

Excavations at Tremough, Penryn, Cornwall, 2000–6

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Between 2000 and 2004, Cornwall Council Historic Environment Service carried out archaeological recording at the site of the Combined Universities in Cornwall campus at Tremough. The excavations were targeted on investigation of a Neolithic flint scatter and pit groups, Early to Middle Bronze Age post-rings and a small enclosed Romano-British settlement situated on a plateau overlooking the Fal estuary. Evaluation trenching was carried out within a rectilinear enclosure at the east end of the plateau in 2006, confirming that the site was of Late Iron Age to early Romano-British date.

The investigations recovered a substantial pottery assemblage, including Late Neolithic Grooved Ware, second millennium BC Trevisker fabrics, Roman-period wares and a small early medieval group which incorporated amphora sherds, grass-marked and bar-lug pottery.

Twenty-four radiocarbon determinations were obtained, ranging between 3950 cal BC and AD 1160.

Cornwall County Council Historic Environment Service was commissioned by Falmouth College of Arts, the Combined Universities in Cornwall (CUC) and Midas Projects to undertake archaeological recording at Tremough, Penryn (SW 726 347), in advance of the construction of the CUC campus (Fig 1). Between 2000 and 2006 approximately 8 ha were subject to geophysical survey and 4 ha on the plateau were topsoil-stripped prior to detailed excavation. In addition, 35 test pits and four evaluation trenches were excavated. Archaeological monitoring also took place during site works across the site.

An account of the 2000 and 2002 excavations has been published elsewhere (Gossip and Jones 2007). The present report covers the results of evaluation trenching undertaken in 2006 with a summary of the earlier excavations. The analysis of the pottery from the 2000 and 2002 investigations has been reproduced in full because of its importance to regional ceramic studies.

Location and context

The Tremough site is on a narrow, flat-topped promontory 600m long lying roughly west – east between two stream valleys on the north-west edge of Penryn (Fig 1) and comprises an area of farmland and former parkland. There are views south east from the site to the Fal estuary and the sea beyond. The underlying geology is varied as the site lies on the junction between the clays and slates associated with the Devonian sandstone and slates of the Mylor Series and the igneous Carmenellis granite (Geological Survey of Great Britain 1974). Most of the bedrock is metamorphic killas and vein-quartz. The natural clay subsoil across the site ranged from a bright pale yellow to a deep rusty orange.

Prior to the archaeological investigations there was no indication that buried remains survived within the project area. No sites were recorded in the Historic Environment Record and the crops in the cultivated parts of the site were not of types which produce identifiable cropmarks. The

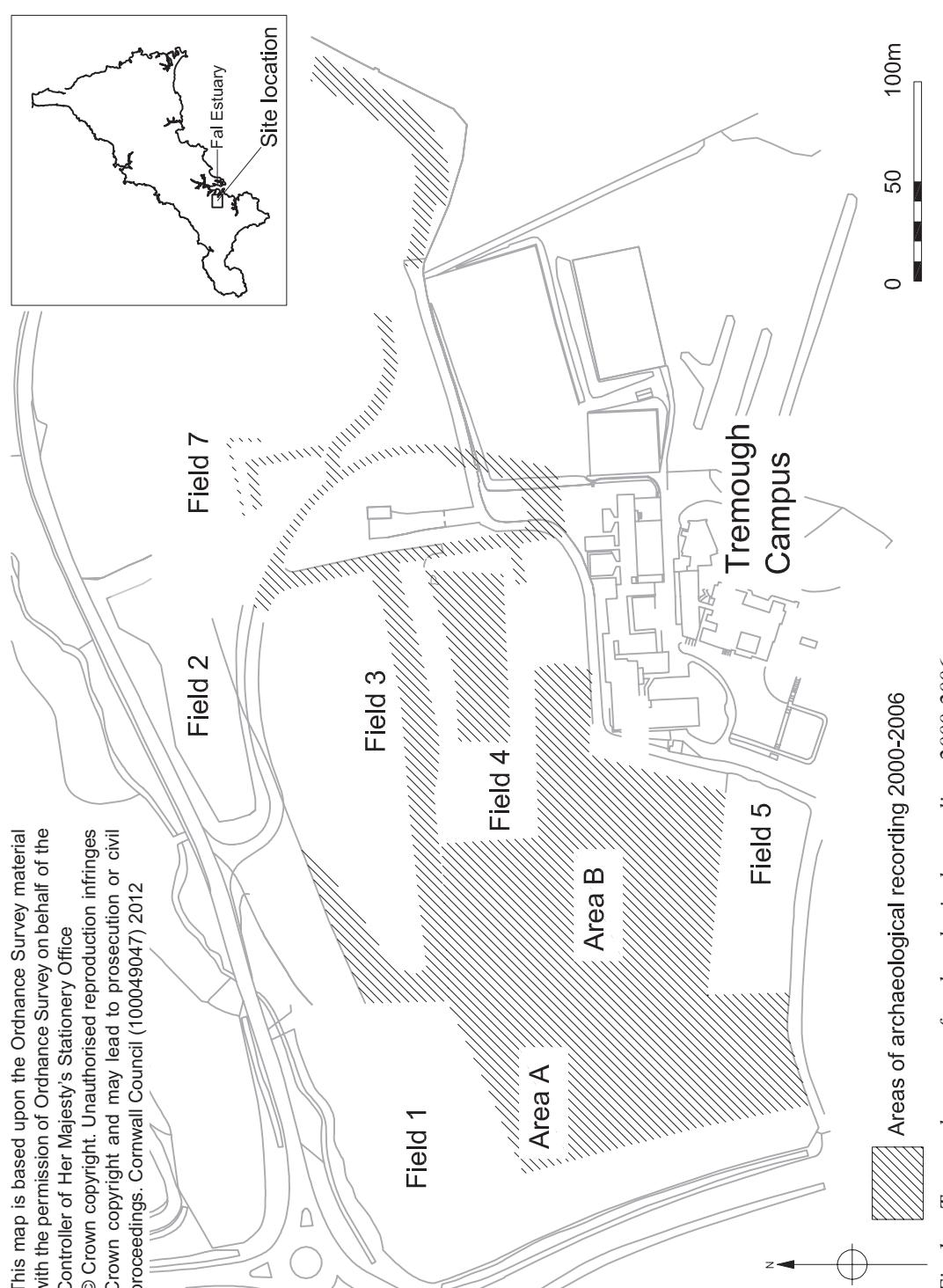


Fig 1 Tremough: areas of archaeological recording, 2000-2006

farmland was characterised as 'Anciently Enclosed Land' (Cornwall County Council 1996), which had been extensively altered in the later eighteenth and nineteenth centuries following the construction of the present house at Tremough. During this period the layout of the field system had been re-organised to make larger fields and an ornamental landscape was laid out to the north and east of the house. Anciently Enclosed Land is associated with farming settlements documented before the seventeenth century AD and investigations across Cornwall have demonstrated that it has high potential to contain buried archaeology of the prehistoric and Romano-British periods (for example: Jones and Taylor 2004; Gossip 2005b). This potential was confirmed by the geophysical surveys undertaken on the site, which revealed a high concentration of archaeological features across the top of the plateau (GSB 2000; 2001; Mercer 2001).

The programme of recording at Tremough included archaeological assessment, geophysical survey, evaluations, test pitting, fieldwalking and watching briefs. The methodologies for these stages of recording have been outlined elsewhere (Gossip and Jones 2007).

The 2000 and 2002 excavation areas were stripped of topsoil by swing-shovel and then cleaned and planned. In 2006 two 20m long by 1.5m wide trenches were excavated by a mechanical excavator, under the supervision of an archaeologist, to examine the character of a rectangular enclosure, which had been identified by geophysical survey (Fig 15).

Radiocarbon probability distributions in this report have been calculated using OxCal (v3.10). The 95 per cent level of probability has been used throughout.

The results

Neolithic

The excavations identified two phases of Neolithic activity. The first dated to the Early Neolithic (*c* 4000–3500 cal BC) and was associated with flint scatters, pits and a possible enclosure ditch. The second dated to the Late Neolithic (*c* 2900–2300 cal BC) and was associated with shallow pits and a small assemblage of Grooved Ware.

Early Neolithic

Early Neolithic activity was revealed during fieldwalking and subsequent topsoil stripping in fields 4 and 7 (Fig 2). Fieldwalking in field 4 led to the recovery of 130 flints and more were recorded during the excavations. A Group I greenstone axe-head was also found during the fieldwalking but this could date to any part of the Neolithic. The majority of the flint from this area, 123 pieces, was pebble flint, probably derived from local beaches. Field 7 could not be systematically fieldwalked because it was scrub-covered, but topsoil stripping from an L-shaped evaluation trench and an access road corridor (Fig 2) led to the recovery of 205 flints. Significantly, 115 of these derived from a nodular source outside Cornwall and were associated with a knapping area (107). A second group of larger and abraded nodular flints found to the north of this area was of a different character to the tiny pieces of knapping debris found in (107).

In field 4, five pits were identified (Fig 2). They were not associated with pottery, were circular in plan and, with the exception of pit [23], contained evidence of burning in the form of charcoal and burnt stones. Pit [21] produced an Early Neolithic determination of 4850 ± 55 BP, 3770–3510 cal BC (AA-44601).

No pits were found in field 7 and the only certain Neolithic feature other than the spread of knapping debris (107) was ditch [76]. This was exposed over a length of approximately 8m and terminated 2m from the eastern edge of the access road. It ran on a broadly north-south, slightly curvilinear alignment and was up to 0.9m wide and 0.5m deep. Notable features of the ditch were the very pale nature of its fills and the stoniness of the upper fill, which appeared to have been deliberately backfilled. It is unlikely that this stony material represents upcast from the ditch since the stone was too concentrated and the blocks were fairly large and unlike those seen in the ditch sides. A Neolithic radiocarbon determination of 4995 ± 50 BP, 3950–3660 cal BC (AA-44604), was obtained from the ditch, with a possible Early Neolithic sherd of pottery (Quinnell, below). Although the date is a little earlier than that from pit [21] in field 4 there is enough overlap to suggest that they could have been contemporary.

None of the remaining features in field 7 were demonstrated to be of Neolithic date. Eighteen pits and postholes were uncovered but only two produced artefacts: some medieval glass from pit

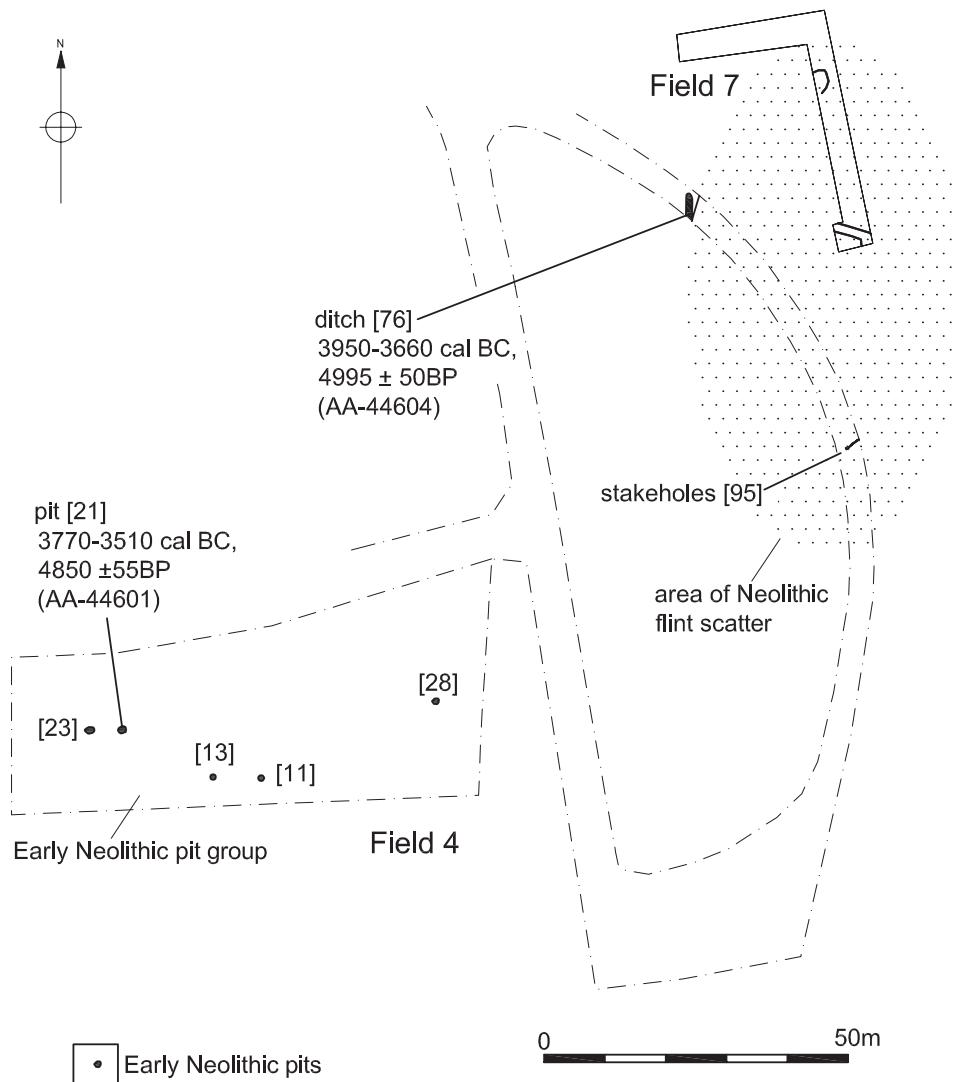


Fig 2 Early Neolithic features in fields 4 and 7

[58] and a post-medieval potsherd from pit [62]. In general, the pits in field 7 had fills which were darker and less compact than that of ditch [76]. A 4.5m-long alignment of 25 stakeholes lying north west – south east [95] was revealed in the access road; they were filled by compact clays which resembled the fills of ditch [76]. It is possible that they also belong to the earlier Neolithic and formed some kind of barrier or boundary.

Late Neolithic

A significant result from the investigations was the recovery of 165 sherds of Grooved Ware representing some 21 vessels (Quinnell, below). All of the identifiable Late Neolithic activity was confined to the north-west portion of Area A (Fig 3), where 12 small pits were identified. Eight produced Grooved Ware but two others may have been Romano-British and a further two were of uncertain date. One of the pits producing Grooved Ware, [494], also produced

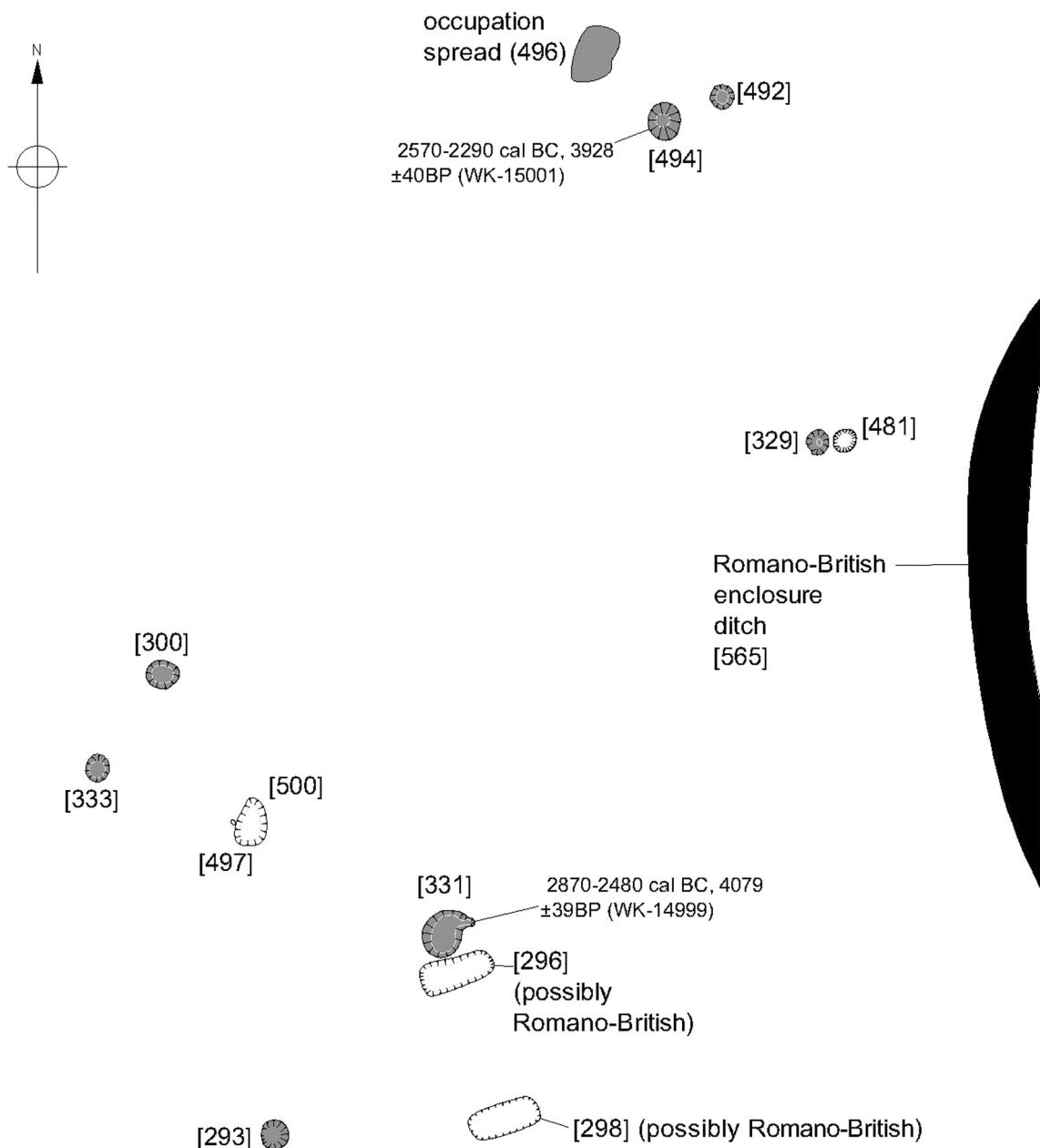


Fig 3 *Later Neolithic features in Area A. Shaded features contained Grooved Ware.*

a possible saddle quern. All these features were shallow, 0.15m–0.25m deep and 0.7m–1m across.

To the north of pit [494] was deposit (496), which may represent a spread of occupation-related

activity. This covered an area approximately 1m by 1.5m and was 0.1m thick; it contained 33 sherds of Grooved Ware, including vessels **PP15**, **PP16** and **PP17**, a stone grinder, a white vein-quartz cobble and four flints.

The Neolithic occupation

The Neolithic evidence comprised lithics, pottery and pits. Across Cornwall a number of comparable pits have been found dating to the Early and Late parts of the Neolithic (Cole and Jones 2002–3; Nowakowski, forthcoming), which were possibly generated by short-term occupations. Evidence for longer-term settlement activity could exist outside the excavated areas but a substantial part of the plateau has been investigated and no evidence for permanent structures was found.

The limited environmental evidence suggests that by the Late Neolithic the plateau was already clear of woodland; clearance may be related to activity represented by the Early Neolithic features. Significantly, however, none of the securely dated environmental samples revealed evidence for pre-Bronze Age cereal cultivation. Although there is some evidence that cereals were being grown during the Neolithic (Robinson 2000; Campbell and Straker 2003), archaeological investigations across Cornwall and elsewhere in southern Britain have found a similar paucity of evidence of early cultivation.

However, there was evidence for other activity across the site, particularly in the Early Neolithic period, c 3900–3500 cal BC. Although only 0.6 ha was investigated in field 7, compared with 2.4 ha in field 4, there were sufficient differences between the two to suggest zonation in contemporary activities. Activity in field 4 was marked by pits containing burnt material adjacent to scatters of flints derived from locally available pebble sources. By contrast, activity in field 7 was possibly demarcated by a shallow ditch, which may have divided the east end of the promontory from the area to the west in fields 3 and 4. A line of stakeholes [95] may represent some kind of subdivision. No contemporary pits were identified: the scatter of pits and postholes found in field 7 could not be convincingly assigned to this phase. Non-local nodular flint was worked in field 7 and it is possible that ditch [76] represents a division between two distinct forms of occupation, characterised in part by the working of different lithic resources. The collection of two types of differently worked nodular flint from two separate areas within field 7 also hints at further spatial subdivisions.

Activities within landscapes during the Neolithic may have been structured so that different places became associated with different

practices and experiences (Healy 2004; Hey 1997; Parker Pearson 2000). At Tremough this could be indicated by the physical separation of different types of archaeological feature and contrasting spreads of lithic working debris. The subdivision of the area indicates a possibly complex pattern of zones appropriate for different knapping activities, which may have been determined by the traditional practices of groups who used the site. The ditch was not deep but could have served to mark a distinction between those who had access to and were able to work nodular flint ‘imported’ from elsewhere, and those who had to rely upon locally-sourced flint pebbles for their tools. The pits may represent the fires of visitors to the site who had more restricted use of the plateau. Such divisions could have helped to define communities, group status or the membership of groups.

It is also possible that the contrasting lithic scatters may have been created by people who occupied the plateau on a seasonal basis. It may have initially been cleared for grazing by pastoralists, or its distinctive topographical setting and views over the Fal estuary may have made it a natural focal point for groups to meet and exchange flint and perishable items such as animal hides or harvested plants.

The Late Neolithic in Britain is characterised by the construction of communal monuments such as henges, with feasting associated with the consumption of meat and the use of Grooved Ware (Barrett 1994, 145; Rowley-Conwy and Owen 2011). Until recently, evidence of Late Neolithic activity in Cornwall comprised a few monuments dated to this period on typological grounds (for example, Castilly henge, Luxulyan) and a small number of sites associated with Grooved Ware (Jones 2005, ch 2). However, recent archaeological investigations have produced several new sites with Grooved Ware (Quinnell, below) and a picture is emerging which is comparable with that from other areas where henges are uncommon, such as the east of England and Wales, where Grooved Ware is principally found deposited into small pits (Bradley *et al* 1993; Peterson 2004).

The Grooved Ware assemblage from Tremough is the largest currently known from Cornwall, an estimated 21 vessels of the 40-plus which have been found to date. Radiocarbon determinations from pit [331], dated to 4079 ± 39 BP, 2870–2480 cal BC (Wk-14999), and the rather later date of 3928 ± 40 BP, 2570–2290 cal BC (Wk-15001) from

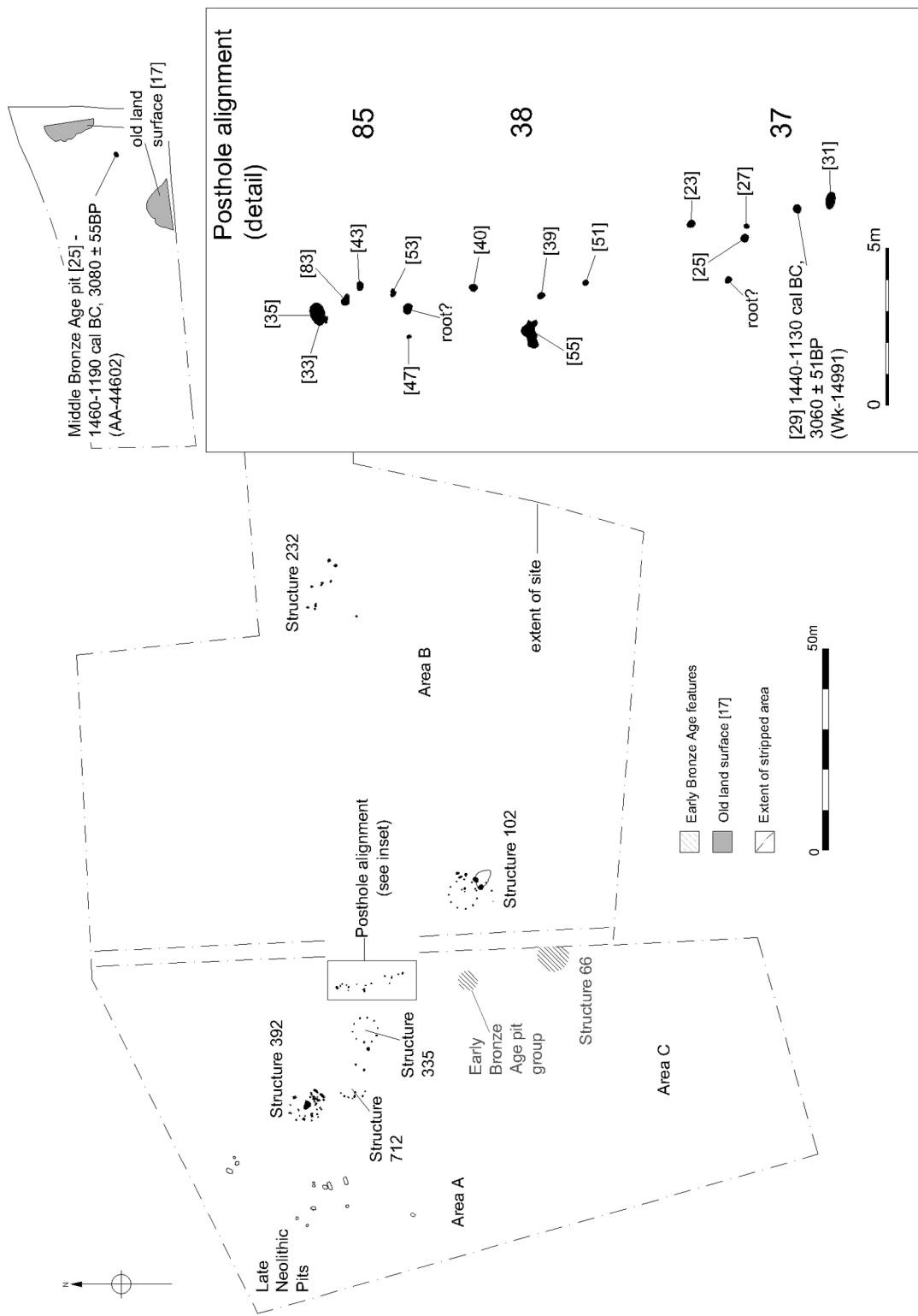


Fig 4 Early and Middle Bronze Age features in Areas A and B

pit [494], fall within the national date range for Grooved Ware use, currently *c* 2900–2300 cal BC (Garwood 1999).

There was no evidence for activity on the site during the Middle Neolithic – evidence for this period is generally sparse in Cornwall – and the Late Neolithic saw the focus of activity shift towards the western end of the plateau. If the radiocarbon determinations are accepted, low-key activity may have occurred over several centuries between 2800 and 2300 cal BC, with the pits perhaps created by small groups of people who sporadically occupied the site. The pits in this spatially tight grouping shared the same general characteristics: they were shallow, concave features containing structured deposits of Grooved Ware pottery, nodular and freshly broken flintwork and worked stone, deposited within single episodes of backfilling. This activity may have had a ritualised character to it, and have been associated with a formalised tradition of occupying sites. Notably, the area of the site with the greatest concentration of Early Neolithic features and artefacts was devoid of Late Neolithic activity. By contrast with the Early Neolithic period, a small spread of material containing pottery and flint (496) probably represented the remains of an occupation-related deposit. However, there was little evidence of permanent settlement; even simple structures, such as those found in Wales (Gibson 1999), were absent.

Bronze Age

Bronze Age activity extending over almost the entire second millennium cal BC was identified, commencing with Early Bronze Age structure 66 and pits [59] and [64], and continuing with Middle Bronze Age structures 102, 335, 392 and 712. The structures consisted of five circular post-built features arranged on a roughly north west – south east alignment. There was also a linear arrangement of posts and a probable sub-rectangular building, 232 (Fig 4). Other Middle Bronze Age activity included a pit [25] and an old land surface (17) in field 4.

Structure 66

This comprised an arc of six postholes, forming part of a ring approximately 6m in diameter, the eastern extent of which was outside the excavation

area (Figs 4–6). The postholes were of a reasonably consistent size but shallow, with a depth of 0.2m–0.26m; the exception was [67], which was 0.73m in diameter and 0.43–0.45m deep.

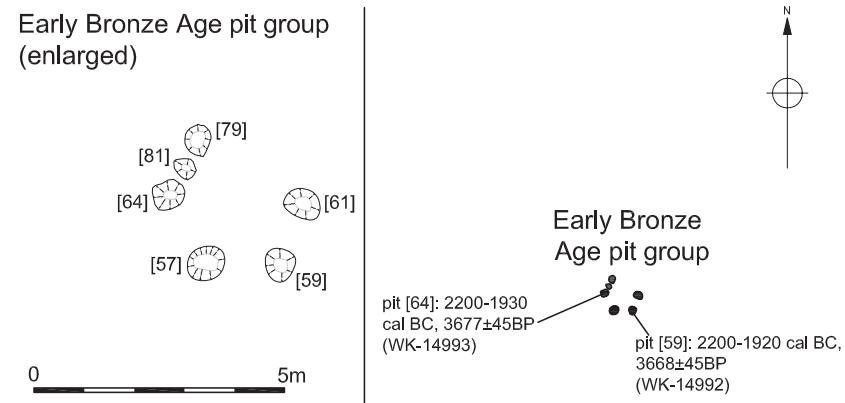
Posthole [73] produced part of a fired clay block (SF1022), possibly connected with either pottery production or metalworking. The unweathered nature of the object suggests that it had been deliberately deposited (Quinnell, below). Since there is no evidence that metalworking or pottery production took place close to structure 66, SF1022 may have been brought from elsewhere. Single sherds of Trevisker pottery were recovered from postholes [67] and [71]. Postholes [75] and [69] produced radiocarbon dates of 3704 ± 38 BP, 2210–1970 cal BC (Wk-14995), and 3380 ± 38 BP, 1770–1530 cal BC (Wk-14994), respectively, suggesting the renewal of the post-ring some centuries after its original construction.

PIT GROUP

This feature comprised an incomplete pit circle 2m in diameter, situated 18m to the north of structure 66 (Figs 4 and 5). The pits were shallow, less than 0.2m deep, and between 0.46 and 0.8m in diameter. No pottery was recovered but all of the pits contained charred plant remains, including hazelnut shell fragments and smaller quantities of charred cereal grains. The greatest numbers of these were produced by pit [57], fill (58). Charcoal in the form of narrow roundwood from species including hazel, holly and oak was also identified (Gossip and Jones 2007). Heat-affected stones were present in the pit fills but as no evidence for *in situ* burning was found it is unlikely that the features were hearths. Two near-identical radiocarbon determinations were obtained: pit [59] produced a date of 3668 ± 45 BP, 2200–1920 cal BC (Wk-14992), and pit [64] a determination of 3677 ± 45 BP, 2200–1930 cal BC (Wk-14993).

STRUCTURE 102

Structure 102 consisted of 12 postholes, evenly spaced 1.9–2m apart, forming a ring approximately 7m in diameter (Fig 7). The post-ring encircled a probable hearth-pit [157] and four post or stakeholes. Two more postholes and five shallow pits, located to the south east, may have formed an entrance. Partially covering these features was stony spread [125], containing sherds of Trevisker-related pottery from vessel **PP30**, with two further sherds of the same vessel in pit [139] (Quinnell, below).



Area A

Structure 66

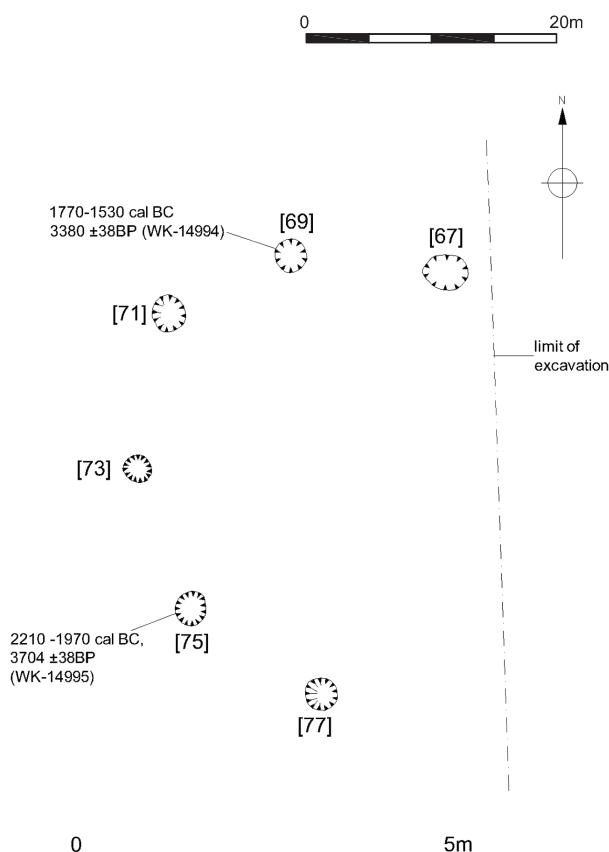


Fig 5 Early Bronze Age features in Area A

Fig 6 Early Bronze Age structure 66

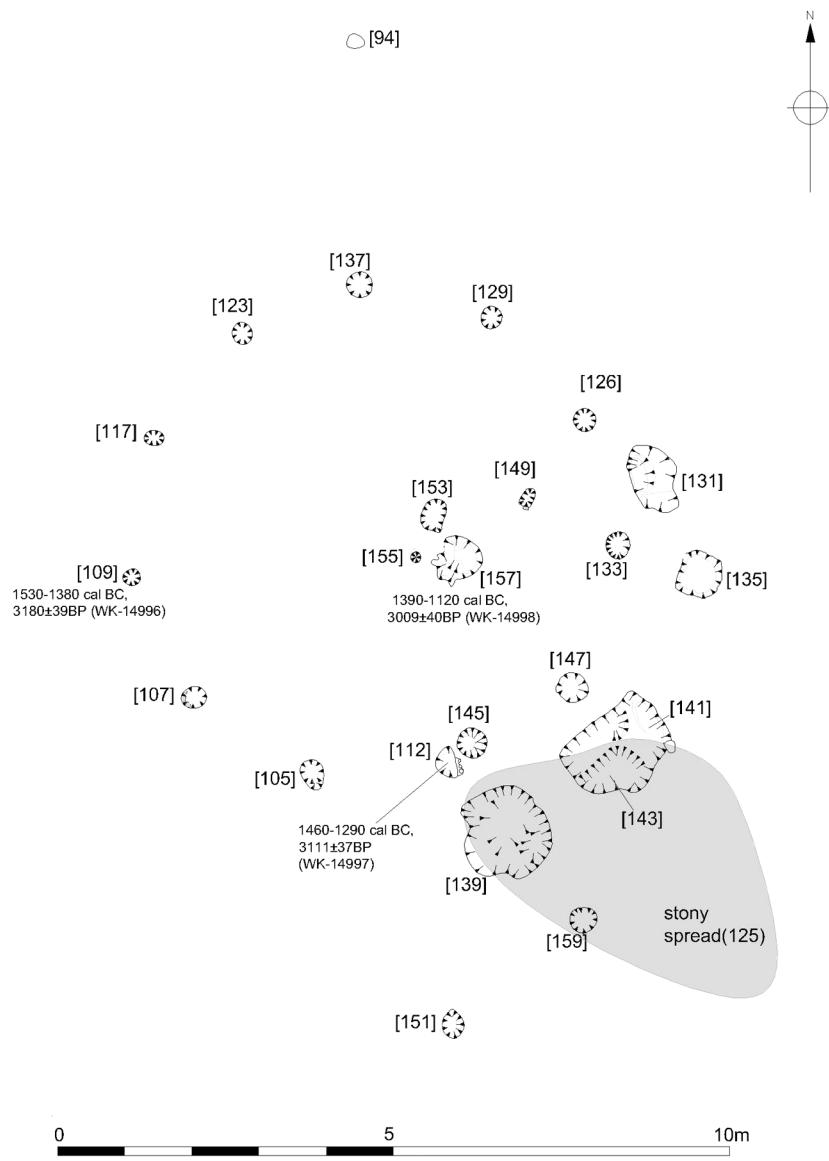


Fig 7 Middle Bronze Age structure 102

The postholes ranged between 0.17 and 0.45m in diameter and were 0.17–0.32m deep. They had steep profiles and generally flat bases. Twenty-nine sherds of Trevisker-related pottery were recovered, of which 11 sherds of vessel **PP30** came from pit [139]. Pottery was also found in postholes [112] (**PP29**), [123], [133], [147] (**PP28**) and spread (125) (**PP30**) (Quinnell, below). Other finds included vein-quartz beach pebbles from [107] and a possible pebble hammer and beach cobble from

(125). Charred plant remains within the postholes included elderberry and mallow (wild foods) and oak and hazel (fuels). The hearth-pit [157] produced cereals and disturbed ground species, including waste from the final stages of cereal processing which may have taken place next to it.

Three radiocarbon determinations were obtained from structure 102. Posthole [109] produced a date of 3180 ± 39 BP, 1530–1380 cal BC (Wk-14996), posthole [112] a date of 3111 ± 37 BP, 1460–1290

cal BC (Wk-14997), and hearth-pit [157] a determination of 3009 ± 40 BP, 1390–1120 cal BC (Wk-14998).

Structure 335

Structure 335 comprised a ring of ten postholes with a diameter of 6.3m (Fig 8, 9). Postholes

were spaced 1.9–2.1m apart and were 0.1–0.3m in diameter and 0.1–0.2m deep, with the exception of [369] and [349], which were very shallow. Posthole [345] was cut by posthole [261], which was perhaps dug to hold a replacement post, consolidating the structure.

Internal features included four shallow postholes [341], [349], [365] and [263], close to the south-

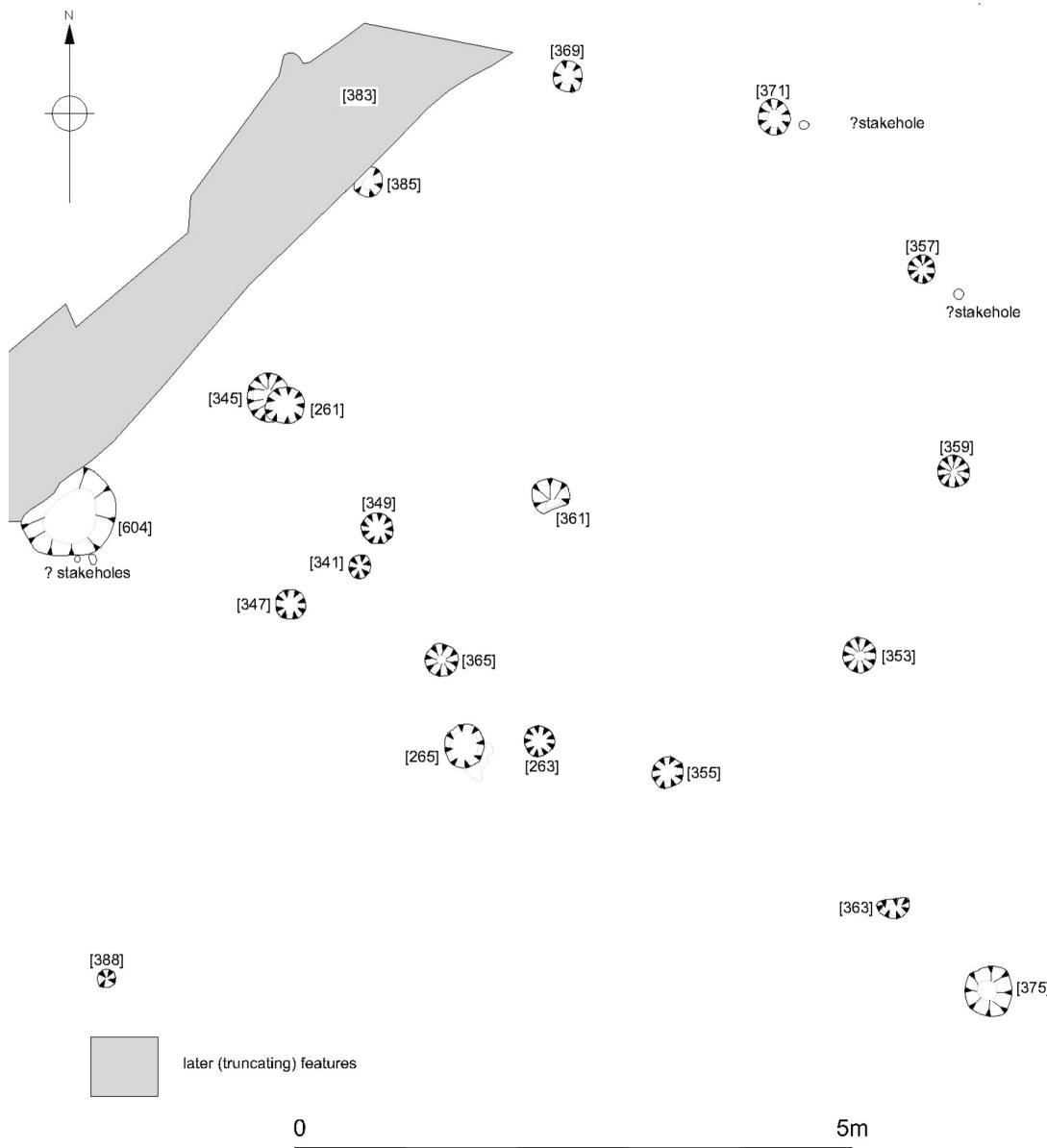
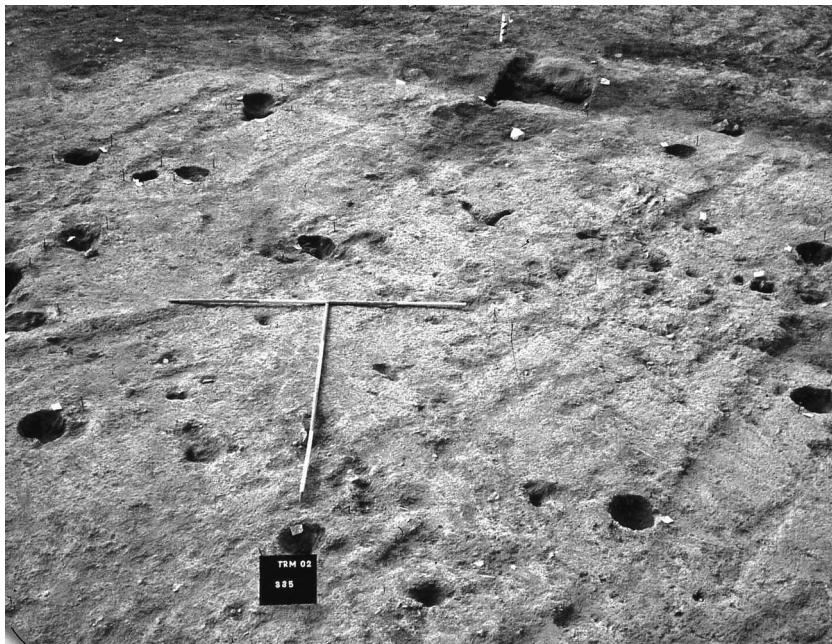


Fig 8 Middle Bronze Age structure 335



*Fig 9 Structure 335, looking west.
(Photograph: Historic Environment, Cornwall Council.)*

western perimeter of the structure, and posthole [361] just to the south west of the centre of the structure. Four features close to but outside the structure may have been associated: postholes [363], [375] and [388] and pit [604]. Postholes [363] and [375] were situated on the south-east side of the post-ring and could have marked an entrance.

A sherd of Trevisker Ware was recovered from the fill of internal posthole [361]. Thirteen sherds of vessel **PP31** were recovered from external pit [604] (Quinnell, below). As with the Early Bronze Age structure 66, no cereal grains were recovered and there was no hearth-pit.

Structure 712

Structure 712 comprised an arc of ten postholes disturbed and cut through by features of the Romano-British settlement, including its main enclosure ditch [565] (Fig 10). The original post ring was approximately 7–8m in diameter but is incomplete in the north-eastern quadrant, presumably as a result of this disturbance, which was probably more extensive than is indicated by the surviving features. The surviving postholes had diameters of 0.2–0.45m and were 0.12–0.41m deep. Two internal features, [704] and [710], lay

close to the western arc of postholes. Feature [704] was a possible posthole or post-base. Other internal features may have been removed by Romano-British ditch or gully [596], which contained two redeposited Trevisker sherds of vessel **PP33** and one of **PP34**. Postholes [606] and [608], on the south east side of the structure, reached a depth of 0.35m, much deeper than all but one of the other posts. This might imply that taller entrance posts were located in a position comparable with the clearly defined entrances into structures 102 and 392. A shallow pit containing burnt stone, [367], was found on the east side of the structure.

An elongated, shallow pit [600] cut the northern part of the structure. The eastern end of this feature had been cut through by a later posthole [729], the fill of which produced one sherd of Trevisker pottery in addition to Romano-British pottery. The Bronze Age material in [792] was almost certainly incorporated as a result of disturbance.

No cereal grains were recovered from the structure and there was no hearth. In consequence no samples were available for radiocarbon dating.

Structure 392

Structure 392 was the most complex of the Middle Bronze Age post-rings, with two approximately

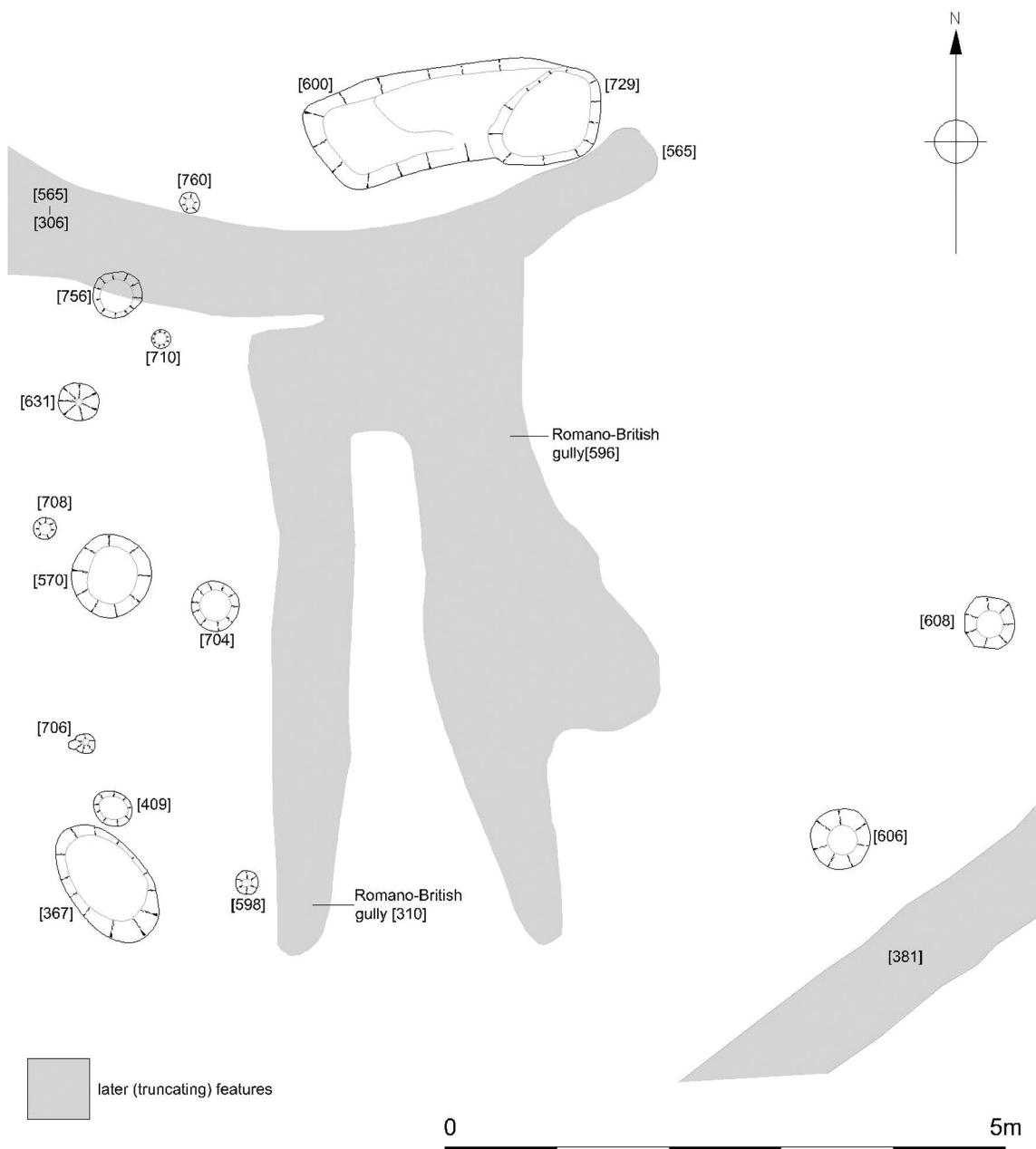


Fig 10 Middle Bronze Age structure 712

concentric rings of postholes and features both inside and outside these post-rings (Figs 11, 12). The western edge of the structure had been cut through by the Romano-British enclosure ditch [565].

The outer ring of the structure was approximately 8m in diameter, the inner around 5m. Spacing between outer-ring postholes was 1.9–2.2m, that in the inner-ring was 1.5–2.2m. The majority of the postholes had vertical sides and flat bases and

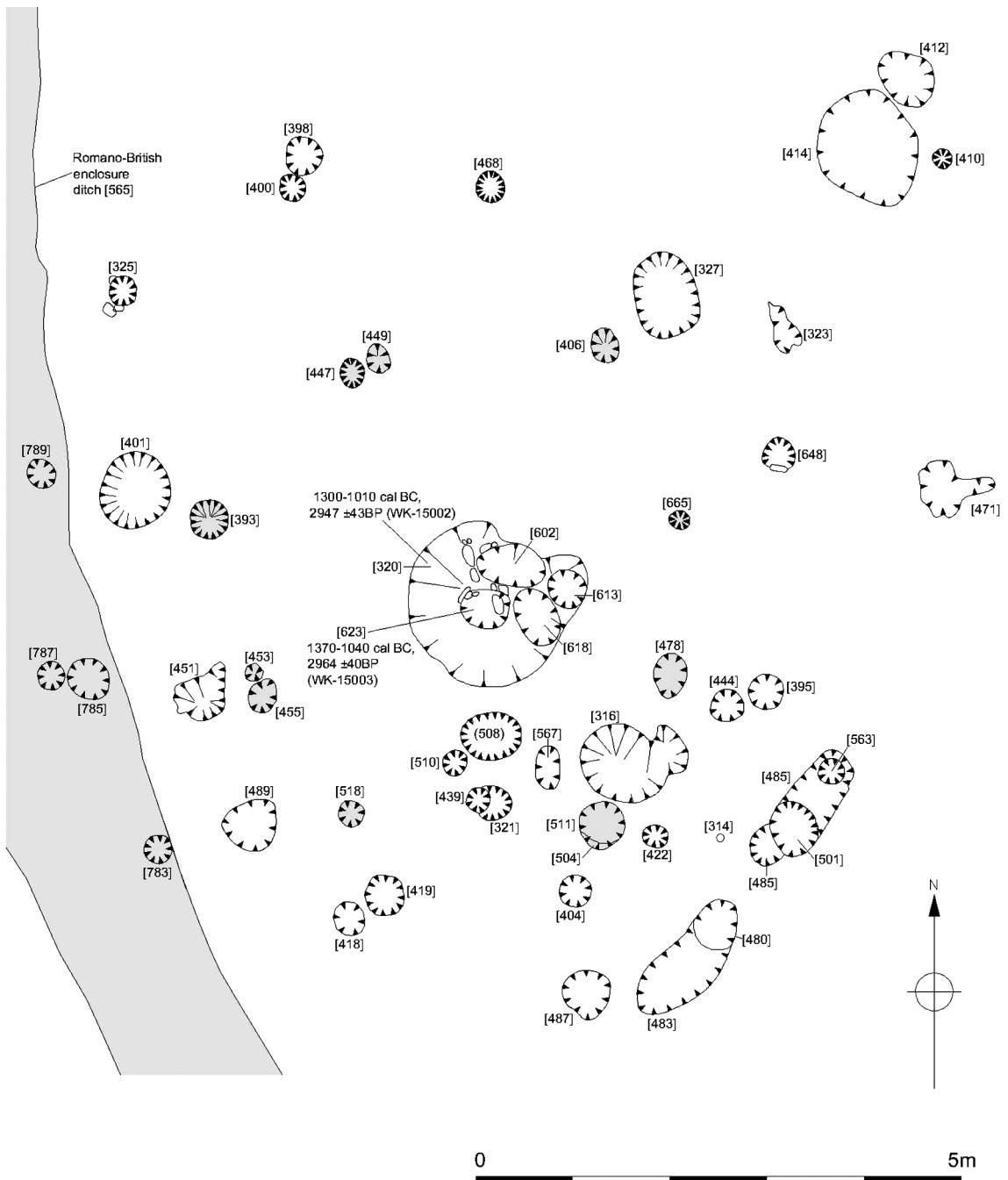


Fig 11 Middle Bronze Age structure 392



Fig 12 Structure 392 from the south east during excavation

several contained packing stones. Postholes in the structure were 0.15–0.44m deep and 0.15–0.42m in diameter. Posthole [325] on the north-west side of the outer post ring contained fragments of a light reddish-brown baked clay with wear suggesting that the material was being ground for use as colourant. Posthole [419] contained a wolframite stream pebble.

Wider spacing between postholes of both rings on the south-eastern edge, and the presence of external features, suggests an entrance into the structure from this side. A cluster of features between the inner and outer post-rings and outside the outer post-ring may have been associated with this entrance. These features comprised pits and postholes and stratigraphic relationships suggest more than one phase of building or the renewal of posts. Sherds of Trevisker-related pottery (vessel **PP19**) were found in postholes [439] and [478]. Outside the outer post-ring on this side were two elongated shallow postholes, [483] to the south and [485] to the north. Entrance posthole [485] contained one sherd of Trevisker-related pottery

and a broken muller, probably deliberately buried. Cut through [485] were postholes [501] and [563], and cut through [483] was posthole [480]. Just to the west of pit [483] was posthole [487]. Together these features form an almost symmetrical arrangement on this side of the structure. Between these and the structure's central features were a small stakehole [314], a posthole [511] set between the inner and outer post-rings cut into posthole [504], a shallow pit [316] posthole [510] and deposit (508). Pit [401] contained four sherds of Trevisker-related pottery, a quartzite beach pebble and a stream cobble rich in cassiterite.

A group of features located slightly off-centre within the structure comprised three steep-sided posthole-type cuts, [602], [613] and [623], a pit [618] and a probable hearth-pit [320], which cut them. Posthole [623] contained both *in situ* and disturbed post-packing stones. Charcoal from fill (622) within this feature produced a radiocarbon determination of 2964 ± 40 BP, 1370–1040 cal BC (Wk-15003). Pit [618] was concave-sided and bowl shaped. Deposits in all these features,

particularly [602], [613] and [618], were rich in charcoal. Features [618] and [613] produced 16 and 17 sherds of Trevisker-related pottery respectively. The central features were cut into by a shallow probable hearth-pit [320]. Its primary fill produced 44 sherds of Trevisker-related pottery, including vessels **PP21–27**. Fragments of burnt bone from a sheep or goat were also retrieved, together with four quartzite beach pebbles and a ripple-flaked flint knife of diagnostically Early Bronze Age form, presumably curated (or retrieved from an earlier depositional context) and selected for deliberate deposition. The hearth-pit fills were charcoal-rich, with oak, hazel, hawthorn and willow or poplar having been used as firewood; they also contained charred cereal grains. However, some of this material could have been the result of contamination: the stratigraphy was shallow and the structure lay inside the Romano-British settlement, which produced a large cereal assemblage. The small amount of Romano-British pottery recovered from structure 392 highlights this problem. A radiocarbon determination of 2947 ± 43 BP, 1300–1010 cal BC (Wk-15002), was obtained from the primary fill of the hearth-pit.

Adjacent to the central feature [320] was (318), a shallow spread of stony, charcoal-rich, silty clay 0.05m deep. It contained five sherds of Trevisker-related pottery, including one of vessel **PP20**.

In total, 174 sherds of pottery were recovered from structure 392. All are distinctive Trevisker-related ceramics appropriate for a late date within this ceramic sequence, some of it deposited with a degree of formality (Quinnell, below).

Posthole alignment 37, 38 and 85

This comprised three groups of postholes to the east of structure 335 forming an approximate north-south alignment with an overall length of about 17m (Fig 4). They possibly represent a boundary. The southernmost posthole group 37 comprised five postholes spaced 1.2–1.8m apart, each 0.3–0.5m in diameter and 0.17–0.26m deep. Two postholes, [29] and [31], each produced a sherd of Trevisker-related pottery. Posthole [29] also gave a radiocarbon determination of 3060 ± 51 BP, 1440–1130 cal BC (Wk-14991). Charcoal and charred cereal remains were recovered in very small quantities. The latter included hulled and possibly naked barley and emmer or spelt wheat grains, together

with weeds and tubers typical of grassland or disturbed/cultivated land.

Only 4m to the north was posthole group 38, comprising a row of three postholes 0.28–0.38m in diameter and 0.19–0.33m deep. Postholes [51] and [39] were 1.4m apart, while postholes [39] and [40] were 2.1m apart. Feature [55], to the west, was probably a result of modern disturbance or natural process.

At the northern end of the alignment was posthole group 85. This comprised an arc of four postholes and a stakehole.

Structure 232

An irregular, sub-rectangular structure (Fig 4) made up of shallow postholes was revealed close to the eastern extent of Area B but had been disturbed by roots and agricultural activity. Ten postholes 0.3–0.8m in diameter and 0.1–0.27m deep defined a structure with an overall size of 13m by 3m. Fills were generally inclusion-free clay silts, but some displayed evidence of *in situ* post-pipes and packing stones. A rim-sherd of probable Trevisker pottery (**PP32**) was recovered from posthole [208]. Although these features had been disturbed, it is likely that they represent a structure of Middle Bronze Age date.

Other features

A large pit and remnants of an old land surface were found approximately 100m north east of structure 232 in field 4 (Fig 4). Pit [25] was oval in plan, 1.15m long, 0.88m wide and 0.33m deep, and was filled with burnt stones and charcoal. However, none of the burning had taken place *in situ*. It contained fragments from a Trevisker vessel (**PP37**) and a sherd from another (Quinnell, below). Pit [25] produced a Middle Bronze Age radiocarbon determination of 3080 ± 55 BP, 1460–1190 cal BC (AA-44602).

The old land surface (17) was found at the eastern end of the 2000 excavation area. Two substantial patches remained (Fig 5), which were found to contain 29 sherds of Trevisker pottery (including vessels **PP35** and **PP36**) and 29 baked clay fragments from cylindrical ‘loom-weights’ (Quinnell, below). A radiocarbon determination of 3055 ± 55 BP, 1440–1120 cal BC (AA-44603), was obtained from ditch [30] cutting through old land surface (17). The determination came from

redeposited material as ditch [30] also contained later pottery of Iron Age date.

Finally, a circular anomaly measuring approximately 8m across was located by geophysical survey about 80m north west of the old land surface in field 3. This feature remains unexcavated but is similar to anomalies which have been produced by hollow-set roundhouses in other parts of Cornwall (Jones 1998–9).

The Bronze Age occupation

The Bronze Age saw the construction of timber post-ring structures and post-settings whose use might have spanned almost a millennium, from c 2000 to 1100 cal BC.

The environmental analyses provided little information about the Bronze Age landscape (Gossip and Jones 2007). Some evidence was found for the consumption of wild foods, including hazelnuts, during the Early Bronze Age. Quantities of cereals were found in Middle Bronze Age contexts. These occurred in the greatest quantities in the hearth-pits in the more complex post-ring structures 102 and 392, with the largest amount in the latter. Similar evidence for Middle Bronze Age cultivation has come from other archaeological investigations across Cornwall and southern Britain (Nowakowski 1991; Campbell and Straker 2003; Jones and Taylor 2004). However, caution is required as structure 392 was located within the Romano-British enclosure, which produced an assemblage of emmer grains. In addition, the charred material from some of postholes, in the form of tubers and other macrofossils, indicates a continuation of an open environment. Oak and hazel charcoal suggests that timber was obtainable locally and suitable timbers for the post-rings must also have been available.

The site's non-waterlogged character means that there is insufficient evidence to prove whether the post-rings were roofed, although if comparisons are made with post-rings associated with ceremonial sites, such as Davidstow site 22 (Christie 1988), it is quite likely that the simpler examples, structures 66, 712 and 335, were not. However, the latest structure, 392, which, with its double post-ring and entrance features, most resembles a house of this period, may have been roofed and some or all of the others could have been.

The radiocarbon-derived chronology for the post-rings suggests a development over time from

south-east to north-west across the site, beginning with structure 66 and the adjacent pit group at the beginning of the second millennium cal BC, and culminating with structure 392 nearer to 1000 cal BC. However, the picture is likely to be more complex, as a second determination from structure 66 suggests renewal of the structure between 1770 and 1530 cal BC, long after its initial construction and broadly at a time when other post-rings were being erected.

Currently, there is a scarcity of evidence for Early Bronze Age (c 2500–1500 cal BC) settlement activity (Jones 2008), although the nature of Middle Bronze Age (c 1500–1000 cal BC) settlement in Cornwall is clearer. However, post-ring roundhouses resembling the evidence from Tremough, which are known elsewhere across southern Britain as far west as east Devon (Fitzpatrick *et al* 1999), have not previously been identified in the Cornish Middle Bronze Age. Instead, two other types of roundhouse are found. In lowland Cornwall, a substantial number of hollow-set roundhouses dating from c 1500 to 1000 cal BC have been excavated (Gossip and Jones 2008). These lowland roundhouses comprise post-rings ranging from 6m to 10m in diameter set within circular hollows cut into the ground surface; they often contain central hearths. These were roofed structures with an entrance, usually on the southern side. Evidence of extended use is often found in the form of occupation deposits, charred plant remains and refurbishment. There is evidence that they were also associated with ritualised activities, especially during their abandonment when structured demolition and infilling of the house-hollows took place (Nowakowski 1991; Jones 1998–9; Jones and Taylor 2004). In upland areas such as Bodmin Moor, roundhouses with stone walls are found, which often contain internal post-rings and features such as paved areas or clay floors (Mercer 1970). In common with the lowland examples, entrances typically face south. Artefactual and environmental evidence from many of these structures suggests that they were occupied as domestic living spaces.

The five Tremough post-rings are rather different from either of these types. They comprise simple post-rings on a level surface with no indication for stone walling or any kind of wall-line. Internal features such as paving or stake-settings are scarce, with the exception of structure 392 which includes not only an internal ring of postholes but central postholes. The regular, circular plans of the post-

rings differ from those of many of the lowland roundhouses, which have irregular spacing between postholes, particularly where post renewals have taken place. In addition, there are only two instances of hearth-pits at Tremough; that in structure 392 was a substantial central feature. The most complete structures, 102, 335 and 392, are associated with external features, such as entrance postholes at structures 102 and 392, and a possible boundary to the east of structure 335, suggesting that the approach to these structures was formalised and from the south east. This orientation was reflected in the overall layout of the post rings, which also aligned from south east to north west. Finally, there was a dearth of evidence for occupation activity; the spaces enclosed within the post-rings did not contain spreads of occupation-related material such as charcoal. Significant quantities of grain were limited to structure 392 and artefacts were largely confined to deposits within post-holes. Despite being covered by topsoil with an average depth of 0.3–0.4m, these sites are likely to have been damaged by post-prehistoric ploughing. This could have eroded features and occupation deposits. However, the preservation of prehistoric land surfaces in fields 4 and 7, the survival of deposits outside structure 102 and of *in situ* walling associated with a Romano-British structure in the 'fort' indicate that ploughing is unlikely to have completely removed internal features or evidence of walling. Furthermore, the postholes comprising the post-rings are, with average depths of 0.17–0.4m (excluding structure 712), comparable with well-preserved roundhouse and ceremonial sites such as those at Trethellan and Stannon site 6 (Nowakowski 1991; Jones 2004–5), again suggesting that truncation may not have been severe.

The Tremough post-rings therefore differ significantly from known Bronze Age roundhouses in Cornwall. Their morphology and the dearth of environmental evidence suggests that they were not conventional domestic structures. Alternatively, they may have been ceremonial monuments. Structure 66 dates to the Early Bronze Age and may be allied to a wider body of timber-circles found during this period. Alex Gibson (1998) has produced a gazetteer of British timber-circles ranging from Late Neolithic structures with large diameters and multiple post-rings, like the Sanctuary, near Avebury, Wiltshire, to simpler constructions as at Charnham Lane, Berkshire. The dating of post-rings suggests a long currency from

c 2800 cal BC to 1000 cal BC and it is unlikely that all were constructed for similar functions.

Post-rings have been previously recorded in Cornwall associated with barrows and cairns. They are predominantly single rings ranging from approximately 5.5m to 20m in diameter (Miles 1975; Jones 2005, 100). The earliest, dating to 2890–2550 cal BC, was found beneath Davidstow site 22 (Christie 1988; Jones 2005, 100–2) and consisted of a post-ring some 10m in diameter associated with Grooved Ware. The remaining Cornish sites are Early Bronze Age in date. At Cocksbarrow a cairn-ring contained a double post-ring and two phases of posts were recorded in the bank at Caerloggas I (Miles 1975). A post-ring identified during excavations at Stannon site 6 was found within an earlier ring-cairn radiocarbon dated to 1600–1400 cal BC and a second possible timber-setting within site 9 at Stannon to 1500–1100 cal BC (Jones 2004–5).

Timber circles dating to the Middle to Late Bronze Age are scarce in the south west. In Devon, a circular timber structure has recently been found within an enclosure at Holworthy, Parracombe, Exmoor, within a Middle Bronze Age hill-slope enclosure (Terry Green, pers comm). The nearest parallels for the Tremough structures are a small group of post-rings that have been found during recent interventions elsewhere in Cornwall. A post-ring approximately 8m in diameter was uncovered at Bosmaugan (St Winnow), which enclosed a central pit containing Trevisker pottery (Cole 1999). It has been radiocarbon dated to 1400–1000 cal BC, but its wider contemporary context is uncertain. Recent excavations along the Goss Moor section of the A30 led to the discovery of three post rings. At Royalton (St Columb Major) a site comprising a segmented ditch and a post-ring has been radiocarbon dated to the first half of the third millennium cal BC and at Lane End (Roche) two post-rings had determinations within the first half of the second millennium cal BC (Paul Clark, pers comm). It is clear that free-standing post-rings were part of the repertoire of ceremonial monuments throughout the later Neolithic and Bronze Age in Cornwall.

The Tremough post-rings are likely to have been related to earlier Bronze Age ceremonial monuments, although the latest, structure 392, had a more 'house-like' plan than the earlier rings. Ritual and domestic practices in prehistory are frequently inseparable from one another

(Bradley 2005), and it perhaps unsurprising that there should be similarities between ‘domestic’ and ‘ceremonial’ buildings. However, a spatial distinction between places associated with more formal ritual practice from those linked with occupation activities is a feature of the Cornish Middle Bronze Age (Jones 2008). In Cornwall, there is evidence from some Middle Bronze Age settlements that certain structures were set slightly apart from the main occupation area, as with Trethellan structure 2192 and a structure excavated at Callestick (Nowakowski 1991; Jones 1998–9). These are unlikely to have been domestic buildings and could have been used for ritual activities. At Stannon site 9, on Bodmin Moor, a ring-cairn located on the southern edge of a settlement, was probably re-used by occupants of the adjacent roundhouses (Jones 2004–5). Viewed in this context, the Tremough post-rings could perhaps have been non-residential ceremonial structures on the edge of a settlement.

In area B/field 4 a possible sub-rectangular building, structure 232, was set near to the remnant old land surface [17] and pit [25], the two latter both dated to the Middle Bronze Age. Further to the north in field 3, an unexcavated circular anomaly identified by geophysical survey may represent a hollow-set roundhouse. Structure 232 was not radiocarbon dated and its dating relies on one sherd of Trevisker pottery. Although rectangular structures dating to the Middle to Late Bronze Age are less common than circular buildings, they have been found elsewhere, for example at Down Farm, Dorset (Barrett *et al* 1991, 201). Only two examples have been recorded in Cornwall, both interpreted as ancillary buildings. At Penhale Moor (St Enoder), a hollow-set structure measuring 5.5m long by 2.2m wide was constructed beside a hollow-set Middle Bronze Age roundhouse (Jones *et al* 1994). The second example, structure B at Trevisker, was also beside a hollow-set roundhouse. It measured approximately 5.5m long by 2.5m wide (ApSimon and Greenfield 1972). If structure 232 was contemporary with the post-rings, then it may provide a significant contrast in the use of architecture between the eastern end of the site with its old land surface which contained occupation-related material, and the circular post-ring alignment in the west associated with placed deposits of Trevisker-related pottery. The boundary (posthole groups 37, 38, and 85) may have separated the two areas.

Zonation of occupation areas has been suggested for some Bronze Age settlements in southern Britain (Parker Pearson and Richards 1994, 51), with middens, for example, being created in some areas and other activities, including feasting, focused in others. Some evidence suggests zonation at Tremough. The post-rings were located at the western end of the promontory and appear to have been used for intermittent ritualised activities, which included the deposition of artefacts. Domestic activities and roundhouse constructions were not found in the immediate vicinity. It would be possible to describe this setting as a ‘ritual complex’, but this would ignore the fact that many of the deposits within the post-rings directly referred to the domestic world, thereby linking two inter-related spheres. Furthermore, evidence for occupation to the east of the post-rings in area B and in fields 3 and 4 indicates that they did not stand in a large space reserved for ceremony.

The issue of whether structures were contemporary with each other extends to the post-rings themselves. The available evidence suggests two possible scenarios for the development of the complex. In the first, the sites had ‘life-cycles’ resulting in a sequence in which only one was used at a time with others in various stages of decay and the sites of the oldest being actively avoided. Alternatively, it is possible that older sites were maintained and their posts renewed so that there was a line of circular structures.

In summary, parallels exist with post-settings associated with earlier barrows and with the few known free-standing Middle Bronze Age post-rings; similarities with roundhouses increased over time. It is therefore possible that the Tremough post-rings may have had links with the post-rings associated with barrows, but these were increasingly supplanted by ideas that were associated with the settled landscape, so that the changing nature of buildings found in the wider landscape was reflected in the post-rings themselves.

The Later Iron Age and Romano-British period

Field system

The primary evidence for Iron Age activity is provided by a rectilinear field system which extended across fields 7 to 3 (Figs 13, 15). It

consisted of a series of fields, each of around 1000 sq m, defined by ditches, alongside which were probably earth banks, possibly topped by vegetated hedges. Although the excavated remains were fragmentary, they indicate an area of fields extending over about 3–3.5 ha.

The eastern end of a rectilinear field system was uncovered in 2000 comprising ditches [15] and [30] aligned north-south and [19] aligned east-west (Fig 13). The ditches measured up to 0.9m wide and 0.5m deep. Their upper fills contained pottery consistent with a date during the currency of South Western Decorated Ware in the later Iron Age – the fourth to first centuries cal BC (Quinnell, below). Ditch [19] also produced a saddle quern fragment. To the north east of these, excavation of the access road in field 7 revealed a short section of east-west ditch [7], possibly part of the same field system, which provided a radiocarbon determination of 2070 ± 55 BP, 350 cal BC – cal AD 60 (AA-44600).

Ditch [5] was also located within an access road (Fig 13). A length of approximately 17m was exposed aligned north east – south west, measuring 0.92m wide by up to 0.17m deep. No artefacts were recovered but its dark fill was similar to those in the ditches of the later Iron Age field system located in Area B to the south.

To the west were further remnants of a field system comprising five subrectangular plots subdivided by a series of linear ditches (Fig 13). These corresponded with linear features recorded in field 3 in 2000. The ditches were shallow and narrow, no greater than 0.3m deep and 1m wide, and oriented east-west and north-south. Further west, a north west – south east oriented ditch [698] and ditches [590] and [716] had an uncertain stratigraphic relationship with Romano-British enclosure ditch [565] (below) but probably formed the western extent of the field system. It is likely that subsequent agricultural disturbance has truncated many of the ditches. The southern boundary of the field system, formed by ditches [169], [173], [179] and [181], may have been incorporated into the later medieval field layout, since they fall on the line of a later medieval ditch (Gossip and Jones 2007, 23). The Romano-British structure 338 and associated enclosure (below) were probably added at a later date and would have put the western end of the field system out of use. The few Roman sherds found in the ditches were small, abraded and probably intrusive. The ditches are likely to have become largely filled before midden material

incorporating domestic rubbish derived from the Romano-British settlement was used for manuring over the field system.

STRUCTURE 338

A Romano-British post-built structure within a C-shaped enclosure appears to have been superimposed on the western end of the Iron Age field system (Figs 13, 14). A small number of pits and other ditches were probably contemporary.

Structure 338 was a complex of postholes, pits, gullies and hearth-pits, which formed an oval structure measuring 8m by 6.7m on a north east-south west axis, its perimeter defined by postholes with interconnecting gullies on the north-western and south-eastern sides. Spacing between postholes was irregular because of the re-cutting of original features. Two large postholes 2m apart on the southern side of the structure, [754] and [725], with diameters of 0.61m and 0.65m respectively, probably formed the entrance. The remaining postholes were of variable depth with those forming the outer-ring tending to be shallow. At least two gullies, [793] and [713], appear to have been wall-trenches, since they link postholes and had stakeholes driven into their bases. The internal surface formed a slight hollow but no distinct floor was recognised.

Internal elements comprised an irregular ring of steep-sided, flat-bottomed postholes, 0.2–0.46m deep. Features [763] and [645] were similar, measuring 0.6m in diameter and up to 0.46m deep. Both were steep-sided and flat-bottomed, and may have supported an internal structure. Two linear scatters of stakeholes [610] were found between the two postholes, and appear to be truncated by a pit [611], and post-pad [627].

In the centre and south-western quadrant of the structure was a complex of inter-cutting hearth-pits. In the south-west quadrant was hearth-pit [743] from which an elongated gully [466] extended linking it to the others in the centre. These hearth-pits were 0.25–0.45m deep and varied in shape from oval cut [680], 0.75m long and 0.54m wide, to [674], 2.6m long and 1.3m wide. The edges of the hearth-pits had been scorched by burning and their fills contained significant quantities of charcoal. Shallower pits with concave profiles – [750], [343], [690] and [727] – in the southern half of the structure to the south west and south east of hearth-pit [773] may have been associated with the hearth-pits.

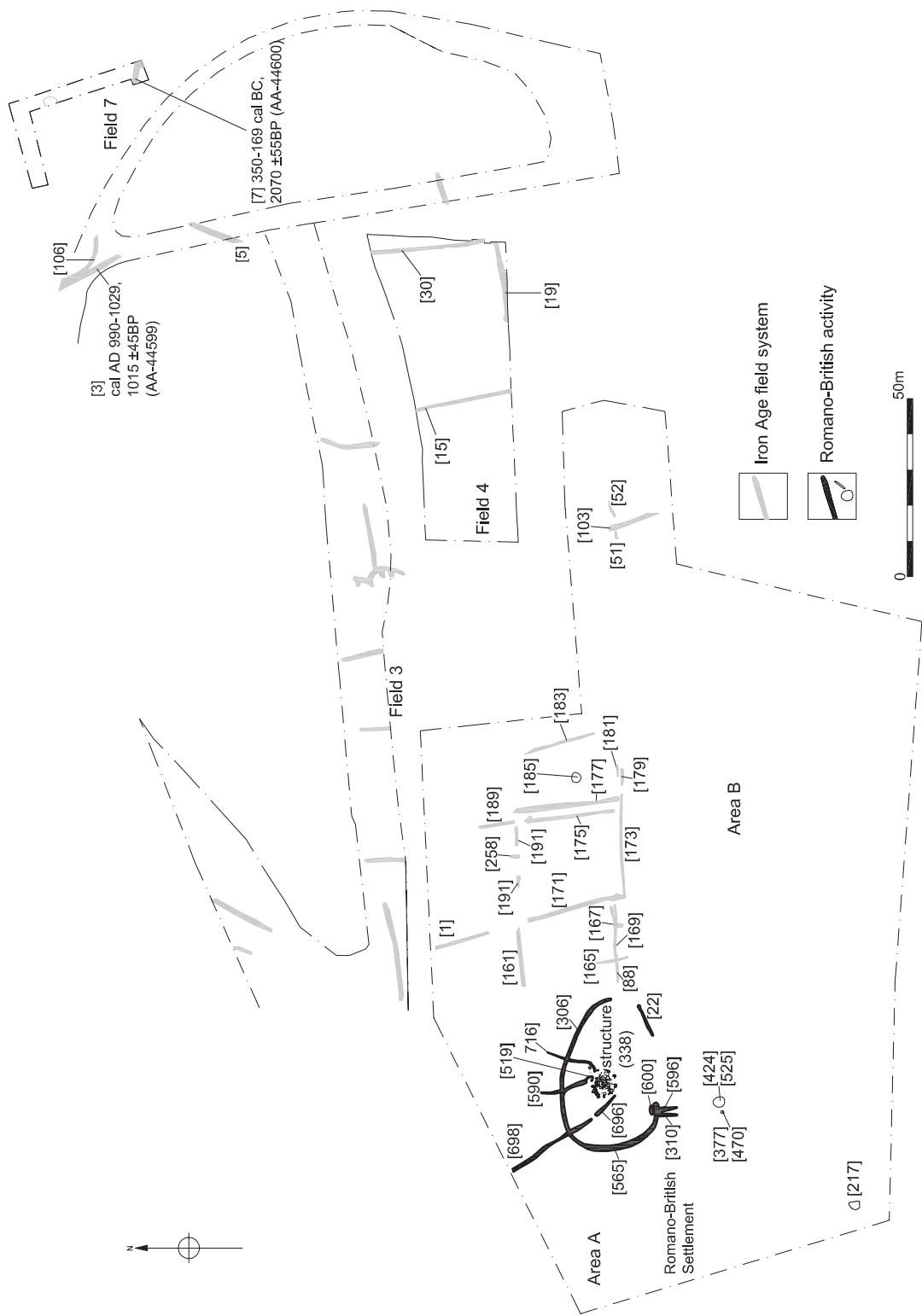


Fig 13 The excavated Iron Age and Romano-British landscape (west)

At least three phases of activity were indicated by stratigraphic relationships between features. These suggest a more or less continuous process of consolidation and maintenance over some 150 years rather than distinct episodes of construction or re-modelling. Use of the structure for a variety of functions produced a mixed assemblage of artefacts. The abandonment process was deliberate with the structure covered by soil and rubbish.

Two radiocarbon determinations were obtained. Hearth-pit [628] provided the earlier date of 1844 ±38 BP, cal AD 70–250 (Wk-15004), while later hearth-pit [674] gave a date of 1770 ±38 BP, cal AD 130–380 (Wk-15005).

The pottery assemblage suggests an initial phase of activity in the late second century, the most distinctive pottery forms being Type 10 bowl sherds **PR1** and **PR2** from posthole [336] and **PR4** from posthole [645]; and gully [519] (**PR3**) located on the north east edge of the structure. A posthole thought to belong to this initial phase of activity [754] (755) contained a worn but intact Cornish mensuration weight, **S8**, made of fine-grained porphyritic elvan (Quinnell, below; Fig 30). Also recovered from this posthole was a slab with a depression, possibly used as a spindle base, and a whetstone. Other stones appeared to 'seal' this feature, reinforcing the notion that the objects had been deliberately buried. The posthole's position as part of what was probably the entrance is likely to have influenced this 'structured' deposit.

Phase 2 appears to be in the early third century AD, indicated by a rather mixed assemblage but including diagnostic forms such as a Type 23 plain-rimmed bowl **PR6** (late second century to fourth century) from pit [611] and a sherd from posthole [669] which has incised decoration typical of storage jars probably introduced in the early third century. Posthole [339] produced pottery **PR5** and a beach cobble utilised as a whetstone.

Use continued (phase 3) until the late third century. Gully/hearth-pit [743] produced a Type 22 rim from a Cornish flanged bowl almost certainly first introduced in the late third century AD. Vessels **PR7** and **PR8** from pit [343] are consistent with this date, Type 12 **PR7** not being produced after c AD 300.

Pottery found within the phase 4 abandonment deposit (503) overlying the structure included Type 22 Cornish flanged bowls **PR12** and conforms to a date range from the late third into fourth century AD. This deposit overlaid all features belonging to

structure 338 and had the appearance of a disturbed cultivation soil, although it may represent a deliberate 'closure' of the structure subsequently disturbed by agriculture. It suggests that the structure went out of use in the early fourth century AD. Deposits overlying the structure contained pottery **PR9**, **PR10**, **PR11**, **PR12** and **PR13**, and a fragment of stone mortar possibly subsequently used as a smelt pot and above this, a whetstone and a fragment of greisen rotary quern. The rim form of the mortar suggests a third or fourth century date (Quinnell 1993, 33).

Charred plant remains from the structure included emmer, spelt and bread-type wheat, hulled barley and oats, mostly from hearth-pit deposits. Chaff in the hearth-pit deposits suggests cereal processing waste was being used as fuel for the fire. Other species differed little from the Bronze Age; a similar range of grassland/disturbed ground, weed and wild food taxa was represented. Hearth-pit fuel deposits indicate that oak was the major source of firewood in the Romano-British period but there was a marked increase in gorse/broom by comparison with the Bronze Age, perhaps suggesting the preferential selection of this type of fuel or changes in woodland composition.

Structure 338 was small but much time and energy was invested in its construction and maintenance, indicating that it was intended to be permanent. The relative absence of non-local ceramics might imply that it was a low status domestic dwelling. The enclosure within which it was sited was also solidly constructed, with its ditch used for special depositions (below). Structure 338 and its enclosure represent part of a larger but poorly understood group of lightly enclosed Romano-British settlements with less substantial dwellings. At Tremough the structure and its enclosure were built on the edge of a field system which may have had as its principal settlement the higher status enclosed 'round' (the 'fort') to the east. The most probable reason for its addition to the local agricultural landscape was to provide additional space and accommodation at a time of expansion, with much of the activity in the structure probably focused on the processing of farm produce.

The enclosure

Two curvilinear enclosure ditches were recorded around structure 338 (Fig 13). Ditch [306], believed

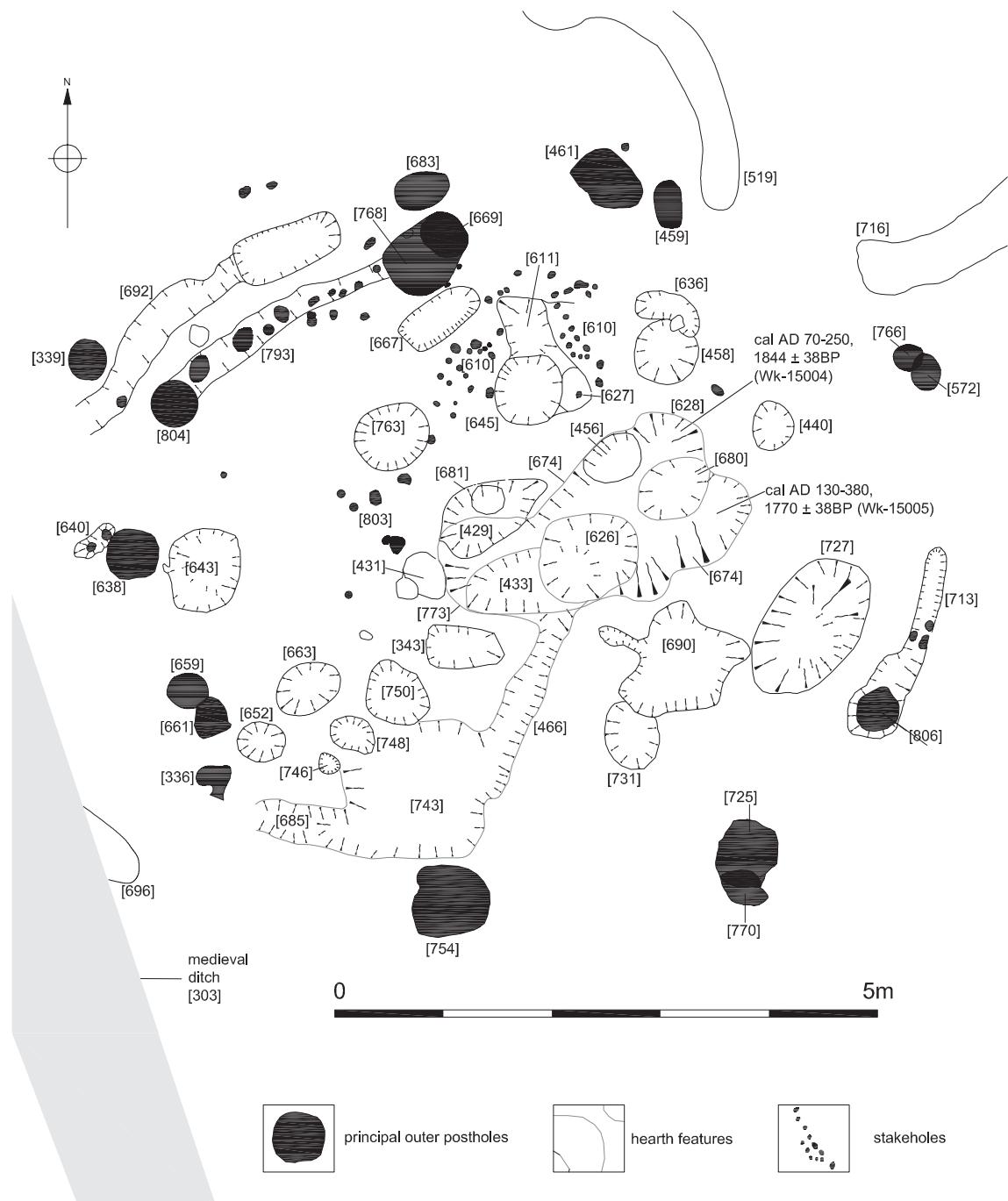


Fig 14 Romano-British structure 338

to be the earlier, formed a C-shaped enclosure, open on its southern side, measuring 48m by 28m, enclosing an area of 0.08 ha. To the west, ditch

[306] was superseded by ditch [565], although the base of the original ditch [306], recorded as [679], was recognisable as an earlier cut for almost its

entire length. A short section of ditch [22] could represent a remnant of the south-eastern arc of ditch [306].

Ditch [306] was 0.7–1m wide at the top, narrowing to a concave base 0.3m wide. The maximum depth was 0.4m, its fill a silt clay suggesting gradual silting and erosion during use. Sherds of Type 4 jars **PR14** indicate a *terminus post quem* in the late second century AD. A cordoned sherd and a necked rim sherd unlikely to date after AD 150 may have been curated prior to deposition. A hobnail was also recovered.

The phase 2 ditch [565] re-cut the western half of [306], forming a smaller C-shaped enclosure measuring 25m by 28m, open on its south-eastern edge and enclosing an area of 0.03 hectares. This ditch was wider, 1.58m at the top, and up to 0.7m deep, with a very steep profile to a flat base 0.3–0.4m wide. The ditch became deeper to the west. Fills were clay silts with large quantities of angular and rounded granite in places. This indicates the gradual silting and erosion of the ditch and bank from its upcast, possibly with a rapid final and deliberate infill event. The three shallow linear ditches [698], [590] and [716] radiating northwards from inside the enclosure ditch did not have firm stratigraphic relationships with it and their phasing is uncertain. It is possible that they represent a remnant of the western extents of the earlier rectilinear field system.

A total of 193 sherds of pottery (**PR 15–22**) were recovered from the fills of the later cut [565], many of which possess fresh breaks and appear to have been covered very soon after deposition. The date range for this pottery is late second century until late third century or very early fourth century AD. However, if the abraded, late second century Type 19 bowl **PR22** from deposit (752), an upper fill of the ditch, was curated or had been re-deposited from an earlier fill into which the ditch was cut, then all dates could be placed within the third century AD. Stone artefacts recovered from the ditch include two possible whetstones, part of a saddle quern, and iron nail fragments. A radiocarbon determination of 1910 ± 42 BP, cal AD 0–220 (Wk-14990) was obtained for this ditch, but since the charcoal from which this date is derived may be re-deposited the date can only be used as a *terminus ante quem*.

The phase 2 enclosure ditch [565] would have produced a significant amount of upcast, which was presumably incorporated into a bank.

Although no bank material survived, the formation of deposits within the ditch suggested that a bank was constructed on the inner side. The small, shallow gully [519], attached to the end of [565] to the north of Structure 338 is unlikely to have provided bank material, and may have functioned as a drainage channel into the main ditch.

Parallel gullies [596] and [310] projected southwards from the south-western terminal of ditch [565], cutting through Bronze Age structure 712 and partly obliterating it (see above). This process explains the presence of Middle Bronze Age finds as well as Romano-British sherds in gully [596]. The gullies may represent a structure, perhaps embanked, defining an entrance to the enclosure. Pit or posthole [729] (Fig 10) just to the north of the gullies was probably associated. This also contained Romano-British pottery (Type 20 bowl) and cut pit [600] which was possibly part of structure 712.

Rectilinear enclosure ('the fort')

Geophysical survey identified a rectangular enclosure lying some 350m east of structure 338, beyond the Late Iron Age field system (Fig 15). The enclosure measured 50m by 40m, enclosing approximately 0.17 hectares. The survey also showed the presence of a number of internal anomalies, arranged around the inside edge of the enclosure. During early work on the site the enclosure became known colloquially as 'the fort' and this name has been retained. Although the feature was not going to be affected by construction work, two evaluative trenches were excavated across the enclosure ditch and into its interior in 2006 (Figs 15, 16) to achieve a better understanding of it.

Both trenches revealed a single enclosure ditch comprising a steep, V-shaped cut through the natural weathered rab and granite bedrock with a flat, very slightly concave base (Figs 16–18). The top of the cut measured 3.6m wide and the base 1.35m. At its deepest, the ditch was 1.95m deep from the top of the cut, 2.25m below the modern ground surface. The ditch was filled with three homogenous mid-brown silt clay deposits (recorded as (101), (102) and (103) in trench 1 and as (201), (202) and (203) in trench 2), although the basal, primary fill (103)/(203) contained a significant number of large stones, particularly along the base of the cut.

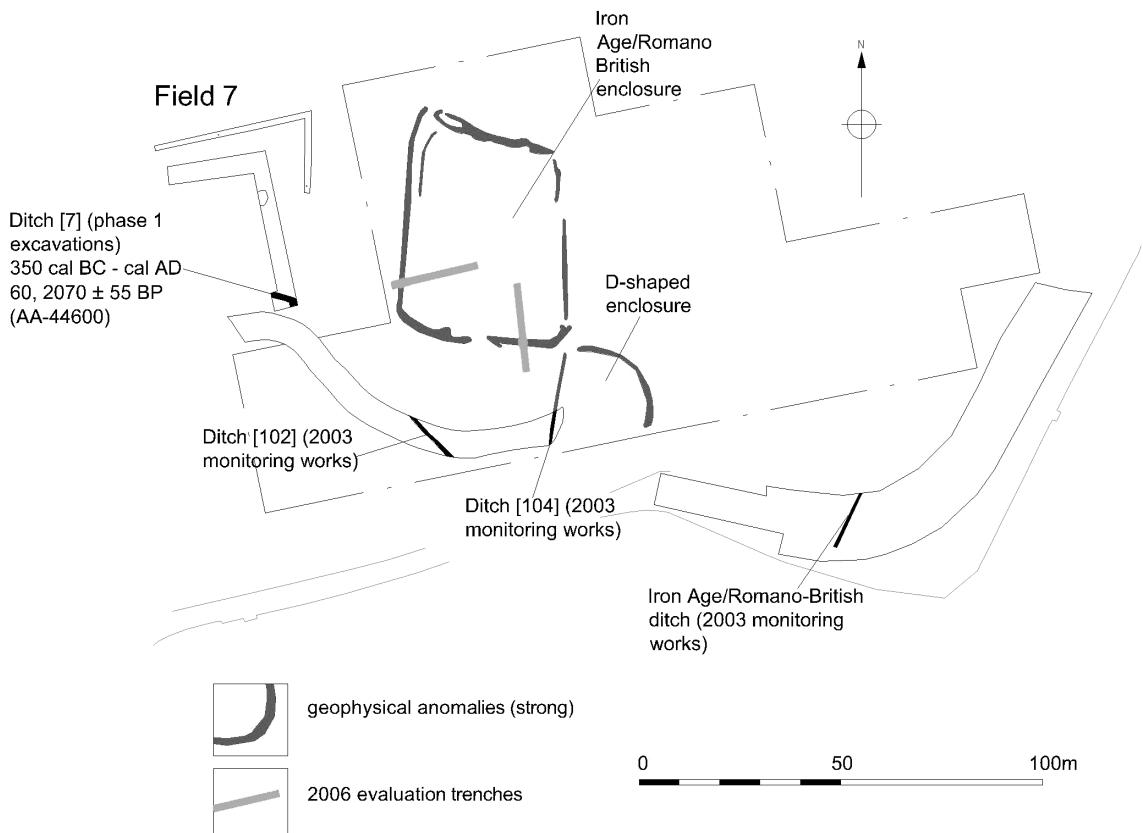


Fig 15 The Iron Age and Romano-British landscape (east) from geophysical survey and excavation

The trenching confirmed the impression given by the geophysical survey that archaeological features were concentrated close to the perimeter of the enclosure. The excavation was on too small a scale to reveal much of the nature of internal features, but postholes, gullies and collapsed walling provided a tantalizing glimpse of relict structures.

In trench 1 (Fig 16), evidence for at least two structures was suggested by postholes and stone walling. Three possible phases of activity were suggested by the archaeological evidence. A structure comprised of gullies [127], [109], walling (111), burnt stone (113), gully (107), construction cut [112] and hearth [114] and a post-built structure comprised of seven postholes, [115], [117], [119], [121], [123], [125] and [130]. Relationships between posthole [125] and linear gully [127] and between the postholes and stone 'walling' (111) with its associated gully [112] suggest that the

post-built structure was earlier than the gullies and the stone walling later than the postholes. It is not known if hearth [114] was purely domestic or had an industrial function, although the intensity of heat suggested by the area of burnt stone (113) and in the hearth base was considerable.

In trench 2 (not illustrated), structural evidence was sparse; two deep postholes [204] and [202] are likely to have formed part of a building.

No traces of bank material were found in either trench and the position of gully [109], close to the inside edge of the ditch, suggests that it was not large.

Radiocarbon determinations were obtained on charcoal from postholes [115] (trench 1) and [204] (trench 2); these were 50 cal BC – cal AD 90, 1978 ± 33 BP (Wk-21590), and 100 cal BC – cal AD 80, 2005 ± 33 BP (Wk-21591) respectively (Tables 10 and 11). Both dates are weighted to the last part of the last century cal BC and the first

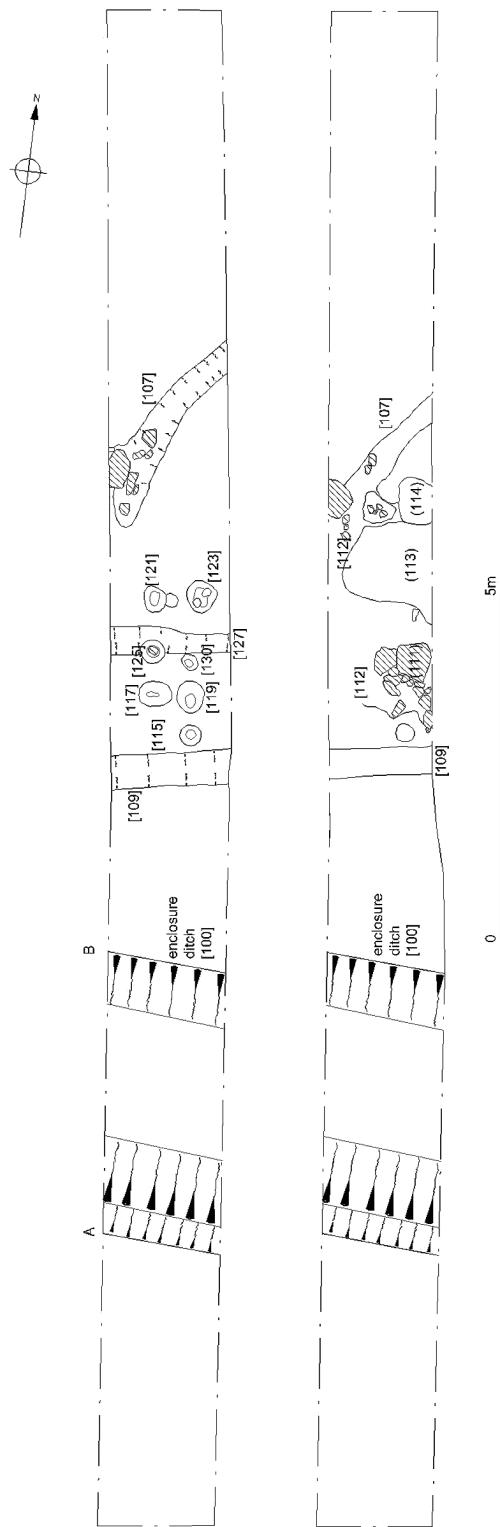


Fig 16 Plan of trench 1, phases 1 and 2 (top), phase 3 (bottom)

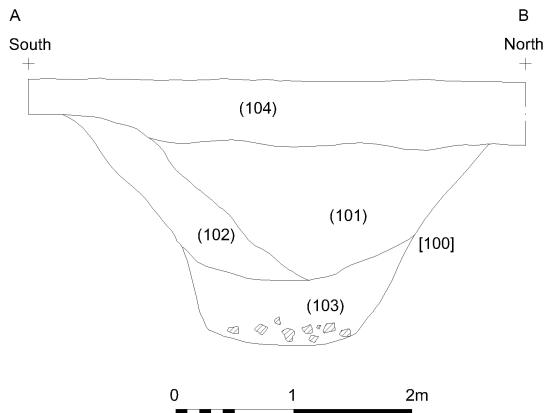


Fig 17 Section across enclosure ditch [100]

decades of the first century AD. The small pottery assemblage from internal features is difficult to date closely but may include an Early Iron Age component, as well as Cordoned Wares with a potential date range from the second century BC to first century AD. A Type N rim from gully [107] suggests activity into the second century AD or later. Overall, the pottery is consistent with the first century BC to first century AD range indicated by the radiocarbon dates. Taken together, the radiocarbon determinations and ceramics indicate that the enclosure was a settlement focus during

the Iron Age and earlier Romano-British periods and probably contemporary with the rectilinear field system.

Outside the south-east corner of the 'fort' a D-shaped enclosure (Fig 15) was identified by geophysical survey. A section of the ditch [104] forming its western side was recorded during monitoring works. This feature was 1.3m wide by 0.8m deep and was filled by a clay silt. No artefacts were found and its date is unknown, although the alignment of the D-shaped enclosure on the corner of the main enclosure suggests there may be an association.

Other features

A number of isolated features were found, including deep pits of uncertain function in areas A and B and fragments of ditched field system in fields 3 and 7.

