seventh century. Brady (pers comm) suggests that the stone had been used as a cap-stone to the drain but had been pushed into the drain by clay and silt landing on top of it; since the stone did not block the drain, it was left there and a new cap-stone placed on the drain at this point.

Fig 4 64a, Tintagel II (Christopher D Morris)

DESCRIPTION

The stone is an incomplete and uncarved piece of slate. It measures a maximum of 33cm in height, 18.5cm in width and its thickness varies between 0.2 and 1.5cm. The two texts are incised on one face of the stone and are probably not primary. Both texts are legible but incomplete and both use a predominantly capital script with the letters set horizontally. Neither text appears to have contained panels or framing-lines. Text (i) is fragmentary and only parts of four letters in one line remain. The letter A is the most complete and probably originally measured around 5.5cm. It is not clear whether this text always contained only one line or whether what remains is the end of a longer text. Text (ii) is set in five lines with the letters varying in height between 0.5 and 2.9cm. Each line of text is complete at the beginning but some text is lost from each line except the second, and possibly the fifth. The V of text (i) and the first T of text (ii) are partly incised on top of each other, but it is uncertain which text was inscribed first.

TEXTS

(i) [-.]/A[.]C[-]
(ii) PATERN[.-]
COLIAVIFICIT
ARTOGNOV[-]
COL[-]
FICIT[-]

DISCUSSION

Text (i) is incomplete at both ends. The first lost letter is ligatured to the A and is likely to have been V or N. If it was a V then the preceding letter could have been one of several with a lower vertical, for example N, P or T. The letter following A is either V or X, but in either case it is considerably larger than the other letters. The text might then read, [-NV]/A[V]C[-] but it is too fragmentary to be interpreted.

Text (ii) reads, PATERN[.-] COLIAVI FICIT ARTOGNOV[-] COL[-] FICIT[-]. The second line seems to be complete, which suggests that only a few letters are lost from the end of each of the other lines. The word FICIT is a spelling of Latin *fecit* with the common spelling of *i* for long *e* (Jackson 1953, 330–1). The verb *facere* commonly means 'to do, make', as on Tintagel I (Okasha 1993, 291–5), though it can also mean 'to write, compose'. The meaning 'to dwell, live, spend time' appears from the early Christian period (Niermeyer 1976, 402; Latham 1965, 183).

The remainder of the text consists of personal names. PATERN[-] is probably the common name *Paternus* in either its Latin or Celtic form (Jackson 1953, 280), or perhaps *Paterninus* as occurs on a Welsh stone from Llanerfyl (Macalister 1945, no 421, pp 398–9 and fig). It is not clear whether PATERN[-] is in the nominative or genitive. COLIAVI is clearly in the genitive. The name is not recorded elsewhere but *Col-* for *Coll-* is a well-attested Celtic name element. The second element is a recorded hypochoristic termination seen in names such as Maeliaw and Keidiaw (Katherine Forsyth, pers comm). ARTOGNOV[-] could also be either nominative or genitive. The name is not recorded elsewhere but *art-* is a common first element in Celtic names, and names in *-ou*, from *–gnawos*, are well-attested throughout the Brittonic-speaking areas (Katherine Forsyth, pers comm).

The fourth and fifth lines of text appear to be a repetition of the second line and a possible interpretation of the whole text is, 'Patern[us], [son of] Coliavus, did [this] (*or* was [here]); Artognou, [son of] Col[iavus] did [this] (*or* was [here])'. The text would then refer to the cutting of the text by two brothers. Text (ii) appears to be casual in nature and less formal than text (i). It may be that the piece of slate containing text (i) had been discarded and it, or part of it, was then re-used by the writers of text (ii). The slate then broke again but whether before or after its use as building material in the drain is uncertain.

The stone belongs to Category 3b, undecorated slabs. It was found re-used in an archaeological

Fig 5 69a, Trevalgan (Ann Preston-Jones)

context of the sixth or seventh century. A sixth-century date is in accordance with the script used and with the probably Latin name of text (ii).

BIBLIOGRAPHY

Morris *et al* 1999, 213–4 and fig.

69a Trevalgan (Fig 5)

The stone stands in the gate-way to a field on Trevalgan Farm, St Ives. National Grid Reference SW 4910 4053. Examined March 1996.

HISTORY
The stone has been known by the land-owner, Melville Osborne, since 1944, since when it has remained in its present position. In the past the stone appears to have been used as a gatepost, perhaps more than once, since holes are visible on both sides, but no gate has been hung on it in recent times.

DESCRIPTION
The stone is an uncarved pillar-stone, apparently set up inverted. It is incomplete, having been trimmed on both long sides and perhaps also at what is now the top. The stone measures 140cm in height, between 11 and 13cm in width and 12cm in thickness. The text is incised without framing-lines or panels on one face of the stone. It is primary but now incomplete. The letters appear to be in one line and to read upwards facing right but, if the stone is upside down, they would originally have read downwards facing left (see Okasha 1993, 28–9). The script used is a mixture of capitals and insular forms. The letters are rather deteriorated and have a maximum height of around 4.5cm.

TEXT
[+..I]TTDISN[U-]

DISCUSSION
The text appears to be complete at the beginning and to start with a cross. The next two letters are very worn but could read R, or A, followed by B. The text may have read, [+ ABI]TT DISN[U-]. Such a text might be expected to contain one or more personal names but, if so, the exact forms and origins of these names are uncertain.

The stone probably belongs to Category 1a, pillar-stones with a simple memorial text. Category 1 stones date from the fifth or sixth centuries to the eleventh century but this stone cannot be more closely dated.

BIBLIOGRAPHY
Unpublished.

Partial entries

16 Hayle (Fig 6)

The stone is still in the same position. Re-examined May 1999.

TEXT
[-]
[-]
[-]
[.VNA.D-]
[. IC]
[T]VM/V[L-]

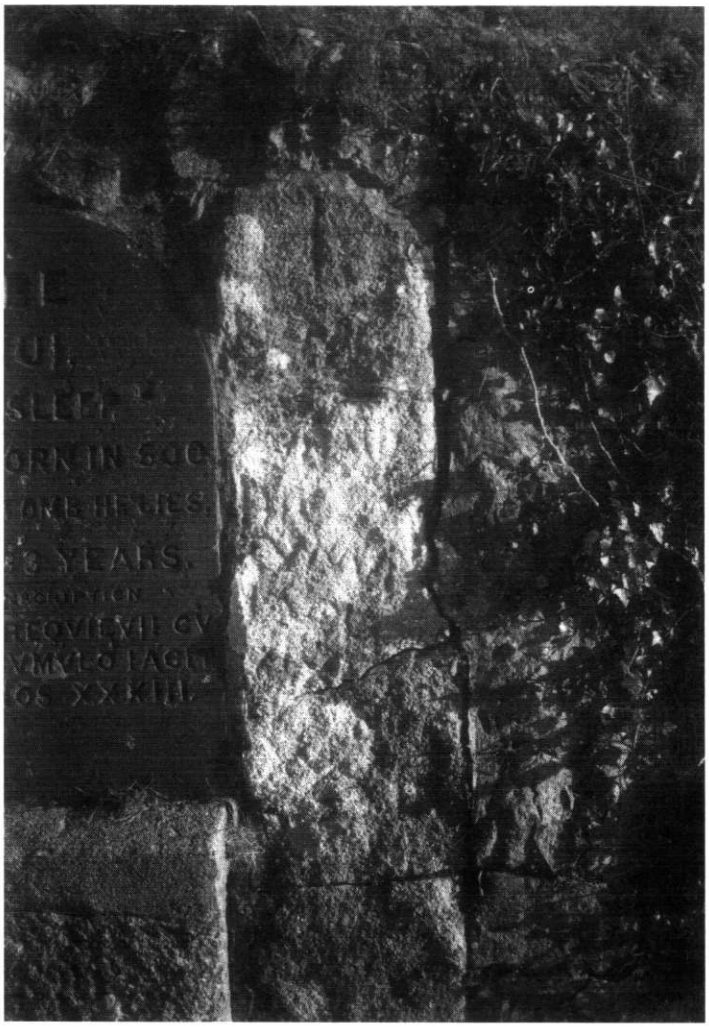

Fig 6 16, Hayle (Ann Preston-Jones)

[..-]
[.IX-]
[-]N[O]S
XXX[III]

DISCUSSION

When I examined this stone in 1984 and 1986, the text seemed illegible, with only traces of lettering visible (Okasha 1993, 116). Interpretation of the text was therefore confined to a discussion of early drawings of the stone which showed the text in a better state than it is today (Okasha 1993, 119–20). Since then, however, photography under better light conditions has revealed that more of the text can be deciphered than I had previously thought. With the aid of the photographs, and a further examination of the stone under better conditions, some letters can be made out, as indicated in the reading above.

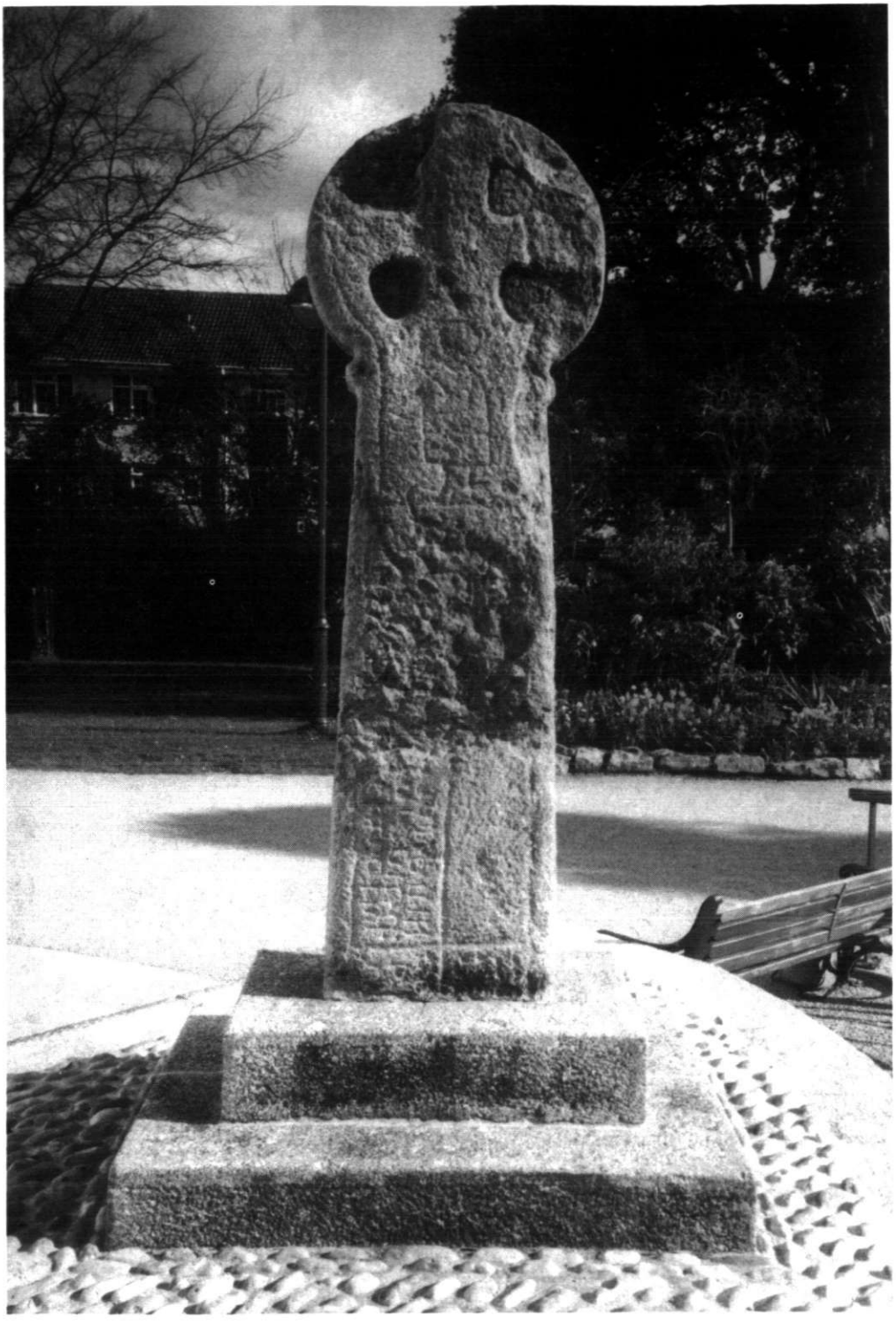

Fig 7 37, Penzance (Ann Preston-Jones)

In the *Corpus*, I suggested that the most fruitful approach to this text was to compare all the early drawings of the text and to reconstruct a text from them. The reconstructed text tentatively suggested there read: [HI]C [PA]CE [-] REQVIEVIT CVNATDO HIC [IN] TVMVLO IACIT VIXIT ANNOS XXXIII, 'Here in peace has rested Cunatdo. Here he lies in the tomb. He lived for 33 years' (Okasha 1993, 119). The first three lines of text, and the seventh, are still illegible today. However enough remains of the other lines to substantiate at least part of this reconstructed text. The traces legible today cannot, unfortunately, determine whether the personal name read CUNATDO or CUNAIDO, as both readings are possible from the traces that remain.

What is absolutely clear from this re-examination of the stone is that the text is in a highly deteriorated condition and cannot, therefore, be firmly dated (cf Thomas 1994, 193: '... certainly within the fifth century and probably not later than 450–75'). It is also quite uncertain how many letters were inscribed, and the number of syllables and of sentences is equally unclear. It therefore seems particularly inappropriate to use this text for cryptographic analysis based on principles involving the relationship between the numbers of such elements (cf Thomas 1997, 42–55).

37 Penzance (Figs 7 and 8)

In 1997 this stone was moved and re-erected outside a new extension to the museum at Penlee House. In its new position all sides of the stone can be examined without difficulty. Re-examined 17 May 1999.

TEXTS

(i) (a) [- V]MBUIN
[-]UI[C]UMQ:
[-]E[N]ITNI
(b) FO[-]
P[-]
C[-]
(ii) (a) [..C.]+S[I]
[.RU.]
(b) D+[.]
X

DISCUSSION

More of text (i) (a) can be read today than was possible in the stone's previous position. However, since the top of the panel is defaced, we cannot be sure whether one or two letters are lost from the beginning of each line. The text seems to be in Latin and reads, [-V]MBUIN [-]UI[C]UMQ: [-]E[N]ITNI. The third line appears to be unfinished and it is possible that text (i) (b) is a continuation of (i) (a). Text (i) (b) reads, FO[-] P[-] C[-] but it is uncertain how much is lost from the end of each line where the stone is broken. If texts (i) (a) and (b) are read together, the first word might end [-V]MBU, which would presumably be an abbreviated form. The word IN might follow and then a word beginning FO[-]. The second line could perhaps have read [Q]UI[C]UMQ: for *[q]ui[c]umque* 'whoever', the double dot indicating an abbreviation. The third line could have contained a verb form, ending [-]E[N]IT, followed by NIC[]. With an indeterminate number of letters lost from all three lines, attempts to read words into the rest of the text can be no more than speculation. It is altogether uncertain how many letters, syllables, words and sentences the text originally contained. In these circumstances, interpretative theories based on the relationship between the numbers contained in these elements of the text must be viewed with scholarly scepticism (see Thomas 1997, 55–63). In particular, the use of these methods to suggest the date of

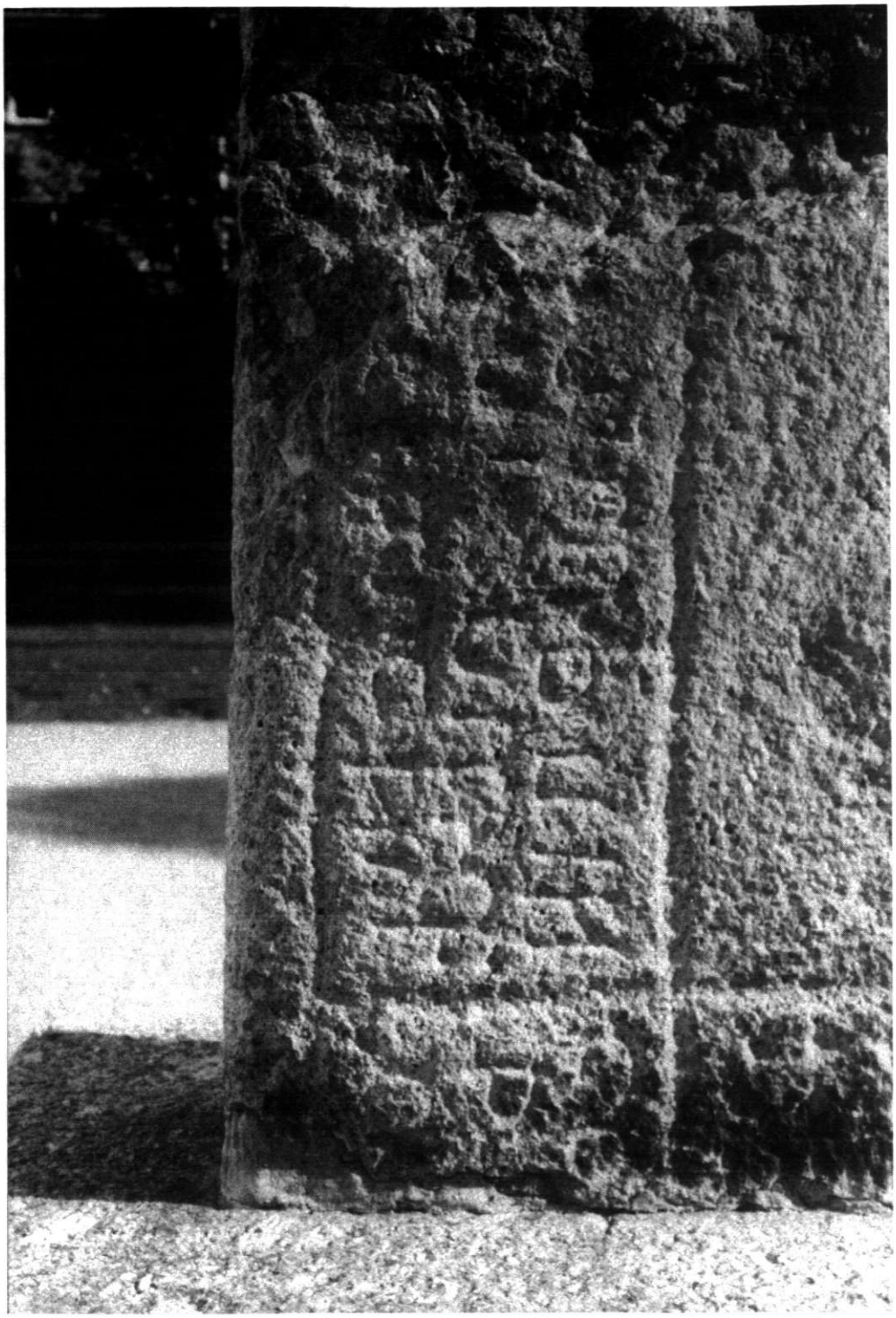

Fig 8 37, Penzance, detail of inscription (Ann Preston-Jones)

erection of the cross and the name of its commissioner should be treated with extreme caution (Thomas 1997, 60–61).

Text (ii) (a) is difficult to interpret. The first two letters of the upper line could read RE but the letter following C is quite uncertain. The first letter of the lower line could be C or E and the last one possibly X. A possible reading of this text is [REC.]+S[I] [CRUX] but it should be stressed that such a reading is far from reliable. If the second word is [CRUX] 'cross', a name in the genitive might have preceded it. The upper line appears, however, to contain a clear cross in the centre, which suggests that this is the start of a new word. Text (ii) (b) also has a clear cross in the upper line and what is likely to be X in the lower line. This text reads, D+[.] X. The uncertain letter resembles in form the quite frequently-used ligature F/I, or possibly a ligature of H and I. It is unlikely to be a ligature of T and I (Thomas 1998, 192) since the form of T required would be unparalleled in south-western inscribed texts. The letters are all clear but text (ii) (b) remains enigmatic. As Thomas suggests, it may have had religious significance (Thomas 1998, 192).

45 Rialton

The stone is now on loan from the Duchy of Cornwall to the Museum of the Royal Institution of Cornwall, Truro, and was moved to the museum in 1991. Re-examined October 1994.

TEXT
BO[N]EMIMORI
[-]ILLI
TRIBVNI

DISCUSSION
The text is considerably easier to read now that the stone has been removed from the wall at Rialton Barton. Unfortunately the letters have been chalked in, which does the stone no good and hampers an accurate reading. However it is clear that there is a third horizontal I, the last letter of the second line.

The text reads, BO[N]EMIMORI [-]ILLI TRIBVNI. The letters of the second line have been read in the past (Okasha 1993, 222), but when the stone was in the wall they were obscured. The letters ILLI start at the broken edge of the stone and it is therefore unclear how much further text has been lost preceding them. A likely interpretation, apparently first suggested by Iago, is that the letter F has been lost and the second word reads [F]ILLI for *filii* (Iago 1870-3, 485). Although the spelling is not otherwise recorded on south-western stones, this interpretation is likely to be correct. Both the other two words are then likely to be personal names and the text to mean '[the stone] of Bo[n]emimor(i)us, son of Tribun(i)us'. The text could of course be construed with BO[N]EMIMORI and TRIBVNI taken not as names but as common nouns (see Okasha 1993, 222–3). However there are no certain examples in the south-west of inscribed texts that contain the word *filius* but do not have two personal names. Unless a large amount of text is lost, this possibility can therefore probably be excluded.

Conclusion

Every new stone found adds something to our knowledge of South-west Britain in the early Christian period. Tintagel II, however, is of greater importance than most since it was found in a securely dated archaeological context. Text (ii) on this stone fits perfectly into the stones of the *Corpus*, in letter-forms, in spelling and in personal nomenclature. On archaeological evidence it is

likely to date from the sixth century. The stone is therefore of the first importance in providing a fixed dating point for the series of south-western inscribed stones. It also provides welcome confirmation for the dating model proposed in the *Corpus* (Okasha 1993, 55–7).

Tintagel II is also valuable in that it provides evidence for literacy. All inscribed stones clearly do this to some extent. The casual, informal nature of Tintagel II, text (ii) is, however, of greater significance than a more formal text would have been, and as text (i) may have been. It suggests that some person(s) at Tintagel in the sixth century was/were sufficiently literate to incise their names in a casual way on a piece of broken slate. In the light of this find, our ideas about the extent of literacy, and the nature of literate people, in the early Christian south-west need to be reconsidered.

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An ancient cathedral of Cornwall? Excavated remains east of St Germans Church

LYNETTE OLSON and ANN PRESTON-JONES

St Germans was ecclesiastically notable in medieval Cornwall for the pre-Conquest *monasterium Lanaletense* of the bishops of Cornwall and the post-Conquest Augustinian priory of *Sanctus Germanus* (Olson 1989, 60–6; Henderson 1929; Oliver 1846, 1–6). Surviving from the latter are the core of Port Eliot house and part of a moderately imposing late Norman church with later alterations and repairs (Radford 1975–6; Gem 1973; Leach 1973; Henderson 1929; Sedding 1909, 135–52; Hingeston-Randolph 1902; Furneaux, H 1892; Furneaux, J 1849). It is known that St Germans church formerly extended further to the east, but that this eastern portion, which at the Dissolution was sold as part of the former priory estate, fell into ruin and was eventually completely demolished. In an attempt to see if any of its remains could be found, archaeological excavations were carried out on the site in the 1920s. Although the results are of great interest – and not only as intimated by our title – they have been almost forgotten. The purpose of this article is to set out the evidence revealed by these excavations east of St Germans church from published and unpublished sources and from what can be observed on the site, and to discuss its significance.

The site lies to the south of a now lost inlet of the tidal Tiddy at SX 359 577; the inlet was infilled in the early modern period to create the lawn north of Port Eliot House (see Fig 1).

First, some more background is necessary. There is consensus among the writers just cited that the eastern structure was the monks' choir, with only Henderson proposing a lady chapel as a possible alternative (1928; 1929, 33–5), one which the proprietary evidence has always made very unlikely and the archaeological evidence given below can now rule out. The point is of importance because in a monastic church the high altar was in the choir. Leland is the sole, inconclusive, witness to St Germans church (just) before the Dissolution (Smith 1907, I.324) when he comes to '. . . a towne cawled S. Germayns, wherin is now a priori of blake chanons, and a paroche chirche yn the body of the same. Beside the hye altare of the same priory on the ryght hand ys a tumbe yn the walle with an image of a bisshop, and over the tumbe a xi. bisshops paynted with their names and verses as token of so many bisshops biried theere, or that ther had beene so many Bisshoppes of Cornwalle that had theyr seete theer.' The evidence of later witnesses (Carew [1602] 1811, 260; Willis 1716, II.150–2; Grose [1787] 1849, 21–6; Britton and Brayley 1801, II, 374–9; and the exasperating Whitaker 1804, from whom we have borrowed part of our title) is sensibly processed by Henry Furneaux (1892, 33–49, 61–3). He deduces from Whitaker's description (1804, I.161–2) that 'the north aisle [subsequently altered and then itself pulled down] must have extended a few feet beyond the end of the nave' (1892, 45–6), although his conjectural plan of the entire church (opposite p 33, reproduced as Fig 2) shows that he conceived of the choir (which he calls 'the old chancel') as otherwise projecting alone. He gives a coherent account of its fate (47–9, 62–3): for reasons somehow connected with the structural collapse of much of the (new) chancel in 1592 of which Carew informs us and the transfer of the Perpendicular window from the original east end of the church to its new east end, both ends of the choir deteriorated before the middle section, which

Fig 1 St Germans from the west showing local topography. Prior to the creation of Humphrey Repton's parkland, a creek of the Tiddy or St Germans River extended to a short distance north of Port Eliot House, the large building north (left) of the church. (Steve Hartgroves; Cornwall Archaeological Unit, F41/95, June 1993)

Whitaker knew to have been roofed and used as a brewhouse before everything was completely removed from the site 'not long since' (1804, I.127, and see below, p 164). Perhaps it was then that the discovery reported by Grose ([1787] 1849, 25) was made of 'a tesselated pavement found about fifty feet from the present east window: this pavement was about ten feet square. Nearly ten feet east of it was the foundation of a wall, which from its thickness and materials seems to have been the original extent of the building.' This corresponds reasonably well to the length of about 55 feet given for the choir by Browne Willis (1716, II.151), who says it was about 24 feet wide, that is, the width of the nave. However, although he was related to the Eliot family by marriage and had been to Port Eliot, his statement that the choir had been 'entirely demolished' conflicts with evidence that later in the century there were still remains of it to be seen. 'Whitaker, however, mentions that a great part of the Chancel was standing in his day, and persons still living can attest the truth of his statement' (Furneaux, J 1849, 88; see also the discussion of Cadman's 1747 map on p 164 and Fig 3). Whitaker explicitly cites Willis for the dimensions of the choir, and gives no details about its ivy-covered walls (1804, I.127). Neither gentleman may have made a close inspection.

Thus early antiquarian sources have little to tell us about the structure. More modern writers have suggested an association of the consecration of the church by Bishop Bronescombe in 1261 with completion of the choir where the high altar was. Henderson, however, strongly rejects this,

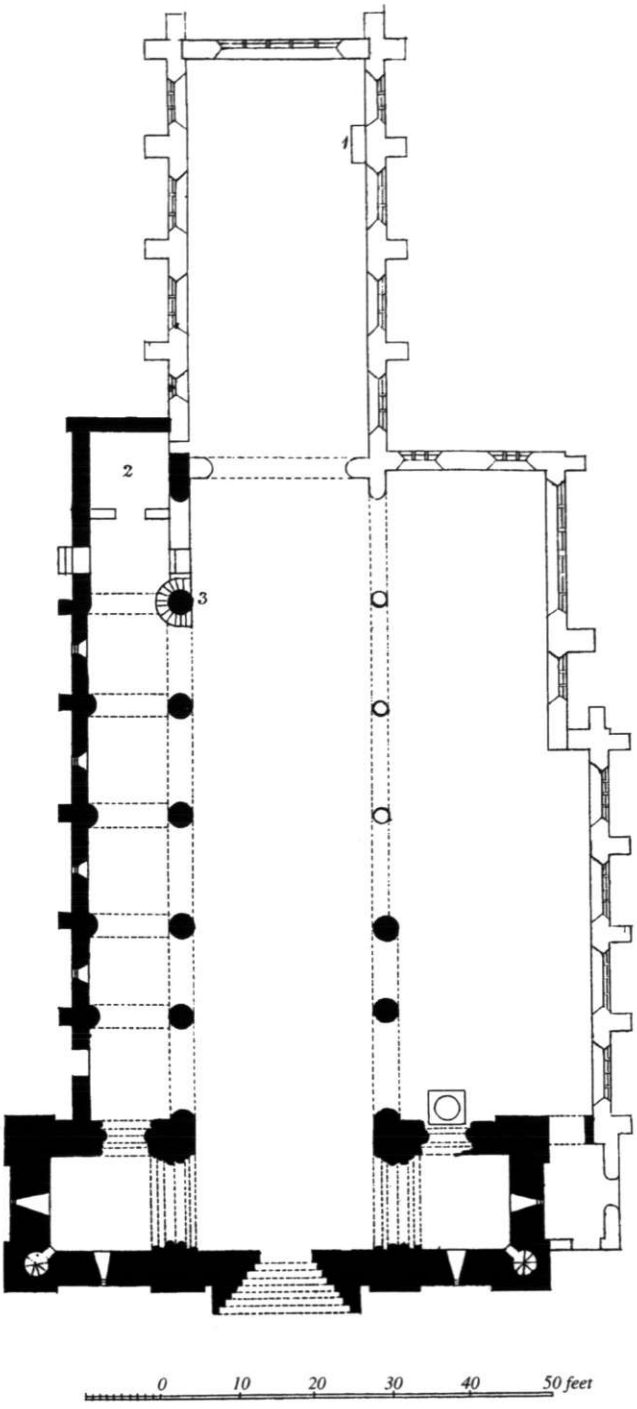

Fig 2 Rev Henry Furneaux's conjectural plan of the church in late medieval times; Norman work shown solid. Numeral 1 refers to a tomb described by John Leland (1530s); 2 the chapel or sacristy described by Whitaker (1812); and 3 the stairs to the rood-loft built round a Norman pillar, also described by Whitaker. (From Furneaux 1871, fig 2)

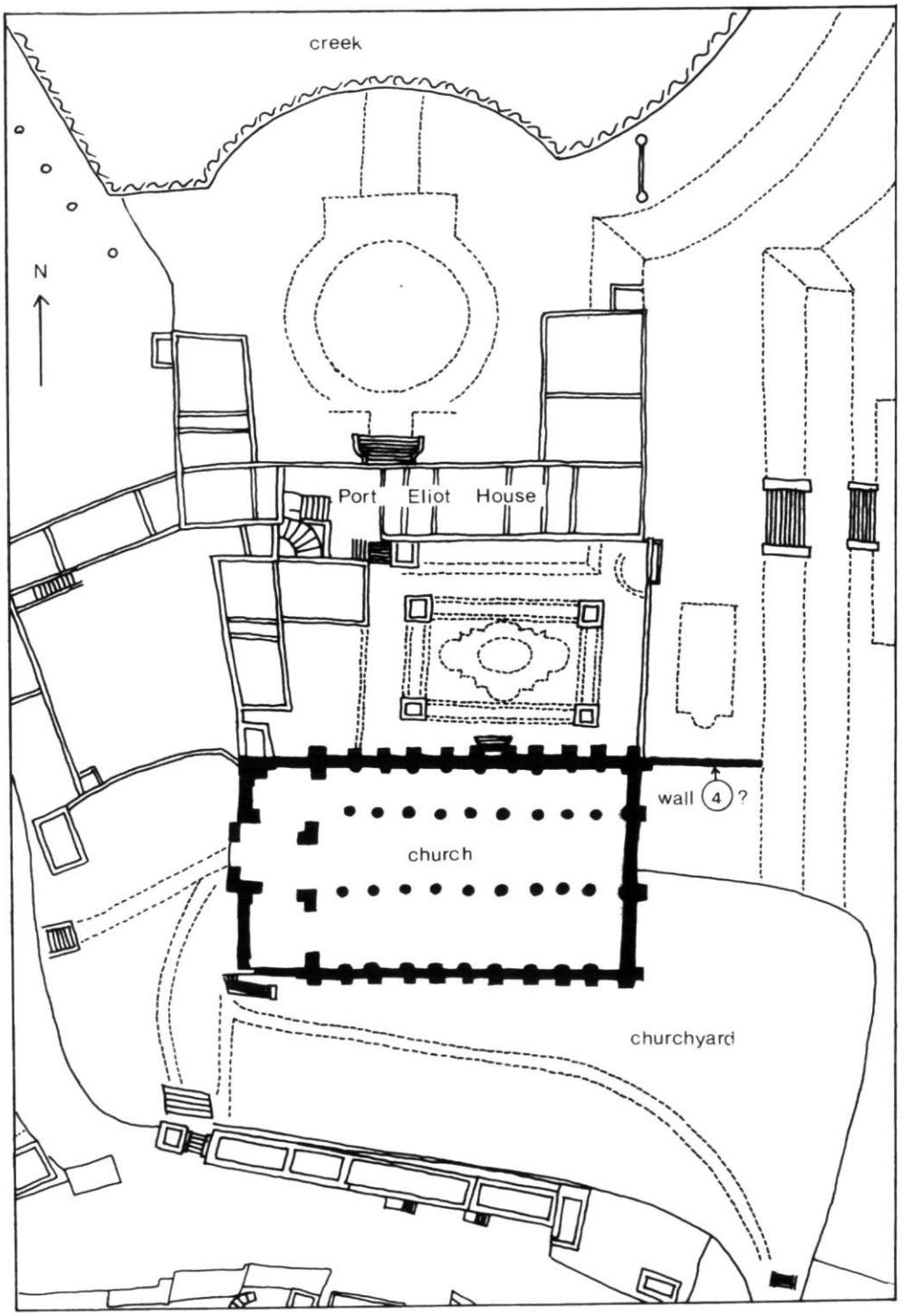

Fig 3 Extract from tracing of Cadman's 1747 map of Port Eliot (held at Cornwall Record Office). Note wall to east of church and creek to north of house

pointing to the conscientious efforts of this bishop to remedy what was considered in his time a deficiency of the English church, which saw him consecrate so many churches in his diocese (1929, 11 and 35). The reference by Gem (1973, 290) to 'an extending of the chancel' in this connection is conjecture; so too are these ideas of Radford (1975–6, 194), who also takes 1261 as a *terminus ante quem*, but they are interesting and worth quoting here, especially in view of what is to follow: 'Since a rebuilding starting at the west end of a church is unusual, it may be suggested that the west front and the two western bays of the nave form an addition to an earlier Romanesque church, which remained in use. . . . The long aisleless eastern arm at St. Germans can hardly be earlier than the 13th century. It probably marked the final state of the rebuilding and enlargement of the church . . .'. That the excursions to St Germans of the Royal Archaeological Institute and the Royal Institution of Cornwall, which gave rise respectively to the last two sources cited, should have taken place in virtual ignorance of the excavated remains with which this article is concerned shows that their publicising is long overdue.