Four pits containing Romano-British artefacts were located outside enclosure [306] within which structure 338 was located. Pit [424]/[525] was situated 15m to the south of the enclosure. It was 3m in diameter and approximately 2m deep and filled with numerous dumped deposits. Twenty-two sherds of Romano-British pottery were recovered from the pit, including a sherd of samian ware that had been re-used as a spindle whorl. Type 3 and 4



Fig 18 The west-facing section of ditch [100]

jar rims **PR 24 – PR27** and a well-made Cordoned sherd conform to a later second century date for the infilling of this feature.

Pit [377]/[470] lay a short distance west of pit [424] and measured 0.8 by 1.1m and 0.2m deep. Within fill (379) were 70 sherds of pottery sealed by layer (378), a greyish-white gritty clay silt. The sherds had been laid with their outer surfaces uppermost. They represent 80–90 per cent of a Type 4 jar (**PR28**) (Quinnell, below). These had apparently been deliberately smashed, possibly by the beach cobble hammerstone recovered from the same deposit. This appears to have been used for a repetitive percussive process, probably breaking-up or crushing stone. A radiocarbon determination of 1926 ± 46 BP, 40 cal BC – cal AD 220 (Wk-15000) was obtained from this feature.

Pit [185] was located 62m to the east of the Romano-British enclosure [306], and pit [217] in the corner of Area A, approximately 45m south west of pit [424]. Each of these pits measured about 3m in diameter and they were 1.25m and 1.6m deep respectively. Both had been backfilled with dumped deposits. The pits had been cut through the natural subsoil and bedrock, and their function is uncertain. On the basis of their similar morphology, the two may be contemporary with pit [424]. It is possible that they had been dug in order to obtain bedrock or as cisterns to hold water, and then used as rubbish pits for organic material.

The Iron Age and Romano-British occupation

The primary evidence for Iron Age activity is provided by the rectangular field system which extended across fields 7 to 3. The probable location for an associated later Iron Age settlement is the ‘fort’, which enclosed approximately 0.17 hectares. This enclosure is comparable with the class of enclosure known as ‘rounds’ that are found across Cornwall. Evaluation trenching confirmed that it was enclosed by a substantial ditch and suggested that it was occupied during the Late Iron Age and Romano-British periods, with two radiocarbon determinations from inside the enclosure spanning the decades either side of the Roman conquest. The available evidence allows a chronology that suggests that the ‘fort’ was broadly contemporary with the fields but was abandoned before Romano-British structure 338 was set within its enclosure in the late second century AD.

It is likely that the settlement enclosed by a ditch of the size of that of the ‘fort’ was of some importance; the excavation of the ditch would have required a considerable investment of time and labour. The two excavated ditch sections showed no evidence of re-cutting and the enclosure may have been of only a single construction phase, with the ditch kept clean subsequently. A bank comprising the excavated subsoil must have been present, probably on the interior of the ditch. It is also clear from the depth of the ditch that this bank have worked as a defensive barrier and as a prominent landmark on the plateau. Significant quantities of stone in the primary and secondary fills of the ditch (103)/(203) and (102)/(202) suggest that the bank may have been at least partly revetted or stone-faced. Examples of rounds with stone-revetted ramparts have been recorded at Trethurgy, near St Austell, and Nancemere on the outskirts of Truro (Quinnell 2004; Gossip 2005a), although in the Tremough instance the narrow space between the internal features and the bank may have meant that it was not very substantial, and was perhaps no more than 1.5m wide by 2m high. Also in common with these sites, evidence of structures was predominantly found around the perimeter, implying an open space at the centre of the site.

Small sub-circular, oval and sub-rectangular enclosures – rounds – dominated the Cornish landscape in the latter stages of the first millennium BC and the first few centuries AD. Most were univallate and they were frequently sited on lower hillslopes. A sub-rectangular round at Boden (St Anthony-in-Meneage) has produced a date of around 400 cal BC (Gossip forthcoming a) but a round at Threemilestone (Kenwyn), appears to be the only excavated example occupied solely during the Late Iron Age (Quinnell 2004, 213). Many rounds appear to have been first established in the Romano-British period. Trethurgy round, near St Austell, remains the only example to have been excavated in its entirety (Quinnell 2004). Partial excavation of several apparently similar enclosures indicates a wide variety in their character (Quinnell 2004, 211–4; Lawson-Jones 2009–10 (this volume); Cole and Nowakowski, forthcoming).

Other than the LIA field system, later Iron Age activity is not represented at the western end of the site where enclosure [306]/[565] and structure 338 were of Romano-British date. Structure 338 appears to have been constructed at some point in the late

second century AD, probably contemporaneously with the initial, larger phase of enclosure ditch [306]. Evidence from the pottery suggests that this ditch was not in existence for long before it was redefined by a smaller curvilinear ditch [565], probably at the very end of the second century or early in the third century AD. Structure 338 seems to have been used from the late second until the late third or possibly into the fourth centuries AD. On the evidence of scattered small Romano-British sherds from the field ditches and within the area of the fields, it is possible that the Iron Age field system saw continued use into the late second century, remained cultivated while enclosure [306/565] was in use.

The enclosure [306] (phase 1) and [565] (phase 2), which surrounded structure 338, has few parallels although a curvilinear, open-sided enclosure excavated recently 800m to the south east at Penryn College is broadly similar and possibly of comparable date (Gossip, forthcoming b). Work carried out as part of the National Mapping Programme has identified morphologically similar open-sided crop-mark enclosures from aerial photographs. For instance, in the hinterland of the Camel estuary, up to 15 examples are known, all but one under 0.3 ha in size (Young, forthcoming).

Early in the third century AD, enclosure [306] was reduced in area from 0.08 to 0.03 ha [565]. The reason for this contraction is uncertain, but the deeper ditch of [565] would have provided a more substantial bank. In both phases, the ditch circuit was incomplete with gullies [596] and [310] providing a hint of an elaborate entrance. The incomplete ditch circuits, apparent lack of a clearly defined entrance, small size and the presence of only a single structure means the enclosure differed from the known examples of contemporary or round-type enclosures. The siting of structure 338 in the centre of the first enclosure allowed a fairly even distribution of space all round between it and the enclosing bank. This differs from the arrangement in rounds, where structures tended to be located around the periphery of the enclosed space. The presence of a single structure implies control by its inhabitants over the working space in the enclosure by contrast with the shared use of space in rounds (Quinnell 2004, 224).

In both phases the enclosure may have contained livestock close to structure 338 when needed, perhaps tethered to prevent disruption to other

activities. The enclosure could also have contained small horticultural plots, as suggested adjacent to houses within Trethury (Quinnell 2004, 228–9), or could have been a place where grain was processed and stored. For such purposes a complete circuit of bank or temporary fencing would have been necessary to make a more substantial barrier. Such a barrier would have kept animals away from activities around structure 338 as well as controlling those brought within the enclosure.

Structure 338 consisted of a complex pattern of postholes, pits and scoops, defined by a ring of postholes forming a slightly oval building measuring 8m by 6.7m. This was occupied for a long period, probably from around AD 170 until after AD 300. It was built of timber, with stones used only for the packing and support of posts. The plan suggests an oval ring of outer posts linked by timbers forming a ring-beam; these would have supported the principal rafters. Some form of walling would have been placed between these posts although there was no surviving evidence for an external wall-line (Fig 14). Internal postholes possibly provided additional supports for the roof structure, although in a structure of this size such additions are more likely to have been alterations rather than original features. The entrance, between two wider-spaced and exceptionally large postholes, was on the southern side.

Oval structures are recognised as the dominant house form for the Roman period in Cornwall, as exemplified by the stone-walled structures within Trethury round (Quinnell 2004, 10.1–2). Structure 338 is the first clear example of a Romano-Cornish oval house in timber. The houses at Trethury and those known from elsewhere in Cornwall were generally larger than structure 338, with the biggest up to 12–17m long and 7–9m wide. They also tended to be more distinctly oval with a greater difference between length and width. Stone walling was used in all the examples studied, presumably because of the local availability of stone (*ibid*, 10.1–2).

The doorway in structure 338 was oriented to the south, towards the entrance into the enclosure. Although this orientation was possibly influenced by a desire to obtain the best available natural light and avoid the prevailing winds, there may have been some symbolic stimulus dictating the construction of entrances. Parker Pearson (1996, 119–20) has argued that cosmology may have had an important role in the layout of Iron Age houses,

especially with regard to the orientation of their entrances towards the eastern side which faced the sunrise. Life in the roundhouse was thus linked to the daily cycle of light and darkness. Given the evidence for continuity between the later prehistoric and Roman periods in other aspects of daily life, it is likely that earlier traditions continued into the Romano-British period. This may demonstrate the spatial differentiation from north to south, between door and rear, which in turn may be reflected in the structured deposition of artefacts. The largest groups of finds in structure 338 were from features along this axis, northwards from the entrance (Quinnell, below). The north-south axis is repeated in the general layout of the settlement; for occupants of the structure the viewpoint along this axis towards the south would include the entrance to the enclosure and pit [377] containing the deliberately broken vessel and a hammerstone.

Within structure 338 the series of inter-cutting hearth-pits suggests long-term use. At Trethury and other rounds hearth-pits seem to be connected with domestic activity (Quinnell 2004, 185), but no other site has a building with such a proportion of its interior taken up by these. The lack of metallurgical debris at Tremough suggests that the hearth-pits were broadly domestic. Activities such as the processing of milk or the smoking of meat would accord with the fairly low levels of cereal processing found around the structure.

The stone weight, whetstones and possible smelting crucible re-worked from a broken stone mortar, and the heavily-used hammerstone from outside the enclosure, could all tentatively be associated with small-scale domestic metalworking, relating to the needs of the occupants of the structure. It is very similar to the low-scale metalworking identified at Trethury and at other rounds (*ibid*, 233). Other enclosures have provided evidence for more concentrated metalworking such as Killigrew, St Erme (Cole and Nowakowski, forthcoming) and at Little Quoit Farm, St Columb Major (Lawson-Jones 2009–10 (this volume)).

The cereal grain assemblage indicates the increased importance of arable cultivation at Tremough (Gossip and Jones 2007, 45). The Romano-British period saw the introduction of spelt alongside emmer wheat, while to a lesser extent bread-type wheat, hulled barley and oats were being grown. Animals would have been kept

too, but acidic soils mean that only scraps of burnt bone were found. Other Cornish sites with better levels of preservation have produced animal bones. In particular, Atlantic Road, Newquay, contained cattle and other domesticated species, with sheep/goat forming the dominant part of the assemblage (Reynolds, forthcoming).

Medieval

Documentary sources demonstrate that Tremough was occupied throughout the medieval period (Gossip and Jones 2007) but excavation revealed little direct evidence of medieval settlement. Although reorganisation of the landscape as parkland in the late eighteenth and nineteenth centuries may have helped preserve the earlier plough-soil, which was found across much of the site, it may have removed much of the surviving structural evidence. However, it is possible that the present house, which lies to the south of the investigated area is on much the same site as its early medieval predecessor, which could have been established at any time from the sixth century (or earlier), which would explain why the early medieval settlement was not uncovered.

Evidence for earlier medieval activity consists of a handful of sherds of early medieval grass-marked ware, mostly unstratified, found in field 4 (Quinnell, below) and a single radiocarbon dated feature. Ditch [3], aligned north west – south east, and ditch [106] diverging eastward from it were located in works for the haul-road between fields 3 and 7 (Fig 13). The ditch cut measured 0.45m wide by 0.1m deep and was exposed for a length of approximately 20m. No stratigraphical relationship could be established as both cuts were filled by identical clay loams. A radiocarbon determination of 1015 ± 45 BP, AD cal 890–1160 (AA-44599) was obtained from ditch [3].

Some unstratified medieval artefacts (AD 1066–1540) were found, especially in field 4. Their presence indicates a continuation of domestic settlement in the immediate area. The majority of the artefacts found are typical of assemblages from fields close to farming settlements, deriving from domestic midden material utilised for the manuring and soil improvement. Traces of medieval ridge and furrow and strip cultivation also seem to have survived in field 3, in the form of changing levels in the subsoil, revealed by topsoil stripping along the southern edge of the field (Lawson-Jones 2002).

Prehistoric, Roman and early medieval pottery

Henrietta Quinnell, with petrographic comment by Roger Taylor

This report presents the assemblages from the 2002 excavations together with those from watching briefs and other works in 2000, and from the ‘fort’ in 2006; for the works carried out in 2000, the detailed account included in the archive report (Lawson-Jones 2002) has been revised for inclusion. The material includes a possible Early Neolithic sherd, Grooved Ware, Trevisker and Trevisker-related material from the second millennium BC, a little Later Iron Age material, a sizeable Roman-period assemblage and a small early-medieval group including imported amphora sherds, grass-marked and bar lug wares. Site plans showing distribution patterns are included in Gossip and Jones (2007, 35, 43 and 47).

Fabric descriptions are included under the sequential chronological headings below. Supporting petrographic data from microscopic examination, described as PS no 1 etc, and thin-section study, described in tables as thin-section no 1, etc, is used: a more detailed report is published in Gossip and Jones (2007) and a full report included in the archives.

Recording of sherd abrasion is based on the system devised by Sorenson (1996) for Bronze Age midden material at Runnymede with some modifications. The following descriptors and numeration are used in the report.

| | |
|--------------------------|--|
| <i>Very fresh</i> | 1; recent breakage, hardly ever applicable |
| <i>Fresh</i> | 1/2; colour of core slightly patinated but unaltered surfaces with sharp corners and edges |
| <i>Moderate abrasion</i> | 2; core colour patinated, some definition in the sharpness of corners lost |
| <i>Abraded</i> | 2/3; core colour patinated, slight rounding of corners and very slight erosion of surfaces |
| <i>High abrasion</i> | 3; core colour patinated, rounding of corners and of sherd outline, surfaces somewhat eroded |

Possible Early Neolithic (2000)

Fill (77) in ditch [76], field 7 (Not illus). A featureless scrap (3g, abrasion 2/3) of gabbroic fabric, softer and less compact than the other gabbroic material from the site. The fabric has many parallels among the ‘medium ware’ gabbroic group at Carn Brea as defined by Smith (1981, 162) (observation by author of material in the Royal Cornwall Museum), although ascription of a small featureless sherd on fabric alone cannot be certain. Radiocarbon determination AA-44604, which calibrates to 3950–3660 cal BC at two sigma, comes from this context and suggests a possible Neolithic date. The sherd may have been re-deposited in the deliberate infill of ditch [76], together with the charcoal which provided the determination. Given the quantity of Neolithic lithics found, and the axe **S1**, the presence of Neolithic pottery might be expected. However, a fabric this soft would not survive unless protected within a stratified deposit and any comparable material in surface levels would have disintegrated. (P1 in Lawson-Jones 2002).

Grooved Ware (2002)

The assemblage consists of 175 sherds weighing 1933g and representing at least 21 vessels. It was found in eight pits and one spread in a group in the north-western corner of the site. Of the 12 pits in this group only one, [296], contained pottery other than Grooved Ware, with one small Romano-British sherd. Pits [296] and [298] had rectangular plans, differing from those of the other ten pits which may well all be of Late Neolithic date.

The fabrics are soft with open matrices containing numerous tiny air pockets. They are therefore likely to have been subject to considerable post-depositional alteration by ground water percolation and bioturbation. Sherd surfaces have generally been compacted by tooling and are less likely to have been affected than edges. However, in some cases there is a marked variation in weathering on the two sherd surfaces, reflecting the way the piece lay in the ground. A number of sherds retain residue on their interiors although the exterior and edges are abraded. It is therefore uncertain how far the recorded degree of abrasion reflects the condition of sherds at the time of deposition and likely that most sherds were deposited in

a fresher condition that the degree of abrasion indicates.

Generally, the material appears to have been freshly broken when deposited and differential weathering suggests that decorated surfaces were normally placed uppermost. Some sherds however, such as **PP6**, **PP11**, **PP16** and **PP17**, are much more abraded than the remainder from their contexts, and are also small; such pieces may well have been broken long before burial and have been curated.

Fabrics

Ga.1 Gabbroic: 76 per cent by sherds, 70 per cent by weight, 61 per cent by vessel numbers. The principal components all indicate a source on the gabbro some 15km to the south (thin-sections 1, 4, 5). Thin-section 1 contained small fragments of micaceous slate. Amount of inclusions vary but particles 0.5mm–1.5mm, occasionally up to 5mm, may form 20 per cent of the body. The fabric may be oxidised or reduced, often with considerable variation in the same vessel: a distinctive feature is the darkness of reduction, sometimes 5YR 3/1 very dark grey, and the brightness of oxidisation, sometimes 2.5 YR 4/8 red, with these two extremes sometimes occurring on the same sherd.

Ga/Gr Gabbroic/granitic: 17 per cent by sherds, 25 per cent by weight, 29 per cent by vessel numbers. Microscopic scanning and thin-section 3 indicated a mix of gabbroic clay with a ‘granitic’ component, biotite and muscovite, probably deriving from granitic or gneissic rocks situated in, or adjacent to, the gabbro. Inclusion size, quantity and colour are as Ga.1.

Vq Vein-Quartz: 7 per cent by sherds, 5 per cent by weight, 9.5 per cent by vessel numbers. Crushed angular vein-quartz has been added to a clay which includes siltstone, hornfels, biotite and a granite fragment (thin-sections 2, 6) which are appropriate to a clay source local to the site. Vein-quartz inclusions (0.5–5mm) form 25 per cent of the fabric and the variation between reduction and oxidisation, and the deep colours these produce, is similar to those on gabbroic Ga.1.

There are no variations in decorative motifs on vessels in the three fabrics, which is likely to be significant in such a small assemblage; all vessels (**PP1**, **PP5**, **PP7**, **PP15**) which have panels defined by vertical or oblique cordons are Ga.1. Ga.1 and Ga/Gr were distributed fairly evenly across

the pit group but Vq fabric was only found in pit [329].

Form and decoration

Rim and base forms are described according to Longworth’s (1971) system. Rims are simple rounded or slightly pointed with one flattened example (**PP12**) and one with a simple in-turn (**PP7**), and come from vessels with straight or, more commonly, slightly incurving sides. Bases are generally simple with one protruding example (**PP14**). Decorative techniques include applied cordons, impressed cord, grooved lines, incised lines, fingernail and possible stab-and-drag. All sherds with decoration are described and illustrated. Insufficient of each vessel survives for complete decorative patterns to be reconstructed. Cordons combine horizontal with oblique (**PP1**), horizontal and vertical in a panel arrangement (**PP7**), horizontal (**PP9**) and vertical and oblique (**PP15**). On **PP5** a vertical cordon has fingernail decoration and is bordered with incised lines. Paired fingernail decoration occurs on **PP3**. Close-set grooves on **PP2** form patterns on both the inside and the outside of the vessel. **PP4** has close-set grooved herringbone, which appears to have covered the whole lower part of the vessel. **PP8** and **PP10** have evenly spaced horizontal cord-impressed lines; these sherds are so similar, even to their distinctive reduced interiors, that they may in fact come from the same vessel. Horizontal impressed cord also occurs on **PP16**. Probable comb-stamping occurs on **PP10A**.

Comparanda and dating

The general shape of the vessels, with a number of slightly curved walls and the simple rims, and the overall range of decorative techniques and designs, especially the use of impressed cord, indicates that the assemblage belongs within the Durrington Walls sub-style (Longworth 1971). The close-set grooved herringbone of **PP4** may, however, be more appropriate to the Clacton sub-style. The three southern British sub-styles defined by Longworth in 1971, Durrington Walls, Clacton and Woodlands, were seen as contemporary variations, but more recent studies and the consideration of the radiocarbon dates now available indicates that Clacton and Woodlands may be sequential rather than contemporary (Garwood 1999, 157).

The possible Clacton vessel **PP4** is from pit [293] which has no date but which lay in the south of the Tremough group (Fig 3), as did pit [331] with the earlier of two radiocarbon determinations, 2870–2480 cal BC (Wk-14999). Pit [331] contained **PP10** and **PP10A**.

The later date 2570–2290 cal BC (Wk-15001) is from pit [494] in the north of the group, with undecorated pieces **PP12–14**. As the dates do not overlap, they should indicate deposition of Grooved Wares over a period of several centuries. The Durrington Walls sub-style was used throughout the depositional sequence but pit [293] with a possible Clacton sub-style vessel and pit [494] with the earlier date lie in the southern part of the group. This data may indicate that pits were dug at Tremough from south to north over several centuries.

The Tremough assemblage provides the seventh definite occurrence of Grooved Ware in Cornwall; details of four are given in the gazetteer compiled by Longworth and Cleal (1999, nos 42–45). Two of these, in addition to Tremough, are from pits, both in the process of publication. That from Trevorva Cott, Probus (Longworth and Cleal 1999, no 45) consisted of a minimum of seven vessels from two pits, mostly in the Durrington Walls sub-style but with two vessels of Clacton type (Longworth, forthcoming). All the vessels from Trevorva Cott are of gabbroic fabric and dates from the two pits are respectively 2880–2460 cal BC (AA-29731) and 2590–2208 cal BC (AA-29732) (Nowakowski, forthcoming). Decoration on the Trevorva Cott vessels is generally more complex than at Tremough, most illustrated pieces having grooved or incised designs covering the exteriors; fingernail is well-represented but there are no cord impressions. A single pit at Trevone, Padstow (not listed in Longworth and Cleal 1999), contained sherds from five vessels, four of Durrington Walls and one of Clacton sub-types. Petrography is not available but a radiocarbon determination of 4175 ± 50 BP (AA-26412) (from *Pomoideae* charcoal) calibrates to 2900–2610 BC. The Trevone pit vessels again have incised or grooved decoration covering their exteriors but in more complex arrangements than on those at Trevorva Cott; neither cord or finger impressions are present, but one sherd has stabbed decoration (Longworth nd). This latter is assigned to the Clacton sub-style but the remainder of the group is Durrington Walls. The mix of a possible Clacton sub-style vessel with

a mainly Durrington Walls group at Tremough therefore reflects the rather more definite mix of the two sub-styles in the two other Cornish pit finds. The Tremough group however, has by far the simplest range of decorative motifs, with only one vessel **PP4** having the whole exterior surface covered. Only Tremough has impressed cord, represented by three vessels.

One of the other Cornish Grooved Ware occurrences comes from a cave and two from old land surfaces beneath barrows. The former is an early twentieth century find at Carrick Crane Crags, St Keverne (Longworth and Cleal 1999, no 44). Sherds from four vessels in the Durrington Walls style came from the floor of the Carrick Crane Crags cave; the illustrations (Patchett 1950, fig 1) show three vessels with overall exterior incised decoration and a fourth with possible fingernail; the published fabric descriptions suggest the use of gabbroic clay which would be appropriate for the location. One of the two old land surface finds came from Trevone, Padstow (Longworth and Cleal 1999, no 43), a short distance from the pit described above. This consisted of sherds of a single vessel in Durrington Walls style with the exterior completely covered with incised decoration from the old land surface beneath one cairn and a plain sherd in a similar fabric from a similar context beneath an adjacent cairn (Longworth 1972). The fabric cannot at present be assigned to a source and there are no dates. The other occurrence comes from a barrow at Davidstow Moor site XXVI (Longworth and Cleal 1999, no 42). Three sherds from the same vessel probably came from the old land surface beneath the barrow (Healy in Christie 1988, fig 71, 121); they are decorated with grooved lines and triangular impressions, ascribed to the Durrington Walls sub-style but perhaps more at home in Clacton. The fabric is gabbroic (Williams in Christie 1988, 161), the first identified Grooved Ware gabbroic fabric from Cornwall and the more remarkable as Davidstow Moor is on the north side of Bodmin Moor, the other side of the county from the source area on the Lizard. The final occurrence comes from Zennor Quoit (SW 469380; not in Longworth and Cleal 1999). Recent examination by the author confirms that the vessels published by Patchett (1944, fig 2) as Zennor II and Zennor III are definitely Grooved Ware and made of a fine granitic fabric; one is plain and the other has simple incised decoration on rim and body. Zennor I (*ibid*) with complex internal and external cord decoration

was not present for examination but may also be Grooved Ware.

Tremough is thus the most simply decorated assemblage of Grooved Ware recognised in Cornwall, and the only one with sherds of probable undecorated vessels apart from Zennor. It is possible that simpler Grooved Ware vessels have not been recognised. Of these the most likely is the small plain straight-sided and open topped vessel with a simple lug from a pit at Poldowrian, St Keverne (Harris 1979, fig 9); possible Grooved Ware attribution is supported by the radiocarbon determination 2950–2050 cal BC (HAR-3108). A plain vessel similar to that from the Poldowrian pit except for the lug came from a cist at Trevedra Common, St Just (Thomas 1961, fig 18). Some of the sherds with incised or fingernail decorations collected from the surface of field 24 at Polcoverack, St Keverne, may also belong within the Grooved Ware category (Smith 1987, figs 20–21); all this material has been identified as of gabbroic fabric.

The scarcity of Grooved Ware in Devon is even greater than in Cornwall. There are only three clearly acceptable occurrences, although occasional possible sherds have been found, such as that from Widegate Nursery, Elburton (Watts and Quinnell 2001, 14). Finds from Three Holes Cave, Torbryan (Longworth and Cleal 1999, no 59) included, from unstratified material, a sherd decorated with incised lines and stab marks (Rosenfeld 1964, pl 1b), perhaps of the Clacton sub-style. The second occurrence is from Ash Hole Cave in Torbay, in the form of sherds from a vessel with complex stab-and-drag decoration. This has recently been identified by the author and is not in the Longworth and Cleal (1999) gazetteer; it is probable that the approximately 2000 other sherds from the cave include further Grooved Ware vessels. The third occurrence, from Bow, near Crediton (not in Longworth and Cleal (1999) gazetteer), consists of 57 sherds from three shallow pits: there are three vessels with grog temper and one of granitic fabric (Brown 2003). Decoration includes incised and grooved lines and also fingernail, the only site in Devon and Cornwall apart from Tremough to display this characteristic. The Bow material is probably to be assigned to the Durrington Walls sub-style.

Details of the assemblage

PIT [193] (194) (Fig 19)

PP1 was probably deposited as one large sherd and several smaller ones, which have disintegrated into small fragments. The largest sherd of **PP1** (illustrated), is very abraded on its decorated surface and fresh on the inside. **PP2** was probably deposited as a group of small sherds. No other vessels appear to be represented.

PP1 Ga.1. Sherds from girth of large vessel, diameter approximately 260mm, simple horizontal cordon with oblique cordon below and a possible second; part of simple base angle Longworth A not included in illustration.

PP2 Ga/Gr. Sherds from rim and girth of large vessel, diameter approximately 300mm, decorated with groups of grooved lines on both exterior and interior, exterior lines interspersed with sparse fingernail, interior lines becoming shallow and more appropriately described as tooling. Simple rounded closed rim, Longworth form 5.

PIT [293] (294) (Fig 19)

PP3 was deposited as a single sherd; the interior is fresher than the decorated surface. **PP4** was deposited as one large and one small sherd; on the former the interior is fresher than the decorated surface. **PP5** was probably deposited as one sherd, with residue on the fresh interior set downwards; a number of small sherds have broken off. **PP6** was abraded when buried, but fresh breaks indicate part is missing. A base angle sherd indicates part of a further vessel in Ga/Gr.

PP3 Ga/Gr. Body sherd with paired fingernail decoration and single oblique incised line. Maximum diameter approximately 250mm. The angle as illustrated must be regarded as tentative.

PP4 Ga/Gr. Basal sherds with close-set incised herringbone design which is irregular in places. Internal base diameter 110mm.

PP5 Ga.1. Girth sherd, vertical cordon with finger tip/nail decoration, oblique incised lines to one side, surface flaked away on the other.

PP6 Ga/Gr. Body sherd with horizontal and oblique incised lines; single circular ‘impression’ may have been caused by loss of an inclusion.

PIT [300] (299) (Fig 20)

PP7 appeared to have been deposited as three sherds or one sherd which has subsequently broken.

Table 1: Details of Grooved Ware in pits and spread (496)

| | | Fabric | | | Weight (g) | Abrasion | Minimum vessels | Mean sherd weight (g) |
|--------------------|-------|--------|-------|----|------------|----------|-----------------|-----------------------|
| | | Ga.I | Ga/Gr | Vq | | | | |
| [193] (194) pit | PP1 | 20 | | | 195 | 2 | 1 | 9.8 |
| | PP2 | 0 | 8 | | 65 | 1/2 | 1 | 8.1 |
| Total [193] | | 20 | 8 | | 260 | | 2 | 9.9 |
| [293] (294) pit | PP3 | 0 | 1 | | 111 | 2 | 1 | 111 |
| | PP4 | 0 | 4 | | 78 | 2 | 1 | 19.5 |
| [300] (299) pit | PP5 | 8 | | | 41 | 1/2 | 1 | 36 |
| | PP6 | 1 | | | 11 | 2/3 | 1 | 11 |
| [329] (330) pit | | 1 | | | 8 | | | |
| | | | 2 | | 29 | | | 4.2 |
| Total [293] | | 10 | 7 | | 278 | | 4+ | 16.4 |
| [331] (332) pit | PP7 | 3 | | | 227 | 1/2 | 1 | 75.7 |
| | PP8 | 0 | 9 | | 78 | 1/2 | 1 | 8.7 |
| [492] (493) pit | PP9 | | 6 | | 44 | 1/2 | 1 | 7.3 |
| | | | 6 | | 53 | 1/2 | 1 | 8.8 |
| Total [329] | | 0 | 9 | 12 | 175 | | 3 | 8.3 |
| [494] (495) pit | PP10 | 0 | 2 | | 88 | 2 | 1 | 44 |
| | PP10A | 2 | | | 11 | 2/3 | 1 | 5.5 |
| [494] (496) spread | | 29 | | | 174 | 2 | 1 | 6 |
| | | 31 | 2 | | 273 | | 3 | 8.3 |
| Pit [333] (334) | PP11 | 1 | | | 4 | 2/3 | 1 | 4 |
| Pit [492] (493) | | | 4 | | 39 | 2 | 1 | 9.8 |
| [494] (495) pit | P12 | 19 | | | 105 | 2 | 1 | 5.5 |
| | PP13 | 4 | | | 13 | 2 | 1 | 3.3 |
| [494] (496) spread | PP14 | 5 | | | 85 | 2 | 1 | 17 |
| | | 2 | | | 3 | 2 | | 1.5 |
| Total [494] | | 30 | | | 206 | | 3 | 7.3 |
| [496] (497) spread | PP15 | 17 | | | 305 | 2 | 1 | 17.9 |
| | PP16 | 2 | | | 17 | 2/3 | 1 | 8.5 |
| [496] (498) spread | PP17 | 1 | | | 17 | 2/3 | 1 | 17 |
| | | 18 | | | 132 | 2/3 | | 7.3 |
| Total (496) | | 38 | | | 471 | | 3+ | 13.6 |
| Totals | | 133 | | | 1348 | | 13+ | |
| | | 30 | | | 488 | | 6+ | |
| | | | 12 | | 97 | | 2 | |
| Overall totals | | 175 | | | 1933 | | 21+ | |

PP7 Ga.1. Vessel with slightly curved/biconical shape, rim sharply in-turned form 12. Internal rim diameter 210mm. Horizontal cordon with vertical cordons below, all plain; a scar in the gap on the horizontal cordon indicates that it may originally have been continuous.

PIT [329] (330) (Fig 20)

PP8 and **PP9** were deposited as groups of fresh small sherds. **PP9** and body sherd **SF1025** from a separate vessel are the only vessels in Vq.

PP8 Ga/Gr. Girth sherds with three evenly spaced lines of horizontal impressed cord. Internal diameter approximately 210mm.

PP9 Vq. Rim, form 2 rounded upright, non-joining girth sherd with plain horizontal cordon.

PIT [331] (332) (Fig 20)

PP10 was deposited as two sherds, probably with decoration uppermost. **PP10A** was worn before breakage. The other sherds in Ga.1 were buried as a group and probably represent one vessel including a base angle.

PP10 Ga/Gr. Rim of open vessel, Form 1 pointed upright, with horizontal lines of single cord impressions beneath. Internal rim diameter 160mm.

PP10A Ga.1. Body sherd with four impressions of a similar stamp, which has at least three rectangular depressions along it and probably shows the use of a coarse comb-stamp.

PIT [333] (334) (Fig 20)

PP11 was buried as a small and abraded sherd.

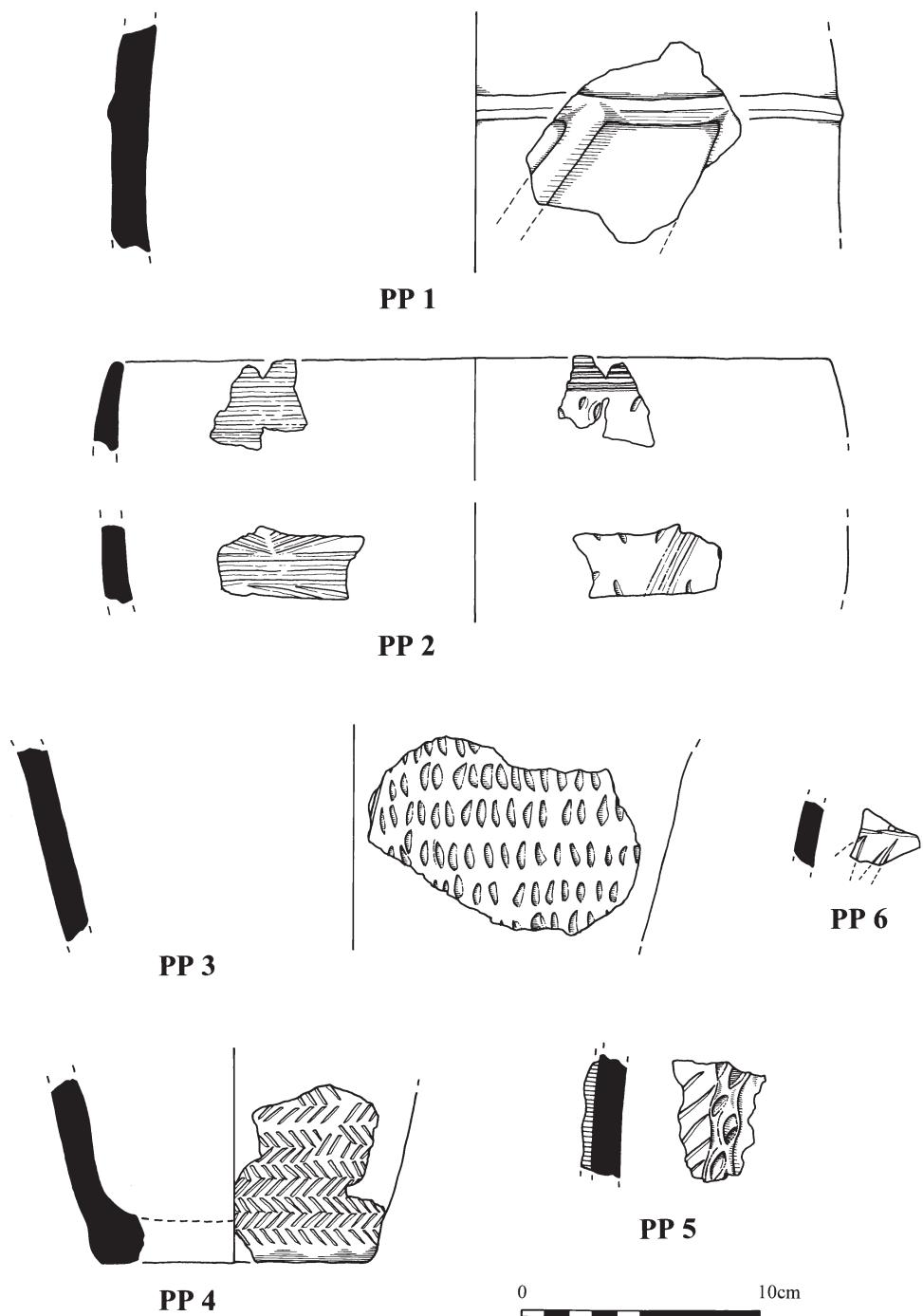


Fig 19 Grooved Ware PP1-2 pit [193], PP3-6 pit [293]. Scale 1:3 (Drawings: Carl Thorpe.)

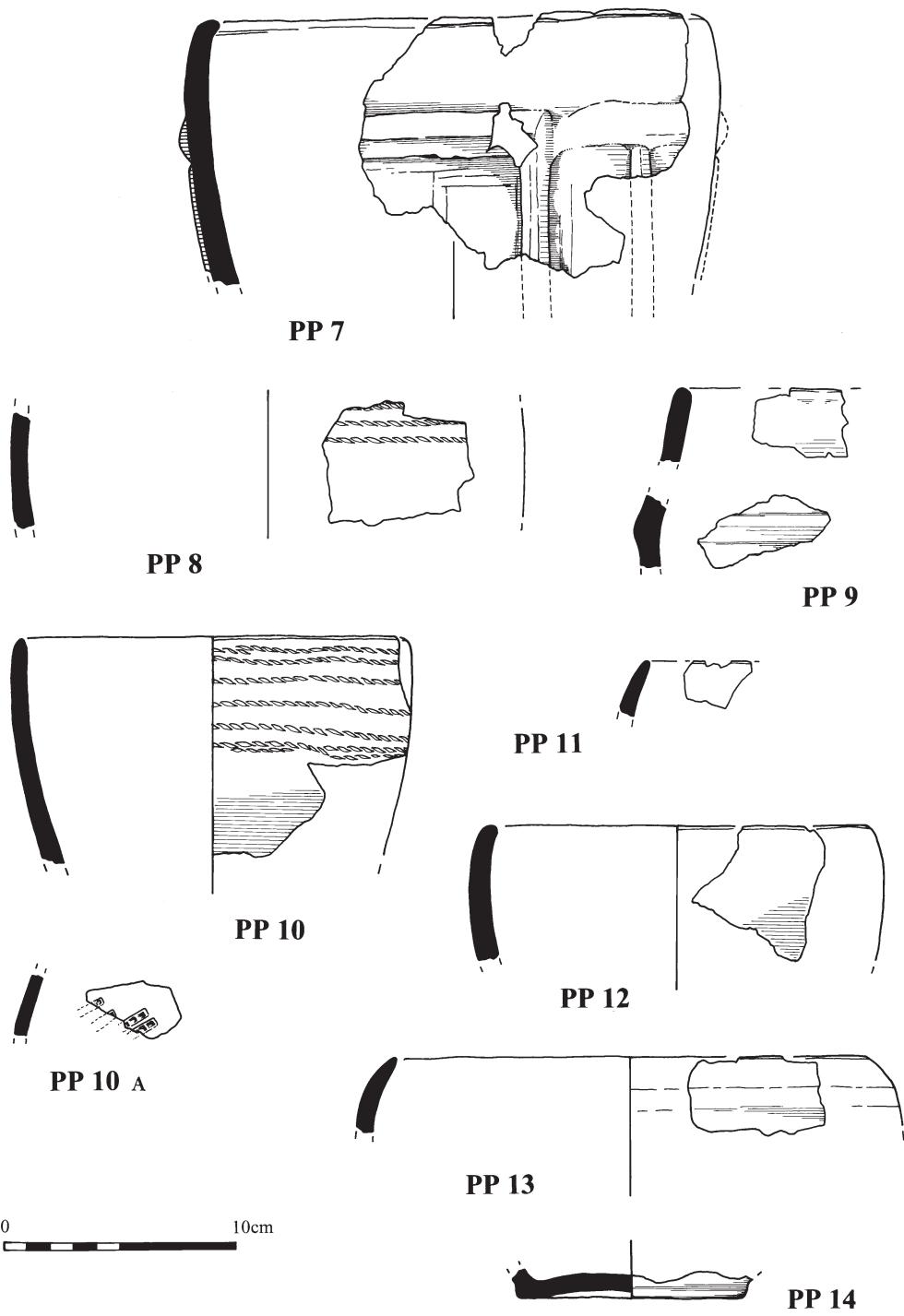


Fig 20 *Grooved Ware PP7 pit [300], PP8–9 pit [329], PP10–10A pit [331], PP11 pit [333], PP12–14 pit [494]. Scale 1:3 (Drawings: Carl Thorpe.)*

PP11 Ga.1. Thin pointed rim of form 4 type from a closed vessel.

PIT [492] (493)

Ga/Gr. Body sherds represent the minimum of one vessel.

PIT [494] (495) (FIG 20)

PP12 was buried as two sherds, **PP13** as several sherds which have subsequently fragmented. The base **PP14** was buried in a complete state and upside down.

PP12 Ga.1. Plain rim of form 3 flattened upright, from a slightly open-topped vessel, internal rim diameter 160mm.

PP13 Ga.1. Plain rim of form 4, pointed closed, with marked in-turn, internal diameter 200mm.

PP14 Ga.1. Gabbroic fabric, very hard. Complete base with form C slight protruding foot.

SPREAD (496) (FIG 21)

PP15 had been deposited as large fresh sherds which had fragmented, while **PP16** and **PP17** were abraded when deposited. It is not certain whether the other featureless sherds belonged to **PP15** or to another vessel.

PP15 Ga.1. Non-joining sherds representing rim, girth and base of slightly open vessel, maximum internal diameter 260mm. Plain rim of form 1 pointed upright. Base angle simple Form A with three close spaced plain cordons, centre vertical and the outer ones slightly oblique. This has been reconstructed in the illustration with the three other sherds, a girth sherd with plain vertical cordon, another with plain vertical and oblique cordons and a third with a plain vertical cordon.

PP16 Ga.1. Rim of form 1 pointed upright with two horizontal twisted cord lines beneath. Second sherd, probably from **PP16**, suggests spacing of cord may not have been regular.

PP17 Ga.1. Plain rim of form 3 flattened upright with possible incised line beneath.

Second millennium cal BC: Trevisker and Trevisker-related (2002)

The assemblage from excavations carried out in 2002 consists of 230 sherds weighing 4822g, representing a minimum of 25 vessels.

Fabrics

Macroscopic examination indicated that most of the assemblage was gabbroic admixture with some sherds apparently of gabbroic fabric without additions. Microscopic and thin-section study showed that some admixture fabrics contained inclusions not found in the gabbro area. However, detailed studies, especially of the Trethellan assemblage (Williams 1991), have shown that it is not possible to group sherds reliably without thin-sections and so overall percentages of fabric groups are not presented.

Gabbroic Ga.2 Well-worked matrix, good surface finish, few inclusions larger than 2mm. PS nos 18, 21, 23 confirm identification. Very similar to Grooved Ware Ga.1; generally oxidised, mostly 5YR 6/6 reddish yellow, occasionally 5 YR 5/1 grey, the highly fired distinctive colours of the Grooved Ware fabric being absent. A minimum of four vessels.

Gabbroic admixture 1 GaAd.1 Well-worked matrix, good surface finish, sparse to common inclusions, which vary from 3mm to 12mm, colour as Ga.2. Thin-section 7 shows the added inclusions to be micro-granitic, thin-sections 9 and 10 to be dolerite and thin-section 11 serpentinite; PS17 confirmed the presence of gabbro rock. All these added materials occur in the immediate area of gabbroic clays. Thin-section 7 showed a loessic component in the gabbroic clay. A minimum of 13 vessels.

Gabbroic admixture 2 GaAd.2 As GaAd.1 but thin-sections 8, 12 and 13 showed the presence of tourmaline, hornfels and other material of which the source is likely to be the metamorphic aureole surrounding a granite, almost certainly very local to the site. A minimum of eight vessels.

Gabbro admixture fabrics have been extensively discussed, especially by Parker Pearson (1990), Williams (1991) and Quinnell (1998–9a). The studies on which these discussions are based showed that admixtures all could be sourced to the immediate gabbro clay area, although earlier comments, notably that on the eponymous assemblage from Trevisker (ApSimon and Greenfield 1972, 355), suggested the mixing of gabbroic materials with clays local to the site. The fabrics from Tremough clearly show that some gabbroic clay had been transported to the area of the site and there mixed with crushed minerals – and possibly some clay – of local origin. This

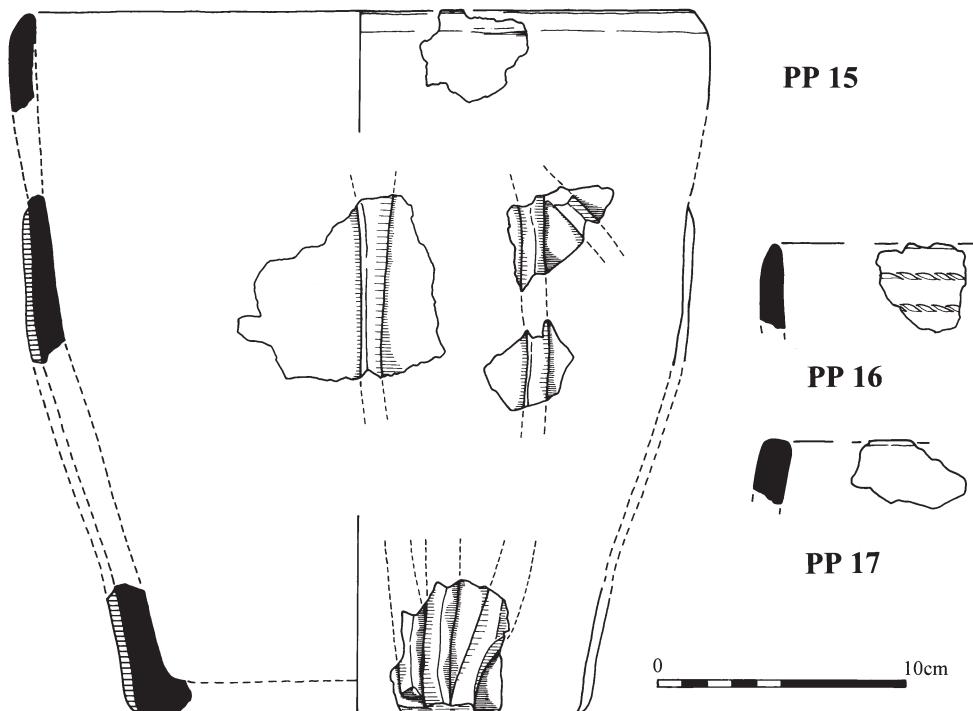


Fig 21 *Grooved Ware PP15–17 spread (496). Scale 1:3 (Drawings: Carl Thorpe.)*

has previously been demonstrated in a limited way with the assemblage from Stannon (Quinnell 2004–5) and the transport of gabbroic clay in an unfired state identified from Bronze Age levels at Gwithian (Sturgess 2007, 31). These results clearly indicate that in the second millennium cal BC some gabbroic clays were being transported to be manufactured near the sites on which vessels were to be used, with the addition of local temper. The transport of clays may have been frequent. Now that some admixture inclusions have been identified as sourced away from the gabbroic, it is reasonable to reconsider those admixtures that could be sourced to the gabbro as possibly sourcing near to the sites on which the ceramics were used. Recent studies have emphasised the symbolic function of inclusions, and that these should not be thought of in terms of practicality but rather in terms of the addition of materials which added meaning to the vessels (Woodward 2002a). The tradition of using gabbroic admixture fabrics in the Cornish Bronze Age, fabrics in which inclusions were large and noticeable, suggests that it was important for the symbolic connections of vessels to be visible.

GaAd.2 vessels were found in structures 392, 102, posthole group 37 and ditch [596] and in all cases were accompanied by GaAd.1 vessels. This indicates that use of this fabric was current from the fifteenth to the eleventh centuries BC. The significance of its absence from structures or pits dated before this period cannot be assessed, due to the general scarcity of ceramics. The practice of transporting gabbroic clay to the Tremough area and mixing it with inclusions and possibly other material of local origin covers the whole of the second half of the second millennium cal BC.

Structure 392 (Fig 22)

There were a minimum of two vessels in Ga.2, 8 vessels in GaAd.1 and 2 vessels in GaAd.2, a minimum of 12 vessels overall. The table shows sherds to be generally abraded, certainly more so than those in the Grooved Ware pits, but this may be due to the action of groundwater and other bioturbation factors on large soft sherds. Average sherd weight was 20.4g; the only contexts which varied much from this were pit [401] with an average of 54g and the inner post-ring with an

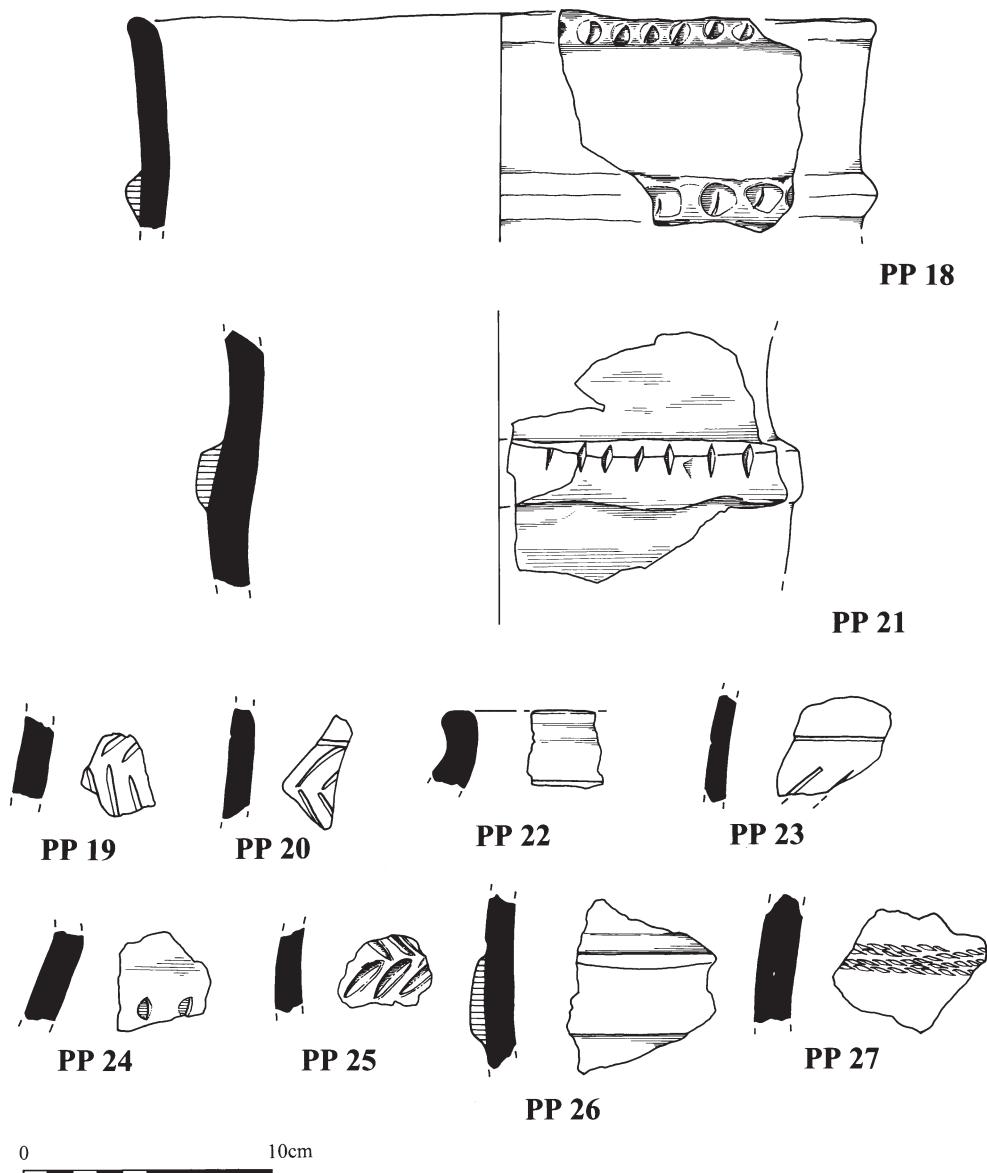


Fig 22 *Trevisker / Trevisker-related ceramics PP18–27 from structure 392. Scale 1:3 (Drawings: Carl Thorpe.)*

average of 9g. However, the average sherd size of the illustrated vessels PP18–27 is 43g.

FORM, AFFINITIES AND CHRONOLOGY

Contexts within structure 392 produced two radiocarbon determinations: Wk-15002 calibrating to 1300–1010 BC at two sigma from hearth-pit [320] and Wk-15003 calibrating to 1370–1040 BC from posthole [623], (622). These two broadly

similar dates cover the thirteenth to the eleventh centuries BC, the Middle Bronze Age, during which Trevisker pottery appears to have been the only ceramic current in Cornwall. The assemblage from Trethellan (Woodward and Cane 1991) with radiocarbon determinations covering the fifteenth to thirteenth centuries BC forms a good reference for current understanding of Trevisker material during the later second millennium cal BC.

All distinctive pieces from structure 392 have been illustrated as **PP18–27** and these together present characteristics which may be interpreted as falling within the Trevisker style combined with some unusual features. The flat-topped expanded rim of **PP18** is a standard Trevisker rim form but the fingernail decoration along it is uncommon and the girth cordon with fingertip impressions unknown. If a vessel of this size, shape and decoration had been found in Dorset or the Wessex area it would be described as a typical bucket urn with Deverel-Rimbury affinities; see, for example, the range from the Simons Ground cemetery (White 1982). The fingertip decoration on rim and cordon also forms part of a wider tradition found, for example, at the Lesser Garth Cave in Glamorgan (Savory 1980, fig 72 no 505:4). **PP19** and **PP20** are both body sherds with incised herringbone, on **PP19** combined with a horizontal line. **PP20** appears to come from a vessel with an incised decoration around its girth bordered by horizontal lines and would be quite at home within a Trevisker assemblage (Woodward and Cane 1991, fig 46, no 36); **PP23** is broadly similar to **PP20**. **PP19** and **PP25** have coarser, unbordered, herringbone incisions, again found at Trethellan and elsewhere (Woodward and Cane 1991, fig 48, no 43). The slightly everted and expanded rim with an incised line beneath on **PP22** comes from a vessel with Trevisker rim form with the very top of a bordered incised design beneath. The plain cordon on **PP26** has Trethellan parallels (*ibid*, fig 46, no 37) but the heavy cordon with fingernail **PP21** has no recognised parallels. Fingernail impressions form 5 per cent of the decorative motifs at Trethellan and were therefore a technique in general use within the Trevisker tradition. **PP24** with fingernail impressions on a girth sherd could be matched by no 4, fig 40, at Trethellan. Finally, **PP27** with its four rows of cord impressions has no recorded parallel. The vessels are too incomplete to be assigned to the classification devised by Parker Pearson (1990, 10).

The presence of unusual features may be due to the comparatively late date of the assemblage, to some form of contact with the ceramics of Wessex, or to the specific choice of vessels with particular decorative motifs for use in a structure of the type of 392. All Middle Bronze Age Trevisker assemblages so far studied come from domestic assemblages within houses with either sunken floors or with stone walls and inner post-rings;

on such undoubtedly domestic structures the type of vessel appropriate for the functions carried out within the buildings may well have been different to those carried out within post-ring structures. Our perceptions of Trevisker material may be influenced by that found on domestic settlements away from the Lizard area. It may be noted that much of the Bronze Age pottery published from Polcoverack on the Lizard (Smith 1987), which comes from surface collection and for which therefore the context of use is unknown, is difficult to characterise and includes a range of pieces with fingernail decoration not assigned to any particular style. The same appears to be true for the assemblage from Kynance Gate, only covered by interim reports (Thomas 1960).

The nature of deposition in this structure is uncertain. The unusual **PP18** was found in [398], the posthole which lay at its rear directly opposite the centre of the entrance, and for this deliberate deposition seems likely. **PP19** occurred in [316] which lies on a direct line through the entrance to [398] and the remaining pieces are either in central spread (338) (**PP20**) or the central hearth-pit [320] (**PP21–7**). The occurrence of all these pieces deposited in a straight line through the structure may have been deliberate. The distribution of sherds differs slightly to the distribution of stonework, which is all to the south west of this line.

DETAILS OF SHERDS

PP18 [398] (397) posthole GaAd.2 with hornfels. Upper part of straight-walled vessel, internal rim diameter 270mm, slight external expansion to rounded rim, fingernail impressions around outer rim edge, narrow girth cordon with fingertip/nail impressions. Inclusions <11mm 30 per cent.

PP19 [316] (317) pit Ga.2. Girth sherd with broad incised lines, herringbone pattern. Inclusions <5mm 25 per cent but non-gabbroic particles rare.

PP20 (318) spread GaAd.1 with gabbro. Girth sherd with narrow incised lines, herringbone pattern, upper bordering line. Fabric as **PP19**.

PP21 [320] (319) hearth-pit main fill GaAd.1 with dolerite. Joining girth sherds with irregular flat-faced square-sectioned cordon; deep fingernail nicks along upper angle partly obscured by scarring. Internal girth diameter 190mm. Fabric 15 per cent inclusions mainly <2mm but some <10mm.

PP22 [320] (319) hearth-pit main fill GaAd.2. Flat-topped rim, external expansion, above distinct

neck; horizontal incised line from top of bordered design on shoulder. Fabric 20 per cent inclusions <10mm but good surface finish.

PP23 [320] (319) hearth-pit main fill GaAd.1 as **PP18**. Girth sherd, top of bordered design with narrow incised lines. Fabric 15 per cent inclusions <10mm but mainly <3mm.

PP24 [320] (319) hearth-pit GaAd.1 with gabbro. Shoulder sherd from just below neck with fingernail impressions. Fabric 20 per cent inclusions <5mm.

PP25 [320] (319) hearth-pit GaAd.1 with dolerite. Girth sherd with slashes forming herring bone design. Fabric 30 per cent inclusions <5mm.

PP26 [320] (319) hearth-pit GaAd.1 with serpentinite. Girth sherd with flat-faced irregular cordon. Fabric 30 per cent inclusions <6mm.

PP27 [320] (319) hearth-pit GaAd.2. Girth sherd with composite cord impressed line, probably composed of five strands which merge. Fabric 25 per cent inclusions <5mm.

Structure 102 (Fig 23)

There were a minimum of three vessels, one each in Ga.2, GaAd.1 and GaAd.2. Abrasion was broadly as in structure 392. Average sherd size was 17g but again illustrated vessels have a slightly higher average of 24.5g.

FORM, AFFINITIES AND CHRONOLOGY

The broad comments on the Trevisker relations for 392 also apply to structure 102. **PP28** has a fingernail-decorated rim and girth; the former is not recorded in Trevisker assemblages but does occur among the Polcoverack material (Smith 1987, fig 20, no1). **PP29** is a standard comb-stamped Trevisker vessel, compare fig 46, no 38, at Trethellan (Woodward and Cane 1991). **PP30** is a more irregularly incised vessel than any recorded within the Trevisker repertoire.

Structure 102 produced three radiocarbon determinations: 1530–1380 cal BC (Wk-14996) from posthole [109] (110), 1460–1290 cal BC (Wk-14997) from posthole [112] (111) and 1390–1120 cal BC (Wk-14998) from hearth-pit [157] (158). These dates cover the fifteenth to twelfth centuries BC, rather earlier than, but overlapping with, the dates from structure 392.

As with structure 392, features with sherds lay in a line across from the entrance with an

un-illustrated sherd in the furthest posthole [123]. As also with 392, stonework by contrast lies to the south west of this line.

DETAILS OF SHERDS

PP28 [147] (148) posthole GaAd.2 Rim and body sherd from the same vessel on fabric and firing similarities. Rounded rim with slight external expansion, slashes across the top. Girth sherd with deep vertical fingernail impressions in two rows which have produced a slight ridge between. Fabric 25 per cent inclusions <10mm.

PP29 [112] (111) posthole GaAd.1 Body sherd with comb stamped chevron; comb used has squarish teeth. Small second sherd with possible decoration from flot. Two sherds, one with similar impressions, were residual in enclosure ditch primary phase [679] (678). Fabric 15 per cent inclusions <5mm.

PP30 [139] (140) pit Ga.2. Sherds, including two from (125), of distinctive reduced fabric, mainly 5YR 6/1 grey with rim darker 5YR 6/4 dark grey. Rim sherd with internal rim bevel and horizontal incised lines beneath. Two girth sherds appear to come from lower border area of an untidy incised design. Internal rim diameter 200mm. Parker Pearson (1990) style 4/5. Fabric 15 per cent inclusions <5mm but very soft which accounts for degree of abrasion on edges.

Structure 335 (Fig 23)

The two features with sherds are not part of the main post-ring, which in any case lacks radiocarbon determinations. Each feature has sherds from a separate vessel. The GaAd.1 fabric of the sherd in [361] is broadly similar to Trevisker sherds from other structures. **PP31** is a distinctive admixture with micro-granitic inclusions (thin section 7); its slight concavity above the base is found on occasional Trevisker vessels (for example, ApSimon and Greenfield 1972, fig 18, no 48). Average sherd weight was 27.5g.

DETAILS OF SHERDS

PP31 [604] (605) pit outside Structure GaAd.1. Base angle with very slight concavity below flare of wall. Interior oxidised (no residue) 5YR 6/6 reddish yellow, exterior reduced 5YR 5/1 grey. Internal base diameter 130mm. Fabric 10 per cent inclusions <1.5mm, a few <10mm.

Table 2 Pottery from structure 392. Features grouped from the outside inwards. Intrusive Roman gabbroic sherds from [323] [414] [401] (318) 2

| Context | PP | Sherds/weight (g) | Abrasion | Comment |
|--|------|-------------------|----------|---|
| Entrance features | | | | |
| [483] (484) pit | | 1/16 | 2 | Ga.2 |
| [480] (479) posthole | | 5/89 | 1/2 | Ga.2 |
| [485] (486) posthole | | 1/1 | 1/2 | Ga.2 |
| [501] (502) posthole | | 3/80 | 2 | Ga.2 |
| Outer post-ring clockwise from entrance | | | | |
| [314] (315) | | 1/36 | 2 | Ga.2 |
| [325] (326) | | 8/88 | 2 | GaAd.1 |
| [398] (397) | PP18 | 1/146 | 2 | GaAd.2 |
| [327] (328) | | 2/15 | 2 | GaAd.1 |
| Between post-rings | | | | |
| [401] (402) pit | | 4/350 | 2 | GaAd.1 PS22 thin-section 9 dolerite |
| [401] (435) pit | | 3/28 | 2 | GaAd.1 |
| Inner post-ring | | | | |
| [511] (512) | | 10/93 | 2 | GaAd.1 |
| [455] (454) | | 3/12 | 1/2 | GaAd.1 |
| [439] (438) | | 4/38 | 2 | GaAd.1 |
| [449] (448) | | 1/4 | 3 | GaAd.1 |
| [478] (477) | | 6/68 | 2-3 | Ga.2 PS23 |
| On or within inner post-ring | | | | |
| [316] (317) pit | PP19 | 1/16 | 2 | Ga.2 |
| | | 6/70 | 2-3 | GaAd.1 |
| (318) spread | PP20 | 1/11 | 2 | GaAd.1 with gabbro |
| | | 4/26 | 2-3 | GaAd.1 |
| [567] (568) posthole | | 5/51 | 2-3 | GaAd.1 |
| [320] (577) hearth-pit upper fill | | 5/17 | 3 | GaAd.1 |
| [320] (319) hearth-pit main fill | PP21 | 5/232 | 2 | GaAd.1 PS21 thin-section 10 with dolerite |
| | PP22 | 1/20 | 2 | GaAd.2 |
| | PP23 | 1/22 | 2 | GaAd.2 |
| | PP24 | 1/24 | 2 | GaAd.1 with gabbro |
| | PP25 | 1/14 | 1/2 | GaAd.1 with dolerite |
| | PP26 | 1/71 | 2 | GaAd.1 with serpentinite |
| | PP27 | 1/58 | 2 | GaAd.2 |
| | | 39/786 | 2-3 | GaAd.1, |
| [613] (614) posthole cut in hearth-pit (320) | | 23/500 | 2-3 | GaAd.1, GaAd.2 PS28 thin-section 13 PS27 |
| [618] (619) posthole cut in hearth-pit (320) | | 22/293 | 2-3 | GaAd.1, GaAd.2 |
| [623] (622) | | 1/8 | 2 | GaAd.1 |
| [504] (505) pit | | 1/12 | 2 | GaAd.1 |
| [665] (666) posthole | | 1/46 | 2 | GaAd.1 |
| [565] (566) RB ditch | | 1/13 | 3 | GaAd.1 PS25 thin-section 11 with serpentinite |
| Total | | 174/3554 | | |

Posthole group 37

The fabric of these non-diagnostic body sherds indicates they come from different admixture vessels. That from [29] contains dolerite while that from [31] GaAd.2 (thin section 8) contains hornfels and other non-gabbroic material; the sherd is hard, accounting for fresh edges. Radiocarbon determination 1440–1130 cal BC (Wk-14991) brackets the twelfth and thirteenth centuries BC, broadly contemporary with the Trevisker sherds

represented in the other structures. Average sherd weight is 43.5g. The sherds occur in the most southerly two features of the posthole alignment 37–38–85.

Structure 232 (Fig 23)

PP32 [208] (209) posthole Ga.2. Rim with rounded external expansion and internal bevel, broken away from the wall along a coil join. Internal diameter

Table 3 Pottery from structure 102. Intrusive Roman sherds in [139]

| Context | PP | Sherds/weight (g) | Abrasion | Comment |
|----------------------|-------------|-------------------|----------|---|
| [147] (148) posthole | PP28 | 2/38 | 2 | GaAd.2 |
| | | 2/5 | 2 | GaAd.1 |
| [112] (111) posthole | PP29 | 4/40 | 2 | GaAd.1 with serpentinite, includes 2 sherds residual in Roman [679] |
| | | 3/10 | 2 | GaAd.1 |
| [123] (124) posthole | | 1/21 | 2 | GaAd.1 |
| [133] (134) posthole | | 1/20 | 2 | GaAd.1 |
| [139] (140) pit | PP30 | 11/339 | 2/3 | Ga.2 PS18 includes two sherds from (125) |
| | | 2/23 | 2 | GaAd.1 |
| (125) spread | | 3/5 | 2 | GaAd.1 PS17 with dolerite (also sherds of PP30) |
| Total | | 29/501 | | |

Table 4 Pottery from structure 335 (Roman sherd in [388]), posthole group 37, structure 232, structure 66 and ditch [596] (Roman sherds, unstratified)

| Context | PP | Sherds/Weight | Abrasion | Comment |
|-----------------------------------|--------------|---------------|----------|---|
| Structure 335 | | | | |
| [361] (362) posthole in interior | | 1/38 | 2 | GaAd.1 |
| [604] (605) pit outside Structure | PP31 | 13/346 | 1/2 | GaAd.1 PS19 thin-section 7 with microgranite material |
| Total 335 | | 14/384 | | |
| Posthole group 37 | | | | |
| [29] (30) posthole | | 1/19 | 2 | GaAd.1 with dolerite |
| [31] (32) posthole | | 1/68 | 1/2 | GaAd.2 PS20 thin-section 8 |
| Total 37 | | 2/87 | | |
| Structure 232 | | | | |
| [208] (209) posthole | PP32 | 1/61 | 2 | Ga.2 PS21 |
| Structure 66 | | | | |
| [67] (68) posthole | | 1/10 | 1/2 | GaAd.1 |
| [71] (72) posthole | | 1/1 | 2 | GaAd.1 |
| Total 66 | | 2/11 | | |
| Ditch [596] | | | | |
| [596] (597) | PP33a | 1/30 | 1/2 | GaAd.2 |
| | PP33b | 1/8 | 1/2 | GaAd.2 |
| | PP34 | 1/13 | 2/3 | GaAd.1 with dolerite |
| | | 3/58 | 2-3 | GaAd.1 with dolerite |
| Total [596] | | 6/109 | | |
| Unstratified | | 2/15 | 3 | |

280mm appropriate from a storage vessel. Well-worked, finger modelled, fabric, with 10 per cent inclusions generally <2mm. No radiocarbon determination but the broad shape of the rim occurs within the Trevisker range (for example, Trethellan, Woodward and Cane 1991, fig 42). The single sherd **PP32** comes from a feature in the centre of the structure.

Structure 66

The sherd from [67] is in well-finished admixture; another, from [71], is too small for comment. Radiocarbon dates from the structure indicate a date probably within the Early Bronze Age:

Wk-14994 from posthole [69] calibrates to 1770–1530 BC and Wk-14995 from posthole [76] to 2210–1970 BC. The structure also produced an oven brick (or mould?) from [73] (see below). All three artefacts were from features in the north side of the circle.

Ditch [596] (597) (Fig 23)

Four vessels are represented. Two GaAd.2 and two GaAd.1; **PP34** and a pointed rim with interior bevel are from separate vessels. The four vessels from the ditch have acceptable mainstream Trevisker associations. **PP33a** and **PP33b** with comb-impressed chevrons can be paralleled at Trethellan

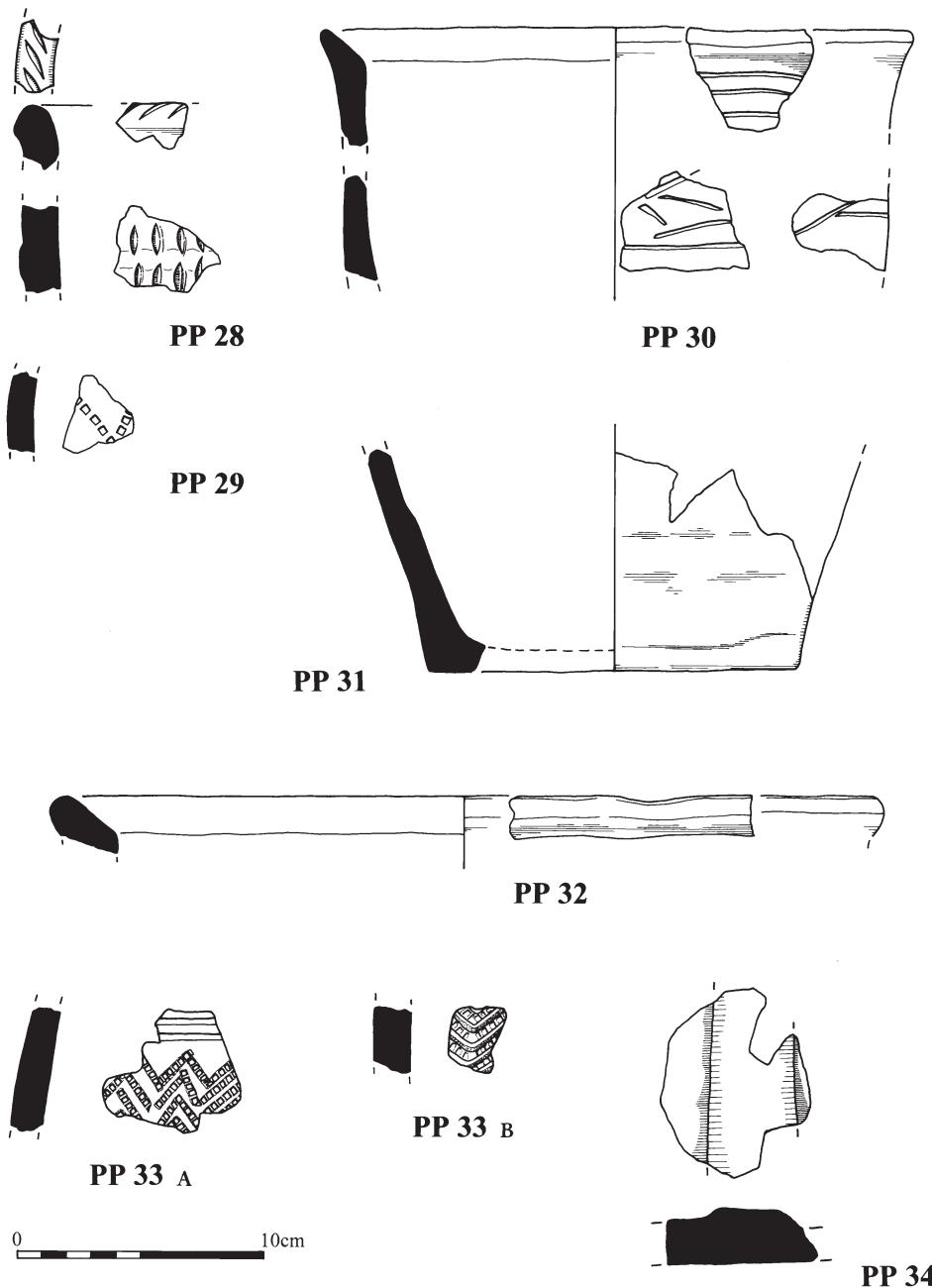


Fig 23 Trevisker / Trevisker-related ceramics PP28–30 structure 102, PP31 structure 335, PP32 structure 232, PP33A–34 ditch [596]. Scale 1:3 (Drawings: Carl Thorpe.)

(Woodward and Cane 1991, fig 46, no 48). **PP34** with its cordon-strengthened base has parallels at Trevisker itself (ApSimon and Greenfield 1972, fig 17, no 41) and at Yes Tor Bottom on Dartmoor

(Worth 1967, fig 27). The presence of gabbroic admixture and of Roman gabbroic sherds leaves the date of [596] unclear, but probably the ditch was Roman in date incorporating prehistoric

material from a feature which it had cut through (see below).

DETAILS OF SHERDS

PP33a GaAd.2. Girth sherd with comb-impressed chevron beneath a border of broad horizontal tooled lines. Fabric 20 per cent inclusions <6mm but mainly <2mm.

PP33b GaAd.2. Girth sherd as **PP33a** but with impressions deeply impressed to form grooves.

PP34 GaAd.1. Base sherd with flat-faced cordon across upper surface. Fabric 30 per cent inclusions between 2mm and 10mm.

Trevisker ceramics (2000)

The 29 sherds weighing 747g are all likely to be Trevisker. A minimum of six vessels are represented of which one, **PP36**, is of local granitic-derived fabric.

Old land surface (17), field 4 (Fig 24)

PP35 Ga.2 Rim sherd from large vessel, flat top, external expansion, internal rim diameter 280mm. Rims of broadly similar form occur in the Middle Bronze Age Trevisker assemblage at Trethellan (Woodward and Cane 1991, nos 29, 44, 57); the fabric is broadly similar to Trethellan Fabric 11. (Quinnell and Taylor archive report P2.)

PP36 Granitic derived. Simple rounded rim from small, thin walled vessel; soft, poorly modelled and finished; a single incised line and parts of a pair of finger dimples. Internal rim diameter 110mm. No close parallel for **PP36** but the paired dimples are found on larger vessels at Trethellan (Woodward and Cane 1991, fig 51). Its fabric is similar to that of the loomweight(s) (see below) from this context. At Trethellan (Nowakowski 1991, 140) several dishes of locally derived 'baked clay' were

identified and **PP36**, although not similar in shape to these, may relate to a similar tradition of *ad hoc* on-site ceramic manufacture. (Quinnell and Taylor archive report P3.)

The remaining seven gabbroic sherds from [17] had no distinctive features; they may be of Middle Bronze Age or of later prehistoric date.

Pit [25] (26), field 4 (2000) (Fig 24)

PP37 GaAd.1 with possible sedimentary rock? Plain cordoned vessel. Internal rim diameter 280mm, original vessel height probably between 250 and 300mm. Out-turned rim with distinct internal bevel: broad flat-faced cordon around girth with simple rectangular lug. On general size and shape **PP37** belongs to Parker Pearson's (1990, 10) style 2, smaller storage and cooking vessels. Woodward and Cane (1991, 122) summarise the data for flat-faced cordons on Trevisker vessels in their report on the Trethellan assemblage; this discussion also covers cordons with simple rectangular lugs. A single sherd with a flat-faced cordon was present at Trevisker itself (ApSimon and Greenfield 1972, 338). The Dartmoor sites of Tunhill Rocks and Raddick Hill (Radford 1952, figs 11, 12) both produced vessels with such cordons and lugs. However, no undecorated vessel with cordon and lugs similar to Tremough **PP37** appears to be recorded. The radiocarbon determination from its find-spot, pit [25], 1460–1190 cal BC (AA-44602) is entirely appropriate. (P4 in Lawson Jones 2002.)

Upper fill (31) in ditch [30], field 4 (2000) (not illus)

Body sherd, gabbro admixture. The sherd is assumed to be redeposited in ditch [30] where it cuts through OLS [17], together with the material

Table 5 Bronze Age pottery from contexts investigated in 2000

| Context | PP | Sherds/weight (g) | Abrasion | Comment |
|----------------------------|-----------|-------------------|----------|-------------------------------|
| OLS (17) field 4 | 35 | 1/26 | 2 | Ga.2 |
| | 36 | 12/17 | 2 | Granitic derived |
| | | 7/21 | 2 | Ga.2? |
| Pit [25](26) field 4 | 37 | 5/641 | 2 | GaAd.1 with ?sedimentary rock |
| | | 1/17 | 2 | Ga.2 |
| (31) in ditch [30] field 4 | | 1/14 | 2 | GaAd.1 redeposited |
| Ditch [48] field 4 | | 1/3 | 2 | GaAd.1 redeposited |
| Unstratified, field 3 | | 1/8 | 2 | GaAd.1 |
| Totals | | 29/747 | | |

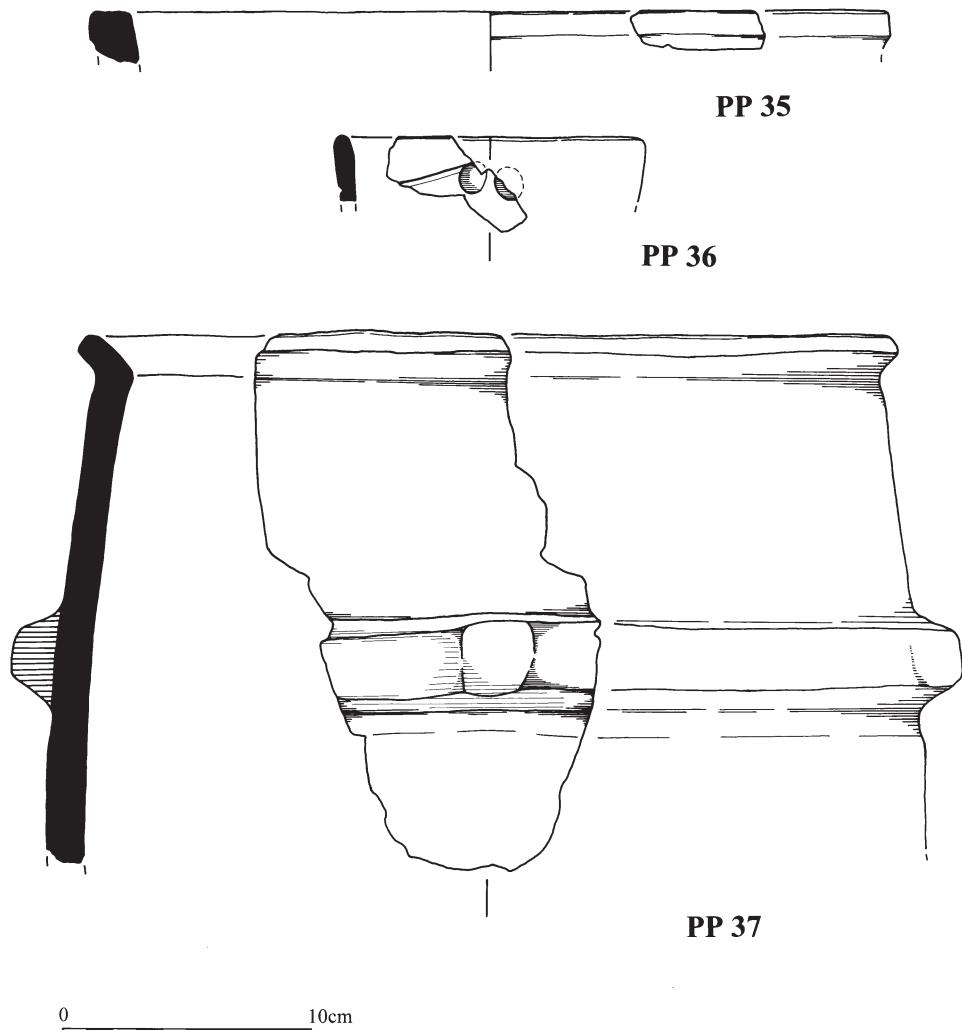


Fig 24 Trevisker / Trevisker-related ceramics PP35–36 old land surface (17), PP37 pit [25]. Scale 1:3 (Drawings: Carl Thorpe.)

from which determination 1440–1120 cal BC (AA-44603) was derived; ditch [30] formed part of the rectilinear field system and is considered Iron Age (below). (P7 in Lawson-Jones 2002.)

Baked clay objects of Bronze Age date

Colourant (not illus)

SF1034 posthole [325] in structure 392. Three small fragments weighing 10g of fine, almost grit-free fabric, light reddish brown 5YR 6/4. Flattened

abraded surfaces on two of the pieces suggest the material was ground for use as colourant. R Taylor (archive) identifies the fabric as a silty clay with some granite-derived mica, probably from a source local to the site. Radiocarbon determinations indicate that the context dated between the thirteenth and the eleventh centuries cal BC. A piece of similar fabric but without the abraded surfaces, weighing 8g, was found in posthole [512] in the same structure. Nothing similar appears to have been recognised from prehistoric sites in Cornwall.

Metalworking mould fragment or possible oven brick (Fig 25)

SF1022 from posthole [73] (74) in structure 66. Part of an irregular rectangular fired clay block, 110mm high, 120mm+ in length and 50mm thick with fragment of a depression surviving in one broken face. Original surface spalled with patchy reduced areas suggestive of refiring. R Taylor (see archive) identifies the fabric as a silty/fine sandy gabbroic clay with a mineral content similar to that of gabbroic pottery clays.

The open-topped shape of the depression and its heavily scorched condition suggests the top of one face of a bivalve clay mould. However, viewed under hand lens, there are no traces of metallurgical residue and most prehistoric clay moulds so far recognised from Britain have an inner layer of fine clay and a heavily tempered outer layer. No clay moulds have survived from Britain before the Late Bronze Age (Tylecote 1986, 89) but the form of many artefacts from the Early Bronze Age onward makes their presence a possibility. Structure 66 produced two featureless gabbroic admixture sherds and radiocarbon determinations Wk-14994 from posthole [69], which calibrates to 1770–1530 BC, and Wk-14995 from posthole [76], calibrating to 2210–1970 BC, both at two sigma.

Broadly similar rectangular clay blocks may have been used in pottery firing. Several sites have produced parts of these blocks in some quantity, together with other detritus appropriate for pot manufacture, all in association with Beaker ceramics, notably Weasenham Lyngs in Norfolk (Petersen and Healy 1986, 97–9, 101) and Hockwold-cum-Wilton ‘Oaks’ site 69, also in Norfolk (Bamford 1982, 29). The clay blocks on these sites have similar patchy firing to SF1022 and, although there do not appear to be close comparanda for the depression in the face of SF1022, they survive in fragmentary state with the detail of the structures involved poorly understood. The dating of these sites is broadly similar to that of structure 66, and detritus with similar blocks has not so far been highlighted as a feature on sites of subsequent prehistoric dates. The similarity of the fabric of SF1022 to that of gabbroic ceramics may support a pot production connection.

The broken surfaces of the fragment were comparatively fresh and unweathered when buried and the object may have been deposited as an act of structured deposition. It was the only artefact present in the structure, apart from two featureless gabbroic admixture sherds, and posthole [73], (74), which contained it was the mostly westerly of those surviving. If SF1022 was connected with either

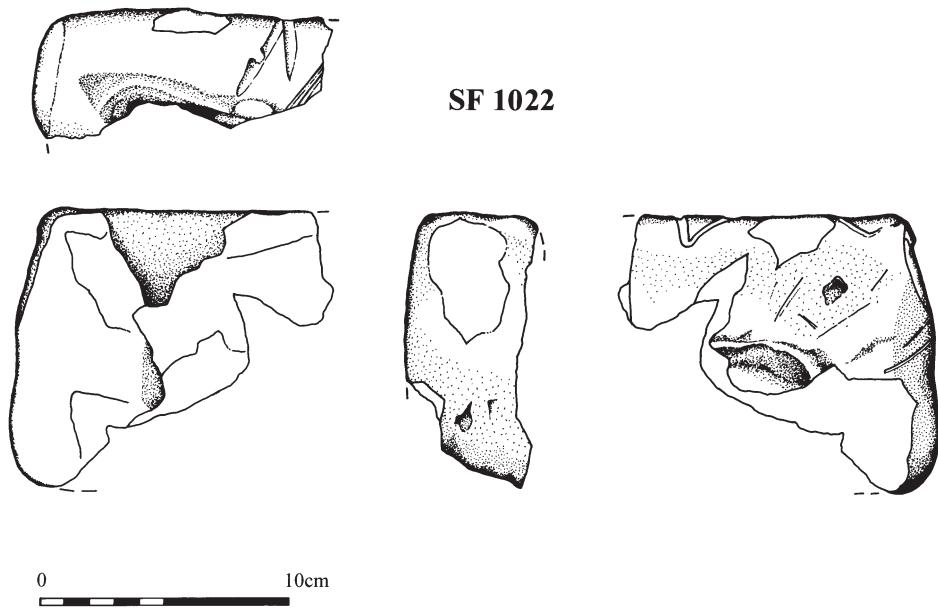


Fig 25 Clay mould / fire brick SF 1022, structure 66. Scale 1:3 (Drawings: Carl Thorpe.)

pottery production or metalworking, there is no suggestion that either of these activities took place close to structure 66. The structure only otherwise produced some charcoal which may have been fuel debris. SF1022 must have been brought from the area where production, whether of pottery or metalwork, took place and have been deliberately deposited.

'Loomweights' (not illus)

OLD LAND SURFACE (17) IN FIELD 4 (2000)

Twenty-nine pieces of baked clay weighing 240g appear to be fragments of one or more cylindrical 'loomweights'. Roger Taylor identifies the fabric as granitic derived with abundant silt/fine sand and some mica and some inclusions of fine-grained granite. Apart from the granite inclusions, the fabric is similar to that of **PP36**, and its source is likely to be local to the site.

Cylindrical clay 'loomweights' occur in the assemblages at Trehellan (Nowakowski 1991, fig 55) and Trevisker (ApSimon and Greenfield 1972, fig 24). In both cases these are made from materials available close to the sites, while all pottery is gabbroic. Cylindrical 'loomweights' generally belong to the Middle and Late Bronze Ages in southern Britain, while those of the Iron Age tend to be triangular; the latter have not so far been found in Cornwall. The presence of the distinctive 'loomweight' shape is consistent with the Middle Bronze Age date for **PP35** and supports the general suggestion that most artefactual material preserved in that segment of (17) cut by ditch [30] is Middle Bronze Age in date.

PIT [316] (317) IN STRUCTURE 392

Two abraded fragments of baked clay, of similar fabric to the pieces from (17) in field 4, are probably from a cylindrical 'loomweight'. One piece has a small part of curved outer surface surviving, the other part of the edge of a perforation. The thirteenth to eleventh century date range indicated by radiocarbon determinations for structure 392 would be entirely appropriate for the artefact.

DISCUSSION

The term 'loomweight' has been put in inverted commas. This is because the triangular 'loomweights' of the Iron Age have recently been

re-interpreted as oven bricks (Poole 1995), used either as cooking oven or kiln furniture. Poole (2006) is now looking critically at Middle to Late Bronze Age artefacts interpreted as 'loomweights', pointing out the minimal evidence for connections with weaving and suggesting that at the least alternative interpretations as oven furniture should be considered, a view that merits support. It is notable that these objects never form the large group finds appropriate for looms known for the doughnut-shaped weights of the Saxon period. At present alternative interpretations as 'loomweights' or 'oven bricks' are possible but the author favours the latter.

Later Iron Age and Roman periods

The assemblage consists of approximately 720 sherds weighing 13,363 grams from 2002 and 59 sherds weighing 442 grams from 2000, with a further 21 sherds weighing 296 grams from the 'fort'. 99 per cent on sherds and weight is gabbroic, but single sherds of Cornish made vessels are of muscovite and granitic-derived fabrics. Non-local fabrics, less than 1 per cent on sherds and weight, consist of samian, SE Dorset black-burnished ware and probable Oxfordshire fabric.

This report is supported by a series of archive tables in which vessel numbers, fabric and abrasion are recorded by context.

Local fabrics

Well-made gabbroic Compact fabric with good surface finish, usually burnished, and sparse inclusions over 1mm. Used during the later Iron Age until the middle of the second century AD (Quinnell 2004, 108). Microscopic examination by R Taylor of PS1 and of archive P5 from 2000 confirmed identification. 2 per cent (sherds) and 3 per cent (weight) of the 2002 assemblage, but 5.5 per cent (sherds) and 15 per cent (weight) from 2000 and 33 per cent (sherds) and 62 per cent (weight) from the 'fort'.

Standard gabbroic Open fabric with wiped finish, inclusions moderate up to 2mm. The principal gabbroic fabric from the second century AD onward but now demonstrated to occur in assemblages of Middle and Late Iron Age date (Quinnell 2011). Microscopic examination by R Taylor of PS2, PS5–8, and of **PR30** from 2000, confirmed identification. All sherds are in this

Table 6: Details of the 2002 Roman pottery assemblage. All sherds standard gabbroic unless specified. Of this 691 sherds weighing 12,775g are standard gabbroic, 14 sherds (331g) are well-made gabbroic, 11 sherds (266g) are coarse gabbroic, two sherds (5g) Samian, one sherd (21g) BB1 and one sherd (2g) possible Oxfordshire

| Context | Vessels (PR) | Sherds/ weight (g) | Minimum vessel numbers | Fabric if not standard gabbroic |
|---|--------------|--------------------|------------------------|--|
| Structure 338 phase 1 | 1–4 | 9/274 | 4 | — |
| Structure 338 phase 2 | 5–6 | 140/901 | 6 | Well-made gabbroic 2/186g, coarse 1/30g |
| Structure 338 not assigned to phase | 7–8 | 47/662 | 5 | Oxfordshire? body sherd 2g |
| Spread over structure 338 | 9–13 | 89/1792 | 15 | Coarse gabbroic 6/156g |
| Enclosure ditch first phase [306] (307) | 14 | 24/257 | 4 | Well-made gabbroic 3/35 |
| Enclosure ditch (753) remnant first phase below [565] | — | 1/3 | 0 | — |
| Enclosure ditch second phase [565] fill (566) | 15–22 | 231/6389 | 28 | BB1 body sherd 21g, Samian rim 3g, well-made gabbroic 8/100g, coarse gabbroic 2/50g |
| [596] [600] [729] by SW terminal of [565] | 23 | 19/66 | 1 | — |
| Pit [424] | 24–27 | 22/386 | 11 | Samian 2g re-used as spindle whorl, well-made gabbroic 1/10g, coarse gabbroic? 2/30g |
| Pit [377] | 28 | 70/2130 | 1 | — |
| Pit [9] | — | 1/1 | 0 | — |
| Pit [296] | — | 1/11 | 0 | — |
| Roman-period fields | — | 6/44 | 2 | — |
| Topsoil, residual, tree throws, unstratified, intrusive | — | 60/447 | 8 | — |
| Overall total | | 720/13363 | 85 | |

fabric unless otherwise specified. 96 per cent (sherds) and 94 per cent (weight) of the 2002 assemblage, 94.5 per cent (sherds) and 85 per cent (weight) from 2000 and 66.6 per cent (sherds) and 38 per cent (weight) from the ‘fort’.

Coarse gabbroic Open fabric with wiped finish, moderate inclusions up to 5mm and occasionally 10mm, used principally for storage jars (type 16) from the third century onward. Microscopic examination of PS3–4 by R Taylor confirmed identification but noted a possible loessic content. A loessic gabbroic fabric has been sourced by Harrad (2004, 282) to Lowland Point in St Keverne but loessic deposits on the gabbro are fairly extensive (P Ealey, pers comm). 1 per cent (sherds) and 2 per cent (weight) of the 2002 assemblage; it was not found in 2000 or at the ‘fort’.

Muscovite Fabric with large quantity of muscovite and some biotite, quartz and feldspar probably sourced to the metamorphic aureole around the Carnmenellis granite. Well made with a burnished finish. Single sherd.

Granitic derived Fabric with some angular quartz, mica and a little feldspar, also some fragments of vein-quartz up to 7mm, sourced locally but a different fabric from Bronze Age granitic derived **PP36**. Single sherd.

Non-local fabrics

| | |
|---------------------------------------|----------|
| <i>Samian</i> | 2 sherds |
| <i>SE Dorset black-burnished ware</i> | 2 sherds |
| <i>Oxfordshire ware?</i> | 2 sherds |

Forms

Cordoned Ware forms are described according to Threipland’s (1956) alphabetic type series and those from the second century AD onward according to the numeric type series developed for Cornish Roman-period gabbroic wares in the publication of Trethury Round (Quinnell 2004).

Type 10 bowls have been added to the forms identified at Trethury: these have a restricted opening, sharply everted rim and rounded shoulder. As with much Romano-British pottery, the date range is difficult to define. The type may relate to St Mawgan-in-Pydar type O and the best comparanda come from Castle Gotha (Saunders and Harris 1982, fig 12, no 10) with the probable date range for the type from the later second through into the third centuries.

Details of ceramics by context

STRUCTURE 338

Structure 338 phase 1 (Fig 26)

PR1 Posthole [336] (337). Type 10 bowl, internal neck diameter 160mm, standard gabbroic.

PR2 Posthole [336] (337). Type 10 bowl, internal neck diameter 140mm, standard gabbroic.

PR3 Gulley [519] (520). Type 10 bowl, internal neck diameter 130mm, standard gabbroic.

PR4 Posthole [645] (646). Type 10 bowl, internal neck diameter 140mm, standard gabbroic.

The only distinct vessels are represented by single sherds of the four type 10 bowl rims **PR1–4**, all fresh, the only type 10 pieces from the site apart from one sherd in (566). The condition of

PR1, 2 and 4 indicates deposition and protection, most probably deliberate, very soon after breakage.

PR2 and 4 both have external sooty, suggestive of cooking. The presence of these vessels may indicate some special activity at the beginning of the structure's life. The type 10 bowls have a broad range from the late second into the third century. The determination from an early phase of structure 338 – 125–225 cal AD at 68.2 per cent probability (one sigma) and 70–250 cal AD 93.4 per cent probability (two sigma) (Wk-15004) – broadly accords with the pottery. A late second century date for this initial phase would be appropriate for contexts preceding those of phase 2.

Structure 338 phase 2 (Fig 26)

PR5 Posthole [339] (340). Type H Cordoned Ware jar, internal neck diameter 300mm, well-made gabbroic, burnished, black coating.

PR6 Pit [611] (612). Type 23 plain rimmed bowl, internal rim diameter 160mm, standard gabbroic.

Contexts [339] and [611] contained large fresh sherds of **PR5** and **6** likely to have been buried quickly after breakage, possibly deliberately deposited, and sherds from this phase are generally fresh. The Cordoned Ware jar **PR5** had a long period of manufacture from the first century BC until around the mid-second century AD. Type 23 **PR6** was first made in the late second century and continued in production until some time in the fourth. Posthole [669] contained a storage jar sherd with incised decoration typical of type 16 vessels, probably introduced in the early third century. A foot-ring base from pit [690] is unlikely

to have been made after the mid-second century AD (Quinnell 2004, P83, 117).

The other two vessels represented are type 4 cooking pots with a long date range. The dating for phase 2 contexts is rather mixed. **PR6** and the storage jar sherds suggest that [611] and [669] do not date before the late second and the third centuries respectively. A date in the early third century for phase 2 could therefore be appropriate, but **PR5** and the foot-ring from [690] would have been several generations old at the time of their deposition.

Structure 338 phase 3 and unassigned features

PR7 Pit [343] (344). Vertically pierced rim-set lug from type 12 vessel, standard gabbroic but burnished.

PR8 Pit [343] (344). Side of type 4 jar, impressions below rim, internal neck diameter 170mm, standard gabbroic.

Type 12 **PR7** is from a vessel form probably not made after c AD 300 (Quinnell 2004, 118). Both it and type 4 **PR8** are fresh sherds. A type 22 rim from [743] is from a Cornish flanged bowl almost certainly introduced in the late third century AD; the introduction of these bowls forms one of the clear indicators in the Romano-British ceramic sequence. A type 23 bowl from [663] should be later third into early fourth century. The small abraded Oxfordshire sherd is not likely to predate the fourth century. Dating spreads across the third century and continues into the early fourth. This accords with the determination Wk-15005 from hearth-pit [674] which calibrates to 210–340 AD 68.2 per cent probability (one sigma) and 130–380 AD 95.4 per cent probability (two sigma).

Spread/infill over structure 338 (Fig 27)

PR9 Soil (503). Type 16 storage jar, incised bands of decoration on shoulder, internal neck diameter 260mm, coarse gabbroic.

PR10 Soil (503). Type 16 storage jar, internal neck diameter 240mm, coarse gabbroic.

PR11 Soil (503). Type 20 flat rimmed bowl, internal rim diameter 140mm, standard gabbroic.

PR12 Cleaning over 338. Type 22 Cornish flanged bowl, internal rim diameter 190mm, standard gabbroic.

PR13 Cleaning over 338. Large Type 4 jar, internal neck diameter 220mm, standard gabbroic.

Three examples of type 22 Cornish flanged bowls, including **PR12**, suggest a late third into

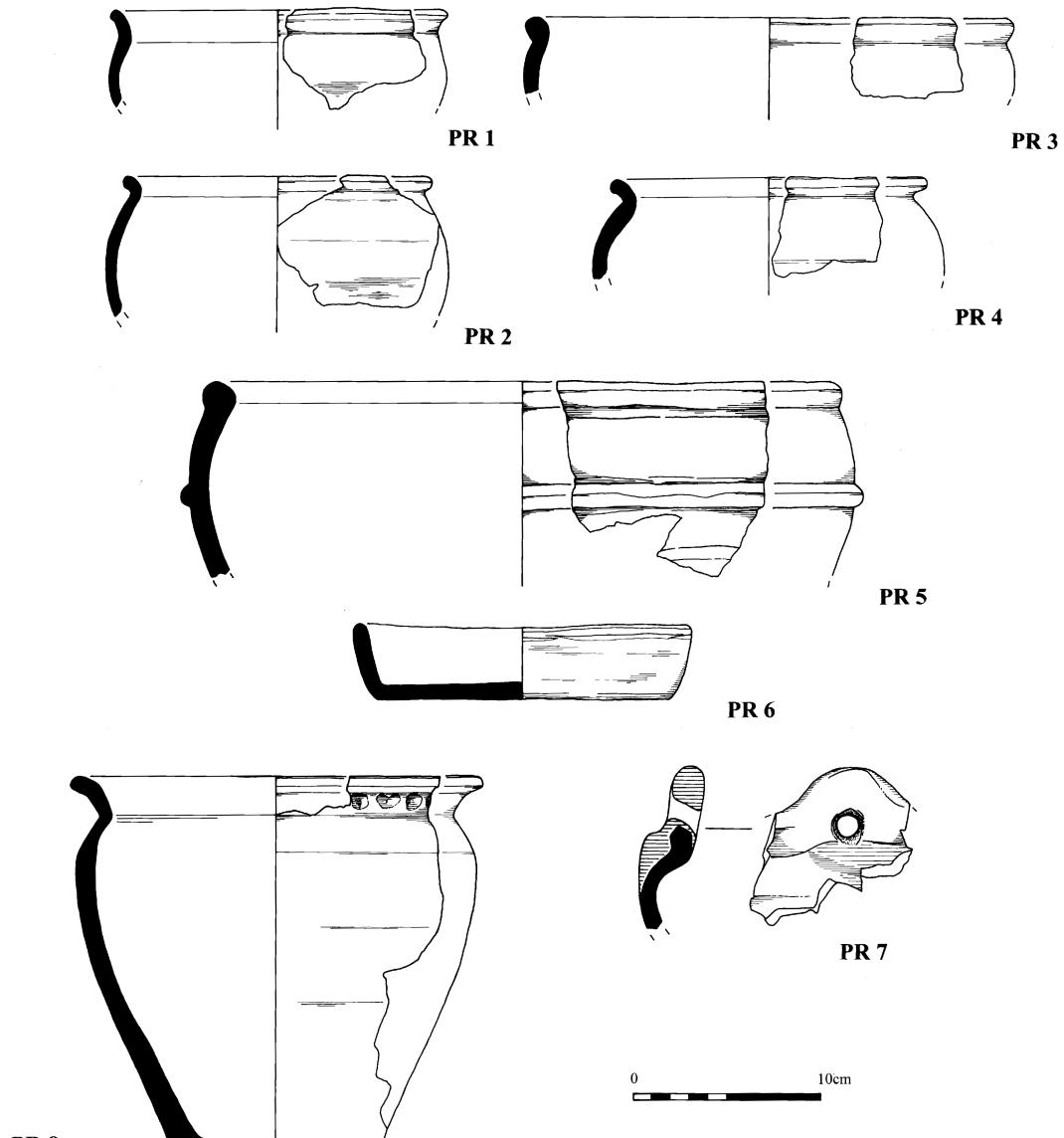


Fig 26 Local Roman-period ceramics PR1-8 structure 338 phases 1-3. Scale 1:4 (Drawings: Carl Thorpe.)

fourth century date. All the pottery present would fit into this date range. There are five type 4 jars, including PR13, and all have diameters between 200 and 240mm, a large size appropriate for a third into fourth century date (Quinnell 2004, 113). There are four bowls in addition to the type 22 examples: PR11 and another type 20, a type 21 and a type 23; these have a late second into fourth century date.

Their presence supports a date before the mid-fourth century (Quinnell 2004, 121-3). Much of the pottery – especially that in (503) – was fresh. (503) appears to have filled a slight depression over the structure and may be regarded as a closing deposit, which accords with the presence of the stone bowl S13 and S15 quern fragments. The condition of the pottery is not consistent with gradual abandonment

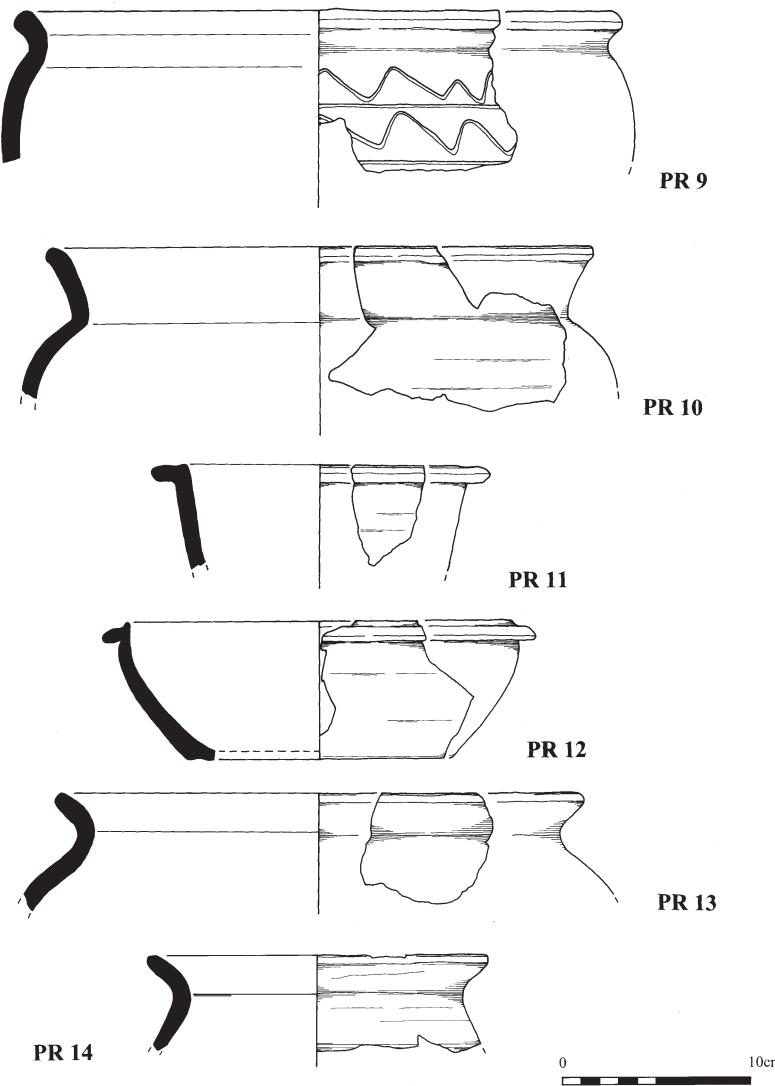


Fig 27 Local Roman-period ceramics PR9–13 spread over structure 338, PR14 enclosure ditch [306]. Scale 1:4 (Drawings: Carl Thorpe.)

and silting, although there has been damage from recent agriculture.

Summary on structure 338

Phase 1 may belong to the late second century, phase 2 to the early third and phase 3 to the late third, with a terminal date in the earlier fourth century.

ENCLOSURE DITCH [306], FILL (307) (FIG 27)

PR14 Type 4 jar, internal neck diameter 130mm, standard gabbroic.

Freshly broken **PR14** type 4 jar indicates a *terminus post quem* in the later second century; sherds of another type 4 jar are abraded. A well-made rim of type 1/Cordoned Ware type D, by contrast, freshly broken, is unlikely to have been made after c 150 AD and may have been in use for a generation or two; this is also the case with a well-made body sherd with a cordon. The sherds in (307) suggest infill covering the later second century, allowing time for type 4 sherds to become abraded. They appear broadly contemporary with those from phase 1 of structure 338. The sherds from [306] are scattered fairly evenly along its

length with no concentration in the terminal. The presence of some fresh sherds indicates the possibility of deliberate deposition but it is unclear how much of the fill was deliberate and therefore uncertain how the date of the infill relates to that of the original cutting of [306].

REMNANT [306] FILLS BELOW (565) DITCH
Only a single body sherd from (753) was found in these fills, the remainder of which were aceramic.

ENCLOSURE DITCH [565], FILL (566)
(Fig 28)

PR15 Parts of body and base of type 13 storage jar, replacing Cordon Ware types H and J sometime in the mid-second century (Quinnell 2004, 118). Internal girth diameter 350mm, surviving height 340mm. Well-produced, possibly later second century. The double cordons are unusual on storage jars or other vessels. Their most common occurrence is at Carvossa, on a variety of vessels which are unlikely to post-date the second century (Carlyon 1987, fig 5 no 150, fig 6 no 176). All except two small sherds join, representing about one third of the vessel with no rim, but it is clear from the position of joins that several large sherds were deposited and had subsequently broken. These formed a tight group, inner side upwards, about halfway up the ditch fill.

PR16 Type 22 Cornish flanged bowl, internal rim diameter 190mm, standard gabbroic.

PR17 Type 4 jar, internal neck diameter 125mm, standard gabbroic.

PR18 Type 11 jar, internal neck diameter 240mm, standard gabbroic.

PR19 Type 20 flat-rimmed bowl, internal rim diameter 300mm, standard gabbroic.

PR20 Type 20 flat-rimmed bowl, internal rim diameter 180mm, standard gabbroic.

PR21 Type 21 flat grooved-rim bowl, internal neck diameter 180mm, standard gabbroic.

PR22 Type 19 cordoned bowl, internal neck diameter 210mm, standard gabbroic.

About 26 distinct vessels are present, in addition to a small sherd of BB1 and a scrap of Samian from a rim of a central Gaulish Dr 27, later first or second century and very worn when broken. As well as **PR15**, there are well-made cordoned body sherds. There are 11 type 4 jars including **PR17**, and a type 10 bowl of the late second to third century. **PR18** and two others are type 11 cordoned jars of various

sizes, probably not produced after the middle third century (Quinnell 2004, 118). Two type 16 storage jars are third or fourth century. Of the six bowls, one is type 19 **PR22**. This derives from St Mawgan type R and, when made in standard gabbroic fabric, is likely to be late second century; as **P22** is abraded, it may have been redeposited from earlier fill. **PR91** and **20** are type 20 flat-rimmed bowls, late second into the early fourth century, one type 21 (**PR21**) flat-grooved rim bowl, very late second century until early fourth, and two type 22 (**PR16**) Cornish flanged bowls, late third until fifth centuries. A type 28 lid is not closely datable.

The date range of the *use* of these types is likely to have been late second until late third or very early fourth century. If activity had continued well into the fourth century, more type 22 bowls and fewer bowls of other forms might be expected. If the type 19 bowl was either curated or redeposited, then all the pottery could be contained within the third century. Radiocarbon determination Wk-14990 which calibrates to 20–140 AD 66.2 per cent probability (one sigma) 0–220 AD 95.4 per cent probability (two sigma) is rather early for the pottery and may come from charcoal re-deposited from the first phase enclosure.

The date range of the pottery from [565] is broadly similar to that from structure 338. All the illustrated sherds (except type 19 **PR22**) and about half the remainder are fresh, which indicates that they were quickly covered. As these include type 22 bowls, which only occur from the late third century, deposition may have occurred over a century or so. Soil may have been pulled down from the bank to cover them. There are no major concentrations around the ditch, although the lengths which include the terminals have rather more sherds than the remainder. None of the sherds were in dumps of midden material and they appear to be parts of individual vessels separately deposited. The enclosure ditch is smaller than those of rounds, on which most work on Roman-period settlements has been carried out, and is the first surrounding a Roman-period settlement to have been fully emptied. The scattered distribution of the sherds around the ditch presents a different pattern to that in rounds, where pottery tends to be sparse unless a distinct midden was dumped (Quinnell 1998–9 b, 92; 2004, 230).

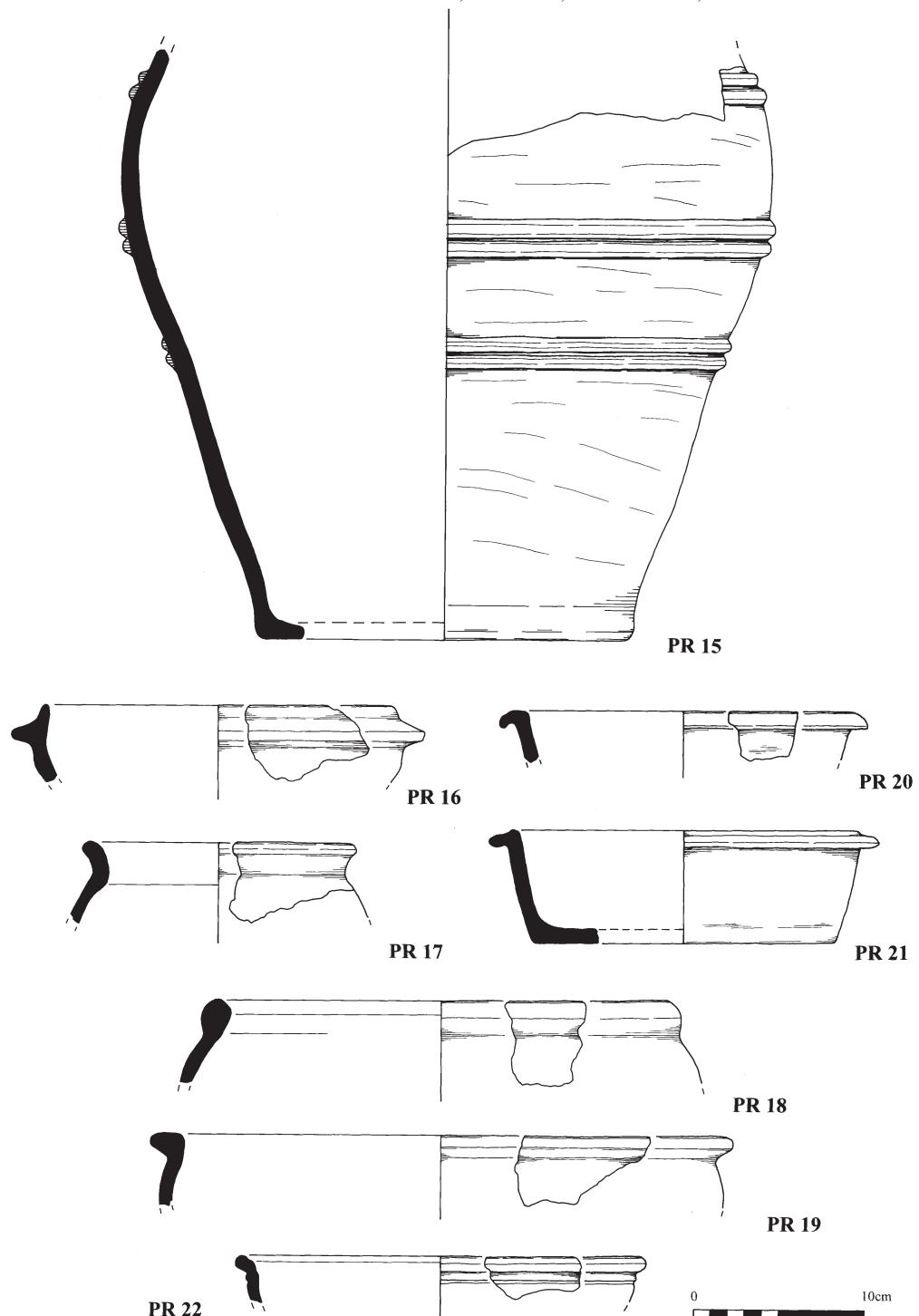


Fig 28 Local Roman-period ceramics PR15–22 enclosure ditch [565]. Scale 1:4 (Drawings: Carl Thorpe.)

DITCH [596] (597), PIT [600] AND PIT [729] BY SW TERMINAL OF ENCLOSURE [565] (Fig 29)

PR23 from [729] (730). Type 20 bowl rim, internal rim diameter 190mm, standard gabbroic.

Ditch [596] contained a quantity of Trevisker-related sherds, including **PP33-4**. Either this feature was second millennium cal BC with the small, fairly abraded Roman sherds intrusive or it incorporated material from a prehistoric feature. If [596] had cut through a prehistoric pit, then it must have been backfilled quickly for the prehistoric sherds to be incorporated in fair condition.

The type 20 bowl in pit [729] has a wide date range from late second into the fourth century AD; there was nothing datable from [600] and no ceramics from [310].

PITS OUTSIDE ENCLOSURE [565]: [424], [377], [9] AND [296]

Pit [424] (Fig 29)

PR24 Fill (475). Type 3 jar rim, internal neck diameter 100mm, standard gabbroic.

PR25 Fill (476). Type 4 jar rim, internal neck diameter 130mm, standard gabbroic.

PR26 Fill (425). Type 4 jar rim, internal neck diameter 140mm, standard gabbroic.

PR27 Fill (474). Type 4 jar rim, internal neck diameter 180mm, standard gabbroic.

The type 3 jar **PR24** suggests a later second century date (Quinnell 2004, 112); this would fit with the presence of a well-made cordoned sherd. The type 4 jars **PR25-7** were being made at that date, as was a type 21 bowl. An abraded piece of samian has been re-used as a spindle whorl. The only items which might be later are some probable coarse gabbroic storage jar sherds.

Pit [377] (Fig 29)

PR28 Type 4 jar, internal neck diameter 180mm, standard gabbroic.

All sherds present are of this jar, representing between 80 per cent and 90 per cent; it appears to have been deliberately smashed, quite possibly by the much-used hammer stone **S16** found in the pit. The deposit is strongly suggestive of structured deposition. The form can date anywhere from the late second century into the early fifth. Wk-15000 provides date ranges of 20–130 cal AD (one sigma) and 40 cal BC– cal AD 220 (two sigma), rather earlier than the date range indicated by other

evidence (Quinnell 2004, 114), and suggests that [377] may belong to the beginning of the type 4 range in the later second century AD.

Pit [9]

Single abraded body sherd.

Pit [296]

Single abraded body sherd. This may be intrusive as it is the only sherd of standard gabbroic fabric in any features in the area of the Grooved Ware pits.

General comment

There is no reason why pits [424] and [377] should not be broadly contemporary and of the same general date range as the first phase of the enclosure. [377] seems likely to have been a deliberate deposit. Sherds in [424] have mixed abrasion and the nature of its infill is uncertain. The preponderance of simple jar forms in these pits is marked but it is unclear whether this has any significance.

THE FIELD SYSTEM IN THE ROMAN PERIOD

The small sherd size and abraded condition is marked; six abraded sherds with an average weight of 7g come from [179], [590], [698] and [716] and include two type 4 jar rims. Some or all of the sherds could be intrusive. None of the material is datable within the Roman period but, unlike the field ditches excavated in 2000 (below), there is nothing of Iron Age date. The ceramics here do not therefore assist resolution of the relationship between the fields and activity within enclosure ditches [306]/565].

Iron Age and Roman-period pottery from fields 3, 4 and 7 (2000) (Fig 29)

ILLUSTRATED SHERDS (Fig 29)

PR29 Upper fill (31) in ditch [30]. Rim sherd, upright neck and rounded everted top, in burnished well-made gabbroic; internal neck diameter 120mm. Standard shape for South Western Decorated jars as at St Mawgan-in-Pydar types A and B (Threipland 1956, figs 14, 15); continues without decoration in the Cordonate Ware tradition until the mid-second century AD, St Mawgan-in-Pydar types D and E (*ibid*, fig 18).

PR30 Unstratified, field 4. Type 20 flat-rimmed bowl, internal rim diameter 180mm. The date range of type 20 bowls is later second century AD

Table 7: Iron Age and Roman pottery from fields 3, 4 and 7. All sherds standard gabbroic unless specified. Well-made gabbroic 3 sherds weighing 55g, standard gabbroic 52 sherds (304g), muscovite 1 sherd 21g, granitic derived 1 sherd (30g), BB 11 sherds (8g), Oxfordshire? 1 sherd (4g).

| Context | PR | Sherds/weight (g) | Abrasion | Comment | Minimum vessels |
|---------------------------------------|-----------|-------------------|----------|-------------------------------------|-----------------|
| Upper fill (16) in ditch [15] field 4 | – | 1/27 | 1/2 | Well-made gabbroic base, archive P5 | 1 |
| Lower fill (33) in ditch [19] field 4 | – | 1/10 | 2/3 | | – |
| Upper fill (20) in ditch [19] field 4 | – | 4/26 | 2 | Well-made gabbroic 1/8g | 1+ |
| Upper fill (31) in ditch [30] field 4 | 29 | 1/20 | 1/2 | Well-made gabbroic, archive P6 | 1 |
| | – | 1/21 | 2/3 | Muscovite, archive P8 | 1 |
| | – | 7/70 | 2 | – | – |
| Gully [53] (51) field 4 | – | 1/2 | 2 | – | – |
| Fill (9) in ditch [7] field 7 | – | 2/3 | 3 | – | – |
| Unstratified field 3 | – | 5/21 | 3 | – | – |
| Unstratified field 4 | 30 | 1/20 | 2 | Archive P10 | 1 |
| | – | 27/139 | 2–3 | BB1 1/8g, Oxfordshire? Rim 1/4g | 2+ |
| | 31 | 1/30 | 2 | Granitic derived, archive P11 | 1 |
| | – | 1/8 | 2 | – | – |
| Unstratified field 7 | – | 6/25 | 2 | – | – |
| Total | | 59/422 | | | 8+ |

through into the fourth century (Quinnell 2004, 121).

PR31 Unstratified, field 4. Edge of lid in granitic-derived fabric, overall diameter approximately 400mm. Exterior wiped smooth, edge very worn. Lids occur occasionally among South Western Decorated (Quinnell 2011) and Cordon Wares and more frequently during the Roman period (Quinnell 2004, type 28, 126). By this date, however, gabbroic fabrics appear to have been in general use. The large size of **PR31** is unusual and, together with the granitic-derived fabric, could indicate a ‘one-off’ vessel of Iron Age date. However, the wiped finish is very typical of the Roman period and the vessel is considered on balance to indicate localised use of a non-gabbroic fabric in this period.

COMMENT ON POTTERY FROM FIELDS 3, 4 AND 7

The sherds from ditch fills not individually described (Table 7) have few distinctive characteristics. The well-made gabbroic base from upper fill (16) in ditch [15], a well-made jar sherd from upper fill (20) in ditch [19], well-made rim **P29** and the well-made muscovite shoulder body sherd from upper fill (31) in ditch [30] suggest that these upper fills were deposited either during the currency of South West Decorated wares sometime during the third to first centuries BC or during that of Cordon Ware from the first century BC to the mid-second

century AD. The radiocarbon determination, AA-44600, from lower fill (9) in ditch [7] calibrates to 180 cal BC–AD 0 at one sigma and 350 cal BC–AD 60 at two sigma, belongs in the date range indicated by the pottery. The determination is more appropriate for South Western Decorated than for Cordon Ware. As there are no finds from lower ditch fills and it is unclear whether the ditches were kept clean, this date only relates to ditch infill, and not of initial laying out. No distinctive Roman material has been found in the fills of ditches or of any other feature. The scatter of Roman period sherds includes type 20 bowl **PR29** and body sherds of BB1 and a small rim sherd of probable Oxfordshire ware. This presumably derives from rubbish used for fertiliser and indicates agricultural activity probably connected with the settlement excavated in 2002.

Late Iron Age/Early Roman-period pottery from the ‘fort’

This small quantity of sherds (not illustrated) is difficult to date closely. The well-made cordoned sherds from (108) and (110) belong to either St Mawgan type H or type J storage vessels and have a date range from the first century BC through to the mid-second century AD. The well-made base from (205) appears entirely appropriate for the determination Wk-21591 calibrating to 100 BC – AD 80. The abraded standard gabbroic rim from

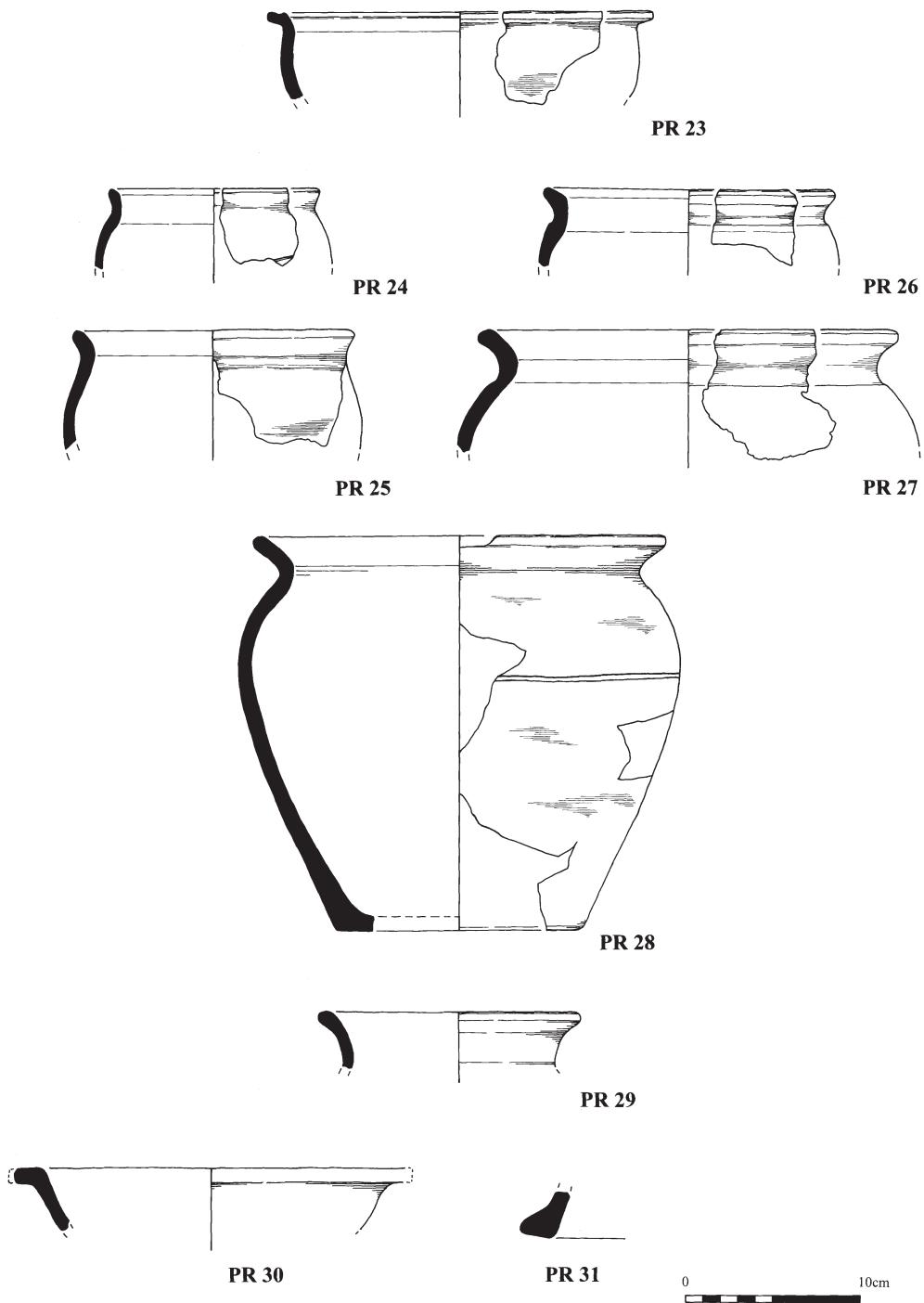


Fig 29 *Later Iron Age and local Roman-period ceramics PR23 pit [729], PR24–27 pit [424], PR28 pit [377], PR29 ditch [30], PR30–1 unstratified field 4. Scale 1:4 (Drawings: Carl Thorpe.)*

Table 8: Late Iron Age/Early Roman pottery from the ‘fort’. All sherds standard gabbroic unless specified. Well-made gabbroic – 7sherds weighing 184g; standard gabbroic – 14 sherds (112g).

| Context | Sherds/weight (g) | Abrasion | Comment | Minimum vessels |
|---|----------------------|----------|--|--------------------|
| (106) in gully [107] | 2/16 | 2/3 | Small abraded rim from Type N jar | 1 |
| (108) in gully [109] | 1/110 | 2 | Well-made gabbroic cordoned sherd | 1 |
| (110) buried soil | 4/22 | 1/2 | Well-made gabbroic cordoned sherd 1/17g | 2 |
| (111) in gully [112] possible structure | 1/23 | 2 | Base of jar | 1 |
| (130) in posthole [131] | 1/3 | 1/2 | Well-made gabbroic sherd | 1 |
| (205) in posthole [204] | 2/10 | 2 | Well-made gabbroic base | 2 |
| Unstratified adjacent to [204] | 1/8 | 1/2 | | 1 |
| Unstratified | 9/104 | 2 | 2 well-made gabbroic sherds, one piece standard gabbroic unusual bowl rim | 2 |
| Total | 21/296 | | | 11 |

(106) is probably from a St Mawgan type N jar, mid-first to mid-second century AD, although it could possibly belong to a Roman-period type 4 jar with a start date in the mid-second century AD (Quinnell 2004, 114). The unstratified bowl has an unusual broad rim and is not closely datable. The second radiocarbon determination, Wk-21590, from (120), which produced no pottery, calibrates to 50 BC–90 AD. Overall, the limited pottery fits the first century BC to first century AD range indicated by the radiocarbon dates well, with nothing which need have been made at a later date. The eroded state of the suggested type N rim, together with uncertainty on its identification, allows the possibility that some features continued in use into the second century AD or later.

Comment on the Roman assemblage as a whole

The assemblage contains very few non-local fabrics compared to other sites. Imported fabrics from 2002 account for 4 per cent on vessel numbers but less than 1 per cent on sherds and weight. Comparable figures are 14 per cent on sherd numbers for Reawla Round and 18 per cent for Trethury round on sherd numbers (Quinnell 1992, table 5), 7 per cent on weight and 19 per cent on vessel numbers (Quinnell 2004, table 5.5). (It is evident that distinctive non-local fabrics make vessels much easier to distinguish and so distort the picture.) Both these figures are much higher than that from Tremough. A difference in patterns of procurement might be expected between rounds and settlements of presumptive lesser status.

The assemblage may be compared to that from Trethury to assess whether there are major variations in the forms of the gabbroic vessels. These can be divided into food preparation (types

1–4, 6, 8, 9, 11, 12), storage (types 13, 16) and serving/eating (types 19–23). On this grouping, 68 per cent from Trethury were used for food preparation but only 57 per cent from Tremough, 13 per cent at both sites for storage and 19 per cent for serving/eating at Trethury as opposed to 30 per cent at Tremough. These figures may indicate greater provision of eating vessels at Tremough than Trethury but the assemblage is small and factors such as selection for deliberate deposition around the ditch may have affected these. Only when comparable figures are available from a range of other sites will the significance of the difference be assessable.

Post-Roman imported wares (2000)

Paul Bidwell

Two sherds with rilled surfaces are of interest (not illus). The thicker sherd (no 1) definitely comes from an amphora and equally certainly is not of an amphora type familiar from Romano-British deposits in the south west. The general type would correspond to late fifth- and sixth-century imports, but the fabric is not similar to the B-ware range. However, Dr V G Swan, who has examined the sherd, saw some similarities to Black Sea amphorae, as found on sites of the sixth and seventh centuries on the Lower Danube. Such amphora have not been recorded from post-Roman sites in Britain as yet. Sherd no 2 is much thinner and has a fabric not dissimilar to the fabric of Late Roman 1 (Bii) amphorae, but is too small and abraded for positive identification.

1. Rilled body sherd. 47g. Sandy orange fabric with darker orange surfaces, and a thin

light-coloured wash on the exterior. Gold mica plates visible on the surfaces. Field 3.

2. Rilled body sherd 9g. Gritty orange fabric, with paler exterior surface. Field.

Early medieval

Henrietta Quinnell

A grass-marked base sherd came from the fill (19) of medieval field ditch [20]. Two sherds, unstratified from area A near enclosure ditch [565], were from a bar-lugged vessel. One had a simple flattened rim and part of the seating for a horizontal bar lug handle, the other was a wall sherd. Both were thin for a bar lug vessel and had soot coating on the exterior. All three sherds were gabbroic, the bar lug sherds also including a number of quartz fragments making a coarse fabric comparable with that used in bar-lug gabbroic vessels at Halligye (Elsdon and Quinnell, 2009–10). A further five grass-marked sherds of gabbroic fabric were found unstratified in 2000.

Grass-marking, with distinctive straight-walled cooking pots and platters, may have been introduced in the seventh century (Thomas 2005); the addition of bar-lug handles has been suggested to have occurred around AD 850–900 (Thomas 1968) but a recent review of the evidence from Gwithian indicates an earlier date, within the eighth century AD (Thorpe and Thomas 2007). Grass-marked bar-lug ceramics continue until the late eleventh century (Thomas 2005). This material, as with the possible post-Roman imported sherds, indicates the use of the area for agricultural purposes through the early medieval period although settlements of these periods remain to be located.

Spindle whorl

Henrietta Quinnell

Part of a spindle whorl (not illus) from pit [424] (425) was made from a samian sherd, approximately 35mm in diameter. The surfaces of the samian pottery had eroded completely but the fabric is probably central Gaulish. The presence of samian in pit [424] would be appropriate for the late second century AD date which has been tentatively suggested.

Roman-period stonework

Henrietta Quinnell

The Roman stonework assemblage is discussed in full elsewhere (Quinnell 2007); a brief outline is given here. The assemblage contains a range of artefacts commonly found on Romano-British settlements in Cornwall (Quinnell 2004, ch 6). The combination of rotary querns such as **S15** and saddle querns is usual for cereal processing equipment in the area. The mensuration weight **S8** (Fig 30) and mortar **S13** provide examples of two distinctively Cornish, Roman-period, fully modified stone artefacts (Quinnell 1993). The weight **S8** although worn was far from unusable; its deposition in posthole [754] is likely to have been deliberate. The heavily used hammerstone **S16** with possible metalworking connections found with sherds of a broken vessel in pit [377] may also have been deliberately deposited.



Fig 30 Romano-British stone weight S8

Ironwork

Henrietta Quinnell

Hobnails A single hobnail in enclosure ditch [306] (307). Hobnails are being identified with increasing frequency on Cornish sites and are known so far from Trethury, Grambla Round, Penhale Round, Nornour and Duckpool (Quinnell 2004, 78), and also from Atlantic Road, Newquay (Quinnell, forthcoming).

Nails with L-shaped heads Three broken examples, from (122) subsoil in area B, [685] (686) gully in structure 338 and [748] (749) posthole in structure 338. This type of nail has an L-shaped head which can be driven right down into woodwork so that it does not show (Manning 1985, type 4).

Ordinary nails Parts of small examples in [341] (342) in structure 335 (intrusive), in posthole [126] (127) in structure 102 (intrusive) and in [565] (566) enclosure ditch.

Strap or plate fragments Two scraps from (425) in pit [424].

Tip of punch A round-sectioned point 9mm across and 24mm long from posthole [204] in the ‘fort’, with radiocarbon determination Wk-21591 calibrating to 100 BC – AD 80. This could be the tip of a large nail, except that nails do not generally occur in Late Iron Age Cornish contexts. It is more likely to come from an iron rod, possibly used as a punch (cf Sellwood 1984, 354 and fig 7.13).

Comment

The quantity of ironwork is sparse. Although few Cornish sites have much published ironwork, this usually is due to problems of presentation and of identification. Details of the objects identified from Cornish rounds are given in Quinnell (2004, 78). Given the extent of excavation at Tremough, the small quantity from the site may reflect a real difference in the amount of iron in use. The strap fragments may have been cut up during on-site smithing, a very frequent practice on rural sites (*ibid*, 83).

Charcoal from the ‘fort’

Rowena Gale

This study examines four samples of charcoal collected from postholes associated with

structures inside the ‘fort’. Bulk soil samples were processed by flotation and sieving using 1mm and 0.5mm meshes. The resulting flots and residues were scanned under low magnification and the charcoal separated from plant macrofossils. Intact segments of narrow roundwood were infrequent. Charcoal fragments measuring more than 2mm in radial cross-section were considered for species identification.

The samples consisted of small fragments of poorly-preserved charcoal. These were prepared using standard methods (Gale and Cutler 2000). The anatomical structures were examined using incident light on a Nikon Labophot-2 compound microscope at magnifications up to x400 and matched to prepared reference slides of modern wood. When possible, the maturity of the wood was assessed (heartwood/sapwood).

Results

Contextual details and the taxa identified are presented in table 9. Classification follows that of *Flora Europaea* (Tutin, Heywood 1964–80). Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level. These include members of the Pomoideae (*Crataegus*, *Malus*, *Pyrus* and *Sorbus*), Leguminosae (*Ulex* and *Cytisus*) and Salicaceae (*Salix* and *Populus*). When a genus is represented by a single species in the British flora, it is named as the most likely origin of the wood, given the provenance and period, but it should be noted that it is rarely possible to name individual species from wood features and exotic species of trees and shrubs were introduced to Britain from an early period (Godwin 1956; Mitchell 1974).

The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa:

Aquifoliaceae. *Ilex aquifolium* L., holly

Betulaceae. *Betula* sp., birch

Corylaceae. *Corylus avellana* L., hazel

Fagaceae. *Quercus* sp., oak

Leguminosae. *Cytisus scoparius* (L.) Link, broom and *Ulex* sp., gorse

Rosaceae. Subfamilies:

Pomoideae, which includes *Crataegus* sp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam.

Table 9 charcoal from the 'fort', h = heartwood; r = roundwood (diameter <20mm); s = sapwood (diameter unknown, *Quercus* only)

| Sample | Context | Description | Betula | Corylus | Corylus/ Alnus | Ilex | Pomoideae | Quercus | Salicaceae | Ulex/ Cytisus |
|----------|---------|---------------------------|--------|---------|-------------------|--------|-----------|--------------------|------------|------------------|
| Trench 1 | | | | | | | | | | |
| 402 | (116) | Fill of posthole [115] | – | 1, <1g | – | – | – | 1r, <1g | 1, <1g | 2, <1g |
| 403 | (120) | Fill of posthole [119] | – | – | 1, <1g | – | – | 1s | – | 1, <1g |
| Trench 2 | | | | | | | | | | |
| 400 | (210) | Fill of posthole [209] | – | 3, <1g | – | 1, <1g | – | 3h, 1s, 1r(<1g) | 1, <1g | cf. 1, <1g |
| 401 | (205) | Fill of posthole [204] | 1, <1g | – | – | 1, <1g | 1, <1g | 8s | – | 4, <1g |

Salicaceae. *Salix* sp., willow, and *Populus* sp., poplar. In most respects these taxa are anatomically similar.

Trench 1

Charcoal recovered from the fills of adjacent postholes [115] and [119]. Samples 402 and 405 included small fragments of oak (*Quercus* sp.), hazel (*Corylus avellana*), gorse (*Ulex* sp.) and/or broom (*Cytisus scoparius*) and willow (*Salix* sp.) or poplar (*Populus* sp.).

Trench 2

Charcoal was recovered from the fill of postholes [204] and [209]. Samples 401 and 400 included oak (*Quercus* sp.), hazel (*Corylus avellana*), holly (*Ilex aquifolium*), birch (*Betula* sp.), the hawthorn/*Sorbus* group (Pomoideae), gorse (*Ulex* sp.) and/or broom (*Cytisus scoparius*) and willow (*Salix* sp.) or poplar (*Populus* sp.). Oak charcoal included both heartwood (probably roundwood) and narrow roundwood, some of which was moderately fast-grown.

Discussion

Charcoal was collected from postholes [115] and [119] in trench 1 and [209] and [204] in trench 2, all of which were associated with post-built structures. It is assumed to be fuel debris, probably domestic in origin, although industrial remains in trench 1 also seem possible on the basis of the intense heating in hearth [114]. Despite its paucity, the charcoal included a broad range of species: oak (*Quercus* sp.), hazel (*Corylus avellana*), birch

(*Betula* sp.), holly (*Ilex aquifolium*), hawthorn/*Sorbus* group (Pomoideae), willow (*Salix* sp.)/poplar (*Populus* sp.) and gorse (*Ulex* sp.)/broom (*Cytisus scoparius*). Although the samples were too small to evaluate species selection, it may be relevant that oak and gorse/broom were common to each sample (perhaps reflecting local distribution), whereas the remaining taxa occurred more sporadically. Both oak and gorse provide excellent firewood (Edlin 1949).

Environmental evidence

Although the extent of woodland clearance is unknown, it is probable that extant woodland was restricted to areas unsuited to agriculture and may have been managed (coppiced) from an early period. Re-growth or re-colonisation of secondary woodland and scrub on agricultural land probably fluctuated, depending on the population at any given time.

Charcoal deposits from settlement areas within the enclosure indicate that during the late prehistoric and Romano-British periods, the local community had access to a broad range of woodland species including oak (*Quercus* sp.), hazel (*Corylus avellana*), birch (*Betula* sp.), holly (*Ilex aquifolium*), the hawthorn/*Sorbus* group (Pomoideae), willow (*Salix* sp.)/poplar (*Populus* sp.) and gorse (*Ulex* sp.)/broom (*Cytisus scoparius*). These represent several distinct ecological habitats and it is probable that fuel was sourced from a wide area around the enclosure. Although it was not possible to obtain secure evidence of species dominance, those named are consistent with woodland composition typical of the region: predominantly oak with hazel and holly (Marren 1992). The moderately fast growth rate

recorded in oak roundwood in sample 400 suggests that fuel was obtained from woodland growing in fairly sheltered conditions. There was insufficient evidence, however, to verify the use of coppiced stems. Gorse/broom tolerates impoverished soils. Gorse, in particular, can withstand exposure to harsh conditions and probably grew as dense scrub in open or exposed areas. Hawthorn also tolerates some degree of exposure but prefers open or light woodland. Willow is more likely to have occurred on the lower, damper valley floor or alongside streams.

These results correlate with those from the Neolithic, Bronze Age and Romano-British contexts at Tremough (Gale 2007). The evidence indicates that despite land clearance during the Bronze Age, woodland composition remained stable and included a similar variety of species at least until the Roman-British period.

Conclusion

Charcoal was sparsely recorded in a number of postholes. The four samples selected for species identification (Table 9) almost certainly represent

fuel debris, probably from domestic use. These were more or less similar in species content and included oak, gorse, hazel, birch, hazel, willow/poplar, holly and the hawthorn group. The samples were too small to assess the use of coppiced woodland but demonstrated that the woodland environment retained a rich mixture of woodland species. Each sample provided short-lived material for radiocarbon dating.

Radiocarbon dating: the ‘fort’

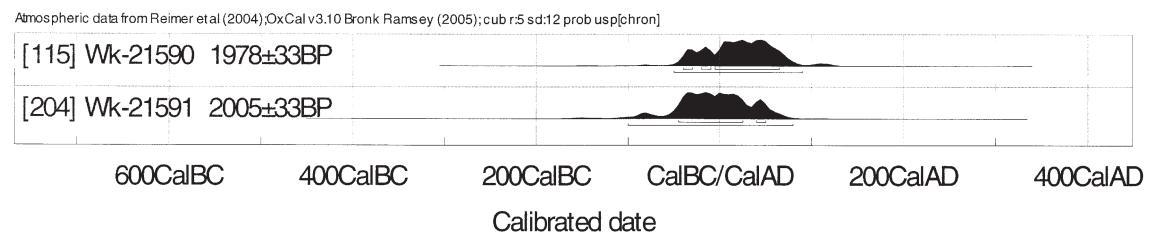
The dating strategy for the enclosure was designed to obtain secure determinations from contexts that would clarify its date. Although material could not be recovered from the primary silt of the ditch, charcoal associated with two posthole structures was submitted for dating. Both of the selected samples were derived from charcoal from short-lived species. They were submitted for accelerator mass spectrometry dating at the University of Waikato in New Zealand.

The results from the wider dating programme are discussed in Gossip and Jones (2007).

Table 10 Radiocarbon determinations

| Feature | Material | Lab. no. | Age BP years | Calendrical years 68% | Calendrical years 95% |
|----------------|-----------------------|----------|--------------|--|-----------------------|
| Posthole [115] | Charcoal. <i>Ulex</i> | Wk-21590 | 1978 ±33 BP | 40–30 BC (3.8%) 20–10 BC (5.5%) 5 BC–AD 65 (58.9%) | 50 BC–AD 90 (95.4%) |
| Posthole [204] | Charcoal. <i>Ulex</i> | Wk-21591 | 2005 ±33 BP | 45 BC–AD 25 (65.9%) AD 40–50 (2.3%) | 100 BC–AD 80 |

Table 11 Radiocarbon dates from the ‘fort’



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Excavation of a barrow on Constantine Island, St Merryn, Cornwall

ANDY M JONES

with contributions from SUE ANDERSON, ANNA LAWSON-JONES, HENRIETTA QUINNELL,
ROGER TAYLOR and TOM WALKER

In August 2007, an inhumation burial was reported within a cist at the seaward end of Constantine Island, St Merryn. The National Trust commissioned the Historic Environment Service to undertake an archaeological excavation of the site (SW 85719 75122). The cist, which was found to hold a crouched adult male, was set within a cairn over an earlier small mound that was largely comprised of sand, stone and midden material. The mound in turn was found to overlay an earlier land surface. The site was not completely excavated but a section was cut across it so that its construction sequence and relationship with the cist could be better understood. In an attempt to stabilise the site, the upstanding section was subsequently reburied beneath the spoil from the excavation. It is recognised, however, that the site will in time be lost to coastal erosion.

A radiocarbon date on bone from the skeleton fell between 1380 and 1110 cal BC, providing a Middle Bronze Age date, a period from which very few human remains are known from Cornwall and no other barrow-associated burials are currently recorded.

In August 2007 the Historic Environment Service (HES), Cornwall County Council, was commissioned by the National Trust Regional Archaeologist to undertake the survey and excavation of a previously unrecorded prehistoric burial. As a result of coastal weathering and footpath wear this was eroding out of a cist on Constantine Island, St Merryn, and had been reported by a visiting member of the public, Trevor Renals (Fig 1). The aim of the project was to record the burial, recover dating information and ascertain whether the cist was set within a purposefully constructed mound or had been built within a pre-existing midden heap. The archaeological fieldwork was undertaken in October 2007 during a week when tides gave the longest access to the site.

Location and setting

The site lies at the western, seaward end of a small tidal island measuring approximately 60m by 19m wide, situated within Constantine Bay on the north Cornish coast (Fig 1). The island is approximately 5m OD above sea level. The underlying geology is slates associated with the Meadfoot Beds (Geological Survey of Great Britain 1974, sheet 335).

On the island the bedrock is overlain by a substantial deposit of accumulated midden material, which rises to form a slight but distinctive knoll at the western end of the island, where the barrow is located. Much of the hinterland to the east of the island is of a contrasting terrain covered by deposits of windblown sand. This topographical

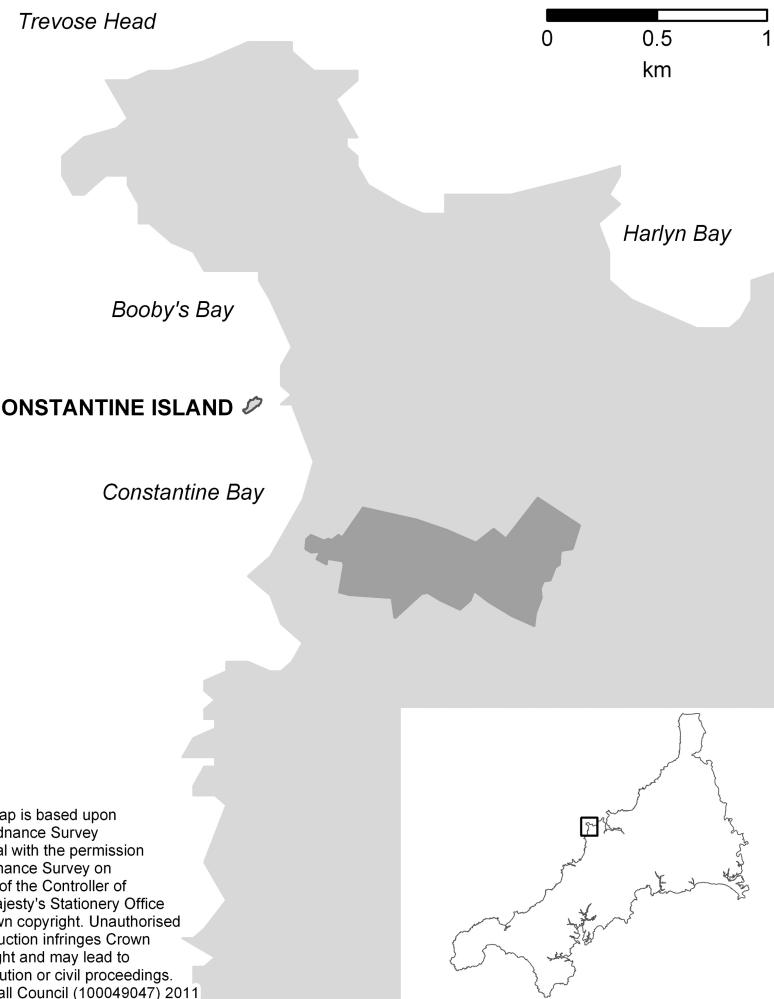


Fig 1 Constantine Island: location

setting gives the island a visual distinctiveness which is reinforced by the fact that it is cut off from the mainland at times of high tide.

The island lies within Coastal Rough Ground, a landscape type made up of marginal grazing land which often contains upstanding prehistoric features such as cairns and barrows (Cornwall County Council 1996). Even in this context, however, the island stands out, being covered by a remarkably dense concentration of archaeological features, which may relate to its perceived and later physical separation from the mainland and its liminality in the landscape (below).

The precise character of the Bronze Age setting of Constantine Island is uncertain. The -5m contour

lies approximately 600m offshore from the western end of the island. Traces of a submerged forest have been found on the beach 300m to the south, with wood from one of the trees radiocarbon dated at the 81.8 per cent confidence level to 4068 ± 31 BP, 2700–2480 cal BC (OxA-18045) (Cornwall HER PRN 176968). Therefore, during the Later Neolithic or Early Bronze Age, or even later, the island was not cut off from the land and might have appeared as a raised knoll or promontory above woodland, towards the edge of the land overlooking the sea.

Previous archaeological investigations have found that the island contains a significant number of prehistoric sites and find-spots, probably

extending across the Mesolithic, Neolithic, Bronze Age and Iron Age (Bullen 1912; Crawford 1921; Norman 1977; Taylor 2003). In addition to barrow 20, these features include substantial accumulations of midden material containing flint, shell and bone, as well as two cists and an oval hut of possible prehistoric date. The precise locations of two of these sites, the hut and one of the cists, are no longer known. The hut is said to have stood at the north west of the island and to have been of elliptical shape (Bullen 1912, 83) but there were no surviving traces when O G S Crawford visited in 1917 (Crawford 1921). The 'lost' cist was excavated in the early part of the twentieth century by Penrose Williams and reported to contain a neat pile of bones, a sherd of hand-made pottery, flint and quartzite fragments (Taylor 2003, 25). This description suggests that the cist dated to the Early Bronze Age. These sites may have been lost through coastal erosion.

Two further possible burial sites were identified by the recent archaeological assessment (Taylor 2003): an eroded cist which is visible in the north-east cliff edge, and a second small mound located to the south of the site that might also prove to be an eroded barrow, although it could be a further midden mound (Fig 2). Barrow 20 appears to have been set within or against a mound of midden material, which may predate the barrow or have developed alongside it in a synchronistic manner. Indeed, given the spread and density of culturally derived material across the surface of the island it is often hard to tell where the natural soil horizon begins or ends.

A large number of round barrows and other prehistoric sites are known in the wider coastal area (Crawford 1921; Christie 1985; Whimster 1977; Rose and Preston Jones 1987; Jones 2005, 63–7). In particular, significant Bronze Age barrow cemeteries are found in the parish of St Merryn at Trevose Head, Cataclews and Harlyn Bay to the north and north east and at Park Head (St Eval) to the south. The former area is associated with the largest collection of Early Bronze Age gold and other metalwork in the south west (Rose and Preston-Jones 1987; Taylor 1980; Jones 2005, chapter 3; Jones *et al* 2011).

However, this picture of intensive barrow construction focused along the coastline may be somewhat biased, as further inland the survival of upstanding prehistoric remains has been affected by agriculture and settlement and the development

of holiday parks and of a large golf course immediately to the east of the island. Nonetheless, extensive lithic scatters and midden mounds have been recorded at Trevose, approximately 500m to the east, and at Harlyn 1.5 km to the north east. Further deposits of midden material have also been found in the dunes immediately to the east of Constantine Island and exposures of organic deposits are visible in the cliff section (Bullen 1912; Taylor 2003).

Although most of the sites have not been systematically investigated, and consequently are not well dated, the overall impression from the archaeological record is that the area around Constantine Island was the focus for sustained, but probably episodic large-scale activity from the Mesolithic period onwards, with a peak of activity during the Early Bronze Age when it is believed the main barrow complexes were constructed. This is also reflected in the lithic assemblage from the island as a whole, which has produced a chronologically mixed assemblage with a large Bronze Age component (Lawson-Jones, below).

Methodology

The project consisted of two stages: surveying significant archaeological features on the island, followed by the excavation of the contents of the cist and the recording of a section through the mound. The site is referred to in this report by its context number, barrow 20.

Survey

An archaeological assessment of the island had been undertaken by HES in 2003 (Taylor 2003). This identified a number of archaeological sites, which were plotted onto a base map. As part of the 2007 fieldwork it was decided that significant archaeological features should be located with a greater level of accuracy (Figs 2 and 3). Much of Constantine Island was surveyed using a total station. This was set up over an existing survey peg near to the summit of the island and all measurements were made from this control point. An attempt was made to tie in the survey to Ordnance Survey (OS) mapping by including an OS datum located on a house 700m to the south but the benchmark could not be found. Instead,

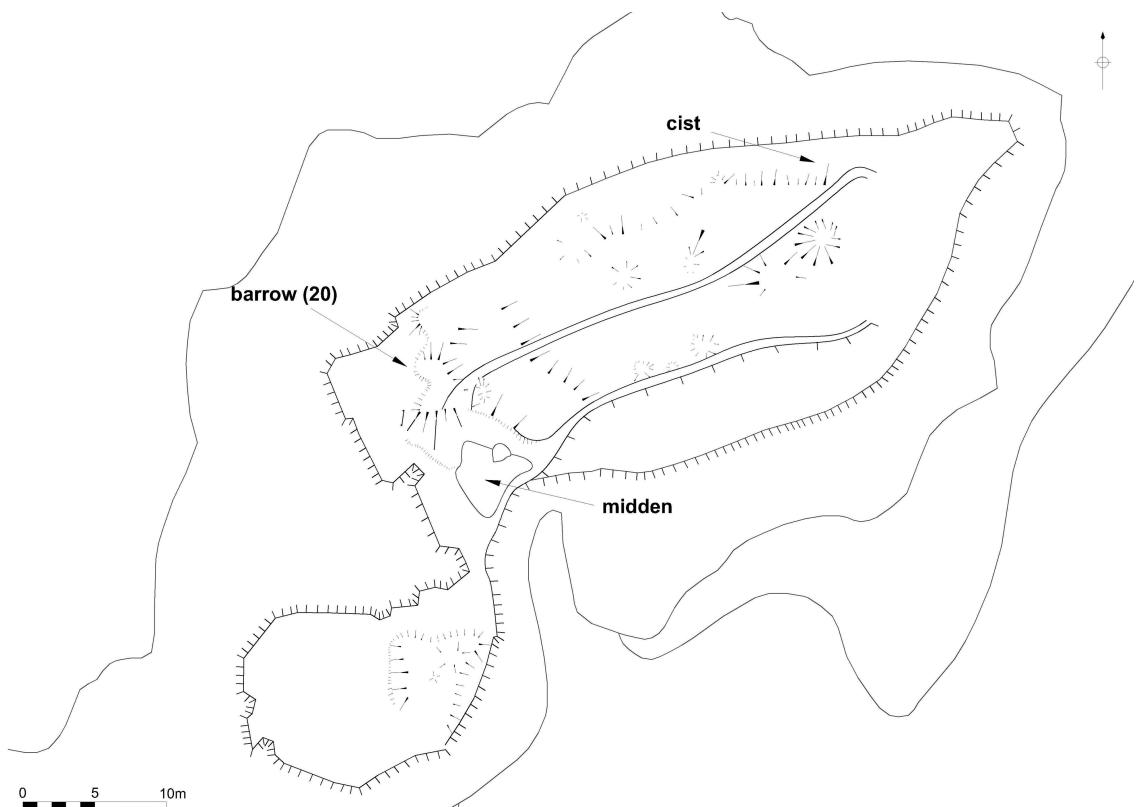


Fig 2 Archaeological features on Constantine Island

the outlines of the house marked with the OS benchmark and of the structure approximately 120m to the north east known as Tom Parson's Hut were recorded. Three additional control points on the island were surveyed in.

In addition to the barrow, various mounds and hollows were surveyed (Fig 2), thought to be the remains of trenches and spoil heaps from previous excavations on the island (see below). The position of another cist recorded by the earlier archaeological assessment (Taylor 2003) was also surveyed and various areas suffering from erosion were also recorded, including a substantial midden mound to the south east of the excavation and a second possible barrow or midden mound to the south.

Excavation

The eroded seaward portion of the barrow was hand-cleaned and excavated by phase. A north-

south section which included the long axis of the cist was established and cut back (Fig 3). This ensured that the relationship between the cist and the mound could be established and recorded in profile, as well as the sequence of the site's construction. The un-eroded eastern portion of the mound was not excavated but the section was hand-cleaned and drawn. The cist and the excavated portion of the barrow were recorded with a series of phase plans.

During excavation a number of prehistoric artefacts, notably lithics, were recovered (below). On completion of the archaeological recording the upstanding section was reburied.

Results of the excavation

Barrow 20 was located at the western, seaward end of the investigated area (Figs 2 and 7) on the most exposed part of the island. It survives as a

distinctive knoll with a well-defined western side, but merges into accumulations of midden material to the east. It is probably for this reason that earlier archaeological surveys and excavations (Bullen 1912; Crawford 1921; Taylor 2003) did not identify the site in its own right but instead assumed that it was part of the midden. In fact, it was only when the cist became exposed through erosion that the true nature of the feature became evident. However, the excavation did not investigate the physical relationship between barrow 20 and the midden to the east.

The north-south section through the barrow revealed that it was approximately 7m in diameter and survived to a height of 1.3m (Figs 3 and 4). Previous disturbance was evident in the form of a large scar which had been eroded through the northern side of the mound and through the recovery of artefacts, including flints and a human vertebra, from loose unstratified material.

The excavations also revealed that, despite its small size, barrow 20 was a complex monument. It was partially constructed upon the natural slate bedrock (Fig 8) and partly upon layer (13), a 0.08m

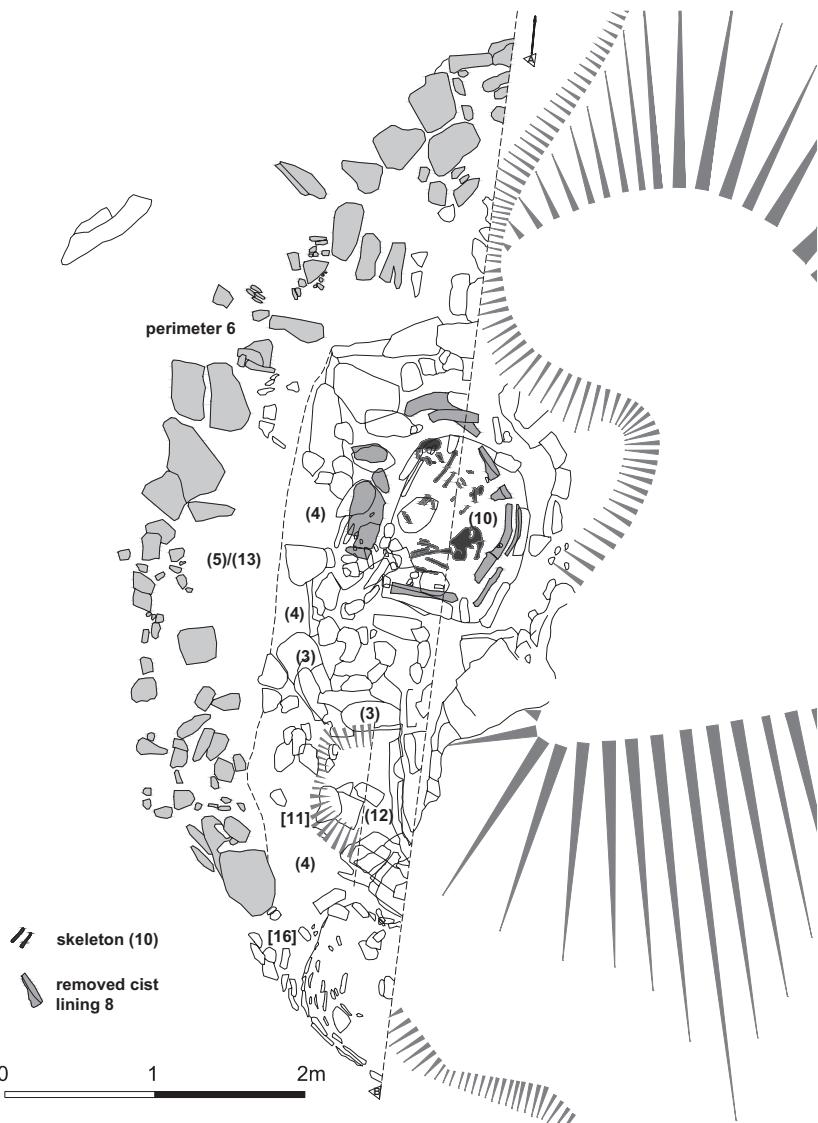


Fig 3 Plan of barrow 20, as excavated

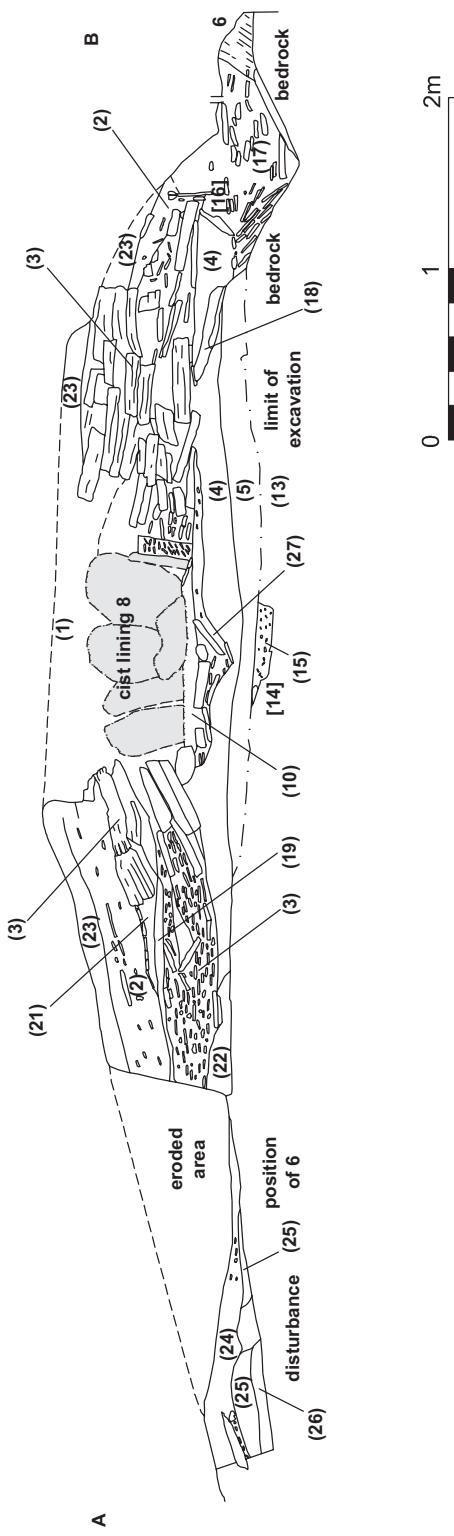


Fig 4 North-south section across the centre of barrow 20

deep deposit of reddish-brown sandy clay material from which a number of artefacts were recovered and which may have been an old land surface. The finds included flints and a sherd of Early Neolithic pottery. A single possible feature, pit [14], was found cutting in to (13). It was a shallow pit, measuring 0.65m across, just 0.08m deep, and was filled by (15), a deposit very similar to (13), but less compact. It did not appear to cut into the bedrock (28) and may just have been a soft area within (13).

Construction of the barrow probably commenced with the marking of a circular space approximately 7m in diameter, defined, for the most part, by a rough ring composed of a single course of slate slabs, 6, laid flat on layer (13) (Fig 3). However, unlike other Cornish barrows, which were often initially defined by open rings of stone or timber (Smith 1984; Jones and Quinnell 2006), it is unlikely that this ring of stones was free-standing as the slates were weak and would have fractured if they had been left exposed for any length of time or trodden on. A few artefacts were recovered from the ring of stones, including a calcareous nodule, quartz pebbles and a 'knife-like' slate object (Taylor, below).

Several sand-rich layers were located within the area defined by the ring of slates (Fig 4). Layer (5) was the lowest deposit in the mound and overlay (13). It contained a small quantity of shells and flint artefacts and part of a human mandible. The layer is likely to have been the primary deposit in the barrow or might have been derived from the adjacent midden mound. It is also just conceivably an *in situ* occupation deposit, which could have predated the site's subsequent development as a barrow. Layer (22) was very similar to (5) but was only recorded in the northern part of the section. Layer (4) covered (5) and was a loose deposit of sand containing shells and crab claws, suggesting that either the sand had been introduced from an adjacent beach or that shellfish had been consumed on the site. Other finds included flints and several small pebbles. Apart from a lens of lighter coloured sand (18), it was a homogeneous deposit. The overall height of this sand mound was approximately 0.4m (Fig 4). The flint assemblage would suggest that the mound was constructed during the Early Bronze Age (Lawson-Jones, below).

The sand mound was covered by a capping deposit of slates (3), which formed a cairn up to 0.7m high. It is uncertain how long the sandy

mound stood before the stones were placed over it but it is possible that layer (27), a thin 0.05m thick deposit of mid grey-brown loamy sand might represent the development of a soil horizon which had become established over layer (4) before the slate cairn (3) covered it. If this was the case, the mound must be seen as a two-phase construction, perhaps separated by a considerable period of time. It seems probable that the cairn was constructed eccentrically to the sandy mound, which could extend further to the east.

Layer (3) was comprised of overlapping, horizontally-laid slates up to 0.45m long. Some disturbance and slumping within the cairn material was indicated by two of the deposits. Layer (21) appeared to be formed by cairn stones that had fallen off the northern side of the cairn and layer (7) (not shown on Fig 4) was comprised of a small patch of grey clayey material which appeared to be decayed slate. A thin sandy deposit (19) had also accumulated on the northern side of the mound.

A small number of finds were recovered from layer (3); these included several quartz pebbles and some human bone, including a toe bone from an adult and some fragments of bone from a juvenile and a child (Anderson, below).

The cist (structure 8) was 1.4m long by 1m wide and 0.7m deep, constructed of overlapping vertical slate slabs and a floor of slates laid flat. The structure had been set within layer (3) and it is likely that the cist and cairn were constructed at the same time (Figs 3 and 4; colour plate 1). It is uncertain whether the cist was ever sealed by covering slates or whether it was originally an open-topped structure which had been buried beneath mound material. Prior to the HES excavations in 2007 the cist's fill had been explored down to the top of the burial and then rapidly backfilled once the burial had been discovered. This backfilled layer (9) was found to contain bits of human bone and a child's tooth. A large number of small water-rounded pebbles were recorded, a significant proportion of which were of quartz. Sixteen flints, shells, and a further part of the calcareous nodule from the stone ring, structure 6, were also found, the latter demonstrating the problem with disturbance to most of the cist's fill. Further fragments of human bone were also recovered from the top of the cist fill, but again their original provenance is far from certain and given its loose sandy nature, much of it could have come from the primary sand mound.



Fig 5 Plan of the crouched inhumation burial (10) *in situ*

Beneath the redeposited cist fill, layer (9), a thin, 0.07m thick deposit of undisturbed greasy sand, layer (10) was revealed, which contained an *in situ* articulated human skeleton. This deposit comprised the main burial and took the form of a north-south aligned crouched inhumation (Figs 5 and 6). The body had been placed with its head at the northern end of the cist, facing westwards towards the sea. The skull rested upon a white rectangular quartz-rich stone, which had the appearance of a 'pillow'. The higher part of the body was fairly

well-preserved as it was covered by the sandy matrix of layer (10). However, the underside did not survive so well (Anderson, below) as it lay directly upon the slate slabs of the bottom of the cist and had been damaged by the acidity of the rock. The body did not appear to have been accompanied by any artefacts or 'grave goods', although, as with layer (9), a number of small water-rounded quartz pebbles were recovered from this deposit, which might have been purposefully placed into the cist, around the body. Several flints and marine shells



Fig 6 *The crouched inhumation burial 10 in situ*

were found. A radiocarbon date of 2985 ± 35 BP, 1320–1110 cal BC (90.2 per cent) (SUERC-16818) was obtained from human bone.

The cairn and sand mound was covered by a 0.28m thick layer (2), a dark, loose sandy loam. This layer was very disturbed by roots, animal burrowing and by more recent activity, including erosion by the footpath, which had created a large scar in the northern side of the mound, so it is uncertain how much of layer (2) was an *in situ* prehistoric deposit. A small number of pebbles, a flint core and a crab claw were recovered from the layer. Finally, a thin loamy sandy layer (1) / (23) developed over the site.

The barrow mound had also been disturbed by at least two pits excavated into it. Pit [11] (Fig 3) had been cut into the southern side of the barrow from the top of the section down through layer (3). The cut was rectangular in plan, measuring 0.6m by 0.9m and 0.25m deep. It was filled by layer (12), which contained redeposited cairn stones and an occasional piece of flint. A second rectangular pit, [16], measuring 1.2m by 0.6m and 1m deep was also located on the southern side of the site. It had clearly been cut through the stones of layer (3) which had been squared off, as well as layers, (4), (5) and the perimeter course of slates, 6. The pit was filled by [17], a loose, sandy deposit containing re-deposited stones, which were probably derived from layers (3) and feature 6. The pits are likely to be of relatively modern origin and may be

associated with antiquarian excavations known to have taken place on the island. Pit [11] could have held the cist that was excavated by Penrose Williams in the early years of the twentieth century (Taylor 2003, 25).

Beyond the northern edge of barrow 20, and separated from it by an erosion hollow, were layers (24), (25) and (26). Layer (24) was a root-filled sandy loam deposit, similar to topsoil layers (1) / (23) which covered the barrow. The remaining layers were both sandy deposits likely to have been produced by anthropogenic activity but they were only recorded in section and were not investigated.

To the east and merging into the eastern side of the barrow was the midden deposit. It was seen to contain banded layers of shell and investigation of an erosion scar led to the recovery of 40 flints. Like the barrow itself, it appears to contain a mixture of Mesolithic and Bronze Age flintwork, which suggests that it had accumulated gradually over a long time span. Unfortunately, as the midden was not excavated its relationship with the barrow is uncertain.

In summary, the excavation revealed that barrow 20 comprised four major components: a stone ring, a sandy core, a cairn capping and a central cist, which overlay an older occupation layer. These individual components are paralleled at other sites on the north Cornish coast. Sandy mounds and cists have been found at Harlyn Bay (Rose and Preston-Jones 1987; Jones *et al* 2011) and stone



Fig 7 Constantine Island from the east



Fig 8 The excavated section through barrow 20 from the west

kerbs and cairns are a feature of the barrows at Cataclews and Trelliga (Christie 1985). However, the barrow's setting within an area of a midden and the preservation of cultural material from older episodes of activity beneath it is highly significant; this will be discussed below. The discovery of a Middle Bronze Age inhumation burial is especially important because of the rarity of burials dating to this period in Cornwall and the generally poor survival of unburnt human bone. The absence of human bone from the Bronze Age funerary record is in part due to Cornwall's acidic soils, but probably also to a preference for cremating human remains in the Cornish Early Bronze Age (Jones 2005, chapter 3). The recovery of at least four individuals, one inhumed, and three disarticulated, including parts of two children, is therefore of great interest.

Flint

Anna Lawson-Jones

The excavation resulted in the collection of 197 pieces of worked flint and chert. The majority of this material was found in association with the cist and the surrounding mound. Flint was recovered from two fills within the cist itself, from the body of the primary sandy mound (4) and the basal mound deposit (5), and from the remains of a probable old land surface (13). A number of conjoining pieces came from the two mound contexts (4) and (5). Other flint came from a late, shallow pit cutting the mound, a remnant layer sealing the mound, probable mound slippage deposits, and from a mounded midden located a short distance to the east of the site.

The assemblage appears to date to the Late Mesolithic, Neolithic and Bronze Age periods but includes few modified or obviously utilised pieces and a minimal number of diagnostic tools. Consequently, quantification by period has not been attempted. Residual Mesolithic material, evidence of Early Neolithic activity beneath the mound and *in situ* Bronze Age deposits have all been identified within the immediate area of the site.

Raw material source and working

The flint assemblage, regardless of date, has been worked from locally derived pebble flint and chert.

An identical array of raw material can be found along the adjacent beaches. Only about 2 per cent of the assemblage consists of chert. This is likely to be a reflection of the natural ratio of flint to chert locally available rather than deliberate selection; selection would seem unlikely given the apparently spontaneous character of much of the material. Because of the presence throughout the assemblage of material with different degrees of patination it is not useful to comment on the quality or colour of the raw material.

Faulted, poor-quality material is evident within the assemblage, as are tested and abandoned pebbles and cores. However, this same pebble source material was quite capable of being finely-worked, as shown by items dating from the Mesolithic period. The large-scale use and abandonment of the pebble flint may be a reflection of the proximity of an abundant raw material source but it could also perhaps be given the context of the conjoining pieces, a deliberate display of conspicuous 'consumption' and abandonment of flint resources.

The largest pebble in the collection is only 72mm long. The majority of pieces, based on the complete and split pebble measurements, averaged approximately 40mm, and were restrictive in terms of the sizes and types of tools it was feasible to make. The relatively small size of the parent material, as found across many prehistoric Cornish sites, influenced the technology employed in core reduction. One response to the small size of pebbles was the use of an anvil, which left ricochet-like damage at the distal end of some of the flakes (Norman 1977, 4; Knight 1991).

Testing of pebbles either by the removal of an initial flake from the top prior to working, which numerically accounts for the majority of the assemblage, or by the splitting or halving of pebbles was seen in all contexts. None of the cores had been worked through to exhaustion and few were particularly diagnostic. Many were rapidly abandoned with only a minimal number of often large or chunky removals made.

The number of primary pieces (pieces with more than 50 per cent corticated surface) and near-primary pieces indicates on-site primary knapping. The assemblage is heavily flake dominated, with many having been removed by hard-hammer, leaving characteristically pronounced bulbs and often clearly defined rippling. But there are in addition other pieces which were removed and/or

subsequently worked by soft-hammer. This was most evident in the tertiary material, but there were also several notably thin, curved primary flakes, which had been so skilfully removed that they gave the impression that selected pebbles had been 'skinned'. These, like some of the better formed flakes and rejuvenation pieces are likely to predate the more bulky, sometimes hinged and often amorphously shaped, sometimes short, apparently later pieces, including some of the conjoining cores and related pieces

Results

Table 1 presents a summary of the results of analysis. Measurements refer only to the longest axis. Abbreviations within the table are as follows:

- P Primary (a piece with more than 50 per cent surviving pebble cortex)
- S Secondary (1–49 per cent surviving pebble cortex)
- T Tertiary (0–1 per cent surviving pebble cortex)
- C worked chert.

The vast majority of the flint is markedly patinated and this may have limited the macroscopic recognition and recording of slighter, ephemeral or less focused use-wear. Post-depositional damage appears to be minimal, if not non-existent. In contrast to the majority of the assemblage, two strikingly 'fresh', unpatinated, very sharp angular pieces were identified from within the mound slippage (below).

Note: reference to use-wear is made on the basis of macroscopic study.

Discussion

Worked pebble flint and chert were recorded from the majority of contexts within, on and near barrow 20. As a whole, the assemblage is of mixed date, containing evidence for residual, re-deposited and *in situ* deposits. Proximity to the shore and its reasonably abundant supply of flint has resulted in all aspects of flint working being present in the assemblage. These include the initial collection and testing of material, discard or selection, core preparation and on to reduction and finally the production of either usable pieces with little need of modification or of specifically worked tools, or – in the case of some of the earlier material

– components of these. The general impression is that economy of raw material use was not a primary concern.

Numerically this assemblage shows a distinct bias towards the generation of large flakes and knapping waste, with little clear evidence for actual flint use in the form of retouch or heavy, focused wear. Approximately 70 per cent of the assemblage consists of waste flakes, the majority of which are primary. Many, but not all of the associated cores are angular, with little coherent platform use. The preparatory flake removals are often thick, chunky and occasionally hinged. Much of the remaining material consists of tried or tested and abandoned pebbles, split pebbles and secondary flakes. The vast majority of these show no sign of use, even if they could have been held comfortably in the hand, which for many would not have been feasible. Within this material is a smaller, less chunky and differently worked assemblage, largely associated with an earlier, blade and bladelet-based technology. No evidence for hafting-related notching, abrasion or other modification was noted. Very little of the material is retouched, even in terms of backing to facilitate handling, as only seven pieces in total displayed any retouch, while only 18 pieces showed any macroscopic evidence for use and much of this was fairly minimal.

There is no evidence for post-depositional damage or abrasion through exposure and general 'wear-and-tear', or for the re-use of material despite the apparent long-term occupation and significance of this location. In excess of 90 per cent of the assemblage is patinated. This patination is variable, and ranges from a dense, white chalky surfacing recorded on much, but not all of the Mesolithic material (exceptions include the microlith) to a notable all-over discolouration or clouding of a generally greyish hue that was found on much of the assemblage. The exceptions were two strikingly fresh looking pieces, one of which is a probable Middle Bronze Age denticulated scraper.

Mesolithic and transitional Neolithic

Residual Mesolithic material is present within the assemblage, including finds from the mounded barrow contexts (4) and (5), barrow slippage material, and the nearby midden mound to the east. Sealed beneath this later activity is layer (13), the old land surface. More than half of the flint

found in layer (13) is clearly Mesolithic in date, and none is diagnostically later. Interestingly, this context also produced a probable Early Neolithic pottery sherd, suggesting a transitional Mesolithic-Neolithic date for this layer.

Mesolithic sites have been found around much of the south west coast (for example, Jacobi 1979; Berridge and Roberts 1986). North Cornish coastal sites near Constantine Island include scatters located immediately to the east (Johnson and David 1982) and at Penhale Point (Perranzabuloe) some 19 km to the south west (Smith 1988). Other inland and coastal Mesolithic sites and scatters have come to light more recently. Recent research on Trevelgue Head (Newquay), to the south west of Constantine, has shown a clear Mesolithic presence (Lawson-Jones 2011) and new sites are still being found around Gwithian, supplementing those discovered by Charles Thomas over the last 50 years (Nowakowski *et al* 2007). Large, focused Mesolithic scatters have also recently been found along the North Land's End pipeline in West Penwith (Lawson-Jones, forthcoming). In the light of these recent developments, the discovery of an underlying Mesolithic presence on Constantine Island is not surprising. This was suggested by Norman (1977, 3–9) for a larger collection of lithic material from Constantine Island and this element is also present in Mr Deyman Eastmond's collection (below).

Many of the most diagnostic pieces within the assemblage belong to the later Mesolithic period. These include a microlith, a microburin, and a small number of narrow, often short, parallel-sided and / or triangular-sectioned pieces. A lot of these are distinctively chalky in appearance, although there are exceptions. Some were deliberately snapped, a technique often found in conjunction with notching in Mesolithic microlithic manufacture. Some of these forms, and the techniques involved in their production, continued to be used during the transitional Late Mesolithic-Early Neolithic period and would not be out of place in conjunction with the Early Neolithic sherd of pottery recovered from the old land surface, (13).

No classically diagnostic Mesolithic cores were recorded, although there are a limited number of single and opposed platform cores with reasonably controlled blade and / or flake removals. These could well belong to the transitional and earlier Neolithic period, as could the occasional larger flaked pieces with patinated, thin, dorsal blade and

flakelet scarring. A broad, rounded, well-formed flake of this sort with a small patch of edge-wear, and tentatively termed a knife flake was located within disturbed material deposited in the cist (9), and is considered likely to be of Neolithic date.

Associated with the preparation and use of cores are primary flakes, and within the 75 primary flakes in this assemblage are a small number of very thin, patinated pieces, for example in (4), which neatly hug the outer profile of the decorticated pebbles. These have been skilfully removed with the use of a soft hammer, and may reflect raw material of a particularly good or sought after quality, the value of which is reflected in the care with which the pebble was 'peeled' prior to no-doubt careful reduction. The careful reduction of other pebble cores, as reflected by occasional core rejuvenation pieces and other well-formed flakes, attests to an ongoing Neolithic presence, although they are not sufficiently frequent or diagnostic to suggest a prolonged Neolithic focus of activity in the immediate area.

Bronze Age

Much of the material identified as being of Bronze Age character, like the Neolithic material referred to above, is not classically diagnostic. General characteristics include the presence of a range of often large, occasionally broad flaked material of variable quality and occasional multi-platform flake cores, some showing very few removals (Figs 9 and 10). Crudely worked pebble cores, particularly those of potentially Early Bronze Age date, are notoriously hard to date and categorise, particularly where the number of removals is limited (for example, Healy 1993, 33). In conjunction with a number of conjoining abandoned and partially reduced cores within mound deposits (4) and (5), this range of pieces would suggest that a good proportion of the mound's assemblage is Bronze Age. However, since little is demonstrably fully Bronze Age, there is the potential for a Late Neolithic cross-over. A similar reticence in categorically dating some of the flint from Constantine Island can be seen in the study of a larger assemblage from the island (Norman 1977).

Regardless of date, the exaggerated creation of waste pieces appears aberrant and, as such, is likely to be significant. A similar case was suggested by Brown (1991, 104) for a refitted core found within a Late Neolithic ring ditch, which had probably been reduced without the intention of it ever being

Table 1 Constantine Island flint assemblage

| Context | No | Form/Tool | Max. length | P, S, T, (C) | Retouch | Use-wear | Comment |
|----------------------------------|----|-------------------------|-------------|------------------|---------|----------|---|
| Unstratified (4 pieces in total) | 1 | Waste flake | 35mm | S | — | — | Good flake – no obvious use. |
| | 2 | Waste flakes | 27–29mm | T | — | — | — |
| | 1 | Blade-like waste | 25mm | T | — | — | Mesolithic /Early Neolithic? Rejuvenation piece from a blade core. |
| (2) | 1 | Split pebble | 37mm | P (C) | — | — | — |
| (4) | | | | | | | |
| (72 pieces in total) | 2 | Untried pebbles | 35–57mm | — | — | — | Unused pebbles. |
| | 2 | Tried pebble waste | 60–72mm | — | — | — | Tested and discarded pebbles. |
| | 1 | Split pebble | 38mm | — | — | — | — |
| | 25 | Waste flakes | 13–43mm | P | — | — | Variable patination, some snapped. Occasional thin, curved, soft-hammered removals. |
| | 9 | Waste flakes | 16–31mm | S | — | — | Variable patination, some snapped. |
| | 3 | Waste flakes | 27–38mm | S | — | — | Core rejuvenation waste flakes. |
| | 3 | Waste flakes | 16–21mm | T | — | — | Small, tool manufacture / debitage. |
| | 1 | Bladelet | 33mm | T | — | ? | Mesolithic. Possible slight lateral use-wear. |
| | 1 | Microlith | 21mm | T | — | — | Mesolithic. Unmodified, pointed rod-like form. |
| | 1 | Flake | 33mm | S | — | ? | Probable rejuvenation flake from a blade / bladelet core, with possible lateral use-wear. |
| | 1 | Waste chip | 13mm | T | — | — | Tool manufacture / debitage. |
| | 1 | Flake core | 50mm | P (C) | — | — | Single-platformed long flake chert core. |
| | 1 | Waste hinged flake | 32mm | T (C) | — | — | Hinged. |
| | 1 | Waste flake | 33mm | P (C) | — | — | — |
| | 1 | Flake core | 35mm | P | — | — | Multi-platformed flake core. |
| | 1 | Flake core | 40mm | P | — | — | Single platformed, long flake / blade core. |
| | 1 | Tried pebble | 45mm | P | — | — | Tested and discarded pebble. |
| | 1 | Core tool | 42mm | S | — | Yes | Poor, multi-platformed flake / blade core with crushing / use-wear on short working edge. |
| | 1 | Core tool | 50mm | P | ? | Yes | Possible core with rough removals on slightly nosed and denticulated edge, with chopping (?) use-wear. |
| | 1 | Scraper | 34mm | P | Yes | ? | Half-moon shaped, 180° convex worked edge, with fairly regular, chunky 45° retouch. |
| | 1 | Core tool | 38mm | P/S | ? | Yes | Chunky flake core, possible retouch / modification. Crushing on short, convex working edge. |
| | 2 | Conjoining flake | 38mm | S | — | — | Bronze Age. Broken (or snapped) flake. |
| | 3 | Conjoining (tried) core | 50mm | P | — | — | Bronze Age. Near complete (tested and abandoned) pebble core (Fig 9, bottom). |
| | 4 | Conjoining (tried) core | 40mm | P | — | — | Bronze Age. Near complete (tested and abandoned) pebble core. |
| | 4 | Conjoining core | 41mm | P | — | — | Bronze Age. Partially complete pebble core. One side missing and a good flake removed, possibly for use (Fig 9, top). |
| (5) | 1 | Natural chip | 6mm | P | — | Glossy | Natural. |
| (35 pieces in total) | 12 | Waste flakes | 14–45mm | P | — | — | Variable patination. |
| | 2 | Waste flakes | 19–24mm | T | — | — | Thin pieces. |
| | 1 | Waste flake | 25mm | S | — | — | Thin piece. |
| | 1 | Waste blade | 23mm | T | — | — | Mesolithic. Thin, with dorsal bladelet scars. |
| | 1 | Blade | 20mm | T | — | — | Mesolithic. Small, triangular-section blade. |
| | 1 | Waste blade | 23mm | S | — | — | Thin blade-like piece |
| | 4 | Waste pieces | 12–27mm | S (x 2), T (x 2) | — | — | Tool manufacture / debitage |
| | 1 | Knife flake | 40mm | S | — | Yes | Unmodified flake with lateral use-wear running along slightly convex, lightly patinated edge. |
| | 1 | ? Knife flake | 36mm | S | — | ? | Possibly utilised edge of flake. |
| | 1 | Denticulated piece | 34mm | T | Yes | Yes | Modified for manual hold, with retouched (semi-notched), denticulated working edge. |
| | 2 | Conjoining flake | 50mm | P | — | — | Bronze Age. Large unused primary flake and much smaller adjoining one (Fig 10 bottom). |
| | 2 | Conjoining (tried) core | 38mm | P | — | — | Bronze Age. Two thick, primary joining flakes (Fig 10, top). |
| | 1 | Waste flake | 15mm | S | — | — | Broken. |
| | 1 | Tried pebble | 58mm | P | — | — | Tested and discarded. |
| | 1 | Snapped flake | 26mm | T | — | ? | Snapped or broken long flake. Small area of damage looks slightly as though it was hafted. |
| | 1 | Hinged waste flake | 38mm | S | — | — | Broad, short, hinged; possibly Bronze Age. |
| | 1 | Waste flake | 25mm | S | — | — | — |

EXCAVATION OF A BARROW ON CONSTANTINE ISLAND, ST MERRYN, CORNWALL

| Context | No | Form/Tool | Max. length | P, S, T, (C) | Retouch | Use-wear | Comment |
|--------------------------------------|------------|--------------------------|-------------|--------------|---------|----------|---|
| (9) (16 pieces in total) | 1 | Waste flake | 24mm | P | — | — | Thick, rounded split pebble with steep, broad flaked removals around edge with a hard sandy concretion adhering to what would have been the working edge only; possible effect of residue? |
| | 1 | ? Scraper | 34mm | P | Yes | ? | |
| | 1 | Split pebble | 25mm | P | — | — | |
| | 1 | Flake core | 32mm | P | — | — | |
| | 3 | Waste flakes | 21–26mm | P | — | — | |
| | 1 | Waste flake | 30mm | P/S | — | — | |
| | 5 | Waste flakes | 29–65mm | P | — | — | |
| | 1 | Tried pebble/core | 47mm | P | — | — | |
| (10) (3 pieces in total) | 1 | ? Core tool | 32mm | P/S | — | ? | Pebble with 3–4 removals prior to abandonment. Fits comfortably in the hand and appears to have wear / damage along edge. |
| | 1 | ? Knife flake | 38mm | S/T | — | ? | Early Neolithic? Broad, slender, rounded flake with bifacial, soft-hammered flake / blade removals. Possible edge wear. Some backing removals. |
| | 1 | Core | 45mm | P | — | — | Opposed platform, long flake core. |
| | 1 | Waste chip | 10mm | T | — | — | — |
| | 1 | Flake | 45mm | P | — | — | Distinctive mottling, like the piece in context (9). |
| (12) (4 pieces in total) | 1 | Waste piece | 24mm | T | — | — | Sharp, angular, patinated. |
| | 1 | Tried pebble | 44mm | P | — | — | Some small concreted patches on surface. |
| | 1 | Waste flake | 13mm | T | — | — | Thin and broken. |
| | 1 | Waste flake | 25mm | P | — | — | Some small concreted patches on surface. |
| (13) (9 pieces in total) | 1 | Waste flake | 33mm | P | — | — | Tried pebble with slight crushing; possible light use as a small hand-held chopper? |
| | 1 | Tried pebble / ? chopper | 48mm | P | — | ? | |
| | 1 | Blade core | 39mm | S | — | — | |
| | 1 | ? Denticulated scraper | 42mm | P | — | Yes | Mesolithic. Opposed platform blade core. |
| | 1 | Microburin | 15mm | T | — | — | Bronze Age. |
| | 1 | Waste flake | 26mm | S | — | — | Mesolithic. Probable microburin. Chalky-white patination. |
| | 1 | Waste flake | 12mm | T | — | — | — |
| | 1 | Bladelet | 18mm | T | — | — | (?) Mesolithic. Chalky-white patination |
| | 1 | Waste piece | 26mm | T | — | — | Mesolithic. Broken, triangular-section blade-like piece with chalky-white patination. |
| | 1 | Waste flake | 26mm | T | — | — | Mesolithic. Triangular-section snapped piece, with chalky-white patination. |
| Unstratified, from Slipped material | 1 | Untried pebble | 17mm | P | — | — | Natural. |
| | 5 | Waste flakes | 27–35mm | P | — | — | Waste material of variable thickness; occasional snapped material. |
| barrow/mound (14 pieces in total) | 4 | Waste pieces | 10–26mm | S | — | — | Some debitage. |
| | 1 | Waste flake | 15mm | T | — | — | Thin and broken. |
| | 1 | Burnt knife (?) blade | 46mm | P (?) | Yes | ? | Bronze Age? Complete, burnt, thick straight-edged blade with platform alteration. |
| | 1 | Waste | 23mm | T | — | — | Bronze Age? Notably fresh-looking, sharp, narrow, angular debitage piece. |
| | 1 | Waste (?) | 39mm | P | — | ? | Bronze Age. Notably fresh-looking. Long, narrow, slightly twisted. Not modified. Possible / minimal distal wear. Piercer use? |
| Unstratified. Midden east of | 3 | Split pebbles | 30–37mm | P | — | — | Variably shaped, sized, patinated, coloured pieces. Some snapped. Some of this is likely to be Bronze Age. |
| | 20 | Waste flakes | 14–34mm | P | — | — | |
| barrow mound (39 pieces in total) | 5 | Waste flakes | 13–31mm | S | — | — | Variably shaped, sized, patinated, coloured pieces. Some snapped. Some of this is likely to be Bronze Age. |
| | 9 | Waste flakes | 10–20mm | T | — | — | Variable, and includes some clear tool manufacturing waste / debitage. |
| | 1 | Flake core | 30mm | S | — | — | Opposed platform flake core. Banded colouration. Potentially Neolithic. |
| | 1 | Misc tool | 44mm | T | ? | Yes | Mesolithic. Narrow, but with variable width and thickness with opposed platform removals visible. Possibly a rejuvenation piece. Its use, perhaps as a ? piercer or awl, has resulted in an indented, notched area. |
| Total | 197 pieces | | | | | | |

used for the production of tools. Its inclusion was interpreted as evidence for structured deposition and the 'all-round symbolic importance of flint working over a prolonged period of time' (*ibid*, 131). It is suggested here that similar activity was taking place at Constantine Island.

The presence of conjoining material within mound layers (4) and (5) confirms the presence of contemporary, undisturbed, *in situ* deposits. Their surprisingly abundant presence appears to suggest that they were deliberately included within both of the primary mound contexts. Interestingly, no pieces were found to join *between* these contexts, nor did other Bronze Age contexts produce conjoining material. Their marked presence implies that specific knapping episodes took place during the deposition of each deposit, and that some structuring of the content of the two different mound deposits

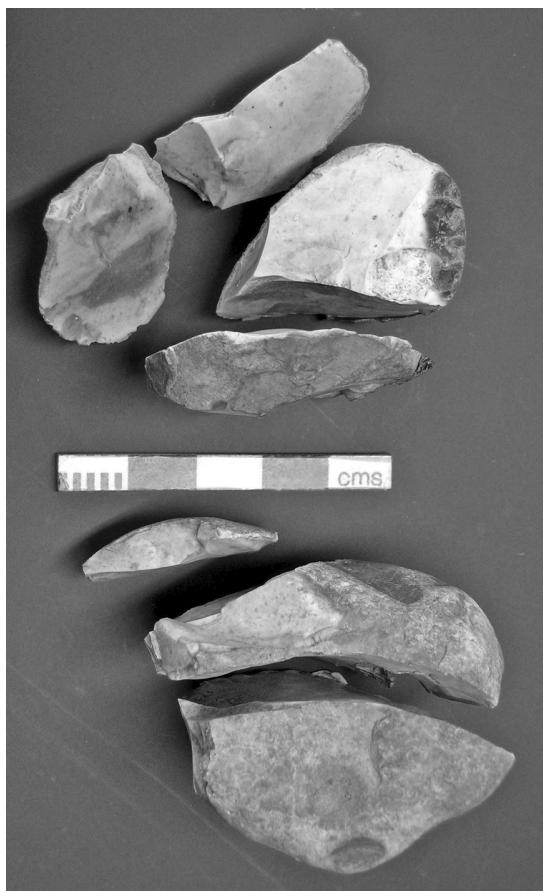


Fig 9 Tried and abandoned refitting flint cores from layer (4)

was taking place. The only difference between these contexts in terms of the flintwork is that upper context (4) contained proportionately more primary material than basal mound deposit (5).

It is possible that these pieces were purposely produced and deliberately deposited. Considerably more conjoining material undoubtedly exists within the remaining unexcavated mound, and perhaps within the present assemblage. Although much of the material in the assemblage as a whole – and perhaps more specifically from the mound itself – does initially appear unskilled and wasteful, it should probably be seen alternatively as considered and purposefully extravagant.

No obviously 'special' pieces were included within the 19 pieces of flint recovered from within the cist itself in contexts (9) and (10). The cist would appear to have contained a significant number of flints, but up to 16 of these may have been introduced into it when it was partially uncovered and backfilled in August 2007 before archaeological excavation. Some pieces within the cist had a hard, sandy concretion adhering to them, which may mark the former presence of use-related residues, particularly since the most pronounced concretion was noted on the working edge of a scraper, itself one of the few pieces found within the cist to have been modified. This suggestion (although not made on the basis of specific residue analysis) would not seem beyond the realms of possibility, particularly in the light of recent research identifying, for example, meat / blood



Fig 10 Tried and abandoned refitting flints from context (5)

residues and hafting mastics on lithics (Pawlik 2004).

The only other pieces noted during analysis to have had an adhering concretion came from pit [11], fill (12). Here the concretion is small and patchy. Given the late date of this feature, the origin of this material and the concretion is uncertain.

In addition to the artefacts potentially intentionally included in the mound, as discussed above, a single, relatively large, heavily burnt probable knife blade was recovered from the barrow slippage material. This has been damaged by heat, but may represent a Bronze Age piece. If so, it is the only piece to show any concerted working, platform alteration, and so on.

Note

An additional collection of worked flint recovered from the island between 1952 and 2008 by Mr Deyman Eastmond was examined. This consisted of 740 pieces, the vast majority of which came from the midden exposure located to the south east of the excavation (approximately SX 8572 7512). Most of this was Mesolithic in date, although there were later elements. A further 13 pieces from elsewhere on Constantine Island and Trevose Head were larger, often worked and almost without exception diagnostically later (Middle-Late Neolithic to Early-Middle Bronze Age in date). The range of tools included knives and well-worked points. Neither collection contained material readily comparable with the larger flakes, particularly the conjoining flakes and cores, found during the 2007 excavations.

Pottery

Henrietta Quinnell

A single soft well-made body sherd at least 7mm thick and weighing 4g was found in context (13) beneath the mound. The surviving inner surface was burnished and reduced dark reddish-grey 5YR 4/3; the core was reduced grey 5YR 6/1 but the external surface had been completely eroded away. The sherd had obviously been exposed on the surface for some period.

Roger Taylor comments after binocular microscopic examination that it contains sparse inclusions: *quartz* – vein-quartz, transparent colourless and white to brown translucent angular

grains, 0.2–4.5mm; *mica* – biotite and muscovite rare cleavage flakes up to 0.2mm; *limonite* – sparse, soft, dark brown rounded grains, 0.3–0.5mm. *Comment*: a vein-quartz tempered ware with traces of mica indicating a clay source with input from a granite area.

The general well-made appearance of the fabric and its inner surface burnish, together with the inclusions of crushed vein quartz, suggest a Neolithic date. The granite area source from which it comes could be either Bodmin Moor or the St Austell granite, 25 and 20 km distant respectively. The fabric is broadly similar, although not identical, to Early Neolithic fabric 2 from Tregarrick Farm sourced from the edge of the St Austell granite (Quinnell and Taylor 2002–3, 114). Fabrics including crushed vein quartz are frequent in the Cornish Early Neolithic (*ibid*, 119), although they have now been recognised in a Late Neolithic Grooved Ware assemblage at Tremough, Penryn (Quinnell 2007, 52). The well-made appearance and burnished surface of the sherd are more comparable to Early Neolithic than to Grooved Ware material (although the attribution cannot be certain), and would be appropriate for the Early Neolithic lithics from the same context. No other Neolithic sherd has been identified from this area: the nearest find-spot is some 12 km to the south at Trevelgue Head (Nowakowski and Quinnell, forthcoming).

Stonework

Roger Taylor

A piece of slate from stone ring 6, suggested as a possible slate knife, and fragments of calcareous nodules from 6 and (9) with horizontal and rough circular lines were subject to binocular microscopic examination. There was no indication of any anthropogenic working or use-wear. The nodules are probably derived from the Middle–Upper Devonian slate bedrock of the site which contains calcareous bands and beds in places.

Mollusc analysis

Tom Walker

A sequence of samples for mollusc analysis was taken from the buried land surface and the

overlapping layers of the sand mound. Samples were obtained from the sand layers comprising contexts (27), (4) and (5), lying above the old land surface (13) and below the stones of the cairn, (3). The base of the profile was the old ground surface which was overlain by coarse sand lacking in shells (layer (5)); the sand at higher levels (layers (4) and (27)) was medium to coarse and contained the shells analysed here. The uppermost 30mm was browner in colour. A column approximately 0.3m wide was taken, with sample thickness varying from 20–50mm. A total of 1500g of sand from each sample was processed using standard procedures (Evans 1972), and the shells identified with the aid of standard textbooks (Kerney and Cameron 1979) and reference collections. Nomenclature follows that of Anderson (2005).

A total of 547 non-marine shells was obtained from seven taxa. Mollusc diagrams (Figs 11 and 12) show the absolute and relative numbers of shells found in each layer. Ninety seven per cent of the shells were in the upper half of the sand, with virtually no shells in the lower half. It was thought that this might be due to decalcification of the sands. However, pH measurements showed that the pH at every level was between 8.7 and 9.3; thus, although earlier decalcification could have led to the loss of shells before the pH was later raised by subsequent sand deposition, current acidity does not account for the lack of shells. The few shells present in the upper part of context (5) can be accounted for by earthworm action. Insufficient shells are present in the lower levels of this context to permit any environmental or dating analysis.