The excavations

In discussing the former eastern portion of St Germans church, Charles Henderson published the following information (1929, 35–6; subsequently cited only in Spence, nd, 4):

'Some excavations carried out in 1928 on the site revealed, at first, an undisturbed patch of encaustic tiles at the south-west corner near the old chancel step. These tiles, arranged in square groups separated by bands of thinner tiles, were mostly adorned with fleurs-de-lis and a herring-bone pattern. Some loose tiles were also found near the presumed site of the altar. The tiles were laid on the "country" without any sort of foundation. The ground is very damp and several drains have been constructed across the site in ancient and modern times.

'The patch of encaustic tiles found *in situ* at the S.W. corner of the area has been left open for inspection. This was the only place where the mediaeval floor had not been broken up. No traces of the south wall of the "choir" could be found, an eighteenth-century drain of brick having been built on its site. Forty-nine feet east of the present East end, however, a retaining wall was found, 11 feet long, running north and south. Inside this, though no traces of the mediaeval wall remained, there have been found at a lower level the foundations of two very primitive walls meeting at right angles. These walls are made of rough unhewn "Elvan" stone, found in the immediate vicinity, put together without mortar. They are about 3 feet wide and meet at a right angle. That going east and west (or nearly so) is 12 feet long, the other about 6 feet. Their base lies about 3 feet below the level of the encaustic tiles, so that these walls are quite possibly vestiges of the Saxon or pre-Saxon Church. In mediaeval times the High Altar presumably stood close at hand, though on a much higher level. It is reasonable to suppose that the primitive church was on this site as it was unusual to move the most sacred part of the church unless there was a cogent reason. Apart from the primitive character of the building, these newly discovered walls contain no pieces of Tartan Down stone, which was the principal material used here by the Normans and those who came after them. For instance, Tartan Down stone is found in the retaining wall close by and in the massive wall recently found extending eastwards from the north-east corner of the church. This wall is 5 feet thick and has been traced for 20 feet. It is clearly a continuation of the wall of the destroyed North Aisle, and proves that the Choir did not project alone. Unfortunately, the centre of the area, where the Choir foundations would have been, has been disturbed at too great a depth for any remains to have survived.

'Though the excavations have been in some degree disappointing, the discovery of the primitive walls at the east end is of great interest. We may have here something as old as the Oratory at Perran-in-the-Sands, something that ranks among the oldest Christian masonry in Britain. Mr. Montague Eliot, under whose direction the excavations have been carried out, has kept these walls open.'

An earlier notice of these excavations appearing in *The Western Morning News and Mercury* for 1 May (Henderson 1928) supplies a little more information but is more notable for what it leaves out:

'A gently-sloping lawn now covers the site of choir and cloisters, and it was in the hope of finding the foundations of the walls, or, better still, a crypt, that excavations were begun some years ago by Mr Eliot, and resumed after a lapse of time during the past month.

'On the whole these excavations have yielded much less than might have been reasonably expected, granted that the choir or conventual church stood on this site.

'The whole area seems to have been repeatedly disturbed in the 18th century for the construction of brick and stone drains. Immediately below the east window of the church, on the outside, is a large vault of brick, built at the close of the 18th century to contain two coffins.

'The only undisturbed area is a small patch at the south-west corner, close to the present church wall. This retains its flooring of encaustic tiles. Some 80 tiles remain in situ, in spite of their proximity to the wall and vault. The tiles are much worn, and the glaze on most of them has perished.

'From the accompanying drawing (page 10) [*see* Fig 4] it will be seen that the square tiles are grouped in squares of 36, separated by bands of small rectangular tiles without ornament. The predominant patterns show chevrons and fleurs-de-lis.

'There are some much-worn tiles of other patterns, including apparently the letter "M." The tiles are set in a rough bed of lime and sand, but beneath them, where the ground is undisturbed, there are no signs of any crypt, although the soil is "made" ground to a depth of four feet and probably more.

'There are no signs of any floor below the tiles, although they are apparently (from their coarseness) of a late (15th–16th century) date. The excavations revealed no signs of walls that could be definitely assigned to a pre-Reformation period, and though bones were found, there was no regular grave. Fragments of tiles were found all over the area, but nowhere else were they in situ.'

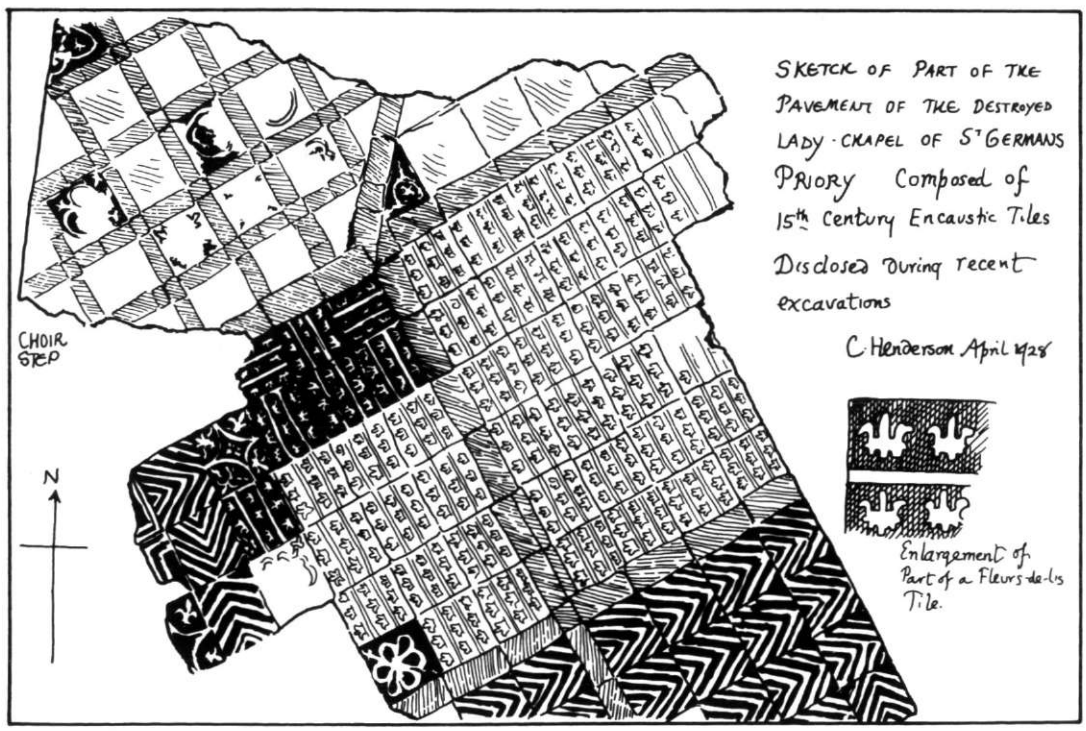

Fig 4 Tracing of Charles Henderson's 1928 drawing of the tiled pavement (from Henderson 1928)

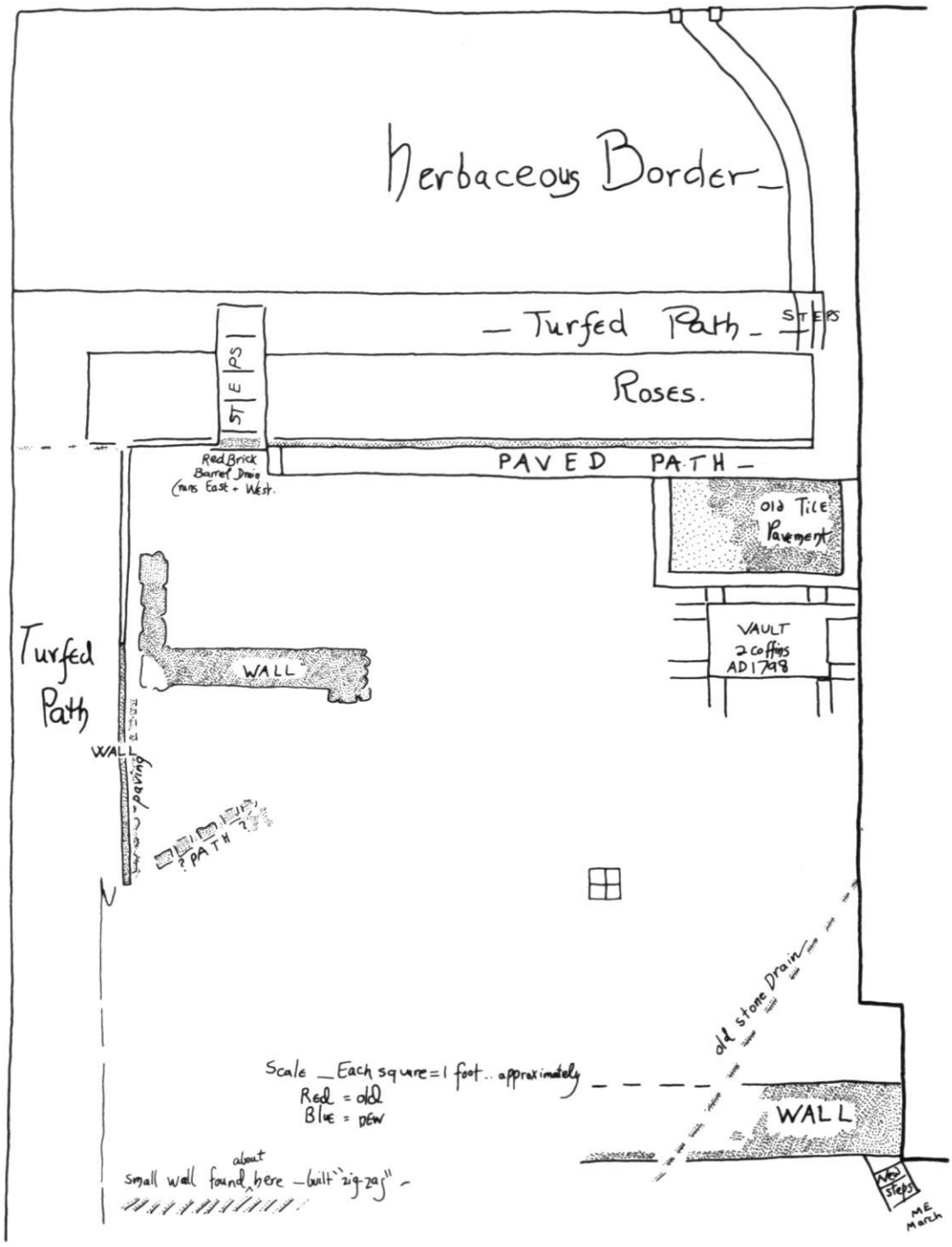

Fig 5 Tracing of Montague Eliot's sketch plan of c1929 (original in Port Eliot archives)

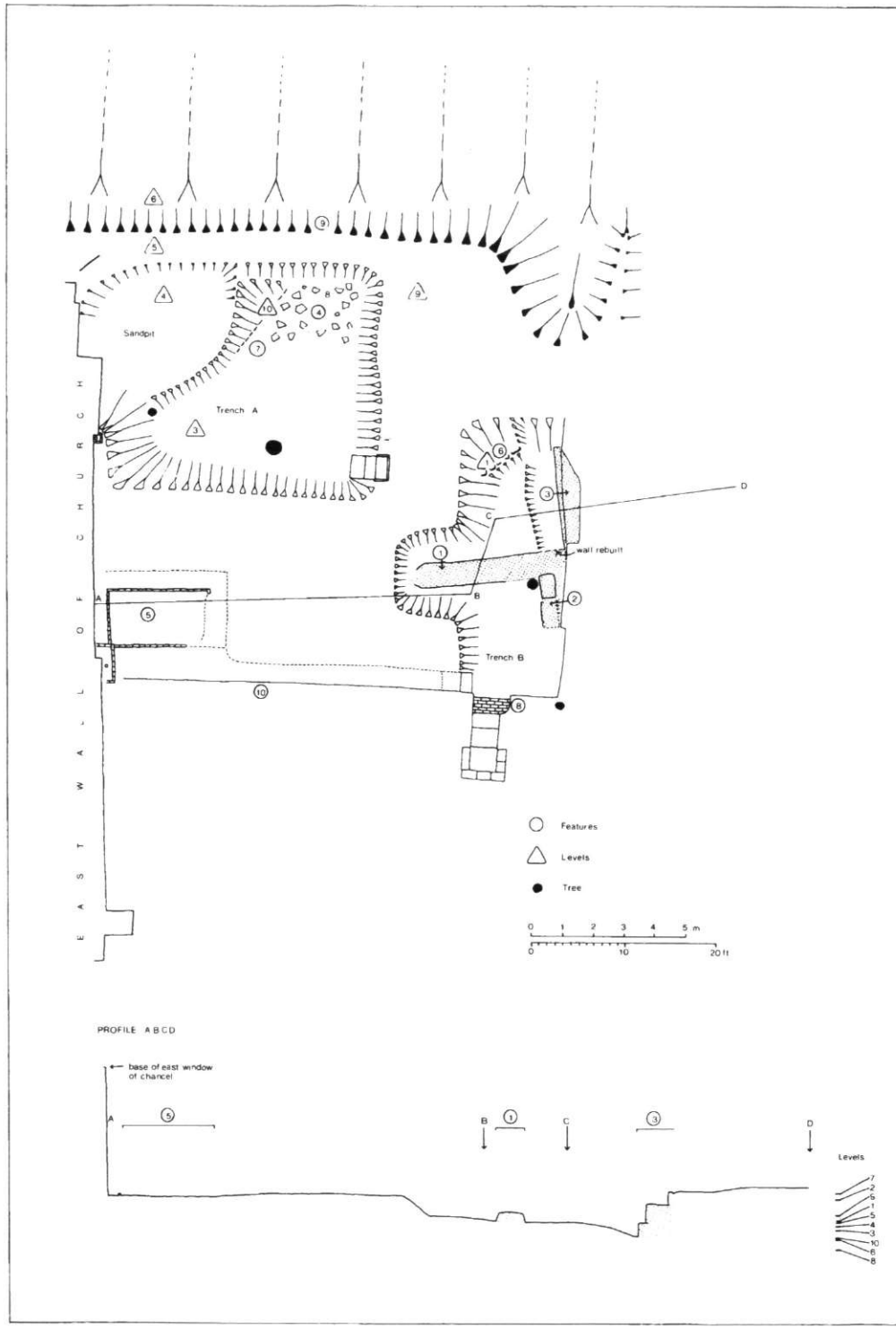

Fig 6 Survey made in 1984 by Ann Preston-Jones, Lynette Olson, Peter Rose and Oliver Padel

Montague Eliot's contemporary notes together with an article he wrote for the *St. Germans Parish Magazine* of January, 1923, corroborate Henderson on most points, while showing that the latter in 1928 did not have all of the available evidence ('St. Germans Church and Port Eliot House' MS, held in the muniment room at Port Eliot). Excavation actually began in August, 1922, when Eliot reported discovery of a masonry wall about 50 feet east of the east (chancel) window of the church and a tile pavement at the south-west corner of the 'old Chancel'. The results of this first investigation were also published in the parish magazine: 'A considerable amount of paving made of tiles, corresponding to the description given by Whitaker of those found in the 18th century, was laid bare, and the East Wall of the old Chancel, solidly built of faced and mortared stones, was discovered; apparently, if completely excavated, this wall would be from two to three feet high. [His accompanying handwritten note dated October, 1923, reads, 'Am told by the masons this is probably a "retaining wall"'.] A red-bricked drain was partly unearthed, but this is probably comparatively modern.' John Whitaker had described tiles and their location about 50–60 feet east of the existing altar before being relaid within the church (1804, I.224, and see below p 164; probably those mentioned earlier in Grose, see above p 154); however, the loose tiles mentioned by Henderson (1929), probably from the same site, were not referred to as such by Eliot in any of his notes.

His article went on to state the aims of further excavation as being location of foundations of the north and south chancel walls, adding that excavation of the whole site might reveal more tile pavement, and called for volunteer diggers. In May, 1923, Eliot recorded discovery of a brick burial vault dating from the second half of the eighteenth century about 3 feet outside the east window. His next excavation note is dated 1928, when a stone wall 5 feet wide was found about 4 to 5 feet below the surface to run for about 10 feet (compare Henderson's 'traced for 20 feet') eastwards from the north-east corner of the church. 'Found large stones and semblance of a wall about 50 feet out from East end of Church' probably refers again to the 'retaining wall'. The angle of walling of which Henderson made much was recorded in 1929, Eliot noting that 'it is differently oriented (and more correctly) than the present Church, and contains no Tartan Down stone'. In this year his plans for the site came to fruition. Already in 1923 he had hedged in the old chancel remains and the north side of the church and in 1928 bricked in the tile pavement, which was dated by A Ponsonby to *c*1250; now came references to a herbaceous border, retaining walls and steps. Eliot carefully notes that he placed along the top of 'the low retaining wall' some carved stone fragments which had been lying about in the Port Eliot estate yard, possibly from the destroyed north aisle of the church, others possibly from the former bishops' residence at Cuddenbeak. Finally he provided a useful and rather endearing scale plan with archaeological features (*see* Fig 5) clearly distinguished from new construction among the roses and turfed paths. 'It is proposed that the whole site of the Chancel when excavated shall be left bare, and never again filled up or turfed over', Eliot wrote in his 1923 article, and in large part his wishes have been observed.

The remains are still to be seen, except the overgrown tile pavement and the large wall in the north-west corner of the site, where the excavation trench was filled in by Lord Eliot to make a sandpit for his children. Lynette Olson examined them in 1974 and in the summer of 1984 Ann Preston-Jones surveyed the site, assisted by Peter Rose, Oliver Padel and Lynette Olson, and drew the following plan (Fig 6).

The survey

An area extending approximately 20 metres beyond the east end of St Germans church was surveyed with plane table at 1:100. In addition, a levelled profile was made of the most important remains and levels taken at various other points on the site. The resulting plan and profile are shown on Fig 6. The purpose of the survey was to provide an accurate plan of the remains from which their relationships could be considered and their significance assessed.

The remains are in two trenches, labelled A and B on the plan (Fig 6). With neat slate steps leading down into them, these must be the areas intentionally left bare by Montague Eliot to display the excavated features. Unfortunately, since his time, they have become rather overgrown with trees and shrubs. Therefore a certain amount of clipping and pruning was necessary before the features could be seen clearly, and even then, the bushes and trees made surveying difficult.

Despite this, many of the 'archaeological' features shown on Montague Eliot's plan could be located and surveyed. The 18th-century brick drain (feature 8 on the plan), the '?path?' (6), the so-called retaining wall (3) and, most importantly, the 'two very primitive walls meeting at right angles' (1, 2), are still to be seen. Apart from these, a stony line at the edge of the sandpit (7) only possibly represents the line of the 'old stone drain'. Also, as mentioned above, the medieval floor tiles are no longer exposed, though their location is indicated by a brick edging and an area of parched grass (5). The five-foot-thick wall extending from the north-east corner of the church is now buried beneath the sandpit; however, a very stony area in the bottom of trench A, to the east of the sandpit, may represent the remains of this wall (4). The only features shown by Eliot which are definitely not now locatable are the 18th-century vault and the 'small wall . . . built "zig-zag"' (shown on Fig 5).

It is surprising that the excavators were so disappointed with their discoveries. As will be revealed by the following descriptions of the principal features, and the concluding remarks, there is much of significance in what they found.

The 'retaining wall' (3)

Only the west face of this neatly-coursed, north-south wall is visible. It is 3.2 metres (10 ft 5 ins) long and its total height is 1.1 metres (3 ft 6 ins): as the profile shows, the top of the wall is at the level of

Fig 7 St Germans from the north-east as photographed by Charles Henderson (from Henderson 1929, opposite p7). Note that the excavation area to the east of the north aisle is open

the medieval floor tiles. The wall consists of two courses of relatively large, unmortared slab-like stones with above these, and offset by 0.2 to 0.3 metres to the east, three courses of slightly smaller, mortared stone. According to Charles Henderson, the wall is built of Tartan Down stone (from nearby Landrake parish), the Normans' principal building material at St Germans. The full width of the wall cannot be ascertained, the brick wall retaining the excavation trench having been built on the top. Nor did the excavators record its width; however, it must have been fairly substantial, for a width of at least 0.7 metres (2 ft 3 ins) is visible. (In fact, Montague Eliot's plan suggests that the wall was never excavated to its full width, perhaps because it was dismissed early on as a retaining wall.)
As Henderson and Montague Eliot noted, the wall is approximately 15 metres (49 ft) from the east end of the church but, as the plan shows, it is not exactly parallel with the church. On the other hand, it is nearly parallel with wall 2, one of Henderson's early walls. It is not clear what happens at either end of the wall: at its north end, it may have been cut.

Wall/stony area (4)

A sandpit now completely covers 'the massive wall extending eastwards from the north-east corner of the church' (Henderson 1929). This wall was said by Montague Eliot to be 5 ft thick and, like wall 3, to be constructed of Tartan Down stone. His plan shows that it extended for about 10 ft and for a further 10 to 15 ft in a very robbed state. No mortar was recorded and no height given, perhaps because only the bottom course of stone remained. This possibility, and an interesting relationship, is also suggested by the fact that the wall was apparently found 4–5 ft below the surface, which presumably then, as now, was roughly that of the medieval tiles. It would therefore have been at approximately the same level as the unmortared bottom course of wall 3. Directly to the east of the sandpit and 1.1 m (just over 3 1/2 ft) below the surface is an area of loose stone in the base of trench A. This may represent the remains of a continuation of the wall. The possibility that it did originally extend further than the excavators found is suggested by a map of St Germans in 1747 (Fig 3). This shows a wall in exactly this position which, as far as one can tell from a map with no scale, extended for about 40 ft from the north-east corner of the church.

Scarp (9)

A marked scarp, 0.8 to 1.1 metres wide and 0.5 to 0.6 metres high extends along the entire north side of the church and eastwards for 17.6 metres (57 ft 8 ins) beyond the east end. It is approximately 1.6 metres (5 ft 3 ins) from the north wall of the church. Between 14 and 17 metres (46 and 56 ft) from the north-east corner of the church, the scarp is cut by a slight hollow. At its eastern extremity it turns a right angle to the south and fades out uphill. This scarp presumably marks the edge of the platform upon which the church was built on a sloping site. That it existed in the 18th century is indicated by the flight of steps shown leading from the north aisle of the church to Port Eliot's gardens on Fig 3. Photographs in Henderson's *St Germans* (1929, opposite p 7, also showing the excavations from a distance; Fig 7) and St Germans' church guide (Spence, 11) indicate that between *c*1928 and 1965 there was a hedge along the entire length of the scarp.

The drain (8)

A red brick barrel drain is displayed at the south end of trench B. Its position and east-west orientation indicate that it conducts water from the drainpipe collecting water from the valley between the nave and south aisle roofs. It should therefore be on the site of the south wall of the choir (or of a sleeper wall supporting an arcade along the same line). However, no trace of this wall

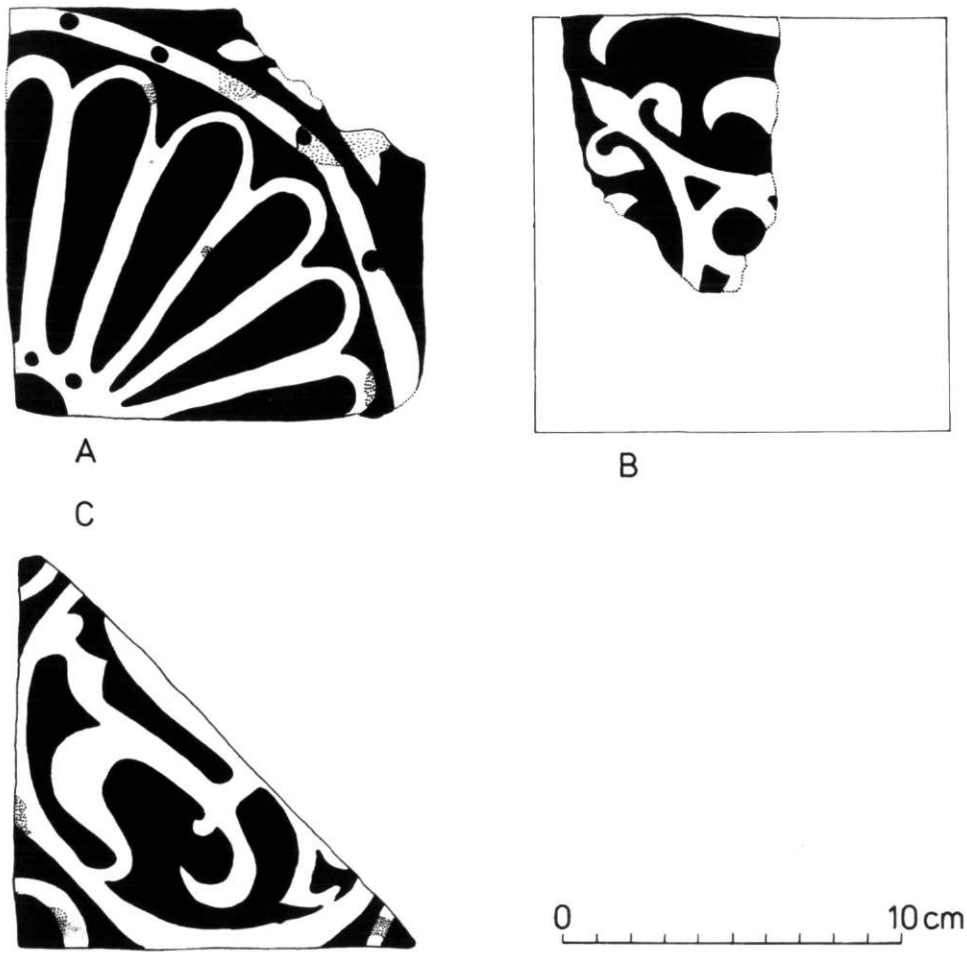

Fig 8 Detailed drawings of three tiles from St Germans tiles now held in the Royal Cornwall Museum

was found during the excavations. Nor was any trace found of a corresponding north choir wall or arcade. 'The centre of the area, where the choir foundations would have been [had] been disturbed for too great a depth for any remains to have survived' (Henderson 1929, 36). This disturbance undoubtedly occurred in the late 18th century when the remains of the choir 'were levelled to the ground, and their very foundations dug up' to make a lawn around the church (Whitaker 1804, 127).

Two walls at right angles (1 and 2)

Both walls, of similar character, consist of two or three courses of 'rough, unhewn', unmortared local stone. According to Henderson, neither contains Tartan Down stone. Only the west face of wall 2 is clear, the east face having, in all probability, been destroyed when the stone and brick wall retaining the trench was built behind it. As visible now, it is only 0.2 metres high. Wall 1 is 0.8–0.9 metres (2 ft 8 ins) wide, approximately 0.3 metres high and 5 metres (16 1/2 ft) long. The two walls are at the same level and meet at right angles: unfortunately, the exact nature of their relationship is

unclear because of the tree growing in the angle between them. As noted earlier, wall 3 is slightly to the east of, and roughly parallel with, wall 2. However, this similar orientation is the only point of comparison between 2 and 3, for apart from their very different natures the base of wall 2 is approximately 0.4 metres above the base of wall 3 and its top approximately 0.3 metres below wall 3's top course. This difference in levels is illustrated by the profile (Fig 6). Walls 1 and 2 are also 0.3 metres below the level of the medieval floor tiles. Indeed, if the line of 1 were extended to the west, it would run straight under the tiles (5) and must also have been beneath the supposed original site of the high altar. In addition, it is notable that the orientation of these two walls is markedly north of east (approximately 15°) in comparison with the present east end of the church.

The medieval floor tiles (5)

The area of medieval tile pavement discovered in the 1920s is now defined by modern bricks on edge in a rectangle 3 metres x 1.5 metres but the tiles are no longer visible, being hidden by a thin layer of turf. For fear of damaging the tiles, the turf was not disturbed other than in a tiny area to verify their existence beneath the turf; it is therefore fortunate that Henderson recorded the pavement in the 1920s (Fig 4). Henderson also mentions that loose tiles were found all over the area excavated and it is presumably examples of these which were given to the Royal Institution of Cornwall by Lord St Germans and are now part of the collection of the Royal Cornwall Museum. The latter are illustrated in Fig 8. Two tiles were also given, presumably at the same time, to the British Museum (Eames 1980, 15, 201). This small area of pavement is important for medieval floor tiles are relatively scarce in Cornwall and this is the only known example of tiles surviving *in situ*.

The tiles are of two broad types: larger, square decorated tiles and smaller, rectangular or square plain tiles. In the area of pavement drawn by Henderson they were laid in two different ways: either in square blocks of thirty-six decorated tiles surrounded by bands of plain half tiles or with single decorated tiles (apparently with floral designs) entirely surrounded by a band of narrower plain tiles. Henderson's drawing shows the tiles to have been laid diagonally (ie at 45°) to a step which he refers to as the choir step. In each of the square groups of thirty-six, the decorated tiles were all of the same pattern, either chevrons or an arrangement of nine small fleur-de-lys. One square containing tiles of various designs had almost certainly been repaired at some stage for the mixed tiles are haphazardly arranged, in varying orientations. The existence of two different layouts need not mean that the pavement is of two periods or phases: medieval pavements are frequently of complex and varying design. Here, the variation may be part of a grand overall design which relates to the altar or some other fittings which are not obvious in this small surviving section (although for Exeter, where the contrasting layouts exist on separate sites, Allan and Keen [1984, 233] have suggested that there may be a chronological significance: see below).