The vast majority (84 per cent) of non-marine molluscs are those which favour open ground with *Pupilla muscorum* and *Vallonia excentrica* being strongly predominant. The remaining shells are catholic in nature, there being none usually associated with purely shady conditions. A single specimen of the wetland species *Oxyloma elegans* is anomalous and may have been windblown or carried on the feet of animals from a local marshy area. The mollusc diagrams demonstrate that *Vallonia* increases at the expense of *Pupilla* in the upper samples of context (4). Although both characterise open grassland the shift from *Pupilla* to *Vallonia* is consistent with change from a more unstable surface to a more stable non-arable grassland (Evans 1971), which may indicate more intensive grazing. There is no difference in the mollusc composition in the buried soil of the

uppermost 30mm of the sand (27).

The absence of *Cochicella acuta* and *Helicella itala* is relevant. These xerophile shells are frequently found on Cornish sand dune sites, but may only be present from the Iron Age onwards (Evans 1979); they were absent at Perranporth and in lower levels at Newquay (Spencer 1974), suggesting a pre-Iron Age date for those sand accumulations. *Ponentina subvirescens* has rarely been reported from Cornish archaeological sites, but at Trebetherick Point (4 miles east of Constantine Island) it was found in Bronze Age or earlier levels (Davis 1956). The deposition of the upper sand levels in the Constantine barrow are therefore consistent with the Late Neolithic or Bronze Age.

The sands are unlikely to be of wind-blown beach origin. The grains are coarse, 83 per cent being over 0.5 mm in size, and 61 per cent over 1 mm (the corresponding figures for current beach sand at Constantine are 61 per cent over 0.5 mm and 22 per cent over 1 mm) There were many minute (<1 mm.) apical fragments of marine gastropods, but these all appear of a much older date than the non-marine shells, being considerably more worn and often heavily encrusted. It is possible that the basal sands are derived from the Pleistocene raised beach deposits which are known in the low cliffs immediately adjacent to the island (Selwood *et al* 1998).

Bulk sampling of the barrow included 32 intact *Patella vulgaris* in the upper sand layer (4), with another six among the stones of the Bronze Age cairn; they may be food residue. Twenty six intact *Cepaea hortensis* were also found in sand layer (4).

Conclusion

Samples for mollusc analysis were obtained from the sand layers between the Mesolithic old ground surface and the stones forming the Bronze Age cist. *Pupilla muscorum* and *Vallonia excentrica* are strongly predominant in the upper half of the sand, indicating an open landscape; *Vallonia* only tends to achieve the proportions present here in grazed grassland, indicating an improved environment prior to cairn construction. Very few shells were present in the lower half of the sand, and none just above the old land surface. The marine gastropods consist entirely of minute fragments of an older date than the land shells, suggesting that the sands are not blown beach sand; the large size of the sand

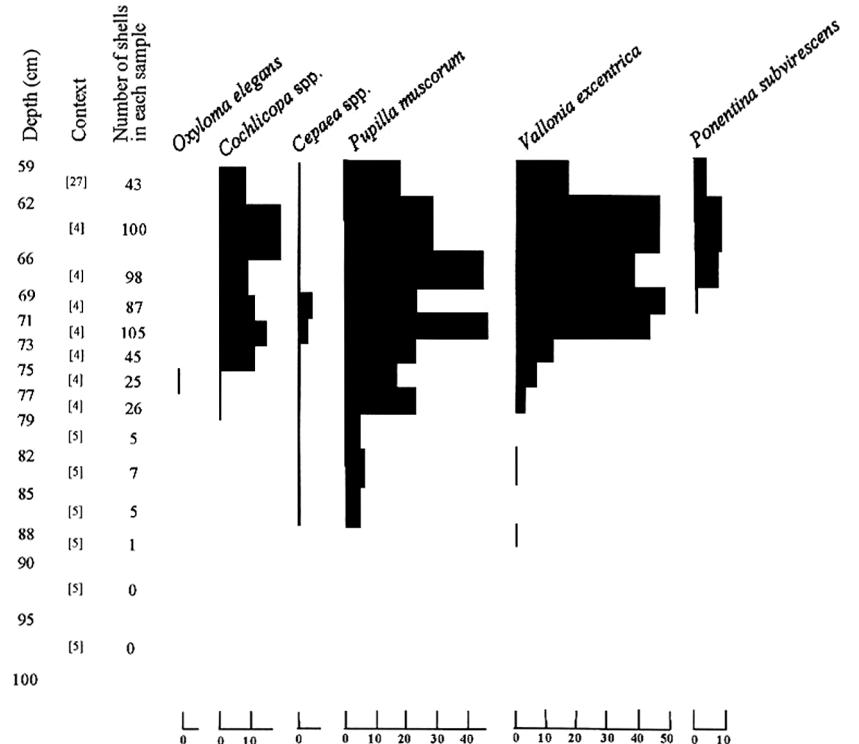


Fig 11 Mollusc sampling: absolute numbers of shells

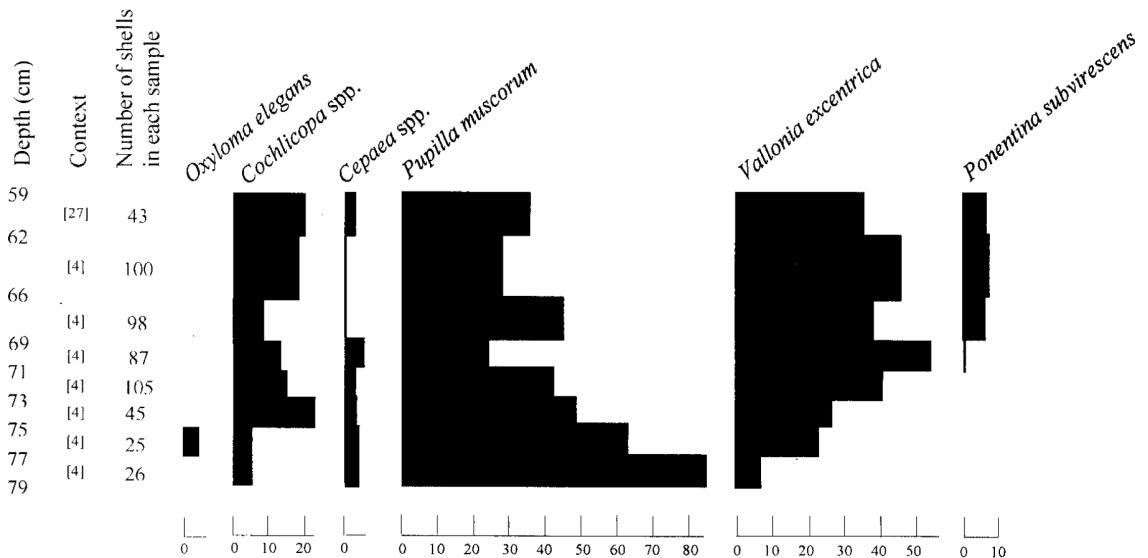


Fig 12 Mollusc sampling: relative numbers of shells. Context (5) is not included due to the inadequate number of shells present

grains supports this. The sand layer may originate from a Pleistocene raised beach.

The absence of some shells frequently found in ancient sand dunes, particularly *Cochlicella acuta* and *Helicella itala* is of interest. Their lack, and the presence of *Ponentina subvirescens* in the highest levels, supports dating of the upper sand layers to the Late Neolithic or Bronze Age. Mollusc analysis does not contribute to dating the lower sands.

Bulk samples included several intact limpets, *Patella vulgata*, in the upper sand layers, probably food residue.

Human remains

Sue Anderson

A human skeleton was excavated from a cist grave of Bronze Age date. Disarticulated remains were also recovered.

Measurements were taken using the methods described by Brothwell (1981), together with a few from Bass (1971) and Krogman (1978). Sexing and ageing techniques follow Brothwell (1981) and the Workshop of European Anthropologists (WEA 1980). Stature was estimated according to the regression formulae of Trotter and Gleser (Trotter 1970). All systematically scored non-metric traits are listed in Brothwell (1981), and grades of osteoarthritis can also be found there.

Full details of observations and measurements are included in the site archive.

The *in situ* burial

The main inhumation was in fair condition, but heavily fragmented and most bones showed some degree of surface erosion, particularly on the right side. Most areas of the skeleton were represented by one or more fragments, although the lower right arm appeared to be missing. The remains consisted of fragments of cranial vault and face, upper cervical, some upper, mid and lower thoracic and all but one lumbar vertebrae, fragments of ribs, both clavicles, the right scapula, both humeri, fragments of the lower left arm and hand, the pelvis, both legs and some bones of the feet.

The bones were medium in size but robust with pronounced muscle markings, and the sciatic notch of the pelvis was narrow. All epiphyses were fused and there were some signs of degeneration,

although the teeth were only moderately worn. The burial was probably that of a male in middle age.

No long bone lengths could be measured, so it was not possible to estimate living stature. Non-metric traits were recorded where possible, those present being retention of the metopic suture, an abundance of wormian bones in the lambdoid suture, and third trochanter of the left femur. A small acetabular crease was also present on the left side. Retention of the metopic suture occurs in about 5–8 per cent of populations and is useful for identifying family relationships if other individuals in a group have it, but unfortunately this was an isolated burial. The presence of a large number of wormian bones in the cranial sutures is sometimes the result of a developmental illness, but is more commonly an inherited trait which may be influenced by environmental factors.

Part of the dentition was present. The teeth were relatively small for a male. Tooth wear was not particularly heavy but there was some polishing of the front of the lower anterior teeth, suggesting a slight overbite. There was a deposit of calculus (tartar) on the rear of some lower anterior teeth and alveolar re-sorption was advanced. The upper left second molar had been lost in life and there appeared to be an abscess below the root of the first, which had penetrated the maxillary sinus. Pitting on the floor of the sinus indicated that there had been some infection as a result.

Some degenerative changes were observed, most notably the presence of osteophytosis on the bodies of the lower thoracic and fifth lumbar vertebrae, particularly the L5. Schmorl's nodes, a lesion associated with stress on the spine, were present in the same regions. Osteoarthritic changes (Grade II) were noted on the left zygapophyseal joints of the second to third cervical vertebrae of the neck. Other changes which were likely to be either degenerative or traumatic in origin consisted of lipping of the left sacro-iliac joint (innominate only assessable) and new bone growth at the gluteal tuberosity of the left femur.

Some lesions associated with physical stress or trauma were present. A small exostosis was present within the greater trochanter of the left femur, at the attachment of the *obturator externus* muscle. This muscle rotates the thigh laterally and a tear in this position could indicate a groin strain. A possible fracture of one proximal toe phalanx was observed; the bone appeared slightly mal-aligned to the lateral side but the end was incomplete. A

mid left rib was also fractured but had healed well with little callus or deformity.

Additional remains

Amongst the disarticulated remains recovered from the fill of the cist and the layers overlying and beneath it, it was possible to identify the bones of at least four other individuals: a small child, a juvenile (approximately 8–9 years?) and two adults. Bones from (3) included a fragment of unfused epiphysis (humerus/femur head) of a juvenile, as well as two metacarpals and a metatarsal with unfused proximal ends, and a left upper rib of a smaller child. An adult toe bone was also recovered from this layer. Within the disturbed redeposited cist fill (9), most of the disarticulated bones probably belonged to the main inhumation, but material which was certainly additional consisted of adult cranial vault fragments, an extra right first metatarsal, possible juvenile radius shaft fragments, and a deciduous upper left canine and permanent upper right first incisor of a child aged about 8–9 years. From (5) a cremated fragment of right mandible (with intact socket for the ?third molar) probably represented another adult. Other bone fragments identified as ‘possibly cremated’ from the top of the cist may be bleached through exposure, although it is possible that some or all were burnt.

Summary and discussion

The *in situ* burial was that of a mature male, but there were fragmentary remains of at least four other people in the soils of the mound, including two children. The position of the bones within the grave appears to indicate a degree of post-mortem disturbance or collapse of the body, as the skull was lying too far away from the pelvis. This may simply be due to burial within a cist, with the potential for movement within the void before the chamber collapsed and was filled with soil.

There was evidence for some dental and bony pathology in the main skeleton, which indicated that he probably suffered from some pain in his

jaw, neck and lower back. He also had a fractured rib which may have been caused by a fall or a deliberate blow to his side, but it healed well and probably would not have caused too much discomfort after this. Well-developed muscle markings and the strain showing in the bones of his back indicate that his lifestyle was not sedentary, and it is likely that he was involved in some form of manual labour. He may have had a fracture of one toe at some point, and a pulled muscle in his groin. Taken together, this indicates an active life with some potential for injury.

Little can be said about the other individuals identified in the group as they are represented by so few fragments. Whether they were redeposited from earlier burials or deliberately included in the mound as ritual offerings is a matter for speculation.

Radiocarbon dating

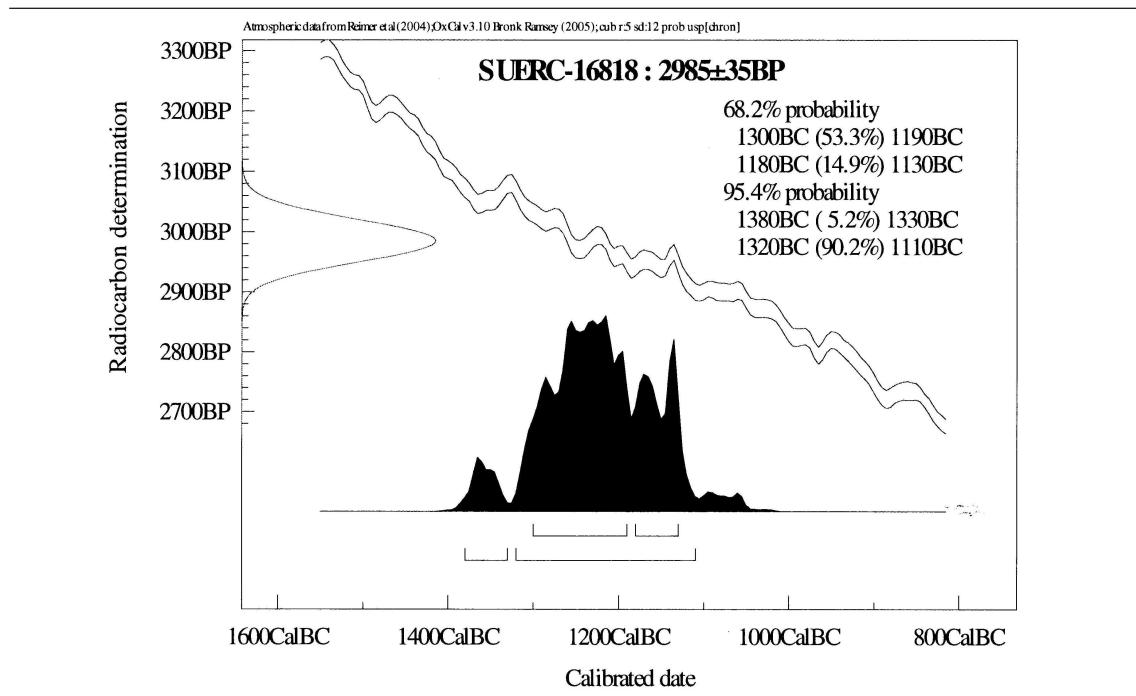
One sample was submitted for accelerator mass spectrometry dating (AMS) at the Scottish Universities Environmental Research Centre SUERC (Table 2). The date was obtained on human bone from the crouched inhumation within cist 8. The sample was taken from the femur. The probability distribution (Tables 2 and 3) has been calculated using OxCal (v3.10).

The results

The radiocarbon determination 2985 ± 35 BP, 1320–1110 cal BC (90.2 per cent) (SUERC-16818), with the weight of probability at 53.3 per cent falling between 1300 and 1130 cal BC (Tables 2 and 3) is much later than radiocarbon determinations which have been obtained from a large number of other cairns and round barrows that have been dated in Cornwall and Devon (Jones 2005, chapter 3; Quinnell 1988). These tend to fall between 2000 and 1500 cal BC. Indeed, with the exception of a very small number of settlement sites that have produced human remains dating to the Middle Bronze, there are very few comparanda for the date of the Constantine Island inhumation burial (below).

Table 2 Constantine Island radiocarbon dating

| Material | Context | Lab. no | Age BP | Delta 13 | Calendrical years 68% | Calendrical years 95% |
|--------------------|---------|---------|---------------|----------|--|---|
| Human bone (femur) | (10) | | 2985 ± 35 | -20.4 % | 1300–1190 cal BC (53.3%) 1180–1130 cal BC (14.9%) | 1380–1330 cal BC (5.2%) 1320–1110 cal BC (90.2%) |

Table 3 Constantine Island radiocarbon determination

Discussion

Despite the small scale of the excavation, the barrow on Constantine Island was demonstrated to be a surprisingly complex structure on a site which appears have been the focus for human activity over a considerable period of time. The barrow was a two-phase structure, initially made up of a sandy mound and followed by the construction of the cairn and cist upon the older site. It is uncertain how much time elapsed between these two events although it seems likely that it was long enough for a soil to have become established over the sand mound and colonised by molluscs.

The primary sand mound was itself constructed over a much older culturally produced surface and was located within a densely occupied area, which may have contained a variety of contrasting mounds. Some of these of these were middens, generated by the activities of the living, while others were for the disposal of the dead.

The remainder of this discussion focuses on the material practices which led to the formation of the barrow, as well as providing a wider interpretation for activity on the island during the second millennium cal BC.

Before the barrow

Pre-barrow activity is indicated by artefactual evidence from beneath the mound, from later contexts within the barrow and unstratified contexts beyond the mound. The principal evidence is in the form of a handful of diagnostic flints dating to the Mesolithic period recovered during the 2007 excavation (Lawson-Jones, above) and other examples recovered during earlier fieldwork on the island which could also date to this period (Norman 1977). Most of the diagnostic pieces appear to date from the latter part of the Mesolithic period, c 4500–4000 cal BC. These were mostly concentrated in layer (13), which predated the barrow. In fact a large number of flint scatters dating to this period have been found in the wider area, with substantial collections of flint being collected from Trevoe Head (David and Johnson 1982) and more widely from along the north Cornish coast generally (Jacobi 1979; Ashbee 1982; Berridge and Roberts 1986). This distribution is often cited as providing evidence for seasonal occupation of the coastal zone by mobile hunter-gatherers, who it has been argued, may have become more dependent upon marine resources

over time (Johnson and David 1982; Berridge and Roberts 1986). However, the chronological resolution of many of the Mesolithic flint scatters is often quite poor and high-quality radiocarbon dates are few and far between.

Evidence of Early Neolithic activity is confined to a very small number of flints from a variety of later contexts and one sherd of probably early pottery from layer (13). This sherd is of interest as it was recovered close to the later Mesolithic flints. Early Neolithic sites dating to between 3900 and 3700 cal BC have been identified in other coastal locales in Cornwall (Herring 2000, 114; Smith and Harris 1982) and Early Neolithic pits containing pottery and flint have recently been found at Portscatho (Gerrans) (Jones and Reed, 2006).

Early Neolithic activity in the coastal zone may show some continuity from the Mesolithic period. However, analysis of stable isotopes in human bones from Early Neolithic contexts elsewhere in the British Isles (Richards 2003; Schulting 2004; Richards and Schulting 2006) suggests that significant changes to dietary intake, from marine to terrestrial sources of food, may have occurred at the onset of the Neolithic; this casts some doubt on models based on straightforward continuity from the Mesolithic period. Although poor survival of human remains currently precludes isotope analyses being undertaken in Cornwall, with the exception of a few sites on the Lizard there are few locations in Cornwall with both Late Mesolithic flint and Early Neolithic pottery (Smith and Harris 1982).

Nonetheless, human occupation during the Mesolithic and Neolithic periods on what is now Constantine Island, involving the consumption of food and the working of flint may, by the formation of mounds comprised of shell, flint and organic remains, have significantly transformed its appearance, creating a distinctive place. This sense of distinctiveness may have been heightened by the fact that throughout the Mesolithic and Neolithic periods the location may have been a large rocky outcrop, within the woodland. Distinctive rocky outcrops were often the focus for monuments and ritualised deposits within pits during both the Neolithic and the earlier Bronze Age (Tilley 1995, 12, 39; Cole and Jones 2002/3).

Recent fieldwork across Britain has found evidence for the creation of large middens throughout prehistory. These sites, along with

other places associated with the consumption of food are often sited in liminal places on the margins of settlements or at significant points in the landscape. These appear to have been the focus for ritualised activity associated with feasting and social gatherings (McOmish 1996; McOmish *et al* 2002, 73–4; Parker Pearson 2003, 18; Richards 2005, 43, 210).

Coastal midden mounds were first identified in the Harlyn Bay area in the earlier part of the twentieth century (Crawford 1921). Most of these sites are undated. However, a recent study of Cornish Beakers (Jones and Quinnell 2006b) has revealed that a significant proportion of them were recovered from midden mounds, including sites at Poldowrian, (St Keverne) Praa Sands (Germoe) and the nearby site of Cataclews (Harris 1979; Patchett 1944; Crawford 1921), with a further possible site at Polcoverack (St Keverne) (Smith 1987). The special nature of the Cataclews site is perhaps indicated by the fact that, as with Constantine Island, it became the focus for burial activity in the Early Bronze Age.

In addition to these sites another, possibly later mound was found close to the coast at Higher Polcoverack (St Keverne) (Harris and Smyth 1983). This site was thought to be a barrow; however, no burial was found but sherds from several Trevisker Ware vessels were recovered and it is possible that the mound was generated by the accumulation of midden material.

All of the currently known Cornish midden sites were located in what might be considered as 'liminal' locales, accessible from the land and from the sea, and therefore possibly open to visitations from more than one community. Indeed, it is tempting to think that some of these sites may have been stopping or meeting places of dispersed communities, who were perhaps engaged in inter-communal contacts and exchanges (*cf* Malinowski 1922, chapter 13; Helms 1988; 1993).

The formation of midden deposits on Constantine Island would in any case have drawn it into the realm of social memory by making it a place associated with cultural activity and story. It may have been precisely these previous actions which made it a suitable focal point for further activity in the Bronze Age. Seen in this way, pre-barrow events need not have involved long-term continuity of practice or meaning but rather that it was acknowledged as a significant, yet periodically renegotiable social space.

The barrow

The barrow was a monument of two strikingly contrasting phases, the first a low sandy mound with a stone ring containing cremated human bone and the second a cairn associated with an inhumation burial (Fig 8). It is uncertain how long an interval there was between these phases but it was long enough for a soil horizon to become established over the sandy mound. Garwood (2007) has pointed out in relation to well-dated multi-phased barrows generally, that the gaps between phases of activity tend not to be very long. However, the flintwork found *in situ* in the first phase of the barrow was of an Early Bronze Age character whereas the phase 2 inhumation burial was several centuries later and of a Middle Bronze date, a time for which very few human remains are known from Cornwall and no other barrow-associated burials are currently recorded.

It is likely that the site was an ongoing 'social project' (Barrett 1994, 14; Bradley 2007a) which involved intermittent activities, with sustained stoppages punctuated by shorter periods of more intense activity. Indeed, it is quite probable that acts of construction were at least as important in terms of social cohesion as the finished monument was itself. The materials involved in the site's construction or deposited in specific contexts may have carried certain symbolic resonances, or have been metaphorically associated with particular parts of the landscape (Taçon 1991; Thomas 1999, 134; Lewis 2007).

The primary barrow comprised a small, soft sand mound using Pleistocene sands that had been brought up to the outcrop and were probably collected from the low cliffs immediately adjacent. This mound would probably have grassed over quite quickly and blended in with the surrounding environment. It was associated with small amounts of human bone, food residues in the form of shellfish and waste from *in situ* flint knapping. This first mound cannot be precisely dated. Charcoal was sparse and of uncertain origin and the cremated human bone was in poor condition and likely to have been of insufficient quantity to get a radiocarbon date. However, flint working associated with layers (5) and (4) is of an Early Bronze Age character and as this material was found *in situ* and had therefore not moved, it is reasonable to assume that the first phase of barrow construction occurred during the first half of the second millennium cal BC.

The burial activity on the barrow site occurred in two distinct forms, which contrasted with one another as much as the materials that were used to construct the mound. In the first phase human bone was deposited within a sand mound in an apparently unstructured way. A cremated human mandible was deposited along with bits of shell and knapped flint, without any formality or indication of grave goods.

Further fragmented human remains derived from an adult, a child and a sub adult were also recovered from the backfill deposit layer (9) within the cist, and as unstratified finds (Anderson, above). Given the subsequent disturbance to the site, it is not possible to determine where the majority of these bone fragments originated but it is certainly possible that some were associated with the primary mound. This possibility is further strengthened by the fact that part of a calcareous nodule from stone ring 6 was also recovered from (9), the re-deposited fill of the cist, but apart from the inhumation burial no other human remains were found in the undisturbed layer (10).

If this were the case, the initial barrow may have been akin to a cemetery mound (Lynch 1991, 159–86; Bonington 1999; Smith 1996), given over to the deposition of smaller amounts and multiple internments of bone from a variety of people of differing genders and age groups. It is possible that the heap of bones, pottery and flint found in a cist recorded somewhere in the near vicinity during the early twentieth century excavations belonged to this phase of activity, although it is perhaps more likely that this was a separate site and unrelated to the excavated mound.

Although, as several writers have recently pointed out, barrows were used for many things and there is probably no such thing as a 'typical barrow' (Healy and Harding 2007; Bradley 2007a), the primary phase of barrow 20 does bear similarities with other sites in the area. Several of the excavated barrows at Trelegga and Cataclews were found to contain small amounts of cremated human bone, which was sometimes placed within cists but at others merely deposited into crevices in the bedrock (Christie 1985; Jones 2005, chapter 5). This suggests that along the north coast of Cornwall it was fairly commonplace to place parts of several people in token quantities, beneath barrow mounds. The lack of burial goods is also in keeping with many barrow sites in Cornwall (Jones 2005, chapter 4) and is also typical of other regions of Britain (Mullin 2007).

The presence of limpet shells and *in situ* flint knapping debris might also indicate that the primary mound was associated with the consumption of food as well as with funeral activity. On a much larger scale, feasting at barrow sites is documented elsewhere in Britain, where some barrows, as at Gayhurst and Raunds have produced huge quantities of animal bone which may have been associated with conspicuous feasting during funerals (Chapman and Deighton 2005; Healy and Harding 2004). More locally, Davidstow site I produced a small piece of crustacean, which may have been consumed as food (Christie 1988).

The flint assemblage associated with this phase is also of interest as it suggests that flint used in association with activities on the site was not taken away from the island but was left *in situ*. Flint may have been specifically knapped for or to mark events that took place on the barrow. It is possible that, given that the consumption of food often forms part of funerary rituals (Van Gennep 1960, 146–65), implements associated with the consumption of food around funerary rites might have been considered to be in some way ‘unclean’ or ‘polluted’ (Douglas 1966; Watson 1982; Metcalf and Huntington 1991, 81–2) and were left on the site after particular events were concluded. It is even possible that this practice arose from a re-interpretation of the adjacent earlier Mesolithic and Neolithic deposits; the heaps of discarded shell and flint work may have been seen as the left-over residues of earlier rites.

With this in mind, and assuming that Constantine Island was not at the end of a promontory, it is possible to visualise people collecting sand, flint for tools and seafood for consumption from below. Others may have carried the cremated remains of deceased community members up the steep side of the outcrop. It is possible that the bones from one or a number of individuals may have been retained until it was an appropriate time for burials to take place. Having reached the western end, a space was defined by a roughly laid circle of slates. It is likely that other ‘ancestral’ mounds with shell and flint spilling out of them would have been evident, and in clearing the space for the stone ring, earlier occupations in the form of flint and pottery would have been exposed. The stone ring defined the area for the barrow and sand was heaped up inside it to create a low primary mound.

Certain events during the mound’s construction may have been marked more purposefully with

deposits of flint knapped and used, shellfish consumed and thrown into the site. Indeed it is possible that the flint was deposited in a deliberately extravagant way and in part represents conspicuous consumption. Given the uniformity of the sand comprising the mound, it is perhaps unlikely that these actions were carried out over a prolonged period. Having finished, the party left the site leaving the mound to grass over and become one of many small knolls overlooking the sea. In this way a ‘place’ would have been created, incorporating both earthworks and a variety of specially collected materials and items.

By contrast, the second phase involved the transformation of the site into a large, hard stone monument, comprised of slates that may well have been quarried from the island’s bedrock. It was constructed on top of, but not necessarily directly over the earlier mound, which may have been centred further to the east. This newly constructed cairn would have stood out starkly from the surrounding open grassland environment, making a distinct visual statement. It may not be coincidental that the burial of a single individual was associated with the marking of the landscape with a prominent stone monument, which would have transformed the appearance of the island or promontory or outcrop.

Small amounts of human bone from at least three individuals were also recovered from between the cairn stones (3). It is uncertain whether these bones were intentionally placed in the cairn or if they entered the site fortuitously, perhaps as a result of disturbance to the primary barrow mound or any adjacent monuments. If they were intentionally incorporated into the cairn matrix then it is possible that the stone and bone were being deliberately mixed, and this provides a contrast with the complete burial within the cist. The incomplete nature of these deposits and the emphasis on the bones of children could be taken to indicate that the bone was being deployed as a symbolic resource in its own right, rather than representing a *prima facie* act of burial (Jones 2005, 115; Taylor 2002).

In the second phase there was a marked change in the way that human remains were deposited into the site, the interment of a complete single unaccompanied articulated mature male, rather than as bone *per se*. This event appears to have occurred in the Middle Bronze Age 2985 ±35 BP, 1320–1110 cal BC (SUERC-16818). Evidence for the treatment of human remains during the Middle

Bronze Age has been found in other parts of Britain (Bradley 2007b, 197), especially close to or within settlements (Barrett *et al* 1990, 168–76; Brück 1995; Bradley 1998, 148–58) and occasionally as secondary interments within barrows (Thomas 2005, 258), however, as Harding and Healy (2007, 237–8) have pointed out most Middle Bronze Age inhumation burials from barrows are without artefacts and have only been identified through radiocarbon dating, which means that they are almost certainly underrepresented. Nonetheless, identifying comparanda for burials of this period in the south west region is exceptionally difficult: few inhumations dating to the second millennium cal BC as a whole are known and there is an almost complete absence of Middle Bronze Age burials.

Evidence for ceremonial and funerary activity in the region is well established for the period between 2000 and 1500 cal BC; however, after this time there is a marked decline in sites of this type, although this corresponds with a substantial increase in settlement activity (Quinnell 1988; Jones 2008). Middle Bronze Age ceremonial activity has recently been identified at Tremough (Mabe) in the form of timber circles (Gossip and Jones 2007) and some indications of burial activity have been found at a few more recently excavated settlement sites. Traces of an inhumation burial were found beneath a hearth within a roundhouse at Trethellan Farm (Newquay); a radiocarbon determination from the overlying hearth fell in the period 3191 ± 41 BP, 1420–1300 cal BC (UB-3114) (Nowakowski 1991). Burnt human bone was found in a mound adjacent to the Middle Bronze Age settlement at Gwithian (Thomas 1958; Nowakowski *et al* 2007) and at Scarcewater, St Stephen-in-Brannel, a ceramic vessel containing a small amount of burnt human bone was recovered from a pit near to a roundhouse settlement. The vessel has an associated radiocarbon date of 3191 ± 41 BP, 1540–1390 cal BC (Wk-21461) (Jones and Taylor 2010). At the latter site, a second ceramic vessel dated to 3174 ± 34 BP, 1510–1390 cal BC (Wk-21460) was found on the edge of what is likely to have been a ploughed-down barrow. However, this vessel was not associated with human remains and, unlike barrow 20, is indicative only of a continuing interest in an earlier mounded site, rather than representing a funerary deposit *per se*. It is noteworthy that the radiocarbon dates from the Middle Bronze Age settlements at Scarcewater and Trethellan are

possibly up to two centuries older than the burial from Constantine Island.

Recorded prehistoric inhumation burials in Cornwall are generally very scarce, although a few have been recorded in mid and north Cornwall. An undated crouched burial was recovered from a cist within a cairn at Carthamartha Wood, Lezant (HER, PRN 6967), and another was found beneath a barrow at Trevelgue accompanied by a stone axe-hammer (Borlase 1872, 86). In addition, an extended inhumation was found beneath the Lousey barrow in association with a Beaker (Christie 1985). Further afield, an inhumation was found at Rillaton in association with the gold cup (Way 1867; Needham 2006, 84) and two coffins made of one piece of wood were found within the Watch Hill barrow (Miles 1975; Jones and Quinnell 2006a). This handful of burials is greatly outnumbered by examples of cremations and the individuals involved were probably interred over a span of several hundred years. The Lousey burial probably dates to around 2000 cal BC, Watch Hill has been radiocarbon dated from 1980 to 1730 cal BC (Wk-12940) (Jones and Quinnell 2006a) and the Rillaton burial with its Camerton-Snowhill dagger association to c 1750–1550 cal BC (Needham 1996; 2006, 62). With a date falling between c 1300 and 1100 cal BC the Constantine island burial cannot be directly linked with any of this small number of burials. In other words, there is no clearly defined, tight chronological horizon for inhumation burial in Cornwall during any part of the second millennium cal BC.

As at many of the earlier Bronze Age sites along the north Cornish coast, there is no evidence that the inhumation burial, or in fact any of the human remains within barrow 20, were associated with any form of ‘grave goods’ beyond the sprinkling of a few small quartz pebbles within the cist. Quartz pebbles and stones have been recovered from a variety of Early Bronze Age barrows in Cornwall, including from an urn in nearby Harlyn Bay (Dudley 1964; Jones *et al* 2011). Quartz is also associated with ritualised contexts in Middle Bronze Age settlements, particularly those associated with the abandonment of roundhouses, such as infilling deposits and the demarcating of the edges of disused structures (Nowakowski 1991; Jones 1998–9; Jones and Taylor 2004). In some parts of the south west during the Bronze Age, quartz may have been deliberately extracted from particular sources for use in ritualised

contexts (Juleff and Bray 2007). Although specific meanings are likely to have shifted over time, it seems likely that quartz was considered to have symbolic properties and continued to be deposited into ritualised contexts throughout the second millennium cal BC in Cornwall.

Given the Middle Bronze Age date of the inhumation burial it is consequently difficult to parallel. In southern Britain generally cremation is usually held to be successive to inhumation burial after the first quarter of the of the second millennium cal BC (Barratt 1994, 125–6; Garwood 2007) and in southern central England flat cremation cemeteries and small mounds dating to the Middle Bronze Age are known (for example, Ellison 1980; White 1982). However, as has been argued, inhumation burials in Cornwall are generally uncommon, and where inhumations have been recovered, as at Watch Hill or Rillaton, they are often found in a late position in the barrow's history (for example, Jones and Quinnell 2006).

Instances of later burial activity could be said to represent appropriation of a significant burial site by individuals or groups for themselves, by stamping a new form of secondary burial rite upon it, perhaps to provide a form of legitimacy for a particular genealogy (Garwood 1991). However, given the significant length of time between the two phases of activity at Constantine Island it is possible that the reasons behind the reuse of the site were rather more complex and were perhaps more associated with social memory, involving the way that the place was perceived in the Middle Bronze Age and its, increasing separation from the land, which might have increased its liminal position in the landscape.

By the middle of the second millennium cal BC it is quite likely that phase 1 of barrow 20 had the appearance of a grass-covered knoll. After several centuries the site would almost certainly have blended in with the adjacent accumulated heaps of midden material, and in fact the island may not have looked vastly different from today (Fig 6). It is very possible that over time the actual location of the earlier burial deposits had become forgotten and memories of people buried there 'mythologised' (Gosden and Lock 1998; Mullin 2001; Littlejohn 2008). The island itself may have been remembered as an 'ancient' place of feasting and of past communities. Memories of earlier events or people are therefore likely to have been the product of 'misremembering', perhaps

in an attempt to justify action in the then present (Bradley 2002, 112–24).

At the same time, it is possible that over time the island's feeling of liminality would have been heightened by the continuing rise in sea level. Liminal places on the edge of the inhabited world often become the focus for monuments, or for other kinds of ritualised activity such as feasting or for 'socially dangerous' activities, including the disposal of the dead (Turner 1967, chapter 7; Pryor 1998; Thomas 1991, 36–8). Elsewhere in Britain, during the Bronze Age wet places such as rivers, the sea, or marshland islands were sometimes the focal points for ceremonial monuments and the structured deposition of artefacts (Bradley 1991, chapter 3; Samson 2006; Pryor 2001; Brennand and Taylor 2003) and in Cornwall barrows are frequently found in coastal positions (Christie 1985; Bonnington 1999).

Returning to Constantine Island, as the ground became progressively wetter and beach deposits formed, the surrounding trees on the low ground would have died. If there was no land between, the island would have been cut off from the mainland. Physical separation may have made it an increasingly appropriate place to dispose of the dead, and one or more of the other recorded cists on the island may have been added at this time. Seen in this light, the Middle Bronze Age burial was not so much a secondary mound-heightening interment (*sensu stricto*), as is found at some Wessex barrow cemeteries (for example, Barrett 1994, 125–8), but may have been more about the renegotiation or manipulation of an already 'ancient' space on the edge of the world that was 'remembered' as being associated with particular forms of social consumption and death.

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Archaeological recording of a multi-period site at Dolphin Town, Tresco, Isles of Scilly 1999–2003

SEAN R TAYLOR AND CHARLES JOHNS

with contributions from HENRIETTA QUINNELL, ROGER TAYLOR and CARL THORPE

In 2003 an archaeological watching brief during construction of a playing field at Dolphin Town, Tresco, Isles of Scilly revealed medieval middens overlying prehistoric settlement remains and possible ritual structures. The position of the playing field was subsequently changed to enable preservation of the remains in situ.

In October 2003 Cornwall County Council Historic Environment Service (Projects) undertook an archaeological watching brief for the Tresco Estate during construction of a playing field at Dolphin Town, Tresco, Isles of Scilly. Previous work in the vicinity had included archaeological recording during the 1985 Isles of Scilly Electrification Project. This identified concentrations of pottery around the Dolphin Town area, suggesting activity in the Neolithic and Romano-British periods and also around the twelfth to fifteenth centuries AD, the latter identified with the establishment of a settlement related to the harbour at Old Grimsby (Ratcliffe 1991, 141–6). A concentration of flint artefacts was also found in the vicinity of Dolphin Town (*ibid*, 28).

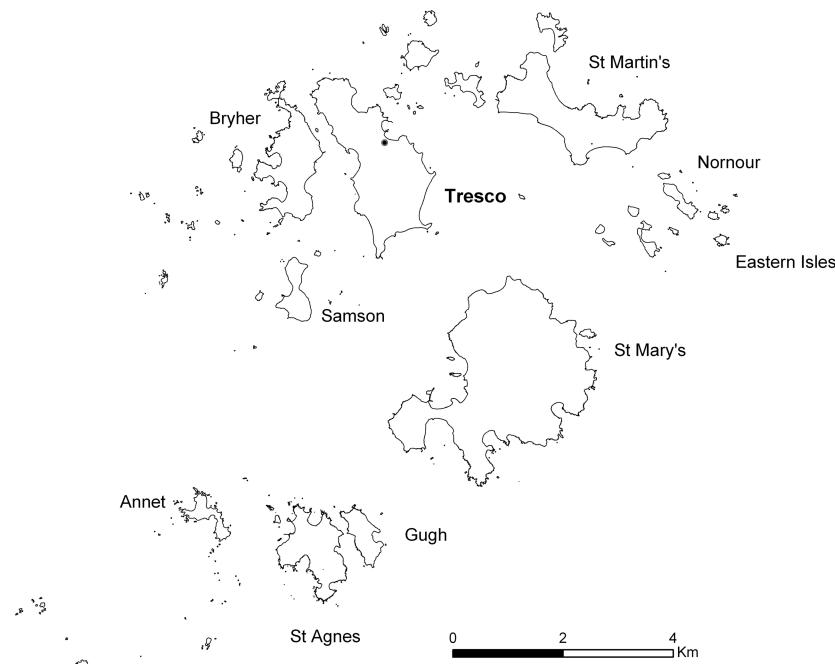
A geophysical survey (Gater 1999) and evaluation (Ratcliffe 2000) were carried out to assess the impact of the construction of the proposed playing field at Dolphin Town on historic landscape features and buried archaeological remains. This work focused on the field immediately to the east of St Nicholas' church, the adjoining field not at that time forming part of the proposed playing field (Fig 3).

The evaluation entailed excavation of three trenches (Fig 3) to investigate anomalies discovered

by the geophysical survey. Two of the trenches (1 and 2) revealed little buried archaeology, although finds indicated a human presence from the prehistoric period onwards and particularly from the medieval period to the present. In the third trench an extensive deposit of midden material was uncovered that contained an assemblage of medieval pottery and was found to overlie a dark grey silty deposit. In one area of the trench this deposit filled a shallow depression 1.5m wide from which a large number of Bronze Age sherds were recovered. One of the edges of the depression coincided with a void in the trench section that may have represented a wall (Ratcliffe 2000, 8).

Location and context

The site of the playing field at Dolphin Town (SV 8937 1539) lies at the base of a hill near the east coast of Tresco, at between 3m and 5m OD, just inland of extensive dune formations. Much of the granite bedrock in Scilly is covered in head deposits of periglacial origin known locally as *ram* (similar material on the mainland of Cornwall is called *rab*). This material consists of fine grains of parent rock encased in clays. The soils on the site are



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deep, sandy ploughsoils overlying the *ram*. There is no running water in the vicinity but a medieval stone-lined well nearby indicates a source of fresh water that has probably been available since the prehistoric period.

The Isles of Scilly Historic Landscape Assessment (Land Use Consultants 1996) classified the playing field area as Anciently Enclosed Land (AEL), originally enclosed in the medieval period. There had been some alteration in the nineteenth and twentieth centuries with the removal of a field boundary, wall 33 (Fig 4), since the compilation of the OS 1st edition 25in: 1 mile map of 1888, and its replacement with a barbed wire fence. Modified AEL, although containing fewer upstanding archaeological features than AEL, has similar potential for buried archaeology from the prehistoric to medieval periods.

The Isles of Scilly as a whole constitute an archipelago of over 200 islands and islets situated 45 km (28 miles) south-west of Land's End, Cornwall (Fig 1). The island of Tresco lies on the northern fringe of the group and is now approximately 3.5 km by 1.3 km in extent. However, current models suggest that around 3,000 BC it formed part of a larger land mass which

also included the present islands of Bryher, St Martin's, St Mary's, Samson and the island groups around St Helen's and the Eastern Isles. Sea level rise throughout the Holocene led to the division of this proto-island into its present constituents. Charles Thomas (1985) used archaeological and place-name evidence to postulate a final division of the northern group of islands by the end of the medieval period. More recent assessment of intertidal peat deposits indicates a much earlier separation of the main islands (Ratcliffe and Straker 1996), with the central area between Tresco, St Martin's, and St Mary's perhaps occupied by a brackish lagoon that was inundated only infrequently by the sea. Subsequent modelling of Ratcliffe and Straker's data (Johns *et al* 2004) suggests division of the main islands at high water by c 1000 BC, although Tresco, Bryher and Samson may not have been finally separated at low water until the Tudor period.

The project

The proposed construction method for the playing field involved disturbance of the stratified sequence

Fig 1 *Dolphin Town, Tresco: location*

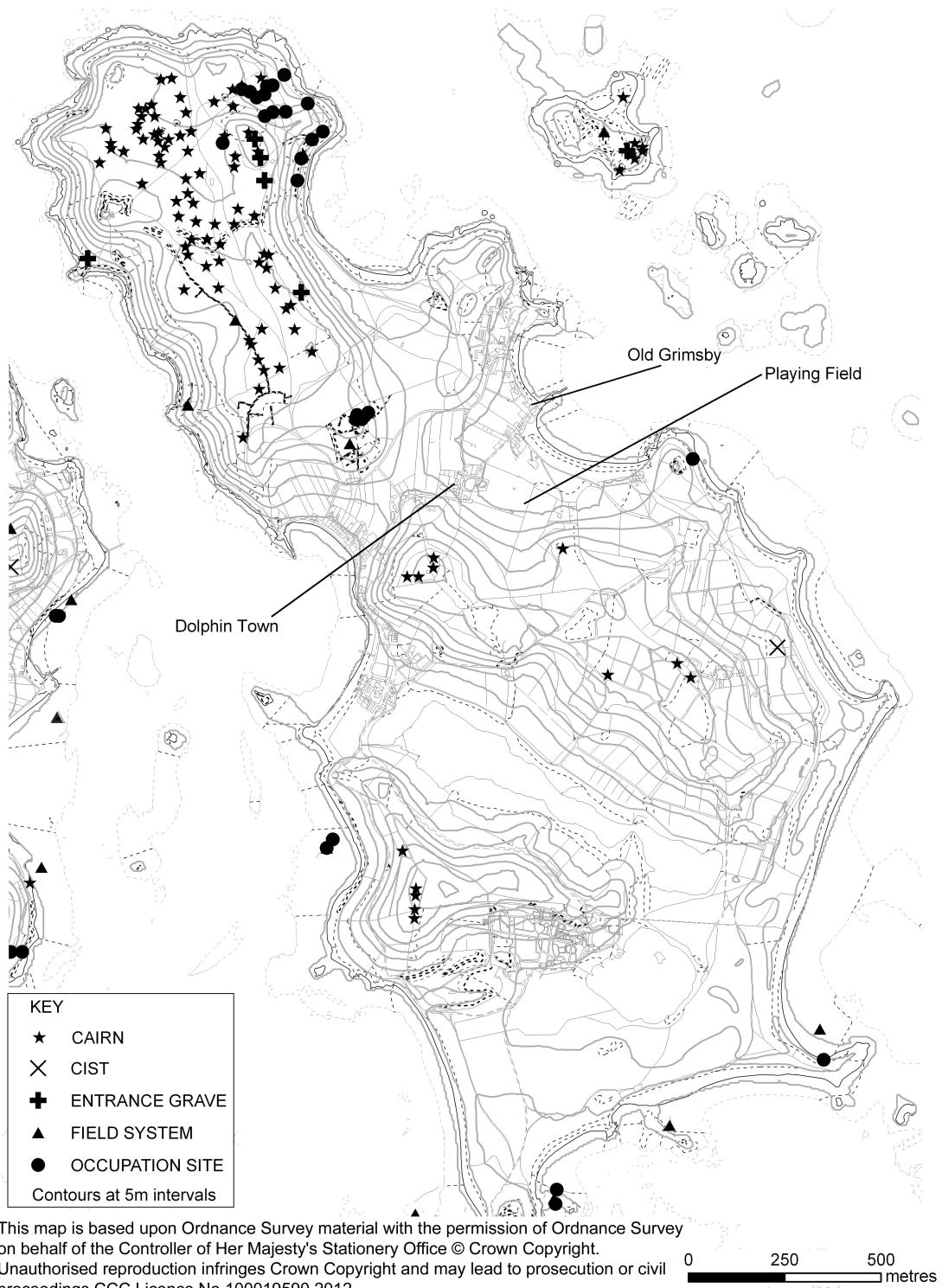


Fig 2 Tresco: the location of the site and other prehistoric sites on the island



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Fig 3 The Dolphin Town site, showing the extent of the geophysical survey, location of the evaluation trenches and excavated features

of buried archaeological remains on the site. The evaluation had indicated that medieval layers would be uncovered from a depth of 0.3m and Bronze Age deposits at a depth of approximately 1m (Ratcliffe 2000, fig 6). As the maximum depth of cutting required for construction was 0.78m it was thought possible to preserve the Bronze Age remains and the lower part of the medieval layers *in situ*, assuming that they occurred at similar levels across the site.

The first-phase archaeological work was undertaken as a controlled soil strip of the whole site using a machine fitted with a toothless bucket, supervised by the HES archaeologist. The topsoil was stripped cleanly to the level at which archaeological features or layers were revealed. On completion there was a rapid review of the features exposed by the soil stripping. This review, combined with the complexity and importance of

the remains already identified by the evaluation, led to a decision to re-position the playing field so that after appropriate archaeological recording the remains could be preserved *in situ*.

The groundworks for the playing field involved excavation of material from the southern edge of the playing field which was then re-deposited on the northern side of the field to create a level surface. All of the sites exposed were therefore in the southern part of the works area, extending over an area approximately 45m by 15m. Excavation was generally carried out by hand, but mechanical excavation of some deposits was undertaken under archaeological supervision.

Post-excavation analysis was undertaken of all pottery and post-medieval artefacts recovered (below); assessments of metalwork, animal bones, plant macrofossils and charcoal recovered are deposited with the project archive. The metalwork

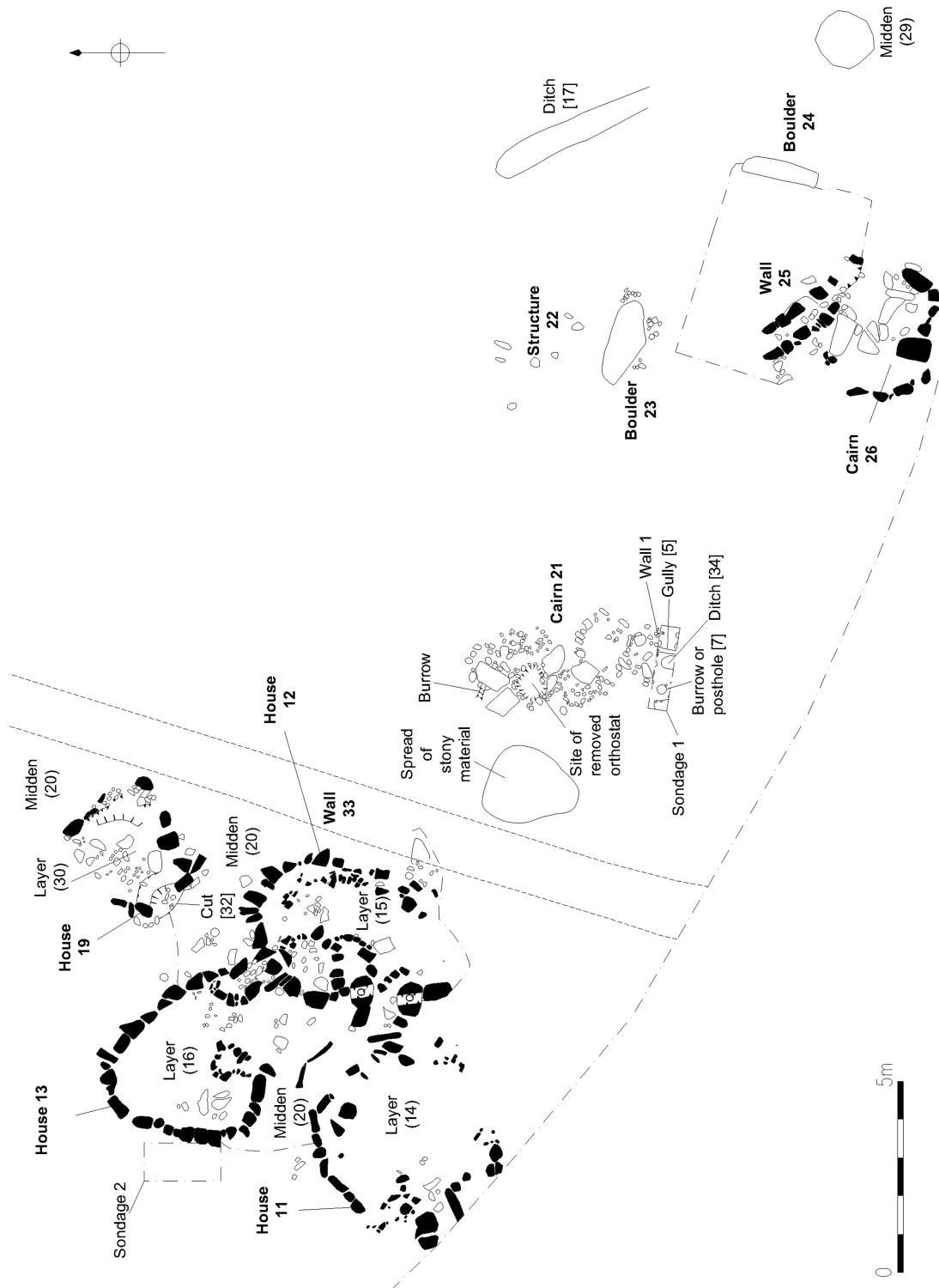


Fig 4 Plan of selected features recorded during the investigation

and animal bones came predominantly from medieval or later deposits. Plant macrofossils and charcoal were retrieved in very small quantities. The two samples of charcoal were suitable for Accelerator Mass Spectrometry (AMS) dating but were not submitted as part of the project.

The excavations

(In this report structures are denoted by numbers without brackets; for example, wall 25. Context numbers for cuts – ditches, pits, postholes and similar features – are shown in square brackets [34] and fills, layers and other deposits are shown with context numbers in round brackets: (20).)

The excavations first uncovered a stony mound, later identified as possible cist cairn 21, to the west of which a group of three adjoining house structures (11, 12, and 13) was located (Fig 4). An additional house structure 19 was subsequently identified to the north. A midden deposit (20) containing abundant limpet shells was concentrated around and within the house structures. Further exposures of midden material (29) were encountered in the south-eastern corner of the site but were not excavated. Another structure, 22, to the east of the cairn, was also tentatively identified as a house. To the south and east of this feature a kerbed structure, 26, was interpreted as a platform cairn. This had been cut by a later field wall, 25. Two large boulders were located downslope and may have originated from the platform cairn. One of them, 24, lay on a Bronze Age land surface; the other, 23, was not excavated.

Possible ritual monuments

Cairn 21

This feature appeared initially as a stony mound. Further cleaning revealed that it comprised two conjoining sub-circular stony mounds, both incorporating large flat-laid granite slabs (Fig 4). The features were 2.2-2.5m in diameter and both had an arrangement of stones around a central stone-free area. In the case of the northernmost mound this was observed to be due to the removal during machining of a squat upright orthostat, the location of which was preserved as a ring of packing stones surrounding a central depression (Fig 4). Overall the mounds covered an area

approximately 5m by 2.5m, oriented north-south. At an early stage a small sondage was excavated at the edge of the initial stony mound. This missed the two distinct mounds but did reveal a possible rubble wall, 1, 0.4m wide and high, running north-south with an accompanying ditch, [34], 0.35m wide, to the west. Whether this ‘wall’ was a field boundary or the southern extent of a cairn overlying the central features could not be determined. Neither was it clear whether the ditch was a field ditch or part of a ring ditch surrounding a cairn. Pottery recovered from wall 1 and from the fill of [34] was all medieval, predominantly of thirteenth- to fourteenth-century date, with a few sherds of eleventh- or twelfth-century Grass-marked pottery recovered from within the wall. These finds suggest that the wall and ditch were components of a field system and probably unrelated to the stony mounds. Considerable rabbit disturbance in this area, however, makes it possible that there had been contamination of earlier deposits by later material.

Cairn 26

This was a sub-circular kerbed feature approximately 3.5m to 4m in diameter, the interior of which contained several large flat granite slabs (Figs 4 and 5). It lay some 20m south east of the house structures identified during the watching brief (below). The kerbing was nearly continuous to the east, south, and west and built of moderately sized (the largest 0.8m x 0.6m) flat-laid granite blocks. The northern side of the cairn had been cut by wall 25 (below). The central area was covered by two large flat slabs (the larger 1.3m x 0.5m) and five smaller stones. A large space approximately 1m across in the central area, up to 0.4m deep, may have housed another large stone in the past, but no sign of this was observed during machining. The structure is interpreted as a probable platform cairn, and the layer overlying it, (27), was found to contain Bronze Age potsherds, prehistoric flints and a fragment of burnt clay.

Features 23 and 24

In the eastern part of the excavation area two large granite boulders were encountered, the tops of which lay just below the turf line (Fig 4). Boulder 24 was 1.7m by 0.9m by 0.4m and rectangular. A sondage excavated to the west of it revealed that it



Fig 5 Wall 25 (front) and cairn 26 (behind), facing south west. (Photograph: Historic Environment, Cornwall Council.)

rested on a dark grey deposit, (31), homogenous over a wide area, which was found to contain prehistoric potsherds and flints and was identified as a Bronze Age land surface.

Boulder 23 was 1.6m by 0.9m by 0.6m and sub-triangular in plan. It was not excavated but observed to have an accumulation of small granite rubble upslope of it from within which an assemblage of pottery spanning the fourteenth to eighteenth centuries AD was recovered, together with a small collection of prehistoric worked flint. Whether this accumulation was the result of colluviation or of medieval or post-medieval field clearance was unclear. Since the boulder was unexcavated it was not possible to ascertain upon which surface it lay but comparison of its size and position with that of 24 suggested that it too rested on the Bronze Age land surface (31).

The two boulders lay between 3m and 5m downslope of wall 25 and cairn 26. The size of the boulders and their position within an area identified as having been used as agricultural land from the Bronze Age onwards suggests that they

do not represent *in situ* natural clitter but are more likely to have originated from a structure upslope, probably cairn 26. It is possible that these boulders were capstones or large kerb stones which have either been deliberately displaced or, perhaps less probably, have moved downslope under the influence of gravity. It is also possible that they are fallen standing stones or livestock scratching posts.

Settlement and field system

House 11

House 11, the first of the three adjoining or conjoining structures to be found, consisted of a foundation wall of single-stone thickness, built of granite rubble (Fig 4). As revealed, the feature appeared to be sub-circular in plan, although if a concentration of what appeared to be rubble along its south-western side was in fact part of an exterior wall, the building would take on a more rectangular form. It was between 3.8m and 4.3m wide,



Fig 6 House 12, entrance flanked by quern stones. (Photograph: Historic Environment, Cornwall Council.)

although the exact dimensions were unclear due to the interrupted nature of the exterior wall. The wall was best preserved to the north west where a 3m long unbroken section was found; elsewhere it was more interrupted and harder to define. An interruption along the north-eastern portion may represent an entrance to the space, or 'courtyard', between the three conjoining structures. A large gap, up to 1.7m wide, in the south-eastern wall may be an entrance but an arrangement of stone to the south west, only part of which was uncovered, is more probably the remains of a stone-flanked doorway.

It was not possible to establish the relationship between house 11 and houses 12 and 13. A long, thin stone, 1.5m long and 0.12m wide, laid on edge on a north west – south east axis between the three structures may have demarcated a passageway or courtyard between them.

The interior of the house was excavated down to the top of an orange silty layer (14) which contained finds ranging from the Bronze Age to the eighteenth century.

House 12

This feature was sub-oval in plan with internal dimensions of 5m by 3m (Fig 4). It was unclear whether an apparent gap in the south-eastern part of the exterior wall represented an entrance or was the result of the partial excavation. The north-east portion of the building showed evidence of a double-faced wall up to 0.7m thick with an earth core, faced externally by larger granite blocks and internally by small granite rubble. A narrow possible entrance 0.6m wide to a short passage leading to a small 'courtyard' to the south west was flanked by a pair of saddle querns built into the walls (Figs 4 and 6). From the more northerly of these, a small length of return wall 1.3m long and 1.3m wide protruded into the interior. It was unclear whether this wall continued to the north, perhaps forming compartments similar to those found in building 5 on Nornour (Butcher 1978); there was a large quantity of rubble within this area and the interior was not excavated to a depth sufficient to define the internal features more fully. The interior of the house was excavated down to the top of an orange silty layer, (15), which contained finds ranging from the Bronze Age and early-medieval period to the eighteenth century.

House 13

This sub-oval structure was attached to the north-western wall of structure 12 (Fig 7). The best-defined of all the buildings examined, it had internal dimensions of 5.2m by 3m. The exterior wall was of single-stone thickness and a sondage dug against the outside of the building found that it survived to a height of four courses, the lower two of which lay within a trench cut into the *ram*. The 1.8m wide entrance was located to the south-east, opening into the area between the three structures. A return wall ran into the building from the western door jamb for 1.2m, and further rubble to the west of this may also represent internal features. A small rectangular compartment 0.8m by 0.6m was identified in the north-east corner of the building. The interior of the house was excavated down to the top of an orange silty layer, (16), which contained finds ranging from the Bronze Age to the eighteenth century.



Fig 7 House 13, facing south east. (Photograph: Historic Environment, Cornwall Council.)

House 19

This feature was located 2m north east of house 13 and consisted of a poorly-defined sub-circular ring of large stones 3.2m in diameter. The structure lay in a position where initially it was thought that soil stripping was unlikely to disturb it but it became apparent that one of the higher perimeter stones would have to be removed. A sondage through the area to be disturbed revealed an outer wall of larger orthostats set into a cut in the *ram*, [32]. The interior of the structure, below midden material (20), was filled with a rubble deposit, (30), which was not excavated to any depth; no internal features were observed.

Wall 25

During excavation of the sondage to investigate boulder 24 a length of stone wall approximately 3.3m long and 1m wide was revealed. Aligned

north west – south east, it was constructed of granite rubble facing an earth core. At least two courses were revealed but the base of the wall was not excavated. During the course of the excavation of the sondage by machine a granite bowl mortar was removed from the wall, of which it had presumably formed an integral part. The material over the wall, (28), included Bronze Age potsherds and prehistoric flint, but one piece of post-medieval stoneware was also found in this layer. The wall was observed to cut a kerbed stone feature, cairn 26, and thus post-dated it. This had resulted in the removal of part of the cairn.

A section of truncated field ditch [17] was identified 6.5m to the north east of wall 25. The base of the ditch was cut into the *ram*, and was 0.75m wide and 0.07m deep. It was aligned north west – south east. It did not share an alignment with the extant field system but did with wall 25, and the two are likely to date to the same period.

Medieval activity

Middens (20) and (29)

The interiors and the immediate exteriors of structures 11, 12, 13 and 19 were covered by an extensive deposit (20) of dark grey material containing abundant limpet shells. This material was up to 0.2m deep, although typically 0.1–0.15m. Although the bulk of the material in the midden was Bronze Age, it also included later finds, predominantly later medieval in date but also including some sherds of early medieval Grass-marked ware.

The midden deposit (20) is similar to contexts identified by the evaluation (Ratcliffe 2000, 7), and probably all represent the anomaly identified by the geophysical survey. The evaluation contexts also contained artefacts from a wide range of periods, but predominantly early medieval to late medieval. A small number of sherds of both Bronze Age and post-medieval pottery were also present, as well as a quantity of flint artefacts and a roofing slate.

The relationship of the midden with the layers within the structures – (14), (15), (16), and (30) – was unclear: the midden appeared to lie at the same level as these layers but there was a large amount of mixing throughout these deposits, as evidenced

by the wide temporal range of the artefacts within them. The principal difference between the midden and the other layers is that no artefacts later than the fifteenth century AD were found in the midden while pottery up to the eighteenth century AD was found in all of the layers within the structures. The mixing of deposits due to the extensive rabbit burrowing in and around the site may have rendered any objective analysis of the finds impossible.

Midden (29) was exposed in small areas 7–10m to the east of cairn 25. It was of an identical nature to midden (20) and is likely to be the same deposit. It was not excavated here.

Post-medieval activity

The only feature likely to be of post-medieval date, although without any specific dating evidence, was wall 33, which could be seen to be a recently removed continuation of an existing wall to the south west. Only the base was extant and this survived to a height of 0.4m in places, usually as a single orthostat. The wall was 1.3m wide and contained within it potsherds of Bronze Age and medieval (eleventh to twelfth centuries) date: these are likely to derive from midden deposit (20) or other layers as a result of animal burrowing within



Fig 8 Quern stones recovered during the evaluation. (Photograph: Historic Environment, Cornwall Council.)

the wall. The wall incorporated quern stones (Fig 8) that had presumably come from the prehistoric house walls; these structures are likely to have been the source of much of the stone used in its construction. The wall appeared to mark the eastern extent of the settlement: no definite house structures were found to the east of the wall. This may be coincidence or the wall may have earlier origins. However, it should be emphasised that soil stripping in this area may not have reached a depth at which features could be recognised.

The prehistoric pottery

Henrietta Quinnell, with petrographic comment by Roger Taylor

The prehistoric pottery assemblage from the 1999 evaluation and the 2003 watching brief consists

of 307 sherds weighing 10,291g with a mean sherd weight of 33.5g. It comes principally from a range of spreads of midden material over the unexcavated remains of a number of structures. These spreads, lying just below the surface, were subject to various degrees of mixing with later deposits deriving from a settlement of early medieval date. The prehistoric material presented here came from only a small area of an extensive settlement. The middens which contain it almost certainly derive from activities on other, unexcavated, parts of this settlement and do not relate to the structures over which they lie.

All pieces with clear form have been illustrated (Figs 9–11): the assemblage contains small fragments from about another ten vessels of similar types. All radiocarbon dates calibrations accord to OxCal 3.10 and are presented at 95 per cent probability.

Table 1 Prehistoric pottery. s = sherds (no), g = grams, Ab = abrasion: 1/2 fresh, 2 moderately abraded. * indicates the presence of post-prehistoric material; there are a few sherds in (16), (30) and (33) and a single sherd in (28).

| Context | GN1 | GN2 | GD | Other | Total |
|--|---|--------------------------------|----------------|------------------------------|--------------------|
| Spread (14) over structure 11 * | 3s 52g Ab 1/2 P1 | | | | 3s 52g |
| Spread (20) over structures 11, 12, 13, 19 * | 17s 276g Ab 1/2 | 15s 306g Ab 1/2 | | | 32s 582g |
| Spread (16) over structure 13 * | 32s 628g Ab 1/2 P2, P3, P4 | 10s 424g Ab 1/2 | | | 42s 1052g |
| Spread (15) over structure 12 * | 36s 1097g Ab 1/2 P4 P5 P6 P7 | 22s 664g Ab 1/2 | | | 58s 1761g |
| Spread (30) over structure 19 * | 8s 103g Ab 1/2 P8 | 7s 181g | | | 15s 284g |
| Wall 33 * | 9s 256g Ab 1/2 | 5s 217g Ab 1/2 P9 | 2s 21g Ab 2 | | 16s 494g |
| (3) in ditch [34] * | | | | GM 3s 13g Ab 2 | 3s 13g |
| (4) deposit in sondage 1 * | 1s 2g Ab2 | 2s 31g Ab 2 | | | 3s 33g |
| Spread (27) over structure 26 | 3s 16g Ab 1/2 | 3s 557g Ab 2 P10 | | | 6s 573g |
| (28) spread over wall 25 which cuts | 21s 825g | 8s 246g | 2s 60g | | 31s 1131g |
| Structure 26 * | Ab 1/2 P11 P12 | Ab 1/2 | Ab 2 | | |
| (31) soil adjacent to boulder 24 | 2s 32g Ab 1/2 | 1s 13g Ab 2 | | | 3s 45g |
| (18) in ditch 17 | 1s 8g Ab 1/2 | | | | 1s 8g |
| Evaluation trench 3, layer 5, feature 3 | | 89s 4163g Ab 1/2 P13 | | | 89s 4163g |
| Evaluation trench 3, layer 8 | 2s 10g Ab 2 | | | | 2s 10g |
| Eastern area 2003 unstratified | | 1s 56g Ab 2 | | GAB 2s 34g Ab 2 5s 47g | 3s 90g |
| Totals | 135 s 3305g | 163s 6858g | 4s 81g | | 307s 10291g |

Fabrics

Five distinctive fabrics were identified within the Dolphin Town assemblage. Fabric descriptions follow the terminology recommended by the Prehistoric Ceramics Research Group (1997). A detailed petrographic report is filed with the archive.

Fabric 1: Granitic 1 (GN1). Generally reduced dark grey 5YR 4/1 or very dark grey 5YR 5/1 but occasionally partly oxidised reddish brown 5YR 5/3; hard; very common inclusions generally 0.5–1.5mm but sometimes up to 3mm; both surfaces smoothed.

Thin-section 1. Context (16):

Feldspar: orthoclase as angular perthitic grains, some twinning, 0.1–1.6mm. Plagioclase as sparse angular polysynthetic twinned grains, 0.15–0.3mm. The feldspar is mainly unaltered with a few sericitised grains.

Quartz: angular grains 0.05–1.5mm and sub-rounded composite sutured grains, 2 and 3mm.

Mica: muscovite mainly as slender laths up to 1.5mm, rarely up to 0.3mm thick. Biotite as rare dark brown weakly pleochroic laths, 0.2 and 0.5mm.

Tourmaline: golden yellow, with some colour zoning, rarely greenish angular grains, 0.1–0.6mm.

Composite grains: quartz-orthoclase-muscovite, quartz-tourmaline, 2mm.

Rock fragment: a single sub-rounded grain of hornfels with finely granular quartz and aligned greenish altered biotite, 0.5mm.

Comment: a granitic temper probably obtained from crushed granite. The feldspar being mainly unaltered also suggests a crushed rock source.

Fabric 2: Granitic 2 (GN2). Colour range as Granitic 1; hard; abundant inclusions generally 0.5–3mm but sometime up to 4mm; both surfaces smoothed.

Thin-section 2. Context (15):

Feldspar: orthoclase as perthitic Carlsbad twinned, angular to sub-angular grains, 0.1–1.5mm, with some larger grains 2.5–4mm. The feldspar is unaltered with few sericitised grains. Plagioclase, as a scatter of angular polysynthetic twinned grains, 1.5–0.5mm.

Quartz: angular to sub-angular grains, 0.05–2.0mm. Some composite quartz grains up to 3mm.

Mica: muscovite as slender laths, 0.1–0.75 mm. Biotite as sparse slender, brown pleochroic laths, 0.1–0.25mm.

Composite grains: quartz-feldspar and quartz-muscovite granitic fragments, 1.4 and 4mm.

Tourmaline: a scatter of golden yellow, pleochroic, angular to sub-angular grains, 0.1–0.5mm.

Rock fragments: very fine-grained sutured quartz with some muscovite, rounded and sub-rounded grains, probably hornfels, 0.2 and 0.5mm.

Comment: a coarse granitic temper with a content of larger feldspar, quartz and composite grains generally similar to TS1.

General petrographic comment on GN1 and 2

The sherds from contexts (15) and (16) are virtually identical in thickness and oxidation, with the main difference in temper being the range of grain size. The occurrence of rare rounded hornfels grains is of interest; the complex sea-level history of the islands could result in hornfels grains being derived from offshore granite contacts. The source of a plastic clay suitable for potting on the Scilly Islands in their present configuration is problematical, but again there is a possibility of sources now lying offshore. There seems to be no particular reasons for these wares not to be of local origin and it is probable that the majority of inclusions result from the addition of crushed granite to a local clay. The vessels tend to be poorly made and finished, with frequent fractures along coil junction lines.

Fabric 3: Granitic derived (GD). Reddish brown 5YR 4/3 throughout; moderate inclusions 0.5–1.5mm; soft; both surfaces smoothed.

Thin-section 3. Context (33):

Feldspar: Colourless transparent cleaved unaltered feldspar grains 0.5–2mm occur in the sherd but are not present in the section.

Quartz: angular and some rounded grains, some zoned probably vein quartz, 0.1–1.6mm.

Limonite: soft dark brown rounded to sub-rounded grains, opaque in thin section, common, 0.2–1.5mm. Some grains contain micaceous flakes similar to those in the matrix indicating that this is a primary component of the clay.

Mica: a mica-like mineral with low birefringence occurs as abundant small laths in the matrix, up to 0.15mm. Muscovite occurs as rare slender laths in the matrix up to 0.2mm. Biotite, a single grain seen in section, 0.22mm.

Rock fragment: a single sub-rounded fine-grained, quartz and feldspar fragment, 2mm.

Comment. A form of granite-derived temper.

This sherd and section is similar to a sherd of Later Iron Age to Roman date found at Tremough, Penryn, which may have derived from the periphery of the Carnmenellis granite (P8, Taylor in Lawson-Jones 2002, 95). The common occurrence of limonite points to a clay deposit situated in waterlogged conditions. It is very unlikely that this sherd is of local origin.

Fabric 4: Gritted micaceous (GM). Reddish brown 5YR 5/6 ; soft; sparse inclusions of ?up to 4mm. Microscopic petrographic examination indicates a sparsely, probably self tempered, clay with granitic and quartz beach sand components indicating a local clay source.

Fabric 5: Gabbroic (GAB) Dark grey 5 YR 4/1; hard; surfaces smoothed. Microscopic petrographic examination confirms the source as the gabbroic clays of the Lizard.

Discussion

The two granitic fabrics, GN1 and GN2, are finer and coarser versions of the same fabric and together make up 97 per cent of the assemblage by sherd numbers and 99 per cent by weight. The fabrics are local, sourced in Scilly, and are generally similar to the granitic fabrics which to date form the only material to be clearly identified from second millennium BC Bronze Age assemblages from Scilly (Williams 1978; Wardle 1983; Quinnell 1994). The new feature highlighted in these fabrics is the probable addition of crushed granite temper to a local clay, a feature which close reading of earlier petrographic reports allows.

Three gritted micaceous (GM) sherds, undiagnostic as regards form, from context (3) in ditch [34], are from local clay without added temper and similar material does not appear to have been previously noted. However, small sherds may have escaped identification in large assemblages such as that from Nornour.

The four granitic derived (GD) sherds include the side of a jar with a slight neck from spread (28) which typologically could belong to the second or earlier first millennia BC. However, the probability that this fabric was not Scillonian makes a prehistoric dating unlikely. There are few prehistoric fabrics on Scilly sourced to the mainland. At Nornour Ware D (Williams 1978), with mica and quartz but no other granitic components, appears to have only diagnostic Late Iron Age Cordonate Ware forms but occasional sherds may occur from Period 6, broadly Late Bronze Age (see below), onward. Virtually no gabbroic vessels occur on Scilly before the Late Iron Age (Quinnell 2002–3): the one clear exception is P11 of broadly Late Bronze Age date from Porth Killier (Quinnell, forthcoming). The two small unstratified rims from Dolphin Town are of simple types which typologically could belong in the main assemblage but are more probably to be grouped with the early medieval Sandy Lane material present on the site.

Form and chronology

Prehistoric settlement sites on Scilly such as Nornour (Dudley 1968; Butcher 1978), Little Bay (Neal 1983), Halangy Porth (Ashbee 1983) and Porth Killier (Quinnell 1994; forthcoming; Ratcliffe and Straker 1996, 62–7) tend to have been used over a long period with a good deal of re-deposition of material as buildings were re-structured and re-sited. These sites have, to varying extents, a mixture of decorated and plain pottery forms. Close date ranges within the second millennium BC are still uncertain but the data from these sites taken together suggest that plain forms continue to around the end of the millennium or later and are in general terms Middle Bronze Age. Decorated vessels become uncommon during the Middle Bronze Age and indeed may be restricted to the earlier second millennium, the Early Bronze Age (Robinson 2007, 61). The spreads at Dolphin Town are important because they consist, with the exception of the small comb-stamped sherd P12, entirely of plain forms and therefore derive from a settlement of Middle Bronze Age date with some continuation into the Late Bronze Age.

Spreads (14) (15) (16) and (30) on the west side of the site form a broad continuum over structures 11, 12, 13 and 19 (Fig 4); spread (20), medieval midden deposits, contains sherds probably mixed

in through bioturbation. One hundred and fifty sherds weighing 3651g were recovered from these contexts. The forms consist of closed jars with short upright rims (**P1, P6**), open straight-sided vessels (**P3, P7**), a simple closed vessel (**P5**), a vessel with an upright, slightly curved, wall (**P2**) and a rim with a marked internal concavity (**P4**). There are many parallels to the first four forms from the substantial assemblage at Nornour (Dudley 1968; Butcher 1978) and the smaller assemblage from Little Bay (Neal 1983), and some among groups from Porth Killier (Quinnell, forthcoming) and Halangy Porth (Ashbee 1983; Gray 1972). The form of **P4** occurs at Halangy Porth (Gray 1972, fig 15). A radiocarbon determination 3045 ± 42 BP (Wk-19902) from residue on a fresh body sherd in context (16) calibrates to 1420–1130 BC and supports the ascription of these ceramics to the Middle Bronze Age (*c* 1500–1100 BC). There are two broadly similar radiocarbon determinations from period 5 contexts at Nornour, 1450–900 cal BC (HAR-457) and 1430–1050 cal BC (HAR-460), and one similar date of 1750–1100 cal BC (HAR-1715) and one rather later 1130–790 cal BC (HAR-1726) from Little Bay, St Martin's; all these earlier dates, presented at 95.4 per cent probability, are less precise than that from Dolphin Town. Robinson (2007, 61–3) has recently produced a well argued case for most of the Nornour ceramics being of Middle Bronze Age date rather than earlier: He also presents a comprehensive list of relevant radiocarbon determinations (*ibid*, Appendix A).

The only vessel from this group of spreads which is not appropriate for the Middle Bronze Age is **P8** from (30). This is a small plain carinated bowl of broadly Late Bronze Age type (Barrett 1980). A similar vessel is represented by **P9** found in association with later wall (33) in the east of the area. A range of these vessels is present at Nornour in period 6 contexts (for example, Butcher 1978, fig 24, nos 12–15) which also produced a radiocarbon determination of 1150–500 cal BC (HAR-240) at 95.4 per cent probability. Butcher's publication of Nornour preceded Barrett's work on Late Bronze Age ceramics and her report provides no clear guidance as to the date of these distinctive vessels but recent reviews (Quinnell, forthcoming; Robinson 2007) provide clear interpretations of this Late Bronze Age phase. Dolphin Town is the only site on Scilly apart from Nornour to have produced Late Bronze Age carinated bowls, although a group

of these occur on the mainland at Bodrifty in West Penwith (Dudley 1956, fig 9). A slightly later but closed group of Late Bronze Age to Early Iron Age ceramics occurs at West Porth on Samson (Ratcliffe and Straker 1996; Quinnell 1994) with determinations of 840–480 cal BC (OxA-3651) at 93.1 per cent and 820–480 cal BC (OxA-3650) at 91.6 per cent probability. The presence of **P8** and **P9** indicate the continuance of activity on the Dolphin Town settlement into the Late Bronze Age, in the eighth or seventh centuries BC or even later. There is however no indication of subsequent activity on the site until the early medieval period.

Pottery from the east side of the site includes **P10** from spread (27) and **P11–12** from spread (28) (Fig 10). The former lay over possible cairn structure (26) while the latter covered subsequent wall (25). The amount of pottery from these contexts is much less than on the western side of the site, totalling 37 sherds weighing 1704g. **P10** is a version of the closed straight-sided vessel form represented by **P5** while **P11** is a closed jar with a slightly everted rim, a form which occurs in Middle Bronze Age contexts at Nornour (Butcher 1978, fig 30, nos 31–4) and at Little Bay (Neal 1983, fig 13, nos 35, 36, 39). It appears likely that the pottery from this area derives from an extension of deposits deriving from the same Middle Bronze Age settlement as that in the west area. The exception is comb stamped **P12** in spread (28): its diagonal comb-stamping is unusual on Scilly, where most decoration consists of horizontal lines (for example, Ashbee 1983, fig 7) but occasional, broadly similar, pieces do occur such as P133 from Nornour (Butcher 1978, fig 34). **P12** may be residual in (28) from an unidentified source, but its broadly Early Bronze Age date would make it contemporary with cairn (26) and it is possible that the sherd derives from this.

The final group of material came from the 1999 evaluation trench 3, to the north of the watching brief site. A total of 89 sherds weighing 4163g came from a depression or pit in layer 5, feature 3. Most sherds were from **P13**, of which perhaps half was present, but a few represented at least two other vessels. Lugged vessels of slightly globular and biconical form occur regularly in Middle Bronze Age contexts and are well represented at Little Bay which includes a probable parallel to the unusual vertical lug (Neal 1983, fig 12, no 16). It is suggested (see below) that the concentration of pottery in layer 5, feature 3 at Dolphin Town

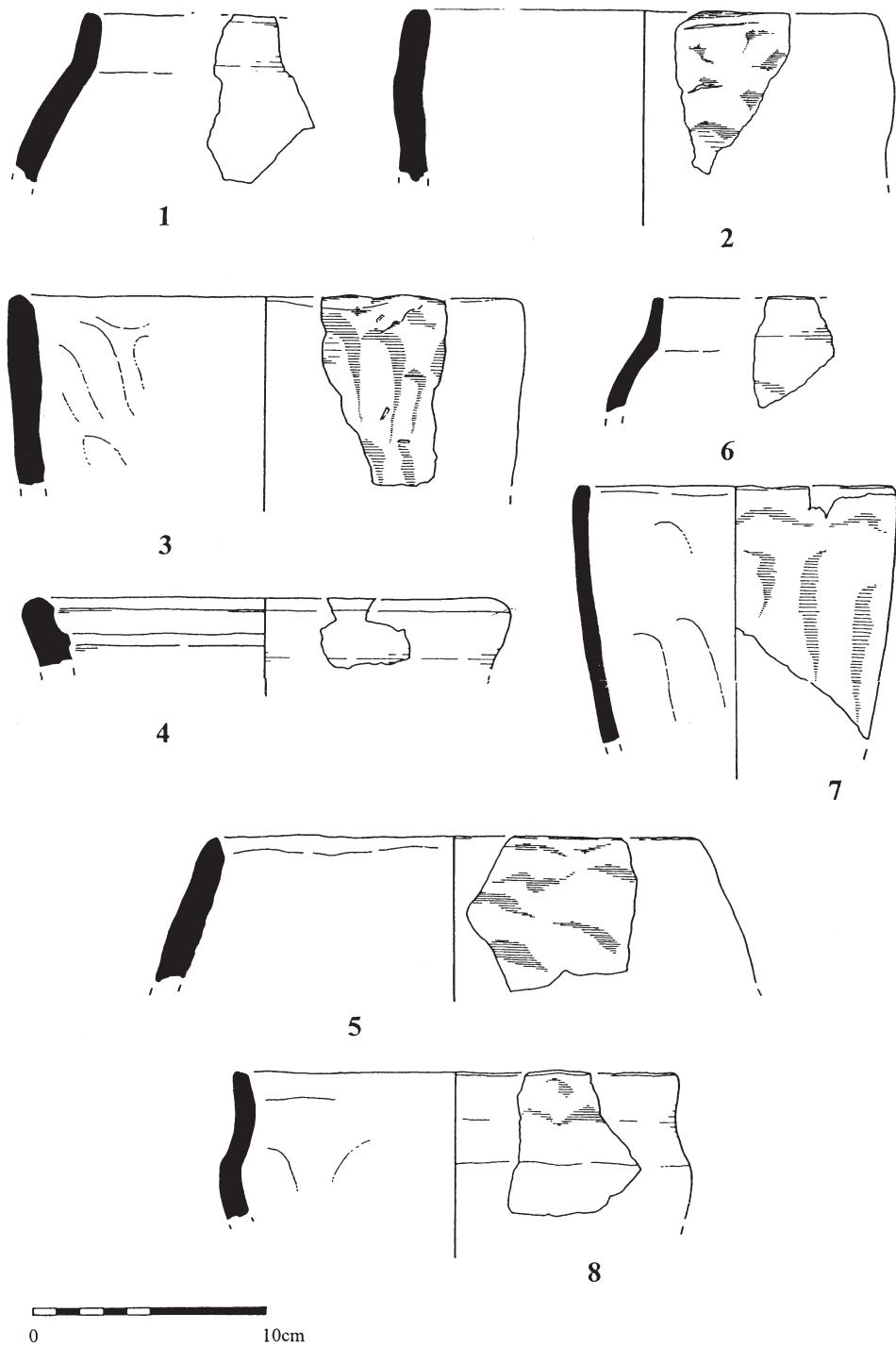


Fig 9 Enumerated potsherds P1–P8, granitic fabric, from the west side of the site. P1 spread (14); P2–3 spread (16); P4–7 spread (15); P8 spread (30). (Drawings: Carl Thorpe.)

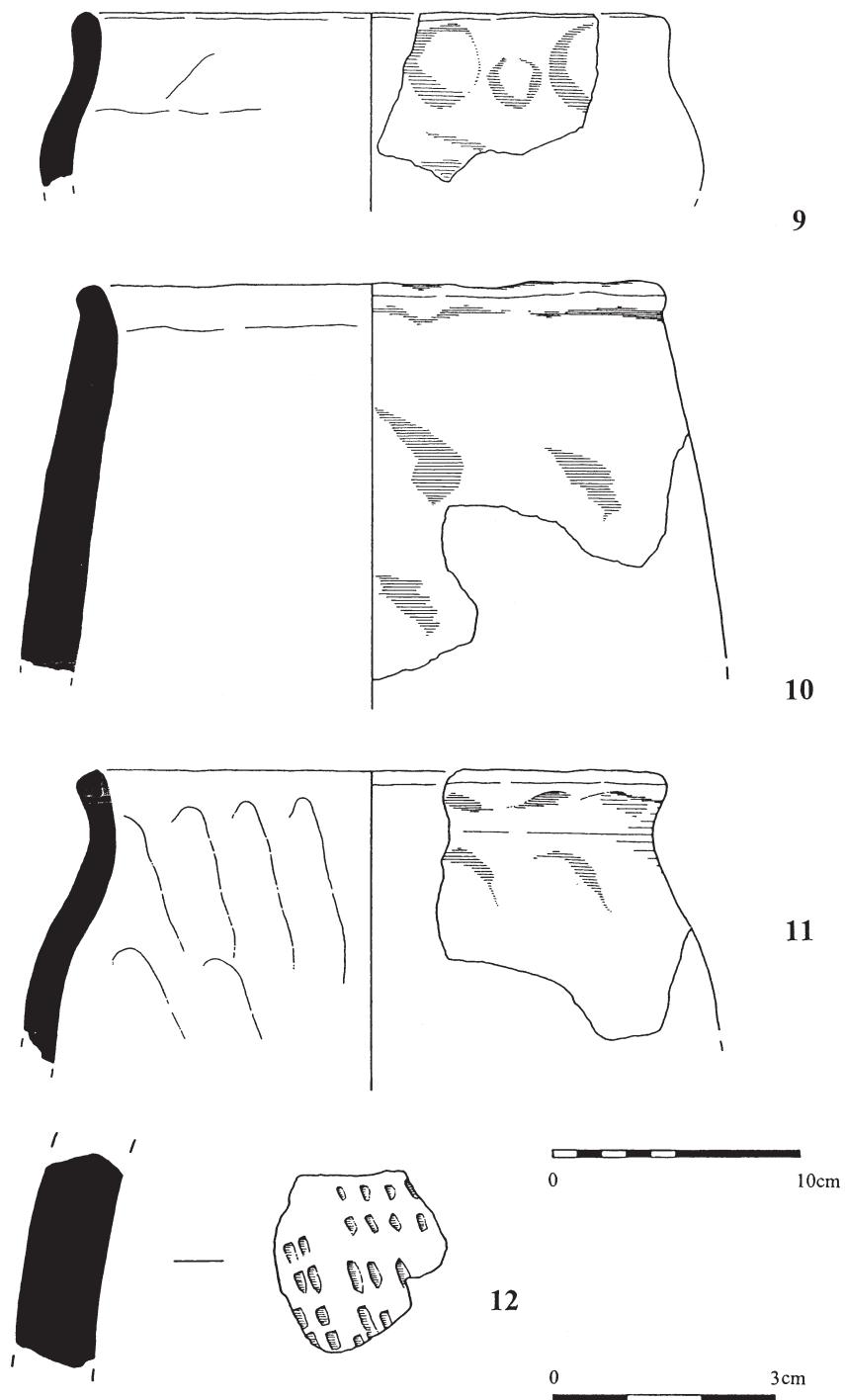


Fig 10 Enumerated potsherds P9–P12, granitic fabric, from the east side of the site. P9 wall (33); P10 spread (27); P11–12 spread (28). (Drawings: Carl Thorpe.)

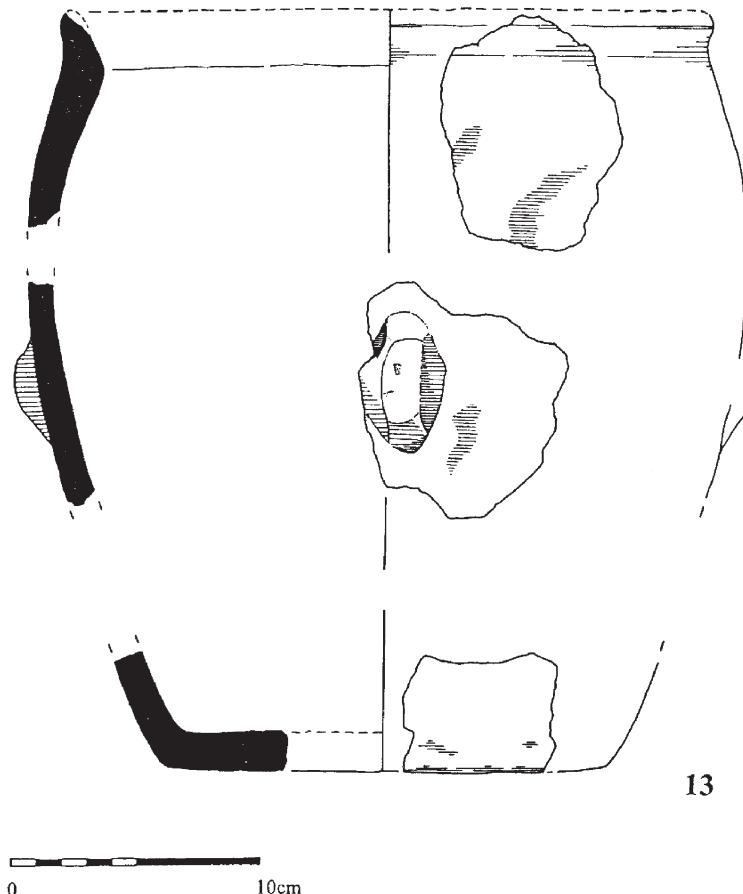


Fig 11 Enumerated potsherd P13, granitic fabric: evaluation (1999) trench 3, layer 5, feature 3. (Drawing: Carl Thorpe.)

represents some form of distinctive deposition. Undecorated lugged vessels appear to be present on Scilly in both Early and Middle Bronze Age contexts, with good probable examples of the former in the entrance cairn chamber at Salakee Down (Grimes 1960, fig 70). A group of five undecorated lugged vessels were smashed and deposited in a cist adjacent to the Porth Killier settlement (Quinnell, forthcoming) and appear to represent the selection of a particular vessel form for special deposition. Possibly undecorated lugged vessels were, in certain contexts, viewed as 'special', the lugs remembered as the final representative feature linking these pots to the elaborate lugged and cord-decorated containers of cremated bone found in local chambered tombs of the Early Bronze Age and possibly earlier date. It may be significant that an 'urn' of this type, no XIV, was the last vessel to be deposited at Knackyboy Cairn (O'Neil 1952, 28 and fig 3).

Descriptions of illustrated sherds

P1 Spread (14) over structure 11. GN1. Slightly shouldered closed jar with flat-topped rim.

P2 Spread (16) over structure 13. GN1. Vertically sided jar with slightly curved side and irregular flat-topped rim. Internal rim diameter 178mm.

P3 Spread (16) over structure 13. GN1. Straight-sided slightly open vessel with slightly pointed rim; marked finger impressions from modelling on both surfaces. Internal rim diameter 190mm.

P4 Spread (15) over structure 12 (1s from spread (16) over structure 13). GN1. Rim sherd with slight out-turn and marked internal groove. Internal rim diameter 175mm.

P5 Spread (15) over structure 12. GN1. Pointed rim from closed vessel, marked finger modelling. Internal rim diameter 190mm.

P6 *Spread (15) over structure 12.* GN1. Small jar with slight shoulder and upright flat-topped rim.

P7 *Spread (15) over structure 12.* GN1. Tall open vessel with pointed rim, extremely hard fired and thin. Internal rim diameter 125mm.

P8 *Spread (30) over structure 19.* GN1. Jar with marked, almost carinated, shoulder, slightly concave neck and flat-topped rim: finger modelling on neck. Internal rim diameter 170mm.

P9 *Wall 33.* GN2. Shouldered jar with flat-topped rim and finger modelling which, on the neck, may be decorative. Internal rim diameter 210mm.

P10 *Spread (27) over structure 26.* GN2. Slightly closed vessel, rim rounded and slightly everted with finger modelling below it; non-joining wall sherd belongs. Marked external sootting. Internal rim diameter 200mm.

P11 *Spread (28) over wall 25.* GN1. Shouldered jar with slightly out-turned rim, finger modelling below may be decorative. Internal rim diameter 210mm.

P12 *Spread (28) over wall 25.* GN1. Body sherd with diagonal comb stamped lines.

P13 *Evaluation trench 3, Layer 5 Feature 3.* GN2. Large jar with out-turned rim with internal bevel; shoulder sherd with small oval square profiled vertical lug; two joining base angle sherds. The majority of sherds from this context appear to belong to this vessel. Internal rim diameter 220mm.

Daub or briquetage

Small abraded pieces of baked clay, some with surfaces suggesting they had formed parts of vessels, were found in evaluation trench 3: layer 8 7s 74g, layer 5, feature 3 3s 21g, layer 3 7s 49g. It is possible that some of these pieces may have been briquetage but, except for the three small pieces in layer 5, come from contexts in which the other finds are post-prehistoric. Briquetage has not previously been identified on Scilly and the presence of these pieces is noted here so that, if future work produces well-dated briquetage, these can be considered in context.

Petrographic comment on daub/briquetage

All the fragments are essentially of identical composition. There is nothing to clearly identify this material as briquetage or pottery. Most is

probably daub. The matrix and mineral content of all these fragments is very similar and is of local origin, again indicating that a source of workable clay was available in Scilly at this time.

The post-prehistoric artefacts

Carl Thorpe

A total of 498 artefacts dating from the early medieval to modern periods were recovered during the archaeological recording at Dolphin Town, principally from spreads of midden material over the remains of prehistoric buildings. Pottery comprises the largest group within the assemblage; however there was also metalwork, glass, tile and clay pipe. A detailed list of the finds is held in the site archive.

The early medieval period (fifth to eleventh centuries AD)

Pottery (some 24 sherds) was the only category of find that could be assigned to this period. The sequence of post-Roman or early medieval ceramics within Cornwall is currently being re-evaluated in the light of the re-examination of excavated sites at Gwithian (Sturgess and Lawson-Jones 2006), and Halligye fogou, in Mawgan-in-Meneage (Startin 2009–10), and recent work at Boden Vean fogou, St Anthony-in-Meneage (Gossip, forthcoming). It is hoped that at the end of this process secure dating will have been obtained and sufficient fabrics and forms described to provide a picture of ceramic development throughout Cornwall during this period. Two types of pottery were identified, Grass-marked ware and E-ware.

Grass-marked ware

A total of 22 sherds of Grass-marked ware were recovered in both granitic and gabbroic fabrics. Nine sherds were recovered in 1999 from the plough soil in trench 2 and contexts (3), (4), and (8) in trench 3, while in 2003 13 sherds came from the eastern part of the site, unstratified, and from contexts (3), (10), (15), (16) and (20). Two rimsherds were identifiable as coming from cooking vessels; most sherds, however, were too small and abraded to be further identified. Grass-marked pottery is thought to have been introduced

in the late seventh century, continuing into the eleventh century (Thomas 1963; 1991).

E-ware

Two sherds of E-ware were recovered at Dolphin Town in 2003. These came from contexts (14) and (15). A single rimsherd and a basal angle were identifiable coming from an E1 form jar, possibly from the same vessel (Thomas 1990). E-ware is a wheel-thrown pottery with a hard-fired (almost stoneware) fabric. Its date range has been considered to extend from the late sixth century to the early eighth (Hill 1998; Campbell 1991; 1996). No kilns for this ware are known, but evidence points towards a source in western France, probably somewhere accessible from the Loire or Gironde.

The medieval period (twelfth to fifteenth centuries AD)

The largest collection of artefactual evidence dates to this period, including 313 sherds of pottery. It is possible that some of the stone and iron artefacts are also of this date. The study of Cornish medieval pottery is still at an early stage; most published sites lack stratified sequences, and their dating is often established only in relation to broad regional traditions. Close dating from a few rimsherds alone is not possible because coarseware forms may be of long duration; some rim forms from Exeter continued unchanged from the late tenth century to the early fourteenth century (Allan 1984).

The collection comprises:

Sandy Lane Style 2 (SL2)

Ten sherds (rim and basal) were recovered in 1999 from the plough soil in trench 1 and context (3) in trench 3, and in 2003 from the western part of the evaluation area, unstratified, and in context (15). The vessels represented were cooking pots. The fabric is gabbroic. Dating is uncertain but similar wares found during excavations at the Hermitage on St Helen's, Scilly, have been considered to be of twelfth-century date (O'Neil 1965).

Sandy Lane Style 3 (SL3)

Four sherds, including one rim, of this ware came from context trench 3 context (4) in 1999 and

context (15) in 2003. The vessel forms represented were cooking pots. SL3 is completely wheel-thrown, the fabric is gabbroic. Thomas (1964; 1968; 1991) gives a late twelfth- and thirteenth-century date for this ware.

Cornish medieval coarsewares

Some 230 sherds of Cornish medieval coarseware were recovered at Dolphin Town. In 1999 material came from the plough soil in trenches 1 and 2 and contexts (5) and (8) in trench 3, while in 2003 contexts (2), (3), (140), (15), (16), (20) and (30) produced pottery. There was also unstratified pottery from across the entire site. Vessels represented were mostly cooking pots (with rare pie-crust decoration) and occasionally jugs. These are long-lived forms, unchanging practical designs, continuing in use from the late twelfth century to the end of the fourteenth century (Allan 1984; O'Mahoney 1989a; 1989b; 1994).

Cornish medieval coarseware, Bunnings Park / Stuffle Ware

Some 39 sherds have been recognised from Dolphin Town, although most are undiagnostic. In 1999 this material was found in the plough soil and context (4) from trench 1, while in 2003 it came from contexts (2), (3), (4), (9) and (14). Vessels were mostly cooking pots with the occasional jug. This pottery is hand-made, often wheel-finished, in a thin-walled, micaceous granitic fabric. It was probably made in the Lostwithiel area and dates from the thirteenth to fifteenth centuries.

Cornish medieval coarseware, St Germans ware

Three undiagnostic sherds were recognised from contexts (2) and (3) of the 2003 excavations. They are probably from cooking pots dating from the thirteenth to fourteenth centuries. This pottery is wheel-thrown, thin-walled and hard-fired, with a micaceous granitic fabric.

Ham Green wares

Two small sherds of this material were recovered in 1999, both from the modern plough soil in trenches 1 and 2. Although undiagnostic they are most likely to have come from a jug. This pottery is

hand-made (although some is possibly moulded), with thin-walled vessels. The centre of production was Ham Green, Bristol, and the ware dates from the late twelfth to the end of the thirteenth centuries (McCarthy and Brooks 1988).

Cornish late medieval coarsewares

A single unstratified rimsherd was recovered from the eastern part of the evaluation area in 2003. These are wheel-thrown vessels with a micaceous granitic fabric. Forms are long-lived, continuing through the fourteenth and fifteenth centuries (O'Mahoney 1994) and include cooking pots, bowls and jugs. The centre of production is not known but is most probably in the Lostwithiel area.