The St Germans tiles at the Royal Cornwall Museum are of a fine red fabric with an inlaid white slip decoration approximately 1 mm deep. They have bevelled edges, are 15 to 17 mm thick and between 118 and 123 mm square. On the back of the single almost complete tile are four knife-cut scoops. On fragment C one of these hollows is still filled with the mortar in which they were laid 'on a rough bed of lime and sand' (according to Henderson 1928). Henderson (*op cit*) noted that the tiles were much worn and that the glaze on most of them had perished. This is borne out by the condition of the Royal Cornwall Museum's tiles: the decorated surface of C retains slight traces of a greeny-yellow glaze, but the glaze is best preserved on B and C where it has run down the sides and onto the backs of the tiles. The tiles at the British Museum include the two main types on Henderson's drawing, ie that with chevrons and that with nine fleur-de-lys, and have been examined by Alan Vince who considered the presence of both biotite and muscovite mica in the fabric to indicate a local place of manufacture (Eames 1980, 201).

The tiles from St Germans at the Royal Cornwall Museum are decorated with floral designs (A and C) and a fleur-de-lys in a roundel (B). Those shown on Henderson's drawing include, as noted above,

chevrons, several designs based on fleur-de-lys and a further floral pattern. Although Henderson refers to a tile bearing the letter M, none is obvious in his drawing. Groups of tiles of similar type are also known from the two other Augustinian priories in Cornwall, at Launceston (Peter 1896) and Bodmin (W. Iago, MS at Royal Institution of Cornwall library), but the only design these groups have in common is the chevron pattern. The Launceston group is characterised by a high proportion of armorial tiles (i.e. tiles decorated with coats-of-arms): designs which are conspicuously absent amongst those from St Germans. The St Germans tiles (and indeed those from Launceston and Bodmin Priories) are of the same type as the Series 1 inlaid medieval floor tiles from Exeter, recently discussed and illustrated by Allan and Keen (1984, 232–47). These tiles, found principally in ecclesiastical contexts, date to the late 13th and early 14th centuries. Within this short period, chronologically significant differences in the patterns on the tiles have been detected with, for example, animal and floral designs predominating on the earliest known pavements and armorial tiles becoming popular at a slightly later date. A few of the patterns on the St Germans tiles can be paralleled at Exeter. Chevron-patterned tiles are known from Polsloe Priory and the cathedral chapter house. One of the floral tiles shown in Henderson's drawing can be compared to Exeter Series 1 tiles 42, 43 and 44 from, amongst other places, the Franciscan Friary and St Nicholas Priory; this design has also been found at Newenham Abbey, Axminster (Allan and Silvester 1981, 165).

The Series 1 tiles at Exeter begin in 1279–80 with the paving of the eastern transepts of the cathedral. The floors at Polsloe and St Nicholas Priories are probably to be dated a little later, to between 1280 and 1300; those from the Franciscan Friary are likely to date to after 1300, for the site was not occupied until 1291 and building work was still in progress after 1310 (Allan 1984, 164). As far as the rather limited parallels for the tile designs are concerned, the St Germans examples compare most closely with those from Polsloe Priory but the combination of layout designs at St Germans is in contrast with what is found at Exeter and at Newenham Priory. The use of plain narrow third tiles with square ninth part tiles at the intersections surrounding a single decorated tile was a distinctive feature of a floor at Newenham Abbey, likely to be similar in date to tiles from the Franciscan Friary in Exeter. The thin third tiles suggestive of this type of layout were not found at Polsloe Priory. Here, and in the eastern transept of Exeter cathedral, plain rectangular half tiles only were used as borders. Despite these slightly conflicting parallels, it would probably be safe to suggest a date centring on 1300 for the paving of the former eastern extension to St Germans church.

Eames concludes that 'on the present evidence it looks as if a small group of Wessex tilers worked their way south-west, producing tiles for Exeter, Buckfast, Launceston and St Germans and possibly for other sites also, probably setting up a kiln at each place where tiles were required and making use of local materials' (1980, 202).

The 'small wall built zig-zag' (see Fig 5)

In the course of excavation in the 1920s a length of herringbone walling was found, running on the same line as, but to the north-east of, wall 4. Although described as only a 'small wall', the possibility that it constituted an element in the layout of the priory at St Germans must be considered, since walling of a similar nature has been observed here on other occasions in the past. Whitaker describes how, when cellars were being dug on the south side of Port Eliot house (which itself contains significant remains of the refectory and undercroft) the ground 'appeared full of walls, ranging in all directions, but all laid invariably in a mode . . . in the herring-bone fashion' (1804, 131). Also, it is likely that the 'traces of rough walling, resembling the monastic cells of early date . . . at Tintagel' which Radford observed six feet below the surface of the gravel sweep to the west of Port Eliot house were of a similar nature, for some of the stone-work at Tintagel is in herringbone style (Radford 1975–6, 193; 1935a, 411; 1935b, 31). In comparison, it may be relevant that the foundations of the 13th-century buildings at Launceston Priory were of 'unmortared herring-bone coursing' (Peter 1892, 93).

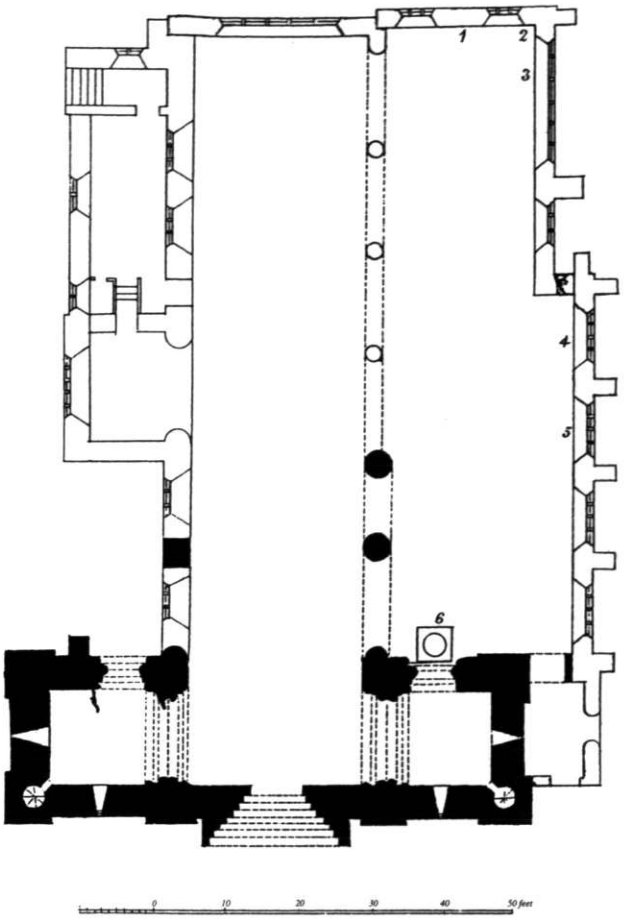

Fig 9 Rev Henry Furneaux's plan of the church; Norman work shown solid. Numeral 1 refers to a saint's niche; 2 the piscina; 3 the sedilia; 4 the priests' door; 5 a canopied tomb; and 6 the font. (From Furneaux 1871, fig 1)

Concluding remarks

Wall 3 was not simply a retaining wall but in all probability the eastern wall of the destroyed eastern portion of St Germans church. Structure, materials, size, location and orientation all point to this conclusion. Wall 3, wall 4, which continues along the line of the outer wall of the former north aisle, and the tile pavement to the south define a structure which was internally approximately 15 metres (49 ft) in length and at least as wide as the nave and north aisle. The hitherto unnoticed scarp corroborates these dimensions on the downhill side. Thus the structure was aisled at least to the north, although no evidence was found of a foundation for the arcade there. Nor did the excavators find either a wall or the foundation for an arcade to the south, although there must have been either one or the other. Probably they did not investigate any further once they had struck the drain. On balance, we suspect that there was no aisle on the south side, given that the adjacent wall and window of the church are always presented as good fourteenth-century work.

The alignment of wall 3 with wall 2 raises the interesting possibility that the whole destroyed eastern portion had a different orientation from the rest of the church, and one which followed the

Fig 10 St Germans from the north. (Steve Hartgroves; Cornwall Archaeological Unit, F41/96, June 1993)

orientation of an earlier structure. Might it be significant in this regard that even the eastern ends of the chancel and south aisle are not quite squared off on Furneaux's plan of the existing church (Fig 9)? The collapse and repair here recorded by Carew must be recalled however. There is no evidence for the precise date of walls 3 and 4, only that they are of Tartan Down stone used by the Normans and their successors, and that wall 4 is thick enough to be Norman and continues the line of the narrow Norman north aisle. The structure was there to be at least partly tiled *c*1300, the tiles being laid in mortar on 'made' ground. There was a fifteenth-century window at the east end of it. We suggest that the destroyed eastern portion of St Germans church was Norman with later embellishments. Given the dimensions established here, it was certainly the canons' choir and not merely a lady chapel. However, the 'Chapel of St. Mary in the Priory Church of St. Germans' which existed at the Dissolution (Henderson 1929, 21) may also have been contained within the structure in question, perhaps in the aisle adjoining the choir, although lady chapels were usually sited away from the cloister, which, because of the local topography at St Germans, was atypically on the north side of the church.

Walls 1 and 2 which meet at right angles on the same level are presumably the corner of some structure. Their character and context on this site indicate a pre-Norman date. They are in an ecclesiastically significant position, beneath the post-Conquest choir of a priory church in proximity to the presumed site of the high altar there. From such fragmentary evidence it is not possible to reconstruct the building, of which these walls were part, or to know which way it faced; nevertheless, even the longer wall 1's degree of difference in orientation about 15° north of what was later considered to be east suggests parallels with a number of early ecclesiastical sites (Hague

1973, 22). The walls may have been part of an earlier church (with a northern door?) or shrine connected with the tomb and commemoration of the bishops of Cornwall described by Leland as being in the wall to the right of the high altar of the priory. It is quite possible that this article has presented the remains of an ancient cathedral of Cornwall archaeologically surveyed.

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The authors wish to thank Lord Eliot of Port Eliot, St Germans, for enthusiastic cooperation in permitting research on his property, and Ms Angela Broome and staff at the Courtney Library of the Royal Institution of Cornwall in Truro for invaluable help in locating recondite sources.

Cornish Archaeology nos 37–8, 1998–9

The restoration of some North Cornwall crosses

ANDREW LANGDON

Youlstone no 2, Warbstow

Discovery. In 1973 Mr Shute of Youlstone Farm widened an entrance to a field at Higher Youlstone (formerly known as Higher Youlton; SX 2002 8968) to give access for larger farm machinery. This necessitated the removal of a granite gatepost, which on completion of the entrance was replaced by a new one. The old gatepost, which was covered in a large ball of concrete at its end, was brought back to the farmyard for storage. Later that year whilst rolling a ploughed field the landowner decided to increase the ground weight of his implement. He therefore placed the granite gatepost onto the framework of the roller and continued his task. Later that same day Mr Shute was surprised to find that the concrete, which had been attached to the stone, had vibrated loose, revealing a small wheel-headed cross!

In 1976, both Mary Henderson and Ruth Hirst recorded the cross (Henderson 1952–83, 1040). At that time it lent against a hedge in an old garden on the north side of Youlstone Farmhouse. Here it remained for over twenty years and was first examined by the writer in 1985 (Fig 1).

Topography. The parish of Warbstow is dominated by the large Iron Age hill-fort which can be seen from miles around. The parish is bounded on the north side by the parishes of St Gennys and Jacobstow, and in the east by Tremaine and Treneglos with Davidstow, Treneglos and Otterham bounding the southern and western sides. Youlstone Farm is situated in the far southern end of the parish close to the river Ottery and the parish boundary with Treneglos (Fig 2). Here where the church path crosses the river from Treneglos to Warbstow stands the wayside cross known as Youlstone No 1 (Langdon 1896, 51; and Langdon 1992b, 64) which holds a dual function marking both the parish boundary and the church path.

Two ancient routes link the parish of Treneglos with Warbstow. The eastern route leads north via Nether Scarsick, Lower Town and Downinney, while the western route leads north-west via Higher Scarsick, Trewonnard, Youlstone and Higher Youlton to St Werburga's church at Warbstow.

Description. The wheel-headed cross is in a good state of preservation despite having been re-used as a gatepost. Except for the loss of its base-stone, the monument is virtually complete. On both the front and reverse faces the stone displays an incised latin cross, the lower limb of which extends down the full length of the shaft. The cross-head has no bead and the shaft is plain except for a slight entasis. The monument is short by Cornish standards, although the existence of a tenon on the end of the shaft, would suggest that the cross was originally this height. The cross is cut from fine-grained granite from nearby Bodmin Moor.

Re-erecting the monument. In November 1995, David Attwell of North Cornwall Heritage Coast and Countryside Service (NCHCCS) and the writer agreed a project with the landowner Mr Michael Shute to erect the cross beside the farm drive on an existing public footpath.

When a wayside cross is discovered, the writer endeavours to persuade landowners to allow the stone to be erected on its original site, if this can be identified. If the original location is unknown,

Fig 1 Youlstone cross soon after its discovery

then the best alternative to this, in the writer's opinion, is to set the cross up close to its site of discovery and where possible in a position where there is public access.

In this particular case the original base-stone indicating its former position was never found. As the cross had been utilised at least once as a gatepost, its original site could be anywhere in the vicinity. Taking this into consideration the writer still considers that the cross would not have been moved far and probably originally stood beside the church path somewhere on the existing farm drive.

In January 1996, a piece of moorland surface granite was purchased from near Hantergantick Farm in the parish of St Breward to be utilised as a base-stone. A mortice was cut through the stone by stonemason, Mr Ernie Hillson, at Tynes Quarry near Pendoggett.

On Thursday March 14th 1996, the monument was at last re-erected, twenty-three years after its initial discovery. David Attwell and the writer collected the new base-stone from Tynes Quarry early in the morning and transported it to Youlstone Farm at Warbstow. Mr Michael Shute, the farmer, assisted in removing a small section of turf and top soil to allow the base-stone to sit firmly on the ground, beside the farm drive. The base-stone was lifted into place with the aid of a JCB mechanical digger.

When the cross was taken from the garden, Mr Shute removed the gate-hangings with an angle-grinder, to allow the shaft to be fitted into the new base-stone. As the original tenon was rather short, and safety being paramount, a decision was made to cut the mortice wide enough to receive not only the tenon but also the lower part of the shaft. Although this resulted in the cross being slightly shorter, the monument is now much more stable.

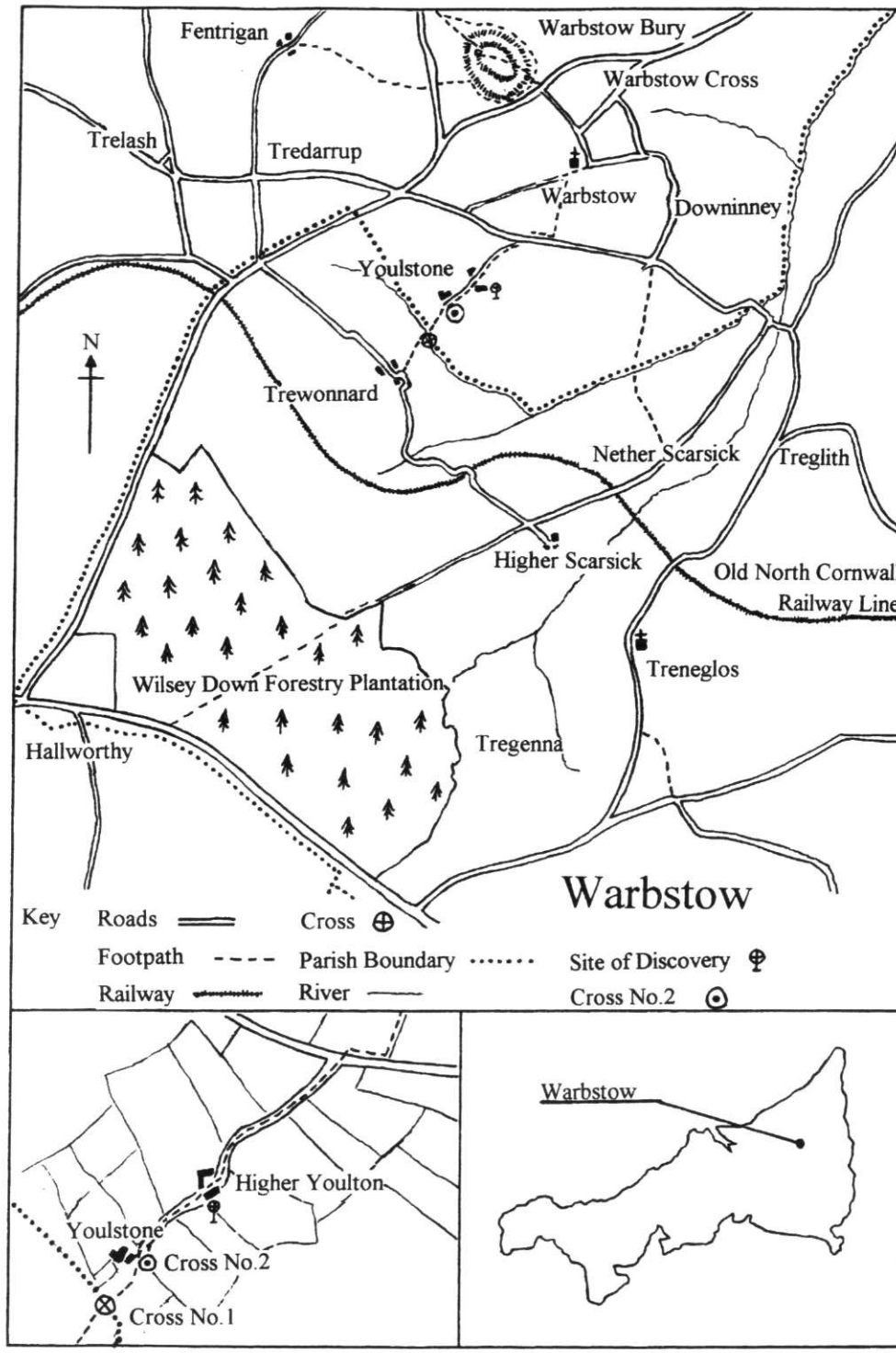

Fig 2 The Youlstone crosses in their landscape

The cross was lowered into the base-stone, again with the aid of the digger, and the shaft bedded into the mortice with a lime-based mortar, with the most prominent face of the monument orientated towards the track. This was also the face without the scars of the old gate-hangings which now face the hedge. The cross now stands beside the church path at SX 1989 8960 (Fig 3).

Dimensions. Prior to re-erecting: Height 5ft $0\frac{3}{4}$ in (1.545m); width of head 1ft 6ins (0.457m); width of shaft (at the neck) $11\frac{1}{2}$ ins (0.292m); (at the middle) 1ft (0.305m); thickness 8ins (0.2m);

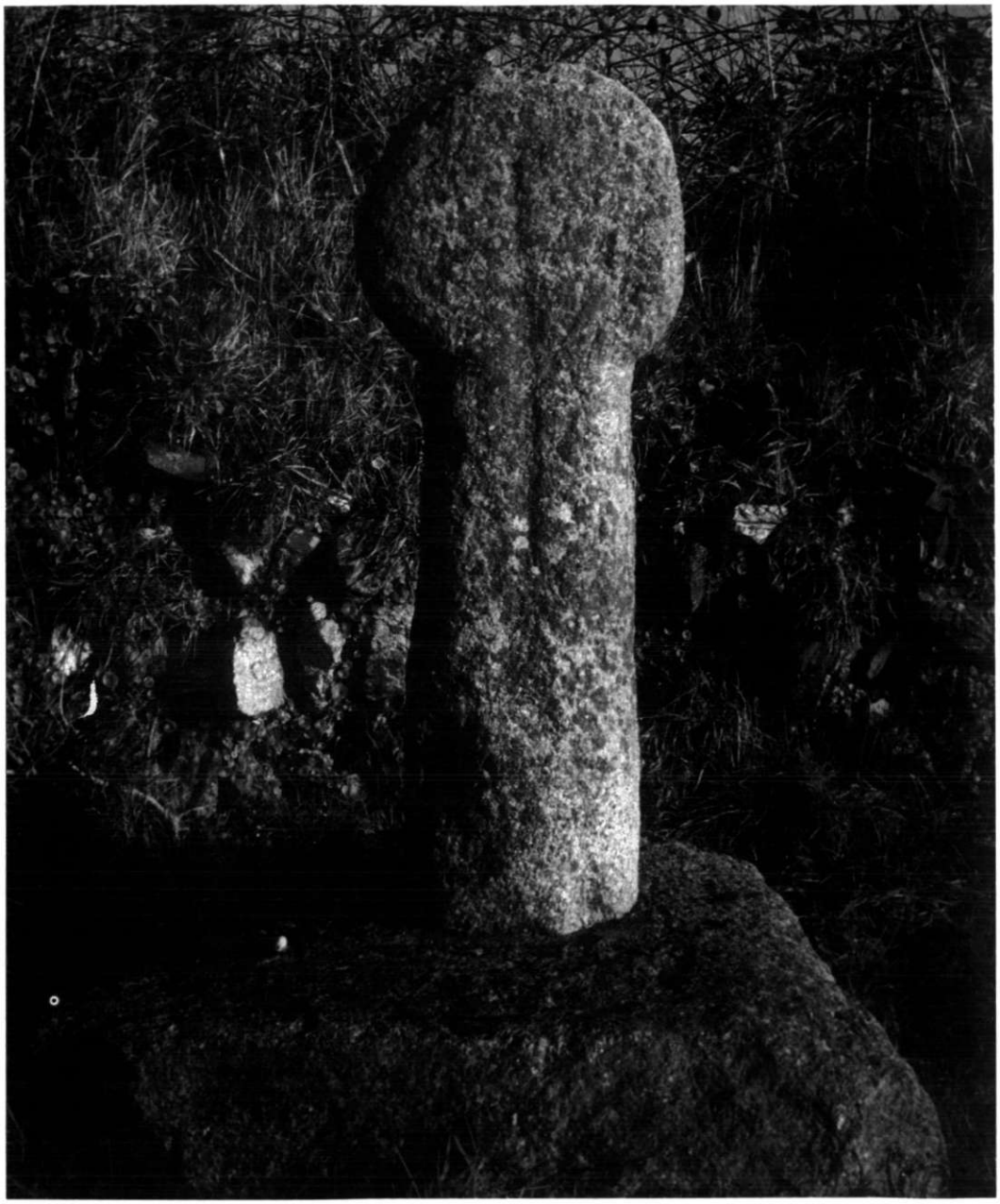

Fig 3 Youlstone cross re-erected in 1996

tenon width 9ins (0.228m). After re-erecting, the total height with its new base-stone was 4ft $10\frac{1}{2}$ in (1.485m); base-stone length 3ft 9ins (1.143m); width 2ft 10ins (0.863m); height 1ft (0.305m).

Conclusions. It is rare to get the opportunity to examine a complete cross, out of the ground, but this example showed that Cornish wayside crosses can be as little as 5 feet high plus the tenon. Crosses of this size have, in the past, often been assumed to be incomplete, broken, or deeply sunk in the ground.

Another interesting observation is that this particular cross is completely different in style from the monument known as Youlstone no 1 (Langdon, 1896, 51 and Ellis, 1965, 1–2), which as already stated is situated on the parish boundary and less than half a mile from the discovery site of the Youlstone no 2 cross. The Youlstone no 1 cross, displays a much larger wheel-head and broad equal-limbed crosses on each face, in contrast to the incised latin crosses on Youlstone no 2.

Acknowledgements. The writer would like to acknowledge his thanks to stonemason Mr Noel Hill of St Breward for advice, to Mr Michael Shute for allowing us permission to re-erect the cross, and for all the assistance he gave us with setting it up. The project would not have come to fruition without the organisation by David Attwell and the skills of stonemason Mr Ernie Hillson of St. Tudy.

Trefranck Cross, St Clether

The Trefranck Cross was discovered in 1994 in a garden hedge at Trefranck Farm, the home of Mr and Mrs J Kempthorne, and reported in *Cornish Archaeology* (Langdon 1995, 186; 1996, 26). The monument remained in the garden for security until arrangements were finalised to re-erect it. Again, the project was organised by David Attwell of NCHCCS and a suitable site agreed with the landowners Mr and Mrs Kempthorne. The writer considered that the cross might have originated on the minor road which leads from the parish of Treneglos through Trefranck to the parish church at St. Clether. Again public access was a major consideration in deciding the new site, as was the security of the monument. Agreement was later made to erect the cross on a hedge at the entrance to the farm, where it is visible to the public, but also in full view of the farmhouse.

The hedgebank on which the new base-stone was to be located had fallen into a state of disrepair and required partial re-building prior to erecting the cross. On Saturday 8th 1997, the writer with Mr Attwell purchased two pieces of granite from a field near Hantergantick Farm in St Breward parish, one stone to use as a base-stone for the Rectory Cross Head at Lanteglos by Camelford and the second, a smaller piece, to use as a base-stone for the Trefranck Cross. These stones were later transported to Tynes Quarry at Pendoggett, where stonemason Mr. Ernie Hillson was commissioned to cut two mortices.

On Sunday 15th June 1997, the base-stone was transported up to Trefranck Farm. Re-building the hedgebank took longer than expected, as large roots had to be dug out and cut with a chain-saw before re-building could take place. The hedging work was undertaken by David Attwell and Andy Gray, assisted by the writer and Mr Kempthorne. Additional stone had to be collected from neighbouring fields and the hedge was not completed until late afternoon.

The new base-stone was then lifted into position on top of the hedge by Mr Kempthorne with his tractor and foreloader. The stone was stabilised prior to the cross being lowered into it. Owing to the absence of part of the shaft and tenon, the mortice was cut wide enough to receive the lower portion of the shaft. The shaft was bedded into the base-stone with a lime-based mortar, once the monument had been checked for alignment. Wooden wedges were inserted between the shaft and the sides of the mortice to hold the monument firm until the mortar set. A week later Mr. Attwell removed the wedges and made good the joint. The cross now stands on the hedge at the entrance to Trefranck Farm at SX 2036 8494 (Fig 4).

Dimensions of the cross on completion. Height above base-stone 2ft 3ins (0.685m); width of head

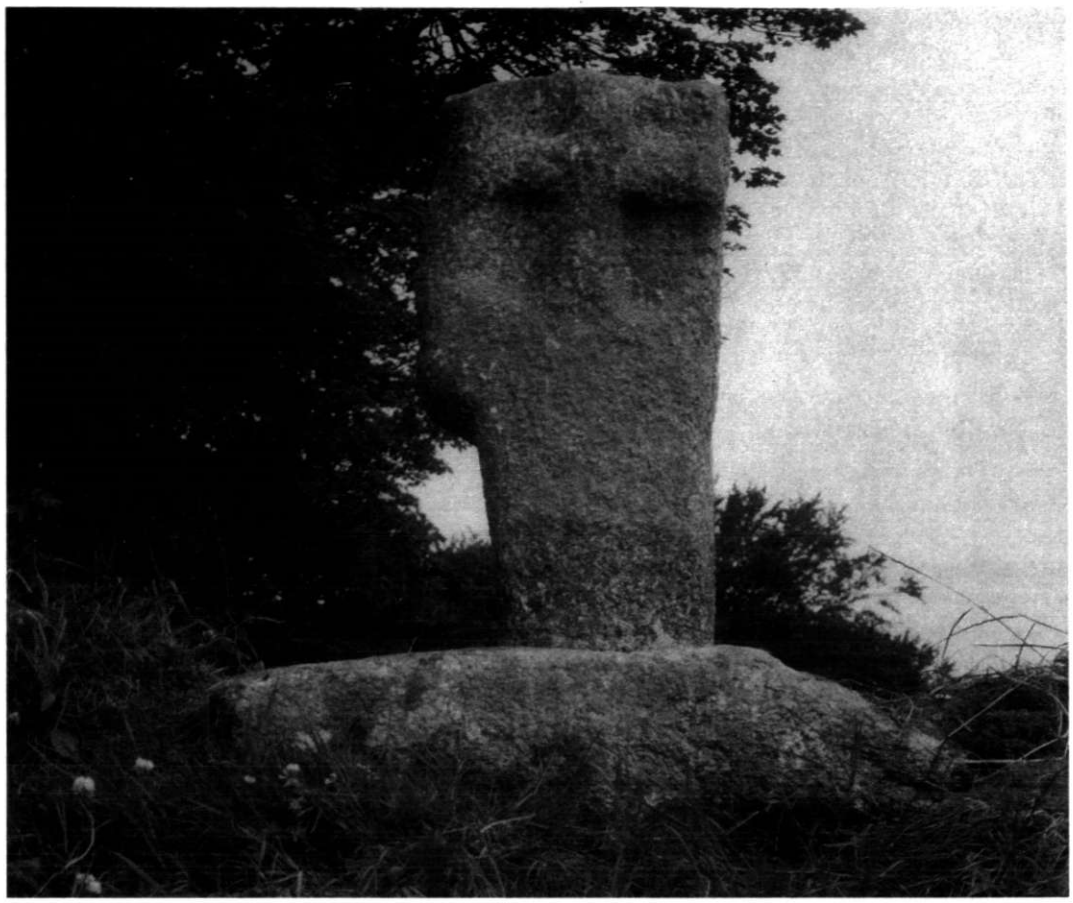

Fig 4 Trefranck cross restored

1ft 1in (0.33m); thickness 7½ ins (0.19M). The new base-stone is triangular in shape and measures 2ft 11ins (0.89m) by 2ft 10ins (0.865m) by 2ft 9ins (0.84m) with a thickness of 1ft (0.305m).

Conclusions. Although this wayside cross has been badly treated, and is today far from wheel-headed, the relief-carved cross remains very clear and the writer considers that it was definitely worth re-erecting. It is now accessible to the public and very near its site of discovery.

Acknowledgements. The writer would like to acknowledge the help and hospitality given by Mr and Mrs Kempthorne and their family. Thanks to Andy Gray for his help in re-building the hedge and assisting in erecting the monument, to Ernie Hillson for again preparing the new base-stone, and more importantly to David Attwell of NCHCCS for not only organising the project but also for doing the lion's share of the work.

Addendum (2002). Since the discovery of the Trefranck cross, another three wayside crosses have been found, all re-used as gateposts. The most recent (2002) was discovered at Ta Mill, St Clether.

Tregrylls Cross, St Michael Lesnewth

This latin wayside cross was discovered in 1988, and erected in 1991, with a report being published in *Cornish Archaeology* (Langdon 1992a, 157-162). Since the completion of this project

negotiations have been taking place between the landowner and the County Council about diverting the church path (a public footpath) at Tregrylls Farm. The writer and friends originally set the cross up at its site of discovery adjacent to the church path, where public access to it existed. The diversion of the footpath would deny this access and as the cross was not *in situ*, he considered it should be moved to retain a right of public access.

The County Council was approached regarding continued access to the cross and when a diversion order was drawn up, the re-siting of the cross was made a condition of this order (Cornwall County Council 1997).

On Sunday 20th July 1997, the writer accompanied David Attwell of NCHCCS to Tregrylls to ascertain the best position to re-site the cross. Factors we took into consideration in making this decision were: i) maintaining the monument on the original church path and not the new diversion section, ii) public access, and iii) a position where the monument could be easily examined. Two possible sites were identified, both close to the junction of the new path and the existing track.

This information was then passed to Mr. Chris Monk, the Rights of Way Officer for Cornwall County Council who finalised the position with the landowner. The site chosen was in a clearing just north of the new diversion and less than one hundred metres from the monument's former 1991 site.

Fig 5 Tregrylls cross re-positioned

In August 1997, a piece of moorland granite was purchased from land near Hantergantick Farm at St Breward by David Attwell and transported to Tynes Quarry, Pendoggett, where Mr Ernie Hillson cut a mortice to receive the cross-shaft (no tenon existing on the end of the shaft).

No objections to the diversion order were received, and on Friday 31st October the new base-stone was delivered to Tregrylls by David Attwell and the cross was re-erected by Chris Monk and Andy Gray from the Transportation and Estates Department of Cornwall County Council. The cross now stands at SX 1279 8955 (Fig 5).

Dimensions of the cross in its new position. Height 4ft 6ins (1.37m); width of head 1ft 10ins (0.56m); thickness $9\frac{1}{4}$ ins (0.235m). The new base-stone is irregular in shape and is approximately 5ft 4ins (1.625m) by 4ft 10ins (1.47m), with a thickness above ground of 6ins (0.15m). The mortice measured 1ft $6\frac{1}{2}$ ins (0.47m) by $10\frac{1}{2}$ ins (0.265m).

Conclusions. The project has proved successful, as it has fulfilled the wishes of all concerned. The diversion of the footpath has given the landowner more privacy; the Ramblers Association has welcomed the new route; and the cross has remained accessible to the public.

In 1998, the Tregrylls Cross was given Scheduled Ancient Monument status by English Heritage, and is now legally protected for future generations. It is Cornwall Scheduled Monument number 31846.

Acknowledgements. The writer would like to thank Mr J Linnington of Tregrylls for access, to Mr Ernie Hillson for preparing the base-stone, and to Messrs Chris Monk and Andy Gray (County Council) and David Attwell (NCHCCS) for organising the project.

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Investigations at Nos 4–6 Pydar Street, Truro

PETER STEAD, with JOHN ALLAN, GRAHAM LANGMAN and ROGER T. TAYLOR

Introduction and background

In February 1999 Exeter Archaeology were commissioned by Guardian Properties Ltd to undertake excavations at 4–6 Pydar Street, Truro (NGR SW 8255 4492) prior to redevelopment of the site as retail premises. It was hoped that the investigations would provide useful information regarding the early occupation and development of the town.

Pydar Street lies within the centre of Truro and is one of its oldest streets, the survival of a number of burgage plots along its length attesting to its medieval origins. It lies within what has probably always been the main trading area of the town although our understanding of the wider medieval street plan is far from clear. In 1998 an historical assessment and limited evaluation of 4–6 Pydar Street was undertaken by the Cornwall Archaeological Unit (Jones and Reynolds 1998). The assessment traced the development of the site and established that the earliest reference to Pydar Street dated to 1464. A deed dated 1479 refers to a house in the general location of No 15 Pydar Street, suggesting that Nos 4–6 would almost certainly have been developed by this time. The evaluation consisted of two hand-dug trial pits, one of which exposed a waterlogged feature containing a single sherd of medieval pottery.

The Investigations

The 1999 investigations followed the demolition of Nos 4–6 and removal of a concrete slab floor, which extended across the greater part of the site. Those areas due to be disturbed by piling, groundbeams and other groundworks were excavated, in total approximately 50% of the site area. During the initial cleaning it became apparent that levelling prior to the laying of the concrete slab had resulted in truncation of the site down to subsoil, resulting in the removal of all archaeological material apart from deeply dug features. A number of relatively recent features of probable eighteenth or nineteenth-century date were found, including parts of the front, rear and side walls of a building. Excavation across the front of the site failed to locate any evidence of earlier (ie medieval) buildings, which would suggest either that they had been built with shallow foundations, or that they had been removed as a result of later truncation.

Although the investigations proved somewhat disappointing in that no medieval building remains were identified, two pits containing medieval pottery were located. The first (Pit A) was situated 9m from Pydar Street on the line of the rear wall of the later building. As this pit would have been dug within an open area to the rear of the house, its location is useful in providing an approximation to the line of the rear wall of the medieval property. The pit was sub-rectangular in plan and 1.40m deep. The fills were all clay-based and generally fairly clean, although the base fill (518), which was

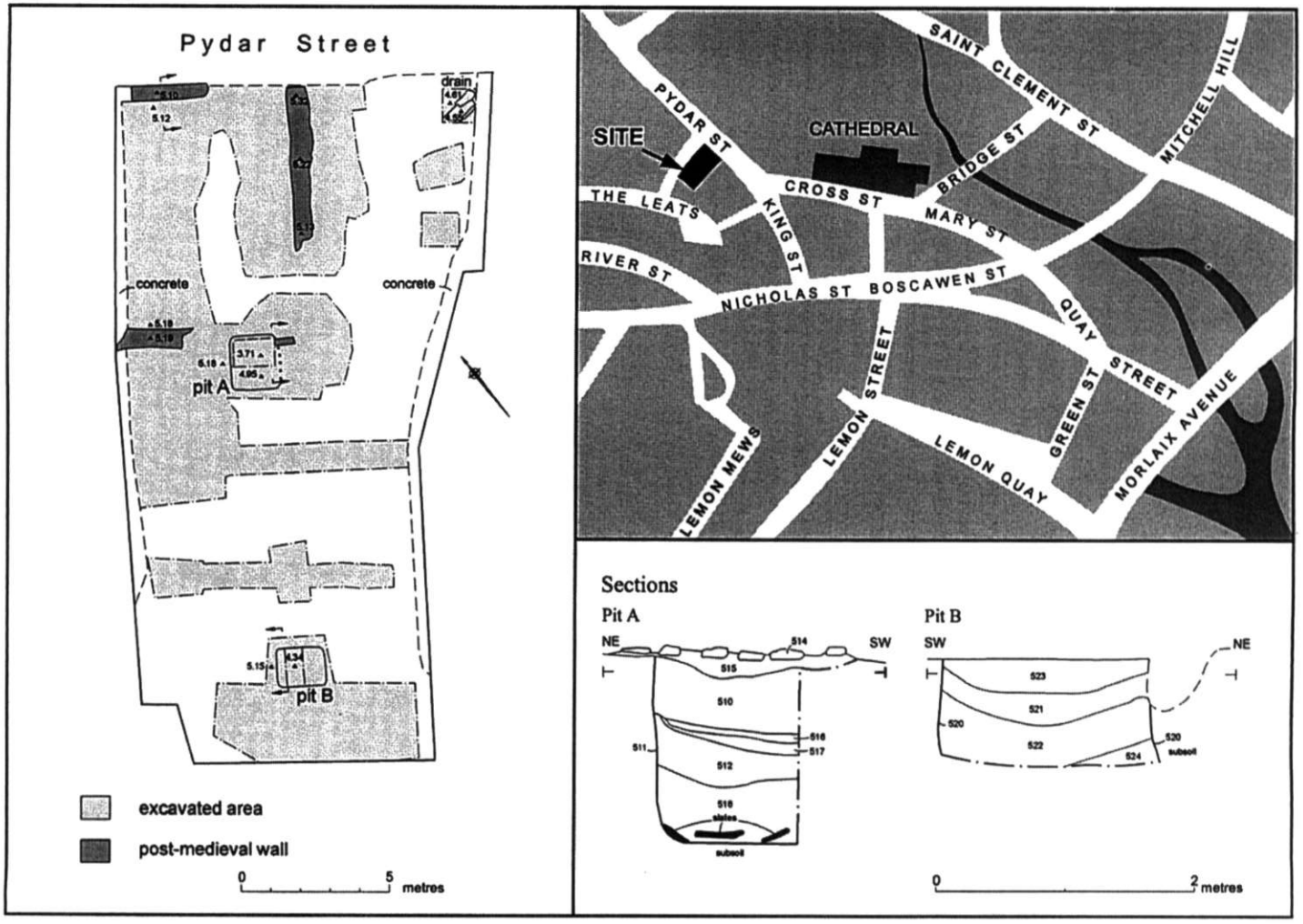

Fig 1 Location of site (top right), excavation plan (left) and sections through Pits A and B (bottom right)

waterlogged, contained broken pieces of rough-hewn slate together with fragments of coal and plant remains. Although the nature of the feature was suggestive of a cess or rubbish pit, analysis of its fill produced very little domestic waste and no evidence of cess. Examination of pollen and waterlogged plant remains indicated that it probably did represent a domestic waste or cess pit, but that it had been cleaned out shortly before infilling. Pottery recovered included a sherd of a Dorset sandy ware jug (512) and two sherds of green-glazed pottery from Saintonge, south-west France (510). Together these provide a date range for the pit of 1250–1500. More interestingly, a number of residual sherds were also recovered. These included 29 fragments from the base of a Cornish grass-marked bar-lug vessel dating from the tenth or eleventh century (518) and a sherd of a late twelfth- or early thirteenth-century London-type ware jug (510).

The second pit (Pit B) was situated towards the rear of the site. It was broadly square in plan and was excavated to a depth of 0.85m. Its fills were clay-based and generally clean apart from flecks of slate and charcoal. Pottery sherds dating from between the mid to late fourteenth century and the fifteenth century were recovered from its upper fills (521, 522).

The Pottery

by JOHN ALLAN and GRAHAM LANGMAN

Introduction

The pottery assemblage recovered at Pydar Street is a small one – merely 53 medieval sherds from 11 vessels. It is nevertheless of considerable interest, since it provides the only excavated sample of medieval ceramics from any of the Cornish ports. It is at present difficult to publish meaningfully the local Cornish pottery which normally makes up the bulk of any medieval series in the county, since much remains to be done in defining the fabrics of the various Cornish kilns and establishing dated sequences of local pottery types. A programme of petrological study is much needed in west Cornwall to complement the work being undertaken at the time of writing by D. Brown and A. Vince for Launceston Castle in the east of the county. Dr Taylor's study of the Pydar Street sherds (Appendix below) is an important initial contribution to such a study. All the known medieval Cornish wares are coarse products, so fine jugs for use at table were often brought from elsewhere. As the finds from the Isles of Scilly (Allan 1991) and Launceston Castle (D. Brown and A. Vince, forthcoming) illustrate, French wares (both from Normandy and the Saintonge), a variety of sources in Devon, Somerset, Bristol and Dorset and a few more distant kilns supplied this need.

Foreign imports are represented by two Saintonge green-glazed jugs (Nos 4, 6). Although only one other example has previously been recorded from any medieval Cornish town (a handle from Lostwithiel), these finds are of course widely distributed along the south coast of England (Allan 1983), and are plentiful both at Plymouth and, in unexpectedly large quantities, on the Isles of Scilly (Allan 1994; 1991). At Truro they could represent either direct trade with western France or coastal redistribution of French goods from Falmouth, Fowey or even Plymouth.

More surprising is the find of London-type ware of the late twelfth or early thirteenth century (No 5). A series of at least a dozen vessels of this ware, including Rouen-type jugs, decorated slipwares in North French style and vessels with painted white slip lines, has been recorded from Exeter (Allan 1984, Nos 701, 1112, 1148, 1401); in recent years the writers have noted further sherds from Launceston Castle (Brown and Vince forthcoming) and Dartmouth Bus Depot (unpublished excavation by Exeter Archaeology in 1994). The Truro find thus extends the distribution pattern considerably (cf Pearce *et al* 1985, 8–12) and is indeed the most distant distribution point of this ware in England and Wales, although there are also finds on the Scottish coast (*ibid*). Coastal trade

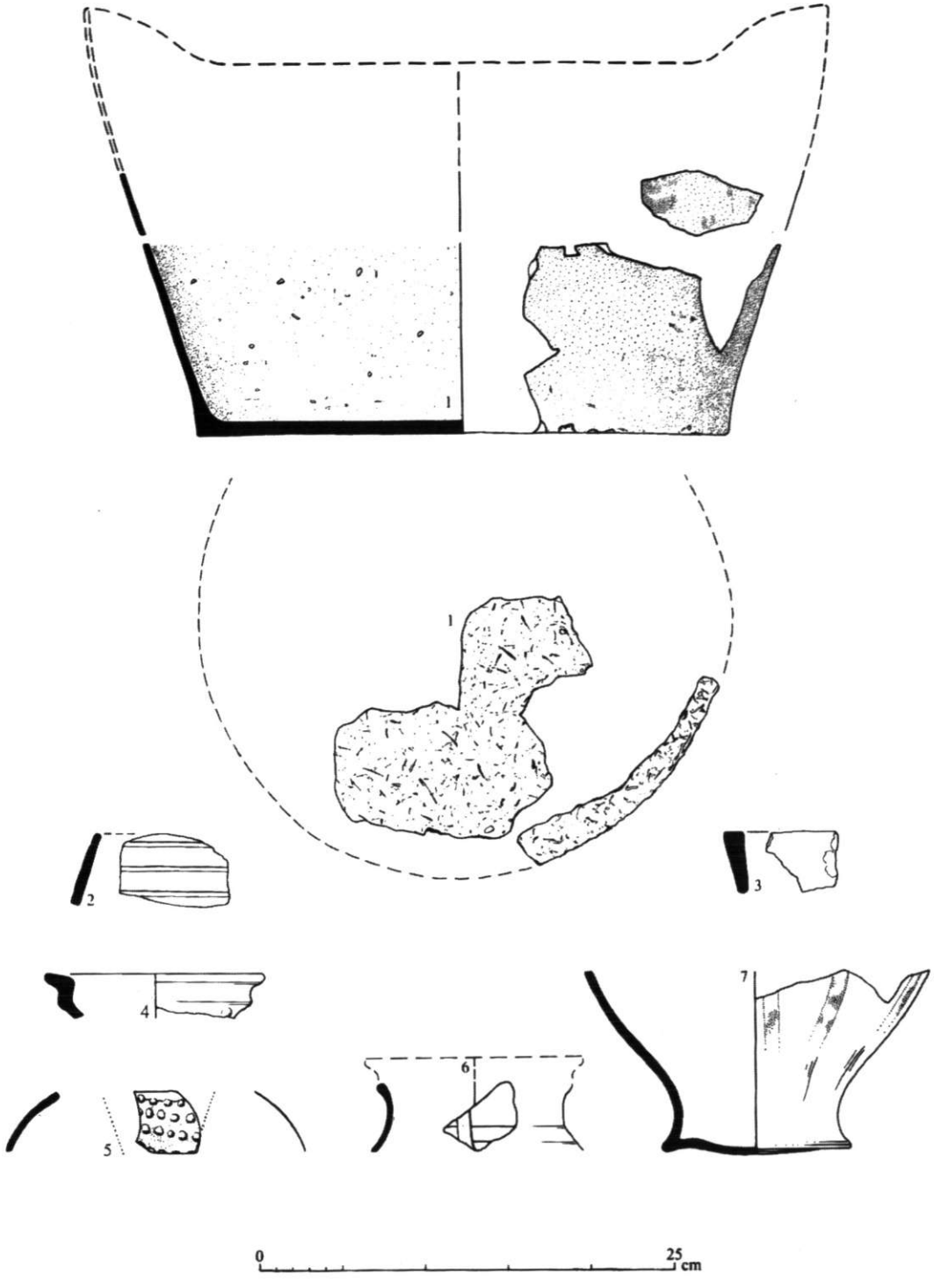

Fig 2 The medieval pottery from Pits A and B

is, presumably, also reflected in the sherd of a jug in a pale-firing sandy greyware fabric (No 2). Such wares are known in small quantities from a number of sites in Devon (eg Allan 1984, fabrics 62, 44) but must have been made further east, probably in South Dorset. One definite and a few probable sherds of Dorset pottery are also present on the Isles of Scilly (Allan 1991, 94). Regional movement, again probably by coastal trade, is likewise reflected in the finds of Exeter fabric 40, which Dr Taylor's examination indicates probably comes from the lower Exe valley and probably from the vicinity of Exeter itself (see below).

In the understanding of the origins of Truro the most significant finds, however, are the two gabbroic vessels Nos 1 and 3, which must both be grass-marked bar-lug wares (Thomas 1968; Hutchinson 1979). These are broadly datable to the tenth and eleventh centuries (*ibid*); at Launceston Castle, the best-dated sequence in which they are at present known, they fall out of use very soon after the Norman Conquest. Although the use of such vessels may have continued well after 1100 in areas closer to their production source around St Keverne, they are surely much earlier in date than the other wares in Pit A, and indicate tenth- or eleventh-century occupation of the site. Their presence in the lowest layer (518) of a pit whose upper layers belong to the late thirteenth or even early fourteenth century poses an unresolved problem. The grass-marked sherds in context 518 are large, unweathered joining fragments which are very unlikely to have been redeposited from an earlier context. The pit can hardly have been open for two centuries or more prior to the deposition of the later medieval pottery in the upper fills, and it seems most probable that the pit was re-cut in the late thirteenth/early fourteenth century, emptying the upper fills of the earlier pit.

Catalogue (Fig 2)

1. Pit A, context 518 (bottom layer)

1. Grass-marked ware: base and wall sherds of tall vessel with steeply angled walls – surely a bar-lug vessel, despite the absence of any elements of the lug itself – the base unsooted and grass-marked externally but heavily sooted internally. Vessel walls with heavy external sooting but unsooted internally. Gabbroic (see Taylor below). Tenth or eleventh century (cf Thomas 1968, fig 15/2; Bruce-Mitford 1997, 99–112).

   Dating: Discussed above, tenth-eleventh century.

2. Pit A, context 512

2. Sherds of a pale-firing sandy ware wheel-thrown jug, the fabric described by Taylor (below). External shallow horizontal grooves, speckled light green glaze. This provides a good visual match to the local wares of the Poole Harbour area, such as those from Poole (Jarvis 1992). The context also contains a single sherd of a grass-marked vessel, probably No 1.

Pit A, context 510 (upper fill)

3. Upright rim with external sooting; gabbroic fabric (see Taylor below). A bar-lug vessel is the only known gabbroic vessel form with such a rim. Tenth or eleventh-century. Residual (cf Thomas 1968, fig 19/14).
4. Rim of a Saintonge mottled green-glazed jug rim with the top of a vertical applied thumbed strip.
5. Shoulder sherd from a London-type ware jug with Rouen-style decoration (Pearce *et al* 1985, 28–9). Typical granular sandy fabric, horizontal band and edge of a diagonal stripe of thick brushed white slip outlining part of a triangle, within which are rows of white clay pellets, (cf

Table : Summary of total quantities of medieval pottery from Pydar Street

	Sherds	Min. No. vessels	Forms
Grass-marked ware	31	2	bar-lug vessels (?)
Saintonge green-glazed	5	2	jugs
London-type ware	1	1	jug
?Dorset sandy ware	1	1	jug
Exeter fabric 40	11	1	jug
Cornish, granitic	3	3	
?Regional import	1	1	
Total	**53**	**11**	

ibid, fig 25, Nos 51–55). The type comes into circulation after c1180, is common in the first half of the thirteenth century, and dies out after *c*1250 (*ibid*, 19–20).

Dating: The Saintonge jug offers a *terminus post quem* of *c*1250 for the group. London-type ware was going out of circulation by that date (?residual). On the Exeter evidence, the coastal trade in pale-firing sandy wares from ?Dorset is a thirteenth-century phenomenon. Probably mid or late thirteenth century.

Pit B, context 522

6. Body sherds of a Saintonge mottled green-glazed jug with external vertical applied thumbed strip. The type has a long life of *c*1250–1450.
7. Base of a globular jug with near-continuous pulled foot, brown stripes (probably mixed red clay and iron oxide, now partly peeled off) over external slip; patchy green-glaze. Exeter fabric 40.

Dating: This pit group could belong to any period between the late thirteenth and the late fourteenth/early fifteenth century (cf Allan 1984a for groups of both extremes containing these fabrics).

Appendix : The mineralogy of the temper of sherds from Pydar Street, Truro

by ROGER T. TAYLOR

Each of the Pydar Street vessels, apart from the Saintonge and London wares, was examined under a binocular microscope at 20x magnification without thin-sectioning. The temper mineralogy is listed in approximate order of abundance.

Grass-marked wares (Nos 1 and 3)

The sherds are medium-oxidised and low- to medium-fired. The temper consists of:

Feldspar — Angular soft, white, altered grains; less altered grains showing smooth cleavage faces and traces of twinning characteristic of plagioclase feldspar. Grain size very variable, up to 5mm.

Quartz	Mainly angular, white to transparent, vein-quartz and some composite grains, also a few waterworn rounded grains. Grain size generally less than 1mm, occasionally up to 4mm.
Pyroxene/amphibole	Some dark greenish pyroxene grains with typical cleavage and greenish-grey fibrous amphibole.
Magnetite	A few black glossy grains.
Mica	Fine-grained white mica in matrix.
Rock fragments	Two silvery talcose grains, one fine-grained granitic grain seen.

These sherds have all the mineralogical characteristics of the gabbroic-tempered wares made from clays derived from the St Keverne gabbro of the Lizard. The quartz content of the temper is also characteristic of Cornish gabbroic wares of Neolithic to Romano-British date. The quartz is not an original constituent of the gabbro but appears to result from contamination of the near-surface clay by material derived from the quartz-rich gravel which lies on the surface nearby at Crousa Down on the Lizard. Some of this gravel is waterworn and rounded. The talcose and granitic grains are likely to have been derived from the Lizard serpentine and from local granitic veins respectively.

?Dorset sandy ware (No 2)

Pale-fired bodysherd, with thin very weakly oxidised surfaces. Inclusions consist of abundant quartz sand, angular to sub-rounded, *c*0.1mm, with some dark grains, forming 25–35% of the ware. There are also some soft black grains up to 0.5mm, possibly limonite or carbonaceous grains. The pale-fired colour of the ware indicates a low iron content in the original clay, so the clay was a ball or pipe clay, either from Dorset or Hampshire or from Bovey Tracey or Petrockstow in Devon. White quartz sand is associated with the Dorset clays. Since there is no evidence for the use of the Bovey Basin or Petrockstow clays in the medieval pottery of Devon (pale-firing wares being absent from the medieval pottery assemblages from Newton Abbot and sites in the Dart valley in south Devon, and from north Devon sites such as Bideford, Barnstaple and Roadford: Allan, pers comm), and Allan has noted a good visual match to pottery of the Poole area, Dorset seems the most probable source.

Exeter fabric 40 (No 7)

This ware does indeed show the characteristic inclusions of Exeter fabric 40 (Allan 1984, 5) as currently understood. The bulk of the temper is angular to sub-angular fine-grained quartz; rounded polished marine/beach sand with some white angular vein quartz grains are also present. The sand is possibly derived from an estuarine source where marine/beach sand has become mixed with fine, angular, alluvial sand. The presence of vein quartz points to an area from the Exe estuary westwards. Since the local pottery of the areas from the Teign area westward consists entirely of very much coarser, largely granite-derived, wares (Allan, pers comm), the lower Exe estuary seems the most probable source.

Cornish granite-derived coarseware (Pit B, context 522)

The temper consists of:

Quartz	Angular clear and translucent grains up to 1mm, rarely up to 2mm.
Mica	Flakes of muscovite are common, generally less than 0.5mm, a few up to 1.5mm.

Biotite	Occurs but is relatively rare.
Rock fragments	Micaceous slaty hornfels, very common, generally less than 1mm.
Feldspar	White angular grains, some showing cleavage surfaces, relatively rare.
Tourmaline	Some black grains, some showing crystal form. Generally less than 0.5mm.

Provenance
Probably stream/river sand derived from a stream with its headwaters on granite. The abundance of slaty hornfels suggests a source fairly close (*c*1km) to the granite margin. The fairly fine grain size suggests that the sand was sieved or otherwise prepared prior to use. Of the documented local Cornish potteries (Douch 1969) those at Constantine, Penzance and Madron, but not at Truro/Kenwyn, Feock or Veryan, could have made wares of this broad type from local clays (see below).

Cornish coarseware (Pit B, context 521)

The temper consists of:

Quartz	angular, uniformly fine-grained, *c*0.3mm.
Rock fragments	abundant micaceous slate fragments, platy grains *c*0.3mm.
Mica	some flakes of white mica.
Tourmaline	rare black grains.

Provenance
The abundance of fine slaty grains in the temper is unusual. It is possible that this temper was artificially prepared; the micaceous nature of the slate suggests a source fairly close to a granite mass.

Unclassified regional import (Pit B, context 522)

Bodysherd, oxidised red, with mid green glaze. The temper consists of:

Quartz sand	Translucent, white and pink-stained, predominantly rounded grains, some polished, but often with frosted surfaces, 0.1–0.5mm, mainly about 0.25mm.

The sand forms about 30–40% of the ware. The provenance of the temper is uncertain but the rounded polished grains are marine/beach-derived. The frosted grains resemble those of aeolian origin derived from some of the Permian sandstones of Devon. On geological grounds a local Cornish origin could not be dismissed, although the rarity of comparable finds in other Cornish collections makes this unlikely (John Allan, pers comm).

Addendum: A note on the petrology of Cornish potteries

BY ROGER T TAYLOR AND JOHN ALLAN

Douch (1969) has shown that at least nine potteries operated in Cornwall in the sixteenth and seventeenth centuries. Many are probably of medieval origin since post-medieval potteries were so often the successors to medieval ones throughout England. Past publications of the medieval and later ceramics of Cornwall have not generally attempted to distinguish the products of these various centres (but see Allan 2000, 79–80). The opportunity has therefore been taken to provide published descriptions of the fabrics of the three Cornish kilns from which wasters have been recovered and to discuss the likely petrology of pottery made in the other Cornish kilns. Series of sample sherds from each of the Cornish kilns from which wasters have been recovered were therefore examined and their mineralogy described; the sherds examined are held in the regional reference collection of medieval and post-medieval pottery held at Exeter City Museums. Temper is described in approximate order of abundance.

Descriptions of kiln wasters

1. MAWGAN-IN-MENEAGE

Ten sherds from the Mawgan kiln site were examined; all are clearly wasters. They are believed to be of broadly sixteenth/seventeenth-century date and include oxidised, part-oxidised and reduced sherds with some unglazed material. The sherds have a consistent temper content; the typical mineral components are:

Quartz	Usually as translucent clear or white angular grains; the sorting is poor with a grain size range usually up to 2mm but occasionally grains reach 4mm.
Muscovite	Common and noticeable on thrown surfaces of the sherds. The flakes vary widely in size, reaching 1.0mm.
Feldspar	Relatively sparse, visible as white grains which are usually altered and soft. A few grains are sufficiently fresh to show cleavage.
Biotite flakes	are present in some sherds but are quite rare.
Rock fragments	Granite-derived grains including quartz with needles of black tourmaline; quartz-feldspar; quartz-feldspar-biotite, and quartz muscovite. A few slate grains occur in several sherds; both normal slate and hornfelsed slate are present. Slate fragments were also caught up in faulty glaze on two sherds, probably because slates were used as separators between pots in the kiln firing.

Lying to the south of the Helford River, Mawgan is not on a stream system running off the granite, and local river valley sources would yield a temper of quartz stream sand with an admixture of local rocks – slate and sandstone. The temper is, however, quite typical of material derived from the granite. The proportions of the components indicate that it came, probably from a stream or river, at some distance from the granite margin, since mechanical action following *in situ* alteration and weathering have reduced the content of the less stable mineral components, feldspar and biotite. The presence of slate and hornfelsed slate indicates a collection point 2 km or more from the granite margin. The nearest source of granitic sand to Mawgan is the southern margin of the Carnmenellis Granite to the north. The implication is that the tempering sand was imported to the kiln site.

There is no evidence of the temper having been prepared prior to use. The angularity of the grains probably reflects a short distance of stream transport rather than crushing. It seems likely that suitable material was simply selected at source.

2. St Germans wares

Some 10 sherds at Exeter, selected to show the range of fabrics and both glazed and unglazed wares, were examined. The St Germans kilns were far from streams running down from the Bodmin Moor granite, and local temper would consist of sandstones and slates. Three quite different fabrics are represented:

(a) Shell-tempered wares

Four sherds contain distinctive white shell fragments in the temper. The shell is of uniform size: 0.2–0.3mm. The remainder of the temper consists of white and translucent angular quartz and dark rounded to sub-rounded grains (some of which are ferruginous but the remainder of uncertain identity from surface examination). These components are also of uniform size: in the range 0.2–0.3mm. The three main components occur in about equal proportion. A few slate fragments are also present. The uniform size of the shell fragments suggests crushing and sieving before adding to the clay. The components for this temper, and possibly the clay, may derive from the muddy tidal estuaries of Lynher and Tiddy downstream from St Germans. This is the typical 'St Germans-type' ware as defined by Allan (2000, 69–70).

(b) Granite-derived temper

This contains:

Quartz	Mainly as angular, clear grains and some white vein quartz grains, some of which are several millimetres across.
Muscovite	Mica flakes ranging up to 1.5mm are common.
Feldspar	Occurs as white angular grains, some of which are relatively soft and altered and some sufficiently fresh to show cleavage.
Rock fragments	Some composite quartz-feldspar and quartz-biotite granitic grains are present.
Biotite	Relatively rare but occasional fresh unaltered flakes 0.7–2mm across occur.

(c) Wares with locally derived temper

Two rim sherds of a completely oxidised ware had a relatively sparse temper consisting of quartz, white vein-quartz, muscovite, and a few fine-grained sandstone fragments and siltstone fragments. Rare grains of black tourmaline were also visible. This temper has a mineral content consistent with a source in the vicinity of the kilns. The situation of St Germans, away from streams draining from the granite, implies that the tempering sand containing granitic constituents was transported to the site. The potteries must have produced (a) shell-tempered wares, (b) wares containing no obvious temper and (c) wares tempered with sand transported from some distance, perhaps the northern parts of Plymouth Sound. This range of fabrics may be compared with that of the North Devon potteries, which produced from the end of the medieval period (a) 'calcareous' wares (really shell-tempered), (b) gravel-free wares and (c) gravel-tempered ware, the last using gravels transported to site.

3. Lostwithiel

Sherds recovered by the Cornwall Archaeological Unit from the Quay Street site (see Jones and Reynolds 1998) were examined.

(a) Fabric rich in muscovite

Most were of coarsely tempered granite-derived type including some tile fragments as well as wheel-thrown wares. The temper, which was generally poorly sorted, includes:

Quartz	Mainly very angular, clear and white translucent grains of granitic origin 1–2mm.
Muscovite	Abundant, relatively large flakes, commonly up to 1.5mm and occasionally 2–3mm.

Feldspar	White angular grains, some soft and altered, some relatively fresh, showing cleavage faces.
Tourmaline	Black angular grains, some showing parts of crystal faces, up to 0.5mm.
Slate	Slate occurs and rare fragments in some sherds have been hornfelsed.
Biotite	Relatively rare flakes but more common than in similar wares from Mawgan and St Germans, up to 1mm.

The notably high content of white mica probably indicates a source deriving from an area of kaolinised granite, since the kaolinisation process tends to increase the proportion of white mica in the altered granite. Some parts of the south-western area of the Bodmin Moor granite are kaolinised and streams draining this area flow into the River Fowey above Lostwithiel. A likely source of the tempering sand used for the coarsewares would be the Fowey to the north of Lostwithiel. Most sherds contain 20–30% granite-derived temper, but in a group of glazed sherds the proportion is considerably less, 5–10%.

(b) Sparsely tempered or untempered ware

One sherd has a buff fabric with very sparse temper, giving very smooth surfaces. A second pale pink oxidised sherd also contained only a few temper grains. The pale colour of the body of these sherds indicates a weakly ferruginous clay, possibly derived from an area of kaolinised granite. They indicate that some Lostwithiel pottery was tempered with little or no granitic filler.

General summary

On present evidence it seems reasonable to retain Allan's distinction of (a) St Germans-type ware (referring to the shell-tempered fabric there) and (b) Lostwithiel-type ware (the muscovite-rich fabric) although we do not yet know whether non-granitic shell-tempered wares were made elsewhere in Cornwall.

However, the position regarding the sherds with granite-derived inclusions is more complicated since the examples of such pottery from Mawgan-in-Meneage are not readily distinguishable from the sherds of this type from the St Germans kilns. An important conclusion from the present study is that granitic sands were transported for use as temper in potteries where they were not available locally.

The petrology of the local clays

If the other known Cornish kilns acquired their temper from local sources, particularly stream or river sands, there would be quite pronounced distinctions between their fabrics reflecting the catchment of local streams. In fact the excavated kiln material discussed above shows that granite-derived temper was transported to kilns where it was not available locally, so the picture will be more complex. Nevertheless a starting point in considering Cornish fabrics should be the geology of local deposits of clay and sand. Broadly, they fall into two major groups, the first characterised by temper of sandstone and slate, the second by granite-derived temper, as follows:

(a) Sandstone and slate temper

Truro and Kenwyn	Quartz stream-sand with local rock additives – slate, sandstone.
Feock	Quartz stream-sand with local sandstone additions. Possibly also quartz silt/sand from Carrick Roads.
Ruan Lanihorne and Veryan	Quartz stream-sand and with local rock addition – sandstone.