Cornish late medieval coarseware, Lostwithiel ware

Five sherds of this material were recognised in 2003 coming from contexts (16), (20) and (23). All are from jugs with rod handles. This pottery is wheel-thrown and thick-walled, with a fabric similar to but distinct from Bunnings Park / Stuffle Ware. The similarities in fabric suggest that Lostwithiel ware replaces Bunnings Park / Stuffle ware in the fifteenth century (O'Mahoney 1989a and b; 1994).

French late medieval coarseware, Saintonge plain ware

Nineteen sherds have been recognised from Dolphin Town, including a green-glazed white ware mask from an all-over-green jug rim dating from c 1280 to 1330. In 1999 this material was found unstratified in the plough soil in trench 2 and trench 3, and in contexts (3) and (4), while in 2003 it came from the western part of the evaluation area, unstratified, and from contexts (15), (16), and (20). The vessels represented were most probably jugs, probably dating to the late fifteenth or earlier sixteenth century (Platt and Coleman-Smith 1975; Hurst *et al* 1986; Brown 2002).

Non-ceramic and other medieval finds

The only non-ceramic item that can be definitely assigned to this period was a heavily corroded

iron arrowhead found in 2003, in context (15). It is a bodkin (Ward Perkins 1940, London Museum classification Type 9) dating from the thirteenth or fourteenth centuries. Many hand-forged iron nails were recovered and it is possible that these are also medieval.

The post-medieval period (mid-sixteenth to eighteenth centuries)

A number of artefacts (of various categories) relating to this period were recovered, the bulk being ceramics, mostly unstratified from within the plough soil.

Post-medieval glazed red earthenware (GRE)

This is by far the largest group in the post-medieval assemblage and it, with specific GRE groups that follow, dominates the collection of post-medieval pottery. Thirty-seven sherds have been recognised from Dolphin Town, although most are undiagnostic. In 1999 this material was found in trench 2 plough soil and context (3), while in 2003 it came from the western part of the evaluation area, unstratified, the eastern part, unstratified, and contexts (14), (15), (16), (23), and (30). Glazed Red Earthenware (GRE) was produced from the first half of the sixteenth century and continued throughout the seventeenth and eighteenth centuries with little evident change in fabrics (Allan 1984). Most comes from Devon but some was produced in Cornwall, with other sources including Somerset, and perhaps even Bristol (Jennings 1981; Allan 1984). Many of the forms are long-lived, being only datable in association with other artefacts such as clay pipes.

North Devon post-medieval gravel-tempered glazed red earthenware (Barnstaple ware)

Fifteen sherds could definitely be attributed to this ware, from trench 1 plough soil and context (3) in 1999 and unstratified material in 2003. The identifiable vessel types were bowls and cooking vessels. This is wheel-thrown, often thick-walled pottery which begins in the seventeenth century, with increasing production in the eighteenth and nineteenth centuries. The main centre of production was North Devon (Fairclough 1979; Grant 1983; Allan 1984).

Post-medieval glazed red earthenware decorated slipwares (Donyatt ware)

A single sherd from a dish which could definitely be attributed to this ware was recovered in 1999 from the plough soil in trench 2. The earliest known production is in the thirteenth century but it continued to be made until the eighteenth century (Coleman-Smith and Pearson 1988; Barker 1993).

Post-medieval yellow-glazed red earthenware (Bristol / Staffordshire ware)

A single undiagnostic sherd could definitely be attributed to this ware, found in 1999, from trench 3, context (3). The ware was produced in Staffordshire from the mid-seventeenth century, reaching a height in the mid-eighteenth century. Pottery of almost indistinguishable fabric was manufactured in Bristol (Allan 1984; Barker 1993; Jennings 1981).

Post-medieval salt-glazed stoneware (Frechen ware)

A single undiagnostic sherd could definitely be attributed to this ware, recovered in 2003 from context (14). Frechen ware is reduced grey stoneware, the exterior covered with a saltglaze, usually brown speckled; the typical form is a Bellarmine jug. The height of production and importation into Britain was during the seventeenth century (Jennings 1981; Allan 1984).

Post-medieval salt-glazed stoneware (Normandy stoneware)

Six sherds, all undiagnostic, could definitely be attributed to this ware. All were found in 2003, coming from contexts (2), (14), (15) and (25). They date from the end of the sixteenth century to the eighteenth century (Allan 1984).

Non-ceramic and other post-medieval finds

Numerous pieces of glass (both window and bottle) dating from the sixteenth to eighteenth centuries and clay pipe stems ranging from pre-1650 to the early nineteenth century were recovered from unstratified contexts throughout the study area during both phases of work. Some of the undated iron work recovered (hand-forged nails, horse

shoes, a sickle blade and other items) is also likely to be post medieval.

The modern period (nineteenth and twentieth centuries)

Activity on site during this period was indicated by the occurrence in the ploughsoil of sherds of modern white glazed stoneware ('china'), modern yellow glazed stoneware and modern terracotta flowerpot, and probably some of the undiagnostic metalwork.

Post-prehistoric artefacts: conclusions

The majority of the artefacts recovered are typical of assemblages recovered from fields close to farming communities resulting from domestic midden material being utilised for the manuring of fields.

The occurrence of grass-marked pottery of the seventh to eleventh centuries and imported E-ware from France dating to the late sixth to early eighth centuries indicates a focus of settlement in the Dolphin Town area during the early medieval period, although the exact nature and location of the settlement is uncertain. The E-ware recovered is an important addition to the small collection of this material from Tresco, the nearest site previously identified being Dial Rocks. Both of these sites may be related to a site on Tèan which produced more than 50 sherds of E-ware when excavated in 1956 and 1960 (Thomas 1985; 1990).

Continuation of settlement in the vicinity is indicated by the presence of Sandy Lane ware dating from the eleventh to twelfth centuries and there is a large concentration of medieval material dating from the thirteenth century onward which, although recovered from mixed contexts, suggests the close proximity of a settlement to the excavation areas. The vast bulk of the pottery is of Cornish manufacture, although there is some imported material, all of it from France. The largest group is Saintonge ware (although there is no polychrome ware) but there is also some material from Normandy. All is of domestic coarsewares.

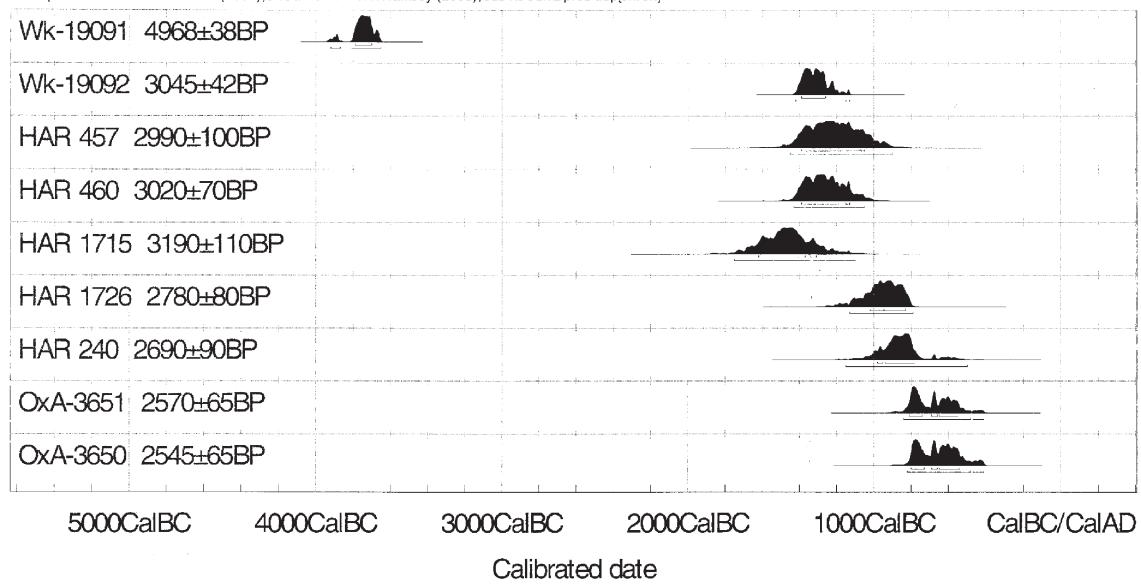
There is evidence of continuing occupation throughout the post-medieval and early modern periods with pottery from the sixteenth to nineteenth centuries occurring within many of the contexts. There are few foreign imported wares,

Table 2 Radiocarbon results from Dolphin Town playing field, Tresco

| Context | Laboratory code | Radiocarbon age (BP) | $\delta^{13}\text{C}$ (‰) | Calendrical years 68.2% | Calendrical years 95.4% |
|---------|-----------------|----------------------|---------------------------|-------------------------|---|
| (15) | Wk-19091 | 4968 \pm 38 | -25.8 \pm 0.2 | 3790-3700 BC | 3920-3870 BC (6.1%) 3810-3650 BC (89.3%) |
| (16) | Wk-19092 | 3045 \pm 42 | -24.8 \pm 0.2 | 1390-1260 BC | 1420-1190 BC (94.4%) 1150-1130 BC (1%) |

Table 3 Radiocarbon dates from Dolphin Town (Wk-19091, Wk-19092) and from later prehistoric sites at Nornour (HAR-240, HAR-457, HAR-460), Little Bay, St Martin's (HAR-1715, HAR-1726) and West Porth, Samson (OxA-3650, OxA-3651).

Atmospheric data from Reimer et al. (2004); OxCal v3.10; Bronk Ramsey (2005); cub r.5 sd:12 prob usp[chron]



perhaps indicating the limited prosperity of the settlement at this period. It is possible that some items were traded from passing ships sheltering from bad weather or picking up provisions.

Radiocarbon dates

The principal aim of the dating strategy was to tighten the chronology of the Bronze Age pottery recovered from the abandonment layers of the house structures.

Results

Two samples of material were sent to the University of Waikato in New Zealand for radiocarbon dating.

Both were from residues attached to potsherds recovered from layers within the roundhouses. One of these, from a sherd found in layer (15) within house 12, produced a determination of 4968 \pm 38 BP, 3810-3650 cal BC (Wk-19091). The other, from a sherd in layer (16) within house 13, produced a date of 3045 \pm 42 BP, 1420-1190 cal BC (Wk-19092).

Discussion

Determination Wk-19091 of 4968 \pm 38 BP from context (15) is anomalous. It comes from residue inside a GN1 base angle. This sherd, which appeared typical of the assemblage, is fresh and by its form cannot possibly be of earlier Neolithic date as suggested by the radiocarbon

determination. Possible reasons for the anomaly are problems with the pre-treatment of the sample (although procedures here have recently much advanced), the possibility of old carbon within the sherd being removed with the residue (which was removed before being sent to the laboratory), and the presence of carbon deriving from marine organisms.

Wk-19902 3045 ± 42 BP from context (16) calibrates to 1420–1130 BC (95 per cent probability) and appears appropriate for the main group of plain forms on the site.

Conclusions

Early Bronze Age

The earliest features encountered during the watching brief are the probable ritual monuments: the two small cairns comprised by feature 21, and the possible chambered cairn 26. The dating evidence for these features is sparse and circumstantial and relies on comparison between the unexcavated forms and similar features on Scilly and further afield. Cairn 26 is also cut by a wall, 25, which is interpreted as part of the settlement pattern that includes the Middle Bronze Age house structures.

Cairn 26 should perhaps be identified as a kerbed cist cairn. However, the cairn, with its kerb and flat central capstones, to some extent resembles examples of entrance graves found all over Scilly, although its small size would render it atypical. These monuments generally consist of a central chamber defined by orthostats linked to the exterior by a passage of coursed stone walling, both covered with large capstones. The entrance graves on the mainland are thought to date to the Early Bronze Age (Jones and Thomas 2010) but those on Scilly may have continued to be built and / or re-used into the first millennium BC (Ratcliffe and Johns 2003, 7).

Scillonian entrance graves vary in diameter between 5.2m and 22.7m (Robinson 2007, 210). However, with a conjectured diameter of 3.5m, cairn 26 would be smaller than the known Scillonian tombs. In addition, no obvious signs of a passage linking the exterior of the monument with the centre were identified, although of course the cairn was both truncated (by wall 25) and unexcavated. A putative passage might

be located on the eastern side of the monument with an entrance that turns sharply to the north-east. However, such a kinked passage would be unique.

The twin cairns of structure 21 most closely resemble small cist cairns, at least one of which appears to be kerbed. Their proximity to the settlement site suggests that they too pre-date the settlement, although no dating evidence was found to support this. The Isles of Scilly Historic Environment Record records 384 cairns, most of which, although not all, lie within six cairnfields: one each on Bryher, Tresco, St Martin's and St Agnes, and two on Gugh. Most cairns are 4–7m in diameter and up to 0.5m high. Some are kerbed while others show no structure at all and are merely piles of loose stone rubble. Few have been excavated but, of those that have, a number were found to contain a stone-lined cist or a burial pit at their base. Several cists have also been found without a covering cairn: this is thought to be the result of the removal of cairns through, for example, field clearance (Robinson 2007, 102).

By analogy with similar features on the mainland, these cairns may date to c 2000–1500 BC, a period associated with the laying out of field systems, the beginnings of widespread archaeologically visible house structures, and individual burials (cf Ratcliffe and Johns 2003, 8).

Middle Bronze Age

The early field system discovered during the watching brief, comprised of ditch [17] and wall 25, if contemporary, can be seen to post-date cairn 26. The short distance between the two, 6m–7m, implies that they may represent successive re-ordering or modification of near-contemporary fields, or may represent a trackway. An abundance of pottery likely to date to the Middle Bronze Age was found within and over wall 25, suggesting that the field system may be contemporary with the settlement features. However, the presence of a granite bowl mortar within the structure of the wall suggests that an earlier settlement pre-dated construction or repair of the wall.

The pottery recovered from both the wall and the houses is remarkably homogenous and suggests a broadly contemporary date for them. On the other hand the incorporation of two saddle querns within the walls of house structure 12 suggests that the settlement may have grown over a period of time,

additional houses being built to accommodate a growing population, or again that material from an earlier settlement was deliberately incorporated into the structures. Evidence from other Middle Bronze Age sites suggests that querns have been used symbolically in the 'closure' of structures. Parallels for the incorporation of querns within walls is limited, although a quern was apparently in the wall of a possible Bronze Age hut at Bar Point, St Mary's (Butcher and Johns, forthcoming), and a quern fragment was incorporated, along with a number of broken mullers, within a roundhouse wall at Callestick (Jones 1998–9, 12, 28); two querns were incorporated in a Middle Iron Age enclosure bank at Trenowah near St Austell (Johns 2008). Radiocarbon date 3045 ± 42 BP (Wk-19902) from a sherd within context (16) from structure 13 calibrates to 1420–1130 BC (95 per cent probability) and probably dates the main group of plain forms of pottery on the site.

The settlement site is sheltered from the prevailing south-westerly airstream, although open to northerly or north-easterly winds, and occupies a similar position in relation to local topography to that of Porth Gimble, to the north, the site of one of Charles Thomas' proposed 'founder settlements' on Scilly (Thomas 1985, 104–5). In addition the presence of the nearby well is evidence of a source of freshwater that is likely to have been there throughout prehistory.

The date of and reasons for the abandonment of the settlement are unknown; no Iron Age or Romano-British pottery was recovered, suggesting a latest date for occupation in the Late Bronze Age. The large number of prehistoric pot sherds in the deposits within the house structures suggests the possibility of a process of ritual abandonment or closure, as recorded at excavated sites on the mainland (for example, Nowakowski 1991; Jones 1998–9; Jones and Taylor 2004). However, this hypothesis could only be tested by further excavation.

The presence on either side of the walls of the house structures of midden material consisting of large quantities of limpet shells, within which were a number of potsherds of medieval date (and few sherds of prehistoric date), sealing the prehistoric abandonment deposits, suggests that the house structures were visible in the medieval period. Their survival above ground, presumably as ruined walls, may have provided perches or seats for people engaged in the processing of

the limpets. Alternatively, the remains of the settlement, perhaps a derelict site, may simply have represented a convenient place to dump domestic rubbish. The extent of the midden shown by the geophysical survey (Fig 3) might therefore define the size of the prehistoric settlement, or at least that part of it which survived into the period at which the midden was created.

Post-Roman and early medieval

The appearance of imported E-Ware and early Grass-marked gabbroic pottery may attest to the re-emergence of a focus of human activity in the vicinity of the site. The concentration of these finds in the layers within the house structures begs the question of whether the houses were being re-used, either as houses or in some other way, in this period. Sherds of early Grass-marked pottery were also found within the midden (20) covering the houses.

This activity could represent new settlement of Scilly in this period, or perhaps a shift in the pattern of occupation, possibly enforced by encroachment of the sea during an episode of submergence, onto land not occupied for settlement since the Bronze Age. Alternatively, during the period between the Bronze Age settlement and the post-Roman activity, this area may have been used solely for agriculture, although some artefacts from the Iron Age or Romano-British periods might be expected to appear in the assemblage if this were the case.

Medieval

Some problems arise in the interpretation of the medieval deposits from the site. The 1999 evaluation identified two stratified medieval phases in trench 3, a gravelly soil (4) overlying midden deposits (3), (6) and (8) (Ratcliffe 2000, 8, fig 6). However, layer (4) contained predominantly Grass-marked pottery of eleventh- or twelfth-century date while layer (8) below it contained an assemblage weighted heavily towards material from the thirteenth to fifteenth centuries. This may be due to the mixing of deposits through animal and plant disturbance (bioturbation) and ploughing or it may be due to the long life of the earliest pottery. Perhaps more probable is that the deposits are broadly contemporary and the sample area was not large enough to adequately reflect the total assemblage.

All of the contexts covering the prehistoric structures were rich in medieval pottery (as well as Bronze Age and post-medieval material). However, patterns in the finds assemblage can be discerned: the midden material (20) was particularly rich in pottery dating to the fourteenth to sixteenth centuries, as were layers (14), (15) and (16). If the Bronze Age material is ignored (assuming it to be so abundant in the layers below that bioturbation has mixed it with the layers above) then a date can be suggested for intensification of activity around the prehistoric settlement in the late medieval period, with the midden being deposited between the fourteenth and sixteenth centuries, presumably from a settlement in the near vicinity.

In consequence, a number of cautious suggestions can be made about the settlement and the wider environment. Firstly, the coastline may have assumed the form it takes today by this period: that is, sea level rise had engulfed the land between Old Grimsby, Norwethel, Tèan and the western end of St Martin's, ensuring that a source of limpets was available close by. Second, the increase in activity might be associated with the construction of the nearby settlement and harbour of Old Grimsby. The concentration of the midden within and against the Bronze Age houses at Dolphin Town suggests that they were extant as at least partly standing features when the midden was created. If the latter is true, the extent of the Bronze Age settlement, at least as it may have survived into the medieval period, might be expected to coincide with the extent of the midden deposit recorded by the geophysical survey.

Post-medieval

The relatively small quantity of post-medieval finds from the site, compared with the medieval assemblage, suggests that the nearby medieval settlement went out of use and that the land it had occupied returned to agriculture during this period. The presence of a saddle quern of Bronze Age date within the structure of wall 33, itself likely to be of early post-medieval origin, reinforces this interpretation: the robbing of stone from the prehistoric settlement, including perhaps the quern, probably led to the disappearance of its above-ground remains, aided by ploughing across the site and the consequent colluviation. Indeed the wall may even have been situated over the settlement precisely because of the access to plentiful supplies

of stone rubble. These changes may themselves have coincided with the rise of Dolphin Town as a focus of settlement.

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Halligye fogou: excavations 1980–82

BILL STARTIN

Investigations at Halligye fogou in the early 1980s involved clearance of post-medieval deposits from the fogou, recording of the structure, examination of thin basal deposits and a limited exploration of the associated enclosure. The fogou and first settlement enclosure appear to have been constructed at the same time in the fifth or sixth centuries BC. The northern creep was shown originally to have exited via a doorway structure into the ditch of a surrounding enclosure; at a later stage this doorway was blocked and the enclosure ditch was enlarged. No basal deposits were discovered that could be related to the original use of the structure, suggesting that it was cleared and sealed at the end of its life, but it apparently continued in use and subject to alteration until at least the immediate pre-Roman period. The enlarged enclosure ditch was backfilled during or after the fifth century AD. The pottery assemblage recovered has a date range from 600 BC to c AD 1100 but the limited investigations recovered no pottery from the second and third centuries AD.

The excavations at Halligye fogou, Treloarren, Mawgan-in-Meneage (Fig 1), were carried out by the author on behalf of the then Directorate of Ancient Monuments and Historic Buildings of the Department of the Environment, mainly in September 1980 and May 1981 (Startin 1981; 1982); further observations were made during site work in spring 1982. The extent of the examination was largely limited to that required as a prelude to repairs to the robbed southern end of the straight passage, both to secure the surviving standing structure and to provide safe access for visitors. The opportunity was also taken for further study and recording of the surviving structure and limited exploratory work to follow up antiquarian accounts of a surrounding enclosure. Although a preliminary report had been produced by the mid 1980s and was subsequently made available to the Cornwall Archaeological Unit and those who inquired, full publication has been badly delayed. The original works were carried out by the Department of the Environment before the creation of English Heritage in 1984. Subsequently the author must take responsibility for the lack of progress until the report work was transferred in the mid 1990s

into the general backlog programme for sites now in the care of English Heritage. The delay since then is simply an illustration of the overall size of that backlog and the relatively limited resources available for tackling it. ‘Time goes, you say? Ah no! Alas, Time stays, we go’ (Austin Dobson).

The site

Christie (1979, 191) notes that the fogou at Halligye does not appear to have attracted the notice of Cornish antiquaries until the beginning of the nineteenth century. Thereafter several accounts and illustrations of the structure were published, notably by Blight (1866; 1885), Iago (1885) and Vyvyan (1885). Prior to the excavations and subsequent re-presentation, the site had changed little since these early descriptions (Fig 1d).

Blight (1866; 1885) and others suggested that the fogou lay within an enclosure. Figure 2 shows an aerial view of the site looking towards the north west; it can be seen that, apart from the south-western boundary which cuts straight across the landscape, there remains the suggestion of

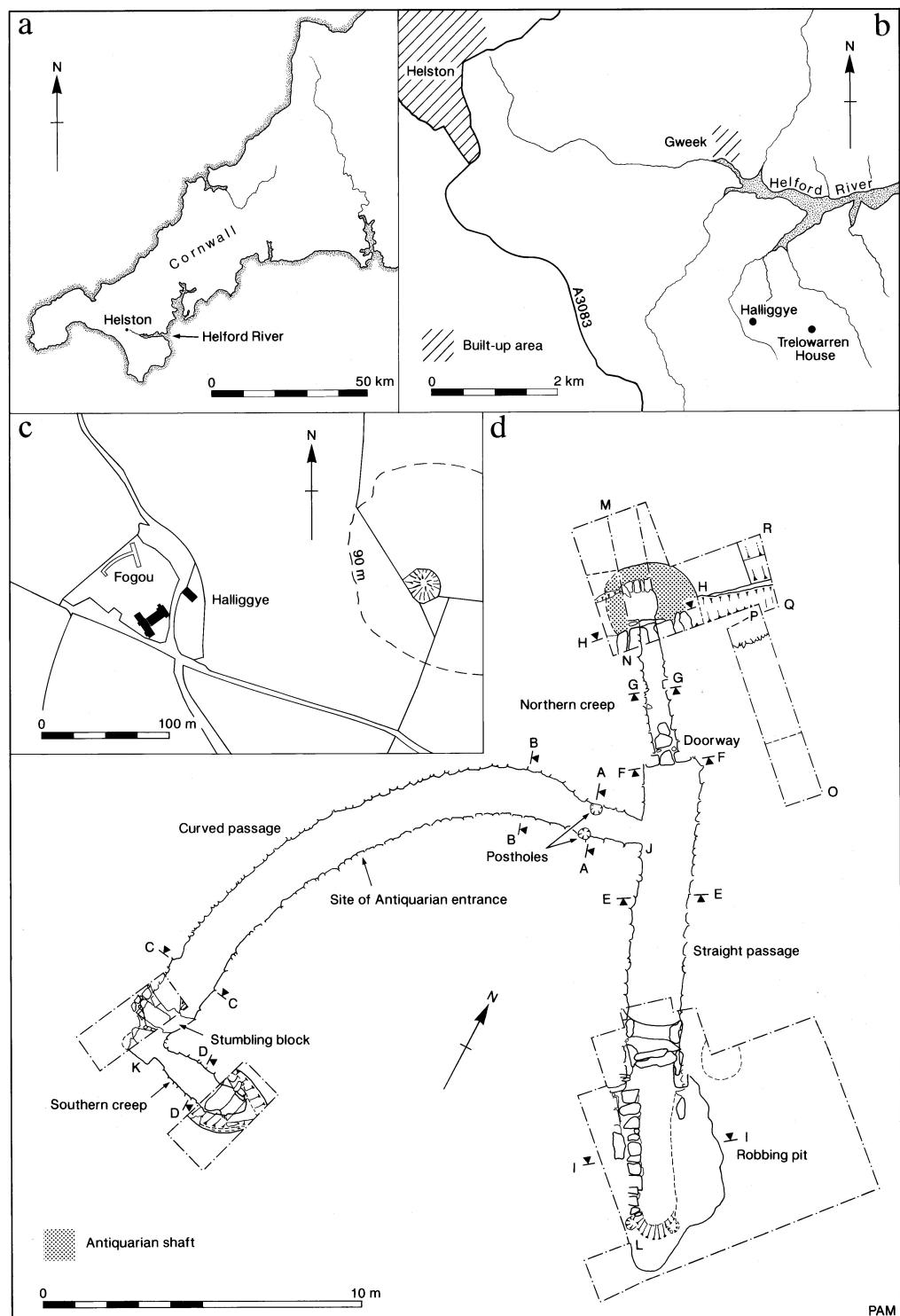


Fig 1 Location and plan of Halligye fogou

an enclosure respected by the field boundaries, especially on the eastern side. The fogou lies adjacent to and beneath the north-western boundary (Fig 1c). The 'enclosure' is on high ground which slopes away steeply to the north west but is approached by fairly level ground from the south east. The natural bedrock is Meneage Crush Breccia, the surface of which has been subjected to periglacial conditions (Geological Survey of Great Britain (England and Wales) sheet 359).

The fogou, located at NGR SW 713 239 and most recently described by Christie (1979), is a large and complex example. Constructed of rough dry-stone walling and massive capstones, it is now entirely subterranean and prior to excavation consisted of (Fig 1d):

1. A main curving passage, 1.2m wide and 1.8m high and more than 16.5m long, orientated north east – south west. This terminates

against natural rock at its south-west end, just beyond a feature interpreted by antiquaries as a 'stumbling block'.

2. A short 'creep' passage running south from the south-west end of the curved passage.
3. A straight passage running north-south measuring 8.4m long by 1.63m wide by 1.8m high; this is connected to the curved passage by a well-constructed doorway 0.68m wide by 0.9m high.
4. Two further straight 'creep' sections, extending north from the straight passage via a well-built doorway and exiting, according to antiquarian descriptions, into the now filled ditch of the surrounding enclosure.

The only previous discoveries from the fogou, recorded by Vyvyan (1885, 258), were 'a vase containing ashes, and a rude cup – both of Celtic manufacture'. He also noted the presence of bones resembling those of deer.



Fig 2 The modern settlement and landscape at Halligye, looking north west, photographed by RNAS Culdrose on 10 December 1981 (PO69/4). (Photograph: MOD Property, © Crown Copyright.)

The excavations

The principal aim of the 1980 excavations was to clear the collapsed southern end of the straight passage. This involved more work than predicted in that the passage was shown to have extended several metres further south, this section having been largely robbed and backfilled, probably in the sixteenth or seventeenth century. The backfill had been partly revetted within the passage by a rough dry-stone wall that antiquarians had assumed to represent the genuine end of the passage. In order to excavate this robbed section a trench was opened that extended well beyond the limits of the passage (Fig 1d); however, the surface area was not excavated below the level of modern disturbance.

In addition, the northern field boundary was partially examined at a point where site access was planned; this work was completed in 1982.

The 1981 excavations were mainly concerned with the clearance of the remaining post-medieval deposits in the fogou, the recording of the structure, and the examination of any surviving basal deposits. However, it was also decided that the antiquarian shaft sunk to discover the northern 'exit' (Vyvyan 1885, 257) should be re-opened and the presence or absence of a ditch should be confirmed. In addition, trenches were opened above points of limited collapse at the south-western end of the curved passage and in the south creep.

The fogou

The structure was built within a rock-cut trench and then covered over. Although much of the structure might have been masked by the rampart of the enclosure, at least the southern part of the straight passage must have been clearly visible as a mound when first constructed. The change in levels is obvious on site on the western side of the straight passage, further emphasised by a later property boundary. However, later deposits, up to 0.8m deep, built up to the level of the tops of the capstones.

The floor of the fogou was generally very rough, largely as a result of the nature of the rock into which it was cut; even so, no basal deposit was discovered that could be related to the original use of the structure. In fact, the only deposit apart from shattered rock pre-dating the post-medieval backfill was a discontinuous layer of grey-black silty soil, much disturbed, up to 10 cm deep, in

the lowest part of the fogou (where the curved passage joins the straight passage). This deposit, well worm-sorted, appears to have been formed by water and worm action, material presumably having percolated through the structure of the fogou.

For further description the fogou can be divided into several sections:

The curved passage and south creep

When investigations were begun, the fogou was entered via a hole in the wall of the curved passage (marked as 'Site of Antiquarian entrance' on Fig 1d); however, this entrance was not original and, since both the curved passage and the creep ended against bedrock and were fully roofed with capstones (Figs 5, 6), access during use was apparently only via the well-built doorway from the straight passage (Figs 1d, 7). However, entrance could have been gained by lifting capstones, as appears to be indicated for souterrains elsewhere (Warner 1979).

The curved passage is apparently of one build with the straight passage, but study of the wall elevations (Fig 3) would suggest that it originally ended at the so-called 'stumbling block' and that the far end and the southern creep were a later addition. The base of the creep is of smooth hard rock, an altogether different quarrying problem from the upper crushed breccia elsewhere, and it seems probable that the 'stumbling block' has no more significance than being an unquarried outcrop of harder rock (Fig 6). However, deliberate changes of levels are known in Irish souterrains (Warner 1979).

No exit was apparent from the south-west end of the curved passage, although it remains possible that one was removed when it was remodelled and the southern creep added.

From our limited examination little more can be said about the construction of this passage except to note that the roof slabs appear to have been laid in sequence starting from the original south-west end. The excavations above the curved passage and the creep showed only that the construction trenches had been backfilled with clean, re-deposited natural breccia and that the roof slabs appear to have been laid more or less flush with the ground surface at the south-west end of the curved passage.

Within the narrow north-east end of the curved passage, where it connects with the straight

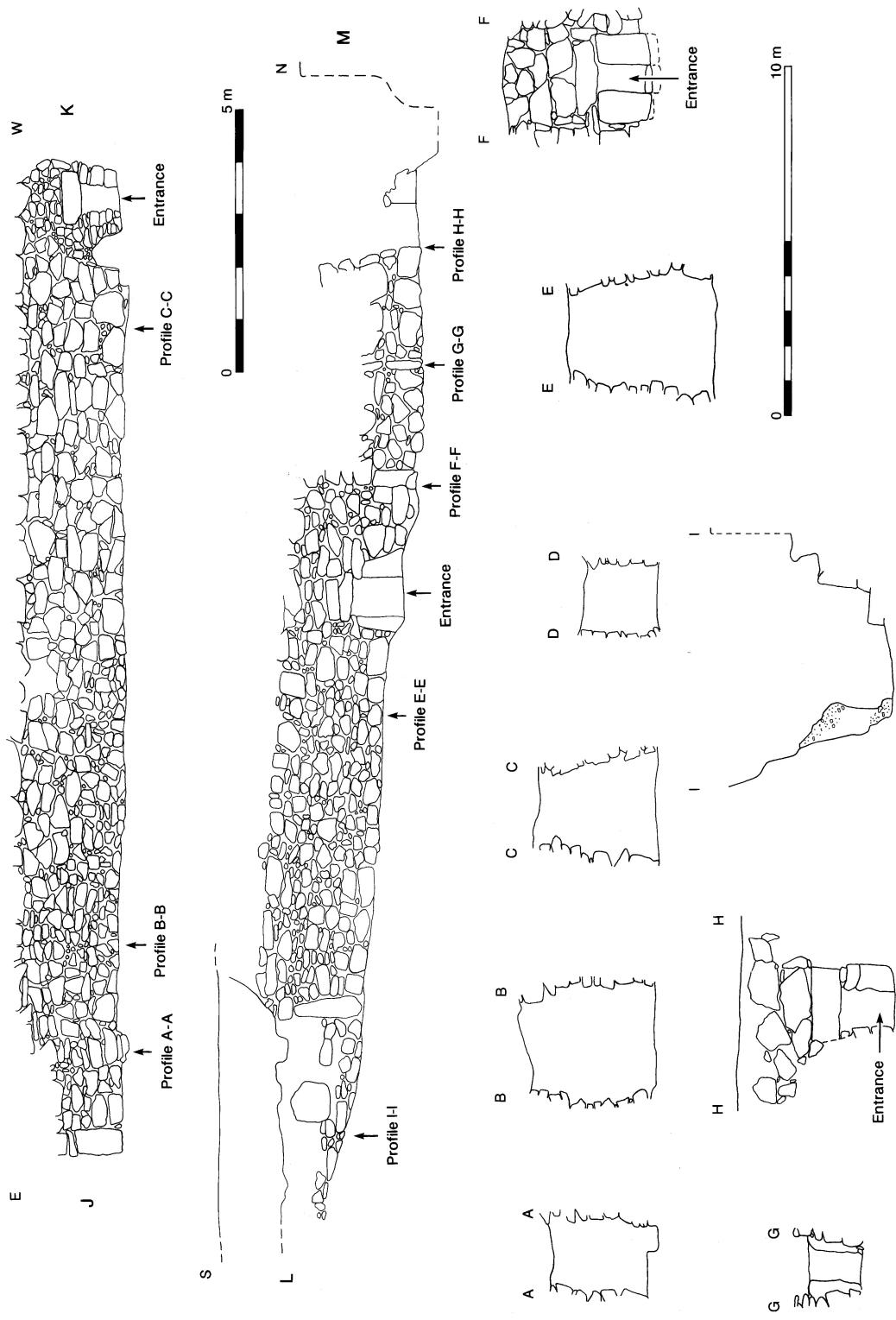


Fig 3 Elevations and profiles within the fogou



Fig 4 Excavated sections of field bank and ditch at the northern end of fogou

passage, two shallow postholes were discovered (Fig 1d). These contained packing stones and were otherwise largely filled and sealed by the same grey-black silty soil which covered the floor of the fogou in this area. However, this layer was heavily disturbed, containing among other things a modern house brick, and it cannot be demonstrated that these postholes did not result from modern usage of the fogou, perhaps during the last war (information from local residents).

The straight passage

The doorway at the southern end of the northern creep has clearly been inserted into the original structure of the straight passage (Fig 7); presumably the creep was at some stage extended southwards into the straight passage and, accordingly, the internal faces of the original northern end of the straight passage could not be examined. Moving southwards, the passage was constructed initially to end at a point some 2.1m beyond the present standing structure (Figs 1d, 8). At a later stage it was shortened, the floor at its original end was

lowered by some 0.6 metres, and a longer narrower passage (the 'robbed section', below) added to the remaining structure. When this took place, the last 2.6–2.8m of the present standing structure appears also to have been partly rebuilt (shown by a slight alignment change and somewhat different stonework), possibly as a result of the lowering of the floor but also presumably to ensure structural stability at its new end. The little that was examined of the construction trench fill of the straight passage showed that it consisted either of rocks or clean redeposited breccia.

It is suggested below that there may have been an exit to the settlement at the southern end of the robbed section; similarly, there may also have been an original exit from the first phase of the straight passage.

The robbed section of the straight passage

This section is about 4.3 metres long with a floor that slopes upwards but still finishes at a level some 1.6m below what was apparently the contemporary ground surface. The passage was



Fig 5 The curved passage, looking south west. (Photograph: Department of the Environment Photographic Section, J95-4-82; 24 March 1982. © Copyright English Heritage.)

extensively robbed at some time prior to the first antiquarian descriptions of the monument. The backfill was at one time revetted in the mouth of the standing structure but a later disturbance either broke through this or occurred around the collapse of it; before excavation it was necessary to remove a concrete slab which sealed the deposits.

The robbing cannot be accurately dated but had certainly occurred by the time of the antiquarian interest in the nineteenth century (Christie 1979, 191); the earliest plans and accounts show no knowledge of the continuation of the straight passage. The bulk of the pottery from within the backfill layers dates from the sixteenth-seventeenth

century to the modern day, although earlier sherds are represented, and it would seem reasonable to assume that the robbing took place during this period; the 'antiquarian entrance' might also date from this time.

The sequence of deposits within this section suggest that it was robbed and largely backfilled soon after. On the western side, the bottom courses of the structure survived (Fig 8); elsewhere the lower part of the construction trench fill of rubble stood virtually intact whilst the initial backfill was composed of collapsed construction trench fill and material derived from overlying deposits. It is possible that the stone 'robbers' merely took



Fig 6 The south-western terminal of the curved passage, with the entrance to the southern creep to the left and the 'stumbling block' in the foreground. (Photograph: Department of the Environment Photographic Section, J95-1-82; 24 March 1982. © Copyright English Heritage.)

what was easily obtained and stopped when they reached the main structure, which may have become unstable; the lower courses of the west side seem to have been protected from robbing by the collapse of a large roof slab.

Allowing that stones of a similar size to those remaining were probably used throughout this section, we can reconstruct the passage as having been 4.3m long by about 0.6m wide (Fig 1d). No estimate can be given of its height and we cannot tell whether there was originally an exit at its southern end, although the way the floor slopes up suggests that this might have been the case. Evidence from elsewhere (Giot 1973; Warner 1979) indicates that fogous (souterrains)

were entered via vertical shafts. In contrast to the construction fills encountered elsewhere, those for this section included occupation debris, presumably derived from occupation remains pre-dating its construction.

The northern creep

The creep can be divided into two sections separated by a doorway (Fig 1d); as noted above, the southern section is a later addition within, presumably, the original northern end of the straight passage. The northern end of the creep exited via a well-built doorway (Figs 1d, 3 (section H-H), 9) into the enclosure ditch (below). Directly behind

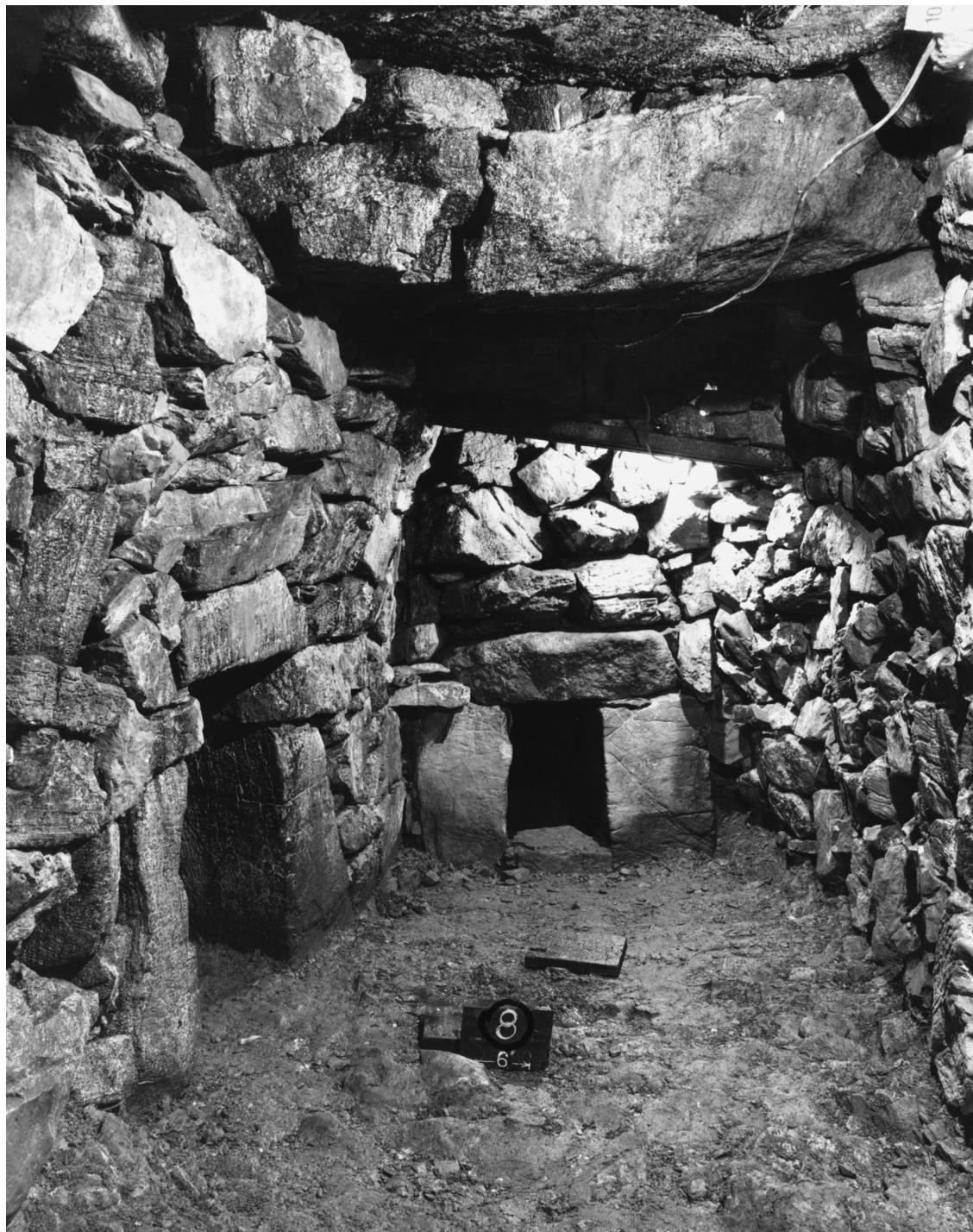


Fig 7 The northern end of the straight passage and entrance to the northern creep, looking north. The entrance to the curved passage is to the left. (Photograph: Department of the Environment Photographic Section, J95-8-82; 24 March 1982. © Copyright English Heritage.)



Fig 8 The robbed section at the southern end of the straight passage, showing on the west side both a remaining stone (set back) from the original southern end and the surviving lower courses of the later remodelling. (Photograph: Halligey archive. © Copyright English Heritage.)

the door dividing the two sections (Fig 10) and within the wall of the inserted section were gaps in the stonework, possibly for a drawbar. In order to insert the southern section, the floor of the original passage had been quarried and then levelled; apart from the material used in the levelling, some of the grey-black silty soil described above, and backfill of antiquarian excavations (below), there were no archaeological deposits surviving within the creep.

The enclosure ditch

Antiquarian sources had suggested that the northern creep originally exited into the ditch of a surrounding enclosure; following re-excavation of the antiquarian shaft sunk to locate the entrance, our trench was extended to elucidate the nature of the deposits at that point.

The northern creep was shown to have exited via a well-made doorway structure some 2.2m below the present day ground surface and at the base of what may have been a flat-bottomed ditch (Fig 9). At a later date the entrance was blocked

and a deep ditch dug across the front; part of the blocking of the entrance within the original ditch was roughly revetted to form the new ditch face (Figs 4, 9). Because of the limited nature of our excavations and the presence of the later ditch, the description of the earlier ditch as flat-bottomed is uncertain; this may merely have been so where the fogou exited.

The later ditch was not fully excavated and little can be said other than that it was more than 3m deep and 3m wide and apparently deliberately backfilled, probably during or after the fifth century AD.

The rampart

The northern field boundary was partly examined at the point shown on Figure 1d. Although this examination was limited, it suggested that the boundary had originally been a rampart made up of quarried breccia which had later been cut back and stone faced to give it its present form (Fig 4).



Fig 9 The door structure providing access to the northern creep from the enclosure ditch, with the later blocking wall and later, deeper ditch in the foreground.
(Photograph: Halligye archive. © Copyright English Heritage.)

The enclosure

Our excavations clearly demonstrated the presence of an enclosure, as suggested by the topography (Figs 1d and 2). Its ditch on the south-east side is now presumably marked by the modern track (Fig 1d) while the modern western boundary may

have been formed at a tangent to the original – now disappeared – earthwork. It is tempting to suggest that there may originally have been an entrance to the earthwork where the present access leads up to it from the south.

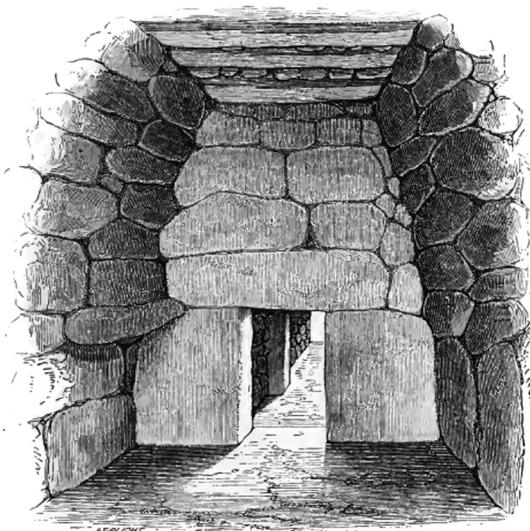


Fig 10 J T Blight's depiction of the northern end of the straight passage, showing the inserted doorway of the extended creep, the doorway at the southern end of the original creep beyond, and the exit to the ditch beyond that (Blight 1885, pl 4). Blight shows the further end of the passage open, at the point where it exits into the enclosure ditch, although it is clear from his description of the site, written in the 1860s, that the ditch was at that time infilled and this access blocked.

Other occupation traces

Our examination of the interior of the enclosure was limited to the area above the robbed section plus the information revealed by the stratigraphy cut by the robbing. The level of the top of the natural bedrock was some 0.8m below the apparent later occupation surface, sealed by tips of dirty re-deposited breccia. The bedrock in this area may have been lowered during building operations but the surrounding levels suggest that, if so, it was not by much; it is noticeable that this bedrock level is some 0.8m below the level of the tops of the roof slabs of the straight passage although subsequent deposits built up to that level. The bedrock surface was not examined but there appeared to be occupation traces upon it and one feature cut through it was visible in the side of the cut for the robbed section (Fig 3); these traces may belong to the first phase of the straight passage.

The surface of the dirty re-deposited breccia, presumably laid down when the robbed section was constructed, was not examined in detail but one feature, which yielded a fragment of samian dated to the late first century AD (Flavian), was obvious within the cleared area on the east side of the robbed section (Fig 1d). Two robbed-out features in the southern end of the robbed section may have formed part of the structure of the fogou.

Chronology

The excavations were largely concerned with clearing material re-deposited after stone-robbing or antiquarian examinations and, as a consequence, little material was recovered from closed or primary contexts. However, many fragments of pottery show uneroded break surfaces and are therefore likely to be close to their original location; some indications of chronology can be given.

The pottery ranges in date from around 600 BC to 1100 AD or later, a range apparently unparalleled in Cornwall. The foundation trenches of the fogou as originally constructed are filled with clean, re-deposited natural and it is reasonable to assume that the fogou and the first settlement enclosure were constructed at the same time, in about the fifth-sixth century BC. The available evidence for the construction of the robbed section of the straight passage of the fogou suggests a date for this work in the period 100 BC to 50 AD. A feature in the area alongside the fogou yielded a samian sherd of late first century date but there may have been a break in the occupation of the site in the later second and third centuries AD, with pottery clearly of this period not represented in the collection. There is pottery dating from the fourth century AD onwards and the final filling of the later enclosure ditch included pottery from the fifth to sixth century AD. A fragment of pottery from within the fogou suggests it might have remained open until at least the sixth century AD but this is not conclusive. The pottery range suggests that the site may have continued to be used until at least 1100 AD. The robbing of the southern end of the straight passage appears to date from the seventeenth century but the existence of the fogou appears to have been unknown to antiquarians before the beginning of the nineteenth century.

Discussion

Souterrains (fogou being the Cornish term) are an ill-understood class of monuments. They have a restricted distribution, occurring in Brittany (Giot 1971, 157-9; 1973), Cornwall (Christie 1979), Ireland (Warner 1979; this being the most useful recent general discussion of the overall distribution) and Scotland (Wainwright 1953). The date ranges of the Breton and Cornish examples would seem to correspond, running from around the fifth century BC to the first century AD; in contrast, none of the Irish examples can be shown to be earlier than the sixth century AD, although for those in the Cork region (morphologically the ones most similar to the Breton examples) there is little dating evidence (Warner 1979). The Scottish groups may begin as early as the first century BC but are geographically distant with no obvious links with the Cornish, Breton or even Irish traditions. However, we must remain aware that 'souterrain' is a no more specific description than would be 'sur-terrain' and that contemporary structures might have had different functions (see, for example, Gowan (1992) as well as the variety of forms indicated by Warner) whilst non-contemporary structures might have been built for similar purposes.

The Cornish and Breton traditions can reasonably be linked. Although the Breton examples are generally structurally different from those in Cornwall this can arguably be interpreted as a result of different geological conditions. Unfortunately, it is generally the contents of Breton souterrains which have been studied and not so much the structures themselves or any relationships with associated settlements; the contents, as in the Cornish examples, have almost certainly nothing to do with the purposes for which these structures were built, except in the sense that some were clearly deliberately backfilled. As in Cornwall, the Breton souterrains are apparently normally associated with settlement.

The best known Cornish fogou is that which was excavated, along with the associated settlement, at Carn Euny by Christie (1978), who has also published one of the most recent descriptions of Cornish fogous (Christie 1979; see also Cooke 1993, as reviewed by Herring 1994). Their distribution may not be quite as restricted as Christie (1979, fig 1) shows, but in general there is a concentration in the Land's End peninsula. This distribution is similar to that of the courtyard

houses but, excluding as possibly different the two 'above-ground fogous' (Porthmeor and Bosporhennis) described by Christie, courtyard houses appear to post-date the original construction of fogous and we should avoid necessarily linking the traditions (Christie 1978, 332).

It is important to note that three (Treveneague, Halligye and Boleigh) of the remaining six fogous described by Christie are unequivocally linked with ditch and bank enclosures, as is the recently discovered example at Boden Vean (Gossip, forthcoming) and another recent discovery at Penhale round, St Enoder, in mid Cornwall (Graeme Kirkham, pers comm). Two (Pendeen Vau and Boscaswell) of the other three might arguably have been linked with settlement enclosures of 'Cornish hedge' type; Carn Euny is the odd one out in this respect, although its west end is close to the line of a possibly contemporary boundary (Christie 1978, fig 2; 383).

Halligye is one of the five fogous clearly linked to a settlement enclosure. Five points can be made:

1. Although the excavated evidence is not extensive enough to be conclusive, the fogou was apparently part of the original design and provided for a clear access under the enclosing bank into the settlement area. No exit was discovered from the fogou to the settlement, but the way that the floor of the robbed section sloped upwards suggests that such an exit was provided at its southern end, as was the case in some Breton examples (Giot 1973) and in later Irish examples (Warner 1979).
2. Although the ditch access was restricted and from the ditch bottom, it was not necessarily hidden; the outer facade was well-made and arguably meant to be seen although, conversely, it was small and could easily have been covered over.
3. Although the excavated evidence was not extensive enough to be conclusive, the top of the straight passage apparently stood proud of the contemporary ground surface (as also at Boden Vean: Gossip, forthcoming) and would have been clearly visible within the settlement when originally constructed, although the curved passage would have been masked by the rampart. Levels within the site did apparently build up to the level of the top of the straight passage and it could have

been masked from the start by above-ground structures or deliberate landscaping.

4. The entrance function was apparently important enough for it to be restricted, both by a remodelling of the robbed section and by an extension of the northern creep. Pottery from the remodelling may date this to the period 100 BC to 50AD.
5. When the enclosure ditch was enlarged the entrance was intentionally blocked.

Without attempting to explain the function of the curved passage or the southern creep, it was apparently a specific and original function of the fogou to provide access through the enclosure via the straight passage to the area of the settlement.

This entrance function can also be clearly seen in a number of Irish examples – for example, Raheenamadra, Co Limerick (Warner 1979, fig 4:12) – but is absent at a number of others; for example, Ballycatteen, Co Cork (*ibid*, fig 4:10). At Callanafersy, Co Kerry (Habison 1979, 105), one of only three Irish sites I have visited, a ringfort has no apparent entrance except for two souterrains, each entered from the surrounding ditch.

The deposits within the Halligye fogou shed no further light on its original function. The basal deposit, the only one pre-dating the robbing, consisted of a fine grey muddy earth much disturbed by later activity in the fogou. Soil analysis by Dr Helen Keeley of the Ancient Monuments Laboratory could provide little information, but it seems most likely that the deposit was formed of material washed or fallen into the fogou through the interstices between the stones and later worm-sorted rather than an *in situ* accumulation of occupation debris. The scarcity of biological remains within this deposit would suggest that the fogou could well have been sealed for a long period prior to the robbing. There was *no* deposit that can be said to have been contemporary with the use of the structure, although presumably worm action or later disturbance might well have mixed a thin deposit into the washed-in material. The impression given, although the evidence is by no means conclusive, is of a structure completely cleared and sealed when abandoned. A date for when this may have occurred cannot be given, but there is evidence for the slighting of the settlement ditch in or after the fifth century AD and this might provide a context; alternatively, an earlier context might be provided by when the

northern exit was blocked and the ditch enlarged. All of the pottery from within the fogou, including the early post-Roman material (see especially Elsdon and Quinnell, this volume, fig 15, **P105**) can be assumed to have found its way into the fogou after the robbing, although it is possible that the earliest material is contemporary with its sealing.

Since the deposits within the fogou tell us nothing of its function, it remains to consider the settlement itself. Johnson and Rose (1982) provided an admirable resumé of the then current general state of knowledge (note particularly their figure 3, which illustrates both Treveneague (118) and Halligye (137), figure 13, which gives a chronology, and figure 14, which illustrates the limitations of the excavated evidence).

As with the Breton souterrains, the Cornish fogous would appear to be associated with enclosed or unenclosed settlement, although, unlike Brittany (*cf* Giot 1971, 157), there would appear to be no association with cliff castles. At Carn Euny the settlement excavation was undertaken in order to lay out the courtyard houses and little of the settlement phases contemporary with the original construction of the fogou was uncovered; by the time the courtyard houses were being built the fogou either had been or was being altered (Christie 1978, 320-1, 356) and we cannot be certain of its original form. In the cases of Boleigh, Treveneague, Boden Vean and Halligye, the fogous were associated with defended enclosures of the type known as rounds, as was a recently excavated example at Penhale, St Enoder, in mid-Cornwall, some distance away from the previously known distribution of fogous. As Johnson and Rose (1982, fig 3) illustrate, the term round covers a wide range of morphological types. Nothing specific, other than the presence of a fogou, apparently distinguishes these three sites from other rounds. This immediately raises two questions:

- a) Why were these provided with fogous and others not?
- b) Why do fogous not appear in apparently contemporary enclosures of other types; for example, Castle Dore (Johnson and Rose 1982, fig 13)?

This may be partly a matter of discovery. Other rounds may contain undiscovered fogous, but this cannot be the case at Porthmeor (Hirst 1937),

Goldherring (Guthrie 1969) and Trethurgy (Quinnell 2004), and seems unlikely at Threemilestone round (Dudley 1960; Schwieso 1976). Alternatively, it may be a matter of chronology; if the enclosure at Halligye was constructed in the sixth–fifth century BC (that is, contemporary with the earliest pottery found there) it would, on present evidence (Johnson and Rose 1982, fig 13), be one of the earlier rounds and it is possible that fogous were only constructed during a limited early period (*cf* Boden Vean: Gossip, forthcoming), albeit used over a much greater timespan. A third alternative is that the rounds which contained fogous had a special status, particularly considering the communal effort which must have been involved in building them. All of these possibilities can only be further examined by study of the settlements and it is this direction which fogou studies must take; there is little more to be gained from studying the structures in isolation.

The excavations at Halligye were too limited to enable many conclusions to be drawn concerning the settlement. If the enclosure is reconstructed with the ditch on the east side following the modern sunken trackway (Fig 1d, but see also Blight 1866; 1885; Vyvyan 1885), the ditch might enclose an area perhaps 70m across, including the bank (this would be slightly larger than shown by Johnson and Rose 1982, fig 3). The present earthwork morphology would suggest a rather ‘squared’ round, as apparently existed at Treveneague (*ibid*, fig 3: 118) and Boden Vean (Gossip, forthcoming). There is, unfortunately, no complete modern plan of Boleigh to check whether that also had a ‘squared’ shape (*cf* Young 2000–1). Allowing for the bank, the settlement area might have been some 0.3 ha. Hencken (1932) suggests there were two ramparts and it may well be that when the ditch was deepened and enlarged (and the fogou exit blocked) the spoil was partly dumped on the external side.

We know virtually nothing of the nature of the internal occupation of the site. Pottery suggests a date range from the sixth–fifth century BC through to at least the second century AD, if not to the end of the Roman period and beyond, albeit that there is a possible gap in the late second and third centuries AD; the fragment of Flavian samian from a possible posthole certainly suggests active occupation in the late first century AD. The presence of a spindle whorl (Quinnell and Elsdon, this volume, fig 2) suggests some domestic

occupation, even if the presence of a fogou defines special status. Post-Roman pottery from the site could span more or less the entire period to the present day, but it is also possible that the site was abandoned when the ditch was slighted and that the present settlement dates from a later time. In the tiny area excavated the ditch seems to have been deliberately backfilled, possibly in the fifth century AD (the pottery dating is not firm), but since the backfill material may have been derived from earlier deposits it could have happened at any time after this. Elsewhere the ditch and bank(s) have sufficiently disappeared to perhaps argue that this slighting was general but this is not certain and, in any case, occupation on the site could have continued after this.

Quinnell (2004, 211–7, 243–4) has now provided an excellent discussion of what we know about rounds and the contexts within which they were built and used, inevitably providing more questions than answers. I have left reference to this work until now because both the date identified for the commencement of rounds and the depth of the later ditch would put the enclosure at Halligye outside the definition Quinnell suggests for ‘rounds’, and the limited work undertaken at Halligye cannot cast further light on this wider issue. However, as our understanding of the range of Iron Age and Roman sites in Cornwall develops over time, the possibility that the sites containing fogous are different from rounds should clearly be tested. Otherwise, the date at which the ditch at Halligye may have been slighted does fit into the broader pattern of settlement change in Cornwall that Quinnell describes.

Summary

On the basis of current evidence, which is far from conclusive, the following sequence can be suggested:

1. Construction of the fogou and enclosure in the sixth–fifth centuries BC.
2. Curved passage extended and southern creep added, possibly soon after construction.
3. Northern entrance remodelled. Southern end of the straight passage rebuilt. This latter alteration may be dated to the period c 100 BC to 50 AD.
4. Enclosure ditch massively enlarged and the northern exit of the fogou blocked.

5. A possible break in occupation in the late second and third centuries AD.
6. Enclosure ditch slighted, at least in the area excavated, possibly as early as the late fifth century AD.
7. Fogou sealed, possibly at the same time as 4 or 6.
8. Occupation continuing to modern day, possibly following a break.
9. End of straight passage robbed in the sixteenth-seventeenth century.
10. Antiquarian interest from the early nineteenth century.

Function

Christie (1979) and Warner (1979) have discussed at length possible functions for souterrains and fogous. Cooke (1993, but see also Herring 1994) has more recently emphasised the spiritual dimension. This account makes one further contribution in emphasising the apparent 'access' function of part of the design of certain of the Cornish fogous, although this is far from a complete explanation. As Warner has pointed out, a structure with difficult access and restricted sections (creeps) appears unlikely to have been designed for day-to-day storage. A more convincing proposition, as attested in the later Irish literary sources, is for refuge and the storage of valuables. Depending on the nature of the contemporary forms of hostile social engagements, such as raiding, a restricted access to or escape from the site via a 'rear' exit would not be inconsistent with this. Kenneth Lyden (pers comm) has pointed out to me the possible defence against the raiding for slaves that is generally attested for this period. These thoughts do not rule out a spiritual explanation, and the Halligye fogou could easily have provided the structure for an 'oracle' or secret access or exit for spiritual ceremonies. What appears now to be most needed is further information on the nature of the sites that were furnished with fogous.

Acknowledgements

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The finds from Halligye fogou

HENRIETTA QUINNELL and SHEILA ELSDON

with contributions from ROGER TAYLOR, CHARLES THOMAS and DAVID WILLIAMS

An initial report on the pottery from Halligye fogou was completed by Sheila Elsdon in 1982. Work on the publication then lapsed until 1997 when Henrietta Quinnell revised and updated the 1982 report, with final revision in 2005. This revision retained the framework of the report as originally devised by Sheila Elsdon.

In the report original context numbers from the excavation are presented in the form HF1, HF5, HF26, etc. Because of the disturbed stratigraphy contexts have been combined in a number of Context Groups, described below. Some finds are noted as 'not grouped'.

Copper alloy ring-headed pin

Sheila M Elsdon and Henrietta Quinnell

SF1 (Fig 1) Context Group 4, HF23. Ring-headed pin of bent copper alloy; point missing, high lustrous finish. The ring-headed pin has generally been considered a fourth-century BC introduction since Dunning's (1934) study, but recent work – for example, the discussion centred on finds from Rainsborough, Northants, and Crickley Hill, Gloucestershire (Dixon 1994, 242) – demonstrates that the type may have been in use from the beginning of the Iron Age. The only other ring-headed pin from Cornwall, in iron, comes from Harlyn Bay, with a possible initial date of fourth to third centuries BC for the beginning of the cemetery (Whimster 1977, 83). The closest find geographically for a copper alloy pin is Mount Batten in Devon (Cunliffe 1988, 65, and fig 34).

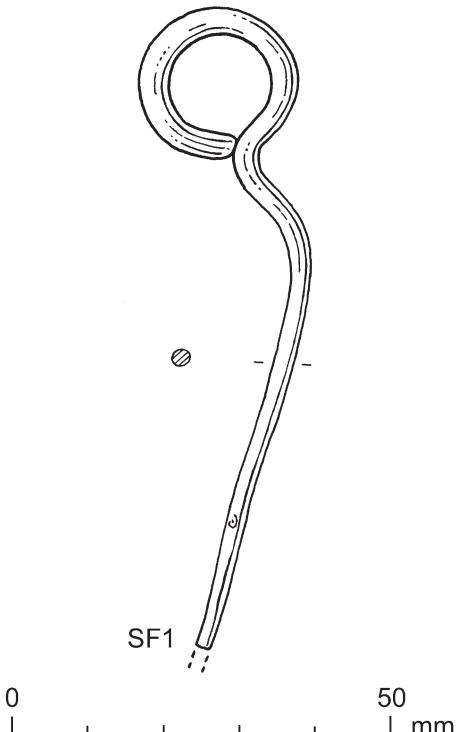


Fig 1 **SF1.** Ring-headed pin, copper alloy. Context Group 4. Scale: 1:1 (Drawing: Jane Read.)

Beads, spindlewhorls and slate 'needle'

Sheila M Elsdon and Henrietta Quinnell

SF2 (Fig 2) Not grouped, HF1. Tool with small, chisel-like point for boring, local Mylor slate;

central hole bored from each side. Similar to, but slightly smaller than, the slate 'needles' from the Harlyn Bay cemetery (Whimster 1977, 78).

SF3 (Fig 2) Context Group 4, HF7. Large spindlewhorl in local Mylor slate, hole bored from both sides, worn edge, 42g but broken. Comparanda may be found among the slate disc group from Castle Gotha (M Irwin in Saunders and Harris 1982, fig 11).

SF4 (Fig 2) Context Group 8, HF90. Pottery spindlewhorl manufactured from gabbroic clay, 15g. Spindlewhorls made from gabbroic clay, as opposed to the more frequent finds re-using pot sherds, occur occasionally in the Cornish Iron Age, for example in the structure set into a Bronze Age barrow at Glendorgal, Newquay (Dudley 1962, fig 5) and at Trevelgue Head cliff castle (Quinnell 2011, fig 11.7 no 279b).

SF5 (Fig 2) Context Group 3, HF26. Spindlewhorl in local Mylor slate affected by heating from Carnmenellis granite, hole bored from both sides, 13g but broken.

SF6 (Fig 2) Unstratified. Bead, flattened biconical cross-section, 30mm diameter with 3mm perforation. Fine-grained elvan of local origin. Parts of sides show wear from rubbing against other beads in string. A bead in gabbro rock of similar size and profile comes from Trevelgue (Quinnell 2011, fig 11.6 no 501); Trevelgue also has a similar bead made from gabbroic clay (*ibid.*, fig 11.6 no 388A), and three identical beads come from the Late Early Iron Age at Boden Vean (Quinnell, forthcoming a).

The pottery

Sheila M Elsdon and Henrietta Quinnell

Character and presentation of the assemblage

The assemblage consisted of approximately 1214 sherds weighing 37,484g representing a continuous sequence from the Early Iron Age until the early medieval period, with a further 284 sherds of medieval, post-medieval and recent date. It is characterised by five features. Firstly, few contexts produced many sherds. Secondly, there were few closed contexts and much of the pottery had been re-deposited. Thirdly, much of the pottery came from contexts which either were only partly excavated, such as those predating the extension to the fogou, or which were to some extent disturbed, such as those in the robbed fogou infill. Fourthly, there were many large sherds with fresh breaks, but comparatively few joins were found indicating that parts of some vessels remain in unexcavated areas; this also implies that most sherds had not been moved far before final deposition. The average sherd size was 31g, compared for example with 9.4g from Trevelgue Head (Quinnell 2011, table 7.1). Finally, the collection has a long range, from perhaps 600 BC to 1100 AD or later, a range almost unparalleled from a Cornish site.

The stratigraphy at Halligye is of limited help in determining the chronology and sequence of ceramic forms present. The assemblage is therefore presented with contexts grouped together as Context Groups (CG), with actual context numbers

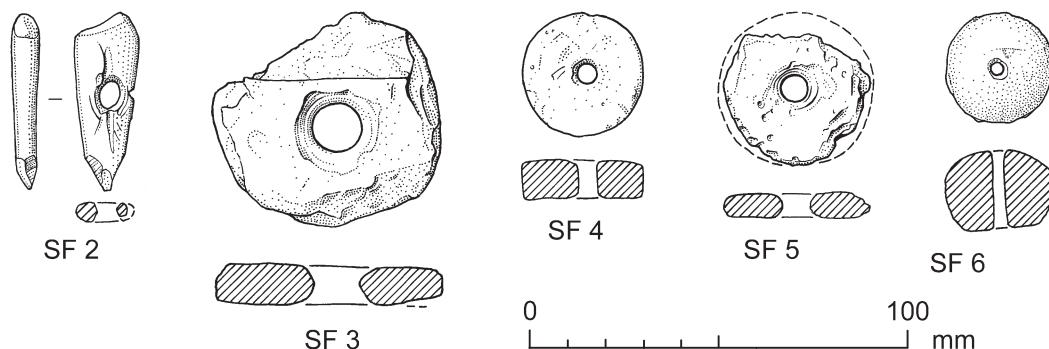


Fig 2 SF2, slate 'needle', not grouped; SF3, slate spindle whorl, Context Group 4; SF4 pottery spindle whorl, Context Group 8; SF5 slate spindle whorl, Context Group 3; SF6, elvan bead, unstratified. Scale: 1:2 (Drawings: Jane Read.)

(for example, HF5) given for each enumerated piece. Significant pieces not otherwise represented are noted as 'not grouped'. Illustrated vessels are described following the recommendations of the Prehistoric Ceramic Research Group (1992); a more detailed version of these descriptions is filed with the archive.

The chronology of the ceramic sequence

Pottery, mainly of gabbroic fabrics, was made and used in west Cornwall in a continuous sequence from the Iron Age until the early medieval period. While the overall sequence is now reasonably well understood, much chronological and typological detail remains unclear. This is largely because on most sites stratigraphic deposits contain residual and intrusive material, and few of the closed groups found are associated with either datable artefacts or radiocarbon dates. For a site on the Lizard, close to the presumed source of gabbroic clays, the situation may be complicated by the presence of forms which do not occur elsewhere, as indicated by the published multi-period collections from Carngoon Bank (Smith 1980) and from Polcoverack – Poldowrian (Smith 1987).

Recently the completion of work on the 1939 excavations at Trevelgue Head cliff castle near Newquay has provided a much clearer framework for Early and Middle Iron Age ceramics, the latter supported by a series of radiocarbon dates (Quinnell 2011). In the Trevelgue report, the type series devised for the hillfort of Danebury, Hampshire, has been extended to cover common Cornish types and has been applied to Halligye where applicable. The Trevelgue report has been complemented by that on the assemblages excavated in 2003 from the fogou and enclosure at Boden Vean, St Anthony-in-Meneage (Quinnell, forthcoming a), south of the Helford River, with a long series of radiocarbon dates which relate to the Early Iron Age.

The Early Iron Age

Ceramics of this period, before the third century BC, present a confused picture because few sites have been excavated. Bodrifty (Dudley 1956), West Penwith, provides the longest published sequence but without much stratigraphic separation. However the Trevelgue report (Quinnell 2011) has identified a period late in the Early Iron Age, perhaps from

600 BC onward, represented by a range of jar forms for which the term 'Plain Jar Group' (PJG) is appropriate. These occur at Trevelgue immediately prior to the introduction of Middle Iron Age South Western Decorated Ware (SWD), and at Halligye they are the earliest ceramics present. The dating for this group has been clarified by a series of radiocarbon determinations from Boden Vean (Quinnell, forthcoming a) and from Trenowah, near St Austell (Johns 2008).

The commonest Early Iron Age PJG vessel at Halligye is the carinated jar JB2.4, which typically occurs in various sizes without decoration; for example, **P35–P37, P39** (Fig 8) and **P93** (Fig 14). These JB2.4 jars range from poorly made, usually oxidised, roughly finished pieces to those with well-made compact reduced fabrics with a burnished finish such as **P36**. Versions of JB2.4 carinated jars occur at Carn Euny, with stamped decoration probably of the fifth century BC (Elsdon 1978). Plain versions occur at Trevelgue, Bodrifty (Dudley 1956, fig 9), at Kynance Gate (Thomas 1960), and at Boden Vean (Quinnell, forthcoming a). Other types which should belong to the Early Iron Age PJG are the jar with girth grooves **P43** (Fig 8) for which Carn Euny Type Po 3 (Elsdon 1978, fig 55, nos 25–26) from 'early contexts' (*ibid.*, 400) provides the best parallels, and simple necked jars such as **P18** (Fig 6) loosely related to Carn Euny Po 1A types. Overall, there is a minimum of 26 vessels of this date from Halligye (Table 2).

The Middle Iron Age

This is represented by South Western Decorated Ware, dating from the later fourth to the first centuries BC. Study of the stratified sequence with radiocarbon dates from Trevelgue indicates that South Western Decorated Ware (SWD) starts with an early phase with only the 'Outline' style in the fourth century BC, and a developed phase with 'Standard' and 'Accomplished' styles commencing between 350 and 270 BC and continuing through to the first century BC. The Outline style probably continues throughout the currency of South Western Decorated ware. Vessels appear to be restricted to necked bowls or low jars, which occur in various sizes, all of BD6 form. BD6 vessels are usually well made, reduced and burnished, with a zone of decoration on the shoulder, usually broad tooled but sometimes

rouletted or a mixture of both. The Outline style has rather irregular decoration, with no use of compass in design layout and no infill of design. The Accomplished style has regular curvilinear designs which involved the use of a compass to some degree; these designs frequently have blocks infilled by parallel or cross-hatched tooling. The Standard style has non-curvilinear geometric designs and infilled blocks of tooling. At Trevelgue occasional rouletting and stamping is in use from the Outline style onward.

The basic SWD form BD6 divides into two principal varieties. BD6.1, by far the most common, has rounded shoulders and sometimes slashed neck-cordons and 'rim grooves' or 'lid seatings' on rim interiors. BD6.2 has shoulders of more pronounced shape, decoration usually confined to rouletting and fine tooled lines and, as far as reconstructions allow, an absence of neck cordons and rim grooves. Only BD6.1 occurs in the Outline style at Trevelgue, but consideration of data from Cornwall as a whole suggests that the BD6.2 variety occurred throughout most of the main phase but with greater frequency towards its end. This is a reversal of some previous tentative typological sequences, largely based on finds of rouletted BD6.2 beneath the rampart at Castle Dore (Radford 1951, 80), and accepted by successive workers (Avery 1971; Elsdon 1978; Quinnell 1977; 1986).

At Halligye a larger proportion of SWD is rouletted, and of probable BD6.2 form, than is recorded for any other site, totalling about 20 vessels as against 20 with tooled decoration; there are in addition about half a dozen BD6.2 vessels with lightly tooled simple chevrons such as **P5** (Fig 3). Much of this is in Context Group 1, the construction of the fogou extension and in association with cordoned sherds, probably first century BC to first century AD. BD6.2 rouletted vessels may have had a distinctive symbolism and have been selected for deposition in association with fogou construction.

Broad tooled complex patterns including dimples such as **P24** (Fig 6) in the Accomplished style are less common in Cornwall than simple geometric designs of the Standard style. They occur at Castle Dore (Radford 1951), Trevelgue (numerous examples) and Carloggas, St Mawgan-in-Pyder (Threipland 1956), but are absent at other sites such as Killibury (Miles 1977) and Threemilestone (Schweiso 1976). As with rouletting, it is may

be that functional and symbolic differences are involved in the use of Accomplished designs.

The most distinctive vessels at Halligye which may belong to the Outline style are handled jars **P20**, **P21**, **P51**, **P52** and **P97** (Figs 6, 9, 15). These are not common in SWD in Cornwall, and at Trevelgue are restricted to stratified deposits with only Outline style ceramics. (Rather different handled jars occur in Cordon Ware assemblages of the first and second centuries AD (Carlyon 1987, figs 3 and 6) and through the Roman period (Carlyon 1995).)

The end-date for manufacture and use of South Western Decorated Ware is not clear as there was a degree of overlap with the subsequent Cordon Ware. It was certainly still in use in the first century BC, with evidence now accruing for pieces curated well into the Roman period. **P12** (Fig 4) may represent a Late South Western Decorated phase in which cordons appear alongside South West Decorated decoration.

One side of an iron clamp or 'rivet' for mending a break was noted in a base sherd (GB3/WMG, see below) from Context Group 3. Iron clamps have been frequently noted in gabbroic collections from north Cornwall such as Killibury (Miles 1977, fig 40), Trevisker (ApSimon and Greenfield 1972, fig 23), the Rumps (Brooks 1974, figs 24 and 25) and Trevelgue Head (Quinnell 2011). It appears unusual for pottery to be mended so close to source.

The Late Iron Age

Cordon Ware is now known to appear in the later second century. The generally accepted arguments for deriving this from north French La Tène 3 material, before the Caesarian conquest of Gaul, are set out by Quinnell (1986, 119). Examination of the assemblage from an open settlement at Higher Besore, Truro, supported by a range of radiocarbon determinations, has thrown the first new light on the chronology of Cordon Ware for 50 years (Quinnell forthcoming b). Different vessel forms appear at different stages, with drinking vessels and storage jars introduced alongside South West Decorated cooking vessels in the later second century BC. In the first century BC plain cooking jars gradually replace SWD jars and other forms appear. The vessels at Halligye with slight, elegant, cordons represented by **P32** and **P70** (Figs 7, 10) are much closer in general style to the suggested Breton originals than any other large vessels

so far published. Bowl forms such as **P102** (Fig 15) are fairly close to the originals, but the larger cordoned vessels such as **P68** (Fig 10) have only general similarities. The type series introduced by Threipland (1956) for Carloggas, St Mawgan-in-Pydar, still works well for the classification of Cordon Wares. Cordon Ware generally has often been described as wheel-made, but on close examination proves only to have been finished on a turntable device.

Cordon Ware falls into three chronological groups. The first is purely Late Iron Age and consists principally of 'drinking' bowls of Types F and G (**P102**) and storage jars of Types J and H (**P68**). The second includes copies of, or influence from, forms of around mid first century AD date such as Type R (**P103**). The second group is, like later Iron Age forms, made of compact and often fine fabrics and is finished by thorough burnishing. Its end date appears to be somewhere around the mid second century AD.

The third group represents the continuance of cordoned styles throughout the Roman period and was only clearly distinguished during the 1980s (Quinnell 1986, 120; 2004, 5.6.2). Apart from stylistic differences, the fabric changes to the standard gabbroic fabric in general use during the Roman period, oxidised, well-mixed but less fine than during the Iron Age, and with surfaces generally smoothed rather than burnished. **P108** and **109** (Fig 15) are good examples.

The Roman period

Local pottery is entirely gabbroic, of standard fabric less well made than in the Iron Age and continues to be hand made. The fabric tends to become less well made and to contain larger inclusions in the late Roman period. Forms may reflect continuance of cordoned traditions or in a general way reflect those current in southern Britain, especially those of south-east Dorset black-burnished ware (Holbrook and Bidwell 1991). The general sequence was set out by Quinnell (1986, 129) and with the publication of the large collection from Trethurgy (Quinnell 2004) a numerical type series was proposed which is used for reference in the catalogue. Carlyon (1995) provides a useful compilation of data available up to the mid 1980s. In Cornwall non-local products such as samian **P76** are uncommon, but south-east Dorset black-burnished ware can form a significant

component during the third-fourth centuries (Quinnell 1992, 94). The Roman period collection from Halligye is probably too small for the absence of black-burnished ware, except for the probable first-second century **P101** (not illustrated), to be significant.

The post-Roman period

Fourth-century AD forms, manufactured in gabbroic clays, continued in use during the fifth and possibly the sixth centuries AD at Trethurgy (Quinnell 2004, 111, 178), in association with post-Roman imported wares. At Halligye, Context Group 6, the ditch infill, contains the one closed group on the site with Roman forms such as **P88–P90**, but these are associated with the sixth-century North African slipware bowl **P91** (Fig 13). It is suggested below that the ditch fill represents deliberate infill, and that **P88** is an unusual vessel from its firing and manufacture. Most of the Roman-type forms in the fill may well be sixth century in deposition if not manufacture.

AFRICAN RED SLIP WARE BOWL P91 (Fig. 13)

Charles Thomas (report written 1997)

Five joining sherds, all from HF104, make up a large fragment, about 74 by 85mm, of the rim and upper part of a wheel-made bowl, the rim curvature indicating an external rim diameter of 325mm. The fine fabric, averaging 8mm thick, is 2.5 YR 6/8; there are internal and external remnants of a smooth slip, colour between 2.5 YR 6/8 and 5/8, and internally near the bottom of the fragment the trace of a shallow V-shaped groove. The fractures between the sherds are both sharper and more 'grainy' than those around the perimeter, and my strong impression is that this piece was present on site, not as a complete vessel at all, but as a fragment that came from some already-broken bowl, possibly elsewhere.

In all respects these characteristics are of African Red Slip Ware (ARSW), and are matched by hand-specimens from Morocco and Egypt, and the considerable quantity of known ARSW sherds from Tintagel. The large footed bowl, with externally-thickened rim for handling, is Dr John Hayes' 'Form 103' (Hayes 1972, 157 ff., illus), which he describes as '[R]ather uncommon' and, from known examples, having an external

rim-diameter range of 260 to 355mm (which covers 325mm). The suggested dates (1972) were 'c 500 to third quarter sixth century' but on 'almost entirely stylistic' grounds. Subsequently, in a Carthage report (Fulford and Peacock 1984, 73), on contextual grounds this estimate for Carthage form 64 (= Hayes 103) was refined; 'form first appears c 500 established by c 525–540 seems to become residual in second half of 6th century, perhaps c 575. Date range – c 500 to c 575.'

This is probably all that can be said, chronologically, and the parent ARSW Form 103 bowl will have been among a range of such wheel-made exotics (table wares and containers) brought from their Mediterranean sources to Cornwall during the sixth century. Here, the most that could be inferred is that a fragment from a vessel unlikely to have reached Cornwall before c 525–550 may imply occupation or activity at Halligye in the sixth century; an inference, with general date, that other considerations could support or narrow down. More to the point is the source. Possibly a dozen different ARSW forms are represented among British and Irish finds, the overwhelming bulk of course from Tintagel (Thomas 1988). In some cases there are single sherds; ancient souvenirs, like another Form 104 rim from Iona (unpublished, a large 104 B bowl with rim diameter 420mm), a rim of Form 103 among the Cadbury-Congresbury material, and certainly parts of at least one other Form 103 from Tintagel. It seems unlikely that the Halligye fragment came from as far afield as Tintagel, which lies about 80 km to the north east. I have suggested, on the distribution of such finds in the south west (Thomas 1988, figs 4 and 5) that on a minimal view of these postulated trading voyages there was one along the south coast of Cornwall and Devon. Some major point of importation – perhaps on the Lizard, in the Fal or on the Roseland – almost certainly awaits (fortuitous) discovery.

THE GWITHIAN STYLE

Subsequently, but probably during the sixth century AD (Quinnell, forthcoming a), the Roman-period forms are replaced by the Gwithian Style, first recognised, again in association with post-Roman imports, at Gwithian by Thomas in the 1950s (1968, 314). Gabbroic fabric tends to be high fired. Forms consist of a range of jars, of platters without grass-marking and a series of experimental

or innovative pieces. A comprehensive review of this style awaits publication of the Gwithian assemblage but a preliminary study has been made by Thomas (2005) and a group with an associated radiocarbon determination on residue of cal AD 590–670 (95% probability) (OxA-14560) comes from Boden Vean (Quinnell, forthcoming a). For Gwithian a radiocarbon determination for a Gwithian platter is now available, 1460 ± 27 BP calibrating to AD 550–650 (OxA-14528) (Thorpe and Thomas 2007).

Rapid scanning of the assemblages at Carngoon Bank (McAvoy 1980) and Goldherring (Guthrie 1969) indicate a range of forms at both these sites in addition. Jars such as **P45–47** (Fig 9) with a slack profile, poor modelling and interior rim concavity, but with a good burnished finish, almost certainly belong to this style. The poor modelling and concave rim forms are not known in Iron Age or Roman contexts but comparable examples have been noted in Layer C at Gwithian (Quinnell in Nowakowski 2004). Other forms suggested, again on parallels from Gwithian and a lack of comparanda from sites of other dates, are the jars with more restricted necks **P48** and **P49** (Fig 9), and the small conical vessels **P80** and **P114c** (Figs 12 and 15); the latter have parallels at Boden Vean (Quinnell, forthcoming a).

The unusual vessel **P73** (Fig 11) from CG4 was initially considered both on form and the style of its stamped decoration to be an unusual local sixth-century copy of an Anglo-Saxon vessel from eastern England. Two different stamps were used, 12mm and 15mm in diameter respectively, each with 4 x 3 grid, (cf Briscoe, 1981, A 3a). The only other examples of Anglo-Saxon circular stamps with 4 x 3 grid occur at Illington, Norfolk, 14mm diameter (Myres 1977, no 2153, fig 349) and at Lackford, Suffolk, 11 x 10mm diameter (Myres 1977, no 861, fig 335), and so belong to the distinctive Illington-Lackford workshop: circular stamps with 3 x 3 grid are much more usual.

Recently, however, Thomas (2005) has grouped **P73** with other stamped vessels of the Gwithian Style, plain platters and a jar from Carngoon Bank (Smith 1980, 55–7; fig 18) with stamps of rosette, segmented circle and rectangular cross type, and a platter with a complex rectangular stamp from Gwithian itself. Thomas considers that the derivation of these stamps is from those on African Red Slip Ware (Hayes 1972), examples of which

were imported into Cornwall. This explanation firmly situates **P73** within the local Cornish tradition of experimentation. (Thomas considers, awaiting final analysis of the assemblage, another vessel with a cross stamp from Gwithian (Thomas 1964, 59. GM1000) as a probable eleventh-century import from eastern England, quoting Dunning (1959).) Another fragment, **P96** (Fig 14), a stamped vessel of similar form to **P73**, should also belong to the Gwithian Style.

P73a, **P82a** and **P82b** (Figs 11 and 12) are examples of platters without grass-marking, the latter two being larger and with more substantial side-walls than is usual for Gwithian Style, which typically has minimal or low walls as **P73a**.

The early medieval period: grass-marked and bar-lug pottery

Gabbroic fabric tends to be coarse with large inclusions, roughly smoothed surfaces and soot on exterior. At least 25 vessels are represented. Early (pre- bar-lug) grass-marked pottery continues platters, although none are definitely present at Halligye, and introduces simple straight-sided cooking pots (Thomas 1968, 316) instead of necked jars from the local Roman tradition. The date of introduction may be early in the seventh century (Thomas 2005). Rim sherds can be difficult to distinguish from those of the later bar-lug ware but simple forms such as **P114a** and **P114b** (Fig 15) may belong to the early grass-marked phase.

Bar-lug pottery is definitely and substantially represented, with parts of at least five bar handles present (**P117–P118**) (Fig 15), and perhaps as many as 20 different rims (Thomas 1968, fig 73). Bar-lug vessels are represented by large thick sherds. At Gwithian use of bar-lug pottery was suggested to start by 850–900 AD (Thomas 1968) or perhaps a little earlier and continues until the late eleventh century (Thomas 2005). Hutchinson's (1979) study provides a useful catalogue and argues for slightly earlier dates. However, Thorpe and Thomas (2007) now suggest, following recent work including C14 determinations at Gwithian, that bar-lug and grass-marked ceramics may be contemporary, both with a start date in the seventh century AD.

P119 (Fig 16), and perhaps other less distinctive sherds may belong to Thomas' 'Sandy Lane Style 1' or late grass-marked group, but the cooking pot rims with internal concavity which are common

over southern Britain from the Norman period onward, and which are copied as Sandy Lane Styles 2 and 3, are absent. The date of the first Sandy Lane material should follow on from bar-lug, perhaps c 1100–50 AD.

Medieval, post-medieval and modern pottery

About a fifth of the assemblage is of these dates, mostly from Context Group 4 and from disturbed surface layers (Table 1). No attempt has been made to quantify the vessels represented. It is possible that small sherds of twelfth- or thirteenth-century medieval pottery are present but not clearly recognisable; the earliest identifiable sherd is a mica-dusted piece of probable fourteenth- or fifteenth-century date. Otherwise the sequence seems to start with south Cornish bowls which may be as early as the fifteenth century and continue into the seventeenth century. Much of the pottery may come from kilns nearby at Mawgan Bridge (J Allan, pers comm). There are also coarse wares from kilns at Truro, a little seventeenth-century Barnstaple ware and numerous sherds of eighteenth-century combed ware. Bristol Delft is represented by two sherds. Post eighteenth century to recent pottery is also present.

Fabrics and sources

The archive holds detailed fabric descriptions. Broad characteristics of the main fabrics were described by Dr D Williams in 1982; his study of a range of chronological samples included thin-sectioning and provided confirmation of initial macroscopic identifications. Further microscopic examination of gabbroic and granitic fabrics was carried out in 1997 by Dr R T Taylor whose suggestions for sub-groups are used.

Gabbroic

This comprises the majority of the assemblage, resembling Peacock's Group 1 gabbroic pottery, using the clays of the Lizard (Peacock 1969).

GB1

Typical gabbroic temper with coarse white altered feldspar abundant; the most common category, 84 per cent of the gabbroic assemblage. In use throughout.

Table 1 Sherd and weight counts by fabric and Context Group

| | | GB1 | GB2 | GB3 | GN1 | GN2 | Import | Med/PM | Totals |
|-------------|--------|-------------------|----------------|-----------------|-------------|-------------|--------------|-----------------|-------------------|
| CG1 | WMG | 74/1733 | 2/9 | 12/112 | — | 1/45 | — | — | 89/1899 |
| | STG | 25/354 | — | — | — | — | — | — | 25/354 |
| | Total | 99/2087 | 2/9 | 12/112 | — | 1/45 | 1/181 | — | 115/2434 |
| CG2 | WMG | 6/160 | — | 1/25 | — | — | — | — | 7/185 |
| | STG | 5/108 | — | — | — | — | — | — | 5/108 |
| | Total | 11/268 | — | 1/25 | — | — | — | — | 12/293 |
| CG3 | WMG | 44/1419 | 15/378 | 58/4888 | 2/39 | 1/16 | — | — | 120/6740 |
| | STG | 54/2407 | — | — | — | — | — | — | 54/2407 |
| | Total | 98/3826 | 15/378 | 58/4888 | 2/39 | 1/16 | — | 4/102 | 178/9249 |
| CG4 | WMG | 153/5477 | 30/709 | 35/1407 | 1/22 | — | — | — | 78/7615 |
| | STG | 191/6737 | — | — | — | — | — | — | 191/6737 |
| | Total | 344/12214 | 30/709 | 35/1407 | 1/22 | — | — | 141/5347 | 551/19699 |
| CG5 | WMG | 2/15 | 12/178 | — | — | — | — | — | 14/193 |
| | STG | 66/1596 | 3/71 | — | — | — | — | — | 69/1667 |
| | Total | 68/1611 | 15/249 | — | — | — | 1/10 | 1/4 | 85/1874 |
| CG6 | WMG | 1/31 | — | — | — | — | — | — | 1/31 |
| | STG | 44/1820 | 1/96 | — | — | — | — | — | 45/1916 |
| | Total | 45/1851 | 1/96 | — | — | — | 4/81 | — | 50/2028 |
| CG7 | WMG | — | — | — | — | — | — | — | — |
| | STG | 1/104 | — | — | — | — | — | — | 1/104 |
| | Total | 1/104 | — | — | — | — | — | — | 1/104 |
| CG8 | WMG | — | 1/36 | — | — | — | — | — | 1/36 |
| | STG | 56/1053 | — | — | — | — | — | — | 56/1053 |
| | Total | 56/1053 | 1/36 | — | — | — | — | — | 57/1089 |
| Not Grouped | WMG | 12/426 | 1/13 | 8/203 | — | — | — | — | 21/642 |
| | STG | 281/5542 | 9/71 | — | — | — | — | — | 290/5613 |
| | Total | 293/5968 | 10/84 | 8/203 | — | — | 2/8 | 138/3580 | 451/9843 |
| Totals | WMG | 292/9261 | 60/1323 | 114/6635 | 3/61 | 2/61 | — | — | 471/17280 |
| | STG | 723/19721 | 12/142 | — | — | — | — | — | 735/19863 |
| | Totals | 1015/28982 | 72/1465 | 114/6635 | 3/61 | 2/61 | 8/280 | 284/9033 | 1498/46517 |

Imports: CG1 amphora; CG5 samian; CG6 North African slipware; Not grouped BB1, samian. Total assemblage less medieval / post-medieval, 1214 sherds /37,484g.

GB 2

Using distinctively fine gabbroic clays, equivalent to GA.3 at Trevelgue (Quinnell 2011), 6 per cent of the gabbroic assemblage. In use through the Iron Age and Roman periods.

GB 3

Clay derived from gabbroic rocks, with crushed serpentinite or other local rock temper, a composite category, 10 per cent of the gabbroic assemblage. GB3 occurs only in Iron Age forms and appears to be one of a group of rock-tempered gabbroic fabrics identified in current work on other Cornish Iron Age sites (Quinnell *pers comm*). Serpentinite (serpentine) is a common component of Middle Bronze Age gabbroic 'admixture' fabrics (Parker-Pearson 1990) and GB3 represents a finer version of these in use in the Iron Age. Examples belong to the Iron Age, and a few to the grass-marked/ bar-lug style.

WELL-MADE GABBROIC (WMG)

Has a compact matrix and burnished finish. Represents 29 per cent of GB1, 83 per cent of GB2 and 100 per cent of GB3. It was used for about half the PJG Early Iron Age forms, most of the SWD and Cordon Ware 1 and 2, ceasing sometime in the mid-second century AD.

STANDARD GABBROIC (STG)

More open and lacks a surface burnish. Represents 79 per cent of GB1 and 17 per cent of GB2. It was used for about half the PJG forms, a little in Cordon Ware 1 and 2 and then becomes the sole fabric of the Roman period and continues through until bar-lug wares. The Gwithian Style pieces are distinctively high fired. Distinguishing sherds of different periods in this fabric is difficult unless typological indicators are present.

Table 2 Minimum vessel counts by Context Group and chronological period (medieval and post-medieval not included)

| | PJG | SWD | CORD1 | CORD2 | RB | PR | GW | GM/BL | Totals |
|--------------------|-----|-----|-------|-------|----|----|----|-------|--------|
| CG1 | 1 | 20 | 1 | — | — | — | — | — | 22 |
| CG2 | — | 4 | — | — | — | — | — | — | 4 |
| CG3 | 6 | 19 | 2 | — | — | — | 1 | 2 | 30 |
| CG4 | 17 | 32 | 2 | 1 | 1 | — | 8 | 4 | 65 |
| CG5 | — | — | — | 8 | 4 | — | 3 | 4 | 19 |
| CG6 | — | — | — | 1 | 6 | 1 | — | — | 8 |
| CG7 | — | — | — | — | 1 | — | — | — | 1 |
| CG8 | 2 | — | — | — | — | — | 2 | — | 4 |
| Not grouped | — | 7 | 1 | 1 | 15 | — | — | 15 | 39 |
| Totals | 26 | 82 | 6 | 11 | 27 | 1 | 14 | 25 | 192 |

Granitic

This comprises 0.4 per cent of the local assemblage. All well made with good burnish.

GN1

P30 HF26, and **P65** HF22, together with a body sherd from HF93, have granite-derived temper, especially quantities of muscovite and biotite which give the surface a distinctive shiny appearance. Sherds tend to be average/soft. The source is likely to derive from a kaolinised granite, the nearest of which would be St Austell.

GN2

Represented by two body sherds from HF13 and HF91, with temper deriving from a greisenised granite, the nearest sources either Carnmenellis or St Austell.

Other wares

AMPHORA

P13 HF27, substantial chunk from lower body of either Dressel 1 or 2 to 4 (D P S Peacock, pers comm).

BLACK-BURNISHED WARE

P101 HF2.

SAMIAN

P76 HF18 and rim scrap HF2.

NORTH AFRICAN SLIP WARE

P91 HF105, parts of one bowl.

Petrological analysis 1

D F Williams (DOE Ceramic Petrology Project, Department of Archaeology, University of Southampton)

A representative selection of Iron Age, Romano-British and Dark Age sherds from Halligye fogou were submitted for fabric examination in 1982. All the sherds were studied macroscopically with the aid of a binocular microscope, and many of them were thin sectioned and examined under the petrological microscope. The object of the analysis was to confirm the validity of a provisional fabric identification in the hand-specimens.

Petrology and fabric

1. Iron Age: **P101** HF2. Small sherd of south-east Dorset black-burnished ware (Williams 1977).
2. Iron Age: HF13 and HF22. Both sherds are in a highly micaceous fabric. This sectioning reveals frequent flecks of mica, mostly muscovite but with some biotite, together with quartz, orthoclase and plagioclase felspar, a little tourmaline and fragments of granite. The petrology indicates an origin in an area of granitic rocks, the nearest deposits of which are situated about three miles north and south of Halligye Fogou.
3. Iron Age: HF7, HF2 and HF110; Romano-British: HF5 and HF2 (two sherds); Dark Age: HF66, HF91 and HF2

Small angular fragments of white felspar are clearly visible in the majority of the sherds. In thin-section the most prominent inclusions are

made up of angular grains of altered felspar, some fresher plagioclase and colourless grains of amphibole, many of which appear as fibrous aggregates. Also present are grains of quartz, pyroxene and magnetite. This assemblage of minerals closely resembles Peacock's (1969) description of the gabbroic clays of the Lizard, just to the south of Halligye fogou. This group of pottery provides additional information that gabbroic wares were also produced in the post-Roman period (Peacock 1975).

Petrological analysis 2

Roger T Taylor

A selection of sherds was studied under a binocular microscope and variations within those of gabbroic fabric were detected. Those grouped as GB3 had rock inclusions which appeared to be mainly serpentinite. To confirm the character of these inclusions, grains were selected from five sherds, thin-sectioned and examined under a petrological microscope. This confirmed that serpentinite was present in all those sherds so examined, and small fragments of gneiss and granite in one. This thin-section work confirms the suggestion of continuation into the Iron Age of the gabbroic admixture fabrics previously considered as occurring only in the Bronze Age. Full details are presented in an archive report.

Descriptions of illustrated finds

Context Group 1 (Figs 3, 4)

Contexts associated with the construction of the robbed section of the main passage.

P1 GB1/STG Rim of thin-walled jar JB2.4, PJG. HF28.

P2 GB1/WMG Body sherds BD6.2, SWD. Decorated chevron pattern, two tooled lines either side of square-toothed rouletting. HF6, 7, 91.

P3 GB1/WMG BD6.2, SWD. Chevron pattern of lightly tooled lines forming rough leaf shapes infilled with triple rows of rouletted triangular impressions. HF91.

P4 GB1/WMG BD6.2, SWD. Decoration of single rows with oblong roulette in rectangular pattern. No direct parallel in Cornwall. HF91.

P5 GB1/WMG BD6.2, SWD. Sharply tooled paired grooves forming rough chevron pattern

on shoulder with double groove below girth. HF91, 28.

P6 GB1/WMG BD6.2, SWD. Paired sharply tooled lines criss-cross on girth. HF91, 26, 28.

P7 GB3/WMG BD6, SWD. Irregular tooled chevron decoration. HF91.

P8 GB3/WMG BD6.2, SWD. Lightly tooled curvilinear decoration of intersecting arcs, defined spaces infilled with diagonal lines. HF91.

P9a GB1/WMG Body sherd with heavily tooled complex design. HF92.

P9b GB1/WMG Body sherd as **P9a** but from different vessel. HF92

P10 GB1/WMG BD6, SWD. Tooled groove on neck and beneath out-turn of rim. HF91.

P11 GB1/WMG BD6, SWD. Rim. HF91.

P12 GB1/WMG BD6?, SWD. Girth sherds of jar with raised cordon beneath rows of oblong single roulette impressions defined by curved, lightly tooled lines. Close parallel at Threemilestone (Schweiso 1976, fig 24, no 42) from context indistinguishable from those containing SWD jars, and also at Trevelgue (Quinnell 2011, P121). Other (tooled) SWD vessels with cordons occur in the penultimate structural phase at Killibury (Miles 1977, fig 41, no 17), from Carlogas (Threipland 1956, fig 21, nos 63, 64) and from the Rumps (Brooks 1974, fig 22, no 10). These vessels would appear to belong to a late SWD phase contemporary with Cordoned Ware, first century BC possibly to early first century AD. HF91, also from HF7, 8 in CG4.

P13 Substantial chunk from lower part of amphora; either Dressel 1 or 2 to 4 (D P S Peacock, pers comm). If from Dressel 1a form probably pre-50 BC, if Dressel 1b c 50 BC – AD 10, if Dressel 2 to 4, later first century BC through first century AD (Tyers 1996, 89–90). HF27.

GENERAL COMMENT

About 115 sherds, representing a minimum of 22 vessels. Only one or two sherds with slight, flat cordons are of types not illustrated. **P12** may indicate construction of this section of the fogou between c 100 BC and AD 50, in which case amphora sherd **P13** should come either from a Dressel 1a or 1b form. The presence of so many BD6.2 high shouldered vessels with lightly tooled and/or rouletted decoration is notable.