(b) Granite-derived

Constantine	Granitic/derived granitic.
Penzance	Stream sand with derived granite-derived inclusions and metamorphosed slate; beach sand/dune sand, quartz sand with minor additions of local rock.
Madron	Granitic/derived granitic with possible contact metamorphosed slate (stream sands).

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Recent work by the Cornwall Archaeological Unit, 1997

Sites and Monuments Record

Steve Hartgroves

Great changes have taken place with the Unit's computerised archive of archaeological information, the Sites and Monuments Record (SMR). Superfile, the database software which we have been running since 1984, was not designed for modern systems running on Windows, and its outputs cannot be configured to allow communication with other programmes such as word processors and geographical information systems (GIS), ie, electronic maps. Development of the Unit's computer systems was being inhibited by the need to maintain an operating environment that would support our antiquated database, and its replacement was a matter of some urgency.

Once the decision to upgrade was reached, a range of software options was examined before we opted for Access, the relational database from Microsoft. The migration of data proved less of a problem than anticipated, thanks to some clever programming and a versatile word processor, and the new system came online early in 1997. Development work continues, creating diverse problems to be resolved and prompting suggestions for all kinds of desirable features to be built in. Access is remarkably flexible and endlessly configurable, so that staff have found it easy to adapt to the new system.

There is still much to do: the SMR for Scilly has yet to be transferred, as has the photo catalogue. We are also considering creating an additional 'Site Management' module in which to monitor the condition of sites and to note down any perceivable threats to their survival, and to record management recommendations made, agreements reached, or actions which have taken place. We are also contemplating an 'Interventions' module to record all archaeological events in a site's history, for example, surveys, excavations, geophysical surveys, assessments, and evaluations.

The transfer of mapped data to computer and the creation of the GIS is under development, with all sites on a single 1:10,000 sheet currently linked to the OS digital base map. We are experimenting with various conventions to show different kinds of data, and thinking hard about the best ways to indicate the spatial extent of some site types, not all of which have well defined edges or locations.

The variability of the old SMR data has posed a significant problem, and the data transfer has revealed large numbers of errors and uncorrected mistakes. The process itself has provided the means to identify and in some cases to rectify such mistakes, but much work still needs to be done. A Data Audit is being carried out with assistance from RCHME in an attempt to quantify the work required to bring the database content up to an acceptable level of reliability and currency – and we still have a large backlog of information waiting to be input. These analyses will assist in the formulation of a project designed to tackle these problems, which we hope to fund from a concerted bid by SMRs nationwide for Heritage Lottery funding.

All these developments are a vital part of enhancing the SMR to a level of reliability that will be required should it become a statutory planning database.

Aerial reconnaissance in 1996

Steve Hartgroves

May and June were dry months in Cornwall, leading to the expectation that 1996 would be a good cropmark year. A successful application for a small grant from the RCHME helped us to carry out three cropmark flights in the summer, and a fourth flight in the winter months over the Lizard Peninsula and along the south coast to Praa Sands.

The first flight, on 17th July, inspected the area on the eastern side of the Roseland, which, unlike the western side, is poorly populated with enclosures and other cropmark sites. Five new sites were discovered and, although only a modest number, this was considered a good result in this area. All were found between St Austell and Mevagissey, including a section of a multi-vallate enclosure in the corner of a field at Lancallen near Kestle (= castle/fort?), a small rectilinear enclosure just visible at Bosue, and a strange double-ditched linear feature running across the landscape in an irregular fashion at St Ewe.

In addition to these 'new' sites, a known round at Higher Demain was photographed almost 50 years to the day since it was last recorded by the RAF in 1946, and the known round at Resugga, near Trispen, now showing only as a cropmark, was revealed to have an annex attached to its western side.

Two flights were then carried out on consecutive days in late July (25th and 26th), around the Camel Estuary; a total of three and a half hours was spent flying over this region. The archaeology and geology showed clearly as crop, grass and parchmarks, and these flights were very productive, yielding thirty new sites, 19 of which were defended enclosures of probable Iron Age or Romano-British date. Sites ranged from small univallate rounds to large and/or complex enclosures. In this area, which we are targeting for aerial reconnaissance on account of the high potential for cropmark production, and where numerous new enclosures have been discovered during the past ten years flying, it is surprising that such varied and important new sites continue to appear, year after year.

The flight concentrating on the Lizard took place in early April, when masking vegetation was at a minimum; a range of landscapes was recorded, including prehistoric settlements and field systems, coastal quarries, churches, mining features and china-clay works. Following vegetation clearance on Carn Brea hill, the hut circles on the summit were showing clearly for the first time in photographs taken at the end of the flight.

Overall this was a productive summer season, with thirty-five new sites recorded in total, twenty-one of these being prehistoric enclosures, rounds or ring-ditches. We were fortunate this year to have the benefit of the services of James Keasley, just about to start his archaeology degree at Reading, who accurately located and catalogued all of this year's aerial photographs. Meanwhile, Andrew Young has completed the third year of the National Mapping Programme, the systematic plotting of archaeological sites from aerial photographs for the whole of Cornwall, funded by the RCHME.

Church archaeology in 1996

Steve Hartgroves and John Gould

Advice to parish churches about the implications of repairs, renovation and extensions has continued. This involves site visits and meetings with the Diocesan Advisory Group, Parishes and English Heritage Officers. Watching briefs were carried out at Callington, St Ervan Churchyard, St Levan Church and at Little Petherick Church. These watching briefs have enabled development work to limit the destructive effect on archaeological remains which survive below ground in Cornish churches and churchyards.

At St Ervan the western gate to the churchyard was widened, revealing a lost medieval cross base and two human burials. These were excavated and recorded before being removed for reburial. At St Levan Church a series of niches and/or blocked windows was uncovered during the removal of plaster on the north wall of the 12th century chancel. These were recorded before the new plaster was applied. Recommendations were made for archaeological recording projects at St Minver Church, St Issey Church, Bodmin Church, St Mawgan Church and Stratton Church. Smaller scale curatorial watching briefs to monitor pipelines and drains in churchyards have been planned at Feock, St Mewan, St Uny, Madron and Duloe Churches.

Old Town, St Mary's, Isles of Scilly

Jeanette Ratcliffe

An intertidal peat deposit was exposed during the rebuilding of the sea wall at Old Town. Recording and sampling of this and a second (lower) deposit was carried out for the Council of the Isles of Scilly during March 1997. The Old Town samples will be analysed for pollen and macroscopic plant remains, as well as for certain types of algae and tiny organisms which provide an indication of salinity levels and other aspects of the conditions under which the peats formed. Radiocarbon dates will be obtained to establish when this formation took place.

Pendennis

Charles Johns

During stormy weather in February 1995 the Unit excavated preliminary evaluation trenches at Crab Quay and Blockhouse Long Platform as part of The Fortress Falmouth project sponsored by the National Heritage Memorial Fund. The purpose of the work was to investigate the remains of the former fortifications with the purpose of informing further consolidation and management works. At Crab Quay the interior of the battery and structural condition of the 18th century guardhouse and the early 20th century spigot mortar emplacement were examined. At the site of Blockhouse Long Platform, near the tip of Pendennis Point, the remains of the gun platform behind the Tudor curtain wall was revealed. Evidence of mid 19th century garrison gardens and late 19th century rifle butts on the site were also uncovered.

Coastal Archaeology

Jeanette Ratcliffe

During recent years the Unit has become increasingly involved with coastal archaeology. Although the Unit has of course previously been concerned with archaeological remains located on or near the coast (with Cornwall having such a long coastline this is inevitable), during the last three years or so it has contributed to the growing number of strategic documents aimed at the management of the coast, and has been involved in projects very specifically aimed at recording coastal archaeology.

Three main types of coastal archaeology have been defined:

1. *Submerged landscapes* – these are sites which have become inundated as a result of sea-level rise. They are usually recorded in the intertidal zone, are of prehistoric (and sometimes later) date, and in Cornwall and Scilly are characterised by peat deposits and other ancient land

surfaces, and (in Scilly) by the stone remains of houses, field systems and cist burials. The waterlogged nature of these sites means that organic remains often can be very well preserved and provide important evidence of past environments and sea-level change.

2 *Specifically coastal archaeology* – these are archaeological remains resulting from human settlement on the coast and exploitation of the sea. They include ports, harbours, wrecks, navigational aids, fortifications etc, and can be submerged, located on the present-day coast, or stranded inland (if the shoreline has advanced seaward). In Cornwall and Scilly such sites are usually of post-medieval and sometimes medieval date.

3. *Archaeology situated on the coast* – this is terrestrial archaeology adjacent to the coast but not having a specific coastal function. It includes originally inland sites which have become coastal as a result of shoreline retreat – amongst which are some important prehistoric (and later) settlement and burial sites exposed in the low cliff and dune faces around parts of the Cornish and Scillonian coast.

In 1996 English Heritage and the Royal Commission on Historical Monuments of England (RCHME) published *England's coastal heritage. A statement on the management of coastal archaeology* and, in early 1997, *England's Coastal Heritage*, a sizeable report that presents the results of a survey carried out by the Universities of Reading and Southampton. Both these documents highlight the importance of coastal archaeology and the need for it to be taken into account when management strategies and schemes are being designed for the coast. Also in 1996, the RCHME completed a three-year project to create a national inventory of maritime archaeology for England, and information on shipwrecks (and other maritime sites) is now fully integrated into the National Monuments Record (NMR) and will eventually be copied to the County Sites and Monuments Records, including that for Cornwall and Scilly which is the responsibility of CAU. These national archaeological initiatives have taken place against a background of wider government initiatives aimed at the effective and sustainable management of the coastal environment – for example, English Nature's Estuaries Initiative (which involves the drawing up of Estuary Management Plans), the Environment Agency's LEAPs (Local Environment Action Plans) and the Shoreline Management Plans, funded by MAFF and intended to provide a strategic framework for coastal protection schemes.

At the local level, CAU has had both a curatorial and contractual role in promoting coastal archaeology. We have contributed to Estuary Management Plans for the Fal, Tamar, Fowey and Camel Estuaries, and to the Tamar, Fal and West Penwith LEAPs. In the case of the Fal, we were able to obtain funding (mainly from English Heritage) to carry out an historic audit of the estuary (see *Cornish Archaeology* **36**). This was the first time the archaeology of an entire estuary had been recorded, and since then similar audits have been carried out for the Camel and Hayle Estuaries (by the Trust for Wessex Archaeology, for the Environment Agency). The Unit was commissioned to write the historic environment section of the Isles of Scilly Shoreline Management Plan, and is providing advice during the compilation of similar plans for the north and south Cornish coast. In addition, it has contributed to the environmental statements of several coast protection schemes in Scilly, and has been involved in archaeological recording work associated with some of these schemes (eg St Agnes and Old Town coast protection schemes).

Through its membership of the Maritime Sub-Committee of the Association of Local Government Archaeological Officers (Jeanette Ratcliffe is its Secretary) and by attendance at conferences and seminars, CAU is keeping abreast with developments in coastal archaeology and coastal zone management, and we anticipate that our role in respect of this aspect of archaeology is likely to increase.

Godolphin, Breage

Peter Herring

The Unit was commissioned in 1995 by English Heritage to prepare an archaeological assessment of the remarkable historic landscape of the 238 hectare (588 acre) estate surrounding one of Cornwall's best-loved and most important mansions.

The 15th, 16th and 17th century house itself and the largest part of the Elizabethan gardens were planned earlier in the 1990s by the Royal Commission on the Historical Monuments of England, and the gardens had also been studied by both the Cornwall Gardens Trust and the Debois Landscape Survey Group. The Unit prepared a 1:2500 detailed sketch survey of the whole estate, using the RCHME aerial photograph mapping facility available in the office through Andrew Young to plot prehistoric and medieval features on the hill. With the generous help and encouragement of the owner, Mrs Mary Schofield, and her eldest son John, the Unit then attempted to draw together the various strands of archaeological, historical and cartographic evidence to prepare a narrative history of Godolphin. With this in place detailed management recommendations were made, firstly to inform a management plan being prepared for the hill which was within a Countryside Stewardship scheme (initially administered and sponsored by the Countryside Commission, now by MAFF), and secondly to enable the whole of the estate – the hill together with the fields, grounds and woods – to be carefully conserved and presented to the numerous interested visitors it receives.

Prehistoric remains are best preserved in the heathlands on the elegant, conical, granite hill. Its summit is crowned by an early prehistoric enclosure, probably Bronze Age (*c*2000 BC?) apparently re-used by the people who laid out a fine later Bronze Age (*c*1400 BC?) rectilinear field system on the southern slopes. There are other more fragmentary prehistoric field patterns on the northern slopes and within the present fields is a dense pattern of rather later (Iron Age or Romano-British?) small rectilinear fields defined by strong lynchets. Some or all of these may be associated with either the Carsluick round (later prehistoric defended settlement) or a later prehistoric settlement postulated beneath the present settlement at Godolphin.

Until perhaps the 11th or 12th centuries Godolghan (as it was then called) would probably have been a fairly typical Cornish farming hamlet, comprising a group of longhouses whose inhabitants worked strips communally in the subdivided fields established around the settlement and established bundles of outfield strips (some of which survive) further up the hill on the pastures they no doubt shared with tenants in other neighbouring hamlets. Trescowe, to the west of the hill, was probably the dominant estate then and the hill may well have been known as either Trescowe Hill or Trescowe Downs. Godolghan, however, as well as possessing rich alluvial tin deposits beside the Hayle River, lay on some of Cornwall's richest tin lodes. These were clearly worked throughout the later medieval period and provided the massive wealth which was to propel one of the Godolghan families to local, regional and finally national power. On the north-eastern slopes of the hill are the remains of very early lode outcrop workings which pre-date medieval fields (suggesting a date as early as the 11th or 12th century?) and there are others on the southern slopes and within Godolphin Mine (north-east of the house) which appear to be earlier than the late 16th century.

By the early 14th century Godolghan had replaced Trescowe as the most important local estate and it seems likely that it was at this time that a defended house, later referred to as Godolghan Castle, was built, probably immediately south of the present house. Traces of a precinct built around this 'castle' survive in the layout of the later gardens and in the present stableyard. In the later 15th century this defended house was described as ruined and architectural evidence suggests a new house with an impressive hall was then being built to its north, the first phase of the present house.

Over the next 160 years Godolghan blossomed. About halfway through this period the family, which seems to have been blessed by a sequence of extremely intelligent and ambitious men as its lords, changed its name to Godolphin, adopting the dolphin as its device. By then it was providing the county with sheriffs, having members elected to Parliament, and was supporting Henry VIII in

his Protestant schemes. The house was regularly updated and extended, money continuing to pour in from Great Work tin mine and various other sources (including rents and wrecks). At the end of the 16th century under the direction of the sophisticated Sir Francis Godolphin I, friend of Richard Carew of Antony, Godolphin appears to have been transformed. The house was extended twice more and formal gardens laid out which were among the most ambitious anywhere in England at that time. This garden survives virtually intact, making it one of the most important in the country. Beyond it was a 'wilderness' (later the apple orchard), an area with trees, paths and diversions like statues, and a very large deerpark which incorporated the whole of Godolphin Hill and a large part of the earlier field system, and whose pales survive in good condition. A rabbit warren with pillow mounds (nine of which survive) was created on the hill and the old road from Trescowe to Breage which ran through Godolphin settlement was re-routed via a curious zig-zagging route established to the north (the present Godolphin Bridge to Breage road).

A little later, in the 1630s, Sir Francis III built the great colonnaded north front to the house. He was clearly intent on also rebuilding the east side but was thwarted by the Civil War and financial problems. This must have frustrated him, but it saved for us the Elizabethan garden which may well have been altered too. This Sir Francis was the last of the great Godolphins to effect major changes at the family home; two of his sons, however, had tremendous national influence, one becoming Dean of St Pauls, and the other serving two terms as First Lord of the Treasury, the equivalent of our Prime Minister.

From the 1630s onwards the house, grounds and farm seem to have stagnated, decay occasionally checked by certain conscientious stewards before the family became extinct in the male line in 1785, and then by some of the tenants of the Dukes of Leeds after that date. Mining continued into the 19th century both at Great Work and Wheal Dolphin and Godolphin Mine, with other ventures such as West Godolphin Mine and Godolphin Adit also providing employment and wealth. Godolphin Mine, in the woods north of the house, contains some excellent mining earthworks and some important structures, notably the two famous blowing houses.

The survey and analysis at Godolphin, like that on other CAU projects, both landscape based and more site-specific, will contribute to our understanding of the county's landscape history. Here at Godolphin the survey of the prehistoric, medieval and deerpark/warren remains enhanced our knowledge of Upland Rough Ground (one of the Historic Landscape Character Zones identified in the recent countywide landscape assessment) while the close analysis of the main field system allowed us to see how Anciently Enclosed Land could be altered when used as part of a deerpark and then as a substantial barton farm.

Note: Subsequent work by CAU and John Schofield has confirmed that at least part of the garden complex is rather earlier than suggested above; the King's Garden is at least as early as the early 16th century and part or all of the large Side Garden may also be late medieval, as should also be the deerpark.

St Agnes Head

Charles Johns

Between November 1996 and July 1997 the Unit carried out an archaeological and historical survey of St Agnes Head, an area of coastal rough ground with spectacular views on the north Cornish coast, owned by Carrick District Council which has recently entered the Countryside Stewardship Scheme. The survey was commissioned by English Heritage and Carrick District Council.

A wide range of prehistoric and historic remains was discovered in the area. The earliest is a scatter of Mesolithic flint artefacts revealed by erosion near the Coastguard Lookout building. There is evidence of Bronze Age cultivation and, perhaps, ritual activity in the form of mounds, clearance

cairns and banks. Two possible medieval pillow mounds (rabbit warrens) near the cliff edge represent a type of site rarely found in Cornwall. There are also the 18th and 19th century mining remains of Wheal Bungay, Wheal Devonshire and West Polberro, probably more extensive below ground than above, and several quarry sites.

The Coastguard Lookout Station was built in 1926 although the Cornish coastal name 'Carn Gowla' meaning look-out place/rock, indicates that St Agnes Head had been used as a vantage point over the sea long before that date.

During the Second World War St Agnes Head was the site of a Light Anti-Aircraft Training Camp, popularly known as Cameron Camp, which was used as a housing estate in the post-war years and finally demolished in the late 1960s. The site is now overgrown with scrub although there are a few surviving visible remains such as the sentry box and gateposts on the entry road, the Bofors gun emplacement now used as a car park, the buried ammunition store, and two sets of slit trenches.

The positive and sympathetic management recommendations are intended to preserve the historic landscape character of the area which probably dates back some 3000–4000 years, and to protect the extensive archaeological remains some of which are slight and vulnerable, whilst informing and enhancing public appreciation

Drakewalls Mine

Colin Buck

The Unit's role during Land Reclamation works on this large and successful mine (at SX 425 706) was twofold. Not only were archaeological features recorded as they were exposed (during clearance works) but ongoing consultations were carried out with the contractors, consultants and masons over consolidation details and the overall finish of the site. Respect was given to the close inter-relationship of vegetation with the mine buildings to allow the site to give the impression of a derelict mine amongst trees. The area had nevertheless to be made safe for members of the public to use.

Early documentary records of the mine deal with the diversion and use of water to dress ore and to work waterwheels for stamping and winding. The 19th century saw intensive development through the sinking of shafts and later the use of steam power for pumping and winding from increasing depths.

An early significant development of the mine (and a first for Cornwall) was the use of 'shaking tables' to concentrate fine tin; the newly developed Oxland process was also used at this mine for the first time in Cornwall to treat the wolfram which was associated with the tin ore and had previously caused dressing problems. Both of these innovations seem to have been at the instigation of the engineer Percival Norton Johnson who was a director of the mine. In later years, between 1875 and 1888, the mine earned the nickname of 'Dolcoath of East Cornwall' due to the large quantities of tin left below the main gunnis level (at 80 fathoms), and because of the returns gained from the working of copper and arsenic after 1888. Both St Anne's chapel and Gunnislake were formed as a result of the long history and richness of this mine: Drakewalls mine was for centuries the *raison d'être* for the local community.

Remains of associated structures are, in places, well-preserved but have become overgrown. These include engine house, boiler house and smithy, a wheelpit, and a large openwork or gunnis.

In 1994, with 100% grant aid from English Partnerships, Cornwall County Council purchased the western part of the mine with a view to placing industrial units on the old dressing floor dump site. During the first phase of works in 1995 (funded by English Partnerships) contaminated ground (cadmium and arsenic deposits in dressing floor waste) was removed and replaced with non-toxic

soil. The two open mineshafts were made safe by plugging with concrete (Engine Shaft provided with a vent and Footway Shaft with a bat castle). In the event, the industrial units were not constructed and so a scheme was secured a year later from English Partnerships (second phase) to carry out a structural survey of the standing buildings and to consolidate the remains, with a view to an amenity and recreational end-use for the site. The scheme was drawn up and overseen by Peter Sainsbury, Cornwall County Council's Land Reclamation Officer.

In the summer of 1996 vegetation that covered all the mine buildings was removed and a structural survey undertaken to make sure the buildings could be consolidated as part of a site to be used by the public. Trees were thinned out and dead material removed to allow more light to reach the buildings and promote better growth. Fly-tipped material and some rubble were removed. The engine house was cleared of fallen wall debris and trees. This revealed the re-use of an engine house for a larger engine (from 40" to 50") and also intact granite bedstones with cylinder bolt holes and a circular incision for the cylinder base. A tunnel was discovered in the secondary boiler house which functioned as an access to clear out the ash from the boiler.

The waterwheel pit was cleared of obscuring vegetation and during an attempt to clear out rubble from its pit, more walled features were uncovered (which complemented those on the other side of the waterwheel pit), and an adit. The walled features appeared to house either the gearing for flat rods and/or winding drums. Masons were employed by the contractors (Coles Earthworks), to repoint all above ground walls with a mortar mix specification agreed by CAU, site engineers (Mott MacDonald), and Caradon Council Conservation Officer (David Moore), after a series of test panels with different aggregates had been tried. The gunnis was hedged and fenced internally (to restrict public access as the ground stability was uncertain) and the site boundary formalised with new Cornish hedging and some fencing. Safety rails were used where necessary near steep drops. The open areas and landscaped site (previously occupied by the contaminated dressing floor waste) was sown with a grass and wild seed mix. Access into the engine house was improved and the construction of steps in the boiler houses (using fallen granite quoin stones) gave the public access through the mine buildings and towards other features of the mine.

Scheduled Monument Management Project

Ann Preston-Jones

The Monument Management Project has continued to provide the much-needed means of carrying out minor repairs and other small-scale conservation or presentation work to monuments in Cornwall, funded by Cornwall County Council, Cornwall Heritage Trust and English Heritage. Since the last report, a total of fourteen monuments have benefited, including a Bronze Age barrow, two stone circles, a medieval dovecote, a medieval playing-place, two holy wells, a fine wayside cross, two Methodist preaching pits and even an arsenic calciner! The work has been similarly varied, including erosion repair, scrub clearance, stonework rebuilding and consolidation, hedge and fence repairs, research and advice. Each project involves not only the execution of the conservation work but also archaeological recording and the production of a report detailing methods and results, so we are gradually building up a useful library of information relating to the conservation of archaeological monuments in Cornwall.

Although a wide variety of monuments and problems has been tackled over the three years for which the project has been running, no particular themes, monument-types or periods have been intentionally selected for attention. Work so far has generally involved reacting to needs as they arise or are presented to us and so far, there does not seem to be any shortage of potential work. In so far as themes have evolved there has perhaps been a tendency to focus on earthworks, because they are so vulnerable to erosion, and on small stone monuments like holy wells and crosses,

because they are frequently neglected or suffering from ill-advised repairs made in the past, and because their small scale brings them within our budget. The crosses and holy wells are such a distinctive feature of the Cornish countryside that it is particularly important that they should be preserved as vital components of the historic environment, particularly amidst more modern development.

The following form a representative sample of recent MMP works.

Newlyn East Methodist Preaching Pit (SW 8241 5634). This fine site was constructed in 1853 as a memorial to miners who died in the East Wheal Rose disaster. Tiered ranks of turf seats rise from a central arena while to one side is a platform for preacher and choir. By the entrance is a small building with boiler, for brewing tea for the assembled crowds. Following years of neglect, a local association was formed to restore the Pit to use, the main problems in need of attention being the semi-ruined tea-hut and the slumped turf seats. When approached by David Scott for advice, CAU agreed to help with a trial restoration of the seats. The work, which involved lifting turf, levelling, and then replacing the turf in a strip averaging 2 metres wide, was carried out by the British Trust for Conservation Volunteers.

Killigrew Barrow at Carland Cross (SW 8457 5382). The gorse-grown and sheep-eroded condition of this barrow, a familiar sight from the A30, had long been a cause for concern but finally, in the summer of 1996, action was taken to repair the damage. After preliminary recording by Anna and Andy Jones of CAU the gorse was cut and the barrow re-turfed by the British Trust for Conservation Volunteers, using materials supplied by Mr Frank Matthews, the owner. Although the work has revealed an impressive domed mound, it remains to be seen if the improvement can be maintained. If the unsightly encircling fence is removed, will sheep-erosion recur? But if the fence stays, will the mound once more become engulfed in gorse and scrub?

St Piran's Round (SW 7789 5448). Management work for a rather unusual purpose was undertaken recently at this the best-preserved example of a *plen an guary* or medieval playing place in Cornwall. Scrub was cleared from the ditches and the entrance to the earthwork in order to improve its appearance and to provide access for a proposed performance here in 1999 of the Cornish cycle of mystery plays, the *Ordinalia*. The Cornwall Trust for Nature Conservation carried out a preliminary ecological survey and the scrub clearance was carried out by the British Trust for Conservation Volunteers in September 1996. The Cornwall Heritage Trust has now taken on day to day management of St Piran's Round.

Davidstow Holy Well (SX 1516 8736). This site was suffering on two counts. Firstly, one side of its fine granite ashlar facade appeared to be subsiding due to the combined effects of poor foundations, a boggy location and root damage from a thriving thorn tree growing from the structure. Secondly, the failure of a recent attempt to create a pond directly in front of the well-house had left an ugly, muddy crater which considerably detracted from the appearance of the well. Fortunately Holy Well Repair Man, alias David Attwell of the North Cornwall Heritage Coast and Countryside Service, came to the rescue and in association with CAU a scheme to tackle both problems was devised. Phase one involved the partial rebuilding of the structure by Fred Sanders of St Breward (with preliminary archaeological recording by Dick Cole and Ann Reynolds); phase two, which will involve landscaping the pond and improving access, will take place in the summer of 1997.

St Neot Holy Well. The rich legends of St Neot are told in the medieval stained glass windows in St Neot church. A number of the legends centre round St Neot's well, a miraculous source of water of widespread repute up to the early nineteenth century. The well-house, restored in the 19th century, is of similar design to Davidstow well and was suffering from similar problems, principally a movement of the flanking walls away from the arched doorway. To remedy this, the flanking walls were taken down, solid foundations provided, and then rebuilt using (as far as possible) the stones

in their original positions. Colin Buck of CAU carried out the preliminary archaeological recording and a watching brief while the walls were being dismantled. The project was organised by Martin Eddy, the Caradon Moorland Countryside Officer while Mr RJ Jago executed the building work, a difficult task owing to the flimsy construction of the walls.

Trevalsa Cross, St Allen (SW 8170 5183). In 1896, when recorded by AG Langdon, author of *Old Cornish Crosses*, the cross was set upside down, in use as a gatepost. A section from the side of the head was missing, presumably as a result of this abuse. Soon after, the cross was rescued and placed beside the road but by the 1990s it stood at the bottom of an overgrown ditch, leaning at a precarious angle, and was painted with road directions. With the help of Andrew Langdon, a plan to restore the cross was devised. The cross was lifted from the ditch and the missing piece, found at nearby Trerice Farm in 1981, was re-fixed by Sue and Lawrence Kelland. Finally, it was replaced in a prominent but safe position on the roadside bank, in a new granite base supplied by David Attwell.

Halwyn dovecote, St Issey (SW 9374 7384). A major project for 1996 was the consolidation of this ruined dovecote. Only a semi-circle of nest-box-studded walling survives of this once circular building with domed roof and that, prior to the recent work, was in a fragile and dangerous condition, with much loose and crumbling stonework. Fortunately the owners, Graham and Elaine King, were interested and concerned but (having tidied the site and removed abundant ivy and thorn), were uncertain how to secure the dovecote from further deterioration. Acting on advice from Gerald Bird of English Heritage, CAU and the North Cornwall Heritage Coast and Countryside Service helped organise the vital conservation work. Large areas of completely ruined masonry were taken down from the wall-ends and tops and rebuilt to the original profile with original stone where possible but more often with carefully selected stone from the Tredinnick Quarry in St Issey. The work was carried out with great care and attention to detail by Richard Gill.

Truro City Hall

Jacky Nowakowski

Prior to the redevelopment of Truro City Hall (SW 8268 4478) by the Hall For Cornwall Trust, a programme of archaeological work was organised in accordance with the planning consent for the new hall. This provided a valuable opportunity to work in the heart of the city and discover more about the past development and layout of the streets and quay sides. Truro's market did not occupy the City Hall site until 1809; prior to this the market house was situated in Middle Row, a long since demolished row of buildings that ran along the centre of today's Boscawen Street. Private dwellings and gardens all leading onto the then open Back Quay, occupied the City Hall site at this point.

With funding from the Hall For Cornwall Trust, investigations commenced in April 1996 and took the form of a documentary and cartographic assessment of the site, a full photographic record of the existing building prior to demolition, a series of evaluation trenches in the main area of the building and a watching brief during the initial stages of redevelopment, ending in September 1996.

The resulting work provided a valuable synthesis of the development of the site over the last two hundred years. Parts of the original 1809 market place were recorded, including the well preserved cobbled floor surface, along with subsequent phases of redevelopment. This included regular phases of infilling as a result of reclaiming the river mud flats. Possible traces of an earlier quay side were uncovered along with evidence of an old river terrace. This suggested that the original course of the River Kenwyn was much closer to Boscawen Street, effectively bisecting the present City Hall site.

A substantially built stone culvert was identified as possibly being one of the earliest features on site and a sherd of medieval grass marked pottery (11th or 12th century) was recovered in one of the infill deposits, representing the first known occurrence of this material in an urban context in Cornwall, albeit redeposited. A number of well-preserved crucibles were also uncovered and have been typologically linked with those in use at the Calenick smelting site, which operated between 1766 and 1851. The crucibles may be connected with the nearby Coinage Hall.

The 1809 market was replaced by a larger market house in 1847, of which the frontages, adjoining Boscawen Street and Back Quay, remain standing; they are being incorporated into the new hall complex. The main body of the 1847 covered market, between the two frontage buildings, was replaced in 1925 to provide a public hall with a range of facilities. During initial dismantling of the 1925 structure in 1996, removal of the wooden floors revealed the original slate flooring and bases for cast-iron roof supports for the 1847 market house.

All the major phases of activity were linked to the cartographic and documentary sources, which often complemented the archaeological record. However, some features could not be associated with these historical sources, showing the benefits of archaeological evaluation in what appear to be well-documented sites. Although little evidence was found relating to the pre 19th century town, the project provided a clearer picture of the evolution of the site of the hall over one hundred and ninety years.

St Agnes Coast Protection Scheme

Jeanette Ratcliffe

During May and June 1996 archaeological recording and sampling took place along the north coast of the Scillonian island of St Agnes. Associated with the construction of new sea defences, this work was carried out for the Council of the Isles of Scilly. It was concentrated mainly at Porth Killier (SV 8814 0847), where extensive prehistoric remains were exposed in the low cliff section, with a small amount of work taking place at Porth Coose where a peat deposit visible on the surface of the beach was disturbed by the construction operation and a sample taken as a result.

The Porth Killier site was first discovered during the 1930s and had been gradually eroding ever since. In 1989, when the remains consisted of several stone-built round houses and limpet middens, CAU (in conjunction with English Heritage's Ancient Monuments Laboratory) carried out small-scale recording and sampling work to assess the palaoenvironmental potential of the site and establish its extent inland. The middens proved to be rich in animal bones, shells and seeds, and provided valuable information about the diet and economy of the settlement's inhabitants and the nature of the surrounding environment. Radiocarbon dating of material from the middens produced middle to late Bronze Age dates. Resistivity and magnetometer geophysical surveys suggested that the remains exposed in the cliff face extended inland (beneath a cliff-top track and bulb field) for a distance of up to 20 metres. The results of the 1989 work are described in detail in *The Early Environment of Scilly*, a report published by CAU in 1996.

The coast protection scheme involved the construction of a granite and concrete sea wall in front of the archaeologically rich cliff face at Porth Killier. This would affect not only the 30 metres of cliff section recorded in 1989, but also a further 50 metres in which it was suspected that remains were also likely to survive (behind an old sea wall which had masked the cliff face since the 1920s, but which was going to be removed prior to the construction of the new wall). As a result, provision was made for the full 80 metres to be recorded. A plan was made of the cliff edge, and the cliff section was trowelled clean and drawn to scale, with each feature and layer being numbered and described. At a couple of locations, where the cliff face had to be cut back to accommodate the new sea wall, small-scale archaeological excavations took place. Numerous artefacts were collected

(pottery, flint and stone objects), and samples were taken for environmental analysis and radiocarbon dating.

Re-examination of the length of cliff-face previously recorded by CAU, allowed for greater understanding of the relationship between the various walls, middens and other layers exposed here. Excavation of what remained of the interior of the main round house revealed two occupation phases and internal features (drains, gullies, pits, post-holes and a stone door socket). Removal of the old sea wall exposed a series of pits, together with what appeared to be a stone and earth cairn with a stone-lined cist or chamber. The function of the pits is as yet unknown – some contained prehistoric pottery and all had been deliberately backfilled. The 'cist' or 'chamber' contained a significant quantity of clay and broken pottery.

Detailed analysis of the results of the fieldwork at Porth Killier and Porth Coose will take place in the autumn and winter of 1997.

Mennabroom, St Neot

Nigel Thomas

Mennabroom is a moorland farmstead in the northern part of St Neot parish (SX 1673 7057). The small and much altered farmhouse has for many years been recognised as a cross-passage house, featuring in *The Cornishman's House*, a study of vernacular architecture by VM and FJ Chesher. Proposals to build an extension at the southern end of the house led to an excavation being carried out by CAU for the owners of the property, Mr and Mrs Lucas. This has illustrated that much can be learnt about the history of a house from its below-ground remains as well as from the standing fabric.

The area within the proposed development was stripped of garden soil and granite foundations were revealed. Evidence suggests the building was probably a longhouse in its earliest phase; a wide doorway providing access from the cross passage into the lower room suggest a cowhouse once existed here.

Most of the excavated walls contained re-used roofing slate (unusual in a medieval context) which suggested this part of the house had been substantially rebuilt. Floor levels were also lowered, removing traces of earlier features. No evidence was found for a drain from the cowhouse; this and the outflow may have been lost during rebuilding. Archaeological evidence suggested the following phases:

Period I A longhouse, probably with a thatched roof and wooden internal partitions. The earliest pottery from the site suggests occupation dating from the 13th century.

Period II Upgraded longhouse, re-roofed with slate. Masonry dividing walls from the cross passage appear to have been inserted at this time.

Period III Demolition of the lower end of the house followed by reconstruction of the main walls, incorporating re-used slate. At this time the lower end of the house changed function to become part of the dwelling and was equipped with a hearth. Pits and postholes cut into the floor also appear to belong to this phase. Pottery associated with these levels indicate a later 16th century/early 17th century date. During Period III an annexe and a connecting doorway were added to the rear of the house. This appears to be contemporary with the addition of stairs and a first floor in the occupied section of the house.

Period IV Before the mid-19th century the hearth was robbed out and this part of the building was allowed to decay or, more likely, was deliberately demolished.

Period V A 19th century enclosed garden developed on the site.

Period VI Demolition of garden walls.

Period VII Addition of 20th century paths and drains.

Map evidence revealed that during the middle years of the 19th century the house had effectively switched orientation. The St Neot Tithe Map (1844) shows a lane running down the slope to the east of the building, leading to the doorway on that side of the cross passage. When the Ordnance Survey mapped the area in 1882 the main access had changed to the western side of the house, where a garden had been developed adjoining the farmyard. The old lane to the east was blocked off and had become a garden. This layout survives to the present day.

The northern or upper part of the house is still occupied and its plan demonstrates several additions, most of which occurred before the 19th century. It was not possible to make an in-depth study of the relationship between the abandonment of the lower part of the building and the development of the surviving section, although doubtless the phasing evident in the excavated part would also apply to the remainder of the house. The excavation has therefore gained a better understanding of the overall development of the house.

Menheniot to Coldrenick water main

Nigel Thomas

In September 1996, South West Water started work on a new water main between Menheniot and Coldrenick in South East Cornwall. Results from an earlier magnetometer survey (under taken by Geophysical Surveys of Bradford) had located a series of linear features, pits and other anomalies. The varied nature of the recordings suggested a multi-period site. The geophysical team surveyed five areas and three of these were investigated through excavation with a small team from the Unit and a number of volunteers. Most of the archaeological work concentrated on two areas to the west of Bodway Farm (SX 295 623) which was located in the centre of the one kilometre long pipe corridor. The excavation was funded by South West Water.

Bodway Farm, first recorded in 1120, is an early medieval settlement within an anciently enclosed landscape, which is likely to have existed in prehistory. The finds have been provisionally divided into three chronologically distinct groups: slight post-medieval cultivation marks on the same orientation as the surviving field system; deeper medieval ditches, probably associated with Bodway farm; and a series of slight ditches, deep hollows and two possible post-hole structures which might be prehistoric. The medieval ditches were dated by the discovery of a total of 112 sherds of a single large cooking pot dated to the 13th or 14th centuries. Confirmation of dates for the prehistoric activity in this area is awaited from the radio-carbon dating of samples from the excavation.

Killigrew Round

Richard Cole

Archaeological investigations along the corridor of the Carland Cross to Trispen A39 Road Development were undertaken by the Unit between August and December 1996, culminating in the excavation of a Romano-Cornish enclosure or round dating to the 2nd and 3rd centuries AD.

The project, funded by Cornwall County Council's Transportation and Estates Department, had two stages. The first was the initial assessment of the archaeological resource of the road corridor that included a desk-based study, a walkover survey, and a geophysical survey along approximately

40% of the route (by Geophysical Surveys of Bradford). Stage two comprised the excavation of the round, which was located by the geophysical survey. The excavation was undertaken over a period of three weeks in December, during a period of very unpleasant cold, wet weather. A large team of volunteers including 'A' level evening class students from St Austell and Truro Colleges assisted the CAU's core team. The enclosure was located on a north-facing terrace in a sloping field to the east of Killigrew Farm and the existing A39 road, quite close to the Carland Cross roundabout (at SW 8468 5133).

Rounds are an increasingly common feature of archaeological studies in Cornwall and are usually described as small farming settlements enclosed by a single bank and ditch. Some rounds have two enclosure ditches. Such sites can date from the later Iron Age to AD 600. In 1982, the CAU estimated there was evidence for some 630 rounds in Cornwall. Killigrew Round is approximately 30 metres in diameter and enclosed by a double ditch. It is estimated that between 50 and 60% of the round was uncovered. Inside the enclosure, there was evidence of a number of hollows and also walling which sub-divided the round.

This round has been dated from artefactual evidence to the 2nd and 3rd centuries AD, but unlike previously excavated Romano-Cornish rounds contains no evidence of habitation. Instead, the evidence is largely industrial suggesting a specialised working site. Industrial activity within the round included the presence of an hourglass-shaped furnace, with two distinct compartments cut into the ground. Analysis of the fill of the furnace by the Ancient Monuments Laboratory in London found significant traces of tin within the slag. Part of an unalloyed hand beaten tin plate was also found. The plate was 95% tin with a small percentage of lead. Less than 20 pure tin objects of the Roman period have been found in Cornwall, which makes this find all the more significant. The industrial evidence found at Killigrew Round shows it to be unique among the Cornish rounds so far excavated.

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RECENT WORK BY THE CORNWALL ARCHAEOLOGICAL UNIT, 1998

Sites and Monuments Record

Stephen Hartgroves

The exciting time described in the last report has continued to the present, and our increasing reliance on computers to provide a replacement for ageing paper systems is providing new and stimulating challenges for the SMR Team. All of the information from the old Superfile database has now been converted to our new Access database format, though this has meant a re-think of the ways in which information is stored and displayed, and called for changes to be made in the basic structure of the record. These are currently being evaluated to ensure there will be no loss of usefulness, or reduction in information content. During the year we have acquired the OS 1:2500 electronic maps for the whole of Cornwall and Scilly, in addition to the 1:10,000 data; the larger scale mapping is 'intelligent' vector data which allows site boundaries to be defined and areas to be indicated. The new large scale mapping requires that grid references be much more accurate than was previously necessary, and these will need to be updated one by one. We are also experimenting with ways of showing sites on screen and have commissioned the County's computer service, ISG, to programme the link between the maps and the database. The computerisation of these systems is proving to be highly complex, and since all of the over 38,000 sites will eventually have be delineated on the electronic maps by hand, will make a major demand on our limited resources.

Development of the 'Site Management' module, discussed in the last report, has been postponed while we work on the design of a new 'Events' database to hold information on all archaeological activities which have taken place in Cornwall, which, when linked to the Geographical Information System (GIS) will show the locations of all excavations, evaluations, surveys, geophysical surveys, building surveys and any other archaeological activities which have produced significant results.

We are also beginning to consider ways in which the basic SMR, the Photo database, the new Events database, and several other computer catalogues could be linked to provide a single integrated electronic archive for the Unit. This highly complex project will take many years to achieve and require significant additional resources to be found. In the light of the new guidelines for the Heritage Lottery Fund we are hoping that it will soon be possible to apply for assistance in implementing some aspects of these innovations.

Aerial Reconnaissance in 1997–8

Stephen Hartgroves

Three flights were carried out as part of the Unit's on-going programme of aerial reconnaissance in Cornwall and Scilly funded by the Royal Commission on the Historical Monuments of England. Areas investigated or surveyed by Unit staff around Carrick Roads and the Lizard Peninsula were

overflown on 7th April 1997 and a variety of sites and landscapes were photographed. The flight path continued westwards from the Lizard along the coastal fringe to Porthleven and Praa Sands, then overland to inspect and photograph the hilltop sites of Carn Brea, where the round houses on the saddle were showing well as a result of recent 'vegetation management', and Carnmenellis with its characteristic pattern of post-medieval enclosures. Unfortunately, 1997 was another indifferent year for cropmark production, and so our limited resources were saved for the recording of extant sites in the late summer and winter, in particular, gaining an overview of areas of moorland in Zennor burnt off by fires in the previous year. In August a second flight recorded further sites around the Carrick Roads, including the ports of Falmouth and Penryn, but gathering haze kept us out of the Penwith area until a late afternoon flight on 17th February, 1998. In an area already heavily surveyed and recorded we did not expect any major new discoveries, but many additional features were added to known sites; fragments of prehistoric fields were plotted in the moorland and on the cliff tops, and many industrial features were also recorded. Exceptional low light conditions provided the opportunity to obtain excellent record shots of the West Penwith landscape and some superb images were obtained.

Bryn Tapper, who is enjoying a six-month placement with the Unit and has been given special responsibility for our photo systems, is carrying out post-reconnaissance locating and cataloguing of these flights.

National Mapping Programme

Andrew Young

Work has continued this year on this Programme, funded by the Royal Commission on the Historical Monuments of England. The project involves plotting all archaeological features visible on air photographs and is now in its fifth year. So far more than a third of Cornwall has been mapped. More than 3000 new sites have been identified as a result of the project and during this year a third of these were entered into the Sites and Monuments Record. Mapping has concentrated on West Penwith and much new information has been produced, despite the fact that extensive field survey has been carried out previously in this area. Air photo mapping in West Penwith has covered those areas not surveyed in the field and has provided information for some sites made inaccessible by vegetation cover at the time of the field survey. The use of fifty-year old RAF photographs has enabled the recording of sites in areas of moorland taken into agriculture before the field survey programme began in the 1980s. Carolyn Dyer, currently working in the Royal Commission offices in Swindon, is shortly to join the project staff and next year the areas between Newquay and Truro and between Godolphin/Wendron and Camborne will be mapped.

Luxulyan Valley

John R Smith

A wide-ranging programme of works in the Luxulyan Valley was organised by Cornwall County Council and Restormel Borough Council (the joint owners), with Land Reclamation funding from English Partnerships. CAU was involved from the outset as consultants, advising on all aspects of the scheme which would impinge on sites and monuments within the valley. Regular site visits were made during the works, and the CAU officer attended regular progress meetings to monitor the scheme. The outcome has been very satisfactory for the joint authorities. Potentially hazardous shafts and adits have been made safe without compromising the archaeology or disturbing wildlife, being fenced and grilled, not capped; the key structures and buildings in the valley have been

consolidated and made safe; and public access to the Trevanny Kiln and Wheelpit areas has been significantly enhanced. Many of the works involved significant challenges for the contractors and CCC's Design Consultancy. In particular, the 20 metre high chimney stack at the Trevanny Kiln had to be scaffolded, partially dismantled, and rebuilt with new iron bands and lightning conductor. At the Wheelpit, access improvements involved a new footbridge over the leat, the construction of a visitor viewing platform, and new handrails, steps and footways. The scheme was completed in July 1998.

Colliford feeder pipeline

Nigel Thomas, Ann Reynolds

During the installation of a feeder pipeline into Colliford Reservoir, running south of Bodmin Moor towards Lanhydrock, we were commissioned by South West Water to carry out an archaeological watching brief. Evidence from archaeological features pointed to a fairly stable agrarian landscape, characterised by drainage ditches and removed boundaries, but generally with relatively few features or finds. Comprehensive boundary recording took place along the route, including environmental analysis of buried soils from three boundaries. Results indicated an open heathland landscape around Lanhydrock and Mount and a sequence of hazel woodland and open grassland at Lettermoor. Evidence of moorland reclamation and possible World War Two features were located, and ancient boundaries, possibly prehistoric, were surveyed and excavated on Treslea Downs.

St Minver Church

Carl Thorpe

The construction of a toilet and store north of the tower resulted in the exposure of a complex slice through the churchyard, recorded for St Minver Parochial Church council by CAU. Three medieval graves were recorded, one of which pre-dated the 13th century north aisle. The graves themselves were cut into the fill of a substantial early ditch or quarry.

King Street Truro

Jacky Nowakowski and Ann Reynolds

Trial trenches and a watching brief were carried out for Nos. 6 and 7 King Street Truro, prior to the conversion of the shops into one building. Both were known to date to the 18th century and as such were Listed structures. The area to the rear once made up part of the land of the Robartes' Great House which was built in the latter half of the 16th century. Trenches to the rear of No. 6 located a deep channel some 4.5 metres wide, cut into the natural subsoil and revetted by shillet walls. Material from the infill of this channel suggested that it may have predated the extension of the Great House outbuildings along this line in 1663. Other finds pointed strongly towards 16th and 17th century activity in the area, including imported artefacts from Spain and Belgium. High status building materials were again linked to the Great House. Evidence was also found of the 18th century buildings, from both standing remains and below ground features and artefacts. Phases of 19th and early 20th century remodelling were also revealed.

Wheal Owles, St Just

Adam Sharpe

Woven ground reinforcing matting was installed across extensive, loosely backfilled outcrop workings on the seaward side of Wheal Owles, St Just, during land reclamation works for the National Trust and CCC. The area opened up for such treatment was large, requiring an extensive watching brief, which revealed not only a number of unrecorded mining features, but also a Bronze Age saddle quern and a number of rubbing stones within an area where no evidence for prehistoric activity had previously been found.

United Downs

Adam Sharpe

An excavation for Cornwall Environmental Services Ltd undertaken during October 1997 on the fringes of the United Downs landfill site revealed remarkably well-preserved evidence for a small dressing floor associated with the 18th-century Cupboard Hill tin-stamping site (SW 746 410). The features excavated included timber-lined launders, a washing strake, trapezoidal buddles, compacted working surfaces, spalling floors and remains of contemporary mining waste. The investigation of a site of this type and period by excavation has provided a rare opportunity to examine the field evidence for technologies central to the evolution of the ore dressing process, for which documentary descriptions have hitherto been our only source of knowledge.

St Michael's Mount

Peter Herring

Fieldwork is often followed by a lengthy process of archive collation and further analysis before final reports can be presented: it is often only as specialists' reports are completed that the results of fieldwork are fully understood. Trenching in advance of cobbling at the summit of St Michael's Mount was undertaken in 1997. Although no significant structures were recorded, numerous sherds of pottery were collected. Examination by Carl Thorpe, the Unit's finds specialist, has confirmed that most are, as expected, medieval and no doubt relate to the castle and priory, but six others are fragments of the same kinds of post-Roman Mediterranean amphorae (large storage vessels) that have made Tintagel such a famous site. The six sherds of 'B wares' are the first concrete evidence to support earlier suggestions that the Mount may have served a similar function as 'Arthurian' Tintagel, namely as a courtly centre for a local elite.

Cornish hedges

Peter Herring, Eleanor Bull

Much of the landscape character of the enclosed parts of Cornwall (which make up 80% of the county's area) is provided by the tens of thousands of miles of field boundaries, usually known as Cornish Hedges. Their historic importance is considerable. As well as being defining elements of prehistoric, medieval or post-medieval field systems, boundaries contain valuable historic and archaeological information in their variety of forms. These can indicate age, changing boundary

construction methods and management practices, land use on each side of the boundary, social status (via the finish given to the boundary), and changing economic fortunes (via quality of maintenance etc). In addition, built hedges can conceal evidence of earlier episodes in their lives in the layers contained within their structure, and can also seal beneath them buried soils containing, in soil structure and trapped ancient pollen, information concerning earlier local environments.

The Unit has, over the years, carefully recorded boundary form and size in its detailed surveys of field patterns, and in the last ten years has drawn hundreds of sections through field boundaries cut for roads, pipelines etc. Some soil and pollen analysis has also been undertaken of buried soils, mainly by Vanessa Straker of Bristol University. A mass of information has been accumulated.

An opportunity to review the data collected and to draw preliminary conclusions from them was presented to the Unit by the placement with us for nine months of Eleanor Bull, an archaeology undergraduate at Bradford University. A three-part project was devised with Eleanor which has yielded a good draft report which is a valuable overview of Cornish field boundaries. After reviewing the published literature on Cornish field boundaries, a detailed questionnaire was prepared asking respondents for local, farm or parish-based information on various aspects of boundary studies, including boundary form, facing styles, traditional management practices, forms of fences, gates, and stiles. This was sent to various countryside managers and, with the kind help of Mary Combe and the Farming and Wildlife Advisory Group (FWAG), to many interested farmers, throughout the county. The results, as collated by Eleanor, help us to better understand the field boundary geography of Cornwall and will be useful in guiding local repairs and rebuildings. Recommendations for improved procedures for selecting and methods of recording boundaries to be sectioned were also drawn up by Eleanor after she had reviewed the results of the hedge-sectioning programme.

New Protection for Hedgerows

John Gould

Since 1 June 1997 the Hedgerow Regulations 1997 (Environment Act 1995) have given protection to important hedgerows which are integral parts of ancient field systems and/or which contain important plant or wildlife species.

Applicants who wish to take out hedgerows are required to submit a hedgerow Removal Notice to the relevant District Council. The District Council has six weeks to assess the importance of the hedgerow according to archaeological, historic and wildlife criteria. Cornwall Archaeological Unit is consulted by the districts about the importance of each application with regard to archaeological criteria.

CAU has provided historical information on thirty-two hedgerow consultations across the county and provided further information to District Councils for three appeals and has represented a District Council at one appeal. So far two of the appeals have been turned down and the hedgerows retained.

Defence of Britain Project

Nicholas Johnson

This national survey of 20th-century defences is managed by The Council for British Archaeology with important input in England by English Heritage and The Royal Commission on the Historical Monuments of England. In Cornwall the Unit has been pleased to act as a clearing station for new data. The National Mapping Programme is resulting in the 'capture' of substantial military sites including radar and wireless stations, anti-invasion defences, D-Day installations, hutted

encampments, ammunition depots, airfields, seaplane bases, decoy sites and firing ranges. All historic military remains are noted as a matter of course during fieldwork projects.

Much of this information is checked by the indefatigable Defence of Britain Co-ordinator (Cornwall), Alwyn Harvey of Falmouth. Over two hundred sites so far have been visited and photographed. Some of Alwyn's more obscure sites have included a barrage balloon shed, a Cold War nuclear fallout meteorological station, an underground Home Guard Resistance Unit hideout, and a pillbox that having been bricked up and used as a fisherman's store, fell from the cliff and floated upside down into the Hayle Estuary! Alwyn's help is greatly appreciated.

Tamar Valley Land Reclamation Scheme

Colin Buck

Some of the most impressive remains of Cornish mining are to be found in and around the parish of Calstock, and will be included in the bid for World Heritage site status. Cornwall County Council is producing a strategy for the Tamar Valley to assess and address the long-term needs of, in the first instance, the most important complexes. This is intended to result in repairs to crumbling masonry, safety works, arrangements for low key public access and, where appropriate, provision of site information; the works would be carried out as a programme of Land Reclamation Schemes operated by Cornwall County Council and funded by English Partnerships, under the umbrella of the Cornwall Land Reclamation Strategy. Lying as it does within an AONB (Area of Outstanding Natural Beauty) it is all the more important that any proposed works should be designed to protect and enhance the historic, wildlife and landscape value of this area.

In October 1997 Cornwall Archaeological Unit was asked by the Coast and Countryside Unit of the County Council's Planning Directorate to undertake preliminary archaeological assessments of mine sites to guide the strategy, involving a desk-study followed by a rapid field assessment.

Ordnance Survey 1880–1884 1:2500 maps of the study areas and both Cornwall and Devon's archaeological Sites and Monuments Records were consulted as well as relevant historical and industrial archaeological texts. Other useful sources included (for the Cornwall side) the survey findings from the Tamar Valley Rapid Identification Survey carried out in 1994 by Colin Buck and Nigel Thomas of CAU for RCHME. For the Devon side of the Tamar Valley, two survey reports by the Exeter Museums Archaeological Field Unit were studied, covering Gawton Mine and Arsenic Works (1989), and Devon Great Consols Arsenic Works (1989). Field visits within Cornwall were made during November 1997, and those for Devon in March 1998. Thirty-seven separate mine/industrial sites were identified on the Cornwall side of the project area, of which twenty-three have been assessed. Fifty separate mine/industrial sites (including five mines which made up the Devon Great Consols amalgamation) were identified on the Devon side of the project area, of which twenty-two have been assessed.

Each mine site included in the first phase of the proposed works (essentially the larger complexes) has been briefly described in the archaeological section of the forthcoming Tamar Land Reclamation Strategy, in terms of statutory and planning designations, historical background, main extant features, and site/feature condition. Preliminary reclamation suggestions have been itemised and relevant remarks about the site or area noted.

Most sites will require a full archaeological survey with specific management proposals and recommendations for the site as a whole. Adequate recording both before, during and after the works will be necessary given the historical and environmental importance of these mine sites on both sides of the Tamar Valley, and the likelihood that some will be recommended by English Heritage for statutory protection as Scheduled Monuments.

Pengersick Castle, Breage

Peter Herring

Here, hemmed in by the Praa Sands caravan and chalet parks, is one of Cornwall's most romantic castles, and one of its most enchanted, if the legends of wild cavortings by sorcerers, witches and the devil are to be believed. Pengersick's devoted and enthusiastic owners, Angela Evans and her son Guy, have long been considering how best to interpret and present their property to the interested public, and to parties of school children. Recent elusive references to a medieval physic garden and a Tudor rose garden have spurred them into preparing plans for reconstructions of both in their grounds, to the east of the tower. The defended tower is a Grade I Listed Building and some of the site is a Scheduled Monument, so English Heritage has an interest in guiding the family in their decisions. The Cornwall Heritage Trust also became interested in the site and the two bodies jointly commissioned CAU to organise a reconsideration of the various strands of evidence for Pengersick's history so that any advice was well-grounded.

Mrs Evans has been for several years assiduously collecting information on Pengersick and the medieval and Tudor families who shaped it, the Pengersicks, Bevils, Worths and Millitons. This was kindly made available to CAU who re-evaluated it in conjunction with a re-appraisal of the building history of the tower undertaken by Beric Morley. The tower has traditionally been regarded as late medieval, that is late 15th or early 16th century, and attributed to a William Worth through the WW inscribed on the stone labels of the tower's highest window. Beric used numerous forms of evidence within the tower's structure (window forms, timber and stone mouldings etc) to strongly suggest a significantly later date, nearer the end of the 16th century.

With this in mind the family history and other map and documentary evidence was closely reviewed alongside a reconsideration of the text and images in the oil paintings which were once installed in the tower. It appeared that Pengersick had been largely abandoned while owned around the turn of the 16th century by the Worths (a family living in Devon) and that it was the first of the Millitons, captains of St Michael's Mount, who created the house, perhaps in the 1520s, to which the tower was added, as a defended vertical suite of rooms, almost certainly in the 1550s. The oil paintings built into it celebrate the success of the marriage of William Milliton to Honor Godolphin over twenty years earlier with words denouncing divorce so vigorously that they would have been impossible to display in the later part of the reign of Henry VIII, or that of Edward VI. The WW label would then represent the Christian names of William Milliton, the father, and William Milliton his son and heir. Sadly the latter died young and the estate was split up between his sisters, ending its Tudor importance.

A defended western gateway and small courtyard had been previously recorded by Carl Thorpe. A larger eastern court, to the rear of the first, *c*1520 house, but probably made into the front court on the building of the tower, whose decorated side faces it, was recorded by Carl, with Ann Reynolds. Their small-scale excavations within the mowhay, beyond to the east, confirmed what the map and picture evidence had strongly suggested, that this was a late enclosure associated with the post-medieval re-use of Pengersick as farmsteads.

On the rising ground to the north-east, however, a levelled platform *c*33m square was identified in a rapid survey of the wider landscape which also located a small deerpark. The platform was shown on a 1695 map and local relative chronologies suggested a date probably earlier than that of the 1520s house. An interpretation of the development of the settlement of Pengersick was prepared which has this platform as the site of a 14th or 15th century house, possibly defended, either replacing or being attached to a typical Cornish farming hamlet beside the stream to the south-east. This was abandoned in favour of the *c*1520 house, perhaps after a period of abandonment or neglect.

A geophysical survey of this platform, commissioned by the Cornwall Heritage Trust, was undertaken by South West Archaeology and identified what appears to be several conjoined rectangular buildings arranged around a square courtyard. Further geophysical surveys in the area

of the mowhay and the likely site of a late medieval chapel produced the expected traces of the 16th century eastern farm buildings range in the former, but only confused readings at the latter.

The various works carried out at Pengersick in 1997 have produced a fairly radical re-appraisal of the site's history, and a useful assessment of the importance of its components which will not only assist any review of the statutory protection it receives but also guide responses to the several structural, horticultural and arboricultural changes planned by Angela and Guy Evans.

Treen and Rospletha Cliffs, Penberth Valley and Cove

Jeanette Ratcliffe

An archaeological assessment carried out for the National Trust included Treen and Rospletha Cliffs, and Penberth Valley and Cove. Located on the south coast of West Penwith, this is a property of sharp contrasts - between the exposed and rocky coastal heathland, the sheltered valley slopes occupied by small flower fields (now mostly overgrown with scrub and trees) and the tiny fishing harbour of Penberth Cove. The area is popular with visitors, who are drawn to the dramatic granite headland of Treryn Dinas, enclosed by the ramparts of a nationally renowned Iron Age cliff castle (a Scheduled Monument) and dominated by the famous Logan Rock, a large rocking stone which sits atop a crag at the promontory's seaward end. The assessment consisted of a limited amount of historical research, followed by a rapid walk-over survey. The aim was to define the different types of historic landscape (Coastal Rough Ground, Anciently Enclosed Land, 19th and 20th-century Flower Fields and Penberth Cove), identify specific archaeological sites, and draw up archaeological management recommendations for the property.

Ethy, St Winnow

Peter Herring

Ethy is the 18th century park which catches your eye as you come down the Polperro road into Lerryn. It lies on the north bank of the Lerryn River and is part of a National Trust property that has been managed mainly for its superb creek and valleyside woodlands. The Trust intends to restore the park, which is in agricultural tenancy, to something like its former glory, the fine Georgian country house having been sold some years ago. Countryside Stewardship funding (provided by the Ministry of Agriculture, Fisheries and Food and organised by the Farming and Rural Conservation Agency) for capital works and changes to agricultural regimes in parkland is dependent on the preparation of detailed Historic Landscape Surveys and a Restoration Plan, and the Unit was commissioned to prepare such for Ethy in the autumn of 1997.

As well as historical and archaeological surveys (the latter undertaken by Cathy Parkes), the Unit recorded views within, from, and to the park, to help understand and reconstruct the original designs of the multi-period ornamental landscape at Ethy. The Courtneys, that famous Devon family, had established a branch here in the 16th century but Ethy had been a locally important house as early as the late 13th century. Fragments of a 17th century garden layout survive, including embanked avenues along an L-shaped approach and part of a raised walk from which distant views of the Lerryn and Fowey Rivers could be had. The main park, with two lawns edged by ha-has and containing scattered standard trees, was laid out in the 18th century by the Arscotts, and altered and extended by Admiral Penrose, a colourful tenant of the Mount Edgcumbes, in the early 19th century. Walks and drives were guided past rocky outcrops in the wooded western valley and down to a boathouse and quay at Ethy Rock, a low headland in the tidal Lerryn River.

These woodlands, and the wood pastures on the southern creekside slopes, can be demonstrated from both archives and archaeology to be ancient, and thus valuable habitats. To better understand their communities, and to ensure that future management conserves and enhances them, a number of biological surveys, supplementary to the Trust's decennial biological surveys, were sub-commissioned from specialists. All produced valuable information (their lists including numerous protected and rare species) that enhanced our understanding of the development and dynamics of the various parts of the property, not just the woodlands but also the park and the neglected western valley-bottom meadows and orchards.

The general vegetation survey (by Angela Howard and Nicola Roberts of the Cornwall Wildlife Trust) identified various important woodland, saltmarsh and mire communities, as well as important species like bastard balm, hay-scented buckler fern and common twayblade. Parkland trees and woodlands were recorded by Sue Pring of Geoffrey Pring Associates; new formulae for estimating the ages of slower-growing Cornish trees from girth measurements were suggested.

Many rare species of fungi were recorded by Ted Green and his colleagues, especially in the woods near Ethy Rock. These less-shaded beech and oak trees down by the water also host important communities of lichens and bryophytes (surveyed by Dr Francis Rose and Simon Davey), as do some of the parkland trees. Deadwood beetles were found on standing and fallen trees throughout the woods (recorded by Adrian Spalding).

The National Trust will use these findings to ensure that Ethy retains its historic integrity and remains one of the most beautiful and ecologically important corners of Cornwall.

Goonhilly Satellite Earth Station

Charles Johns

In 1997, as part of a joint site management plan with English Nature and English Heritage, British Telecom commissioned CAU to carry out an archaeological survey of their land at Goonhilly Satellite Earth Station.

Goonhilly Downs, situated at the heart of the Lizard peninsula in Cornwall, is an area of unique natural characteristics and is archaeologically significant for the remarkable concentration of Early Bronze Age round barrows, which indicate that the surrounding area was densely settled at that time (*c*2400 to 1500 BC). Within the study area there are seven prominent barrows and a standing stone or menhir that form part of a well-preserved ancient ceremonial landscape at Dry Tree, the highest point of the Downs.

In addition to their ritual significance it is probable that the barrows functioned as important territorial markers, associated with boundaries dividing up the Downs, which at that time were predominantly grassland. The prehistoric fields and settlements would have been in the areas surrounding Goonhilly, in the same areas as the present day farmland.