THE FINDS FROM HALLIGYE FOGOU

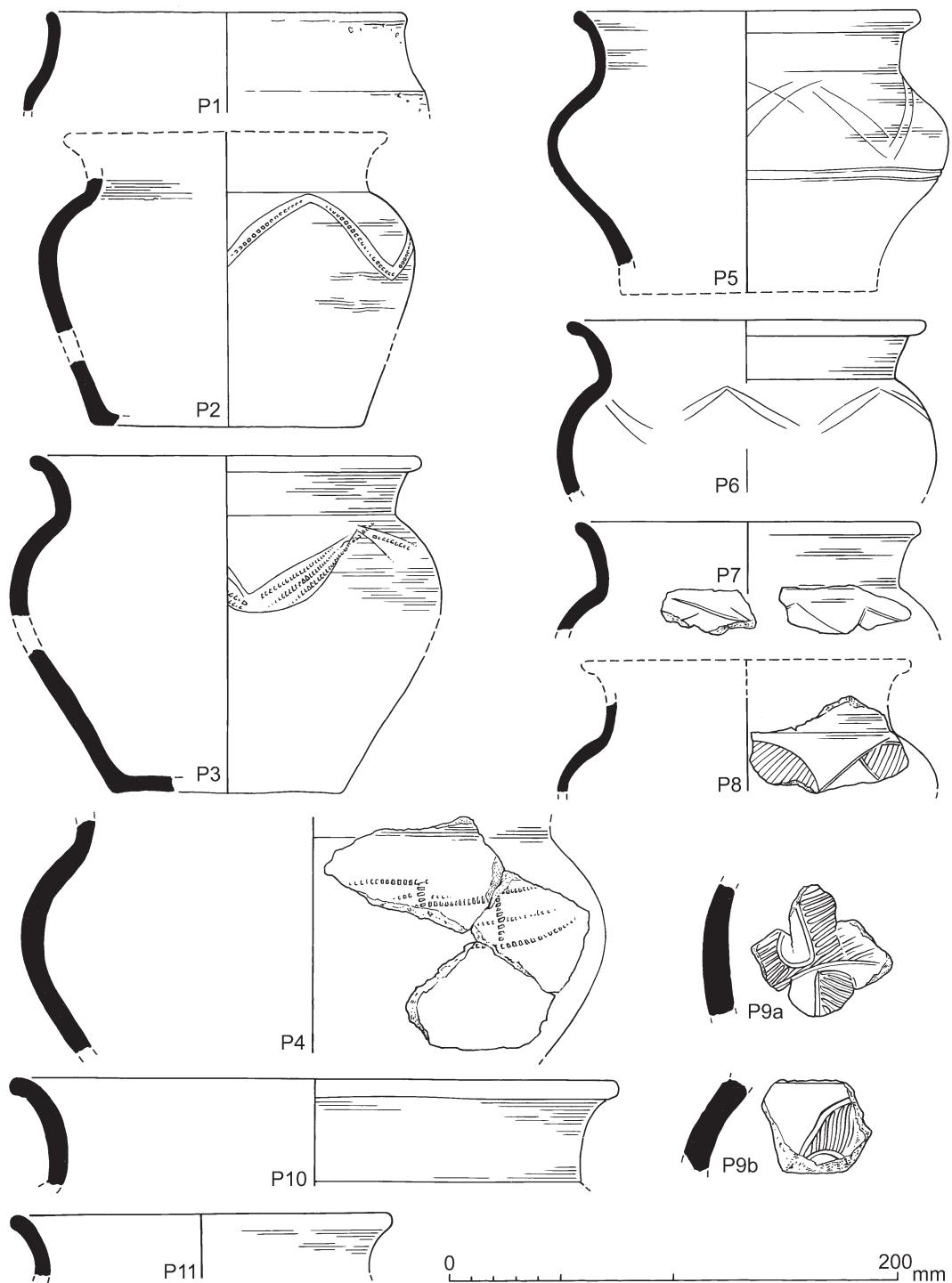


Fig 3 Pottery from Context Group 1. P1 Early Iron Age Plain Jar Group. P2-11 Middle Iron Age South Western Decorated. Scale: 1:3 (Drawings: Jane Read.)

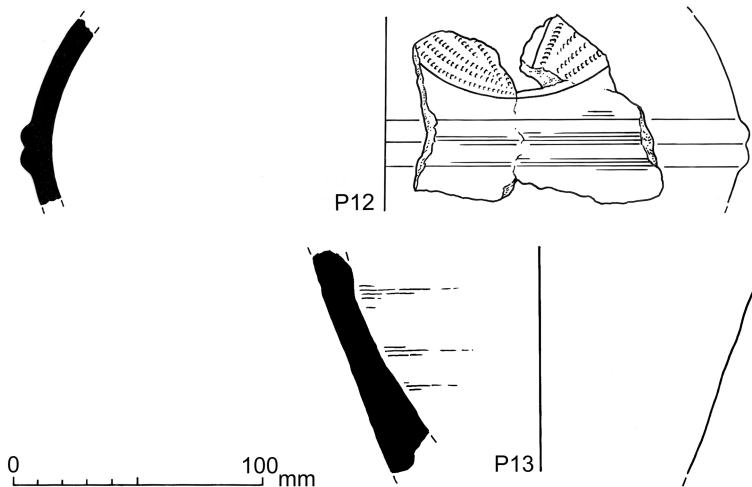


Fig 4 Pottery from Context Group 1 (cont.).
P12 South Western Decorated. **P13** Dressel 1, 2 or 4 amphora.
Scale: 1:3 (Drawings: Jane Read.)

Context Group 2 (Fig 5)

Contexts in the construction trench of the robbed section, which were probably partly derived from occupation deposits disturbed during the rebuilding.

P14 GB3/WMG BD6.2, SWD. Body sherd with lightly tooled double line in chevron pattern below slight groove on girth. HF97.

P15 GB1/WMG BD6, SWD. Rim. HF97.

P16 GB1/WMG BD6, SWD. Rim with tooled neck groove. HF96.

P17 GB1/STG BD6? Base, poorly made. HF97.

GENERAL COMMENT

A total of 12 sherds representing a minimum of four vessels, of which the only distinctive pieces are SWD.

Context Group 3 (Figs 6, 7)

Immediate post-robbing backfill; deposit derived from material immediately around and above the fogou structure.

P18 GB1/WMG, PJG. Rim sherd of large jar broadly comparable to Carn Euny Po.1A (Elsdon 1978, fig 53, nos 18–91). HF48.

P19 GB3/WMG, PJG. Rim and shoulder of jar; as **P18**. HF26.

P20 GB3/WMG, Outline SWD. Parts of handled jar, one handle extant, and stub for second; oval perforation made before firing at base of extant handle. HF43, 48, 50 and probably 31.

P21 GB1/STG, Outline SWD. Vertical handle, decorated with row of stabbed lines, from large vessel. HF47.

P22 GB3/WMG, BD6, SWD. Shoulder sherd, single line of rouletting, impressions rather shapeless. HF43.

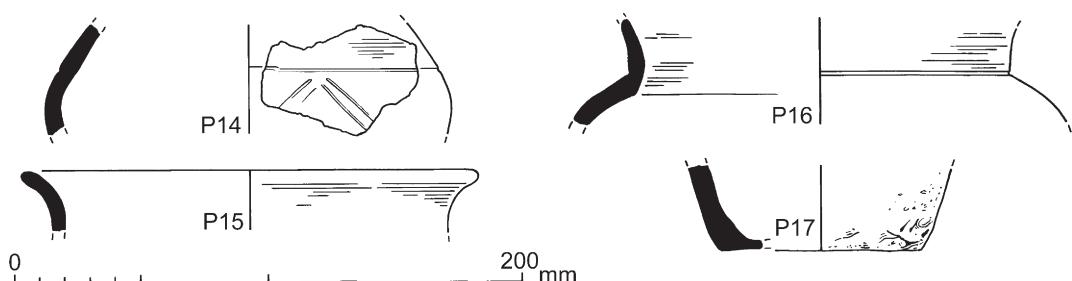


Fig 5 Pottery from Context Group 2. All South Western Decorated. Scale: 1:3 (Drawings: Jane Read.)

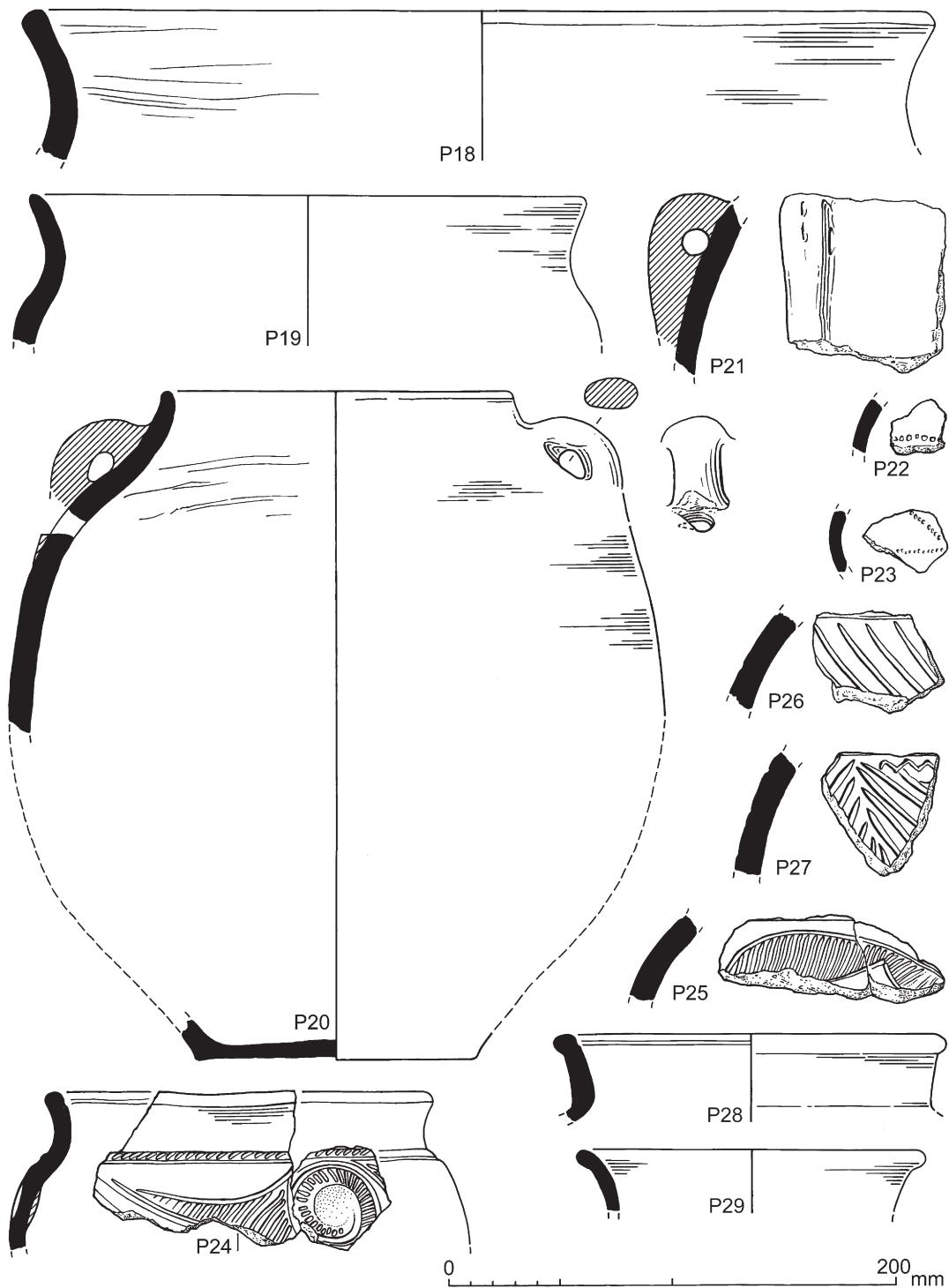


Fig 6 Pottery from Context Group 3. **P18-19** Early Iron Age Plain Jar Group. **P20-29** South Western Decorated. Scale: 1:3 (Drawings: Jane Read.)

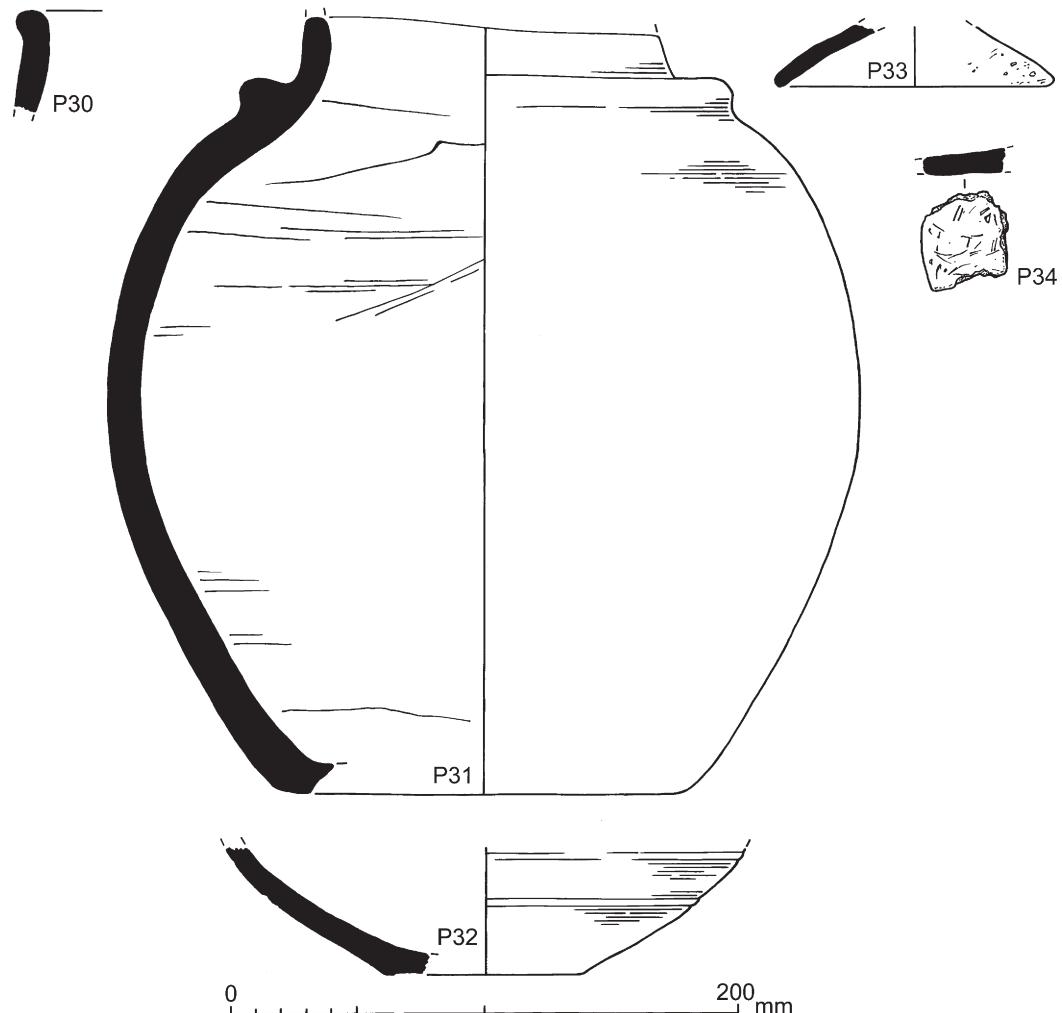


Fig 7 Pottery from Context Group 3 (cont). **P30** South Western Decorated. **P31–32** Cordon Ware 1. **P33** Plain Jar Group onward. **P34** grass-marked base. Scale: 1:3 (Drawings: Jane Read.)

P23 GB2/WMG, BD6.2, SWD. Shoulder sherd, pattern formed by single rows of rouletting, impressions rather shapeless. HF26.

P24 GB3/WMG, BD6.1, Accomplished SWD. Internal rim groove, slashed neck cordon, complex curvilinear pattern heavily tooled with round-ended implement includes impressed dimple. Comparable group from Castle Dore (Radford 1951, nos 3, 7, 26). HF26, 55

P25 GB1/WMG, BD6.1, SWD. Shoulder sherds, heavily tooled with round-ended implement. HF13, joining sherd from HF7, CG4.

P26 GB1/WMG, BD6.1, SWD. Shoulder sherd from large vessel, widely spaced diagonal heavily tooled lines below shoulder groove. HF26.

P27 GB1/ WMG, B6.1, SWD. Shoulder sherd from large vessel, complex pattern of broad tooled lines in opposed diagonal groups below zig-zag line. This and **P26** come from large versions of SWD BD6 jars such as no 10, fig 29 from the Rumps (Brooks 1974) and no 14 from Killibury (Miles 1977, fig 41). HF26.

P28 GB1/ WMG, BD6, SWD. Rim/neck with internal rim groove. HF26.

P29 GB2/ WMG, BD6, SWD. Rim. HF6.

P30 GN1 well-made, BD6, SWD. Rim. HF26.

P31 GB3/WMG, Cordon Ware 1. Almost complete large cordon jar, in large sherds, single heavy cordon below neck, *cf* Carloggas Type J (Threipland 1956). Original rim removed, present rim ground down evenly but at slight slant to original, no known parallel for this. No close parallels known. HF5, 23, 33, 48.

P32 GB3/ WMG, Cordon Ware 1. Base of cordon vessel, with two narrow cordons surviving, cream interior residue. The finish and narrow cordons suggest a closer copy of the presumed north French originals than is usual. HF54.

P33 GB1/ STG. Lid, poorly made and finished. Lids in Cornwall occur from the Late Early Iron Age, as at Trevelgue (Quinnell 2011), and are common in the Roman period (Carlyon 1995). HF26.

P34 GB1/STG. Sherd from grass-marked base. HF26.

GENERAL COMMENT

About 178 sherds and a minimum of 30 vessels. Most vessels are Iron Age, covering the full date range on the site from *c* 600 BC onwards; vessels not illustrated comprise a JB2.4 carinated shoulder sherd and a variant of **P20**. There is nothing of Roman date. A sherd with concave rim as **P48** GB1/ STG is probably Gwithian Style. One grass-marked vessel is represented by base **P34** with two other large base sherds possibly grass-marked. There are four seventeenth-century AD sherds. The main infill may be first century BC/AD, given the fresh sizeable sherds of cordon vessel **P31**. The few later sherds may be intrusive or result from confused stratigraphic interpretation.

Context Group 4 (Figs 8–11)

General fogou backfill. The provenance of this material is less clear than that in Context Group 3, but still must have largely derived from contexts around and above the fogou structure.

P35 GB3/WMG, JB2.4, PJG. Shoulder from large jar. HF22.

P36 GB3/WMG, JB2.4, PJG. Neck and shoulder. HF9.

P37 GB1/WMG, JB2.4, PJG. Shoulder from large jar. HF68.

P38 GB1/WMG, JB2.4, PJG. Shoulder from large jar. HF5.

P39 GB1/STG, JB2.4, PJG. Small jar. HF34.

P40 GB1/STG, JB2.4, PJG. Small jar. HF34.

P41 GB1/ STG, JB2.4?, PJG. Flared rim. HF23.

P42 GB1/WMG, JB2.4, PJG. Shoulder small jar. HF6.

P43 GB1/WMG, PJG. Upper part of very large jar, with curved neck, slight groove on rim top, two shallow cordons on shoulder. Probably relates to Po.1–3 forms at Carn Euny (Elsdon 1978). HF5.

P44 GB2/WMG, PJG. Rim with groove on its top, more marked than that on P43. HF22.

P45 GB3/STG, PJG or Gwithian Style. Jar with everted rim, slight interior concavity, poorly modelled. HF6.

P46 GB1/STG, PJG or Gwithian Style. Jar as P45 with more pronounced concavity to rim. HF66, 69.

P47 GB1/STG, PJG or Gwithian Style. Jar as P45 with distinct interior concavity to rim and shallow girth groove. HF66, 102.

P48 GB1/STG, PJG or Gwithian Style. Upper part of jar similar to P45–7 but with rather straight neck which has diagonal groove. HF31.

P49 GB1/STG, PJG or Gwithian Style. Rim of jar similar to P45–7 but thicker. HF86.

P50 GB1/WMG, BB6.1, Outline SWD. Double arcs incised on wet clay. HF9.

P51 GB1/WMG, ?BD6, Outline SWD. Handled jar, extant handle irregular with thumb-groove down it. HF76.

P52 GB1/WMG, ?Outline SWD. Small handle. H F31.

P53 GB2/WMG, BD6.2, SWD. Double row of square-notched rouletting in chevron pattern. HF5, 6, 7, 22, 69.

P54 GB1/WMG, BD6.2, SWD. Chevron pattern of double row square-notched rouletting. HF5.

P55 GB1/WMG, BD6.2, SWD. Chevron pattern, double lines of rouletting, right pair rectangular, left pair triangular. HF22.

P56 GB3/WMG, BD6.2, SWD. Very fine tooled decoration probably forming infilled leaf pattern, *cf* P8. HF22.

P57 GB3/WMG, BD6.1, SWD. Slashed neck cordon, double tooled line with infill below. HF69.

P58 GB1/WMG, BD6.1, Outline SWD. Irregular tooled chevrons. HF5.

P59 GB1/STG, BD6.1, Outline SWD. Irregular tooled pattern gives herring-bone effect. HF5.

P60 GB1/WMG, BD6.1, SWD. Chevron pattern of fine double tooled lines. HF7.

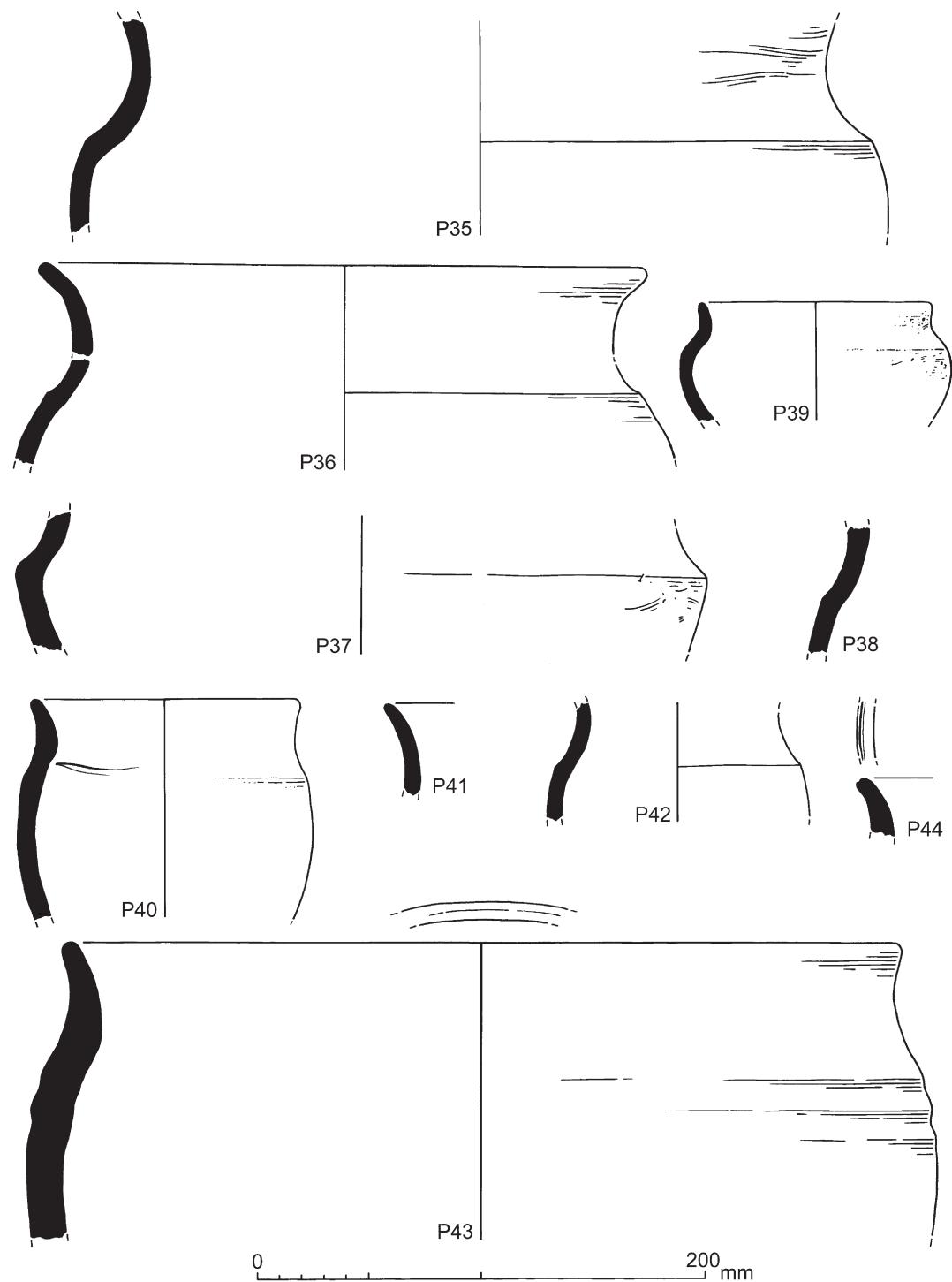


Fig 8 Pottery from Context Group 4. All Early Iron Age Plain Jar Group. Scale: 1:3 (Drawings: Jane Read.)

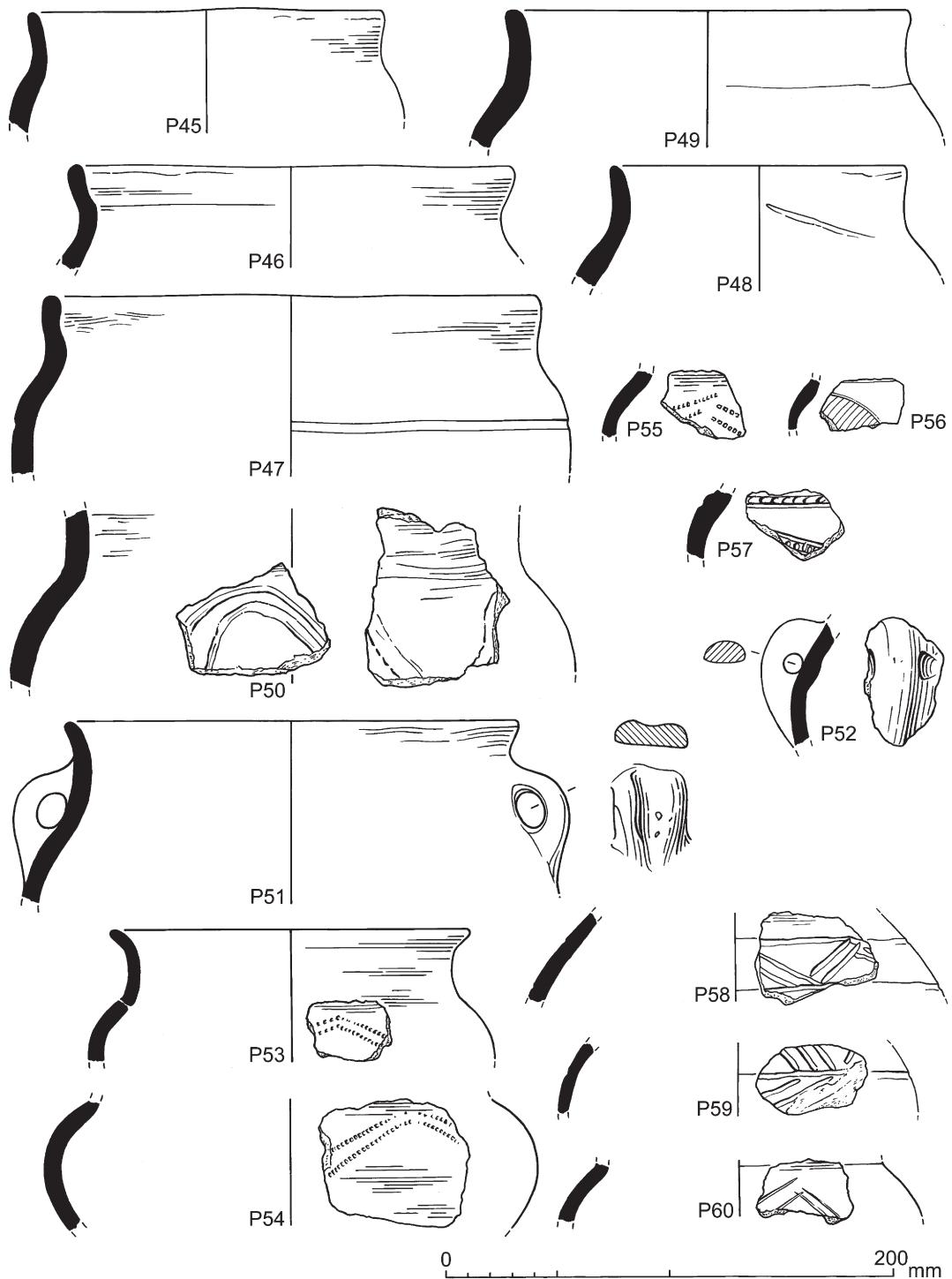


Fig 9 Pottery from Context Group 4 (cont.). P45-48 Gwithian Style (or Plain Jar Group). P49-60 South Western Decorated. Scale: 1:3 (Drawings: Jane Read.)

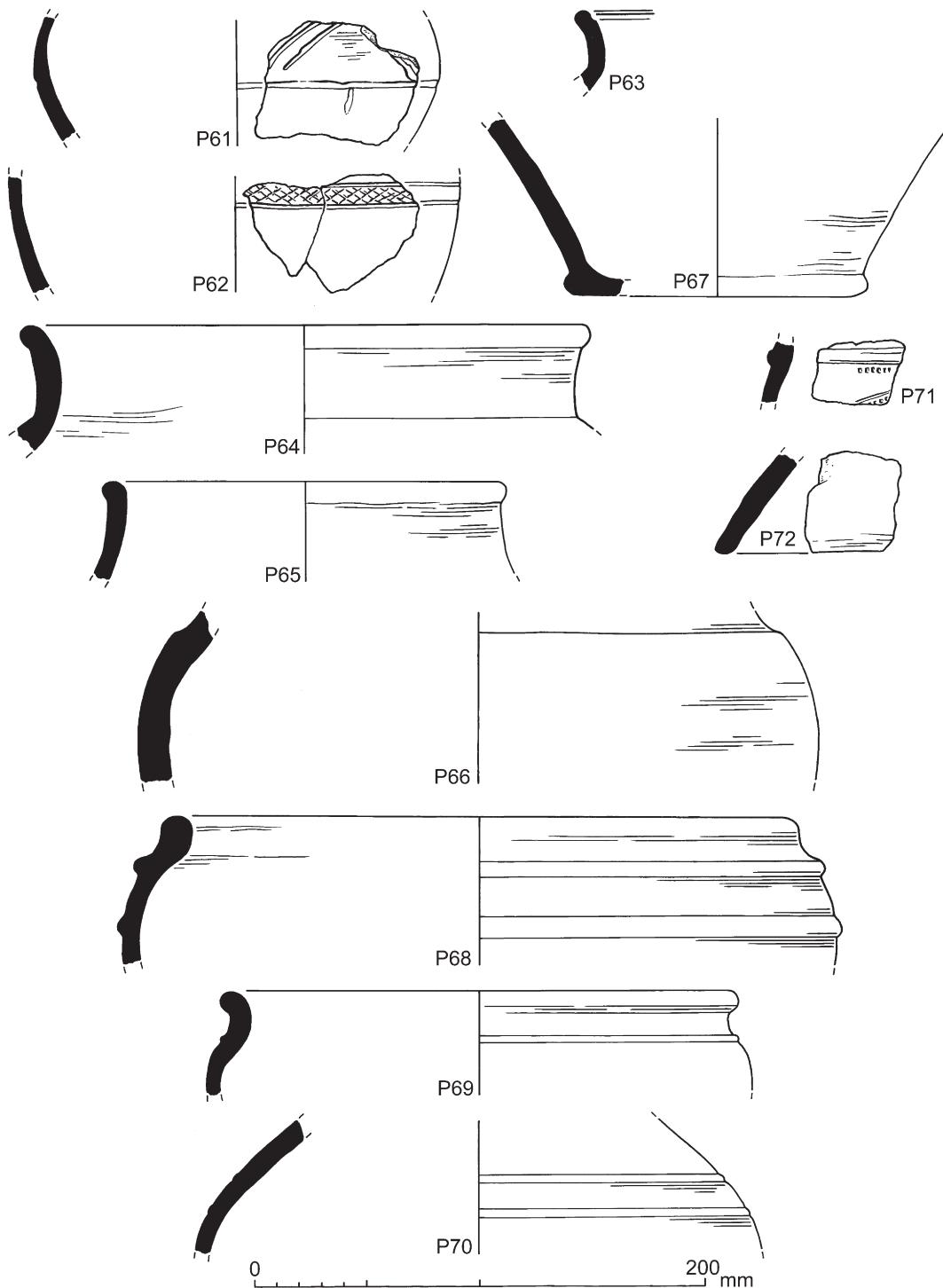


Fig 10 Pottery from Context Group 4 (cont.). P61–67, P71 South Western Decorated. P68, P70 Cordon Ware 1. P69 Roman. P72 Plain Jar Group onward. Scale: 1:3 (Drawings: Jane Read.)

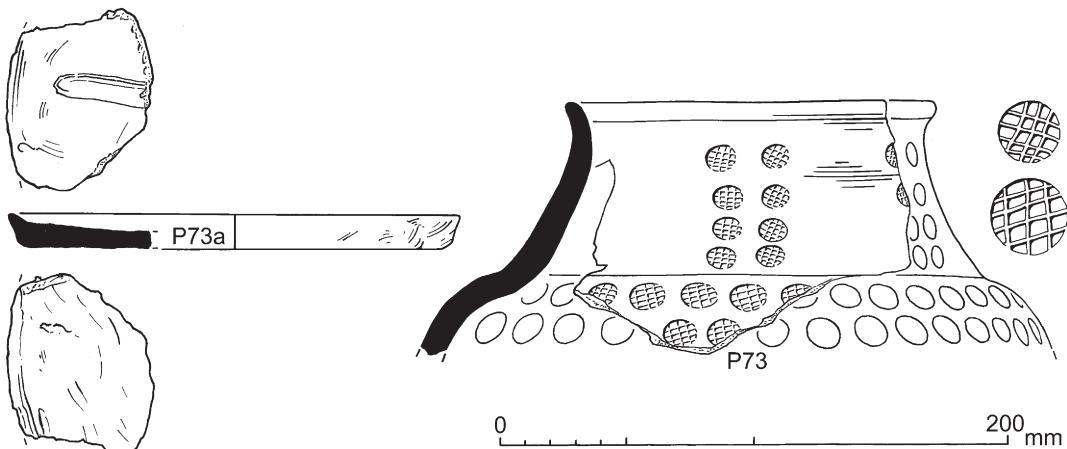


Fig 11 Pottery from Context Group 4 (cont). P73, P73a Gwithian Style. Scale: 1:3 (Drawings: Jane Read.)

P61 GB1/WMG, BD6.1, Outline SWD. Part of tooled double chevron above deep girth groove. HF5.

P62 GB3/WMG, BD6, SWD. Narrow tooled band of lattice between two parallel lines. Close (and ? only) parallel sherd 'r' from Carloggas (Threipland 1956, fig 16). HF5, 6.

P63 GB3/WMG, BD6, SWD. Rim with internal groove. HF6.

P64 GB1/WMG, BD6, SWD. Rim of large jar. HF7, 69.

P65 GN1 well-made, BD6, SWD. Rim, body sherd similar to P30. HF22, 13.

P66 GB1/WMG, ?BD6, SWD. Shoulder angle from large jar. HF33.

P67 GB1/WMG, ?SWD. Base of jar with protruding foot. Such bases occur in SWD (see **P100**) but not so far in Cordon Ware. They may also be Early Iron Age Age; for example, at Mount Batten (Cunliffe, 1988, fig 26, no 1). HF5.

P68 GB1/WMG, Cordon 1. Rim sherd of large cordon jar, Type H. HF5.

P69 GB1/STG, Roman period. Rim of bowl with cordon on neck, related to Type 16. HF5.

P70 GB3/WMG, Cordon 1. Body sherd with shallow cordons produced by paired incised lines. Traces of cream interior residue. Possibly same vessel as P32. HF7.

P71 GB1/WMG, BD6, SWD. Line of square notched rouletting below neck cordon, similar rouletting infills tooled pattern below. Possibly late SWD as P12. HF5. 52.

P72 GB1/STG. PJG group or later (see P33). Part of lid, tooled line above edge. HF9.

P73 GB3/STG, Gwithian Style. Jar with narrow elongated neck and angular shoulder, signs of finger modelling, grey with patchy red-brown and dark grey exterior, vertically burnished neck. Small stamps (12mm diameter) on neck arranged vertically in two rows of four, larger stamps (15mm) in at least two horizontal rows on body. The form has no immediate parallel in Cornwall. See section above on Gwithian Style for further comment. HF5, 9, 31, 22, 69, 102. HF66, 90 from CG8.

P73a GB1/STG. Gwithian Style. Platter, virtually flat, with broad finger trace on upper side which may be part of a central cross. Indeterminate traces of grass-marking on base.

GENERAL COMMENT

The Context Group contains 410 sherd representing a minimum of 65 vessels. Of these, 17 are PJG and 32 SWD, with only three Cordon Ware and a single Roman vessel. There are up to eight vessels of the Gwithian Style and at least two grass-marked (not illus) including part of a barrel. This material broadly replicates the date range of Context Group 3 and represents redeposited material from around the sixth century BC onward. The larger quantity of Gwithian Style demonstrates the mixed nature of at least some of the infill. In addition there are 141 post-medieval sherd (from HF5, 7, 9, 33, 22, 31, 58, 59 and 87, most of this

from HF58), much of this twentieth century, which shows recent disturbance.

Context Group 5 (Fig 12)

General stratigraphy alongside the fogou and sealing the construction layers of Context Group 1.

P74 GB2/WMG, Cordoned Ware 2. Base of large vessel with narrow cordons, no close parallel

known but the second phase of Cordoned Ware has range of copies of non-local forms (Carlyon 1987, figs 3, 6). HF18.

P75 GB2/WMG, Cordoned Ware 2. Foot-ring base. HF18.

P76 Part of South Gaulish samian cup, Dragendorf 27, Flavian. (Identification G D Marsh, Museum of London). HF18.

P77 GB1/STG, Cordoned Ware 2. Rolled rim from bowl, Type H or related. HF18.

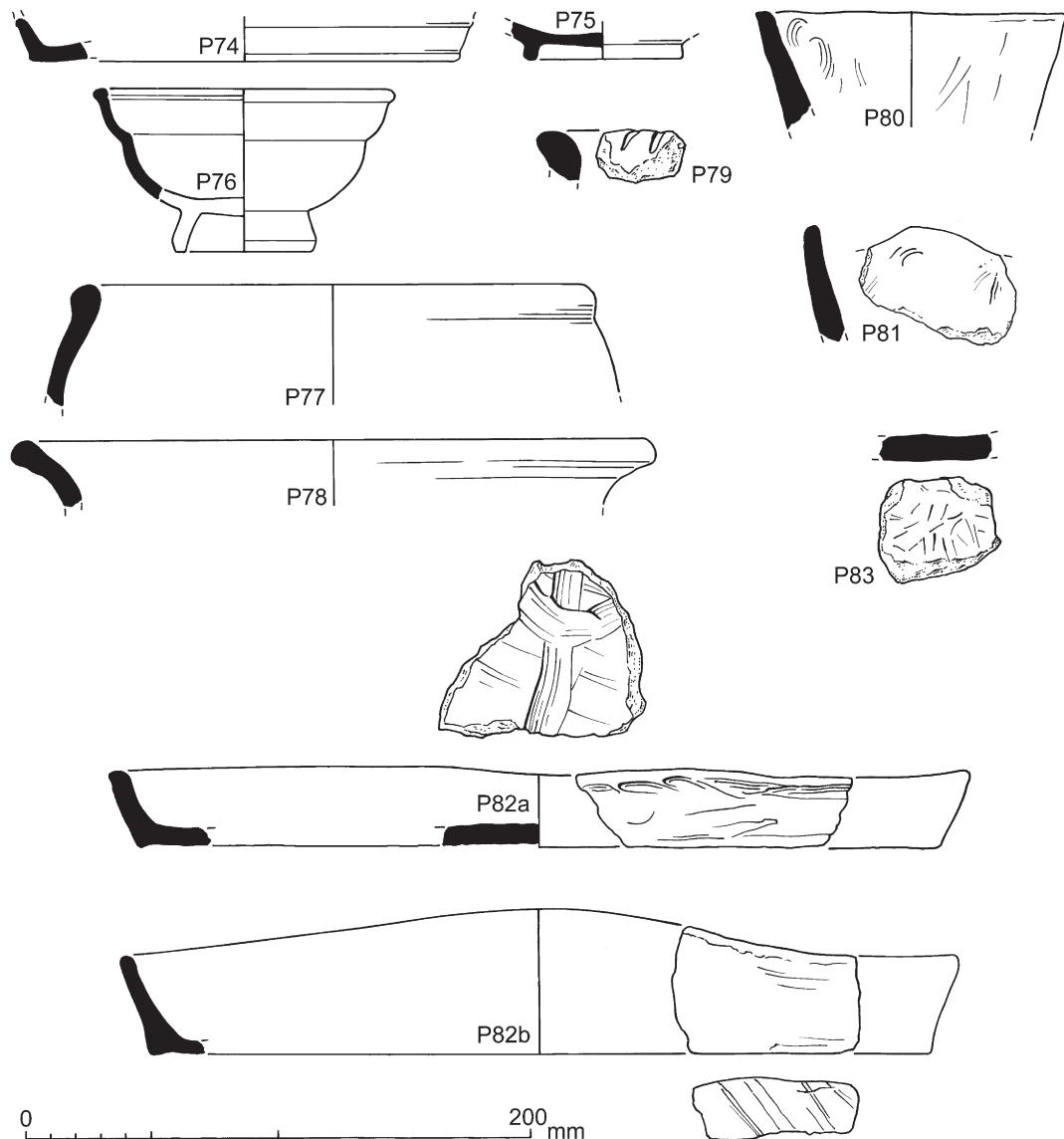


Fig 12 Pottery from Context Group 5. P74–75, P77 Cordoned Ware 2. P76 Samian. P78 Roman. P80, P82a, P82b Gwithian Style. P79, P81, P83 bar-lug / grass-marked. Scale: 1:3 (Drawings: Jane Read.)

P78 GB2/STG, Roman. Rim of large Type 4 jar (Quinnell 2004). HF19.

P79 GB1/STG, Bar-lug. Slashed rim, probably from bar-lug cooking pot (*cf* Thomas 1968, fig 73). HF25.

P80 GB1/STG, Gwithian Style. Sharp knife-trimmed, straight-sided vessel with everted wall. While affinities are not certain, a similar if better made vessel occurs in the Gwithian Style at Boden (Quinnell, forthcoming a, P47). HF19.

P81 GB1/STG, Early Medieval. Lug from bar-lug cooking pot. HF19.

P82a GB1/STG, ?Gwithian Style. Part of large platter with sides of unequal height, sanded base, finger impressed cross on upper surface. HF25.

P82b GB1/STG, ?Gwithian Style. Part of large platter with sides of unequal height, sanded base. HF25.

P83 GB1/STG, Early Medieval. Grass-marked base sherd probably from bar-lug cooking pot. HF25.

GENERAL COMMENT

The Context Group contained 85 sherds representing a minimum of 19 vessels. None need be pre-Roman Iron Age. Phase 2 Cordon Ware, mid first century to mid second century AD, is well represented and is of the same date as samian vessel **P76**. There are at least three Type 4 Roman-period jars including **P78**, which may date anywhere between the second and the fifth centuries. There are three probable Gwithian Style vessels and four which are grass-marked and probably all bar-lug. There is only one intrusive post-medieval sherd. These ceramics represent activity from the first century AD onward in the area alongside the fogou. Disturbance appears to have been minimal. The absence of definite Iron Age material, in contrast to the previous context groups, is marked.

Context Group 6 (Fig 13)

Backfilling layers in the settlement ditch.

P84 GB1/WMG, Cordon Ware 2. Rim, with cordon beneath, of tall narrow jar. Probably comparable to gabbroic copies of first-century AD butt-beakers at Carvossa (Carlyon 1987, fig 4). HF105.

P85 GB1/STG, Roman. Type 23 plain-rimmed dish, probable date range late second to early fourth centuries AD (Quinnell 2004). HF83.

P86 GB1/STG, Roman. Type 21 grooved-flanged bowl, probable date range mainly third and fourth centuries AD (Quinnell 2004). HF105.

P87 GB1/STG, Roman. Type 22 Cornish flanged bowl. Later third century onward into fifth century (Quinnell 2004). HF104.

P88 GB1/STG, Roman. Type 4 jar with sharply everted rim, unusually thin and hard, light grey, noticeable thumbed depression around rim top. Type 4 jars second to fifth centuries but no parallel so far noted for this distinctive grey, thin-walled variant. HF106, 83, 104.

P89 GB1/STG, Roman. Type 4 jar. HF106.

P90 GB1/STG, Roman. Type 4 jar. HF105.

P91 North African Slip Ware bowl. Sixth century. See comment by C Thomas in post-Roman section above. HF105.

GENERAL COMMENT

Fifty sherds represent a minimum of eight vessels.

P91 is the sixth-century North African slipware dish but otherwise, with the exception of **P84**, presumably redeposited, the local vessels are those which occur towards the end of the Roman period. Most breaks appear fresh and sherds large with a mean weight of 41g. Given the spread of **P88** through HF83, 104 and 106, these ditch fills are likely to be broadly contemporary and perhaps deliberate. Given the association with import **P91**, the group is important for the survival in circulation of Romano-Cornish vessel types to the sixth century AD.

Context Group 7 (Fig 13)

Antiquarian excavation of the northern exit of the creep; material must have been largely derived from that in Context Group 6.

P92 GB1/STG, Roman. Type 23 plain-rimmed dish, probable date range late second to early fourth centuries AD. HF87.

GENERAL COMMENT

Deposits only contain the single sherd of **P85**, which is consistent with the suggested provenance of material.

Context Group 8 (Fig 14)

Black silty deposit on the base of the fogou (unsealed).

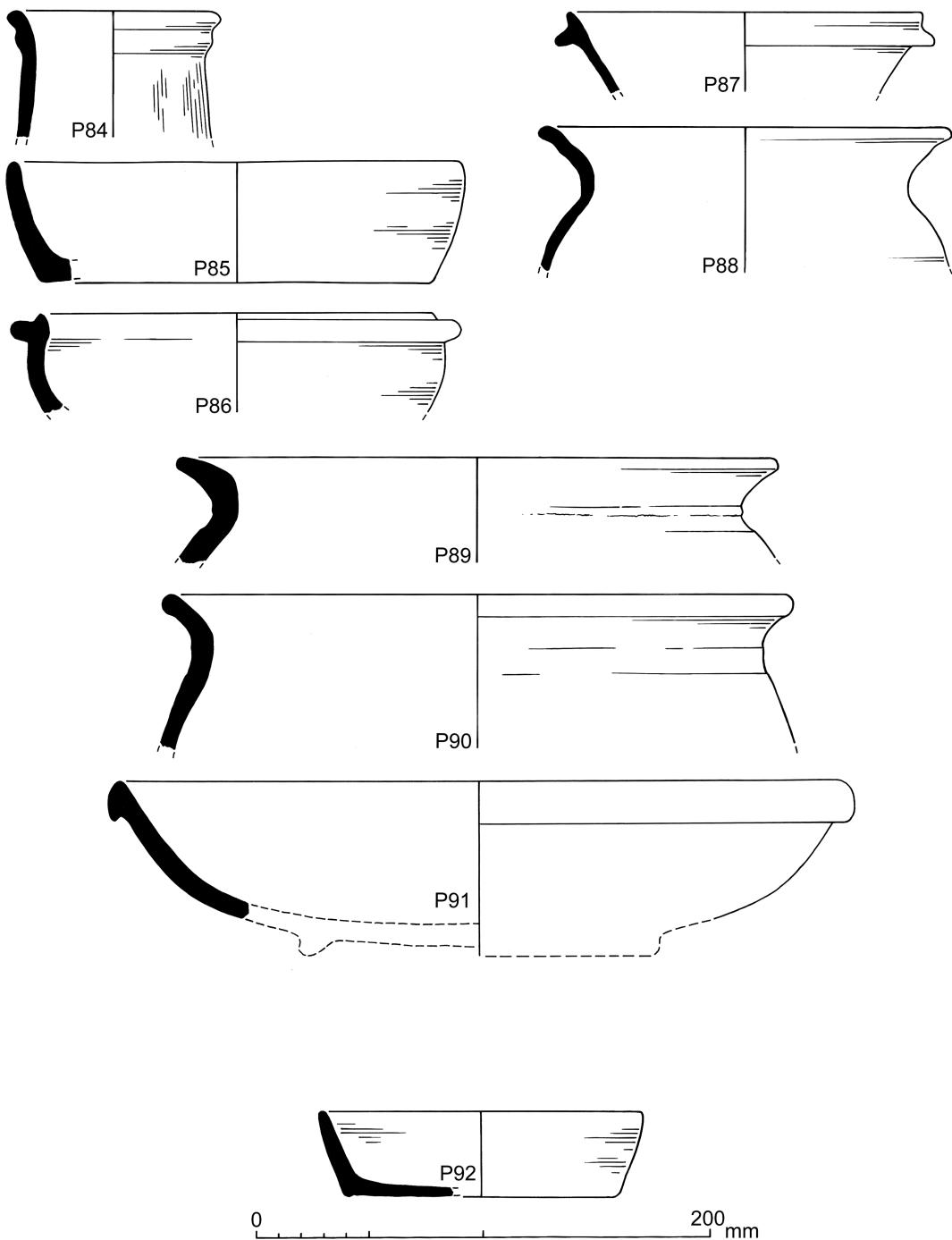


Fig 13. Pottery from Context Group 6, infill of enclosure ditch. P84 Cordoned Ware 2. P85–90 Roman. P91 North African Slip Ware. P92 Roman (from Context Group 7). Scale: 1:3 (Drawings: Jane Read.)

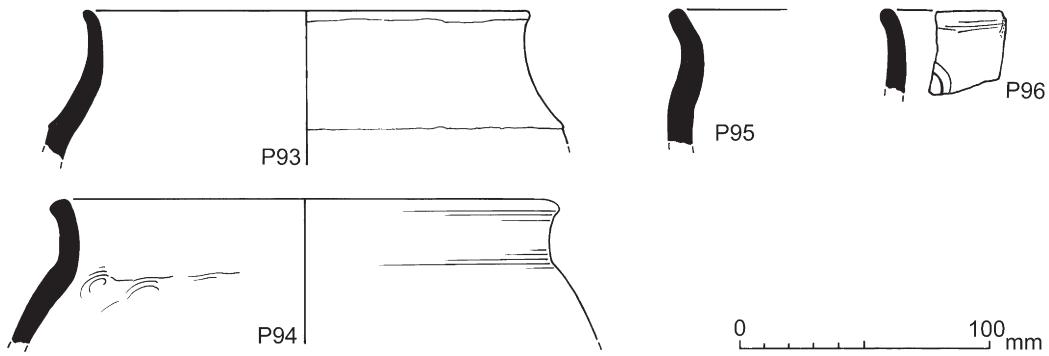


Fig 14 *Pottery from Context Group 8, base of fogou. P93–94 Early Iron Age Plain Jar Group. P95–96 Gwithian Style. Scale: 1:3 (Drawings: Jane Read.)*

P93 GB1/STG, JB2.4, PJG. Rim and neck of carinated jar. HF90.

P94 GB1/STG, PJG. Upper part of jar with slightly everted rim, relate to Po.1 to Po.3 forms from Carn Euny (Elsdon 1978). HF66.

P95 GB1/STG, Gwithian Style. Upper part of jar with slack profile, slight thumbed depression along top of rim. On style probably similar to **P46**. HF90

P96 GB1/STG, Gwithian Style. Sherd from upright rim, slightly everted at top, form probably comparable to **P73**. Part of impression from annular stamp approximately 18mm across. HF66.

GENERAL COMMENT

A total of 57 sherds representing two Early Iron Age vessels and two of Gwithian Style. Also present are a possible sherd from **P88** and a sherd from stamped vessel **P73**. The presence of Gwithian Style material should indicate that the fogou was still accessible at the time of its currency. The absence of medieval and post-medieval material should be noted.

Disturbed contexts, mainly along top of fogou infill (Figs 15, 16)

P97 GB3/WMG, Outline SWD. Vertical handle set just below neck of large jar, single line of triangular rouletting across top of handle and fine incised lines down it. HF1.

P98 GB3/WMG, BD6.1, SWD. Body sherd from large jar. Diagonal band of tooled lines with square notched rouletting in between. HF3.

P99 GB3/WMG, BD6.1, SWD. Shoulder sherd decorated with square-notched roulette between tooled lines. HF4.

P100 GB1/WMG, BD6, SWD. Base with protruding foot decorated with narrow tooled lines confining single rouletted row. Decorated bases occur occasionally in Cornish SWD; for example, no 133 from St Mawgan-in-Pydar (Threipland, 1956, fig 30). HF4.

P101 (not illus). Rim from upright necked jar, SE Dorset Black-burnished ware, Dorset BB1, which may date either just before or just after the Conquest. HF2

P102 GB1/WMG, Cordon Ware 1. Type G bowl. HF2.

P103 GB1/STG, Roman. Type 19 bowl, mainly later second century AD (Quinnell 2004). HF?

P104 GB1/STG, Roman. Type 11 jar, second and third centuries (Quinnell 2004). HF1.

P105 GB1/STG, Roman. Type 11 jar. HF2.

P106 GB1/STG, Roman. Type 3 jar. Later second century (Quinnell 2004). HF1.

P107 GB2/STG, Roman. Type 11 jar ? HF2.

P108 GB1/STG, Roman. Type 16 jar. Third and fourth centuries (Quinnell 2004). HF2.

P109 GB2/STG, Roman. Type 11 jar ? HF2.

P110 GB1/STG, Roman. Type 20 bowl. Late second to early fourth centuries AD (Quinnell 2004). HF2.

P111 GB1/STG, Roman. Body sherd, with incised decoration of arc above horizontal line, from Type 16 jar, third and fourth centuries (Quinnell 2004). HF71.

P112 GB1/STG, early medieval. Rim with slight out-turn from straight-sided vessel, probably barrel-lug cooking pot. HF2.

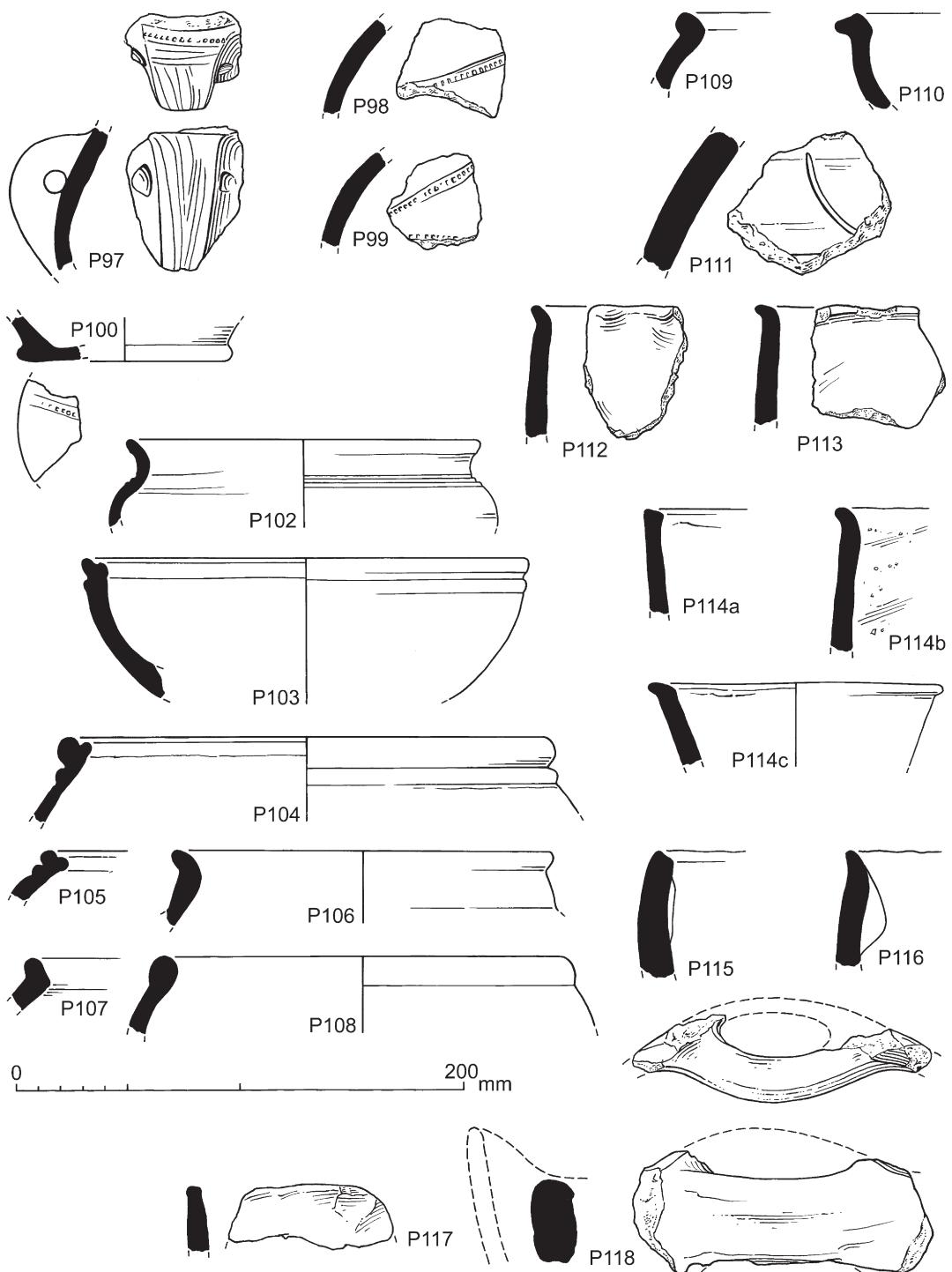


Fig 15 Pottery from disturbed contexts. **P97-100** South Western Decorated. **P102** Cordoned Ware 1. **P103-111** Roman. **P112-118** bar-lug / grass-marked (**P114c** ?Gwithian Style). Scale: 1:3 (Drawings: Jane Read.)

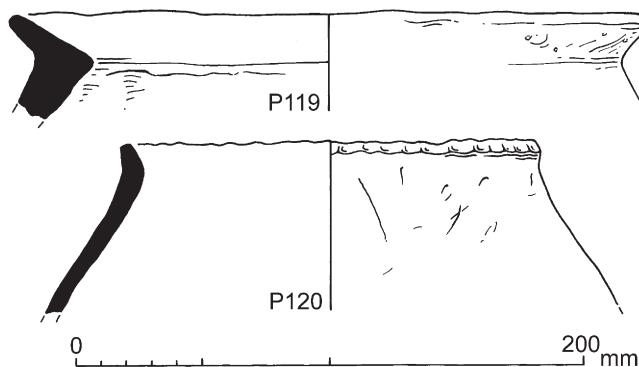


Fig. 16. Pottery from disturbed contexts.
P119–120 Sandy Lane. Scale: 1:3
(Drawings: Jane Read.)

P113 GB1/STG, early medieval. Similar to **P112** but with more pronounced finger modelling. HF2.

P114a GB1/STG, early medieval. Cooking pot rim with slight out-turn, probably bar-lug. HF2.

P114b GB1/STG, early medieval. Similar to **P112**. HF2.

P114c GB1/STG, early medieval (or Gwithian Style). Small bowl with out-turned rim. HF2.

P115 GB1/STG, early medieval. Rim sherd of bar-lug pot with internal thickening for bar attachment. HF2.

P116 GB1/STG, early medieval. Rim sherd of bar-lug pot as **P115** with thickening for bar. HF2.

P117 GB1/STG, early medieval. Lug from bar-lug cooking pot. HF2.

P118 GB1/STG, early medieval. Bar handle from bar-lug cooking pot. HF2.

P119 GB1/STG, early medieval. Thick-walled vessel with small everted rim and marked internal bevel. General but not close comparanda among Sandy Lane material from Gwithian (Thomas 1964). HF71.

P120 GB1/STG, early medieval. Jar with small everted rim, wall slopes in toward neck, finger impressions give rim edge a piecrust effect. Traces of grass-marking on exterior. In-sloping sides below the rim are unusual but may be paralleled by a Style 1 Sandy Lane vessel from Gwithian (Thomas 1968, fig 74, no 5). HF2.

GENERAL COMMENTS

A total of 451 sherds representing a minimum of 35 vessels (not including post-medieval). Seven vessels including **P97–100** are Iron Age, generally scrappy and eroded. 15 vessels are of Roman types and cover the second to fourth-fifth centuries; a scrap of samian rim occurs in HF2. The Gwithian Style is not present, except possibly **P114c**. There

may be 12 bar-lug cooking pots, including two un-illustrated bar handles; the collection does not appear to contain platters. Three vessels may be as late as Sandy Lane in the twelfth century: **P119** and **P120**, the third not illustrated. 138 sherds range from the fifteenth to the twentieth centuries AD. This collection gives a fuller picture both of Roman and early medieval ceramics from the site.

Acknowledgements

Henrietta Quinnell wishes to thank Dr R T Taylor for his contribution, the late Pat (Carlyon) Brierley for helpful discussions, and Professor C Thomas, Carl Thorpe and John Allan for comments and contributions. Sheila Elsdon's acknowledgments are incorporated in the text. Both authors are grateful to Jane Read for illustrations.

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Smithing in the round: excavations at Little Quoit Farm, St Columb Major, Cornwall

ANNA LAWSON-JONES and GRAEME KIRKHAM

with contributions from HENRIETTA QUINNELL, ROWENA GALE and JULIE JONES

Part of a second to fourth century AD enclosure was investigated in 1998 on behalf of South West Water, on the line of the Bears Down to Ruthvoes water main. Excavation showed that it is likely to have been a specialised ironworking site rather than a settlement.

Phase 1 use of the area was represented by a small Neolithic flint assemblage (possibly related to a nearby, destroyed chambered tomb), while phase 2 was represented by a ditched field system of late Iron Age or early Roman date. In phase 3, the field system was overlain by a series of working hollows, possibly located within a palisaded enclosure, associated with smithing activity dating to the second and third centuries AD. No evidence for domestic activity was found. Phase 4 involved the construction of a ditched and banked enclosure dating to the third century AD and perhaps extending into the fourth. Several metalworking-related features and associated waste and deposits were identified. Phase 5 was marked by the cessation of metalworking and abandonment of the enclosure before or during the fourth century AD.

In 1998 Cornwall Archaeological Unit (CAU), predecessor to Cornwall Council Historic Environment, was commissioned by South West Water Services to conduct an archaeological assessment in advance of partial replacement of a water pipeline between Bear's Down and Ruthvoes, in central Cornwall (Johns 1998). Archaeological work carried out on the remainder of the pipeline route has been reported separately (Lawson-Jones 2001).

A geophysical survey (GSB Prospection 1998) along the pipeline route revealed a concentration of anomalies suggestive of an enclosure and other sub-surface remains in a field to the east of Little Quoit Farm, St Columb Major (centred on SW 92560 61940) (Figs 2 and 3). In the event a slight change of the route of the pipeline in this area meant that the stripped corridor adjoined but did not coincide with the area subject to geophysical survey. A measured survey of low earthworks

surviving in the field was also carried out by CAU archaeologists (Fig 3).

Excavations took place over a month during the summer of 1998, undertaken by a small CAU team assisted by volunteers. An 8m wide pipeline corridor aligned north-south was stripped of ploughsoil by swing shovel, under archaeological supervision. This allowed for examination of a narrow but almost complete slot across what was quickly revealed as an Iron Age – Romano-British enclosure containing a number of large internal features. Features outside the enclosure within the same field to the north and the south were also investigated. After completion of ploughsoil stripping, hand cleaning was carried out and the trench was planned. Excavation of features then took place. A trench hand excavated along the length of the stripped area allowed a further opportunity to examine and record a long section across the site (Figs 4 and 5).

Location and historic context

The Little Quoit Farm excavation site is located in the parish of St Columb Major to the south east of the town of that name (Fig 1). The excavated site lay entirely within one large field, at 120m above OD (Figs 2 and 18; colour plate 2). The enclosure lay on a south-west facing slope just below the crest of a broad ridge. This ridge divides the valley of Tresaddern Water to the north (the head of the River Menalhyl, which runs through St Columb Major and down the Vale of Lanherne) from the Ennisworsey valley to the south. The underlying geology consists of hornfelsed slate and hornfelsed sandstone of the Meadfoot Group (British Geological Survey 2004), encountered on site as decaying killas rubble and shilley clays with occasional quartz. The site lies on the junction between Denbigh 2 series soils of loam over shale and Hafren series peat to loam over

shale (National Soil Resources Institute Soil Systems Group, 2004). The overlying ploughsoil was recorded as a well-mixed dark-brown slightly clayey loam. Ploughsoil depth in the north of the field was 0.25m, below which a yellowish-brown natural clay was revealed. Further to the south but within the confines of the enclosure, the depth of ploughsoil occasionally deepened to in excess of 0.45m, reducing again to the south.

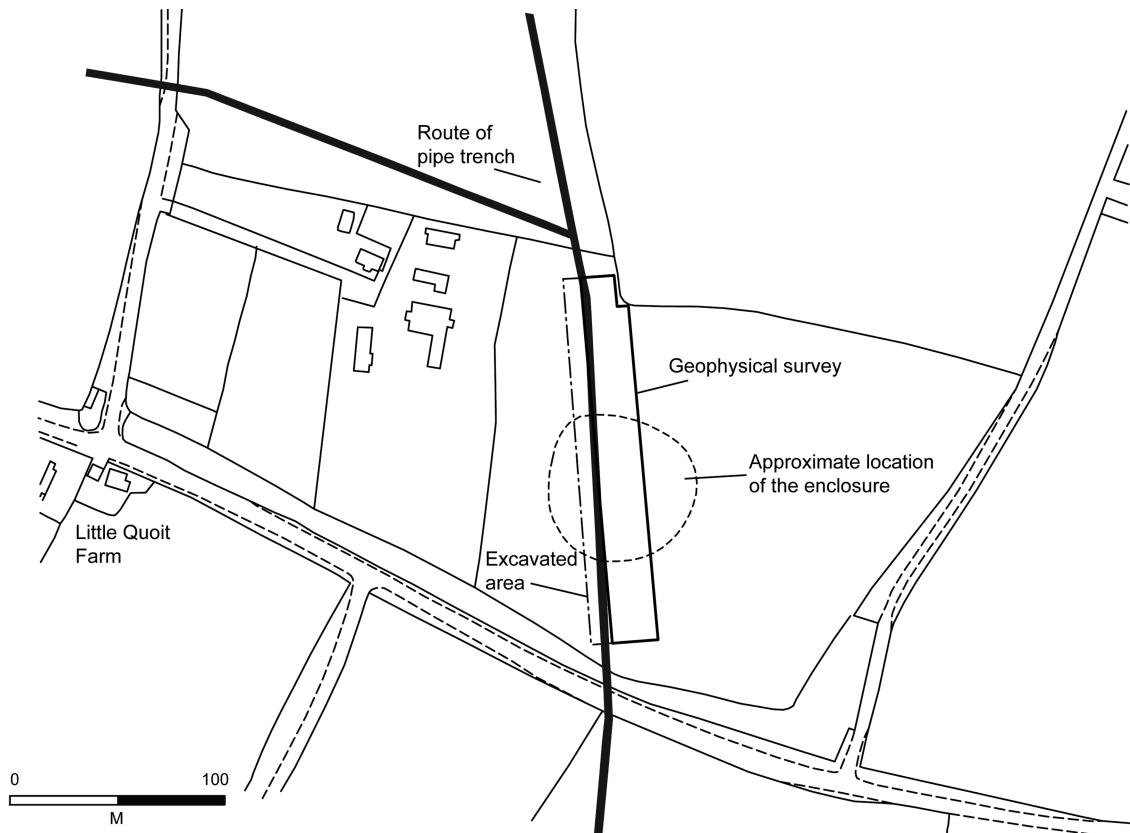
Castle-an-Dinas hillfort lies 2 km to the east and can be seen from the site. The Devil's Quoit, a Neolithic chambered tomb demolished in about 1870, formerly stood 300m to the west (Johnson 1979). This monument gave its name to the locality and to the medieval settlement of Quoit (*ibid*). This is likely to have been sited adjacent to the chambered tomb (SW 923 619); a settlement named Quoit is shown here on Thomas Martyn's map (Martyn 1748) and on the St Columb Major tithe map of 1842 (digital copy held by Historic



Environment Record). It is now named Little Quoit Farm. The wider surrounding area is known as Quoit and two settlements are shown on current maps as Quoit Farm, one 700m west of the excavation site and another 600m to the south.

The Little Quoit Farm enclosure site is located within an area characterised as Anciently Enclosed Land (Cornwall County Council 1996); that is, land enclosed since at least the medieval period and probably earlier. Much of the buried evidence for later prehistoric settlement and enclosure in lowland Cornwall has been located within Anciently Enclosed Land, the fields worked in the medieval period being successors to the fields of Iron Age and Romano-British farmers with occupation of such areas often extending back to the Middle Bronze Age (for example, Gossip and Jones 2007; Johns 2008; Jones and Taylor 2010).

Historic field boundaries on farms in the wider area around Little Quoit Farm (for example, Ruthvoes, Trekenning and Roserrans) clearly fossilise medieval stripfields, and this is also probably the origin of the enclosed landscape south of the road to the west of the site formerly associated with the medieval settlement of Quoit. To the east of the site HLC records a substantial area of Recently Enclosed Land – that is, land enclosed from rough ground since the seventeenth century – and some surviving areas of Upland Rough Ground. Quoit itself was first documented as a place-name in c 1450 (Historic Environment Record Primary Record Number (PRN) 21643), but although noted in the medieval period, the position of the settlement on the fringes of Anciently Enclosed Land suggests that it may itself represent an example of colonisation of rough ground during



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Fig 2 *The pipeline route and location of the enclosure*

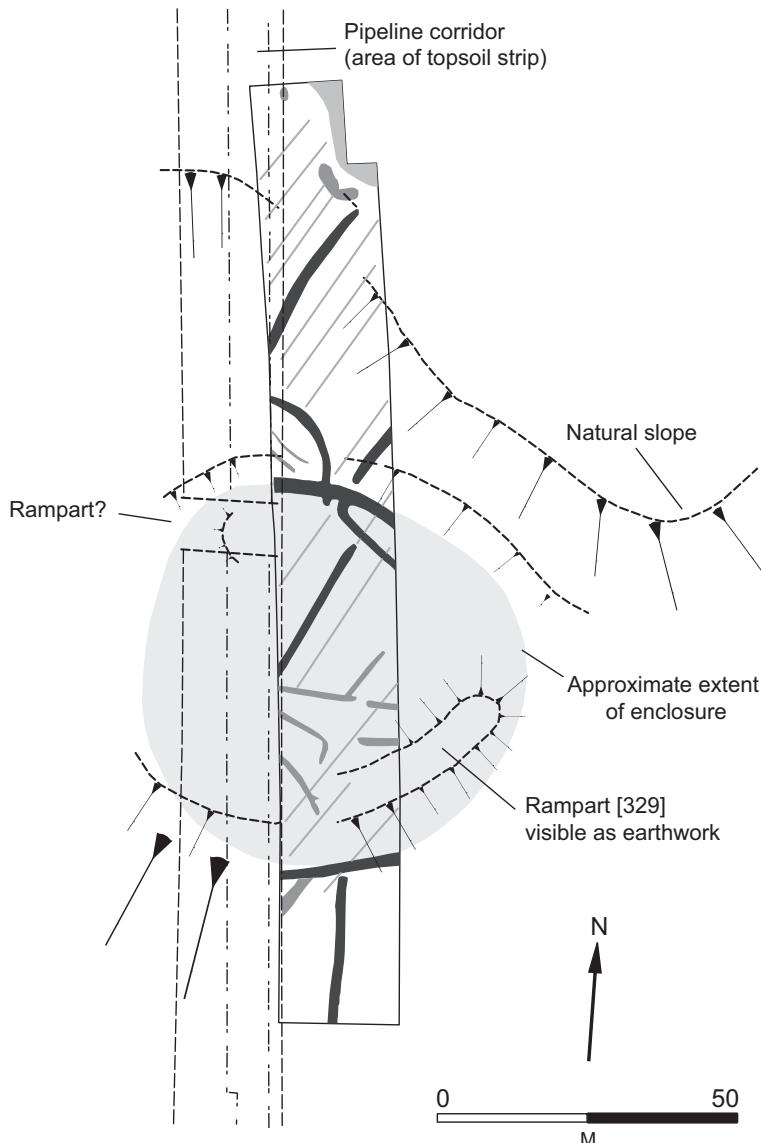


Fig 3 The pipeline corridor with the geophysical and measured earthwork surveys

this period (*cf* Rose 1994; Herring 2006); 'quoit' is an English word (Padel 1985, 72) and its occurrence in a place-name recorded in the mid-fifteenth century may hint that the settlement was of relatively recent origin. The very fact of the survival there into the nineteenth century of a standing megalithic monument suggests that this may not have been a landscape which had been intensively exploited over a period of millennia in the way that is usually understood for Anciently Enclosed Land (Cornwall County Council 1996).

Other evidence also indicates that the Little Quoit Farm enclosure stands on or close to land which was rough ground until the relatively recent past and probably, therefore, also in the later prehistoric and Roman period (*cf* Herring 2011a). Field names recorded by the 1842 tithe survey (HER) include Marks Downs and Downs immediately to the south of the site, the latter surviving as rough ground at that date; Great Downs lay nearby to the east and a group of fields recorded as Higher Downs, Middle Downs and Furze Brake lay just to the west.

Two post-medieval smallholdings and a block of straight-sided fields also likely to be of this period also lay adjacent to the west. Additionally, the tithe map showed a number of houses and small plots occupying a narrow strip of land along the north side of the road running east-west along the south side of the field in which the enclosure lies. These features are typical of areas enclosed from former rough ground in the post-medieval period, probably during the later eighteenth or early nineteenth century (Dudley 2011, 46–55; Kirkham 2011a). The tithe map also shows a large area of upland rough ground around the hillfort of Castle-an-Dinas to the east of the site, much of which survived into the twentieth century. This proximity to rough ground may be significant in terms of access to sources of fuel for the industrial activities which took place in the Little Quoit Farm enclosure during the Roman period, and therefore a factor in determining its location.

The tithe map (1842) and 1st edition 25in: 1 mile Ordnance Survey map (*c* 1880) both show a leat running from south east to north west through the field in which the excavation was carried out. It ran for a total distance of 2.7 km, originating at a spring on higher ground about 1200m east of Little Quoit Farm and running to a reservoir and waterworks south of St Columb. The leat did not survive within the field as an earthwork feature and was not certainly located during the excavations, although it can probably be identified with one or more linear features on similar alignments identified to the north of the enclosure (below).

The excavation

Removal of the ploughsoil revealed the ditches defining the northern and southern sides of the sub-circular enclosure, with an external dimension of about 66m. (Recent air photographs (Fig 18; colour plate 2) indicate a maximum external diameter for the enclosure, across the outer edges of the encircling ditch, of about 71m.) Within the enclosed area two distinct sub-circular features could be seen initially. To the south east of these, against the side of the excavation corridor was a darkened area of burnt material and slag. On the inner edge of the southern enclosure ditch the yellow clay of the former rampart was visible. As excavation progressed much of the remaining skim of basal topsoil was removed to clarify features.

The five phases of activity identified by the excavation are described below, with a number of features which could not be associated with a specific phase.

Context numbers for cut features such as ditches, pits and postholes are shown in square brackets – for example, [499] – and those for layers, fills and deposits in round brackets: (500). Radiocarbon dates are quoted at the one sigma confidence level.

Phase 1: Neolithic activity

Six characteristically Neolithic flints found during the course of the excavation (Table 1) indicate activity dating to around the third millennium BC; the absence of other Neolithic material or features suggests that these were residual. The former presence of a chambered tomb nearby at Quoit indicates Neolithic activity in the near vicinity of the site and Johnson (1979, 9) has suggested that there may have been other Neolithic monuments in the area. The pipeline to the immediate north and south of Little Quoit Farm produced further Neolithic finds, including a leaf-shaped arrowhead, while features potentially belonging to this period were also found along the spur pipeline located nearby to the west of the excavation (Lawson-Jones 2001).

Phase 2: pre-enclosure field system

Demonstrably pre-enclosure features included a number of truncated ditches or gullies which underlay later hollows and metalworking features. These are discussed from north to south across the interior of the enclosure (Figs 4–5).

Ditch [499]

The most severely truncated of these features was ditch [499], which survived to a depth of only 0.1m below later hollow [284] (Fig 5). It was 0.4m wide, with a flat base, and contained a single fill (500), compact and pale brownish-grey in colour. The fill represented natural silting of an open feature. There were no finds.

Ditch [280]

This was more substantial than most on the site, 0.8m wide and about 0.4m deep, with steep sides and a near flat base (Figs 5 and 11). Where not cut

by hollow [287], the ditch appeared to represent a slightly lyncheted boundary. The basal fill (294) consisted of compact grey silts with occasional mineral staining. This appeared to have formed gradually and contained one piece of Late Iron Age to early second century pottery (Quinnell, below). Its middle fill (295) consisted of a pale tan clay with occasional stones and charcoal flecks. Unfortunately, the potential for contamination meant that it was not worthwhile attempting a radiocarbon date.

The upper portion of ditch [280] contained a very different fill (281), which produced a small quantity of metalworking slag from within the area of the hollow (unlike the underlying fills which did not produce any metalworking-associated finds and certainly pre-date any phase 3 activity). The upper edges of this fill were unclear at the time of excavation and could only be identified extending a little way into the base of the mixed and disturbed primary fill of hollow [287] (Fig 5). It is possible that the metalworking waste from (281) is the result of disturbance and the pushing down of waste into the softer underlying ditch fill. Alternatively ditch [280] may still have been open at the start of phase 3 and, as such, required backfilling. If this was the case then the later excavation of pit [292] into the top of this ditch would suggest minor (and probably very short term) sub-phasing within phase 3. This interpretation might explain the apparent targeting of ditch [280] by pit [292], since if [280] had been filled substantially earlier it might no longer have been visible by the time that [292] was excavated and filled.

Ditch [298]

Ditch [298] was 0.5m wide and 0.3m deep and contained two fills (Fig 5). Basal fill (300) consisted of pale grey silt; no artefacts were found within it. Upper fill (299) was a mid grey-brown, firm clay loam, which produced two pieces of undiagnostic pottery; it had been partially removed by later hollow [304]. Both fills appeared to have been produced gradually, as evidenced by silt lines which were most noticeable within (300), implying that the ditch had remained open for some period of time.

Ditch [306]

Ditch [306] was 0.6m wide and 0.25m deep and contained two fills, the upper one of which was

partially cut away by hollow [353] (Fig 5). Lower fill (308) was compact, mid brownish-grey and silty. It produced two pieces of undiagnostic pottery. Upper fill (307) was a mixed orange-brown coloured clay loam and produced no finds. Again these fills appeared to be the result of gradual silting.

Buried soil (504)

Layer (504), cut by hollow [353] and undated feature [301], was an early layer lying directly above the natural. It may represent an early remnant ploughsoil associated with the pre-enclosure field system represented by some or all of the ditches described above. The mixed subsoil shown (un-numbered) immediately to the north of the enclosure rampart in Figure 10 probably equates with this layer.

Discussion

The general similarity of these four ditches, [499], [280], [298] and [306], their fills and the silting processes evident within them, suggests that they may be broadly contemporary. Two ditches found outside the enclosure, [265] and [269], were also similar and may have been associated (below). It seems most probable that these features represent the boundaries of one or more phases of a ditched field system pre-dating construction of the circular enclosure. Slight lynchetting on ditch [280] suggests some period of cultivation across the site during this phase; [280] and [499] together may have bounded a track or access lane between fields. The small assemblage of pottery from the ditches derives broadly from the later Iron Age to the early second century AD but is not more closely datable (Quinnell, below). Ditch [280] was still partially open during initial use of the enclosure for metalworking and is therefore most probably Late Iron Age or early Roman in date.

The geophysical survey (Fig 3) shows features which may equate with ditches [499], [280] or [298] continuing beyond the edge of the excavation to the east, two of them showing fairly abrupt turns to the south which conceivably mark the corners of fields. It is possible that field systems of more than one phase are represented: ditches [280] and [499] were both aligned roughly east-west, paralleling the natural contours, and ditch [269], outside the enclosure to the north, had a broadly similar

SMITHING IN THE ROUND: EXCAVATIONS AT LITTLE QUIT FARM

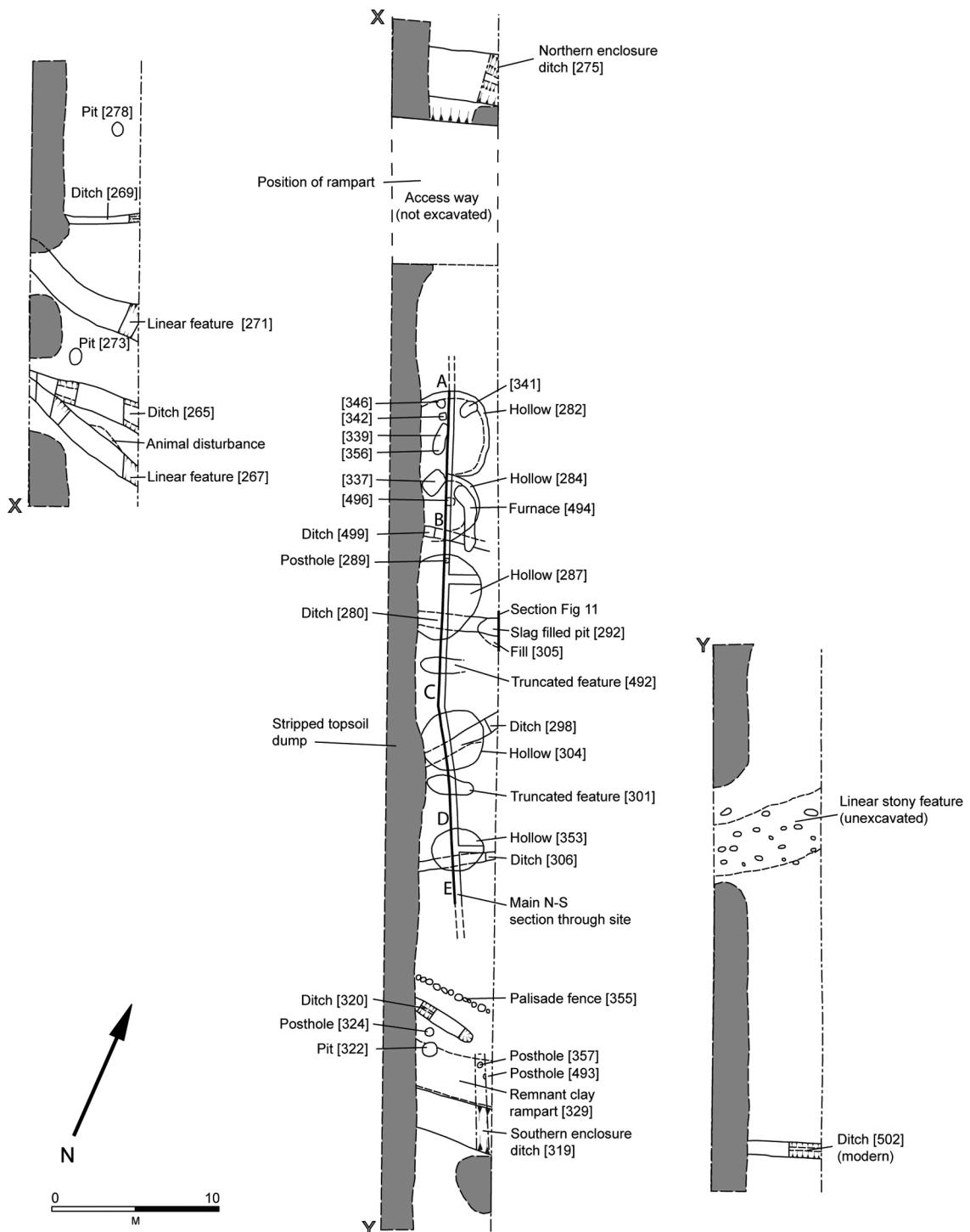


Fig 4 Plan of the principal features excavated within the pipeline corridor

orientation. Ditches [298] and [306], however, were oriented more nearly north east – south west.

The excavation did not produce any direct evidence for domestic settlement in this phase and it is not known where the settlement associated with the probable fields was located, or whether it was enclosed or unenclosed. However, the pottery found in a number of the ditch fills, possibly deriving from domestic midden material spread onto the fields, suggests that a settlement was not far away.

Phase 3: a metalworking site

Five hollows, two or three of which were used for metalworking, were identified in this phase and are dated by pottery finds to the early second century to early third century AD. A possible palisade and shallow flanking ditch may represent enclosure of

the site, although no direct relationship between the palisade and hollows was identified.

The hollows

The five hollows within the excavation corridor were broadly similar in shape and profile but varied in diameter. They appear to lie within the central area of the enclosure with a clear area to the north and south (Fig 4).

HOLLOW [282]

The northernmost hollow, [282], was the largest, with a diameter of 5m; it was 0.2m deep (Figs 5 and 6). Broadly sub-circular in plan, all but its western edge was revealed and the majority of its interior was fully excavated. The northern and eastern sides were most clearly defined, the southern edge being less clear due to the proximity

Historic ironworking techniques

This explanatory note is based on English Heritage *Centre for Archaeology Guidelines: Archaeometallurgy* (Bayley *et al* 2001) and Historical Metallurgy Society Archaeological datasheet, 3, *Iron working processes* (McDonnell 1995).

Smelting is the process of producing metal from iron ore. Pieces of ore (pre-processed by roasting and crushing) and a supply of charcoal were fed into a pre-heated furnace and a draught of air produced by bellows pumped into the base. Iron particles coalesced to form a spongy mass known as a bloom, while impurities liquefied and collected in the base of the furnace as slag, from where it could be tapped and run off, producing tap slag.

Archaeological evidence of smelting includes pieces of tap slag or slag in the form of furnace bottoms, and sometimes fragments of vitrified clay from the blowing holes or *tuyères* through which air was forced into the base of the furnace. Early furnaces were in the form of a vertical clay cylinder, up to 1m in diameter and probably up to 1–1.5m high.

Smithing – the shaping of metal by hammering – required a hearth or forge to heat and thereby soften

the metal. Primary smithing was the hammering of the iron ‘blooms’ resulting from smelting to consolidate the metal and expel impurities. The iron stock or billet created could then be shaped into artefacts by secondary smithing. In this the smith would heat the metal to red heat in the hearth and, using hand tools, particularly hammers, and working on an anvil, the metal could be thinned, thickened, straightened, bent, split, pierced or otherwise shaped (using punches and templates, for example). Secondary working also allowed iron to be welded by heating the pieces to be joined to white heat and then hammering them together.

Archaeological evidence for smithing normally includes quantities of hammerscale around the site of the hearth and anvil where the work was carried out, together with masses of slag known as smithing hearth bottoms or pit bases which accumulated in the bases of hearths, and fragments of vitrified hearth lining. Most hearths are assumed to have been above ground but traces of ground level hearths may also survive.

There may additionally be evidence of some form of shelter around hearth sites, intended to protect both the hearth and smith from the elements but also perhaps to produce dim lighting around the hearth to allow the smith to judge the temperature of the iron from its colour.

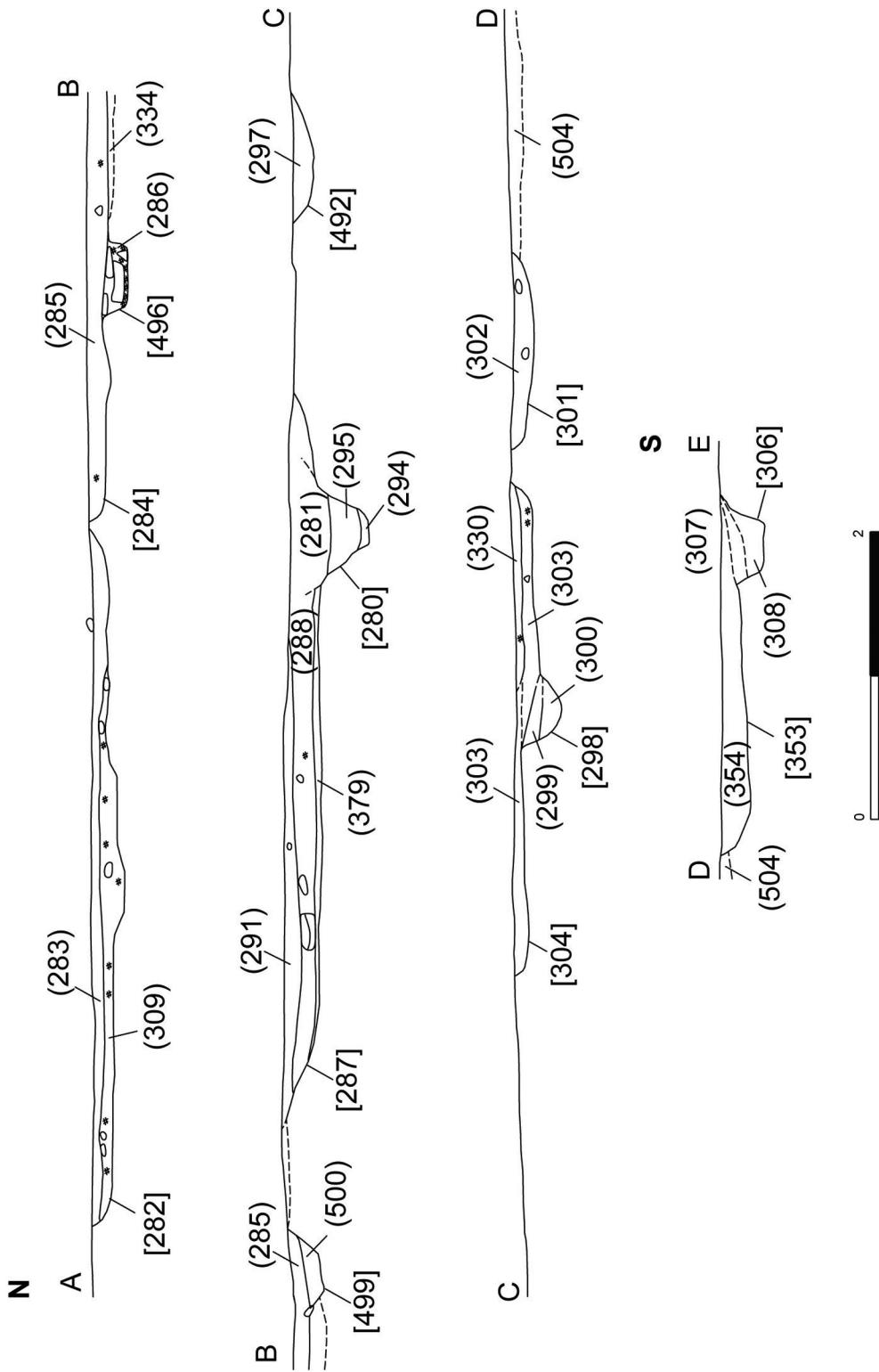


Fig 5 West-facing section recorded along the running excavation trench across the enclosure

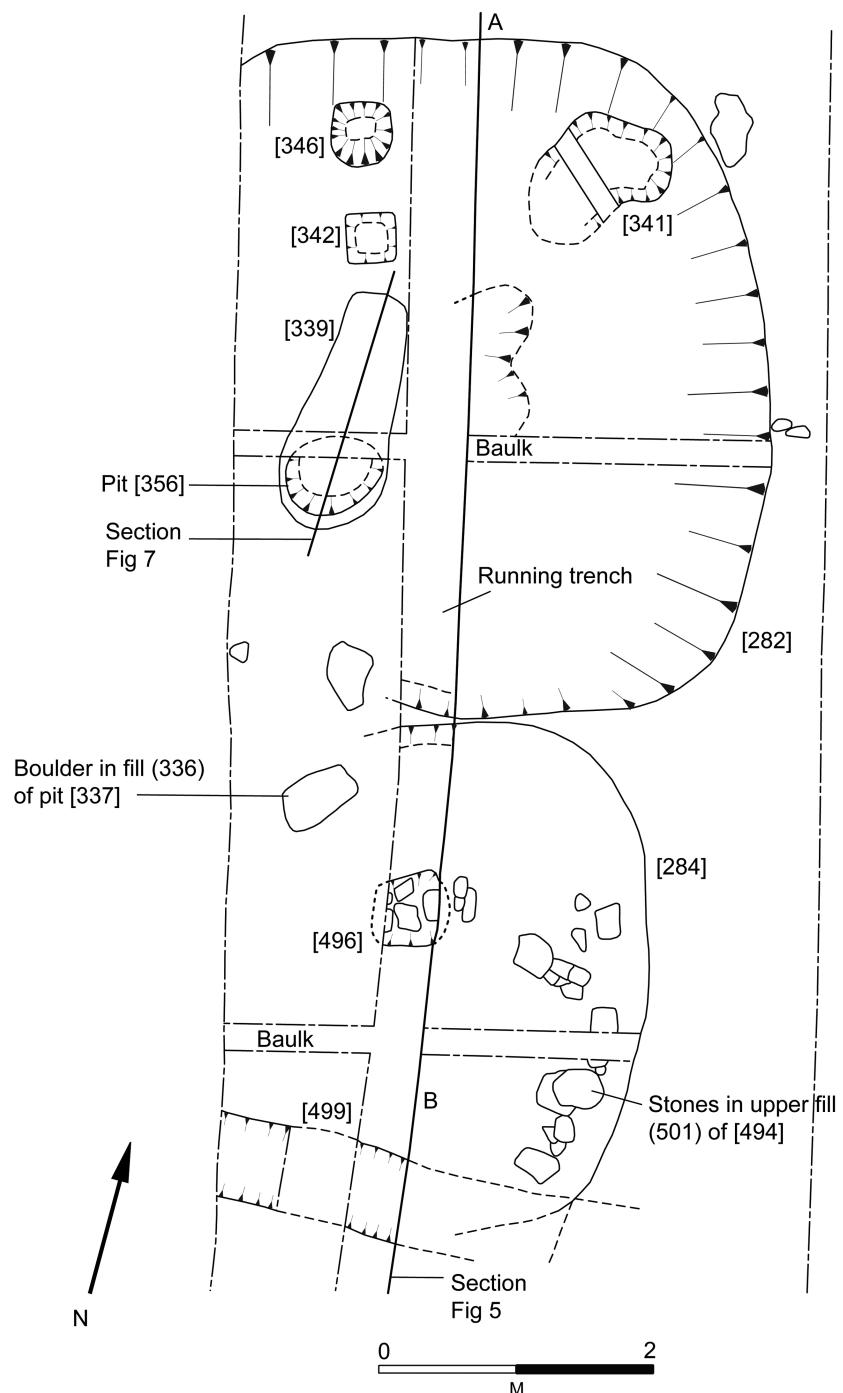


Fig 6 Plan of phase 3 of hollow [282] after removal of main fill [283] with phase 4 pit [356]. Hollow [284] is to the south

of hollow [284]. The sides were concave in profile and relatively steep. The base was near level with the exception of a shallow, elongated and slightly amorphous central depression which contained the same fill as the remainder of the base of the hollow. Within the hollow were a number of features, the majority of which were sampled and provided clear evidence for metalworking.

Feature [342], in the north-western quadrant of the hollow (Fig 6), was 0.6m square in plan and 0.07m deep. The sides were concave and the base near flat, with a thin stone slab positioned centrally. Fill (343) contained variable slags and a small broken iron object. The base, edges and central stone setting did not appear burnt, despite charcoal-rich material having built up around the stone. The stone may have had a function related to smithing, perhaps as a stand for an anvil used during secondary working.

Feature [346] was sub-circular, 0.5m in diameter and up to 0.1m deep, lying close to the northern edge of hollow [282] and feature [342] (Fig 6). It was filled by an orange-red silty clay with grey and brown patches and a substantial layer of charcoal (346a). Positioned centrally on its concave base was an unburned stone. Interpretation of this feature is uncertain: it could represent a hearth pit or may have had a similar function to [342], which also had a central stone.

Feature [341] in the north-eastern portion of hollow [282] was 1.25m long, up to 0.7m wide and 0.1m deep (Fig 6). In plan it had an amorphous rounded shape, and in profile a gently rounded base and concave edges. It contained fill (340), a dark grey-brown silty clay. Again, the specific purpose of this feature is uncertain, but the fill incorporated hammerscale and vesicular slag typical of smithing.

Feature [339] was an elongated pit which appeared to be contemporary with [282] and was located in its western half (Figs 6 and 7). The fill of [339] was (338), a dark grey brown burnt silty clay which contained a comparatively large number of artefacts: 16 pieces of pottery, including two second-century AD jars – **P5** and **P6** (Quinnell, below) – plus quantities of slag and a small collection of broken iron objects. Subsequently, during phase 4, a shallow bowl-like feature [356] was cut into the southern end of the fill (338) of [339] (Fig 7).

The basal fill of hollow [282] was (309), a pale brownish-grey ashy silt deposit containing charcoal and much hammerscale. The fill relates to activity within the hollow and merged with or overlay internal features [339], [346] and [341]. A residual Neolithic flint was found within this fill.

HOLLOW [284]

Hollow [284] was located immediately to the south of hollow [282]; it was sub-circular, approximately 4m across and 0.2m deep (Figs 5 and 6). The majority of the feature was excavated. As with adjacent hollow [282], [284] had concave, shallow but relatively steep edges and a near-level base. In plan its shape was partly obscured by its proximity to [282], by later fire pit [337] cut into its western side and ditch [499] which underlay its southern edge.