The main use of the Downs from the prehistoric period onwards will have been for summer grazing for livestock, the collection of turf and furze (gorse) for fuel and for hunting. The name Goonhilly is first mentioned as 'Moor of *Goenhili*' in about 1240 and probably means 'downs of hunting'.

The large number of 'turf huts' widely scattered over the Downs are now interpreted as post-medieval turf rick steads, for the temporary storage of turves collected and dried for fuel, associated with domestic use rather than with late medieval supply of peat for the tin smelting industry. Within the study area is one small turf rick stead and an area of disturbance that may be the result of turf or peat extraction.

From the 16th century until the mid-19th century Goonhilly Downs was famous for an eponymous breed of hardy ponies; changing land use on the Downs may have been one of the

factors in their disappearance. Within the study area there are a number of earthen boundary banks, evidence of 19th century enclosures and land improvement.

The Earth Station is built on part of the site of a Second World War radar station, RAF Dry Tree, and the concrete bases of the radar mast positions and mast stays are scattered throughout the site. Also dating from the Second World War are over a hundred anti-landing obstructions, the ubiquitous turf stacks which are now a distinctive, rather eerie, feature of the landscape.

Goonhilly Satellite Earth Station is itself of very great historic significance. It was one of the first three satellite stations in the world and it was from here, in 1962, that the first live transatlantic television picture was transmitted to America.

Cornish Woods

Peter Herring and Cathy Parkes

The 1994 Historic Landscape Characterisation project identified a number of historic landscape character zones where archaeological recording and landscape history research has been less thorough than others. One of these was Steep-Sided Valleys, the parts of the Cornish historic landscape that contain most of Cornwall's ancient woodland. In the years since 1994 the Unit has welcomed opportunities to investigate such valleys, either in themselves or as elements of wider landscapes. Earlier surveys of Lanhydrock, the lower Heligan valley and Ethy, were joined in 1997-8 by others of the new Cornwall Wildlife Trust nature reserve at Cabilla and Redrice Woods in Cardinham (by Cathy Parkes for Environmental Consultants (CTNC) Ltd), Home Farm in Minster (by Cathy Parkes for the National Trust), and the lower Seaton Valley (by Peter Herring for Caradon District Council).

Most of these archaeological and historical surveys have been undertaken in conjunction with various biological surveys, and all have identified areas of both ancient and secondary woodlands. Typical components of the former have been large numbers of coppice stools (mainly oak and hazel) with more variable numbers of charcoal burners' platforms (hundreds in Cabilla and Redrice Woods, a handful in Minster Wood at Home Farm, and none recorded in the woods along the Seaton Valley). Woodland banks built around perimeters and to subdivide woods were recorded on all sites, as were woodsmens' trackways.

Equally important has been the lack of evidence of any arable farming within the woods; no field systems, lynchets or cultivation ridges. This negative archaeological evidence can be added to the many biological indicators of continuous woodland cover (species of lichens, moss, fungus, flowering plants, invertebrates and trees) to confirm that these woods really are ancient. They are not, however, wildwoods as all have been thoroughly and intensively managed and harvested from at least the medieval period.

Charlestown

John Smith

Charlestown, a coastal village situated to the south-east of St Austell, includes a tidal harbour and wet dock, hotel, public house, nonconformist chapel, Anglican church, some small shops, and a variety of domestic houses. Until 1986 it was in the sole ownership of the Charlestown Estate. Much of the settlement lies within a Restormel Borough Council (RBC) Conservation Area, and many individual buildings have Listed status. In late 1997, applications for the development of buildings and sites within the Conservation Area prompted the Local Planning Authority (RBC) and English Heritage to jointly commission an assessment of the built environment of Charlestown, which was carried out by Cornwall Archaeological Unit in February and March 1998 on their behalf.

A combination of many factors makes Charlestown a unique settlement within Cornwall. It is one of the best examples of late 18th and early 19th century harbour works in Britain, of an era when the civil (as opposed to the naval) engineer really came into his own. Charlestown's setting in a shallow coastal valley has been maintained into the present day, giving it a truly rural environment at odds with its close proximity to the conurbation of St Austell. Most extraordinary is the preservation of so much of the built environment from the 18th and 19th centuries which has so often been swept away elsewhere in Cornwall. This relates not so much to the houses themselves, for many other examples survive from the same period, but the domestic and industrial infrastructure which surrounds them: the earth closets and wash houses, little yards and gardens, alleyways and lanes, and around the harbour itself bollards, cobbles, steps and mooring rings. Nowhere else in Cornwall is it possible to step so immediately into the ambience of an early 19th-century working port. The underlying reason for this circumstance is the continuity of ownership by two successive landlords from 1784 to 1986. As a result, Charlestown embodies some of the most vital aspects of social and economic change in Cornwall during the period 1790 to 1850.

The first stage of the assessment was a desk-based project to gather together all the readily available historical sources relating to Charlestown. This included literary sources (published and unpublished), historic maps and plans, historic photographs, and air photographs. The Cornwall and Scilly Sites and Monuments Record (SMR) and the English Heritage Listed Building descriptions were also examined. From this material a series of base maps was prepared, using the current OS 1:1250 survey, and the buildings and sites identified as historically significant were defined and numbered. A gazetteer was then prepared in tabular format, keyed to the maps.

CAU fieldworkers took the base maps and gazetteer into Charlestown, and assessed and photographed each significant structure and site. A description was recorded onto tape, for later transcription to the Inventory. Additional sites not identified in the desk study were added by the fieldworkers to the gazetteer. No domestic interiors were visited, but some industrial buildings were examined internally. The Assessment report combined all this information with an inventory and a set of key maps identifying each structure or site at a scale of 1:2500. A total of 241 sites were itemised and described within the report. The survey defines and explains the historic character of Charlestown in terms of its present-day appearance, and aims to provide the Local Authority, English Heritage and the county with a definitive resource document for the town.

Scheduled Monument Management Project

Ann Preston-Jones

Supported primarily by English Heritage, the Cornwall Heritage Trust and Cornwall County Council, the Scheduled Monument Management Project has now been running for four glorious years. Over this time, a surprising total of over forty monuments have benefited in some way, and there never seems to be any shortage of potential work.

The financial year 1997–8 did not turn out quite as initially anticipated: for various reasons, some projects failed to come to fruition whilst others were fitted in at the last minute. In addition to what have now become the almost routine tasks of repair to earthworks, crosses and holy wells, there were a couple of themes evident in our work for this year. The first was in following up work at a few monuments we have been involved with in earlier years. For example, at Davidstow landscaping took place to restore the setting and improve access to the holy well which was consolidated and repaired in 1996. And following on from interest aroused by works at Halwyn dovecote, also in 1996, an information board has been provided this year.

This year we have also been involved in a number of surveys to explore and assess the condition

of monuments with specific problems – badger activity at Governs Round, tree and rabbit damage to a barrow in Mount Edgcumbe Country Park, and the extent of arsenic contamination at Botallack calciner, St Just. It is quite possible that the recommendations arising from these surveys will result in repair work by the project in future years. The following are some of this year's highlights.

Callington churchyard cross (SX 3585 6962)
The first project of the 1997-8 financial year involved the repair and cleaning of this 3.05m high cross with a granite lantern head carved with figures of Christ, saints and bishops, mounted on an octagonal shaft. In 1996 it was noted that the top of the shaft was badly cracked, and as the cross leans heavily towards the main path leading to the church porch this was a potentially very dangerous situation. Removal of the half-ton head by Sue and Lawrence Kelland, with assistance from Andrew Langdon, in June 1997 revealed that a central iron dowel had rusted and expanded, splitting the granite at the top of the shaft. The dowel was removed and replaced with a non-corrosive fitting, the cracked shaft repaired, and the opportunity also taken to clean the sculptured cross-head.

Laneast holy well (SX 229 838)
This delightful 15th-century structure, built of local greenstone, sits in an idyllic pastoral setting. Before repair it was in very poor condition, with the roof slumping, pointing missing, masonry loose in places, and a makeshift wooden door. It was also overgrown with brambles. After preliminary archaeological recording of the well-house by Anna and Andy Jones of CAU, consolidation work, overseen by David Attwell of North Cornwall District Council and executed by Fred Sanders of St Breward, focused on providing a solid and watertight roof and repointing where necessary with a hydraulic lime mortar. Seasoned local oak was used to make a simple and solid but attractive new door and a finishing touch was the provision of a new finger post, pointing the way to the holy well from the nearby road.

Merry Maidens
A vandalised stone at this famous stone circle had been re-erected in 1995 and a management agreement had recently been agreed between the farmer, Penwith District Council and English Heritage. CAU collaborated with Penwith District Council, to produce an attractive information leaflet.

Penbeagle Cross (SW 507 398)
This little cross was felt by St Ives Old Cornwall Society to be at considerable risk of accidental damage by lorries turning into the nearby industrial estate – the more so since past mutilation has left the monument scarcely recognisable for what it is. The Society therefore decided to move the cross back from the edge of the verge on which it was situated and to mount it on a new granite base, to which a brass plaque commemorating the event could be fixed. CAU, together with Mike Rosendale of Penwith District Council, helped in providing the new granite base-stone, carefully selected to blend with the medieval cross in its proportions, texture and degree of weathering of the granite. The work of carving the mortice in the base and re-erecting the cross was carried out by Adrian Thomas, David Cutting and Edward Bolitho.

Padderbury (SX 314 610)
This is a fine hillfort commanding superb views in south-east Cornwall. Thanks to the care and interest of Mr and Mrs Tregellas, the owners, the fort is fenced off from surrounding arable land and available for informal public access. Over the last few years, however, English Heritage had become aware of increased erosion to the rampart as a result of rabbit burrowing and sheep scuffing and in one place a large eroded scar had developed. So in March 1998 a group of volunteers from the British Trust for Conservation Volunteers spent a wet and windy few days infilling the worst scars with earth-filled sandbags, and turfing over. The result is a dramatic improvement in the appearance

of the monument, but it is now essential that the improvement is maintained by adequate protection and careful monitoring of the grazing pressure.

Governs (SW 794 460)
At Governs, just outside Truro, is an excellent example of a small Iron Age or Romano-British round (enclosed, defended settlement) set on a prominent spur overlooking the valley of the River Allen. Although basically well preserved, the rampart is home to a large colony of badgers, whose holes extend around almost a half of the rampart and into the interior. Mr Coad, the farmer, was concerned at the damage the badger sett might be doing, not only to the monument, but also to the ancient oak trees which are such a distinctive feature of the site. For these reasons, as well as to consider the effects of badgers on archaeological sites in general - an increasing problem in the south-west – Penny Cresswell-Lewis of 'Badger' Consultancy was commissioned to carry out a survey of the badger activity at Governs Round and at Mithian Barrow, near St Agnes (SW 739 489).

Marconi Bungalow

Charles Johns
During 1997 the Cornwall Archaeological Unit carried out a building and site survey of The Lizard Wireless Station at Pen Olver for the National Trust (SW 712 119).

The Lizard Wireless Station was established by Gugliemo Marconi in 1900. The Lizard Station, the first radio station to be built in Cornwall, originally consisted of two wooden huts and an aerial mast in an enclosure. The site is of considerable international importance for its role in the history of world telecommunications. As a coastal telegraph station it provided much needed funds to finance Marconi's research work and it was from here in January 1901 that the first wireless transmission was sent beyond the horizon to the Isle of Wight, paving the way for the dramatic trans-Atlantic breakthrough achieved by the powerful 'spark' transmitter at the Poldhu Station in December of that year. Subsequently modified for use as a holiday home and an RAF officers' mess in the Second World War, the building's particular importance lies in the fact that the wooden huts forming the core of bungalow are probably the oldest surviving purpose-built wireless communications buildings in the world.

The two huts used by Marconi form the end parts of the bungalow. The former radio hut is at the east end and the old accommodation hut is at the west end. A photograph of 1911 shows an annexe on the north side of the accommodation hut. The huts were joined by the addition of the kitchen in *c*1934, when another room was added to the west end. The lean-to structures along the north side of the bungalow were added at a still later date.

The buildings are sited at the southern end of a rectangular 2500 square metre site that is enclosed by a perimeter fence. Near the centre of the site is the concrete base for the wireless aerial mast. Amongst the features recorded during the CAU site survey were five aerial mast anchor points and three concrete platforms that probably formed the base of a water tower. At the rear of the bungalow are two level concrete bases probably for Second World War Nissen huts. An intriguing discovery, also from the Second World War, was a set of zig-zag trenches at the northern edge of the site, probably dug by RAF personnel for shelter from air raids.

A metal detection survey was carried out by the Kernow Search and Recovery Society, organised by Paul Frost, with the aim of locating discarded radio equipment which may have been buried on the site. A wide range of metal objects illustrating the history of the site was recovered but few of these could be positively identified as early radio equipment; such items would probably have been re-used or thrown over the cliff between Belidden Cove and Pen Olver.

It is anticipated that The National Trust's proposals to restore the original configuration of the huts will enhance public awareness and appreciation of its historical significance.

Gaverigan, Indian Queens

Jeanette Ratcliffe

During April 1997 English China Clay International (ECCI) obtained permission for a substantial extension to its Wheal Remfry tip, involving the loss of 42 hectares of farmland at Gaverigan (SW 926 575) and the re-routing of the Treviscoe to Indian Queens road. Archaeological assessment of the area revealed the remains of a mid to late 19th century brick and china-clay works (already partly obscured by tipping), field boundaries of medieval origin, and the potential for buried remains of prehistoric ritual monuments (barrows, pits etc) to survive within recently enclosed former heathland. As a result, archaeological conditions were attached to the planning permission and ECCI commissioned CAU to carry out a programme of archaeological recording. Measured sketch surveys were made of the remnants of two kilns and a chimney stack (part of Gaverigan Brickworks) and a pan-kiln (part of Hit or Miss China-Clay Works). Sections cut through the medieval boundaries were drawn to scale and the three buried soils identified were sampled for pollen in order to gain information about the surrounding vegetation prior to the laying out of the field system (the results of the pollen analysis are still awaited). Following a rapid walk-over survey and a magnetometer survey the next (and, as it transpired, final) stage of the fieldwork was to investigate surveyed features by excavating (by machine and hand) a series of test trenches across them. These revealed pits, banks, leats or drains associated with tin streaming or china clay extraction, but no earlier archaeological remains, and, as a result, further excavation was considered unnecessary.

The entire 42 hectares were scanned using a magnetometer in order to obtain an initial idea of the extent of below ground features. 'Hot spots' revealed by the scanning were then recorded by detailed magnetometer survey. This is the first time that this two-stage geophysical survey method has been used in Cornwall. On the whole it proved a cost and time-effective way of dealing with a large area of enclosed land and it has subsequently been used by CAU to assess buried archaeological remains along proposed pipeline routes. Magnetic responses were, however, generally weak at Gaverigan, perhaps as a result of the local geology (the china clay may have had a dampening down effect).

Lanhydrock Park survey

Nigel Thomas

In 1994 CAU carried out a brief assessment of the Lanhydrock estate. During fieldwork, the extensive park surrounding Lanhydrock house was found to contain earthworks of various periods, with many representing part of a strip field system dating to the period before the estate was bought by the Robartes family. Other features reflect changes to the park in the succeeding centuries and include remains of 17th century gardens, a boundary of a deer park, 18th/19th-century ornamental features, and earlier 20th-century remains. In 1997 the Trust commissioned a measured survey, to accurately map all the features within the park. This new survey was intended to provide a tool for positive management to protect the remains and also act as a basis for interpretative material.

Re-survey of the park (covering approximately 65 hectares) was carried out during the winter of 1997-98 by a team comprising Nigel Thomas of CAU and members of the Technical Services

section of Cornwall County Council. Survey was carried out using a total station (electronic theodolite), and data logged during the survey was subsequently edited using AutoCAD software. Older trees within the park are themselves part of the archaeological remains and an earlier tree survey carried out for the Trust was digitised for addition as a layer on the electronic survey base.

Re-investigation has allowed the features within the park to be much more accurately mapped and the relationships between them better understood. More features were recorded than were noted in 1994 and this has in turn enhanced the usefulness of the survey and the interpretation arising from it. The use of computer software has also allowed survey information to be separated and layered by period or interpretative phase and distinguished by colour and other conventions, to give a graphic indication of how the park has evolved.

The study at Lanhydrock has shown that parkland and earlier features have survived through lack of modern ploughing. This has in turn given rise to the question as to whether other estates have potential for survival of pre-parkland relict landscapes.

Pendennis Castle

Charles Johns

Pendennis continues to be the focus of much activity both at the castle and on the headland as a whole, maximising the presentation of its complex military history as a fortress from the 16th to 20th centuries. Careful monitoring and recording during the works adds continually to our understanding of this history.

Car Parks. In 1996 CAU carried out watching briefs for English Heritage during construction of a new staff car park at Pendennis Castle and a new visitors' car park on the lower Hornworks. Groundworks associated with the staff car park revealed the granite footings of a Napoleonic period magazine (magazine No 5) and various late 19th-century ancillary structures. One of the most significant results of the project was the rationalisation and recording of the complex network of buried services in the car park area.

An electric ducting trench revealed a possible Elizabethan wall in Carrick Mount Bastion and the remains of a possible Second World War firing range in the moat.

The Hornworks defences, first built in 1627, have been destroyed in the visitors' car park area by late 19th-century quarrying. However, work on one of the footpaths uncovered steel cables and a concrete slab indicating the site of Second World War barrage balloon winding station. The discovery and disposal of three anti-armour mines nearby attracted the attention of the local media.

Kitchen Drain. In October 1997 CAU monitored and recorded the excavation of two small trenches in the Keep moat with the purpose of isolating the cause of flooding in the 'Tudor' kitchen which is the remains of a later 16th-century building on the outer edge of the keep moat, opposite the entrance block. It was found that the lead outflow pipe from the kitchen had been choked by debris. An interesting result of the investigation was the discovery of a blocked rock-cut underflow drain which was part of the original building.

Electric Services Upgrade. In 1997 CAU carried out a watching brief for English Heritage during the upgrading of the electrical installation. The aims were to deflect the impact of the groundworks on buried archaeological remains and to record any remains uncovered. Structural remains of numerous demolished 18th and 19th-century buildings were uncovered and a large assemblage of artefacts recovered. The watching brief confirmed the complexity of the underground servicing at Pendennis Castle which is recognised as an important but still to be fully understood part of the Castle's historic fabric. Some 223 buried services were revealed including electric and

communications cables, water pipes and drains; each one was recorded and, where possible, cable runs were preserved intact.

St Austell North East Distributor Road

Charles Johns

Archaeological investigations along the route of the St Austell North East Distributor Road were undertaken by the Unit in July and August 1997, concentrating on the excavation of a multi-period prehistoric landscape at Trenowah (SX 0450 5337).

The project was funded by Cornwall County Council, Transportation and Estates. Following an initial assessment of the archaeological potential of the road corridor, which included a desk-based study and a walkover survey of the route, there was further evaluation in the form of a geophysical survey of a sample area at Trenowah (by Geophysical Surveys of Bradford). This revealed extensive traces of probable prehistoric land use, confirmed by a number of trial trenches.

The excavation, taking in a huge area of some 13,000 square metres, was undertaken over a period of four weeks by a core team from CAU assisted by a team of volunteers including students and members of the Cornwall Archaeological Society, to whom the Unit is very grateful. The site was located on a south-facing hillslope looking out over St Austell Bay and the earliest evidence of human activity consisted of a concentration of Bronze Age pottery in a spread of dark-coloured earth sealing a number of small charcoal-rich pits.

The subsequent phases, dating from the Iron Age, consisted of a sequence of curvilinear enclosures culminating in a series of three linked enclosures, the southern one defined by a stony bank, the others by substantial ditches. The middle enclosure had numerous postholes on the inner edge of the ditch. It was remarkable to see a prehistoric field boundary surviving so well just beneath the ploughsoil, in an area that has been settled and farmed continually to the present day. Later in prehistory there seems to have been a drastic change in the organisation of the farming landscape; the enclosures were cut through by a succession of linear ditches also producing Iron Age pottery and there were also a number of pits filled with pottery, quernstones and a mould fragment.

By the medieval period the landscape had changed again; the pattern of strip fields associated with the present farm of Trenowah, a settlement probably of pre-Norman origin, has a different layout and cuts across the line of the later prehistoric fields. In the post-medieval period the area had been disturbed by mining activity and there were numerous miners' shafts and trial pits. A distinctive feature of the site was a large sub-rectangular spoil heap revetted by stone blocks.

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Exeter Archaeology Cornish Projects, 1996-1999

[Editors' note. Exeter Archaeology is an archaeological contracting unit that regularly undertakes recording projects within Cornwall. We welcome the opportunity to publish the following summaries of its work; see also the fuller paper by Peter Stead and others on the 1999 excavations at Nos 4–6 Pydar Street, Truro, presented in this volume. Summaries of work undertaken in 2000 have also been received and will be published in the next volume.]

1996

No 12 Southgate Street, Launceston (SX 332845)

A small evaluation consisting of two 1m square pits was carried out within a courtyard to the rear of the building. The site lies within the medieval walled town and it was considered that deposits or features of this period might have survived. Natural subsoil directly underlay a modern brick surface demonstrating that the area had at some time been truncated. With the exception of a shallow undated drain, no archaeological features were found.

1997

Former Council Depot, Town Mills, Launceston (SX 327850)

A field evaluation was carried out in advance of redevelopment. Archaeological concerns arose as a result of the location of the site within the former Launceston Priory precinct. Natural clay subsoil was located within six of the seven trenches excavated, sloping markedly from south-west to north-east. All the trenches were filled with homogenous clean clay and slate, suggesting a single phase of levelling. No significant features were found with the exception of a discrete area of metalling and a thin buried turf line, both over subsoil. Neither of these could be dated.

St Austell Street, Truro (SW 829448)

Recording was undertaken during the excavation of a 37m long drainage trench at the site of the Old Post Office Sorting Office. The site lay on the western outskirts of the historic medieval core of Truro, within the former intertidal zone of the River Allen. It was established that the site represented a single phase reclamation of nineteenth-century date. No earlier material was identified.

Superdrug, No 13 Boscawen Street, Truro (SW 82594478)

The site lies within the historic core of Truro and the former tidal flood plain of the River Kenwyn. Evaluative investigations were undertaken consisting of 13 hand-dug pits on the sites of proposed pile positions for a new building. It was hoped to reveal evidence of structures or deposits relating to earlier waterfronts and to understand the process and sequence of reclamation.

Three phases of reclamation were identified, each indicating a narrowing or canalisation of the River Kenwyn. A waterfront wall was located 18m back from the present water frontage. This represented the earliest reclamation on the site and was dated by pottery to the eighteenth century. A second wall, later but also of eighteenth-century date, was located 11m from the present frontage. No evidence was found for a medieval land surface.

Trethorne Golf Course, Tregadillet (SX 28858370)

Three extant historic hedgebanks of varying types were recorded prior to their removal as part of the expansion of the golf course. Hedgebank 1 represented a perimeter boundary between medieval field systems; hedgebank 2 was a pre-eighteenth century (perhaps late medieval) close boundary; and hedgebank 3 was a reused medieval strip boundary. All three hedgebanks sealed smaller earlier banks. No obvious differences in bank structure were observed between the three types of hedgebank and no dating evidence was recovered. Soil samples were taken in order to evaluate pollen survival but none proved suitable for micromorphological analysis.

1998

Forrabury Common, Boscastle (SX 09729090)

A watching brief was maintained during the excavation of a 250m long, 0.6–0.8m deep BT cable trench across Forrabury Common. The Common contains a remarkably well-preserved medieval field system characterised by narrow elongated cultivation strips, known locally as 'stitches'. For the greater part of its length the cable extended along the length of one of the stitches.

Deposits consisted of modern plough soil, 0.3m thick, over a band of stony grey soil that became stonier with depth. This lower deposit may represent the remains of medieval ploughing, although it is likely to have been disturbed before the soil developed to present depths. Forty-four sherds of pottery were recovered over the course of the trench. The majority dated from the eighteenth and nineteenth centuries with no medieval, immediately post-medieval or earlier finds being recovered.

Perrancombe Stream Flood Alleviation Scheme (SW 75715435 – 75345355)

The scheme involved the rebuilding and widening of an existing culvert and the construction of a new culvert along the route of the canalised Perran stream. Archaeological monitoring was carried out during construction work, in specific areas where archaeological deposits were considered most likely to be exposed.

The only *in situ* deposits were in the vicinity of Beach Road during the widening and rebuilding of the stream outfall and culvert. Here the stratigraphy consisted of sand and gravelly beach deposits. Elsewhere, substantial spreads of late nineteenth-century mine waste, between 0.7m and 4.0m deep, obscured any potentially earlier material.

No 12 Lostwithiel Street, Fowey

Several loose human bones were uncovered during building works on the site. Exeter Archaeology was asked to determine the character of the finds. Six intercutting burials containing articulated skeletons were uncovered in the north-east corner of a room. All the graves were aligned on an east-west axis in the conventional Christian manner. No dating evidence was obtained from any of the graves. The building dates to the early eighteenth century and backs onto St Finbarrus' churchyard. It is likely, therefore, that the graves represent pre-eighteenth-century parish burials.

No 18 Lower Fore Street, Saltash (SX 43165882)

A watching brief was carried out during groundworks for an extension at the rear of the property. During the cutting of foundation trenches, the slate foundations of a building were identified, lying directly beneath the modern surface. The position of these foundations corresponds to that of a cottage depicted on the *c* 1840 Tithe Map.

1999

Parade Motors, The Parade, Liskeard (SX 251645)

A field evaluation was carried out prior to the conversion of the garage into retail units. A single wall was found, the alignment of which suggested that it represented part of an earlier, possibly eighteenth-century, building. Post-medieval truncation had removed all evidence of earlier occupation.

The Cornish Arms, Crockwell Street, Bodmin (SX 07316703)

An assessment and field evaluation of the car park of the Cornish Arms was carried out in advance of redevelopment. The site lies within 15m of the culverted Town Leat, thought to be medieval in origin. Two trial trenches were excavated. An extensive deposit of rough-hewn shillet and clay was found throughout both. This was excavated to a general depth of 1.30m at which point groundwater was encountered. This material was interpreted as the infill or reclamation of an area of low-lying ground, most likely the upper bank of the stream that at some point was canalised to form the Town Leat. This fill was overlain by the remains of eighteenth-century (or later) buildings. No evidence of medieval occupation was found, although the shillet and clay spread may represent the infill of a medieval horizon.

Whitsand Bay Holiday Park, Millbrook (SX 40855150)

A watching brief was carried out during the construction of a new retaining wall and the widening of a trackway. The main archaeological concern was that the works might impact upon the former access tunnel leading to the north-east *caponier* of Whitesand Bay Battery (built in the late nineteenth century to defend Devonport Dockyard against long-range artillery bombardment, and protected as a Scheduled Ancient Monument). However, no evidence of this feature was found.

The Old School, Old Road, Liskeard (SX 24356455)

A field evaluation was carried out prior to the development of a former school playing field as residential accommodation. In 1996 CAU had carried out excavations on an adjacent site to the north of Old Road following the discovery of a long curving ditch during construction works. The ditch appeared to represent part of an enclosure; its fills produced a radiocarbon date of 1396–840BC and yielded several sherds of probably mid-late Bronze Age pottery (see Jones, this volume). It was considered likely that the ditch would extend into the school playing field and a programme of investigations was agreed.

A geophysical survey was carried out over the area and a number of anomalies recorded. Prominent amongst these was an east-west feature, some 1-1.5m wide, traceable for a distance of almost 100m. This was viewed as possibly representing the southern side of the prehistoric enclosure ditch. All the strong anomalies and a representative sample of the weaker ones were investigated by a total of 29 trenches totalling 181m in length. The site frontage was also thoroughly examined.

The east-west ditch was shown to be very shallow and of probable post-medieval date. Other features were located, but despite intensive sieving of their fills, only a single securely stratified sherd of medieval coarseware was recovered from one shallow curving ditch. The profile and fill of this ditch were very similar to those of several other undated ditches investigated, and they may represent contemporaneous elements of a medieval strip field system. Medieval occupation within the area was suggested by a number of residual sherds of coarseware retrieved from the topsoil throughout the development site.

No evidence was found of a prehistoric enclosure or settlement within the development site. This may necessitate a review of the results of the 1996 investigation. It is conceivable that the ditch found to the north of Old Road may return further to the south of the playing field, although this would imply a very large enclosure and some evidence of occupation within the development site would have been expected. Another possibility is that the ditch represents a territorial division or part of a field system, rather than an enclosure.

The Brunel Inn, No 83 Fore Street, Saltash (SX 42885886)

A field evaluation was carried out prior to an extension to the Inn. The area is within the Historic Settlement designation of Saltash and it was considered that the development might impact upon medieval and post-medieval remains or deposits. Three trial pits were excavated. Natural subsoil was located at a depth of 0.40m. Residual medieval pottery sherds were found in nineteenth-century contexts, but no evidence was found for the survival of medieval deposits or features.

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Reviews

Mawgan Porth Remembered

PAUL ASHBEE

Mawgan Porth, a settlement of the late Saxon period on the North Cornish Coast, Excavations 1949–52, 1954 and 1974, by the late Rupert Bruce-Mitford, with contributions by Paul Ashbee, the late Ernest Greenfield, Fiona Roe and Robin J Taylor (edited by Robin J Taylor). Archaeological Report **13,** English Heritage, London, 1997. ISBN 1-85074-613-3, £35, 160pp, 114 illustrations.

How and why an account of what must have been, in the 1950s, the largest and most comprehensive archaeological excavation to have taken place in Cornwall was so long in gestation requires answers which are largely historical, involving personalities, institutional demands, broader issues, and the nature of English life. Back in 1948, George Willmot's trial trenching disclosed well-preserved stone structure remnants associated with Late Saxon bar-lug pottery and a silver penny of Aethelred II (the Unready), struck at Lydford, Devon, between AD 990 and 995. After consultation between CA Ralegh Radford, who had seen the site, Sir Thomas Kendrick, Director of the British Museum, renowned for his work on Anglo-Saxon and Viking art and culture, and BHStJ O'Neil, Chief Inspector of Ancient Monuments, Rupert Bruce-Mitford was nominated to conduct excavations, as building was anticipated. This nomination was due to the fact that he had been given the task, within the British Museum, of the definitive publication of the Sutton Hoo royal ship-grave material, which would, in time, involve further excavation of the relict parts of the barrow and its boat. Kendrick, with this in mind, considered it necessary that he should gain some field experience. In September 1950, the present writer, who had just completed preliminary work on Halangy Down, St Mary's, Isles of Scilly, was invited to assist him.

In 1951 and 1952 Mawgan Porth became the main activity of the University of London's Archaeological Society, and its Secretary, and later President, Richmal CL Disher (now Ashbee) of Westfield College, University of London, organised the recruitment of volunteers. In the event, as many as 100 people were employed on the site, many later attaining distinction in archaeology and allied academic fields.

The large number of people at work and the complex nature of the site presented especial challenges. For example, problems with sand and soil disposal were solved by the use of level light railway lines and trucks across the site. Rupert Bruce-Mitford was ever adamant that the excavation should in no way seem to follow, neither organisationally nor upon the ground, any of the precepts of Sir Mortimer Wheeler. Thus almost all the elements of co-ordinated archaeological endeavour were successfully given other guises, although arbitrary cuttings led to frequent difficulties with nomenclature, recording and survey. Spells of hot weather made work, especially in the cemetery

beneath the sand dunes, exacting because of reflected heat and the quantities of sand that had to be removed. From the outset there was press reportage of the site (*The Manchester Guardian*, 28 Sept 1950, 30 Aug 1951 and 14 Aug 1952; *The West Briton*, 28 Sept 1950; *Western Morning News*, 30 Aug 1951); the BBC described the scene against an audible background of ingeniously attracted seagulls, and distinguished visitors did their rounds.

In 1954 Bruce-Mitford spent a further short season with a small team of volunteers, completing the work upon Courtyard House 2 and its complexities. Trial trenching had given indications of another house at the foot of the slope, and, when in 1974 a putting green was to be laid out, this was excavated by Ernest Greenfield, at that time living in St Mawgan.

A preliminary account of the work at Mawgan Porth, to the end of 1954, was published in 1956 (Bruce-Mitford 1956, 167–96) and there were summary references in *Cornish Archaeology* (Thomas 1964, 48; Hutchinson 1979, *passim*; Preston-Jones 1984, *passim*; Preston-Jones and Rose 1986, 146–7, 158, 167). Now these observations can be studied in the light of the valuable English Heritage report which is a significant addition to Cornish archaeological literature.

The vale of Lanherne was formed by a forbear of the modest River Menalhyl downcutting to lower sea-levels. There are traces of occupation throughout prehistory and into later times (Ashbee 1997). Indeed, a close investigative survey could add a new dimension to Cornish studies. The settlement lies some 60 yards from the sea's present high-water mark. Between tides a considerable area of sand is exposed, the collecting area for the massive dunes flanking the northern side of Mawgan Porth and the lower river valley. Indeed, a truncated slate-slab grave, with a skeleton minus its lower leg bones found among the dunes, thought comparable with the flagstone cists found at Harlyn Bay (Whimster 1977), was the initial indication of ancient remains. At about the same time, in 1934, test-pits, dug with a view to building, had disclosed stone walls and pieces of pottery. It was, however, George Willmot's trial trenching which gave insight into their character and possible extent. As elsewhere in Cornwall, and on the Isles of Scilly, it was the inroads of blown sand that brought about the end of the settlement. Only inutile artefacts were left behind; the inhabitants moved up the valley and formed the basis of the modern village, as is attested by bar-lug sherds found there in 1955 (Wailes 1956; Hutchinson 1979, 96–7).

The base-line established in 1950 was to be the basis of a grid system, which, with appropriate compensation for the hillslope, would have controlled the investigation of the suspected buildings and their relationships. It was envisaged, at least by the present writer, that squares, with 10ft or 20ft sides, within the grid, would be excavated, a method which would have allowed an integrated system of governing sections. Wheeler had used such a scheme at Maiden Castle (1943, Pl.XCVI, A), and again in India (1976, 44, Pl.29), and this had been generally accepted as the basis of methodical excavation (Atkinson 1953, 50). It had been employed in modest manner at Porth Cressa in 1949 (Ashbee 1954; 1979) and considered as ideal for the extensive area of Mawgan Porth's sand enshrouded houses. In 1950 this had been thought of as the mode for the exploration of the site beyond George Willmot's trenches. Elongated, but rectangular, cuttings within the established grid system were eventually used, and a central finds book and diary acceded to. However, as the enterprise proceed its own characteristics developed and various recording procedures, albeit within the fundamental grid, were evolved.

Excavation reports are traditionally aseptic documents. All kinds of people are acknowledged for their contributions and support of the work in the field, and to subsequent publication, which, following the dictum of Pitt Rivers (Wheeler 1954, 182–3) always takes much longer. We are rarely ever told of who did what on site, the personalities and the tasks they undertook, supervision, practical excavation, record and survey.

In general terms, excavation at Mawgan Porth involved two phases, the removal of blown sand, by exacting shovelling and brushing, to expose the tops of walls, tumbles of stone-rubble associated with them and, thereafter, the detailed investigation of such stratigraphy and other remains that survived beneath the sanding and the rubble slides. House 1, as its excavation proceeded in 1951,

was planned from the base-line, salient points being established by three-point triangulation. Sections were drawn (eg figs 13, 15, 18) by the expedient of plumbed vertical measurements from theodolite-levelled, stepped, horizontal lines, but the recording of rubble spreads posed especial problems. The employment of a portable grid was frowned upon, as was gridding by strings secured to survey arrows. In the event, the margins of spreads were delineated and thereafter, taped, divided strips plotted; a system devised after experiment. A year later, in 1952, when House 2 was partially explored, the same sequence of excavation and survey was followed, although here the rubble slides were modest. Indeed, pinned out grid-systems, related to the site's overall grid system, were employed, as those with excavational experience, beyond trowel-wielding, would not be bound by what they considered to be curious antipathies.

To facilitate sand and soil removal, light railway lines and trucks were obtained from a china-clay plant depot at Indian Queens. These lines, 18ins gauge, were levelled across the hillslope, with a tip turn-table for each. The wooden, cast-iron wheeled tubs, as they were termed, could take a ton of material at one time. Sand and soil were bucketed or barrowed, the last by low plank and steel scaffold ramps, aided by the hillslope. The advantages of the system, which eliminated distance barrowing, were speedily assimilated and mishaps were few. Line-ends were blocked by wheelbuffers, pieces of timber lashed to an end steel sleeper. In 1952, the lower line, for the excavation of House 2, was laid and a great deal of its sand cover was shovelled directly into the tub. As the house was cleared the line proved to be above the walling separating Room 1 from Rooms 2 and 3, and had to be truncated. For some reason the timber buffer was removed and the tub ran from its rails and fell some five feet, down amongst a group trowel-cleaning its floor. Mercifully, no more than shock was sustained, while the incident brought home to all concerned that heavy plant needed using with care and forethought for safety.

As acknowledged in the Report (p ix) the landowner, Philip Wailes, lent his large house, then recently acquired, to the excavation in 1951 and, in 1952, the Bridge Café, in the grounds of which a tented camp was established. During 1951 he took charge of the catering, an onerous task. There was, however, an emergency in his affairs and the pattern was broken for ten days and the excavation was left to its own devices. It was found that ration books, current at that time, were in a safe and the key was at the other end of Britain. Simple food, in fair quantity, had been the norm and, taking local advice, it was found that Army surplus tinned ration stews could be obtained in St Columb market. These were fed to the helpers, with variations, and were commended by those who consumed them. In 1952, when everyone was camped at the rear of the Bridge café, the cesspit began to overflow and the appropriate sanitary authority was slow to respond. Thus emergency lavatories, privy pits disinfected with quicklime, were established at a distance.

Visitors to the site were often memorable. Bryan O'Neil, Chief Inspector of Ancient Monuments, approved of the stripping of House 1 and the, then, partial exposure of 2. He felt that a gridded approach might have been more practical and was concerned that the slatey stone would present problems for conservation were the site taken into Guardianship. Gordon Childe felt that such large-scale excavation was the only practical approach to settlement appraisal. He was excited by what he had seen of the north Cornish coast and had equipped himself with maps. An exacting (to all but himself) walk from Mawgan Porth to Newquay was undertaken and each of the promontory forts minutely scrutinised. CW Phillips was a mine of apposite observation, backed by a wealth of recollection of excavations visited back in the 1930s. At that time he was Archaeological Officer of the Ordnance Survey. A new trigonometrical point was visited as were the Iron Age camp adjacent to St Mawgan village and one of the promontory forts.

AB Tonnochy, Keeper of British and Medieval Antiquities at the British Museum, Rupert Bruce-Mitford's head of department, arrived in, and wore daily, a dark, near-black, London suit of early cut, topped by a light check cap, as appropriate for Cornish rurality. It emerged that he was a more than competent pianist addicted to the melodies of Gilbert and Sullivan. For some three evenings, aided by wine and music sheets with words, which had appeared, we warbled the popular choruses.

In the event we were outshone and Tonnochy charmed, by a group of enterprising girls who had a good grasp of the female parts from *The Mikado*. When he was put on the train, his departing words were of the musical evenings. He had only once ventured onto and into the site, his days being spent sitting upon the summit of a high sand dune. Gerald Dunning, then our direct Ministry of Works contact, looked at our organisation and plant, and spent some time closely examining the bar-lug pottery, for he was at that time moving towards his seminal studies of Medieval ceramics. He thought that the enterprise was an historical occasion and urged that we also photographed various people in action, a notion that stood us in good stead. AHA Hogg, Secretary of the Royal Commission on the Ancient and Historical Monuments of Wales, and his colleagues, including Christopher Houlder, discussed the Welsh coastal sand dune systems, and the implications of the settlement lay-out for various Cambrian sites known to them.

Despite his antipathy to the accepted excavational procedures of the early 1950s (Atkinson 1946, 2nd ed 1953; Wheeler 1954), which surfaced from time to time, Rupert eventually accepted their principles. As has been observed a working *modus operandi* evolved and when, in his later years, Rupert began work upon the Mawgan Porth material, he was pleasantly surprised at the quality of the records.

As was said at the outset of this article, Rupert's primary objective was Sutton Hoo and all pertaining to it. In the early 1960s, the present writer was invited to undertake the excavation of the remaining parts of the royal barrow and to collaborate in the study of the site. In the event gridded squares, which could be subdivided into square yards (Ashbee 1975), procedures initially devised for Mawgan Porth, for Sutton Hoo's 1939 dumps and, thereafter, for the relict parts of the barrow, were employed. Ironically, a reviewer of the initial Sutton Hoo volume said that the cuttings outrivalled anything ever used by Sir Mortimer Wheeler! With the publication of the final Sutton Hoo volumes in 1983, Rupert was able to turn to the Mawgan Porth material. Moreover, with the emergence of the Sutton Hoo Research Committee, supporting Martin Carver's programme which began in 1983, Rupert and the present writer regularly met and were able to discuss such problems pertaining to Mawgan Porth as had presented themselves.

After a start in 1956, a fair draft of the Mawgan Porth report had been completed some four years before Rupert's untimely death in 1994. As a courtesy a copy was sent to English Heritage and fell into the hands of one of the modernists, at that time concerned with publications. This was returned with the comment that it was in an archaic form, over-detailed and prolix. As a result of this abrasive, and quite unnecessary, rejoinder, to his endeavours, which caused him considerable distress, Rupert laid Mawgan Porth aside and concentrated his energies upon the *Corpus of Late Celtic Hanging Bowls* which he had long envisaged. In the event, *Mawgan Porth* was made ready for publication by Robin J Taylor who had worked upon the finds, records and the nature of Courtyard House 1, and who appreciated the essence of Rupert's archaeological endeavours. Indeed, some indication of the report's vicissitudes are reflected in the carefully written acknowledgements and Robin Taylor's supplement to the *Introduction*.

In almost every dimension Robin Taylor's skilful and sensitive editing has preserved the essential nature of Rupert's precise and detailed approach to archaeology. The descriptions of the three courtyard houses are couched in his meticulous prose, while the bar-lug pottery and the stone industry, in consideration and in catalogue, have all the hallmarks of the painstaking descriptive detailing of which he was a master. A further valuable adjunct is the geological identification of the used stones, artifacts and pieces of querns, by Fiona Roe.

This posthumous publication allowed the present writer to update his account of the cemetery where, although containing mostly extended inhumation burials, the slab-sided and covered graves were not unreminiscent of the Harlyn Bay Iron Age cists. A further contribution was a summary of the prehistory of the vale of Lanherne, where deposits that would allow the deployment of environmental archaeological techniques may still remain. Indeed, further insights into the land and sea-based domestic economy of the settlement might be forthcoming.

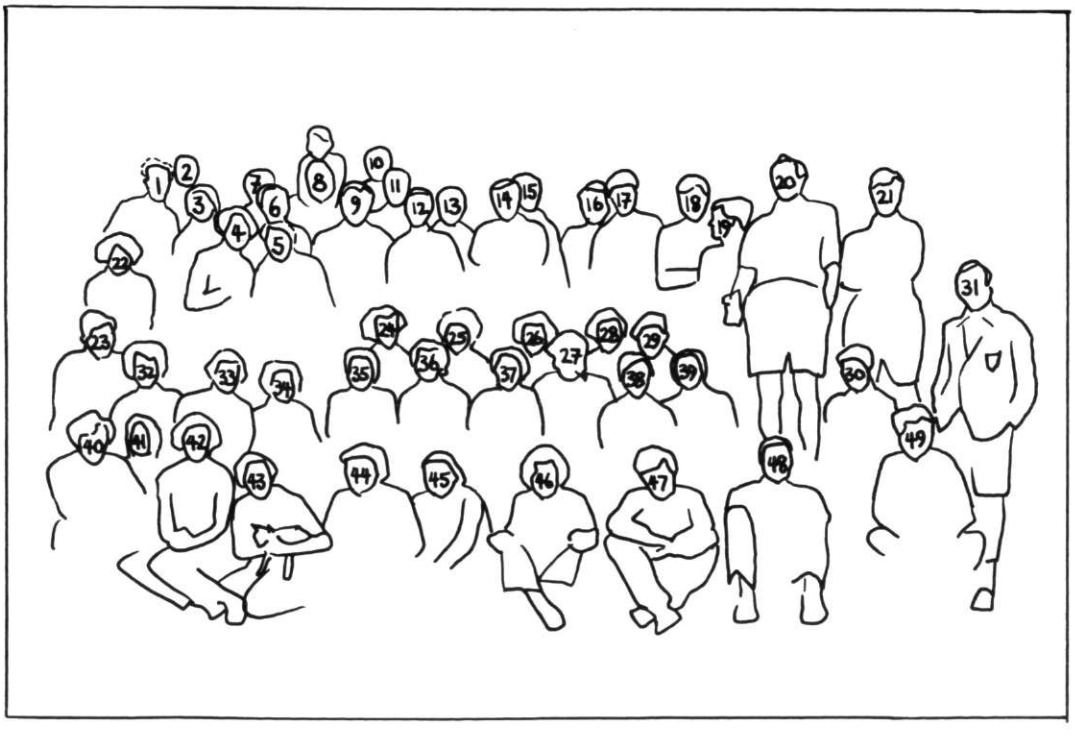

Fig 2 Schematic drawing traced from Fig 1 giving numbers to the individuals listed in the table.

Fig 1 (opposite) Mawgan Porth: photograph by Charles Woolf of the excavation team, August 1952. RLS Bruce-Mitford stands right of group, in blazer. Others in the team, as identified by Richmal and Paul Ashbee, Sarnia Butcher, Nicholas Thomas, Peter Gathercole and others, are numbered on Fig 2, a schematic drawing traced from the photograph, and the following table. The author and editors would welcome any further identifications.

1 Ronnie Rule	2
3 Richmal Disher (= Ashbee)	4 Sonia Chadwick (= Hawkes)
5	6 John Lewis
7 ?Miss Richardson	8 E Peacock (architect) with Michael Bruce Mitford on shoulders
9	10
11	12
13	14
15 John Scantlebury	16 Alan Sorrell
17	18 Bernard Wailes
19 Arthur ApSimon	20 Paul Ashbee
21	22
23 Denis Kenward	24 ?Kay Capes
25 Eileen Sindell Wright	26
27 Carl?	28 Celia Minter
29 Don Minter	30 Denis Fisher
31 Rupert Bruce-Mitford	32 Robin Kenward
33 Dora	34
35 Sarnia Butcher	36 Enid Fisher
37	38 Tony Denton
39 Vi ?Armstrong	40 Mary Pinsent
41 Myrtle Bruce Mitford	42 Diana?
43 Jeanne Harvey = van Gorkom (NZ)	44
45	46 Rose?
47	48 Phil Wailes
49 John Hopkins (Librarian, Society of Antiquaries)	

Even now, as stated in the conclusions, Mawgan Porth is a remarkable and unique site with a central date based upon the, alas, rather uncertain stratigraphical provenance of the silver penny of AD 990-995. All in all, this report is a signal addition to Cornish archaeology at large, for its clear plans, sections and other line drawings, together with various historic photographic illustrations, all geared to an elegant text, make it a pleasure to handle and read. Moreover, its distinctive cover carries a reconstruction of life within House no 1, repeated in closer detail on p8, with a further reconstruction of the exterior on p5. These are from works by Alan Sorrell, well known for his reconstructional drawings and distinctive paintings (Jessup 1967), and are based upon a systematic evaluation of excavational detail. To complete this searching presentation, there is a comprehensive bibliography, which, before all else, sets the bar-lug pottery sites into their wider European context. A further and especially memorable feature are Charles Woolf's dramatic photographs, which, on one particular day in 1952, included the excavation's staff (Fig 1).

As has been observed, the Mawgan Porth operations were at the time with, perhaps, the exception of the work at Tintagel, the most extensive excavations ever carried out in Cornwall. Indeed, they are now a half-century in the past and a part of the history of archaeological endeavour in our

country at large. Since those momentous years, much has changed in Cornish archaeology and the leading figures of that age have acquired misty if not largely unknown qualities. Thus it is apposite to say something of the man who, down the years, carried the ultimate responsibility for the Mawgan Porth excavations and all pertaining to them.

Rupert Leo Scott Bruce-Mitford was the youngest son of a colonial family which had its roots in such diverse matters as vulcanology, ranching and gold prospecting. Educated at Christ's Hospital and Hertford College, Oxford, he obtained a post in the Ashmolean Museum where, with Martyn Jope, he salvaged medieval pottery when the basement of the New Bodleian Library was being mechanically dug. He joined the British Museum in 1938 and, with the exception of the war years, spent the whole of his working life in that institution. His museum work was such that Sir Thomas Kendrick wrote to him, just before his demobilisation, to say that he would be undertaking the detailed publication of the material from the royal ship-burial at Sutton Hoo, when released from the British Army.

Rupert's first action regarding this onerous task was, in 1947, the production of *The Sutton Hoo Ship Burial – a Provisional Guide* which had ten reprints. He became Keeper of British and Medieval Antiquities in 1954 and, for almost a decade, the demands of that post occupied most of his time. Nonetheless, he assembled a team of helpers and, in 1964, the excavation work at Sutton Hoo, in which the present writer was involved, began. The first volume of *The Sutton Hoo Ship-Burial* appeared in 1975, the second in 1978 and the third, in two parts, in 1983. Particularly in matters of publication, Rupert was a perfectionist and, together with his researches into the nature of the objects from the Ship-Burial, he was required to administer a key museum department. It has been widely acknowledged that these volumes, the fruits of some twenty years of detailed research and study, are the greatest archaeological books of the twentieth century.

Besides his work on Sutton Hoo, Rupert analysed the ornament of the Lindisfarne Gospels, the facsimile edition of which was accompanied by commentary and discussion. He also found time to write papers pertaining to Suffolk and Sutton Hoo, as well as editing *Recent Archaeological Excavations in Britain* (1956), which as noted above contained a summary of the work at Mawgan Porth (pp67–96) and *Recent Archaeological Excavations in Europe* (1975b), as well as translations of PV Glob's books from the Danish. There were also the offices which he conscientiously discharged: Secretary of the Society of Antiquaries of London, and later a Vice-President; first President of the Society for Medieval Archaeology and membership of the Ancient Monuments Board for England. Conferences and lectures, particularly those pertaining to Early Medieval art and archaeology, were sought out and attended. After retirement, when he had settled near Oxford, he became a Visiting Fellow of All Souls and an Honorary Fellow of his old college, Hertford.

Rupert Bruce-Mitford's endeavours at Mawgan Porth, and subsequent visits, especially to Ernest Greenfield's excavation of Courtyard House 3, had enchanted him with Cornwall's unique landscape and the nature of its early history and archaeology. This included a regard for the works of Charles Henderson, well remembered in Oxford during the 1930s. He was also interested in the fate of the Halangy houses, on Scilly, where, when the site was abandoned, almost everything was carefully removed as at Mawgan Porth when the blown sand advanced and the houses became untenable.

Rupert Bruce-Mitford's precise, indeed elegant, presentation of *Mawgan Porth*, an extensive, unique settlement site, furnished with pan-European pottery, should be placed in the hands of all who are concerned with Cornwall's engrossing, persistent and enduring past.

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Aileen – A Pioneering Archaeologist. The Autobiography of Aileen Fox., 2000, Gracewing, Herefordshire, ISBN 085 244 523 7, 204pp, 30 plates

At the age of 93, Lady Aileen Fox has published her autobiography. We are privileged to have this account in her own words for it is a story which teaches us as much as it informs us about the development of archaeology in Britain during the twentieth century. This absorbing life story takes the reader on an archaeological odyssey from the genteel affluence of an upper-class upbringing in Edwardian London, to travel in pre-War Europe, challenging new fieldwork and excavation in South-West Britain and Wales, pioneering work in university education at Exeter, right through to an encounter with new world archaeology down under in the temperate climes of far away New Zealand. At each stage of this remarkable career, Aileen achieved success with characteristic determination to take on new challenges. Her story unfolds like a continuous reinvention where a hunger for self growth is channelled through an openness to opportunity, a determination to tackle new problems and a passion for knowledge – all driven by a deep understanding of, and a love-affair with, the study of the past. Throughout her enthusiasm for archaeology is apparent and her tireless contribution to the wider development of archaeology at a grass-roots level – both in Britain and New Zealand – has ensured her a unique place in the history of archaeology within both countries.

More than just a personal account of a remarkable life and career of one of Britain's most respected field archaeologists; Aileen's story also provides unique insights into the early days of the profession in Britain. Aileen's developing apprenticeship as a field archaeologist was moulded at a time when the profession was in its infancy in Britain. In the pre-war and post-war years the

archaeological community was relatively small – latterly dominated by a number of brilliant, industrious, inspired and sometimes flamboyant personalities: Mortimer Wheeler, Stuart Piggott, Christopher Hawkes and of course, her husband, Cyril Fox to name just a few. This was a time where great advances in fieldwork technique and intellectual thought were developing into the foundation for the profession as it has matured in the latter part of the twentieth century. Aileen was well placed to be at the heart of these developments, to assimilate the advances as well as making her own contribution towards them. She was keen to learn at the cutting edge and not only got her hands dirty in the trench but also played a part in the developing world of academia. Her significant role as one of the few women carving out a career both in the field and in the university seminar room in a principally male world should not be overlooked.

Her story is written in a graceful, understated and modest style – but is peppered with anecdote and gossip. It pays industrious, characteristic attention to chronological and daily detail and reveals a determined personality driven by a 'tenacity of purpose'. Aileen's life is rich and full and reveals an individual with admirable indefatigable energies, for her interests are broad – archaeology aside she had a passion for botany, ornithology, travel, languages and, of course, a family life. Despite the age difference, she and Cyril Fox – 25 years her senior – had a happy, idyllic marriage and partnership. After Cyril's retirement, Aileen took on new challenges – the immediate post-war excavations at Exeter and despite tremendous obstacles, achieved success in establishing a freestanding archaeology department at the newly formed University of Exeter. In the South-West her synthetic account of the archaeology of South-West England published in 1964 became a valuable standard text. Less well known perhaps is her collaboration with Alan Sorrell on a children's book on Roman Britain published in 1961. During her time in Exeter she championed the role of local enthusiasm and her contribution to the development of local Sites and Monuments schedules, particularly in Devon was pivotal. Less well known in this country is the contribution Aileen made to the advancement of archaeology in New Zealand – a challenge which she took up after 'retirement' and several years after Cyril's death in the 1970s. She arrived in New Zealand in her late sixties and there she continued with exemplary zeal to make a contribution to the study of Maori hillforts known as 'paa' by publishing a standard work as well as wooing the hearts and minds of the indigenous archaeological community.

This may be a story of a privileged life but it is also a story of commitment to a chosen vocation where an instilled sense of purpose and attention to systematic enquiry is imprinted in each new chapter. Whilst the professional world of archaeology today may be far removed from the early days of the profession this autobiography has a central place in the historiography of archaeology in Britain and should be read by students and archaeological enthusiasts alike.

Jacqueline A Nowakowski

A Portrait of Roman Britain by John Wacher, 2000. London: Routledge. ISBN 0-415-03321-7 Hb £45.00, 147 pages, 52 illustrations.

This is one of those quiet books that creep up on you unexpectedly. The author, married to a Cornishwoman for 28 years and domiciled in Cornwall for 13, frequently refers in his examples to the county, even if it does not immediately spring to mind as part of Roman Britain. A food chemist turned archaeologist, he raises up from the excavator's trench a landscape we can recognise and believe in: the material background of colours and textures, fields and dwellings against which life moved for nearly half the first millennium – and he goes on to indicate the changes that took place, and draws attention to the many ways and places in which we are still surrounded by the Roman legacy today. This is a GOOD BOOK in the full sense and creates exactly what the title promises. Like all good books it subtly infiltrates your imagination.

Here a renowned field archaeologist uses his scientific training with constant concern for human sensations, punctilious in linking all points of all parts of his portrait to the basic material core, both qualitatively *and* quantitatively, but he is really trying to project us into the Romano-British mind – to see, hear, feel, smell, touch and move and think about the total landscape. He does this by building up a basic framework of coloured forms (red and yellow roofs, grey-and-red speckled and whitewashed walls, brown timber structures), against a variegated background of 'natural' trees, cornfields and other vegetation, throwing out scents of wild flowers, textures of log barks, buzz of insects and calls of birds – and within this general environment other people and animals go about their business.

There are dangers and the author warns against them, both plainly and by implication, but we admire his courage and accept his re-creation. We are reassured in this by one or two themes which run through the whole of the performance – for it does process – and provide an overall consistency anchored by continual back-reference to the material core. Perhaps the most characteristic is the concern for timber. How much woodland needs to be felled to provide a clearing for the cavalry? What is the most efficient way of coppicing to serve a bath house? How can we best recycle a temporary fort? Some activities deserve special treatment and more sophisticated and detailed consideration is given to mining and industrial operations.

He considers first the three main forces shaping the landscape and draws attention to the way they can and do change, and mutually affect each other, but at varying rates. The geological nature of an area may seem to have reached some kind of steady state an unimaginable time ago, and yet the exposed surface of soil can be altered drastically in a very short space of time. This can result from climatic upheavals or – as needs no emphasis in the present context of global warming – through human agency. Very properly the Iron Age backcloth is built up in some detail so as to relate the changes paraded before us against it as simply and fully as possible: the needs of the army, developments in agriculture, effects on rural settlement of villa economy and religion; and most characteristically: 'Urban topography and human sensations!'

When the end came the landscape gradually returned, as it always does (says Wacher, referring to Kipling's Old Hobden), to what it was before the foreign arrival – but with the important exceptions of the legacy of roads, structures and administrative layout, many of which are still detectable today. These fill the last chapter – and more keep appearing, we know, as building development continues. In the end piece the author's personal excitement quietly bubbles over when he quotes a fascinating, extended list of tree and other plant remains identified among finds from two excavations in York.

All these various threads are well woven and slide smoothly from the page into the eye. It is clear that writing is a pleasure to the author and the result is therefore a very good piece of communication; indeed, those who don't know him might be forgiven for wondering if it were not just a bit too good for his own good! But even they would be convinced as soon as they saw the academic structure of the section on *Further Reading*, that he knew what he was talking about and was quite serious about it, however simply he conveyed it: a well-known mark of mastery.

So, from all angles and in all senses, I repeat, it is a GOOD BOOK. But is it a good buy? It is hard to be fair.

One of a large number of symptoms of our current general malaise, specialised publication is in a bad way – under pressure from all directions: ever-developing methods of setting, camera-ready for bromide, desktop, disc, talking books, and of course THE WEB! The Bottom Line ratchets downwards at an alarming rate, firms fold and fall by the wayside, no matter how old-established, experienced and respected. What's to be done?

One misguided attempt is to try and turn it into a business. You 'save' a reputable name by buying it out – merge it with others under a different hat and set it up under new rules of maximum efficiency and zero-tolerance. And under new management. This is swiftly followed by getting rid of all the senior, experienced and expensive staff and replacing them by cheap school- or college-

leavers who are made to 'learn on the job'. Pity, but it's got to be done – Bottom Line says so. Everyone is thrown into chaos, desperately looking for a way up or out. There's a lot of leap-frogging which means that a project quickly passes through a number of different editorial hands. In the process, agreed measures are forgotten, serial ventures get stuck between consecutive phases, colour illustrations are changed into black-and-whites and halved – and there is a general loss of interest all round as the project subsides into a quagmire of inertia.

Still, with a bit of luck, after a lapse of maybe a year or two, something revives it – after all, it was not *quite* dead – and great efforts are made to get it out quick! This infuses it with an array of artificial deadlines that lead to cutting text, artwork, and all kinds of corners, particularly and disastrously in final editing and proof-reading. The result is a pathetic emaciated shadow of the original. Doesn't matter, says Bottom Line: we got it out, didn't we? Who will know?

But it doesn't work. Publication is not a business – it's a profession. It can only be run by trained people steeped in printing, art work, layout and particularly editing. Not controlled by people only interested in making money by whatever means – ie financiers, accountants or shareholders. To turn the use of the government's double-pronged terms of growth policy right round: here (and elsewhere) the aim is quite definitely to improve the quality of life, and not wealth creation. Without proper guidance such rescue attempts founder on all the obvious rocks: incompetent and sloppy editing, illustrations seen through Cornish rain, cowboy printers, bizarre layout. Net result sooner than later: the good name and goodwill disappear, dragged down by all the incompetent trash, everything and everybody lost – ultimately sold down the river.

The best thing the publishers did for this book was the dust-jacket: the blurb was carefully conceived, best marketing style. But then it would have been. As for the price – it is difficult to know whether it is meant to be outrageous or derisory. Probably a bit of both: Bottom Line a cast too far!

Is it a good buy? Certainly not. Is it worth having? Most decidedly yes! I am recommending you knowingly ignore not getting 'value for money' and get the value anyway – and blow the money! You only have to look at any of the websites to see, revealed proudly, who owns whom in this kind of global multinational empire without a soul.

Leo Biek

[Editors' comment: This is Leo Biek's last publication, which we are pleased to publish, along with Sarnia Butcher's obituary below. Readers will note the reviewer's characteristic insistence that the publication of a study of the past needs to be done according to the highest professional standards – in this instance sadly lacking. To draw attention to this was one reason why he offered to review the book for Cornish Archaeology.*]*

Obituary

Leo Biek 1921–2001

Although most of his work was done elsewhere Leo had so many Cornish connections that it seems right to commemorate him here, and by chance this volume also contains possibly his last publication: a review (pp 232–4) which demonstrates his concern for standards in all aspects of life, both past and present.

As the first scientist in the Ancient Monuments branch of the Ministry of Works (now part of English Heritage) he was a pioneer in the application of science to archaeology – see his 1963 book *Archaeology and the Microscope*. In the days when rescue excavation was run by 'the Ministry' he would turn up on sites all over the country to apply a startlingly different outlook to the excavator's problems and would go off to consult specialists in all manner of esoteric disciplines. Nowadays it is difficult to realise how remote the study of microscopic deposits in the ground, or on excavated objects, for evidence of environment, manufacture or decay seemed to the excavator preoccupied with stratigraphy and typology. Leo was largely responsible for beginning the education process and when this aspect of archaeology became commonplace he was still in the forefront of new ideas and methods – and was still pursuing new solutions right up to the last month of his life, as I know from a late night phone call enquiring about deposits in an excavation I had done nearly fifty years ago.

He was born in Estonia of Russian parents who subsequently moved to Germany and eventually to England as refugees from Hitler. They had met as music students in St Petersburg and Leo himself was a musician, giving piano recitals in his younger days. He was left at school in Berlin and came to England just before the war. His Marylebone school was evacuated to Camborne, where he attended Frank Turk's evening classes in Biology and there met Stella Turk. He had a great affection for Cornwall and kept in touch with many friends: Stella writes that they were still meeting on Leo's regular visits down to June 2001; Stewart Smith, director of the Trevithick Trust, recalls that the pursuit of metallurgy began their acquaintance, at Ironbridge, and that Leo deposited his 'National Slag Collection' there; John Wacher also writes of enjoyable visits when Leo kept him in touch with archaeological gossip and continued to produce material for the report on the Catterick excavations which has just appeared.

Modest references in *Cornish Archaeology* represent his work here: *eg* the painstaking investigation of tin ingots from Praa Sands in *Cornish Archaeol* **33** and the search for evidence of brooch manufacture at Nornour in *Cornish Archaeol* **17**. The extraordinary number of Roman brooches found during Dorothy Dudley's excavation of the remote Scillonian site prompted the view that they were made there (*Archaeol J* **124**, 17). This of course had great attraction for Leo's metallurgical interests so that he was eager to help when further excavation of the crucial area became possible. His minute examination both on the ground and in the laboratory showed that there was positively no trace of temperatures high enough for metal working, nor of any waste from such processes (*Cornish Archaeol* **17**, 54). Characteristically he didn't let the subject drop and pursued it with continental specialists and with colleagues in the AM Laboratory: work which continues. He also coordinated scientific work on the Caerloggas dagger and slag fragments (*Cornish Archaeol* **14**, 35–8) which led him to a more general consideration of the factors affecting preservation on granite-based soils in the South West (*ibid* 67–71).

But this is only a small sample of his work and interests: a compilation of reminiscences by numerous colleagues in *Current Archaeol* **179** gives a better idea of his scope and of his engaging personality.

Sarnia Butcher

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