North of the centre of [284] was pit [496]. This had a rounded sub-rectangular plan, 0.5m by 0.4m, and was 0.2m deep. Its edges were steep and the base was flat. The fill (286) included a dense basal scatter of charcoal flecks, overlain by a burnt, loamy clay with a stone pad resting on top. The cut appeared to relate to the primary use

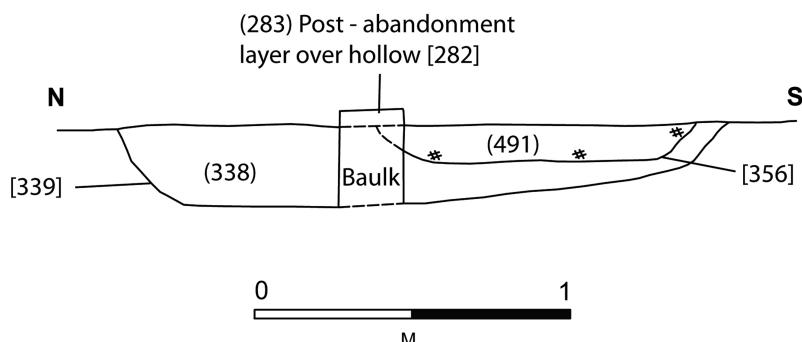


Fig 7 Section through phase 3 pit [339] and phase 4 pit [356]

of hollow [284]. It may have been a small central hearth (possibly originally lined with clay or stone) although the stone showed no evidence of having been subjected to heat; it could represent later infilling. However, the charcoal within fill (286) incorporated hammerscale typical of smithing or secondary smithing and it is possible that [496] was a smithing feature, with the stone having acted as the support for an anvil. A radiocarbon date of cal 760–510 BC, 2740 ±45 BP (AA-36505), was obtained from a sample of alder charcoal. This is probably anomalous, perhaps deriving from residual charcoal, but does raise the possibility of a much longer history of metalworking activity on the site.

Immediately south of cut [496] was a thin layer (334) on the base of hollow [284] consisting of a brown sandy clay and pea-grit, 0.06m thick and 1.4m long from north to south. There were no finds and charcoal was minimal; neither was there evidence for smithing activity. Layer (334) probably derives from silting after abandonment of hollow [284]; it contrasts with layer (309), the basal fill of hollow [282], which derived from contemporary metalworking within hollow [282].

Subsequently, feature [494] was cut into the eastern side of hollow [284], cutting through fill (334), and fire pit [337] was cut into its north-western side (below).

HOLLOW [287]

Hollow [287] (Figs 4 and 5) was located just to the south of hollow [284]. It was 5m in diameter and 0.26m deep, with concave sides less steeply cut than those of hollows [282] and [284] although deeper. This feature was examined only by a single north-south section recorded along the running trench, with a further trench extended east from it to just beyond the edge of the feature. Basal fill (379) covered only the near-flat base of the hollow and did not extend up on to the sides. It was 0.06m thick and consisted of a pale grey-tan coloured ashy silt with occasional tiny charcoal flecks. Oak and gorse / broom charcoal was identified from this fill (Gale, below).

Posthole [289] lay within [287], the only posthole associated with a hollow found on the site. It was 0.3m in diameter and 0.1m deep with sheer sides and a flat base. It was located in the sloping northern edge of the hollow within the pipeline trench (Fig 4). Its fill (290) was very similar to the surrounding natural clay shillet, but

slightly more silty and grey. This posthole could conceivably have related to a structure associated with the hollow but could also have been an earlier feature cut through when the hollow was created.

HOLLOW [304]

Located between two heavily truncated apparently linear features, [492] and [301], this hollow was near-circular and 3.5m in diameter (Figs 4 and 5). It was 0.1m deep on its northern side and 0.18m to the south and the edges were again concave and steep. The hollow overlay ditch [298], which marked the point at which the depth of the hollow altered slightly; the resulting two portions of the hollow were both level. Approximately 60 per cent of the area of the hollow was excavated.

Basal fill (303), a brownish-grey clay with some charcoal flecking, was mostly in the deeper southern half of the hollow, with little more than a skim evident in the northern half. This fill contained 12 pieces of pottery, including a jar (P3) dating no later than the early second century AD. A single fragment of slag, a fragment of granite, apparently unshaped and with no indication of having been utilised, and a water-worn pebble were also found in this layer.

No contemporary internal features were found within hollow [304], although two gullies, [344] and [331], were cut into primary fill (303) of the hollow and were subsequently sealed by upper, post-abandonment fill (330) (below).

HOLLOW [353]

Located to the south, the smallest of the excavated hollows was [353], with a diameter of only 2.5m. It was 0.2m deep and defined on its northern side by a steep, concave slope (Figs 4 and 5). Only a small portion of this hollow was examined: a north-south section was recorded through the centre along the running trench and a further small trench was extended from this towards the hollow's eastern edge. No internal features were identified. The single fill (354) produced 19 sherds of pottery, none of which were datable and may represent post-abandonment infilling (below). The fill lay over pre-enclosure ditch [306].

Ditch fill (281)

Fill (281) was the upper fill of former field ditch [280]. It formed during phase 3, after this part of the field system went out of use, but before the

construction of pit [292] during phase 4 (Figs 4, 5 and 11). It produced substantial quantities of slag, which may have originated from beyond the edge of the excavation corridor. No clear evidence of tip lines was seen in section. The quantity of slag suggests that intensive metalworking was taking place within the enclosure during this period, as was also indicated by the material from pit [339] in hollow [282].

The palisade and ditch

Within the southern side of the phase 4 enclosure rampart the excavation revealed a line of closely-set single and double postholes and stake holes, collectively numbered [355] and interpreted as a palisade, with an accompanying truncated ditch, [320], paralleling it to the south (Figs 4, 8 and 9).

Palisade [355] consisted of ten closely spaced post- or stake-holes aligned roughly west-north-west – east-south-east, extending over a length of 5m within the pipeline corridor. Two postholes, [369] and [371], contained double post settings; a further two postholes were noted but not excavated. Posthole diameters were between 0.21m and 0.51m, while depths varied between 0.18m and 0.35m. They may have suffered some truncation, probably from later ploughing, as holes of this depth would not have been deep enough to support a palisade, fence or structure of any size. Alternatively, it is possible that spoil from ditch [320] immediately to the south was used to create a bank in which the palisade timbers were set and supported.

The fills of the excavated postholes were similar, a mid-brown, silty clay loam with varying proportions of charcoal flecks. Stone post-packing

was present within each, varying in the quantity and size of stones. Most of the postholes had a tapered profile, wider at the top than at the base, and the bases varied from flat to pointed. The double postholes may represent either double post settings or replacement of individual posts or stakes; the latter interpretation would suggest a feature which persisted over some time. The maximum spacing between individual postholes was 0.18m. While the distances between the posts themselves would have been greater than this, the palisade – if it formed a continuous barrier – could have formed a relatively solid boundary, possibly restricting not only access but also visibility into the site.

Three postholes were sampled, [367], [371] and [373]. Charcoal was found but no evidence of metalwork debris, suggesting that smithing activity was either confined to the central part of the enclosure or that the palisade pre-dated the beginning of metalworking on the site.

Ditch [320] paralleled the alignment of the palisade, its northern edge lying approximately 1m south of the line of postholes (Fig 4). It was relatively slight, varying in width from 0.48m to 0.58m, and very shallow, between 0.1m and 0.17m in depth. A 4m length of the ditch, including an eastern terminal, was exposed within the pipeline corridor. It is likely, however, that, as with the postholes, there had been some truncation, in which case it may originally have continued further in this direction. Truncation may also explain the lack of an accompanying bank of material excavated from the ditch. Alternatively, it is possible that the ditch pre-dated the palisade and that the apparent terminal marks one side of a former entrance which the palisade subsequently blocked.

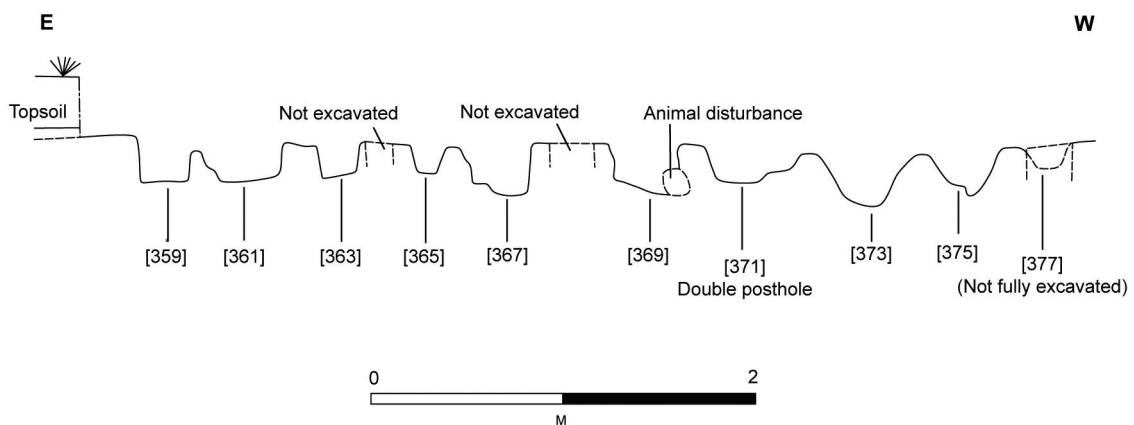


Fig 8 Profile through palisade [355]



Fig 9 Excavation in progress of posthole [369] in palisade [355]

Ditch [320] contained a single fill (321) of mottled mid-brown loamy clay with occasional stones. It produced a single sherd of pottery and five iron joiner's dogs, the largest iron objects to be found on the site, with hammerscale adhering to them (Quinnell, below).

Interpretation and clear phasing of the palisade and ditch is difficult. They were recorded only on the southern side of the enclosure; regrettably, an unexcavated access way ran across the pipeline corridor on the northern side, coinciding with the expected position of the palisade and ditch if they formed a continuous circuit. The palisade and ditch may have been more localised: while lying roughly parallel to the line of the southern enclosure ditch, the short length revealed of each did not appear to

curve as might have been expected if they formed part of a continuous boundary comparable in form with the later enclosure. They could, therefore, represent a simple structure such as a screen or windbreak although the scale of the postholes seems rather too large for this.

Discussion

In plan, palisade [355] and ditch [320] appear to have worked together, possibly to define the southern boundary of the site, and as such they are seen as contemporary; spoil from the ditch may have been used to create an internal bank in which the palisade was set. There is no direct stratigraphic evidence of this, however, or anything

to link them with the phase 3 hollows, other than the presence of hammerscale (attached to the bundle of joiner's dogs) in ditch [320]. Neither have parallels for a possible phase of enclosure by palisade and ditch been identified on other excavated Cornish rounds, although the pre-round enclosure identified at Trethury offers a possible comparison for the phasing (Quinnell 2004). At the same time, subsequent development of the site, with an enlargement of the main metalworking features and enclosure by a substantial rampart and ditch (below) could be seen as a continuation of a process begun during this phase.

The five closely-spaced hollows, two or three of which show evidence of metalworking activity, appear to have been located centrally within the putative palisade enclosure. The latter need not be seen as having been defensive, perhaps rather as a formal barrier separating the space within the enclosure and the specialist activities carried on there from the outside, perhaps also hiding these activities from view. There is, however, an apparent contrast between the site layout at Little Quoit Farm, where the hollows occupied the central area, and that found at excavated rounds with a clear domestic element, where houses were generally located around the periphery of the site, immediately within the enclosing bank, as, for example, at Trethury (Quinnell 2004).

The significance of the five joiner's dogs found in ditch [320] is unclear. The presence of hammerscale in the soil adhering to them may suggest that they were dumped into the ditch with waste material from the interior of the site. Alternatively, they may have been made on site and intended for use in the construction or repair of the adjacent palisade. It is also possible that they represent a deliberate act of deposition, a symbolic placing into an encircling ditch of products and by-products of the industrial activities carried out within the enclosure.

The five hollows within the enclosure were all similar in shape, depth and profile. None was more than 5m in diameter and they were therefore small by comparison with Roman-period domestic structures such as those identified at Trethury, Castle Gotha and Grambla, which were oval in shape and up to 13m in length (Quinnell 1986, 126). None of the hollows showed clear evidence for associated structures: no indications of walls or foundation trenches, cobbling or drainage features were identified in any of them, and only

one posthole. However, it seems likely that there was some form of structural or defining element to them because all are so similar in shape, depth and profile. It is conceivable that stakeholes, gullies, turf walls or banks which formerly existed around them were truncated by subsequent ploughing.

Only the two northernmost hollows, [282] and [284], showed clear evidence of function in this phase. They were very close together and may even have joined. Both produced evidence of smithing and hollow [282] also had iron slag and broken iron objects. Some of the pottery from [282] dated to the second century AD. Microslags were identified in soil samples from most of the small features within [282] and [284]. The other three hollows contained no evidence for either domestic or industrial use. They appear too small and their bases too little disturbed to have been used for keeping livestock and they may have had storage functions.

Feature [339] within hollow [282] contained pottery, slag and broken iron objects and was the only feature located during the excavation which contained such a variety of artefacts. It is unclear whether this fill represented intentional deposition or simply infilling with waste or midden material. Dumps of varied waste material found in other later prehistoric enclosures have often been associated with earlier cut features (Quinnell 1986, 126).

The Early Iron Age radiocarbon date of 760–510 BC, 2740 ± 45 BP (AA-36505), obtained for fill (286) in hollow [284] is considerably earlier than is indicated by any other evidence from phase 3. Anthropogenic contamination of the sample from (286) with earlier material is felt to be unlikely. It seems inherently more probable that the radiocarbon date is unreliable, perhaps through naturally occurring movement and mixing of residual material via worm or root activity, and that feature [496] forms part of phase 3 and in fact dates to the second and third century AD.

Phase 4: construction of the enclosure and increased metalworking activity

This phase comprised construction of a substantial external ditch and rampart defining a broadly circular enclosure. This appears to have been accompanied by an increase in the scale of metalworking. This enclosure was closely comparable in form with the rounds distributed widely across Cornwall in the Later Iron Age and

Roman periods (Quinnell 2004; Herring 2011b, fig 97; Young, forthcoming). The ditch and rampart were identified from the geophysical and earthwork surveys carried out in advance and portions of them to the north and south of the metalworking area were investigated during the excavation. Pottery and radiocarbon dates suggest a predominantly third century AD date for this phase, perhaps extending into the fourth.

Northern ditch [275]

On the northern side of the enclosure the ditch [275] as excavated was 3m wide and 1.3m deep with steep sides and a narrow, flat base (Fig 10). It had six fills, three of which appear to have entered the ditch from the south. The basal fill (313) consisted of mid to dark grey silt mineral-stained silts and produced no finds or charcoal suitable for dating. It was compact and undisturbed and appears to have formed by gradual silting deriving from erosion of the ditch sides. The second fill, (312), consisted of a brown sticky clay and shillet which had slumped into the ditch from the south and probably represents material from an internal rampart. Above this, the third fill, (311), consisted

of a mid-brown loamy clay with occasional shillet. It produced charcoal of gorse or broom and again had entered the ditch from the south, probably also from the rampart. Above this, fill (310) was a dark-brown clay also containing charcoal and entering the ditch from the south.

Fill (277) consisted of a mid orange-brown loamy clay. It could be the result of long-term ploughing down the gently sloping field from north to south but, with a lack of conclusive tip lines etc., its loamy character could also derive from the slumping down and collapse of rampart material from the south after a soil had formed over it. Alternatively it could perhaps have come from an original loamy core of rampart material incorporating turf and topsoil. It was a loamier deposit than those lower ditch fills which originated from the re-deposited natural clay rampart. The upper deposit, compact grey-brown silty loam (276), appeared to be the fill of a cut into the upper surface of the silted ditch (Fig 10). The upper parts of ditch deposits (311), (310), (277) and (276) had clearly been truncated, probably by later ploughing, suggesting that a considerable degree of erosion has taken place across the ground surface contemporary with the rampart.

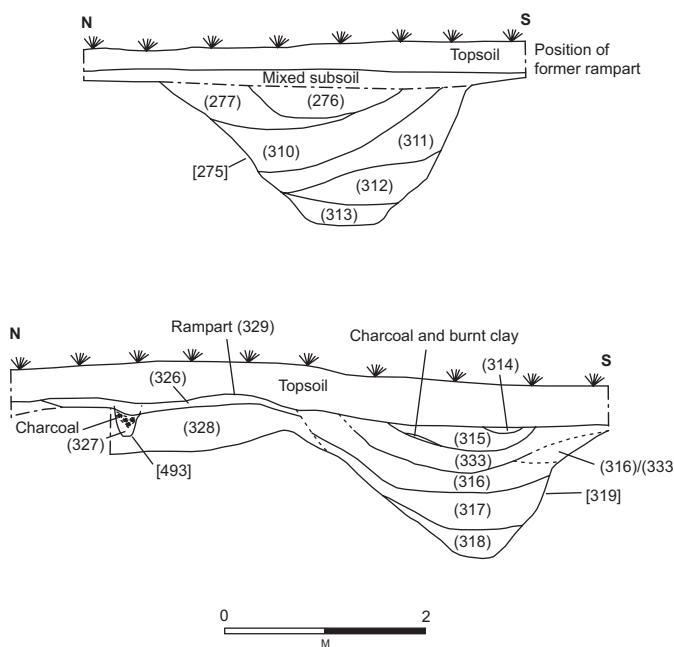


Fig 10 West-facing sections through (top) the northern [275] and (bottom) the southern [319] enclosure ditches, the latter with associated remnant rampart [329]

The three fills (312), (311) and (310) are likely to represent material eroded from an internal bank of clay and shillet; the absence of intermixed artefactual material suggests that they formed during relatively short phases of instability, this may indicate a lack of concern with maintenance of the ditch and rampart at this period. The presence of the apparent re-cut filled by (276) within the upper fill of the ditch could indicate that the enclosure circuit was still being maintained even after much of the bank and ditch had been reduced. Alternatively, post-medieval farmers are known to have dug out the ditch fills of prehistoric enclosures for inclusion in 'composts' for dressing their fields (Kirkham, forthcoming) and fill (276) could have formed in a hollow created by such removal.

A change in the surrounding agricultural regime (perhaps from pastoral to arable use) altered the stability of topsoil in the fields adjacent to the enclosure. As a result, darker loam-based soils filled the remaining open portion of the ditch. Ploughing continued up to (or over) the infilled ditch and denuded the rampart. This is clearly seen in the truncation of the upper parts of fills (311), (310), (277) and (276). The unnumbered mixed subsoil shown immediately overlying the ditch on the section (Fig 10), probably represents this phase of ploughing. The present ploughsoil sealed this layer, and was itself apparently the result of relatively recent deep ploughing.

Southern ditch [319]

The southern enclosure ditch [319] was similar in form and scale to that on the northern side, measuring 3m across and 1.3m deep with steep sides and a narrow, near flat base (Fig 10). The southern side had a slightly stepped profile. The basal fill (318), a coarse-grained reddish-brown silt, probably derived from natural erosion of the ditch edges together with some material from the rampart immediately to the north. The second fill (317) was a light reddish-brown silty clay which again may have partly derived from the rampart. The third fill (316) was a pale brown clay with re-deposited lumps of clay associated with the collapsing clay rampart and had a similar profile. This incorporated seven pieces of gabbroic pottery.

The fourth fill (333) was a brown loamy clay which merged with (316) towards the top of the section on the southern side of the ditch, and was overlain by *in situ* burning probably associated

with a small temporary fire setting on the northern edge (scorching the underlying (333) deposit). Overlying this was fill (315), a pale grey loamy clay with shillet, which represents either a continuation of the ditch silting sequence or possibly the fill of a re-cut (perhaps equating with (276) in the northern ditch). Above (315) was a remnant deposit of burnt clay and charcoal (314), representing either the truncated uppermost surviving fill of the main ditch, or the upper fill of a re-cut, the bulk of which was represented by fill (315).

The narrow layers in the upper portion of the southern ditch suggests that there was fairly considerable and perhaps rapid slumping of rampart material into the ditch. This may then have settled or slumped further as the ditch fills became more compacted, accounting for the apparent abutting relationship of rampart contexts (328) and (326) with ditch fill contexts (317) and (316), resulting in a slumped edge that looks like a re-cut. The drawn section (Fig 10) suggests that a southern 'lip' of natural (seen underlying the rampart) marked the original upper edge of the ditch, but it could simply define the eroding upper edge of the ditch prior to being sealed by collapsing rampart material prior to the internal settling (and slumping) of ditch fills.

Rampart (329)

Immediately north of the southern ditch [319] were the remains of a bank approximately 2.5m wide and surviving to 0.5m high (Fig 10). As excavated, it consisted of two layers. The basal layer (328) was approximately 0.4m deep, composed of dense orange clay and shillet with occasional flecks of oak charcoal; this is likely to be a near-clean re-deposition of natural clay shillet removed from ditch [319]. Above this, layer (326) was 0.1m thick, a pale bluish-grey re-deposited clay with decaying shillet, again very similar to the decaying bedrock seen in the middle to lower portions of the adjacent ditch cut. A soil sample from layer (326) produced charcoal from which a radiocarbon determination of cal 240–380 AD, 1735 ±45 BP (AA-36503) was obtained.

Postholes [493] and [357] (Figs 4 and 10) appear to have been integral with the rampart. Posthole [493] was 0.25m in diameter and 0.2m deep. It contained fill (327), a pale brownish grey slightly loamy silt with an increasing charcoal content in the upper part of the fill. Fill (327) also included a small quantity of fired clay. Posthole [357] was

0.2m across and deep and was filled by (358), a firm, pale, slightly orange grey-brown loamy clay with charcoal flecks throughout. Both postholes were cut into lower rampart material (328). Upper rampart material (326) sealed posthole [357] but the relationship was less certain with posthole [493], which appeared to partially cut (326), suggesting the possibility that the post rotted *in situ*. The postholes were 0.3m apart and may have had a stabilising or supporting function; they presumably represent two of many such postholes set along the internal face of the rampart. The charcoal content was not sufficiently dense to suggest that either was burnt *in situ*.

No evidence for a similar circuit of closely set postholes was found along the outer face of the rampart. This could indicate that the rampart had a near-vertical, timber-reinforced inner face with a sloped outer face above the inner edge of the original ditch cut. No buried soil was located beneath the rampart, suggesting that the former ground surface was stripped of turf and topsoil prior to its construction.

Metalworking features

Phase 4 saw the creation of a number of metalworking features in and around the two northernmost hollows.

FEATURE [356]

This was a shallow, concave bowl 0.65m across and 0.18m deep cut into the fill of pit [339] in the western part of hollow [282] (Figs 6 and 7). Its fill, (491), consisted of an ashy, burnt, silty clay with shillet fragments. The function of this feature is not certain, although it may have been related to metalworking: several small features of unknown function similar to [356] (and [342]) were found at Reawla in association with larger metalworking features (Appleton-Fox 1992, 118).

FIRE PIT [337]

This feature lay across the north-western edge of hollow [284], close to the junction between hollows [282] and [284] (Figs 11 and 12). The western edges of hollow [284] and [282] were not as clearly defined as their central and eastern portions. It is possible that this lack of definition marks an open (western) side to hollow [284] and perhaps [282], (although there is no clear evidence to support a more substantial superstructure on

their eastern sides). The relationship between upper pit fill (336) and the main abandonment fill (285) of hollow [284] was not obvious because of the proximity of a large boulder to the eastern edge of the pit. In places the two fills appeared to merge but where it was possible to determine a relationship the pit's eastern side appeared to cut through (285) while the western side cut down through slightly disturbed natural. The continuing focus of metalworking activity within hollows [282] and [284] implies that phase 4 was probably not significantly later in date than phase 3 and that it essentially represents a continuation of previous activity.

Pit [337] was sub-rectangular in plan, 1.5m long, 1m wide and 0.75m deep. Its base was near flat and the edges sheer. Both the base and the lower edges had undergone pronounced heating, the natural clay shillet having turned a deep pinkish-purple red. The lowest fill (495) was a thin layer of heavily burnt natural clay and charcoal, underlying fill (381), a dark olive-brown, sticky, stone-free clay 0.1m thick deposit incorporating slag and two broken iron objects. This clay might represent a lining to the pit. Charcoal from (381) produced a radiocarbon determination of cal 230–380 AD, 1750 ± 50 (AA-36504). Fill (380) overlay (381) and consisted of a 0.15m deep, hard, red, fired clay with occasional stones and larger charcoal lumps. This may be the burnt upper portion of (381) and represent the last industrial use of the pit.

Fill (336) occupied the bulk of the pit, and represented an abandonment fill. Within it was a large boulder, approximately 1m by 0.5m by 0.5m, which appeared to have been pushed or placed into the eastern side of the pit. The top of this block was level with the top of hollow abandonment fill (285) on the eastern edge of the pit. The block may originally have been located on the edge of the pit and perhaps functioned as an anvil or working surface, although it bore no obvious signs of heating or wear. Fill (336) was a dark grey brown silty clay with charcoal and red clay flecks. It produced a small quantity of slag together with several small broken iron objects and hammerscale. Additionally, a piece of shaped, fired clay was recovered which could derive from a blowing hole or *tuyère* associated with a smithing hearth (below). Three pieces of undiagnostic gabbroic pottery were also recovered. There was some intermixing of fill (336) with layer (285) around parts of the upper edge of pit [337].

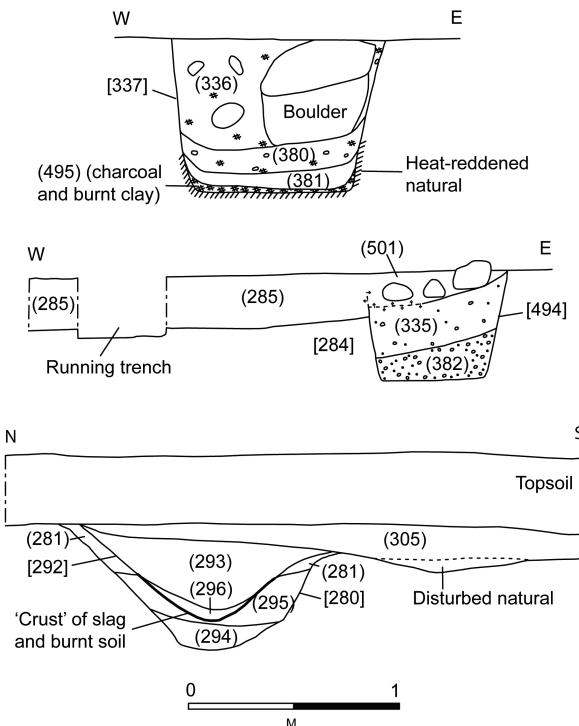


Fig 11 Sections through pit [337] and the 'tail' of linear pit [494], both in hollow [284], and (bottom) pit [292] in ditch [280]

LINEAR PIT WITH BOWL [494]

The bulk of this feature was positioned within the eastern side of hollow [284], extending across its south-eastern edge (Figs 11 and 12). As with fire pit [337], it appears that [494] was cut into an already partially infilled, perhaps abandoned working hollow. Again, the continuing focus of metalworking activity in the same location implies that phase 4 followed on reasonably quickly from phase 3 and that it essentially represents a continuation of earlier activity.

Aligned north-south, this feature was 4m long overall and 0.5m deep. The bowl, located at the northern end, was a maximum of 0.9m wide. Extending south from it was a narrower linear 'tail' 0.65m wide which continued beyond the edge of hollow [284], cutting across ditch [499]. The different alignments of the bowl and tail produced a shape resembling a sock in plan. The natural clay shillet at the bowl end was heat-reddened but the tail showed no substantial evidence of burning. As with most of the metalwork-associated features on this site, it appears that after final use it was thoroughly cleaned out. The basal fill (382), a firm, brown sandy clay with many small stones, did not appear to be burnt but did contain frequent charcoal

and a very small quantity of slag; it appears to represent post-use infilling of [494] with the upper edge of the fill sloping down from east to west (Fig 11). Above this, fill (335) consisted of a very dark grey-brown clay with more abundant charcoal, also sloping down to the west. Ten pieces of gabbroic pottery were found in this deposit, six of which formed part of a probable bowl. It also contained quantities of metalworking waste: more than 3 kg of slag, including a hearth bottom, five broken iron objects and much hammerscale. This fill, as with that below it, appears to have been deliberately pushed or tipped into the feature.

The uppermost fill (501) appeared to merge with the upper part of abandonment fill (285) on the western side, but had clearly built up against natural on much of the eastern side (where it merges with the eastern natural edge of hollow [284]). As with [337] above, limited animal and root disturbance may well have occurred around the upper edges of this feature. Fill (501) consisted of a silty loam incorporating a number of large stones. These could possibly represent an associated structure, although there was no evidence as to the form it might have taken, which had been pushed into the open top of feature [494] on or after abandonment.

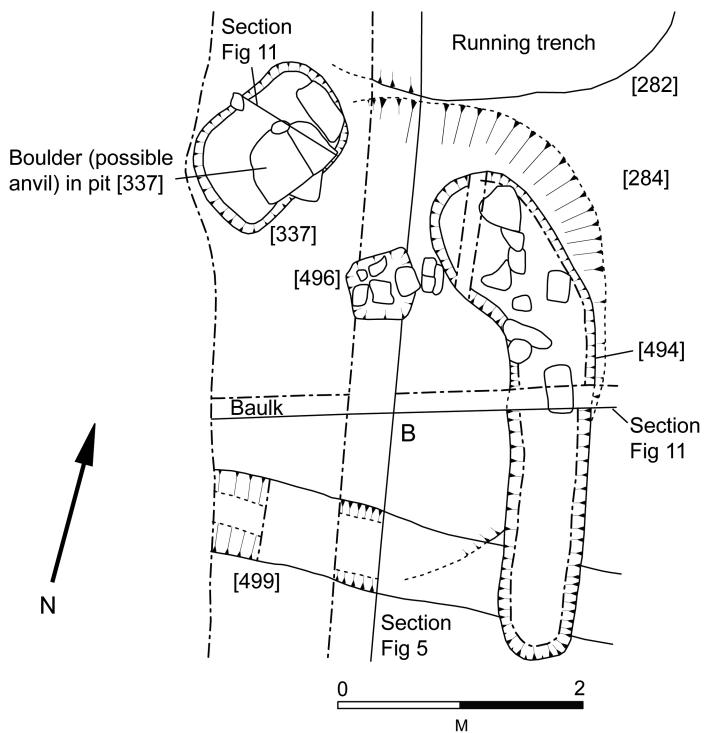


Fig 12 Plan of hollow [284] and phase 4 features after removal of fill (285)

The similarity of (501) to (285) suggests that it too, is at least partially residual in origin, filling in gaps around the collapsed stone work. Fills (501) and (285) may well be near-contemporary in date.

The evidence of burning in the base of the bowl part of feature [494] may indicate that it was a smithing hearth. The function of the extension to the south is uncertain, however. While its form suggests it as a possible flue, there was no evidence of burning in it and hearths and furnaces of this period do not show evidence of flues. It is possible therefore that the feature relates to some other aspect of activity undertaken at the site. As with several other cut features within the enclosure, [494] was used after abandonment for dumping metalworking and other site waste.

FEATURE [292]

This was located to the east of hollow [287] (Figs 4 and 11). Only its western edge was visible, the eastern side extending beyond the edge of the excavation. It was cut into the fill of ditch [280] and could in fact represent either a ditch re-cut or an elongate pit. It had steeply sloping sides, paralleling the profile of ditch [280], and a narrow concave base. Its positioning was apparently

determined by the still visible presence of [280] (the upper fill of which contained metalworking waste), either because it was easier digging or because it represented a continuation of the earlier practice of dumping metalworking waste here.

It contained two fills. A very hard, mineralised crust of burnt soil and slag on the base of the cut suggested that the initial fill (296) – 1.5 kg of slag and two hearth bottoms with burnt clay loam, burnt shillet and hammerscale – was deposited when still hot. Metallic pit bases are clear evidence of smithing activity (below), as is hammerscale. The fill also contained a fragment of Roman roofing tile. Fill (293) overlaid (296) and filled the bulk of the feature. It consisted of a dark, blackish-brown burnt loam with more than 14.5 kg of slag, including seven hearth bottoms, together with hammerscale, a number of broken metal objects, another piece of roofing tile and pieces of highly fired clay, possibly representing fragmented hearth lining. The fill also incorporated several pieces of gabbroic pottery, including a bowl (P9) which is unlikely to be earlier than the late third century AD (Quinnell, below). Charcoal of oak, hazel and gorse / broom occurred throughout the fill. The feature was overlain by (305) (below) which

may represent a continuation of these disposal activities.

The fills of [292] appear to represent dumping of hot slag, hearth bases and other waste from metalworking, together with pottery and tile. It is unclear whether the pit was excavated specifically for this purpose or was a redundant feature subsequently used for disposal. Alternatively, the fills could represent deliberate, perhaps symbolic, deposits associated with metalworking.

Discussion

The phase 4 bank and ditch represent a significant episode of re-modelling of the site. A relatively substantial bank and ditch were created, either replacing or containing the probably earlier palisade fence and shallow ditch or perhaps enclosing the site for the first time. This period of re-modelling was accompanied by a reorganisation of the internal layout of the round and perhaps by an increase in the scale of working. Significantly larger metalworking features appear, focused on the same part of the site as earlier metalworking. Together, these elements suggest a re-shaping of the site and perhaps a change in its status. The area enclosed would have been visually more impressive and the scale of metalworking activities may have increased. In its overall form and dimensions, however, the univallate Little Quoit Farm enclosure was similar to many settlement rounds of this period.

Features associated with metalworking during phase 4 appear to represent a developing complex of industrial activity. The fire pit [337] and possible anvil block, the linear feature burnt bowl [494] and a pit or ditch re-cut [292] filled with slag, pit-bases and iron objects, represent the largest of these features. Smithing was taking place during phase 4 (and the preceding phase), producing numbers of pit-bases and quantities of slag together with hammerscale and many broken iron objects. In addition to the features listed above some other small phase 4 features indicating small-scale smithing were recorded. These appear in part to be a continuation of the small features found within phase 3 of hollow [282]. A similar array of small features was recorded in the 'working area' at Reawla (Appleton-Fox 1992, 80–81, 118).

The discovery of a single piece of possible tap slag (below) from the upper fill (285) of hollow [284] raises the possibility that smelting was taking

place somewhere in the vicinity. If this was the case then it was probably on a very small scale, since no other evidence for it was found during the excavations.

Phase 5: abandonment of the round

This phase is represented by the filling of apparently abandoned features, in particular the five hollows and main metalworking features. (The demise of the external ditch and rampart and subsequent ploughing has been discussed above). The site of the round became part of the wider agricultural landscape although possibly only as rough ground used for extensive grazing. Eventually, new boundaries were created, probably associated with post-medieval enclosure and improvement of land held by the medieval settlement of Roserrans to the north.

Final fill of hollow [282]

The latest context within hollow [282] was upper fill (283) (Fig 5). This consisted of a 0.09m deep, very dark brown mixed loam with small stones and flecks of charcoal of oak and hawthorn and was interpreted as probably resulting from infilling of the top of the hollow with material from the surrounding ground surface. Finds from this context included a hearth bottom and slag, six iron objects and hammerscale, a quartz pebble and five pieces of pottery. Some evidence for mole activity was recorded and ploughing may also have caused disturbance.

Final fill of hollow [284] and associated features

The main fill of hollow [284] was fill (285) (Fig 5). It sealed basal fill (334) and consisted of a 0.13m deep mixed clay loam with oak charcoal flecks and lumps. It produced a single sherd of pottery and had been disturbed by moles. As with fill (283), fill (285) appeared partially residual (presumably washed or trampled in from the surrounding ground surface) but may also have included material dumped from elsewhere on site. Included within this fill was a single piece of denser slag than seen elsewhere. Although possibly tap slag, on the basis that it appeared to have run a little and as such had been produced under a higher temperature, it is also possible that it was accidentally produced

during smithing operations, as was suggested for a single similar piece found at Trethurgy (Bayley 2004, 73). An alternative might be that it came from elsewhere on site. Subsequent ploughing would again have finalised or sealed the formation of this deposit.

The uppermost fill (501) of feature [494] is considered to be near contemporary with fill (285) (Fig 11). It was essentially distinguishable only by its stone content, which could possibly represent some form of collapsed structure, although how this may have functioned is uncertain since none of the stones were *in situ* and there was no evidence for other structural elements. As with other similar deposits, this may represent dumping of stones into open features at or after abandonment. Fire pit [337], for example, also had a clear abandonment fill, (336), which contained a large boulder, possibly previously used as an anvil block, and partially merged with upper hollow fill (285).

Final fills of hollow [287]

Upper fill (291) of hollow [287] (Fig 5) consisted of a thin (0.1m) mixed clay loam and contained two conjoining iron fragments making up a single joiner's dog, comparable with those recovered from ditch [320]. This layer filled the remainder of the abandoned hollow. Located beneath this was fill (288) which might also have been associated with abandonment of the site, although upper fill (281) of ditch [280], which included finds of slag and a metal object, appeared to partially intrude into this. The relationship between (288) and (281) was unclear and the two deposits were in places intermixed. Fill (288) was up to 0.16m deep and consisted of a mixed clay loam with charcoal flecks. Finds from it included three undiagnostic sherds of gabbroic pottery, a notched slate fragment and a fine-grained granite fragment from a probable hammerstone.

Gully features around and above hollow [304]

Gully features [331] and, by implication [344], pre-date hollow abandonment fill (330). Their stratigraphic relationship with underlying hollow fill (303) is uncertain. Gully [331] was 0.9m long, 0.2m wide and 0.1m deep. The base was concave and the sides sheer. It contained fill (332), a pale grey stony clay with occasional charcoal flecks and four undiagnostic pieces of pottery. Gully [344]

was 0.75m long, 0.2m wide and 0.08m deep. It had a concave base and sheer sides and contained fill (345), again a pale grey stony clay with occasional charcoal flecks.

The purpose of these gullies is not apparent and their arrangement not easy to interpret: they do not appear to conform to any particular shape or alignment and their shallow depth would suggest that they would not have survived as visible features for long (given the surrounding activity and ongoing weathering of surrounding surfaces). Both gullies contained charcoal flecks (like most of the other hollow abandonment fills) but they did not produce slag or other evidence of metalworking or any evidence for *in situ* burning which might have indicated a pre-abandonment date.

Final fill of hollow [304]

Upper fill (330) of hollow [304] was interpreted as an abandonment deposit (Fig 5). It was recorded overlying the southern half of the hollow (corresponding with the deeper portion of this feature) and consisted of a 0.08m deep brown clay loam with occasional charcoal flecks. It produced three sherds of gabbroic pottery and a flint. Fill (330), although only recorded in the southern portion of the hollow, may have originally extended across its whole area.

Fill of hollow [353]

Fill (354) was the only fill of small hollow [353] and was a 0.2m thick mixed grey brown silty loamy clay (Fig 5). It differed from the other abandonment fills in the hollows due to its uniformity, shillet content and depth, but also due to the quantity of pottery found (19 small gabbroic and rock-tempered sherds).

This entire fill of hollow [353] would appear to represent a single, possibly deliberate episode of backfilling. The greater quantity of pottery, relative to the size of the hollow and the amounts excavated elsewhere on the site, might possibly suggest midden material. It has already been suggested that hollow [353] served a different function to some of the other hollows found on site. If this was the case then it might account for the different treatment of this feature once it fell out of use. At Trethury a similar situation was hinted at by the apparent backfilling of a structure with waste or midden material (Quinnell 1986, 2; 2004, 229–31).

Final layer over feature [292]

Located towards the central area of the Little Quoit Farm enclosure was slag and metal-rich feature [292] (Figs 4 and 11). Its main upper fill (293) contained seven pieces of pottery, the latest diagnostic pieces of which dated to the later third or fourth centuries AD. Layer (305) partially overlay (293) and spread out to the south for 1.5m, filling a slight, ill-defined hollow area, which appeared related to the presence of [292] and, like [292], extended beyond the edge of excavation. It consisted of a mid to dark brown, partially heated clay loam and contained burnt shillet, occasional iron slag and some charcoal. Layer (305) overlay both (293) and an area of disturbed natural to the south of [292]. The patchy heated appearance of this layer could suggest that activity associated with metalworking continued in the near vicinity after pit [292] had been infilled. Broadly, however, its formation is likely to be contemporary with the formation of the upper abandonment layers and fills formed within the five hollows.

Post-rampart activity

Truncated posthole [324] was located in the southern half of the round, to the north of the rampart and just south of the palisade ditch [320] (Fig 4). It was 0.35m in diameter and 0.1m deep with steep sides and a concave base. It contained fill (325), a dark, grey-brown clay loam. Truncated pit or posthole [322] was located due south of [324] (Fig 4) and cut into the inner edge of the rampart, which had by this point started to slump inwards to the north. This feature was 0.85m in diameter and 0.07m deep with concave sides and a flat base. It contained fill (323), a dark grey-brown gritty, silty loam, suggesting that it had been allowed to fill naturally.

Posthole [324] and pit/posthole [322] are likely to be contemporary and both appear to have undergone considerable truncation. Pit/posthole [322] and by implication [324] postdate the slumping of rampart material, making them post-phase 4 in date. Their shallowness might suggest that they are significantly later in date, and as such had been cut from higher up in the soil profile. Interpretation of their likely function has not been attempted given the lack of other obviously associated cut features or deposits.

Discussion

The latest ceramics from the Little Quoit Farm enclosure date to the late third or early fourth centuries AD (Quinnell, below). This is likely to mark the approximate point at which the site – or at least the western half sampled by the pipeline trench – was abandoned.

Most if not all of the hollows underwent post-abandonment filling. The majority of these fills were silty and are likely to have been produced via relatively rapid but natural erosion processes. Overlying all of these abandonment fills was a skim of mixed clay loam, which underlay the modern dark loam ploughsoil. This was most obvious in the main northern ditch [275] section but elsewhere was seen as a patchy skim of material across the excavated corridor. Initially interpreted as a mergence layer or the junction between the underlying natural and the ploughing horizon, it was not given a context number but is likely to relate to an old ploughsoil horizon.

Features of uncertain phasing

A number of other features are not easy to position within the phasing.

Features [301] and [492]

Two elongated oval features, [301] and [492] (Fig 4 and 5), found in the central area of the excavation, were notably similar in size, shape and alignment. Unfortunately, neither provided evidence for date or function, and neither had stratigraphic relationships with other features. The exception was possible remnant ploughsoil layer (504). Feature [301] was cut through layer (504) and natural clay. It was 3m long, 1.3m wide and 0.18m deep, with a single fill (302) which was compact and clayey. Feature [492] was more than 2.5m long, 0.95m wide and 0.15m deep. It had a single firm clayey fill (297). Neither feature produced any finds.

These apparently similar features are difficult to interpret. The lack of any pottery or metallic finds might imply that they pre-date industrial activity associated with the round or come significantly later. Their fills differ from the paler, slightly more silty clay fills described at the base of the naturally silted-up ditches; both fills (302) and (297) were slightly darker and more loamy in content,

perhaps suggesting that the features filled at a later date.

Features outside the round

This section deals with all features found within field 12 which were not located within the enclosure itself. It has not been possible to relate any of them specifically to the Romano-British period, or to the use of the enclosure, although such an association remains a possibility.

External features to the north of the round

LINEAR FEATURES [271] AND [267]

Features [271] and [267] (Figs 4 and 13) are considered to be broadly contemporary due to their similarity in alignment and appearance. Their presence was identified by the geophysical survey (Fig 3), which showed [271] – a much stronger geophysical signature – swinging south to meet the northern enclosure ditch and [267] to the south stopping just short of it. Linear [271] was 1.9m

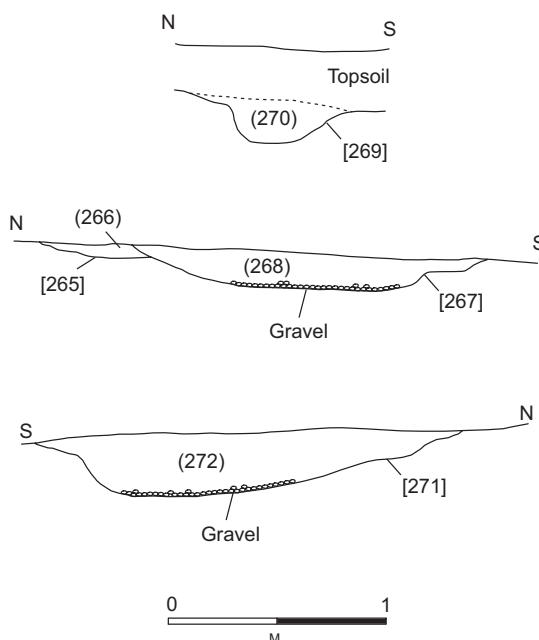


Fig 13 West-facing sections through ditch [269] (part of the pre-round field system) and linear feature [267], and east-facing section through linear feature [271], all located outside the northern side of the enclosure

wide and 0.26m deep with a flat base and gradually sloping sides. The base appeared metalled with a compacted covering of small gravel. Above this, filling the cut, was (272), a dark brown sticky clay loam, which contained a single piece of cut and shaped probable roof slate. Fill (272) was formed after abandonment, probably during a relatively undisturbed phase of erosion or slippage of material from fields alongside.

Linear feature [267] was 1.55m wide and 0.15m deep. It had a flat base, short, steep sides and cut across ditch [265] (below). The flat base was again covered with compacted small gravel. Above this was fill (268) which consisted of a dark grey brown silty loam and, as with (272), is likely to have been the result of a prolonged phase of natural infilling from the adjacent fields. Two sherds of modern glass or ceramics were found in the upper part of the fill.

Both features had been truncated by ploughing and neither cut any dated deposits; ditch [265], cut by [267], did not produce any datable artefacts. It is therefore difficult to relate them to other features. The fact that both appeared to have a compacted, metalled gravel-like basal surface suggests that they may have been trackways (and potentially of any date). However, the gravel had a clean and rather uniform appearance, possibly attributable to sorting by the flow of water, although there was no indication of silting or sediment build-up, and it is possible that these features represent successive cuts for the leat shown crossing the site on approximately the same orientation on historic maps (above). If this was the case the leat appears to have run along the course of the northern enclosure ditch for a short distance.

DITCHES [269] AND [265]

Ditch [269] (Figs 4 and 13) was 0.5m wide and 0.2m deep. It was asymmetric in profile and ran from east to west across the corridor immediately north of features [267] and [271] described above. The ditch was filled by (270), a dark greyish-brown silty clay loam.

Ditch [269], due to its similarities with ditches [499], [280] and [298], is interpreted as pre-enclosure in date and as representing part of an earlier field system.

Ditch [265] was 1.5m wide and survived only to 0.1m deep (Figs 4 and 13). It had a single fill, (266), which was a mid orange-brown clay loam. It had a flat base and very short, relatively steep

sides. In profile the feature seems akin to linears [267] and [271] discussed above, but without the gravel 'metalling'. It was in fact cut by [267] at the western edge of the excavation corridor. Again, it is possible that this represents an abandoned alignment of the post-medieval leat crossing the site.

PITS [278] AND [273]

Pit [278] was the most northerly feature located within field 12. It was circular, 0.75m in diameter and at only 0.08m deep had probably been severely truncated. It was filled by (279), a brown silty clay with occasional stones and produced no finds. Pit [273] was positioned between linear features [271] and [265]. It was oval in shape, 1m long, 0.65m wide and survived to a depth of only 0.05m, again apparently truncated. Its fill, (274), a compacted dark grey brown silty loam, produced no finds.

The absence of finds or of stratigraphic relationships with other features makes pits [278] and [273] impossible to date. Their similarity and proximity may suggest that they are contemporary. Their extreme shallowness could imply that they were late and had been cut through the modern topsoil, thus never cutting deeply into the underlying natural.

External features to the south of the round

LINEAR STONY FEATURE [516]

Approximately 13m south of the southern edge of main enclosure ditch [319] a broad linear stony feature [516] ran west south west – east north east (Fig 4). It was not excavated but was visible over a width of 4m. The stones were very variable in size, ranging from 0.05m to 0.35m, and represented approximately 30 per cent of the fill matrix, (517), which was a dark clay loam very similar to the covering topsoil. Later ploughing seems to have mixed some of these stones with the topsoil. A number of stones were noted during the initial topsoil strip (prior to recognition of this feature), suggesting a more substantial and possibly slightly mounded feature.

Interpretation of this unexcavated feature is difficult. It may be the same feature as was shown by the geophysical survey (Fig 3) running south west to north east to meet the main southern enclosure ditch, suggesting broad contemporaneity. It is possible that it marks the remains of a roughly

metalled trackway damaged by later ploughing. Alternatively, it could perhaps mark a former boundary, although the apparent quantity of stone, on the basis of the surviving visible width, might suggest a reasonably substantial one.

DITCH [502]

Ditch [502] (Fig 4) was the most southerly feature located within field 12 and was investigated by a mechanically excavated trench cut through it on the eastern side of the excavation corridor. It had very clear, sharp edges and was filled with a very dark, slimy olive green to black, organic clay fill, quite unlike the drier, paler topsoil, or indeed any other context excavated on the site. It appeared to be a relatively recently sealed feature on the basis of its organic content, but no map evidence for its existence was found. It ran east – west parallel to the current southern field 12 boundary. There were no associated finds. This is likely to be a relatively modern boundary, unrelated to the round. It parallels the modern field boundary and may represent an earlier alignment of it.

The finds

Flint

Anna Lawson-Jones

Six pieces of worked flint were found during the excavation. Five of the six were moderately large, well formed flakes which would not be out of place in a Late Neolithic context (*cf* Ford 1987, 69; Edmonds 1995, 82). Four retain part of their nodular cortex, which in Cornwall is often seen as indicative of pieces of the Neolithic period (Healy 1985, 18–20; Saville, 1981, 108; Berridge and Roberts 1986, 15). Nodular material in Cornwall comes from a number of sources, including Beer Head on the south-east coast of Devon (Care 1982; Tingle 1988), smaller, less well known but closer primary Devonian sources (Newberry 2002, 1–37), or from secondary sources such as the Devon Head and gravel deposits of western Devon (Wainwright and Smith 1980). Water-worn nodular material can also get washed up on to western Cornish coasts from off-shore deposits. This material was used throughout prehistory. Further detail on the flint finds is presented in the Little Quoit Farm archive report (Lawson-Jones 2001).

Table 1 Worked flint by context

| Context | Feature | Description, source and date |
|--------------|--------------|--|
| (309) | Hollow [282] | Probable knife. Nodular flint. Neolithic |
| (315) | Ditch [319] | Retouched blade. Uncertain. Neolithic? |
| (330) | Hollow [304] | Partially serrated - mini-saw? Nodular flint. Neolithic |
| (379) | Hollow [287] | Burnt distal end of blade. Nodular flint. Neolithic |
| Unstratified | Subsoil | Unmodified flake. Nodular flint. Neolithic |
| Unstratified | Subsoil | Knife with thin arc of gloss suggesting hafting. Uncertain. Neolithic? |

The prehistoric and Roman-period pottery

Henrietta Quinnell

The assemblage consisted of 150 sherds weighing 1392g, of which all but two were of gabbroic fabrics. A total of 19 sherds had heavy sooting or a black residue on the exterior, 40 on the interior.

Fabrics

Gabbroic fabrics have been divided into three categories based on variations originally recognised at Trethurgy (Quinnell 2004, 108). *Well made* has a compact matrix, inclusions generally less than 2mm and an exterior surface often finished by burnishing; this fabric is used during the Later Iron Age and appears to continue until early in the second century AD. *Standard* has a matrix which often contains small voids from poor mixing and inclusions which are generally 2–5mm although occasionally larger; surfaces are smoothed. *Coarse* has a poorly worked body and inclusions which are frequently over 5mm; surfaces have little finish. Both standard and coarse gabbroic appear by the second century. A Late Variant (LV) fabric, recently recognised in assessment of Penhale round at Indian Queens (Quinnell 1998) and thought to be broadly fourth century, or later, in date was not recognised at Little Quoit Farm but may occur in field 23, Lanhainsworth, on the pipeline route (Lawson-Jones 2001, 51).

At the assessment stage the coarse component appeared to contain rock fragments which might not be expected in gabbroic fabrics. Some 33 sherds with these, together with two with possible granitic temper, were examined by Dr R T Taylor under a x20 binocular microscope. Dr Taylor, whose full report is filed with the archive, identified the 'rock' fragments as large (5–8mm) pieces of quartz, quartz-tourmaline and magnetite/ilmenite which occur in the gabbro area. He describes the 'granitic

derived' sherd from (296) as containing 'feldspar, quartz, tourmaline, with mica, all mainly angular; one large quartzitic sandstone fragment and one granitic fragment. A stream-sediment tempered clay with a granitic-derived input. The mainly fine grain size of the temper gives a good surface finish'. Dr Taylor describes the granitic sherd from (283) as containing 'feldspar, with mica, some as large flakes, quartz, some sub-rounded, and tourmaline; a granitic derived temper'. Both these sherds may have a comparatively local origin, from streams draining from the St Austell granite, or from the small granite outcrops at Castle-an-Dinas 2 km east of Little Quoit Farm or Belowda Beacon 4 km to the east.

It is generally accepted that gabbroic fabrics were in general use in Cornwall during the Roman period, at least in the area to the west of Bodmin Moor where most archaeological work has taken place. It is quite possible that other local sources were also utilised and that the production of ceramics in Roman Cornwall was not as single centred as has tended to be supposed for the last three decades. The assemblage from Shortlanesend near Truro includes a proportion containing fibrous chlorite grains thought to derive from the Grampound deposits on which the site is situated (Williams 1980, 71). An assemblage from Atlantic Road, Newquay, also contains locally sourced material as well as gabbroic fabrics (Harrad, forthcoming).

Phase 2: pre-enclosure contexts

The small group of sherds is all in well-made gabbroic fabric and breaks are reasonably fresh. There is nothing that can be dated closely. The material could date anywhere from the later centuries of the Iron Age through to the early second century AD.

Table 2 Pottery from Little Quoit Farm, by fabric and context
s=sherd, g=grams, se=soot or residue on exterior, si=soot or residue on interior.

| Context | Well-made gabbroic | Standard gabbroic | Coarse gabbroic | Other |
|---|---|--|---------------------------------------|---|
| Pre-enclosure, phase 2 | | | | |
| (294) basal fill of ditch [280] | 1s/10g (si) | | | |
| (299) upper fill of ditch [298] | 2s/33g (si): base angle and jar neck | | | |
| (308) lower fill ditch [306] | 2s/17g (si) | | | |
| Phase 3 | | | | |
| (281) upper fill of ditch [280] | | 11s/113g (5se) including P1 and P2 | | |
| (288) in hollow [287] | | 33/5g (1se, 1si) | | |
| (303) in hollow [304] | 12s/160g (6se, 1si) including P3 and P4 | | | |
| (321) in ditch [347] | | 1s/12g (se) | | |
| (338) in pit [339] | 6s/63g including rim from necked jar | 7s/27g (1se, 4si) | 8s/182g including P5 and P6 | |
| (343) in hollow [282] | 4s/23g | | 1s/18g (si) | |
| (354) in hollow [353] | 4s/20g | 15s/32g (4se) | | |
| Phase 4 | | | | |
| (293) in slag-rich feature [292] | 3s/25g (1si) all P7 | 3s/50g (1se) including P8 and P9 | 1s/164g P10 | |
| (296) in slag-rich feature [292] | | | | 2s/80g (2se) P11 granitic derived |
| (316) in ditch [319] | | 7s/13g (1si) | | |
| (335) in linear bowled feature [494] | | 4s/45g (2si) | 6s/99g (si) all P12 | |
| [337] fire pit | | 3s/17g (si) | | |
| Abandonment, phase 5 | | | | |
| (283) top of hollow [282] | | 4s/6g (2si) | | 1s/10g (se) granitic P13 |
| (285) top of hollow [284] | | | 1s/10g (si) from P12 | |
| (332) in gully [331] | | 4s/103g (si) | | |
| (330) in hollow [304] | | 3s/3g (si) | | |
| Unstratified | | 2s/12g | | |
| Totals | 34s/351g (6se, 7si) | 97s/438g (13se, 22si) | 17s/473g (8si) | 2s/80g (3se) granitic derived 1s/10g granitic |

Phase 3: possible palisaded enclosure contexts
(Fig 14)

P1 Context (281). Two joining sherds from a dish or bowl with everted rim in standard gabbroic fabric. A variant of Type 20 flat-rimmed bowls of broadly the late second and third centuries AD (Quinnell 2004, 122). Parallels occur at Carvossa (Carlyon 1995, 29), at Shortlanesend (Harris 1980, fig 30, no 11), a site considered to have a short date range from the later second to the early third century, and at Stencoose (Quinnell 2001a, P1 and P3).

P2 Context (281). Rim of small jar in Cordoned ware tradition, with slight groove on rim top and cordon beneath rolled rim, in standard gabbroic fabric. Trethury Type 11 (Quinnell 2004, 117). A date range through the second century and well into the third may be appropriate.

P3 Context (303). Not illustrated. Roll-topped Cordoned jar rim in well-made gabbroic fabric. Trethury Type 11 (Quinnell 2004, 117). The fabric suggests a date no later than the early second century.

P4 Context (303). Bowl with simple everted rim in well-made gabbroic fabric. Related to Trethury Type 8 (Quinnell 2004, 117) but the well-made fabric suggests a date as for **P3**.

P5 Context (338). Bowl with rounded, everted rim and curved wall in coarse gabbroic fabric. Type 10, an addition to the type series found at Tremough (Quinnell 2007) and probably datable to the later second and third centuries.

P6 Context (338). Not illustrated. Generally similar to **P5**.

The assemblage contains 26 well-made sherds as opposed to 70 standard and nine coarse; some

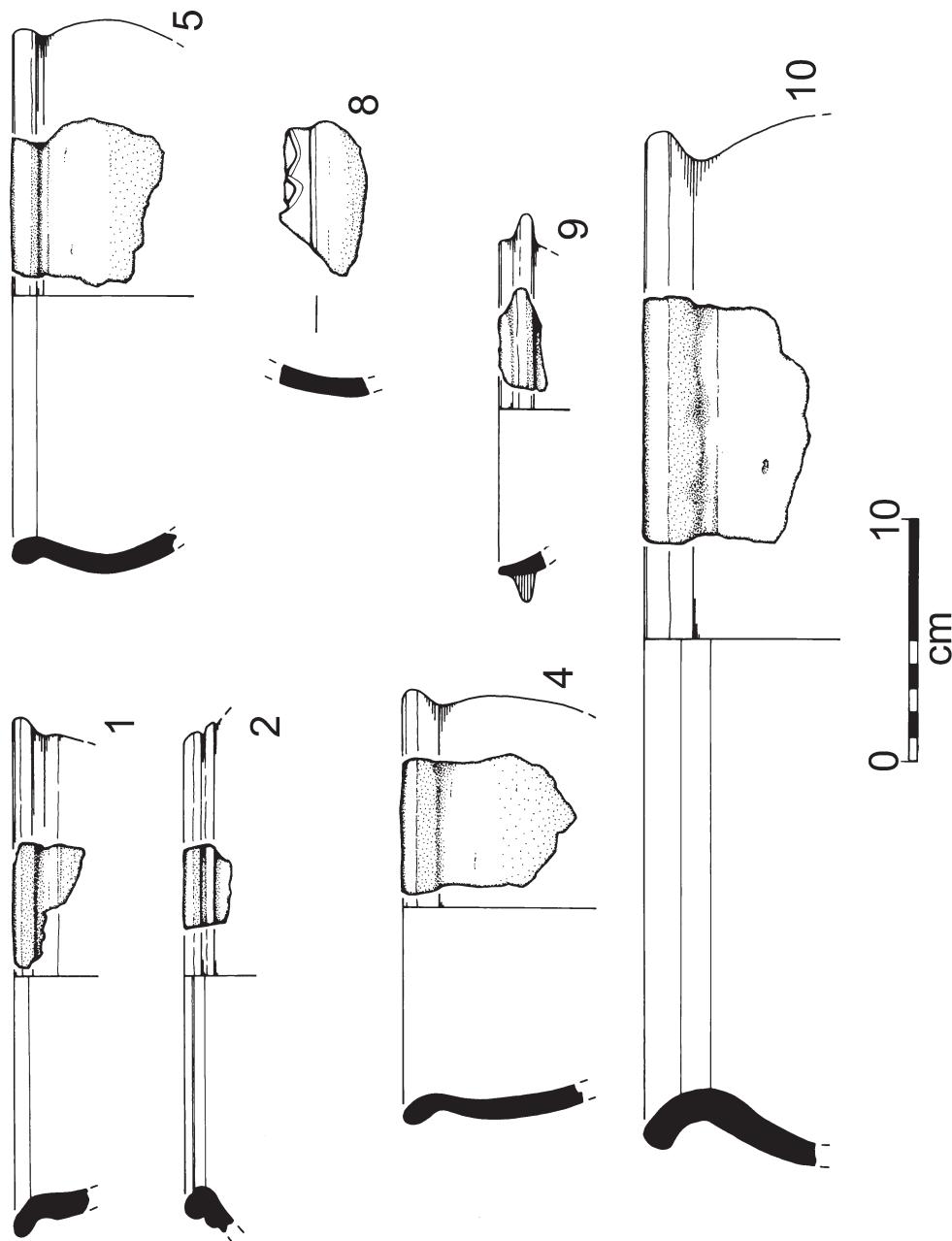


Fig 14 Illustrated pottery sherds from enclosure phases 3 and 4: P1, P2, P4, P5, P8, P9 and P10. Scale: 1:3.
(Drawings: Carl Thorpe.)

of the well-made sherds are abraded and may be re-deposited. On balance, contexts (281) and (338) are likely to be later second or third century and context (303) early second century. The phase as a whole therefore appears to run for perhaps a century from the early second to the early third century but the lack of good datable comparanda for vessels should be stressed.

Phase 4 enclosure contexts

P7 Context (293). Not illustrated. Rim, neck and shoulder, three non-joining sherds with fresh breaks, in well-made, burnished, gabbroic fabric from jar with upright neck and slightly out-turned rim. This form is the basic vessel form of the Later Iron Age South West Decorated and continues in Late Iron Age Cordoned ware as St Mawgan Type D (Threipland 1956). It is presumed to persist as long as Cordoned ware in well-made fabric, until the early second century.

P8 Context (293). Girth sherd from cooking pot in standard gabbroic fabric with wavy line incised on wet clay. A zone of decoration incised on wet clay around the girth appears on Type 4 cooking pots as soon as these were introduced in the mid second century (Quinnell 2004, 114); this decorative feature then persists throughout the Roman period.

P9 Context (293). Rim from Type 22 Cornish flanged bowl in standard gabbroic fabric. The form was introduced in the late third century and persists for the remainder of Roman-style gabbroic pottery production (Quinnell 2004, 124).

P10 Context (293). Simple everted rim from large storage jar in coarse gabbroic fabric. Storage jars with simple rims, Trethurgy Type 16, occur principally in the third and fourth centuries (Quinnell 2004, 120; forthcoming).

P11 Context (296). Not illustrated. Two joining sherds from base and wall of dish with curved wall in granitic derived fabric. The form, without the rim, can only be dated to the Roman period.

P12 Context (335), with a sherd from (285). Not illustrated. Basal sherds probably from bowl/dish in coarse gabbroic fabric with black interior residue that is shiny rather than sooty in appearance. Not closely datable.

Contexts from phase 4 contain 17 standard gabbroic and seven coarse gabbroic sherds as opposed to three well-made (**P7** assumed to be curated or residual); Table 2 demonstrates the

contrast with phase 3. The only datable forms come from context (293) with **P9** late third century at earliest. **P9** is the only sherd from the site with this late date, and while the assemblage is small, it may indicate that the site did not continue long after AD 300.

Two radiocarbon dates relate to phase 4 contexts. AA-36504, calibrating at 1σ to AD 230–380 and at 2σ to AD 130–410, comes from the fill of fire pit [337] with three standard gabbroic sherds. AA-36503, calibrating at 1σ to AD 240–380 and 2σ to AD 170–420, comes from layer (326) of the enclosure rampart. These dates are statistically indistinguishable and suggest a broad third–fourth century date for phase 4. They are entirely consistent with the ceramic evidence.

Phase 5: abandonment contexts

P13 Context (283). Not illustrated. Body sherd in granitic fabric.

The small quantities of pottery from these contexts have no datable characteristics and the site may well have been abandoned by the fourth century.

General discussion

The well-made gabbroic sherds from pre-enclosure contexts may well be South Western Decorated ware. Their presence, together with a distinctive sherd in this ware from field 3 at Ruthvoes and two distinctive and two probable sherds from field 16 at Tregatillian recovered during the watching brief carried out elsewhere on the pipeline (Quinnell 2001b, 101), reminds us that the hillfort of Castle-an-Dinas, 2 km to the east, is likely to have been set in a landscape of contemporary farms and settlements. The only pottery reported from the hillfort was described as 'late South-Western B Iron Age types' (Wailes 1963, 55), an outdated classification synonymous with South Western Decorated ware.

In the small assemblage from enclosure contexts, there are at least seven bowls or dishes, six jars or cooking pots and a storage jar. Generally, jars appear to be at least twice as frequent as bowls on Roman-period occupation sites in Cornwall, as, for example, at Castle Gotha (Saunders and Harris 1982) or Trethurgy (Quinnell 2004, 112, 121–5). Given the suggested focus on ironworking, the site may be regarded as rather different from

the farming settlement usually assumed as the function of rounds. There is an obvious parallel with the assemblage from Killigrew, St Erme, another metalworking site, where the assemblage, again small, although larger than that from Little Quoit Farm, contained a range of bowls and storage jars with very few cooking pots (Quinnell, forthcoming). This was interpreted as related to the provision of prepared food for the site, with the bowls being eating dishes. At Killigrew sherds frequently had sooty residues, interpreted as the result of heating prepared food. The comparison between the two sites can not be extended too far, but the ceramics from them suggest some similarities in the way that vessels were used. The sooty or residue on a third of the Little Quoit Farm sherds appeared to relate to use because breaks were not sooted.

The study of the assemblage has also been of value in demonstrating the presence, on a small scale, of non-gabbroic material. The granitic derived bowl **P11** looks very similar to gabbroic wares. This has two implications. Closer study may reveal that collections assumed to contain only gabbroic vessels in fact have material from other sources. Secondly, other sources may have been selected because their products appeared similar to the popular gabbroic wares.

Roof tiles from Little Quoit Farm, with a comment on the tile from the Magor 'villa'

Two pieces of Roman roofing tile were identified, both considerably abraded.

1 Context (293). Curved fragment of *imbrex*, 18mm thick (73g), pink 7.5 YR 7/4. J Allan pointed to visual similarities with Exeter Tile Fabric 4. However, Dr R Taylor examined the fabric and reports that it contains quartz – translucent to transparent angular to sub-angular grains, 0.05–1mm, rarely 0.3–0.6mm; clay pellets – similar to matrix clay but darker pink oxidized, rounded, 1–7mm; rock fragments – off-white fine-grained sub-angular quartz-feldspar fragments, 1–5mm; limonite – soft dark brown, angular, up to 0.6mm; mica-sparse muscovite cleavage flakes up to 0.1mm. He comments that the white fragments and fabric are not calcareous and there is no evidence of shell, both features of Exeter Tile Fabric 4 (Holbrook and Bidwell 1991, 281). The pale colour points to an iron-poor clay source but it is difficult to suggest a precise locality.

2 Context (296). Fragment of a flat tile, 25mm thick (35g), yellowish red 5YR 5/8, possibly a *tegula*. J Allan comments that there is no obvious match among the Exeter tile fabrics, or among tile fabrics recorded in Devon. Dr R Taylor examined the fabric under a x20 binocular microscope and comments that quartz occurs as polished, clear to translucent, rounded to sub-rounded sand grains. Finer, silt-sized grains are angular. Some fine-grained, quartz-feldspar igneous rock fragments (aplite) are also present; some are rounded, the largest seen 4mm. Very fine-grained white mica is associated with the clay body. The clay body is tempered with marine quartz sand and igneous rock grains. A source in south-west Britain is possible but a continental import is more likely. A source in south-central or south-east England is unlikely because of the igneous fragments.

A scan of the literature confirms that Roman tile has only previously been recorded in Cornwall from the Magor 'villa' (O'Neil 1933) and in 2005 at Penlee House, Tregony (Taylor, forthcoming). More than 100 fragments, probably from a late Roman building with a hypocaust, came from Woolster Street in Plymouth (Bidwell 1986).

O'Neil's description of the Magor material divides the tile recovered into 'typically Roman' and 'native' (O'Neil 1933, 157). The former occurred only in small quantities and was assumed to be imported. The latter formed the bulk of the collection; described as 'very coarse, pale-brown earth-coloured, and contains many quite large fragments of local stone, *viz.*, slate and quartz pebbles up to $\frac{1}{4}$ inch in length'; it was assumed to represent local copies of imported material. Two boxes of tile from Magor now in the Royal Cornwall Museum, Truro, were examined, from which it appears that all or most of the 'Roman' variety was probably retained but only a small part of the 'native' variant. The 'Roman' variety contains at least two fabrics, one hard with white quartz and possible calcareous inclusions, the other softer and sandy. Dr Taylor has done a rapid examination of samples of the 'native' and of two varieties of the 'Roman' fabric. He confirms the author's opinion that the 'native' variety is of gabbroic clay with the addition of coarse quartz and other temper. (The similarity of small fragments of these gabbroic tiles to coarse gabbroic pottery may have confused identification of 'native' tile on other sites.) Dr Taylor agreed the broad character of the harder Roman fabric, but commented that the

softer, sandy fabric includes much rounded quartz sand and igneous fragments including aplite. He considers, therefore, that some of the 'Roman' Magor fabrics are likely to be from the same source as the fragment from (296) at Little Quoit Farm. The date range of Magor is not entirely clear but the excavator considered that the period AD 150–230/40 covered the construction phases (O'Neil 1933, 128–9). There is nothing inconsistent here with the presence of the (296) fragment in phase 4.

The function of the tile fragments at Little Quoit Farm is unclear. They come from different sources in igneous rock areas and may have been imported for use in some furnace-type construction on a part of the site not excavated. Even at Magor the 'Roman' tile was thought to have been used for special features, perhaps connected with ventilation, rather than in a hypocaust for which the shapes of the tiles were designed. The location of Little Quoit Farm, close to the main routeway into Cornwall still taken by the A30, may be relevant. The round's inhabitants may have become familiar with materials being transported along this route and have acquired small quantities for their own special purposes. However, any substantial movement of heavy material such as tile in Cornwall might reasonably be supposed to have taken place by water, as may have been the case for gabbroic tiles from the Lizard to the Magor area; movement by water would also allow for the possibility of occasional imports into Cornwall from further afield in Wales or France.

The iron artefacts

Henrietta Quinnell

Sixty objects considered to be of iron were sent for further study and appropriate conservation to Helen Wilmot, Contract Conservator for Wiltshire County Council. These were all X-rayed and 12 pieces identified as slag. Twenty-seven objects were then partly cleaned and two, no 1 from (321) and no 13 from (291), fully cleaned. A detailed statement of method is filed with the archive. This report is based on the X-rays, the artefacts after cleaning and the comments provided by Helen Wilmot. An assemblage of 60 artefacts (Table 3) is discussed, as investigation showed that several pieces were in fact composed of fragments of more than one object.

Identifiable artefacts (Figs 15 and 16)

1. Context (321) in ditch [320]. Five joiner's dogs, mostly complete (Manning 1985, 131 and R52 pl 61). One with a 150mm stem now firmly adheres to a second with a 100mm stem, the arms pointing in opposite directions; the corner of a third also adheres. Another with a 100mm stem is now separate as is a second with a stem of at least 120mm. Stems are square-sectioned and approximately 10mm across. The two complete adhering examples may just possibly be secured by a rivet; if so the dogs have been joined to make some more elaborate fixture. However, the protuberance suggested as a rivet is slight and on the edge of the stem; any rivet sizeable enough to secure two dogs of this thickness could only have been fixed through holes, the manufacture of which would have distorted the edges of the stems. It seems more likely that a group of dogs of different sizes were bound together and that adherence is caused by corrosion. These dogs are for joining large timbers and are certainly the largest recorded from Cornwall.
2. Context (338), fill of pit [339] in hollow [282]. (Not illustrated.) ? Small punch, 60mm long, square-sectioned tapering from 15mm across top to point; top roundish with flat facets suggesting that if this was a punch it was never used.
3. Context (338), fill of pit [339] in hollow [282]. (Not illustrated.) Possible tip of socketed hook (Manning 1985, 104 and P30/31 pl 49); square-sectioned, 20mm across, curving and tapering to a point.
4. Context (338), fill of pit [339] in hollow [282]. (Not illustrated.) Part of knife blade, 22mm wide, with typical cross-section thinning from 7mm to about 2mm.
5. Context (338), fill of pit [339] in hollow [282]. Looped end of latch-lifter (Manning 1985, 88–89, pl 37). Looped end forms ring 20mm across turned at right angles to the handle, a usual feature. Simple type which was in use from the Later Iron Age onward.
6. Context (293), fill of slag-rich feature [292]. Upholstery stud (Manning 1985, Type 8 nail, 136 and fig 32), slightly domed head 25mm across and shank 20mm long. Similar stud from Trethury (Quinnell 2004, fig 49, no 19).
7. Context (293), fill of slag-rich feature [292]. Probable tip of billhook or pruning hook (Manning 1985, 56–8 'small hooks') with

Table 3 Iron artefacts by form and context 'Strip': up to 20mm wide, flat, rectangular cross-section; 'bar': over 20mm wide but with rectangular cross-section; 'rod': squarish cross-section; 'lump': pieces over 20mm in one dimension but with overall cross-section not ascertainable.

| Context | Nail fragment | Strip | Rod | Bar/lump | Identifiable artefacts |
|----------------------------|---------------|-------|-----|----------|------------------------|
| Phase 3 | | | | | |
| (281) | - | 1 | - | - | - |
| (321) | - | - | - | - | No 1 (five objects) |
| (338) | 2 | - | 3 | 6 | Nos 2, 3, 4, 5 |
| Phase 4 | | | | | |
| (293) | 4 | 3 | 1 | 2 | Nos 6, 7, 8 |
| (335) | 1 | - | - | - | No 9 |
| (343) | - | - | - | 1 | - |
| (381) | - | 1 | 1 | - | - |
| Phase 5 abandonment | | | | | |
| (283) | - | 2 | 5 | - | No 10 |
| (285) | - | 1 | - | 5 | Nos 11, 12 |
| (291) | - | - | - | - | No 13 |
| (336) | 1 | - | - | - | No 14 |
| Totals | 8 | 8 | 11 | 15 | 18 |

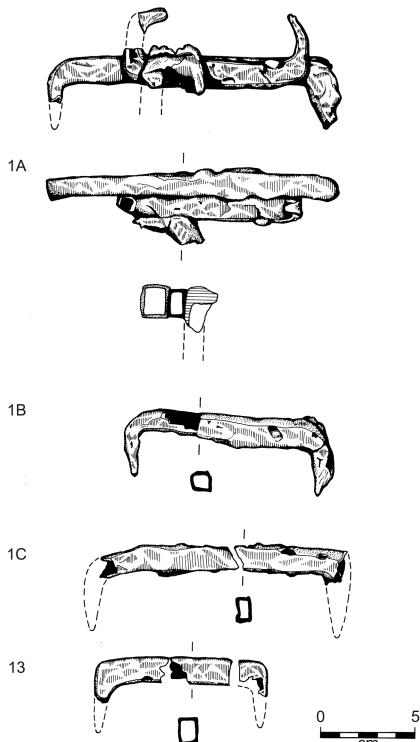


Fig 15 Iron joiner's dogs. 1A – three adhering joiner's dogs; 1B and 1C – single examples. All from ditch [320], fill (321). 13 – single dog; from context (291) over hollow [287]. Scale: 1:4. (Drawings: Carl Thorpe.)

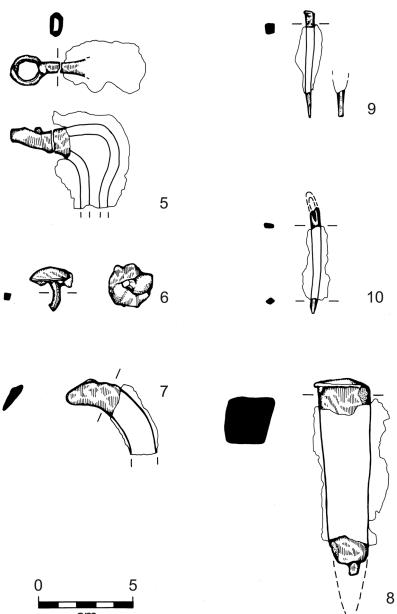


Fig 16 Identifiable iron artefacts: 5 – latch lifter; 6 – upholstery stud; 7 – billhook tip; 8 – ironworking punch; 9 – possible graving tool; 10 – possible needle. Scale 1:4. (Drawings: Carl Thorpe.)

blade at least 17mm across. See Quinnell 1995 for discussion based on parts of two similar hooks from Duckpool.

8. Context (293), fill of slag-rich feature [292]. Ironworking punch, square-sectioned, 25mm across, at least 105mm long, tapering to point which has broken away; head is typically burred, slightly expanded, from use with hammer. Manning (1985, 9–10 and pl 5 A23–25) discusses the various ways in which punches may have been used.
9. Context (335) near base of feature [494]. Possible graving tool, 57mm long, square-sectioned, 5mm across, narrowing to chisel-like tip 1.5mm across. The identification depends on the shape of the tip (Manning 1985, 11); the small chisel-shaped end might be due to differential preservation and cleaning of a nail.
10. Context (283), upper fill of hollow [282]. Possible needle broken across eye; survives 57mm long, rounded shaft near point but other end of shaft flattens and may just have the base of the eye hole (Manning 1985, 35–6 and Pl 15 D14–32).
11. Context (285), upper fill of hollow [284]. (Not illustrated.) Possible top of punch as no 8 above, 25 mm across.
12. Context (285) upper fill of hollow [284]. (Not illustrated.) Possible bit-head, the expanded top of a drill-bit which has broken off (*cf* Manning 1985, 27 and pl 12 B61).
13. Context (291) over hollow [287]. Joiner's dog 85mm long (see no 1).
14. Context (336) upper fill of fire pit [337]. (Not illustrated.) Part of chain link, surviving 35mm long, round section 10mm across.

Discussion of the iron artefacts and ironworking

Any attempt to consider the significance of this material for the Roman period in Cornwall is hampered by two factors. For the artefacts extensive X-ray and selective cleaning to aid identification has only become general practice from the 1980s. It is therefore difficult to use published material as comparanda. For the slags, similarly, there have been significant advances during the 1990s in the understanding of the processes of the production of iron and iron artefacts; many metallurgists who commented on material for past publications, however, had little archaeological background.

The identified artefacts include several, notably the punch no 8, which may be connected with smithing. The suggested bunch of joiner's dogs (no 1) could be products of smithing put aside and not used. Otherwise the range represented is wide, with the latch-lifter no 5, needle no 10 and upholstery stud no 6 perhaps reflecting general domestic activity. There are very few nails in the assemblage. The situation at Trethurgy, with about half the assemblage made up by nails (Quinnell 2004, table 3.6), is probably more typical of Cornish Roman-period sites.

Few artefacts are complete. While an object such as the suggested bit-head no 12 is a type that regularly breaks, the collection as a whole appears very fragmented. The modal size of the assemblage is around 70mm in maximum measurement. It is quite possible that most of this represents material intended for use in smithing new artefacts, with the fragments chopped up by cold chisel. This fragmentary state, probably deliberate, was also noted at Trethurgy (Quinnell 2004, 83). The assemblage at Trethurgy, however, was much less concentrated; some 480 pieces came from the complete excavation of the round and no specific focus for smithing work was identified.

The presence of hammerscale and the bunch of joiner's dogs (no 1) in the phase 3 ditch [320] / (321) suggests that there was ironworking throughout the use of the round. The main activity, however, appears to have been in the phase 4 hollows [282] and [284]. There are two alternatives. Either the focus for smithing before phase 4 was in an area of the round not excavated or the site became the focus of more specialised smithing in phase 4. The latter is perhaps more likely.

The presence of *plano-convex* slag hearth bottoms or pit bases is considered diagnostic of smithing activity. These distinctive slag pieces have only otherwise been identified and published in Cornwall from the round at Reawla (Bayley 1992), where four were found. Reawla also produced a *tuyère* although no actual smithing hearths were identified. The site produced about 3 kg of slag, approximately a tenth of that excavated from a much smaller area at Little Quoit Farm. Reawla was considered by Bayley to represent small-scale smithing over a period of time on a site which was generally concerned with farming. The publication of Reawla benefited from modern understanding of ironworking processes and the site probably represents the situation at a broad range of

Cornish rounds, including Carlidnack, Trevisker, Goldherring and Castle Gotha (Quinnell 2004, 83). From the open industrial site at Duckpool, Morwenstow, there was extensive evidence for lead and other non-ferrous metalworking but no indication of smithing other than the fragmented state of a few iron objects (Quinnell 1995).

The rectangular enclosure at Carvossa produced some 36 kg of slag, described as tap slag, some of it associated with hearths. The report on the Carvossa slags does identify the pieces examined as smelting slag (Bagshaw 1987, 128). It is, however, unclear whether smithing slags were also present and whether the identification of smelting slag would be sustained by modern analysis. A full stratigraphic report on Carvossa has not been possible due to problems with the excavation record (Carlyon 1987, 105). An archive report (Carlyon 1999) includes photographs which suggest that features were present similar to the metalworking features and slag pits at Little Quoit Farm. Structures excavated within a round at Killigrew, St Erme, were also associated with iron working (Cole and Nowakowski, forthcoming).

In assessing the significance of the ferrous metallurgy at Little Quoit Farm it should be emphasised that the material studied was only a sample of what was present: only parts of features were excavated on a small part of the site. Not all the slag was examined by a specialist and it is possible that some smelting slag was present. However, regular smelting would be expected to produce very much larger quantities of slag and can probably be discounted.

The quantity of smithing slag, especially pit or hearth bottoms, and related ironwork, tools and broken-up pieces, is the largest concentration so far found in Cornwall for the Roman period. Until recently, rounds have been interpreted as the settlements of farming communities, perhaps of some status, performing a range of crafts on a 'household production' basis primarily for the benefit of their inhabitants (Quinnell 1986, 124; 2004, 211–4). Little is known about the organisation of smithing in the Roman countryside (Manning 1976). Little Quoit Farm, however, appears to be a round at which, at least for a time, the production of iron objects was on a larger scale, implying that it became a centre serving the surrounding neighbourhood, something akin to the 'household industry' suggested by Peacock (1982, 17–23) for potting.

Slag samples and other metalworking debris

Anna Lawson-Jones (based on comments by Justine Bayley)

This section presents the results of a visual examination of all metalworking debris found during the excavation. Justine Bayley kindly gave advice and provided brief comments; additional information was provided by Henrietta Quinnell and Helen Wilmot.

Most of the material came from bulk samples of slag-rich contexts. All visually identified slag from the bulk samples and the environmentally processed samples has been included in Table 4, showing smithing to have taken place on site. The fragmentary nature of the artefactual material suggests that some at least of the raw material for secondary smithing came from chopped-up previously worked iron objects.

Results

The following section categorises the different types of material identified during the macroscopic examination of the metalworking debris.

SLAG

Iron silicate slag with no specific shape, formed within a blacksmith's hearth. The slag included fuel ash slag and a heavier more solid slag composed of slag prills. Slag was found within the majority of the 17 contexts listed in Table 4 but the largest quantities came from slag-rich pit [292], feature [494] and fire pit [337].

A possible piece of tap slag was recovered and seen by Justine Bayley. Tap slag is indicative of smelting (McDonnell 1983), but since there was only one piece and it was not particularly well defined, smelting on the site appears unlikely.

HEARTH BOTTOMS / PIT BASES

Plano-convex masses of iron silicate slag, their shapes mirroring the bases of the pits in which they were formed, are an easily recognisable by-product formed by the hot working of iron and are diagnostic of smithing activity. The largest recovered from the site measured approximately 130mm in diameter and was 70mm thick. A total of 11 pit bases were retrieved from four different contexts within three different features.

Table 4 Metalworking debris (Iron objects individually identified by letter represent X-rayed items. X-rays are stored with the project archive.)

| Context | Context description / Location | Debris identification | Weight (g) | Comments |
|---------|--|--|---|---|
| (281) | Upper fill of ditch [280] (Associated with / below feature [292]) | Slag Iron object x 1 Slag / pit bases Iron objects x 6 Hammerscale Slag, including one piece of possible tap slag | 1070g 11g 441g 139g 41g 890g | No pit bases (X-ray A) Pit base x 1 (X-rays A-F) Plus inseparable dust |
| (283) | Upper fill of hollow [282] | | | |
| (285) | Upper fill of hollow [284] | Iron objects x 8 Hammerscale Slag – vesicular spheres | 454g 130g – | (X-rays A-H) Plus inseparable dust. Identified during charcoal analysis of sample. |
| (286) | Central feature [496] within hollow [284] | Slag – vesicular spheres | – | Identified during charcoal analysis of sample. |
| (291) | Layer overlying natural and hollow [287] | Iron object (joiner's dog) | 336g | Broken when found |
| (293) | Main (upper) fill of feature [292] | Slag / pit bases | 14,568g | Pit bases x 7 (X-rays A-R) |
| | | Iron objects x 18 | 1199g | Plus inseparable dust. |
| | | Hammerscale, Slag – vesicular spheres | 2321g | Identified during charcoal analysis of sample. |
| | | Fired clay | – | Possible hearth- or furnace-lining fragments |
| (296) | Basal fill of feature [292] | Slag / pit bases | 1559g | Pit bases x 2 |
| | | Hammerscale | 208g | Plus inseparable dust. |
| (303) | Fill of hollow [304] | Heavily burnt stone | – | Not one (?) |
| (309) | Fill of hollow [282] | Slag – vesicular spheres. | – | Identified during charcoal analysis of sample. |
| (321) | Fill of ditch [320] (associated with palisade fence [355]) | Large iron object (identified by X-ray as five joiner's dogs) | 704g | Broken when found. |
| | | Hammerscale and corrosion. | 14g | Retrieved from the soil adhering to the iron object |
| | | Slag / pit base | 3078g | Pit base x 1 (X-rays A-E) |
| | | Iron objects x 5 | 251g | Plus inseparable dust. |
| | | Hammerscale | 641g | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres. | – | No pit bases |
| | | Slag | 146g | (X-rays A-C) |
| | | Iron objects x 3 | 209g | Plus inseparable dust |
| | | Hammerscale | 57g | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres. | – | Probable blow hole fragment or piece of tuyère |
| | | Fired and moulded clay | – | No pit bases |
| | | Slag | 666g | (X-rays A-N) |
| | | Iron objects x 14 | 709g | Plus inseparable dust. |
| | | Hammerscale | 218g | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres. | – | Possible furnace or pit lining. |
| | | Fired clay fragments | – | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres | – | No pit bases |
| | | Slag | 69g | (X-ray A) |
| | | Iron object x 1 | 14g | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres. | – | No pit bases |
| | | Slag | 133g | (X-ray A-B) |
| | | Iron objects x 2 | 21g | Plus inseparable dust. |
| | | Hammerscale | 15g | Identified during charcoal analysis of sample. |
| | | Slag – vesicular spheres. | – | No pit bases |
| | | Slag | 27g | |
| (338) | Main (upper) fill of shallow, linear pit [339] in hollow [282] | | | |
| (336) | Main (upper) fill of fire pit (possible smithing hearth) [337] | | | |
| (338) | Main (upper) fill of shallow, linear pit [339] in hollow [282] | | | |
| (340) | Fill of pit [341] in hollow [282] | | | |
| (343) | Fill of square pit [342] in hollow [282] | | | |
| (381) | A lower fill of fire pit (possible smithing hearth) [337] | | | |
| (382) | Basal fill of linear pit (possible smithing hearth) [494] | | | |

IRON OBJECTS

Two large broken iron objects were found in contexts (291) and (321), the latter being shown by X-ray to consist of five joiner's dogs, and small, mostly broken iron objects were recovered from nine other contexts. In addition, a collection of broken objects was found in pit [292], together with slag and hearth pit bases. The iron objects in [292] may represent a forgotten or lost cache of material but could also simply be part of a deposit of debris into a convenient hollow. Alternatively, this could perhaps have been some form of representative (if rather impoverished) votive deposit near the centre of the enclosure.

HAMMERSCALE

Hammerscale is tiny fragments of solidified, liquid slag and typically takes the form either of flakes (1–3mm in size) or similarly sized spheroids. It is composed of oxide/silicate skin dislodged by mechanical or thermal shock when iron is forged. Spheroidal hammerscale (or small spheres of slag) results from the solidification of small droplets of liquid slag expelled from within the iron during hot working. 'This happens particularly when two components are fire welded together, but also during the primary smithing of the bloom into a bar or billet' (Starley 1995). Numerous contexts produced evidence for secondary smithing via the presence of characteristic hammerscale.

The identification of hammerscale is important because it is diagnostic of iron smithing and is often found in the immediate vicinity of the smithing hearth and anvil. A boulder which may have served as an anvil block was found within the upper fill of fire pit [337]. During excavation it became apparent that the bulk of obvious metalworking waste was located within the northern portion of the excavation, centred around hollows [282] and [284]. Subsequent examination of soil samples taken from across the site has shown that spheroidal hammerscale was primarily found in and around these hollows. The exception to this was fill (321) in palisade ditch [320], which produced soil and hammerscale concretions associated with a large broken iron object subsequently found to be composed of five joiner's dogs.

FIRE CLAY

A small quantity of variably fired clay, some of which was highly fired and represents hearth (or possibly furnace) lining fragments, was found

during excavation in three different contexts: fill (293) from pit [292], fill (327) from posthole [493] and fill (336) from fire pit [337]. Hearth and furnace lining fragments can be broadly recognised via the acquisition of a vitrified (fuel ash slag) surface through contact with fire (Bayley 1992, 114). Hearth lining fragments which have become vitrified after reaching a particularly high temperature cannot always be visibly separated from furnace lining fragments (McDonnell 1983, 82). No evidence was found to suggest that any of the metalworking features were specifically lined with clay below ground level, with the possible exception of fire pit [337], although some at least of the fired clay recovered from that context is likely to represent heat-reddened and fired underlying natural clay shillet; fragments of heat-reddened shillet noted during the excavation would seem to support this interpretation.

In addition to the indeterminate pieces of fired clay, a piece of shaped, curved, fired clay was found in context (336); this could relate either to a blowing hole associated with a smithing hearth (see Cleere's (1972) description of below- and above-ground fired features). Only a small portion was found, and that was brittle and easily fractured.

Comments

More than 26 kg of metalworking waste was found in 17 different contexts in 13 separate features during the excavation of Little Quoit Farm round. Nine of the 13 features were located specifically within the two more northerly hollows found on the site, [282] and [284].

Metalworking within the round was not confined to the excavation area. Feature [292] with its concentration of slag and other metalworking-associated material extended east beyond the edge of excavation and, significantly, no clearly identifiable smithing hearth pits were located (with the possible exceptions of pit [337] and the 'bowl' portion of [494], both in hollow [284]) despite the discovery of a number of hearth pit bases, implying that smithing activity was taking place elsewhere within the round. No evidence was found for metalworking activity outside the round during the related pipeline watching brief.

It should be noted that none of the excavated features was 100 per cent sampled and that the excavation corridor itself only looked at a small proportion of the round (approximately 15 per

cent). Total excavation of Little Quoit Farm round, together with a comprehensive sampling strategy, would almost certainly have produced a much larger amount of metalworking material and a wider range of associated features.

Environmental reports

Charred plant remains

Julie Jones

The samples were sieved in the School of Geographical Science at Bristol University in a flotation tank to a 250 micron float and 500 micron residue. The floats and residues were then dried before examination. While most of the samples produced charcoal, many contained no other plant remains and are omitted in Table 5. Those samples that did contain plant macrofossils included mostly very small assemblages of cereal grain, chaff and weed seeds and other remains. Nomenclature follows Stace (1991). Full details of all samples, including those in which no plant remains were identified, are held in the archive.

Northern enclosure ditch [275]

Of the three contexts examined from this feature, (310), (311) and (313), only (310) produced plant remains: a single rush seed (*Juncus* sp) and a heath-grass (*Danthonia decumbens*) caryopsis.

Hollow [282]

Six samples from contexts (338), (340), (343), (346) and (309) in this large circular hollow with several associated pits produced no plant remains.

Fire pit [337]

Two samples from contexts (336) and (381) were examined from a steep-sided rectangular pit which cut the west side of working hollow [284]. The scorched sides and base of the pit suggest that burning *in situ* had occurred. The basal fill (context (381)) contained two grains and two glume bases of wheat (*Triticum* sp) plus barley chaff fragments. Remains of gorse (*Ulex* sp) were also noted and included seeds, spines and stem fragments. A few other seeds included heath-grass, sedge (*Carex* sp),

buttercup (*Ranunculus acris/repens/bulbosus*) and clover/medick (*Trifolium/Medicago* spp). Charcoal from this basal fill was submitted for radiocarbon dating (below). The upper fill (context (336)) also had remains of gorse spines and stems with one fragment of hazel nut (*Corylus avellana*), plus a single wheat grain.

Hollow [284] and furnace [494]

Four samples from these features (contexts (285), (286), (382) and (335)) produced no plant remains. Alder (*Alnus glutinosa*) charcoal from the basal fill (286) of a hearth-like feature [496] was submitted for radiocarbon dating (below).

Hollow [287]

The basal fill (379) of hollow [287] included one unidentifiable cereal grain plus a possible wheat glume base. There were also two fragments of gorse stem plus a single seed of sheep's sorrel.

Ditch [280] and feature [292]

Although the basal fill (294) of ditch [280] produced no plant remains, the middle fill (295) included a single barley grain. The upper fill of a pit cut into the top of the ditch contained much slag and charcoal and also a single charred fragment of hazelnut shell and one rush seed.

Ditch [298] and hollow [304]

The basal fill of ditch [298], context (300), included a single wheat grain and glume base, with seeds of sedge, heath-grass, brome (*Bromus* sp) and dwarf spurge (*Euphorbia exigua*). The basal fill (303) of hollow [304], included three oat (*Avena* sp) and one barley grains with a few fragments of wheat and barley chaff. Individual seeds of clover / medick and cleavers (*Galium aparine*) were also recovered.

Rampart (329), palisade fence [355] and southern enclosure ditch [319]

None of the samples associated with these features produced any plant remains. However gorse / broom (*Ulex / Cytisus*) charcoal from the upper layer (326) of the rampart was submitted for radiocarbon dating (below).

Discussion

Many of the features examined were from industrial contexts associated with smithing, with deposits containing quantities of slag and charcoal. It is not surprising, therefore, that most deposits contained a few charred plant remains. Some of the macrofossils which do occur can be related directly to the charcoal also present in the samples. Charcoal of gorse / broom (*Ulex / Cytisus*) was common (Gale, below) and other evidence for the presence of gorse was recovered in the form of seeds, spines and stem fragments from several samples. Similarly, hazelnut shells may have been collected with hazel wood for use as fuel.

Gorse commonly occurs in grassy places, in open woods and on heathland, mostly on sandy or peaty soil. Some of the other weeds present in the samples are also typical of heathland. These include heath-grass, which also likes sandy or peaty soils on heaths and moors, and sheep's sorrel, which prefers acid sandy soils. As well as occurring on heathy open ground, however, it can also thrive in short grassland and cultivated land (Stace 1991).

Charred remains of cereals are sparse from most features, with only a few examples of grains and chaff of wheat and barley and some oat grains. The weed species, again mostly present in very small quantities, include brome, clover / medick and scarlet pimpernel and are likely to be arable weeds which grew with the crops. It is possible that cereals including wheat and barley, with the possible addition of oats (although there is no chaff present to confirm whether these are wild or cultivated), were being used on the site. However, the general paucity of cereal chaff and weeds suggests that cereals were not processed in the areas excavated.

Conclusion

Overall, the evidence gained from the charred plant remains is fairly limited. Remains of gorse and hazel in some deposits clearly relate to the use of the wood of these species, also identified from their charcoal as a fuel in the metalworking activities carried out on site. Remains of cereal crops are sparse and may have reached the site in a processed form, ready for use.

Charcoal

Rowena Gale

Charcoal-rich contexts from industrial features at the Little Quoit Farm site provided an opportunity to study the use of local resources to fuel the industry. Detailed analysis was carried out on charcoal from 27 bulk soil samples to provide economic and environmental data and to isolate suitable material for radiocarbon dating.

Materials and methods

Bulk soil samples were processed by flotation and sieving. The resultant flots and residues were scanned for charcoal. Hand-picked samples required no further processing.

Charcoal fragments measuring >2mm in cross-section were prepared for examination using standard methods. 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 sample were selected for detailed study at high magnification. These were fractured to expose the tangential and radial planes, supported in washed sand, and examined using a Nikon Labophot microscope at magnifications of up to x 400. The anatomical structure was matched to prepared reference slides.

Where possible the maturity of the wood (that is, heartwood or sapwood) was assessed and the number of growth rings recorded. It should be noted that measurements of stem diameters are from charred material; when living these stems may have been up to 40 per cent wider.

Results

The results of the charcoal analysis are summarised in Table 7, and discussed in detail below. The anatomical structure of the charcoal was consistent with the taxa or groups of taxa listed below. It should be noted that the anatomical structure of some related taxa can not be distinguished with any certainty, for example, members of the Pomoideae (*Crataegus*, *Malus*, *Pyrus* and *Sorbus*), Leguminosae (*Ulex* and *Cytisus*) and Salicaceae (*Salix* and *Populus*). Classification follows that of *Flora Europaea* (Tutin *et al* 1964–80).

SMITHING IN THE ROUND: EXCAVATIONS AT LITTLE QUIT FARM

Table 5 Charred plant remains

| Context no | Context | Sample size (kg / litres) | Float vol (ml) | Charred cereal grain/chaff | Charred weeds/other plant remains |
|---------------------------------------|--|------------------------------|-------------------|--|--|
| Northern enclosure ditch [275] | | | | | |
| (310) | Fourth fill of N enclosure ditch [275] | 11.9 / 11.8 | 5 | | <i>cf Danthonia decumbens</i> (heath-grass) 1 <i>Juncus</i> sp (rush) 1 Indet 1 |
| Fire pit [337] | | | | | |
| (336) | Main / upper fill of pit [337] | 5.2 / 4.9 | 110 | <i>Triticum</i> sp (grain) 1 | <i>Corylus avellana</i> (hazel) 1f <i>Ulex</i> sp (gorse) - spine 1 <i>Ulex</i> sp (gorse) - stem 3f |
| (381) | Basal fill of pit [337] | 5.2 / 5.0 | 130 | <i>Triticum</i> sp (grain) 2 <i>Triticum</i> sp (glume base) 2 <i>Hordeum</i> sp (rachis internode) 5 <i>Hordeum</i> sp (rachis internode base) 1 | <i>Carex</i> sp (sedge) 3 <i>cf Danthonia decumbens</i> (heath-grass) 1 <i>Ranunculus acris/repens/bulbosus</i> (buttercup) 1 <i>Trifolium/Medicago</i> (clover/medick) 1 <i>Ulex</i> sp (gorse) - seeds 3 <i>cf Ulex</i> sp - seeds 6 <i>Ulex</i> sp (gorse) - spines 10 <i>Ulex</i> sp (gorse) - stems 12f Indeterminate seeds 2 |
| Hollow [284], linear pit [494] | | | | | |
| (382) | Basal fill of linear pit [494] | 5.6 / 4.9 | 25 | | Modern seeds only |
| (335) | Upper fill of linear pit [494] | 12.3 / 11.4 | 250 | | Modern seeds only |
| Hollow [287] | | | | | |
| (379) | Basal fill of hollow [287] | 6.7 / 6.1 | 5 | <i>cf Triticum</i> sp (glume base) 1 Cereal indet 1 | <i>cf Rumex acetosella</i> (sheep's sorrel) 1 <i>Ulex</i> sp (gorse) -stem 2f |
| Ditch [280] and feature [292] | | | | | |
| (293) | Upper fill of feature [292] | 14.0 / 15.1 | 300 | | <i>Corylus avellana</i> (hazel) 1f <i>Juncus</i> sp (rush) 1 Indeterminate 2 |
| (295) | Middle fill of ditch [280] | 14.0 / 14.3 | 20 | <i>Hordeum</i> sp (grain) 1 | Indeterminate 3 |
| Ditch [298] and hollow [304] | | | | | |
| (300) | Basal fill of ditch [298]. | 14.3 / 13.2 | 5 | <i>Triticum</i> sp (grain) 1 <i>Triticum</i> sp (glume base) 1 | <i>Bromus</i> sp (brome) 1 <i>Carex</i> sp (sedge) 1 <i>Danthonia decumbens</i> (heath-grass) 1 <i>Euphorbia exigua</i> (dwarf spurge) 1 |
| (303) | Basal fill of hollow [304] | 15.2 / 13.5 | 5 | <i>Hordeum</i> sp (grain) 1 <i>Avena</i> sp (grain) 3 <i>Triticum</i> sp (glume base) 2 <i>Hordeum</i> sp (rachis internode base) 1 | <i>Galium aparine</i> (cleavers) 1 <i>Trifolium/Medicago</i> (clover/medick) 1 |
| Rampart (329) | | | | | |
| (328) | Basal layer of S bank of enclosure | 6.2 / 5.9 | | | Modern seeds only |

Betulaceae. *Alnus* sp., alder; *Betula* sp., birch
 Caprifoliaceae. *Sambucus* sp., elder
 Corylaceae. *Corylus* sp., hazel
 Fagaceae. *Quercus* sp., oak
 Oleaceae. *Fraxinus* sp., ash
 Leguminosae. *Cytisus* sp., broom; *Ulex* sp., gorse.

Rosaceae. Subfamilies –

Pomoideae: includes *Crataegus* sp., hawthorn; *Malus* sp., apple; *Pyrus* sp., pear; *Sorbus* spp., rowan, service tree and whitebeam.

Prunoideae: *P. spinosa*, blackthorn.

Salicaceae. *Salix* sp., willow and *Populus* sp., poplar.

Oak heartwood was common to almost all features. In the following text and tables heartwood is referred to as (h), while roundwood (diameter <20mm) and sapwood (including roundwood diameter >20mm) are indicated by (r) and (s).

With the exception of oak heartwood all the charcoal identified below was suitable for submission for radiocarbon dating.

NORTHERN ENCLOSURE DITCH [275]

Charcoal from contexts (310), (311) and (313) was sparse, but included oak (s,h) and gorse / broom.

HOLLOW [282]

The hollow contained a pit [339], of which the main upper fill, (338), included oak (r,h), gorse / broom and hazel. The morphology and structure of the oak roundwood (for example, diameter 8mm, six annual rings; diameter 15mm, nine annual rings) suggested an origin from coppiced rods, which were probably cut during the summer months.

The large volume of charcoal excavated from spread (346) within hollow [282] consisted mainly of very fast-grown oak roundwood (for example, diameter 20mm, four growth rings), with more mature oak containing heartwood. Gorse / broom was also frequent but hazel was sparse. Charcoal residues from context (309), the basal fill of [282], mostly consisted of fragments of oak roundwood (for example, diameter 15mm, seven growth rings), although small quantities of blackthorn, gorse / broom and alder were also present. Charcoal from an area around an *in situ* burnt feature [494] in the upper fill, (283), consisted mostly of oak (r,s,h), which included fast-grown coppice stems (for example, diameter 10mm, eight growth rings); and, in addition, hazel, gorse / broom and hawthorn-type roundwood (diameter 30mm, 35 growth rings).

Charcoal was also examined from the fills of two features within the hollow: a shallow truncated pit [341], at the northern edge of the working hollow, and a square pit [342]. Oak (s,h) and gorse / broom were common to both, while pit [342] also included small amounts of hazel and alder.

FIRE PIT [337]

The scorched base and sides of a steep-sided, rectangular pit, abutting the southern edge of the working hollow [282], were consistent with *in situ* burning and it seems likely that at least some of the charcoal examined represents debris from burning within the pit. Fills (336) and (381) included oak (r,h), gorse/ broom stems, hazel stems (diameter 5–25mm), willow / poplar, birch, elder and the hawthorn group.

HOLLOW [284] AND LINEAR FEATURE [494]

The upper fill (285) of the hollow included oak (s,h), gorse/ broom, alder, hazel and willow / poplar stems (diameter 10mm). A rectangular feature, [496], within the hollow, contained a burnt fill (286) mostly comprising oak (s,h) charcoal, but also alder.

Pit [494], cut into the edge of the hollow, included charcoal from the basal fill (382) consisting of oak (s,h) and gorse / broom stems. Charcoal was more abundant in the second fill (335) of the flue and although mostly from oak (r,s,h) and gorse / broom stems (diameter 5–15mm), other taxa identified included hazel (r), alder and the hawthorn group. Fast-grown oak stems (for example, diameter 10mm, four growth rings) suggest the use of coppice rods.

HOLLOW [287]

Charcoal was sparse in the basal fill (379) and consisted of oak (s,h) and gorse / broom. Elder and blackthorn were identified from hand-picked charcoal from the main fill (288) of the hollow.

DITCH [280] AND PIT [292]

The ditch underlay the southern end of hollow [287]. Although charcoal was rare in ditch [280], a piece of oak (h) was recorded from the basal fill (294) and fragments of oak (s,h), gorse / broom, and the hawthorn group from the middle fill (295). Feature [292], cut into the top of the ditch, contained slag, burnt soil and charcoal. Charcoal from the upper fill, (293), included

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Table 6 Charcoal

Key: r: roundwood (diameter <20mm); s: sapwood (including roundwood diameter >20mm); h: heartwood (including unknown maturity); hp: hand-picked charcoal

| Context no | Alnus | Betula | Corylus | Fraxinus | Pomoideae | Prunus | Quercus | Salicaceae | Sambucus | Ulex/ Cytisus |
|--|-------|--------|---------|----------|-----------|--------|---------|------------|----------|------------------|
| Northern enclosure ditch [275] | | | | | | | | | | |
| (310) | — | — | — | — | — | — | — | — | — | 3 |
| (311) | — | — | — | — | — | — | 2sh | — | — | 6r |
| (313) | — | — | — | — | — | — | 2h | — | — | — |
| Pit [339] | | | | | | | | | | |
| (338) | — | — | 1s | — | — | — | 68rh | — | — | 18 |
| Pit [346] | | | | | | | | | | |
| (346a) | — | — | 1 | — | — | — | 101sh | — | — | 44r |
| Hollow [282] | | | | | | | | | | |
| (283) hp | — | — | 1 | — | 3s | — | 22rsh | — | — | 2 |
| (309) | 1 | — | — | — | — | 5 | 68r | — | — | 10r |
| Pit [341] | | | | | | | | | | |
| (340) | — | — | — | — | — | — | 6rsh | — | — | 1 |
| Pit [342] | | | | | | | | | | |
| (343) | 1 | — | 1 | — | — | — | 56sh | — | — | 39r |
| Fire pit (possible smithing hearth) [337] | | | | | | | | | | |
| (336) | — | 2r | 10 | — | — | — | 9rh | 1 | — | 1s |
| (381) | — | — | 56r | — | 2 | — | 19r | 2 | 1r | 29r |
| Hollow [284] | | | | | | | | | | |
| (285) | 1 | — | 1 | — | — | — | 8sh | 3r | — | 2r |
| Pit (hearth) [496] | | | | | | | | | | |
| (286) | 1 | — | — | — | — | — | 36sh | — | — | — |
| Linear pit (possible smithing hearth) [494] | | | | | | | | | | |
| (335) | 2 | — | 2r | — | 1 | — | 71rsh | — | — | 62r |
| (382) | — | — | — | — | — | — | 12sh | — | — | 4r |
| Hollow [287] | | | | | | | | | | |
| (288) hp | — | — | — | — | — | 2 | — | — | 3 | — |
| (379) | — | — | — | — | — | — | 5h | — | — | 1 |
| Feature [292] | | | | | | | | | | |
| (293) | — | — | 17r | — | 1 | 4 | 47rh | 1 | — | 6 |
| Ditch [280] | | | | | | | | | | |
| (294) | — | — | — | — | — | — | 1h | — | — | — |
| (295) | — | — | — | — | 1 | — | 4sh | — | — | 2r |
| Ditch [298] | | | | | | | | | | |
| (300) | — | — | — | — | 1 | — | 3sh | — | — | 1r |
| Hollow [304] | | | | | | | | | | |
| (303) | — | — | — | 1 | 1 | — | 4sh | — | 1 | 2r |
| Palisade posthole [371] | | | | | | | | | | |
| (372) | — | — | — | — | — | — | 1 | — | — | — |
| Palisade posthole [373] | | | | | | | | | | |
| (374) | — | — | — | — | — | — | 2 | — | — | 1 |
| Posthole [357] | | | | | | | | | | |
| (358) | — | — | — | — | — | — | 6h | — | — | — |
| Enclosure bank [329] | | | | | | | | | | |
| (326) | — | — | — | — | — | — | 2s | — | — | 1 |
| (328) | — | — | — | — | — | — | 3sh | — | — | — |

oak (r,h), gorse / broom, hazel (r), blackthorn, willow / poplar, and the hawthorn group. Some fast-grown oak stems measured 8mm in diameter (three growth rings), while oak heartwood included pieces with narrow growth rings indicating slow growth.

DITCH [298] AND HOLLOW [304]

Charcoal was sparse in the fills of both the shallow oval hollow [304] and ditch [298] underlying the hollow. Oak (s,h), gorse/ broom and hawthorn group were common to both features, while elder and ash were recorded only from the hollow.

RAMPART (329), PALISADE [355] AND SOUTHERN ENCLOSURE DITCH [319]

Contexts (326) and (328) represent the upper and lower layers respectively, of the surviving rampart [329]. Both samples included oak and the upper fill also included gorse / broom. Charcoal occurred infrequently in the clayish deposit from the southern enclosure ditch [319]. Charcoal from the fill (358) of posthole [357], probably forming part of the rampart, was very comminuted and composed of oak (h). Sparse charcoal from fills (372) and (374) of postholes [371] and [373] of the palisade on the southern side of the enclosure included oak and gorse / broom.

Environmental evidence

Until the introduction of coke in the relatively recent past, charcoal was the only heat source capable of producing the requisite temperature in the reduced atmosphere of the iron-smelting furnace. Charcoal was probably equally important in smithing, although recent experiments have suggested that this process could also be carried out using well-seasoned wood (Jane Cowgill, pers comm.).

The existence of managed oak woodlands contemporary with the Little Quoit Farm site is clearly demonstrated by the remains of coppiced rods in the residues of industrial fuel. Charcoal production, in particular, consumes huge quantities of wood: it takes approximately six tons of wood to produce one ton of charcoal (Percy 1864; Edlin 1949). Since the narrow corridor of excavation at Little Quoit Farm probably exposed only a proportion of the total iron-working area, neither the output nor the life span of the unit could be assessed. Even if operated on a relatively small-scale, however, it is likely that most oak woodland in the area would have been coppiced at this time.

The availability of oak near the site is substantiated by its frequency in the charcoal residues. Similarly, gorse (*Ulex*) and / or broom (*Cytisus*) also appear to have been common in the region. Gorse typically grows on leached, acid or disturbed soils, sometimes in association with, although usually dominant over, broom (*Cytisus*). Although the anatomical similarity of gorse and broom prevents definitive identification of the charcoal, it is probably more likely to be gorse (below). Certain modifications in structure allow gorse to grow in less favourable habitats, and

although unpleasant to handle, the spiny branches and stems have had numerous economic uses. In some areas (for example, Ireland) gorse has been managed and regularly coppiced (Lucas 1960) and careful management and regular harvesting of gorse is also well attested in Cornwall (Dudley 2011, 139–43). There was no evidence to suggest that coppiced gorse was used here, but its abundance implies that it was common nearby, probably on the extensive areas of rough ground in the vicinity.

The paucity of other taxa in the charcoal residues may reflect the preferential selection of fuel woods, but it is probably also a measure of their distribution in the environment. Additional taxa, used sporadically and sparingly, include alder (*Alnus*), birch (*Betula*), hazel (*Corylus*), ash (*Fraxinus*), blackthorn (*P. spinosa*), hawthorn / *Sorbus* group (Pomoideae), willow / poplar (*Salix* / *Populus*) and elder (*Sambucus*). Hazel may have grown as understorey in oak woodland but may also have flourished in open areas together with marginal woodland species such as elder, hawthorn, blackthorn and birch. Birch typically grows on poor acid soils and possibly formed open communities with gorse and perhaps with oak. There was some evidence from field 25 on the pipeline route, 2 km to the north, to suggest that rowan (*Sorbus aucuparia*) also grew locally. Willows and alder usually require soils with a high water content.

Fuel and fuel resources

The numerous and complex features associated with the ironworking site at Little Quoit Farm suggest that the industry may have endured for some period. This would imply that adequate fuel supplies were available in the area or that fuel was brought from a distance.

As discussed above, charcoal was essential for smelting and was traditionally used for smithing. The quality and performance of charcoal is dependent on the efficiency of its production (that is, its carbon content) (Chris Irwin, pers comm) and oak charcoal was one of the most heat-efficient fuels available in Britain in the Romano-British period (Marren 1992). Evidence from Late Iron Age – Romano-British ironworking sites in Britain shows a strong preference for the use of oak, as for example at Creeton Quarry, Lincolnshire (Cowgill 2002), Bonemills Farm, Cambridge (Gale, unpublished), Pomeroy, Devon (Gale

1999), Bardown, Sussex (Cleere and Crossley 1995), Lefevre Walk and Parnell Road, Bow, London (Gale, unpublished) and Welwyn Hall, Hertfordshire (Gale, unpublished). In common with the Little Quoit Farm site, fuel residues from these sites included both narrow roundwood and oak heartwood, indicating the use of wood mature enough to have developed heartwood. Heartwood formation increases the density of the wood and thus raises its calorific potential. It appears that not all sites, however, favoured or followed this practice, since fuel residues from five Roman sites in the Forest of Dean (Chesters Villa, Woolaston, and four at Ariconium), clearly indicated the specific use of narrow oak roundwood (Leyall 1923; Figueiral 1992; Gale, unpublished).

Traditionally charcoal clamps have been constructed with billets or cordwood, sometimes with narrower roundwood stacked upright around the perimeter (Armstrong 1978). Charcoal residues from the fuel industry at Little Quoit Farm consisted mainly of oak sapwood (including roundwood up to 20mm in diameter) and heartwood, and sometimes narrow roundwood (charred diameter <20mm). Alder, birch, hazel, ash, members of the hawthorn group, blackthorn, willow / poplar and elder could conveniently have been included in the charcoal clamp as narrow roundwood. Gorse, however, poses more of a problem since its morphology does not lend itself easily to upright stacking. Gorse stemwood burns with immense heat and leaves very little ash (Edlin 1949) and has traditionally provided an important source of fuel. Gorse from Little Quoit Farm mainly consisted of fairly narrow stems and its consistent occurrence in the fuel residues implies that it was used with the oak, as an industrial fuel.

This could imply either that gorse stems were, in fact, included in the charcoal clamp, or that the fuel consisted of a mixture of charcoal and wood fuel, or that only wood fuel was used. If the latter, then it seems probable that all the metal-working fuel residues examined derive from smithing and would accord with the use of highly seasoned wood.

It may be significant that, even in contexts not apparently associated with metal-working – for example, the northern and southern enclosure ditches [275] and (329), rampart (326) and palisade postholes [371] and [373] – charcoal residues, although sparse, were still predominantly composed of oak and gorse. Although it is feasible that waste materials from industrial uses may have

been widely scattered, this bias could reflect the multi-purpose use of oak and gorse, owing to their ready availability. Only from the fill of fire pit [337] was there a suggestion of the increased use of another taxon, in this instance hazel.

Evidence for the use of narrow roundwood and coppiced wood occurred in working hollows [282] and [284], fire pit [337] and feature [292]. Charcoal in other contexts was too comminuted to assess. From the few fragments from which it was possible to obtain data, oak diameters ranged from 8 to 15mm, and included from three to nine annual rings; hazel ranged from 5 to 15mm, willow / poplar 10mm, and a member of the hawthorn group 30mm with 35 annual rings. When the trees were living these diameters were probably about 40 per cent greater. Oak stems in the fill of linear pit [339] in working hollow [282] appear to have been felled in the summer months (although an abrupt cessation of growth early in the season would produce a similar effect in the wood structure). It would have been more practical to fell wood in the winter, after leaf fall and when the stem sap was low. Medieval records from iron-working in the Weald of Sussex indicate that woodsmen cut wood and made charcoal in the winter months, while smelting was carried out in the summer (Cleere and Crossley 1995).

Cross-sections of oak showed the characteristic growth pattern of coppiced rods. In narrower stems the age of felling varied from 3 to 9 years. The frequency of oak heartwood, which does not usually develop in stems less than 20 years of age and may not form until the stems are very much older, indicates the use of considerably wider stems or poles. The use of such a wide range of diameter of oak stems may be explained by the method of harvesting oak poles. Coppice stools produce new growth in successive years, and when clear felling poles, for example, of 100mm diameter, much narrower (younger) rods would also have been cut. In addition, wide poles would carry lateral branches, which could provide useful fuel (of the dimensions described above), particularly in areas where wood was a valuable and possibly scarce economic commodity. Evidence of coppicing on taxa other than oak was inconclusive.

Conclusion

Fuel residues from the iron-working site indicate the use of coppiced oak (*Quercus*) wood, which

included both narrow roundwood and poles old enough to have developed heartwood (probably exceeding 20 years of age). Gorse (*Ulex*) (and possibly broom, (*Cytisus*)) was also important in the fuel but other taxa, such as alder (*Alnus*), birch (*Betula*), hazel (*Corylus*), ash (*Fraxinus*), the hawthorn/ *Sorbus* group (Pomoideae), blackthorn (*P. spinosa*), willow/ poplar (*Salix/ Populus*), and elder (*Sambucus*) appear to have been used only sporadically.

It seems likely that, in common with Cornish woods of today and in the historic period, the woodland element of the Romano-British landscape was dominated by oak coppices. The high frequency of gorse/ broom suggests that heathland or scrub was also common. Other taxa may have been comparatively infrequent.

Radiocarbon dating

Charcoal analysis by Rowena Gale allowed the identification of contexts suitable for radiocarbon dating. Selection of suitable material was then made from this list. (For contexts which produced diagnostic, datable finds, radiocarbon dating was not deemed a priority.)

Three samples of charcoal not including oak heartwood were selected, firstly to test the start date for activity in the round (phase 3) and secondly the two-phase interpretation of the enclosure's development. In addition, it was hoped that the third sample would provide a reasonably secure date for construction of the rampart.

Despite identification of a number of definite pre-round ditch features, none of the samples taken produced suitable material for radiocarbon dating. Fill (295) of ditch [280] produced datable charcoal but was probably contaminated by upper fill (281).

The basal fills of the outer ditches and rampart failed to produce adequate material and while one of the rampart postholes did produce charcoal it

was from relatively high up in its profile and could have been introduced after the removal or rotting of the original post. None of the postholes contained evidence for intact, *in situ* post-pipes, indicative of the fills actually relating to construction.

Although a number of the samples produced sufficient charcoal for dating, many of these contexts could have been contaminated by the ubiquitous presence of charcoal associated with on-site metalworking and samples were therefore not submitted.

Results

The three samples were measured at the University of Arizona AMS Facility on behalf of the Scottish Universities Research and Reactor Centre (SURRC), now Scottish Universities Environmental Research Centre (SUERC). The uncalibrated ages are quoted in conventional years BP (before AD 1450). The calibrated age ranges are determined from the University of Washington Quaternary Isotope Laboratory, Radiocarbon Dating Program. The decadal 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 levels of confidence. The calibrated dates have been re-calculated using OxCal 3.10.

Two of the radiocarbon determinations, AA-36503 and AA-36504, are consistent with the dates from the pottery assemblage for phase 4. They are almost indistinguishable from each other and clearly associate the phase 4 metalworking activity with construction of the enclosing rampart.

Radiocarbon determination AA-36505 from context (286), however, is significantly earlier than expected, suggesting that use of feature [496] – ostensibly part of phase 3 on the site – dated to the Early Iron Age. Other features in phase 3 are well dated by pottery to the early second to early third centuries AD and it is likely that the radiocarbon date is anomalous, perhaps derived from residual

Table 7 Radiocarbon determinations

| Context | Laboratory reference | Radiocarbon age BP (uncalibrated) | Calibrated age range, 1s | Calibrated age range, 2s |
|---------|----------------------|--------------------------------------|--------------------------|--------------------------|
| (326) | AA-36503 (GU-8758) | 1735 ±45 | cal AD 240–380 | cal AD 170–420 |
| (381) | AA-36504 (GU-8759) | 1750 ±50 | cal AD 230–380 | cal AD 130–410 |
| (286) | AA-36505 (GU-8760) | 2470 ±45 | cal BC 760–510 | cal BC 770–410 |

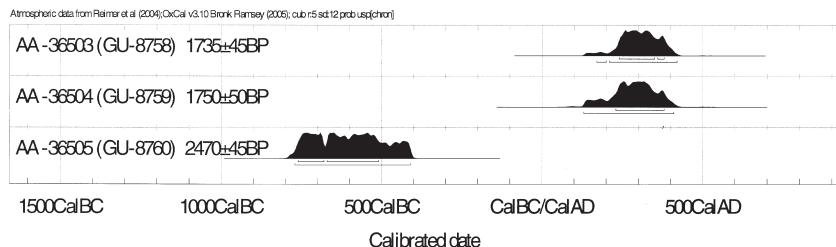


Fig 17 Radiocarbon determinations from the Little Quoit Farm enclosure

material on the site. However, deposit (286) contained hammerscale (indicative of smithing) and there remains the possibility that ironworking in the immediate vicinity of the Little Quoit Farm enclosure may have had much earlier antecedents.

Conclusions

The excavations at the Little Quoit Farm site were intended to investigate an enclosure and possible early field system identified by geophysical survey, where they were cut by the South West Water pipeline corridor. Five main phases were identified, three of them (3–5) related to the enclosure.

Phase 1 was represented by a small scatter of residual Neolithic flints, indicative of activity perhaps broadly contemporary with the Devil's Quoit chambered tomb which stood 300m to the west. The quoit would have been a prominent local feature throughout the successive phases. In the watching brief on the pipeline more obvious concentrations of flint, perhaps also Neolithic, were found in field 9, 400m to the south (centred on SW 925 615, 19 pieces) and in field 16, 800m to the north (SW 922 627, 13 pieces) (Lawson-Jones 2001).

Phase 2 was represented by the ditches of a field system, some of which underlay second century AD features. The few sherds from the ditch fills suggest a date from the later Iron Age to the early second century AD. The field system could therefore be late Iron Age or Romano-British. There has been relatively little work on ditched field systems in lowland Cornwall; excavated examples at Stencoose (St Agnes), Penhale (St Enoder), Pennance (St Stephen-in-Brannel), Threemilestone (near Truro) and Tremough (Penryn) all appear, as at Little Quoit Farm, to date to the later Iron Age or, more often, the Romano-British period (Jones 2001; Nowakowski 1998; Jones and Taylor 2010;

Gossip, forthcoming; Gossip and Jones 2007). Too little of the Little Quoit Farm field system was recorded, either by excavation or by geophysical survey, to determine its extent and form. It appears to have been rectilinear but irregular. No complete dimensions of enclosures were apparent but they appear to have been small. The close spacing of some of the ditches could suggest successive phases or perhaps a more intricate complex of ditches (for example, trackways or enclosures), suggesting a possible focus of activity in the area of the later enclosure. There was no concentration of finds to suggest a contemporary settlement in the area but if these features do represent a field system it seems likely that one existed nearby. More extensive geophysical survey could help to provide a clearer context for the excavated area.

The palisade with shallow outer ditch which may represent the first phase of enclosure at the Little Quoit Farm site appears to be unparalleled in Cornwall. In the third century the site was enclosed by a ditch and bank or rampart, similar in proportions to those of some excavated rounds. The rampart enclosed an area about 54m across, about the same as Trethury and broadly comparable with many other round sites. Charcoal from the rampart material produced a determination of cal AD 240–380.

The two main phases of activity within the enclosure (3 and 4) cannot be stratigraphically linked to the phases of the perimeter but are presumed to broadly coincide with them. The few datable finds, and radiocarbon dates, suggest an early second – early third century date for phase 3 and a late third – early fourth century end date for phase 4 and the abandonment of the enclosure.

In the interior, phase 3 was represented by five closely spaced, roughly circular hollows 2.5–5m in diameter and typically 0.2m deep. There were no clear relationships between them and they need not be directly contemporary with each other. No

evidence for structures surrounding or covering the hollows was found and there were few internal features except in the two northern hollows; these also produced considerable evidence for iron working. Phase 4 involved further metalworking on perhaps a larger scale within and around the two northern hollows.

In summary, the evidence for metalworking within the Little Quoit farm enclosure takes the following forms:

- Slags, which would have formed in the blacksmith's hearth, including hearth bottoms or pit-bases: plano-convex masses of smithing slag. Eleven examples were found.
- Hammerscale, the result of hot working of iron, typically found in the immediate vicinity of smithing hearths and anvils.
- Broken iron objects, probably intended for reprocessing.
- Fired clay, probably from smithing hearths.

The enclosure at Little Quoit Farm forms part of a wider pattern of rounds apparently inserted into enclosed landscapes in Cornwall in the mid-Roman period. Quinnell (1986, 124–5) refers to a 'dislocation of settlement patterns . . . in the second century AD', with a proliferation of new rounds and, in west Cornwall, courtyard house settlements, imposed on what was probably already a well-settled countryside. Penhale round, some 5 km to the south west in St Enoder parish, like the Little Quoit Farm enclosure, was clearly constructed in a landscape which had seen extensive use and was already subdivided into fields: 'the majority of the linear ditches identified . . . pre-date the construction of the round . . . [and] . . . would appear to be part of an earlier field system upon which the round was later imposed' (Nowakowski 1998, 129). Trethury round, in St Austell parish, succeeded an unfinished ditched and banked enclosure, possibly for stock, which had been constructed over an earlier lynchett field system (Quinnell 2004, 214–5).

That the Little Quoit Farm round lay in an 'occupied' landscape is attested not only by the earlier ditched boundaries on the site, possibly part of a field system, but also by evidence from air photographs of three broadly similar enclosures of potentially late prehistoric or Romano-British date within 1.6 km (1 mile) of the site (HER PRNs 75724, 75781, 75792). Substantial parts of lowland Cornwall show comparable distribution

densities of approximately one round per square kilometre (Quinnell 2004, 211–2, fig 1; Edwards and Kirkham 2008, fig 2; Young, forthcoming).

Pre-existing settlements in the vicinity of the Little Quoit Farm enclosure would not necessarily have been directly challenged by it, since it appears that it served solely for ironworking; as such, it may in fact have been subsidiary to a particular nearby settlement. The site produced the largest quantity of confirmed smithing material found so far on a Roman-period site in Cornwall and was presumably making and repairing artefacts and recycling broken iron objects on a considerably larger scale than is represented by the limited smithing activity more typically found in excavated rounds (Quinnell 2004, 83). It is likely, therefore, that the Little Quoit Farm site was serving a number of settlements over a wider area. If this was the case, the metal artefacts recovered from the site, other than the punches which are likely to have been used in specific metalworking processes, may represent 'importation' to the site of broken, discarded iron scrap from the surrounding population rather than non-industrial activities taking place there.

The distinct character of the Little Quoit Farm enclosure is emphasised by the apparent contrast between the evidence recovered from its interior and that from rounds of the same period. Most of these are likely to represent settlements forming the centres of agricultural estates and almost all have revealed clear indications of domestic occupation. The definition of rounds proposed by Henrietta Quinnell (2004, 213) places specific emphasis on the presence of 'substantially built houses'; the accompanying discussion specifically proposes that the Little Quoit Farm enclosure and another industrial metalworking site at Killigrew, St Erme, do not fall within this definition (*ibid*, 214). The limited evidence currently available indicates that domestic structures and associated activity within rounds were concentrated around the perimeter of the enclosed space, immediately inside the rampart, leaving the centre more-or-less open (Thomas 1966, 87). This has only been comprehensively demonstrated at Trethury (Quinnell 2004) but is also suggested by excavations on rounds at Threemilestone (Schwieso 1976), Grambla (Saunders 1972) and Castle Gotha (Saunders and Harris 1982), and excavations and geophysical survey on the round-type enclosure titled the 'fort' at Tremough (Gossip and Jones 2009–10). At Little

Quoit Farm the pipe trench exposed portions of both the periphery and the central area of the enclosure. There was no hint of 'houses' in the excavated area – traces of activity which could be interpreted as 'domestic' were generally very limited – and the portion of the central space exposed was occupied by five hollows, two or three of which were used for metalworking. The evidence from the excavated enclosure at Killigrew, St Erme, similarly indicated that activity within the enclosure was dominated by metalworking, in the Roman period also located in hollows in the central area of the site (Cole and Nowakowski, forthcoming).

The differences between the Little Quoit Farm enclosure and rounds also include a hint that people working at the former may not have been directly involved in the production and processing of crops, at least not at this location. Wheat, barley and possibly oats were found in small quantities but the absence of cereal chaff and weeds suggest that cereals were not being processed on the site.

A parallel distinction may be reflected in the forms of pottery represented: the composition of the assemblage from Little Quoit Farm to some extent resembles that from the Killigrew enclosure, which has been interpreted as suggesting that food was brought to the site ready cooked (Quinnell, forthcoming).

Enclosure may have been achieved initially at Little Quoit Farm with a palisade and ditch; the evidence of the joiner's dogs with hammerscale adhering to them recovered from ditch [320] suggests that metalworking was already occurring on the site at the time these features were created. The dogs (or others like them) may have been used in construction of the palisade. The extents of the palisade and ditch are uncertain, however, and it is possible that they functioned only locally within the site as a screen or windbreak, or as part of a structure.

At some point in the third or fourth century, dated by a radiocarbon determination on a sample from



Fig 18 The Little Quoit Farm enclosure from the south east, with the enclosure ditch and the pipeline corridor showing clearly in a grain crop in early August 2009. (Photograph: Historic Environment, Cornwall Council, F93-100.)

the lower rampart material, the site was enclosed with a ditch 3m wide and probably originally near 2m deep, together with an accompanying bank roughly 2.5m wide, perhaps with a timber revetment along its inner face. The creation of this enclosure appears to coincide with a period of more intensive metalworking on the site. These dimensions may be compared with those of other sites apparently first enclosed during the Roman period (*cf* Quinnell 2004, table 12.1). The ditch of the round at Shortlanesend was about 1.4m deep and 3m wide and the rampart a little under 3m wide (Harris 1980, 67). At Trethurgy the ditch was 3–5m wide and 0.8–1.5m deep and the rampart 3.5–4.5m wide with dry-stone revetment on both faces, possibly bringing it to a height of about 2m (Quinnell 2004, 16–17, 220). The outer ditch at Reawla was cut 2.3m into the subsoil and was 5m wide, with an accompanying rampart which survived in places to 2m high and 4m wide (Appleton-Fox 1992, 86). At Grambla the ditch was 6m wide and 3m deep with a rampart 6m wide surviving to a height of 1.5m and probably originally significantly higher (Saunders 1972, 50).

The form of the enclosing earthworks at the Little Quoit Farm site was therefore towards the smaller end of the range identified for rounds created during the Roman period. It represents, nonetheless, a significant investment of labour in digging out the ditch and shaping the bank and possibly of other resources in the form of a timber revetment and associated fixings and perhaps a gate. This effort created an enclosure which in its surviving elements at least was indistinguishable in form and scale from at least some contemporary rounds. The symbolic significance of enclosure on settlement sites is now widely accepted for the Iron Age (Bowden and McOmish 1987) and Hingley (1989, ch 4) has suggested that the widespread occurrence of 'compounds' enclosing settlements of various kinds during the Roman period may have reflected a continuation of this means of denoting the superior social status of the occupiers. Quinnell (2004, 220) has noted that a round 'was a place shut off, into which only those with the right credentials could penetrate'. Was the act of enclosure intended to mark the particular significance and special character of the activities taking place at the Little Quoit Farm site, or perhaps the prestige and status of those working there, or of those who owned the site and controlled that work? As regards the status of those working within the round, a higher

rather than a lower status might be inferred. It has been noted that in medieval Ireland 'whitesmiths (silver and gold smiths), blacksmiths and bards can be seen as distinct from one another, but with a shared, high 'caste' status' (Budd and Taylor 1995, 140; *cf* Tylecote 1981, 42).

The enclosing earthworks may equally have been intended to exclude those not privy to the technical 'mysteries' practised within the site and to conceal the details of those activities. Budd and Taylor (1995, 139) have suggested that in the prehistoric period metalworking may have had apparently magical qualities to the uninitiated, setting its practitioners apart: '... the ability to put on a show of colourful, transmogrifying pyrotechnics may have commanded considerable respect'. Such an interpretation seems less appropriate for the Roman period in that instances of smithing occur frequently on other settlement sites of the time; Trethurgy (Quinnell 2004, 83, 233) and Reawla (Appleton-Fox 1992) offer well-excavated examples. Such activities would presumably not have been viewed as particularly exotic when carried out at this domestic level. The scale of activities within the Little Quoit Farm site, however, suggests some element of specialisation and professionalism for those involved in metalworking, and there may have been a degree to which enclosure was aimed at enhancing a manufacturing reputation and protecting associated 'trade secrets'.

Of course, enclosures may also or alternatively have had more prosaic functions. At a site such as Little Quoit Farm, possibly then on the margin between an area of farm settlements and fields and an extensive tract of open rough ground, there may have been a need for security, protecting raw materials, finished goods and fuel stores from depredations, for example. Equally, there may have been a requirement to keep children and animals away from the intrinsically dangerous procedures carried out within. The full rationale for enclosure may, of course, have combined some or all of these factors.

Other later prehistoric and Roman-period industrial sites in Cornwall offer little help in resolving these problems. The elaborately defended promontory fort of Trevelgue, St Columb Minor, has revealed evidence of extensive iron smelting (but not of smithing) extending from the fifth century BC to the early first century BC (Nowakowski and Quinnell 2011). Smelting waste has also been recovered, however, at an

unenclosed later Iron Age settlement at Higher Besore, near Threeemilestone, west of Truro (Gossip, forthcoming) and, in association with third-fourth century AD pottery, from an enclosure at Nancemere, on the east side of Truro (Higgins 2009). The large enclosure at Carvossa revealed evidence of extensive metalworking (Carlyon 1987; 1999) but a Roman-period site at Duckpool, Morwenstow, which appears to have specialised in non-ferrous metalworking, was not enclosed (Ratcliffe 1995), although it was in some sense set apart from the local agricultural landscape by its location close to the sea at the lower end of a steep-sided valley. Roman-period salt-production sites at Carnoon Bank and Trebarveth on the Lizard appear to have been unenclosed (McAvoy 1980, Peacock 1969) but another probable site of this type at Porth Godrevy, Gwithian, was located in a small embanked compound (Fowler 1962; Nowakowski *et al* 2007, 53). Killigrew, in St Erme parish, the site apparently most directly comparable with that at Little Quoit Farm, was enclosed by a double circuit of banks and ditches, the inner ditch up to 2.6m wide and 1.1m deep within the subsoil, the outer up to 2.5m wide and 0.85m deep (Cole and Nowakowski, forthcoming). Romano-British pottery was recovered from the upper ditch fills but it is unclear whether metalworking started on the site before or after the enclosure which made it distinctive was created.

It is clear that substantial quantities of fuel must have been required for the metalworking processes carried on in the Little Quoit Farm enclosure. Analysis of charcoal from the site demonstrated that the principal fuels were coppiced oak and gorse, although it is not apparent whether the fuel was burnt as charcoal, as a mix of oak charcoal and wood fuel (gorse) or entirely as wood fuel. The identification of fast-grown oak roundwood and poles in the charcoal indicates that the site was at least partly supplied from managed oak woodlands. Access to fuel is likely to have been a factor in determining the location of this and other such sites.

While there is no direct information on the location of woodlands in Cornwall in the Roman period, place-names and Domesday records offer hints for the early medieval period. The settlement of Nankelly, the place-name first documented in 1330 (PRN 21641) and deriving from Cornish *nans*, 'valley', and *kelli*, 'grove, small wood' (place-name interpretations here and below are from

Padel 1985), lies 2 km west of Little Quoit Farm, towards the head of the valley running west to reach the sea at Porth, St Columb Minor; Tregoose and Melangoose, both incorporating *cos*, 'wood' and documented in 1262 and 1335 respectively (PRNs 22221, 22159), lie a little further down this valley, as does the manor of Rialton, recorded in 1086 with 60 acres of woodland (Thorn and Thorn 1979); 'acres' in Domesday denoted an imprecise area but very many times larger than intended by more recent uses of the term (Hull 1971, lx–lxii).

The place-name Brownwithan, recorded by the St Columb Major tithe map on a north-facing slope approximately 3 km north east of Little Quoit Farm, is probably from Cornish *bron*, 'breast or hill', and *gwyth*, 'trees' (Henderson 1935, 148). Three settlement names on a steep valley side a little further north also hint at former woodland: Killeaganogue, first recorded in 1334 (PRN 26491), is from *kelli* with *cnow*, 'nuts or nut trees' (Padel 1985, 47, 61); Penhellick is from *pen*, 'head, top, end, promontory' and *heligen*, 'willow trees', meaning the 'top or end of the grove of willows' (*ibid*, 128, 178); and Pengelly, first recorded in 1327 (HER PRN 21628), is from *pen* with *kelli*. On the north side of the same valley, a short distance to the east, is Tregolls, from *coll*, 'hazel trees'. In the same area Domesday noted 12 acres of woodland in the manor of Withiel (the place-name from *gwyth*) on a tributary of the Camel 8 km north east of Little Quoit Farm (Thorn and Thorn 1979); Withielgoose and, according to Henderson (1935, 145), Burncoose, both incorporating *cos*, lie nearby. In the Camel valley, still a strongly wooded area, the Domesday holdings of Lancarffe and Colquite held 30 and 20 acres of woodland respectively (Thorn and Thorn 1979). Much the largest area of woodland recorded in this part of Cornwall at Domesday – an area two leagues in length by one wide – was in the manor of Pawton, on the north side of the St Breock Downs, roughly 8 km north of Little Quoit Farm (*ibid*).

Together, this evidence suggests that many stream valleys and steeper hillslopes in the wider region around the Little Quoit Farm site were wooded in the early medieval period. This may also have been the case for comparable topographical locations much nearer to the enclosure, including the valley of the Tresaddern Water, the upper slopes of which lay only about 400m to the north of the site, and another steep-sided valley a similar distance to the south.

In addition to oak, probably in the form of charcoal, gorse was also extensively used as a fuel in the Little Quoit Farm enclosure (Gale, above). The proximity of the site – as with that at Killigrew – to areas of former upland rough ground may indicate that access to supplies of gorse was also a factor in determining their locations. A number of ‘round’-like enclosures have been noted in similar positions on the margins of areas likely to have been rough ground in the Iron Age and Roman period (Dudley 2011, fig 38; Kirkham 2011b, 43, fig 42). Some of these may represent settlements which specialised in extensive grazing of animal flocks or herds on the open heaths and downs. However, sites such as Little Quoit Farm and Killigrew suggest that some at least may have had industrial functions which depended on access to fuel supplies.

The source of the iron used by the Little Quoit Farm metalworkers is unknown. A single piece of possible tap slag was recovered on the site, raising the possibility that iron smelting was also carried out there, although if this was the case very much larger quantities of tap slag would be expected (Justine Bayley, pers comm). Some iron in the form of broken items and scrap is likely to have been brought in from the surrounding area for re-forging into new items. Raw iron in the form of ingots or bars could also have been brought from production centres in the wider region; an example of such a smith’s ingot or ‘stock’ was found at Trethurgy (Quinnell 2004, 78–9). Much iron was produced in antiquity from bog iron ore, formed by the precipitation of iron compounds in lakes and bogs (McDonnell 1995); Goss Moor, less than 4 km to the south east of Little Quoit Farm, could well have offered a source. Additionally, iron lodes worked in the historic period from surface openworks as well as by shafts and below-surface workings are known about 2 km to the south of the site in the Ruthvoes and Toldish areas, 2.8 km to the east at Tregonetha and also around Roche, 6 km to the east (Dines 1988, II, 527–30; Brooks 2011, 119–43). There is currently no direct evidence of early working on these lodes but exploitation in the Roman period is highly probable on surface outcroppings of a large iron lode at Restormel, 18 km to the east of Little Quoit Farm, where there is also evidence of iron smelting at the nearby Roman fort (HER PRN 6693). Middle to Later Iron Age iron smelting sites are known on Trevelgue Head, Porth, 10 km west of Little Quoit Farm (Dungworth 2011),

at Killigrew, St Erme, 15 km distant (Cole and Nowakowski, forthcoming) and Threemilestone, Truro, 22 km (Gossip, forthcoming) and these – all presumably working local sources of iron ore – are likely to have had successors in the Roman period which could have offered sources of raw iron.

The primary activity on the Little Quoit Farm site was evidently smithing, as demonstrated by the hearth bottoms, slag and hammerscale recovered. Features [337] and [494] may have been smithing hearths: the base of [337] had been subject to considerable heat and one of the fills included a piece of fired clay which may represent part of a blowing hole or *tuyère*; the large stone found in the upper fill of [337] could have been used as an anvil alongside the hearth. The bowl at the northern end of [494] also showed signs of burning. Pit [496] in hollow [284] and pits [342] and [346] in hollow [282] each had a central stone slab – possibly a stand for an anvil – and fills containing quantities of charcoal and smithing slag. Larger pits [339] and [341] in [282] did not have stone slabs but both had smithing slag and, in the case of [339], a number of broken iron objects. These features all clearly represent specific working locations within hollows which saw significant use for smithing. However, beyond the tentative identification of the two possible smithing hearths and possible locations for smithing anvils it is not possible to determine more closely the functions of particular features in the complex. The absence of evidence for any form of structure or shelter associated with the working areas – features which are expected on metalworking sites (Quinnell 2004, 233; Bayley *et al* 2001, 14) – may be a consequence of demolition prior to abandonment or subsequent clearance of the site, but could also be due to truncation of the upper layers.

The only hint of the products of the Little Quoit Farm enclosure was the group of joiner’s dogs with hammerscale adhering recovered from ditch [320]. Another dog came from the upper fill of hollow [287]. Metal finds from the site also included possible metalworking tools such as punches (nos 8, 11) but otherwise they appear to form a varied assemblage of broken or fragmented items – a latch lifter, an upholstery stud, a drill bit, part of a chain link, a needle, a knife and a billhook – which is likely to represent scrap collected from settlements nearby and intended for re-forging into new objects.

There is some evidence for a planned layout to activity on the site. The five hollows appear to have been arranged in a linear fashion from north to south and heat-related work and associated dumping of waste appears to have been limited to the two larger hollows to the north, [282] and [284]. The three southern hollows, [287], [304] and [353], were smaller and, by contrast with the extensive deposits in [282] and [284], contained only minor traces of metalworking activity.

Abandonment of the Little Quoit Farm enclosure probably occurred around 300 AD or a little later. Pottery including a bowl **P9** dated to the late third or fourth century AD came from the upper fill (293) of pit [292] accompanying a variety of metalworking waste. This feature was sealed by a layer (305) which appears to be contemporary with other contexts representing abandonment layers over the former working areas within the enclosure. Some features on the site appear to have been deliberately put out of use. Hollow [353] was backfilled with a uniform deposit of shilletty clay which also included pottery, perhaps indicating that waste or midden from the site had been used. Midden material has been found in cut features and structures which had gone out of use on Roman-period sites elsewhere in Cornwall, although these deposits were generally considerably more varied and richer (Quinnell 1986, 126). The secondary fill (381) of the large fire-pit [337] in hollow [284] produced charcoal radiocarbon dated to cal 238–380 AD. Above this was an abandonment fill (336) in which was a large boulder, possibly used as an anvil or anvil base, which had presumably been located close to the pit. Linear pit [494], a possible smithing feature, was infilled with at least two episodes of dumping of metalworking waste which also incorporated some pottery, again possibly midden material. The final fill (501) incorporated a number of large stones, conceivably part of a structure which had accompanied or adjoined [494], which may have been pushed into the open upper part of the feature at or after abandonment. Unfortunately it is not possible to determine whether these deposits of stones into [337] and [494] represented part of a formal decommissioning of the site or more prosaically the dumping of stone debris into open pits or ditches to make the space available for agricultural use.

To conclude, the Little Quoit Farm enclosure is clearly different from the rounds occupied as

farm settlements which it otherwise resembles. The evidence which it and the comparable site at Killigrew, St Erme, together present, however, is important in broadening our perceptions of how the countryside of Cornwall was inhabited and exploited in the Roman period, and of the significance which enclosure had within contemporary society. The existence of these apparently specialised industrial enclosures raises further questions about who may have 'owned' or controlled them. Did such sites lie within specific political or economic territories or were these the working places of independent smiths, whose personal prestige and status was expressed through the act of enclosure? Were the smiths full-time specialists or did they combine metalworking with other activities? While the locations of these enclosures can plausibly be related to access to fuel supplies, were they also perhaps determined by other factors such as supplies of raw iron or proximity to wider trade routes? Did their position 'on the edge' reflect the special, semi-magical qualities of the processes carried out, away from the mundane world of settlement and agriculture, or were these simply convenient places to undertake what must have been a dirty, smoky and potentially risky activity? Future identification and investigation of other industrial sites of this period in Cornwall may provide new information which will enable more of these questions to be answered.

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Archive

The finds and paper archive from the archaeological investigations carried out on the South West Water Bear's Down to Ruthvoes pipeline, including the excavations on the Little Quoit Farm enclosure, are to be deposited with the Royal Cornwall Museum, Royal Institution of Cornwall, Truro.

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The archaeological revision of the Isles of Scilly, 1978, by the Ordnance Survey: some recollections

N V QUINNELL

*This memoir was prepared by the late Norman Quinnell after his retirement and completed in November 2004. It has been prepared for publication by his widow, Henrietta Quinnell. An obituary of Norman Quinnell appeared in *Cornish Archaeology*, 47 (2008), and this provides background on the work of the Archaeology Branch of the Ordnance Survey.*

Prior to 1978 the whole of the Isles of Scilly had been published by the Ordnance Survey (OS) at the scale of 1:2500 (25 inches to 1 mile). The initial surveys of the 1880s had last been revised in 1906, apart from a little in 1958. In 1978 the OS decided that even if the main islands were to be revised at 1:2500, only the areas of Hugh Town and Old Town would be so published; everything else would be at 1:10,000 as the largest scale.

The Scillonian project would necessitate a field section of a half dozen surveyors who, with air photo assistance, would update all field boundaries, houses, roads, paths and other features, applying the normal OS descriptions as required. The archaeology would be dealt with by an Archaeology Branch section, although by 1978 there were some within the OS hierarchy who considered archaeology an anachronism and unnecessary expense. The South West section (Quinnell, John Barton and Nick Attrill) would break off from the archaeological survey of Dartmoor (colour plate 3) which had been under way for two months and go to Scilly.

At the end of January I was called in to the OS Regional Office in Bristol. Their sole responsibility to us was to supply stores such as stationery and tapes and to pay our expenses (other than

salaries). For all other control, movements and other decisions about fieldwork, we came under Archaeology Branch at Southampton. Bristol informed me that they had calculated there were less than 50 archaeological sites on Scilly and we could deal with them in less than three weeks. Therefore we would not be included in the office accommodation that would be found for the other field surveyors, who would be on Scilly for about six months. Furthermore expenses would be paid for residing on St Mary's but not on other islands. Their basis for the 50 sites was looking at the old 2½-inch map; there had been no consultation with Archaeology Branch who had done the primary recording and prepared all the material to be sent to us. The estimates were ludicrous and to be allowed only to reside on St Mary's would clearly limit the working day on other islands.

At Archaeology Branch, Southampton, Arthur Clarke was in charge of all the Field Sections of the country. He rightly decided that since the OS would never undertake another survey of Scilly, all our surveys would be based on the obsolescent 1:2500 plans for archive purposes and re-penned at a reduced scale on the 1:10,000 maps supplied to the other surveyors. These were specially prepared air photo transcriptions.

Starting work

On Tuesday 14 February we arrived at Penzance and collected the boxes of maps and records, compiled by the Archaeology Branch Recording section, which awaited us at the Post Office. A scan of this material that evening revealed that nearly 300 sites had been recorded for investigation. We boarded the *Scillonian* on 15 February with our minimal equipment and met the other half-dozen surveyors who had already loaded their office furniture, including tables, chairs and filing cabinets. Their office was to be a disused flat in part of the Secondary School on St Mary's; their residential accommodation had been arranged close to the School. We had found ours in advance, a hotel somewhat inconveniently 1½ miles from Hugh Town, a temporary expedient.

Clearly our stay would be protracted. We would need to be in Hugh Town for boats, and for cheaper accommodation since the OS would only pay hotel rates for a very limited period; thereafter it was a 'lodging allowance'. Our arrival was greeted with a few days of bad weather. It allowed time to plan our own campaign of investigation but highlighted the need of an 'office' of our own to work from, and in, especially during the evenings since normal working hours would not apply.

A meeting with the Island's Executive Officer was surprisingly fruitful. Explaining the position that Archaeology field staff were deemed 'quick

moving' by the OS and not entitled to office accommodation, I pointed out that, unlike the Field Surveyors' flat that was presumably rented by the OS, there would be no payment for any room which might be offered to us, but that anything would be most welcome. We were told to return the following day when something would be arranged. Thus we were given a room in the Secondary School. Normally used for music practice, the room was large with a view over Porth Mellon beach. Initially empty, the school caretaker allowed us to rummage in a basement for disused tables, chairs, and even two desk lamps. So by 20 February we had our 'office' with keys that allowed access out of school hours. I have always been grateful for the understanding and assistance afforded by the authorities.

All OS staff on Scilly had agreed that to return home at weekends was pointless. There was not enough time and the cost would be prohibitive. Generally there would be continuous working for three or four weeks and then 10 or 12 days away, of which two would be travelling days. Nick Attrill (Fig 2) lived near Plymouth, John Barton near Winchester while I was near Highbridge, Somerset. With personal preferences, a system developed whereby absences became staggered so that usually two would be working while one was away.

Within a month we had found long-term bed and breakfast accommodation in different parts of Hugh



Fig 1 Norman Quinnell surveying a ring cairn on Farway Hill, Devon, in 1982. (Photograph: Henrietta Quinnell.)



Fig 2 Nick Attrill, a member of the Ordnance Survey archaeology team on Scilly, photographed in the 1980s. (Photograph courtesy of Henrietta Quinnell.)

Town and had established a routine. We met at the office at 8 am. If working on St Mary's we would collect the day's work and get the bus to the nearest point. If working on the off islands, we would write up notes of the previous day before joining the boat queues at 10.0–10.30 am. We returned to

the office at about 4.30 pm and, apart from a meal break between 6.30 and 7.30 pm, remain there until 9.30 pm, writing reports and penning surveys. The OS had issued a deadline of 31 July when all staff would leave, so, to complete our work, a 12-hour day seemed imperative, though, of course, there was no recompense for the extra hours.

During February and March field work was confined to St Mary's. There was poor weather and cancellations and irregularities to the inter-island boat services would result in time lost. Wet weather afforded the opportunity for further research at the Museum and its library. While the Archaeology Branch had a fine library of national journals and books it did not extend to many localised or rare ones. (It had always been the policy of the South West Section to research in museums and libraries when facilities and time allowed). Books were borrowed from the island library and that of the Museum, while the latter's accessions were also recorded. As a result, more than 100 additional items were noted for investigation, apart from further information on some previously recorded. Perhaps the most rewarding source was Troutbeck's *Survey of the ancient and present state of the Scilly Islands* (1794), with its wealth of detail on Civil War fortifications.

Archaeology Branch numbered sites consecutively within the relevant OS 6-inch (or subsequent 1:10,000) sheet, but a single number could relate to an isolated cairn, for example, or a group of 30. The latter case would necessitate sub-letters to accompany individual grid references. For each site the research at headquarters (or in the field) was written as brief but fairly comprehensive notes on specially designed forms. To these the field investigator added his report and, perhaps, photographs. When a large number of sites had been completed, the forms were returned to Archaeology Branch where the reports were edited and typed onto index cards. Surveys for publication were given a descriptive name and passed to the draftsmen of the map production department. Other large-scale surveys, made for archive purposes, were retained by Archaeology Branch. Some sites would go into the record but not be published, particularly those of destroyed monuments and the findspots of artefacts.

Survey equipment was the normal individual issue of a drawing board on which to tape or pin survey plans, tape measures, an optical square and a camera. Usually one carried a few 1m bamboo

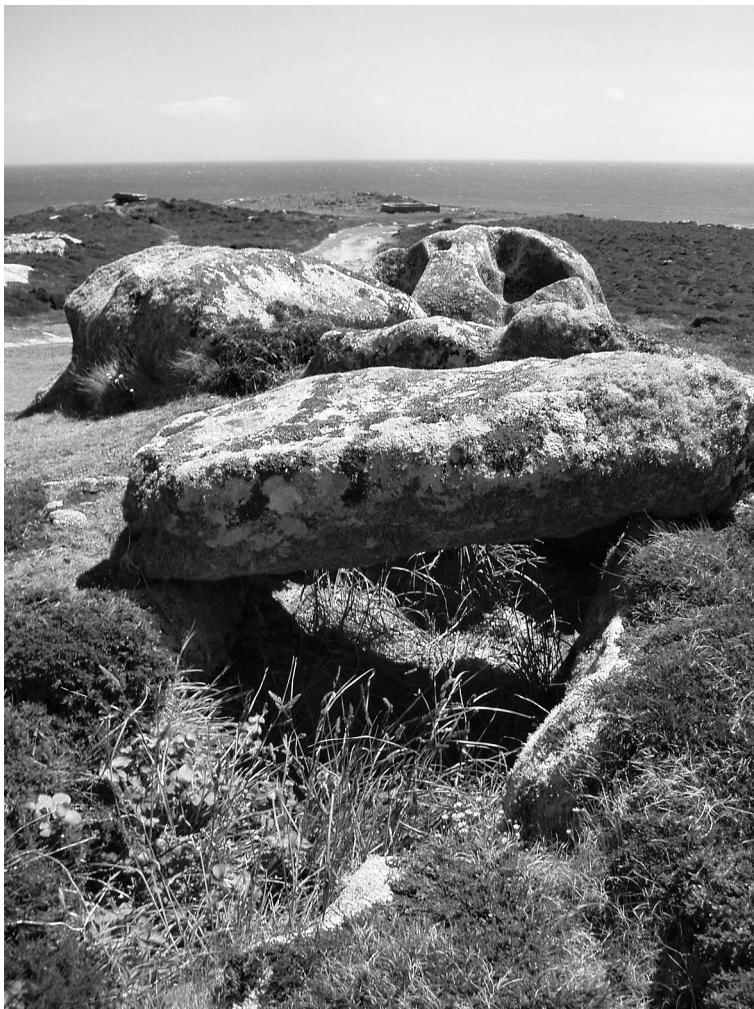


Fig 3 A chambered tomb on Porth Hellick Down, St Mary's. (Photograph: Graeme Kirkham.)

canes to use as markers. For the section as a whole there was one plane table and tripod with non-telescopic legs. This was guaranteed to cause problems when being carried on and off crowded boats and therefore infrequently used. With a haversack containing survey items, a notebook, a file comprising all recorded information and perhaps air photographs, lunch and drink, one was well loaded.

It was evident that the off islands required priority treatment. From the time of landing to that of collection on the last return boat there would only be a maximum of five hours available for field work, and that would usually include an hour of walking. Then there was the matter of bracken which starts early in the year and grows rapidly to

an alarming height, particularly on the uninhabited islands. Most days there were services to Tresco, St Agnes and St Martin's, but Samson, Tean, St Helen's and to some extent Bryher were dependent upon tides and the economics of demand – not enough passengers, no trip. For the lesser islands, Annet, Northwethel and others, we would need to hire a boat ourselves and, since those locations necessitated jumping off the boat, good calm seas were required. Work on St Mary's was relegated to times when boat services were cancelled and when weather was dull and misty; also, as daylight hours lengthened, field work could be extended into the evenings.

Each surveyor was allotted a complete island, if small, or an area of a large one, with perhaps ten

sites to investigate and survey. This could represent a few days work, since a single site number might consist of 20 or more cairns or 500m of fortification. The surveys would be on the relevant 1:2500 plans but, considering the time factors, if he deemed it appropriate for archaeological records, he was free to do additional itemised surveys at a much larger scale; for example, 1:100 or 1:250 (Figs 4, 6, 7, 8, 9). Once the initial area was completed, an adjacent one was taken up. The penning of surveys and the reports were undertaken in the evenings or on wet days. Rarely did two persons work together (with the difficulties of survey), and mostly they were on different islands. Everyone had a log book for the details of each day's work. This would include the island, boat fare, and the number of the site or sites surveyed or the kilometre square in which they fell. The time devoted to evening penning would also be noted, simply for the record as there was no overtime payment.

As i/c section my duties were wider, with responsibility for all administration. A monthly account of section and individual expenses had to be presented to Bristol Regional Office, as had

any request for replacement stores. Completed work was invoiced and despatched to Archaeology Branch, who also required a quarterly statement on progress backed by statistics. One task (termed 'finalling' by the OS) was to visit and check a percentage of the surveys done by my colleagues and read all field reports, to ensure that they were comprehensive and incorporated information towards a two- or three-word 'correct' description, upon which the publication terminology would be based. The above occupied more than half of my time, and the rest was taken up with my share of field work, surveys, reports and penning.

Work progressed smoothly, punctuated by the occasional visit by others who were involved with Scilly. Paul Ashbee had just finished the excavations on Halangy Down (1996); Vivien Russell had almost completed the *Isles of Scilly Survey* (1980), a parochial check-list, while Professor Charles Thomas was active in excavation and research. In May, Cyril Wardale (i/c Field Sections) of Archaeology Branch, spent a week with us to familiarise himself with our problems.

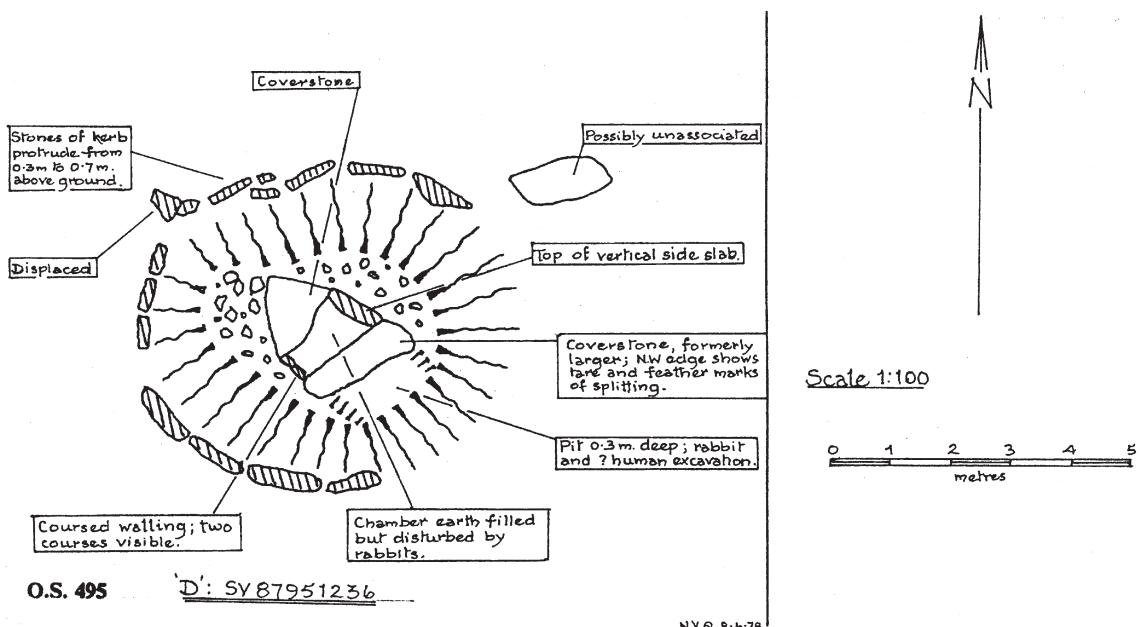


Fig 4 An Ordnance Survey '495' record card with a survey by Norman Quinnell of one of a number of entrance graves and cairns on the eastern slope of South Hill, Samson, surveyed in June 1978. In addition to the detailed survey reproduced here, 'NVQ' added a sketch survey showing a small enclosure or annexe of boulder walling on the north side of the monument (SV 81 SE 21) (PRN 7081.03) (© Crown copyright. Reproduced courtesy of the National Monument Record.)

The difficulty of getting to the small islands was overcome by hiring the Nature Conservancy's small boat and warden. Annet and Rosewear were covered on a calm day and, weeks later, the Eastern Isles of Menawethan, Little Ganilly and Great Ganinick. On successive days in June the skipper of the boat bound for St Martin's was persuaded to divert to Great Ganilly with Nornour, and then Great and Little Arthur; in each case the surveyor jumped onto a suitable shore rock and was collected by the last boat back to St Mary's. Jumping onto the boat, with equipment, was far more stressful than jumping off, in case one fell on the passengers.

Details of islands

Annet and **Rosevear** were visited in April before sea bird nesting was advanced. Rosevear was barely within the OS archaeological remit, being a handful of ruined nineteenth-century structures associated with the construction of the Bishop Rock lighthouse. However it was an opportunity to revise the 1906 surveys and report on the remains. Annet had a few small but significant prehistoric remains that hitherto had been unmapped if not entirely unrecorded (Fig 6). Among the Eastern Isles, Little Ganilly showed nothing of archaeological interest although it is 200m across. The rest had from one to 14 sites, some additional to those previously recorded.

Of the many monuments previously unsurveyed, the most prevalent were prehistoric field systems, sometimes represented by turf-covered banks, at others by lines of stones: 'boulder walls'. Occasionally, as on Great Ganinick, or on Puffin Island, there was simply a short length of one wall. Such features were difficult to detect when under bracken and their survey became a problem in some areas. John Barton dealt with the fields on St Helen's when the bracken was under 1m high, but on Samson Attrill and I had a battle to finish surveying the systems as the bracken rose to shoulder height. On Tresco, St Agnes and Bryher conditions were better, but on St Martin's, which was left rather late in the programme, some areas of field systems were, regrettably, never surveyed. As evidence of inundation, field walls occur below the high water mark on the east side of Samson, of Bryher, and around the southern end of Tresco. Those visible were surveyed at low tide but it was

clear that some would, in time be covered by sand and others exposed, so those published are not necessarily apparent today.

Samson (with **White Island** and **Puffin Island**) Attrill did the surveys on North Hill, and endeavoured to distinguish and describe the numerous cairns on the ridge, but we worked together on South Hill. Here the OS had previously surveyed and published almost all the ruined houses and fields of the seventeenth- to nineteenth-century occupation but not the underlying and intermixed prehistoric houses and fields (Fig 5; colour plate 7). The survey of these was made difficult not just by bracken but by the frighteningly aggressive nature of the black-backed gulls which nest on the southern tip of the island. Everything on Samson was surveyed at 1:2500, and most of the cairns had additional larger scale surveys (Fig 4). I do not recall who visited White Island. Although I believe one can reach it at low water, the tide does not retreat enough to walk without some degree of wading and the reported field walls in the channel were never visible. Walling might now be visible on the island if a visit were made.

Since most prehistoric field boundaries are published as solid lines they cannot be readily distinguished from later walling whenever they occur together, so usually only the later, modern, walls are depicted. Thus on South Hill the prehistoric boundaries are omitted from the published maps.

Bryher was mostly covered by Barton with some work by Quinnell, especially the southern part, including prehistoric settlement, cairns and Civil War earthworks. In the north part of the island, apart from a promontory fort, there was a vast cairnfield with about 150 cairns that had been published on the 1908 25-inch plan. A few, large or with cists, are fairly obvious, but the majority are small and easily overlooked (Fig 7). The OS surveyors of 1906 probably had access to George Bonsor's unpublished work (1899–1901) on the cairns and stone alignments on Scilly, otherwise they would not have bothered to survey them. Certainly there seems to be no other authority to bring them to their attention. It was not until 1974 that Paul Ashbee noted a 'system of linear cairn cemeteries on Shipman Head Down' in *Ancient Scilly* (1974, 297). To make the numbers manageable the area was split into several blocks containing from six to 34 cairns. Some have cists and a few have kerbs but most are slight platforms



Fig 5 Dense vegetation partly conceals the post-medieval settlement and field system on the south-west slope of South Hill, Samson. The underlying prehistoric roundhouse settlement and field system was mapped for the first time by the Ordnance Survey team in 1978. (Photograph: Historic Environment, Cornwall Council, 1987; F14-168.)

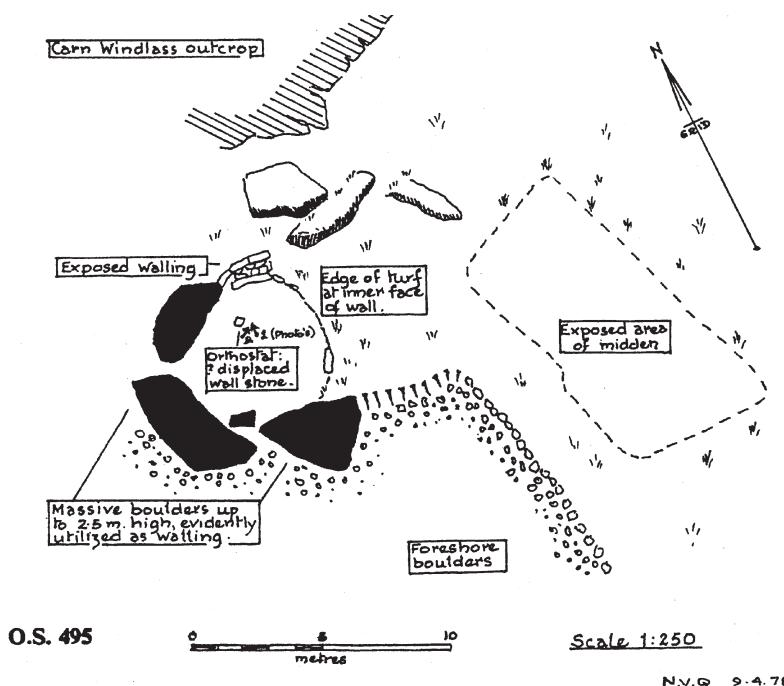


Fig 6 A survey of a roundhouse and adjoining limpet shell midden at Carn Windlass, Annet, dated 9 April 1978. The structure partly utilises massive boulders, probably natural grounders, and elsewhere is defined by a double-faced stone wall up to 1m high (SV 80 NE 39; PRN 7047.02) (© Crown copyright. Reproduced courtesy of the National Monument Record.)

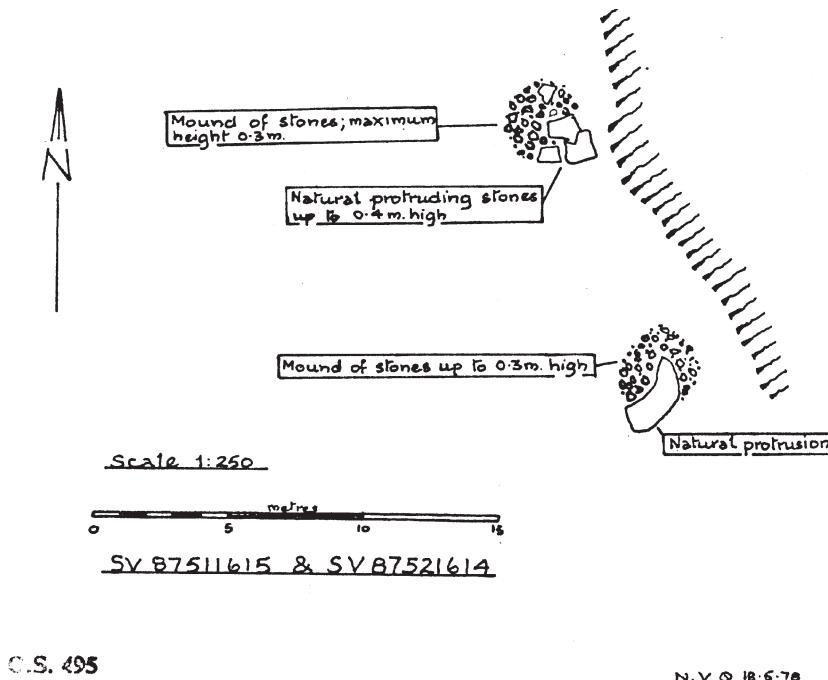


Fig 7 Two small cairns on the exposed granite outcrop on the summit of Badplace Hill, Bryher, recorded by Norman Quinnell (SV 81 NE 30) (PRN 7277) (© Crown copyright. Reproduced courtesy of the National Monument Record.)

or low mounds. Occasionally some are linked by walls of irregularly spaced boulders or small stones, producing the linear system described by Ashbee. A few cairns emulate the 'boulder cairns' on St Agnes, where a natural 'grounder' forms the focus against which a semi-circle of stones or a semi-circular platform has been created.

When the Senior Surveyor, Cyril Wardale, paid a week's visit from Archaeology Branch in May, among sites visited were cairn groups on St Agnes and Bryher. From a degree of scepticism he became convinced enough to write a report on one block (SV81NE1). There are still doubts as to whether some of the small mounds might not be field clearance rather than sepulchral or ritual, or even a combination of both; only excavation could provide some answers. Nevertheless, as it was unlikely that the OS would publish simple clearance cairns, for lack of evidence to the contrary we categorised all cairns as prehistoric and probably associated with burial.

On the north of Bryher the promontory fort had been depicted on the 1908 25-inch map as a wall with slopes to each side but, being uncertain as to what it could be, it was not described or named. Barton revised the feature with an additional representation at 1:500 scale in 1½ hours but for

publication at 1:10,000 it could only be shown as a broad bank. (With walking to the North End and back to the jetty it is unlikely that Barton would have had more than one hour for any other field work that day.)

St Agnes and Gugh Again, largely dealt with by Barton and Quinnell. A variety of sites, from prehistoric houses, fields and occupation debris to a Civil War battery (Fig 8), maze and kelp pits. The latter were perhaps outside the OS remit, being historical rather than archaeological, but we were anxious to widen the range of antiquities beyond the medieval (Fig 11).

Like Bryher, cairns predominated; some were fine chambered tombs but the majority were small, low, occasionally kerbed and often associated with a grounder or field walls. At HQ a Recording Section had split them into workable groups of 10–20 cairns and then correlated the information published over the years by a number of authorities who often had different views and totals, or even grid references, which created duplications. An example is the Kittern Hill, Gugh, linear cemetery (SV80NE3). Sixteen cairns had been published on the 2nd edition OS 1:2500 map in 1908 and a further two in 1963 on the Provisional Edition 6-inch map. Within the OS SV80NE3 grouping

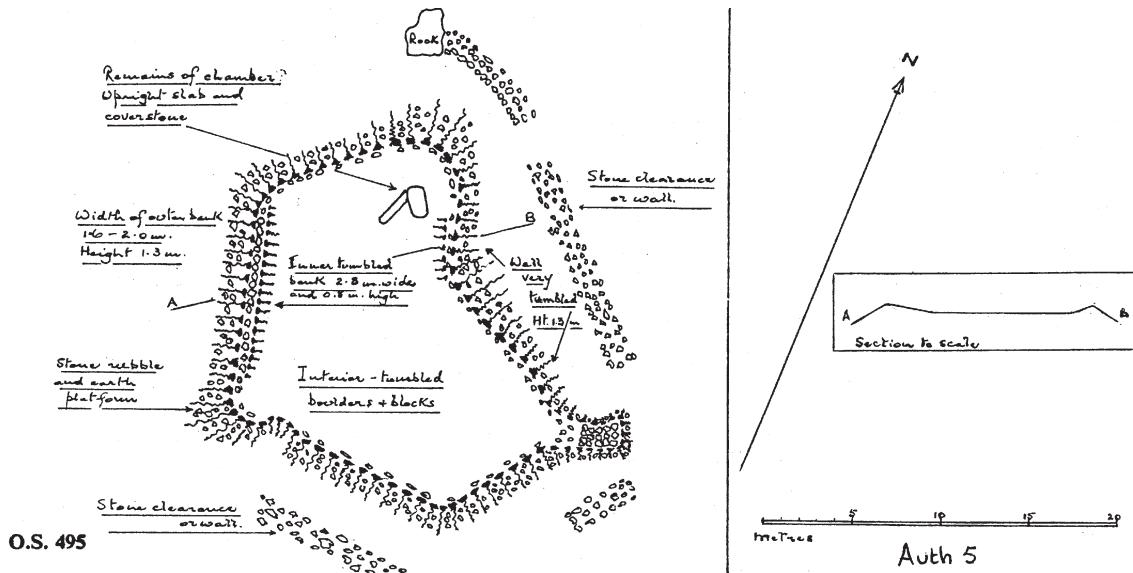


Fig 8 In addition to prehistoric sites, the Ordnance Survey team recorded many later monuments, including this stone and earth Civil War battery on Carn of Works, Gugh. The battery may have incorporated the remains of an entrance grave, the chamber of which was used as a magazine (SV 80 NE 11) (PRN 7058). (© Crown copyright. Reproduced courtesy of the National Monument Record.)

there were five sources of information: Bonsor (Ashbee 1980; Hencken 1933), Hencken (1932, 317–8), Daniel (1950) and Ashbee (1974, 297–8) listed eight cairns, omitting many published on the earlier OS maps but adding two others; Russell (1980) had an extra 11 cairns, including two shown on the 1963 map. There was one OS published cairn not mentioned in the other lists. During field work Barton found one cairn to be a duplicate in recording, and four were reclassified as hut circles; he found three unlisted cairns and the possible site of another, stripped to cover a modern grave. In total he surveyed 17 cairns but even now sorting them out is fraught with some uncertainty.

There may be one site on St Agnes that was not recorded and which we did not see or recognise. Some years later Keith Gardner of Backwell, Bristol, wrote to me saying that he had found, on the extreme south east part of St Agnes, a length of boulder walling that might represent the fortification of an Iron Age cliff castle. I have never been back to see it.

Northwethel The first edition OS 25-inch map of c 1890 showed not only a number of cairns but a sketchy representation of field walls extending

over more than 1 ha ('hedges' had been noted on Northwethel by Borlase in 1756). Though small, the island was visibly bracken infested, so to be sure of completing work in half a day (further boat hire would be excessive) the full section was employed on 10 June. Barton dealt with the cairns and miscellaneous sites while Attrill and Quinnell endeavoured to interpret and survey the field system and possible hut circles in bracken and deep humus. The result was only partially successful since we considered there was probably more we had not found and some we had that might prove irrelevant. Only after a fire would there be reasonable exposure.

St Helen's was mostly the responsibility of Nick Attrill. Not too bad for access: if the tides were right boats took passengers there for a few hours. Apart from revising the published plans of the Pest House and St Helen's church complex, Attrill was able to survey groups of fields, a possible prehistoric hut platform and four cairns. The latter are ring-type cairns and could be described as huts but for their small size and the lack of entrance gaps. St Helen's is another island where bracken obscured any further field walls which, with other monuments, may yet await discovery.

Tean Visited by Quinnell on one day in May and another in June. Chiefly recalled for the fragmentary prehistoric field systems, some submerged at high water, and chambered cairns, one of which was also submerged (colour plate 4). There are a few hut circles and one rectilinear structure showing as a depression in the turf. (This does not appear on any map in my possession and I do not have field reports of sites on Tean.) Remembered because it was unusual, and certainly surveyed. [This may relate to the site investigated by Professor Thomas. *HQ.*]

St Martin's and White Island Investigation carried out by Attrill and Barton. I spent only two days on St Martin's, working on Chapel Down (front cover) and Burnt Hill, and checking a little of my colleagues' work. Being left towards the end of our time on Scilly when the bracken was high, the island may not have had the attention it was due. Certainly some areas of field systems did not get surveyed. (Other than Burnt Hill, of which I have a 25-inch plan, I possess no surveys or field reports for St Martin's and White Island.)

Eastern Isles Investigated by Attrill and Quinnell, the Arthurs (colour plate 6), Great Ganilly and Nornour in mid June, being dropped from the St Martin's boat, though field reports were written almost a month later. The tiny islands of Menawethan, Little Ganilly and Great Ganinick were visited in late July, during the last week on Scilly; a small private boat was hired which lay off each island with the boatman while investigation took place. Waiting for a calm sea had caused delay. On these all that was found was a single cairn and a field wall.

On the larger islands were the usual huts, field systems and numerous cairns. Although it seems to be unmentioned in the final records, I recall finding a saddle quern at the base of the cliff at, probably, Arthur Quay. Left where it was, it may have been given a note under 'miscellaneous information' and not given a site number. To be alone on the Arthurs on a fine June day was a delight only tempered by the problems of surveying from dubious 'fixed' points.

Round Island was incorporated into one of the Tean days. Before the lighthouse was built three cairns had been recorded: there was a faint possibility that some remains survived but nothing was found during the ten minutes spent scouring the small area of the top of the island unencumbered by buildings.

Tresco The island was often served by two boats a day to the southern Crow Point quay or, on occasions of high tides, to New Grimsby. From Crow Point it was a two-mile walk to the northern part of Tresco where the archaeology was densest. Field work was done in March, April and May but the major part in July. It amounted to about 27 days, of which Barton did four, Attrill 11 and Quinnell 12; the latter included some 'finalling' or checking of colleagues' work.

Southern Tresco presented no problems save the tidal ones when dealing with the foreshores of Appletree Bay and Bathinghouse Porth. Here round houses and field walls were visible between high and low water marks and more were surveyed north of Appletree Point (colour plate 5). As elsewhere, scouring and sand drift means that, of those published, more or less may be visible at any given time. I have been told that we missed some walling – it simply wasn't visible at the time and we had not the luxury of being able to re-visit any site. However, there seems to have been an omission at Oliver's Battery since, a year later, an Ancient Monuments Inspector recorded an earlier pentagonal fort visible as sand ramparts below the level of the Battery.

Northwards of Old and New Grimsby from Dial Rocks through Castle Down and Tregarthen Hill there was extensive evidence of prehistoric occupation: settlements with houses and field walls (Fig 9), chambered cairns and cairnfields. The latter were gathered into manageable groups as on Bryher and St Agnes. Many had been depicted on the early 25-inch plans but it was not easy to identify which: some could not be found, others were not on the plan. In one group (SV81NE15), 25 are shown on the 1908 25-inch map. In 1978 seven were not found in their published positions but eight were identified elsewhere, making a total of 26. It is unlikely that there had been any modern interference in the area, so it was either erroneous plotting by the surveyor or later by a draftsman. Even in 1978 there were few points on which to base surveys, and if items appeared to be correctly positioned time was not wasted in proving the cases.

The depiction on the 25-inch map of c 1890 of a field using stone symbols instead of the normal solid lines for boundaries led Barton to the Dial Rocks settlement of round houses, middens and fields. Partly destroyed by modern enclosures, even now it appears to exceed 8 ha in area and,

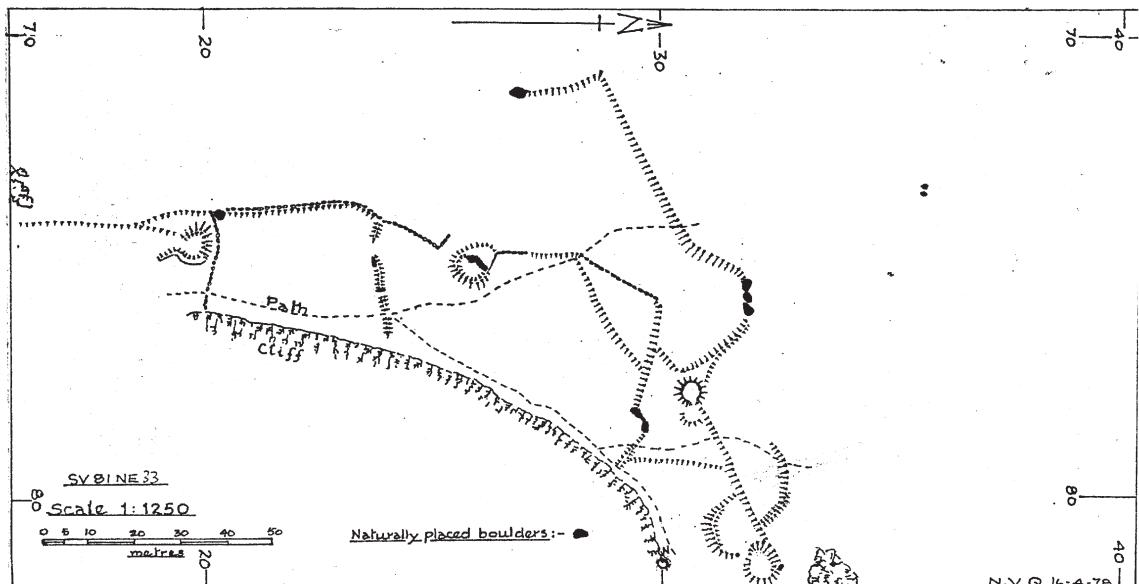


Fig 9 Four houses and a lyncheted field system extending over an area 300m by 50m above Gimble Porth, Tresco, surveyed in April 1978. Vegetation was a major problem on many sites on Scilly during the Ordnance Survey revision and Norman Quinnell described these features in his record of the site as 'encumbered by bracken' (SV 81 NE 33) (PRN 7285) (© Crown copyright. Reproduced courtesy of the National Monument Record.)

as Barton noted, part at least is later than a long linear bank on the west side of Castle Down. Other largely unrecorded settlements were found in the area of Castle Down Brow.

A further two very different items had, surprisingly, not been identified in the past. In 1754 Borlase (1754, 189; pl X) published a description and illustration of a 'stone circle and altar' on Tresco but with no siting information (Fig 10). This was resolved by a quick search of the Borlase manuscripts in the Morrab Library, Penzance, where it was found that his notes gave both direction and distance from King Charles' Castle, as well as a sketch of the monument.

With this information it was soon identified and surveyed though someone in Archaeology Branch subsequently decided it should not be published [on the OS map]; rather annoying since it is an unusual monument (Quinnell 1978a). The second item was the extensive earthen outwork to King Charles' Castle (colour plates 8 and 9), cutting across the whole of the north of the island and probably to be dated to the 1550s (Quinnell 1978b; Bowden and Brodie 2011, fig 11).

St Mary's As mentioned earlier, much of St Mary's was dealt with spasmodically, on days when it was impractical to go to other islands or when the weather was poor. Of about 160 recorded



Fig 10 William Borlase's 'altar stone' on Tresco, published in 1754. It was re-located and surveyed during the Ordnance Survey archaeology revision in 1978 and subsequently published by Norman Quinnell (1978a).



Fig 11 A bowl-shaped kelp pit on Toll's Island, St Mary's, lined with granite slabs. Ordnance Survey 1:25,000 Explorer map for scale. (Photograph: Graeme Kirkham.)

sites, 130 of a wide variety necessitated field work. The others were unresolvable, mostly stray finds of artefacts for which there was no accurate provenance. These were known as 'marginals' since they were noted in a column down the right hand side of the Record Sheet. One major site was the complex of Neolithic, Bronze Age and Roman period settlement excavated at Halangy by Paul Ashbee, with its houses, fields and cairns.

More difficult was the identification of the numerous Civil War earthworks. Troutbeck, in his *Survey* (1794), gives broad descriptions of batteries, redoubts and breastworks, the latter being the most troublesome. Some had evidently been destroyed by coastal erosion, while other intermittent stretches of low cliff-top bank may have had some other purpose and were accepted with a slight degree of doubt. By contrast the multi-period fortifications of the Garrison had been accurately plotted for us at 1:2500 from air photographs: it was simply a matter of compiling an adequate report on their chronology and condition.

St Mary's was interesting in its variety, even if the occasional site was puzzling. An example is Giants' Castle. Apart from a rise in sea level there

must have been a massive amount of cliff erosion since there is but a few square metres of cliff top rock on the seaward side of the ramparts; nothing that is now defensible.

Leaving Scilly

On Monday 31 July 1978 we set about the packing of our OS material and dismantling the contents of the office, returning furniture, desk lamps and other items to the school's basement store. (The other OS surveyors were similarly engaged, though all their furniture, cabinets, lamps and equipment, was OS property and was to be shipped back to the mainland on the *Scillonian* on the following day.) We departed by helicopter on 1 August, all with enough accumulated leave, in lieu of weekend work, to have the rest of the week at home. Thereafter work was resumed on Dartmoor from where we had left it five and a half months ago. There had been no mishaps, such as missing a last boat back to St Mary's. One temporary scare had been in the first month, when one member returned from work well after nightfall, having been marooned on Toll's Island, St Mary's, until the tide receded. The hours, from 8 am to 9 or 10 pm, were

long but the work was thoroughly interesting and people most friendly. I suspect the boatmen were relieved by our departure – no more taking up two seats, one for equipment, and no more pleas for diversions to tiny islands during normal trips.

The Executive's Office helped in various ways, even with photocopying. The Honorary Museum Curator and assistants provided extended access; landladies produced excellent accommodation and accepted our curious working patterns. There were those who assisted when pried with archaeological queries: the late Paul Ashbee, the late Miss Vivien Russell and Professor Charles Thomas, who not only visited but supplied copies of his own research. Finally and not least is the debt owed to the headmaster, staff and caretaker of the School, especially Mrs Mackenzie, who so kindly gave up the practice room of her music class so that it could be our office.

Appendix: some notes concerning the Scillonian surveys

The first OS survey of the Isles of Scilly, with plans at 1:2500 (25 inch: 1 mile) scale, was published in 1889–1890. From these plans the 1:10,560 (6-inch) maps were drawn. Later, from the 6-inch maps, the 2½-inch maps were created. There was a revision of the 25-inch in 1906 and the plans redrawn as the Second Edition, published in 1908, followed by a Second Edition 6-inch. In 1958 there was some minor, partial, revision, published in 1963 as a Provisional Edition 6-inch with a National Grid base. A 2½-inch (1:25,000) map was produced in 1964.

Following the 1978 revision, the 6-inch sheets were in 1980 replaced by the metric 1:10,000 sheets, with some slight changes to the coverage. There are now six sheets instead of the previous eight but this means one sheet may contain elements of several of the previous ones; for example, one has parts of SV80NE, 81SE, 90NW and 91SW. The revised 2½-inch of 1982 was unaffected in this respect, save for a useful inset of Hugh Town at 1:10,000 scale.

Archaeology Branch, disbanded in 1983, adapted the current sheet numbering by cutting and mounting them so that the new Record Sheets conformed to the old numbers. Presumably the system continues with the successors to Archaeology Branch, firstly the Royal Commission

on the Historical Monuments of England (RCHME) and now the National Archaeological Record of English Heritage.

Air photographs and the production of maps and plans

The Admiralty made an air survey of the islands in October 1974 but this was purely for tides and updating charts. The OS made their air photography survey in June 1976 with photographs produced at 1:2500 scale to update all the old County Series 25-inch plans. The OS Photogrammetry Section plotted all the details from these photos, creating a series of updated 25-inch plans, each covering an area of 1 square kilometre. These were issued to the Field Surveyors, who then checked them on the ground, adding and deleting detail as necessary – appearances from the air can be deceptive. Names had to be written on the plans and also a series of codes to denote types of vegetation and other features for use by draftsmen when the completed field work was returned to Southampton. The 1:10,000 plans were treated similarly.

Archaeology Branch surveyors did not have the above documents to work on, only the 1908 25-inch sheets, gridded and cut to 1 square kilometre size. Surveys were done on these and then transferred to the Field Surveyors' 25-inch or 1:10,000 plans as appropriate. We either borrowed them for a short while or went to their office, which had been a flat attached to the school, very close to us.

Summary of archaeological sites

Using the Record Sheets, the number of archaeological sites surveyed and reported upon, and the 'marginals' for which no precise siting was possible, are listed overleaf. As always, a 'site' may have one or numerous components.

Field reports

Although subject to editing at Archaeology Branch they maintain a fairly standard format. Occasionally, under one site number there may be numerous similar components – for example, cairns – and, instead of each being given a specific measurement, there can simply be a 'from...to....' denoting smallest and largest. This was sometimes required by Archaeology Branch, to shorten the

| Sheet number | Area | Sites | Marginals |
|--------------------|--|------------|-----------|
| SV 80 NW | Rosevear | 2 | — |
| SV 80 NE | Annet, St Agnes, Gugh | 55 | 8 |
| SV 81 NE | North Bryher, North Tresco, Northwethel, St Helen's (part) | 67 | 7 |
| SV 81 SE & part SW | South Bryher, South Tresco, Samson | 72 | 11 |
| SV 90 NW | South end of St Mary's | 8 | — |
| SV 91 NW | St Martin's, Tean, St Helen's (part), Round Island | 91 | 17 |
| SV 91 SW | St Mary's, Eastern Isles | 172 | 34 |
| SV 91 SE & NE | Menawethan | 1 | — |
| Totals | | 468 | 77 |

report and cut the cost levied by the OS upon the Branch for the use of the typing pool.

The end product, the Record Card (also called a '495' because of its OS form number) would go into the archaeology index, with a copy being sent to the relevant county Sites and Monuments Register (Figs 4, 6, 7, 8, 9). Additional cards in the Archaeology Branch might include site photographs and large-scale plans produced during field work. If applicable a 10,000 sheet would have an un-numbered 'Miscellaneous' card on which brief details of items of some interest but not within the archaeological brief would be recorded.

Publications and omissions

It took two years from the completion of field work to publication of the 1:10,000 maps and about four years until the 2½-inch Leisure Map appeared.

Archaeology Branch had small sections responsible for the processing of returned field work; this included decisions on what should be published at different scales and the descriptive names. Material was then forwarded to the OS Department of Map Production and the draftsmen for whom archaeology was a minor part of their task. There seems to have been no system of proof reading by Archaeology Branch before printing started. Generally the popular 2½-inch Leisure Map (the last produced) is a direct reduction of the 1:10,000 survey except for lettering which has to be larger and is therefore more restricted in application. Even so, some items may be obscured or omitted on a 1:10,000 sheet.

Examples occur (on SV81NE) on North Tresco. The name 'Castle Down Brow' has necessitated the omission of three hut circles. Another, and part of an adjacent field system, had to give place to the descriptions 'Settlement & Field System' and 'Battery (remains of)'. Again on North Tresco there is a line of pits noted as 'Old Tin Workings'. These

were surveyed on the 1908 25-inch and retained in 1978. The pits are not shown on the 1963 6-inch or the 1980 1:10,000 although the description remains. For lack of room nothing has been shown on any 2½-inch. Occasionally an erroneous symbol has been used. Just north of Higher Town, St Agnes, the hut circle of 'Hut Circle & Field System' is shown with a cairn symbol; a similar item occurs on Samson and a thorough perusal would probably produce others.

On a Record Card there is a heading box in which the descriptive name is given when publication is required; for example, 'Battery'. A cross ('X') in the box means not to be published. For good reasons it was decided that kelp pits were of historical, if not of archaeological, interest. On Bryher and St Mary's they are named 'Old Kelp Pit' in ordinary type face, yet two on Gugh are completely ignored, evidence of inconsistency.

The most serious errors, because they are obvious on the ground, are the omissions by OS draftsmen, and consequently from the published maps, of surveyed cairns in the large cairn groups. A group of up to four cairns is shown correctly but above that number only about half are portrayed; it is not a matter of restricted space since they are mostly in areas unencumbered by other detail.

On Shipman Head, Bryher, 113 cairns were surveyed but only 46 published. On north Tresco 63 were surveyed and 34 published. Together, on Tresco, Bryher and St Agnes, of 254 cairns surveyed on the field maps, only 132 were transferred to the publication maps. This of course makes a complete nonsense on the ground; not only can you rarely establish a specific cairn on the map, one cannot use them to find one's position on the ground. That Archaeology Branch authorised the publication of them all is clear by reference to the box on the Record Cards. Since there is unlikely to be another revision for a century, these gross errors remain for posterity. (On personal copies of

the 1:10,000 sheets missing cairns have been put on as red dots, but not every group or item has been checked throughout Scilly.)

All information recorded on the Record Sheets was transferred to the 1:10,000 scale when published and thereafter kept updated as far as possible. At Archaeology Branch the old 6-inch Field Sheets and Record Sheets were most probably destroyed. (With the advent of 'digitisation' OS maps of 1:10,000 or larger are probably more simplified, and the former Archaeology Branch Record Cards at the National Archaeological Record have, I believe, been slimmed in content when computerised, though the originals are archived). All updated material retained by the author was transferred at the end of 2004 to the Museum on the Isles of Scilly and contains material not otherwise available: this includes a listing of all cairns not published on the 1:10,000 maps.

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Discoveries along the Treyarnon South West Water pipeline

ANDY M JONES and SEAN TAYLOR

with contributions from DANA CHALLINOR, ANNA LAWSON-JONES and HENRIETTA QUINNELL

Archaeological recording was undertaken along a new South West sewage transfer pipeline between Treyarnon Bay and Trehemborne, St Merryn. During the fieldwork a number of archaeological features were uncovered, including two Beaker pits and ditches of probable prehistoric date.

During the summer of 2007 the Projects team of the Historic Environment Service (HES), Cornwall County Council, was commissioned by South West Water to undertake a programme of archaeological recording along the 1.9 km route of the Treyarnon pipeline in St Merryn. The pipeline ran from close to the coast (SW 86024 74025) to Trehemborne (SW 87267 73324) (Fig 1). Recording along the pipeline identified a number of archaeological features, including two enclosures of possible prehistoric date, pits associated with Beaker pottery and remains of medieval ridge and furrow. This short report focuses on these significant discoveries. The full results of the project have been set out in an archive report (Taylor 2007).

Results

Treyarnon Beaker pits (SW 86516 73931)

A field at Treyarnon (Fig 1), close to the northern extent of the pipeline, contained two small pits or postholes. The pits, [124] and [126], were small, shallow, sub-circular features. Pit [124] was 0.48m in diameter and 0.15m deep with steep sides and a flat base. Pit [126] (Fig 2) was located 1.5m to the north of pit [124] and measured 0.4m by 0.3m and 0.16m deep. The upper fills of both, (125)

and (127), were dark with frequent charcoal and a variety of prehistoric artefacts. Lithics recovered included three flint scrapers, a flint flake and a struck flint pebble, as well as a single pebble of water-worn vein quartz, probably from a beach. From the larger pit [124] 11 sherds of Beaker pottery were recovered, three of which conjoined. Charcoal recovered from the pits was notable due to the presence of yew (*Taxus baccata*) (Challinor, below). Radiocarbon determinations of 3810 ± 30 BP, 2350–2130 cal BC (SUERC-19975) (at 93.9 per cent) and 3795 ± 30 BP, 2340–2130 cal BC (SUERC-19976) (95 per cent) on charcoal from the pits were remarkably consistent and gave a date within the Early Bronze Age.

Shallow, circular pits represent a relatively common context for Beaker pottery in Cornwall, with comparable sites known at Killigrew, Nancemere, Bosmaugan and Scarcewater (Jones and Quinnell 2006; Jones and Taylor 2010). Broadly similar radiocarbon determinations have recently been obtained from pits at Scarcewater and Nancemere (Jones and Taylor 2010; Jones and Quinnell 2006). The identification of yew charcoal in both pits is unusual in a domestic context as the wood was not a popular fuel source (Challinor, below). Yew is, however, strongly linked in early medieval northern European mythology with the gods, and it has been suggested that this association

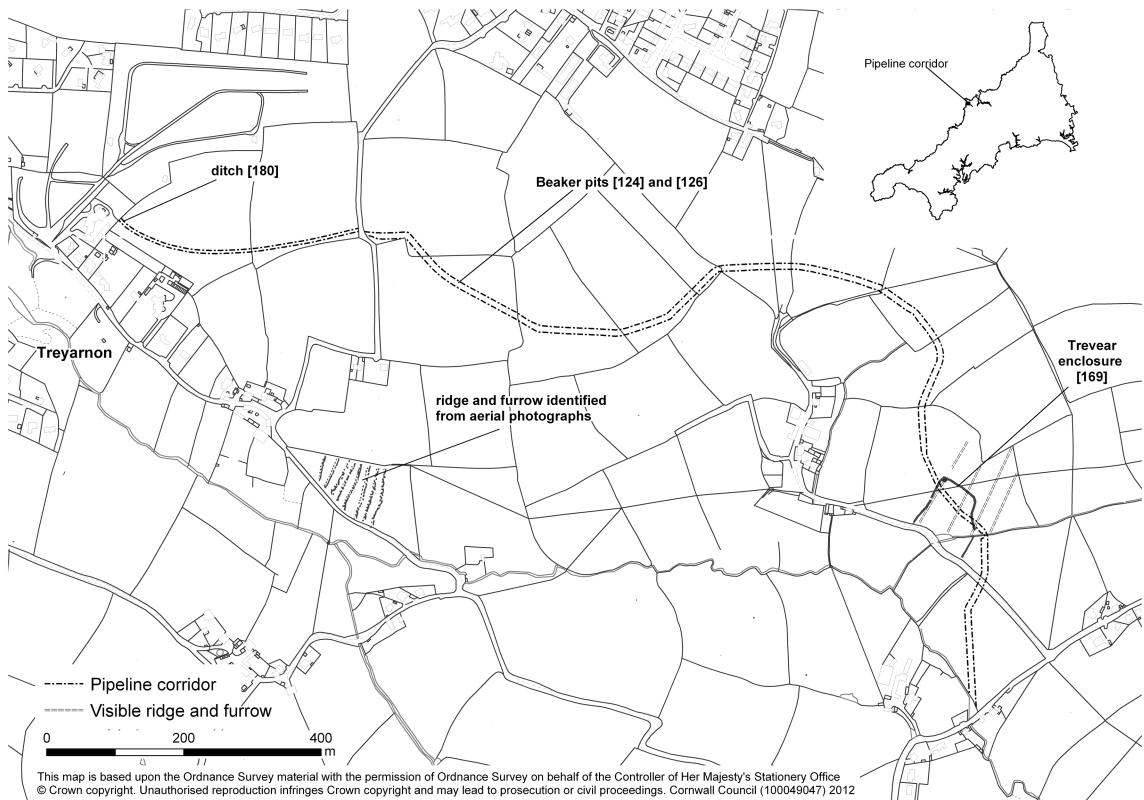


Fig 1 Location map

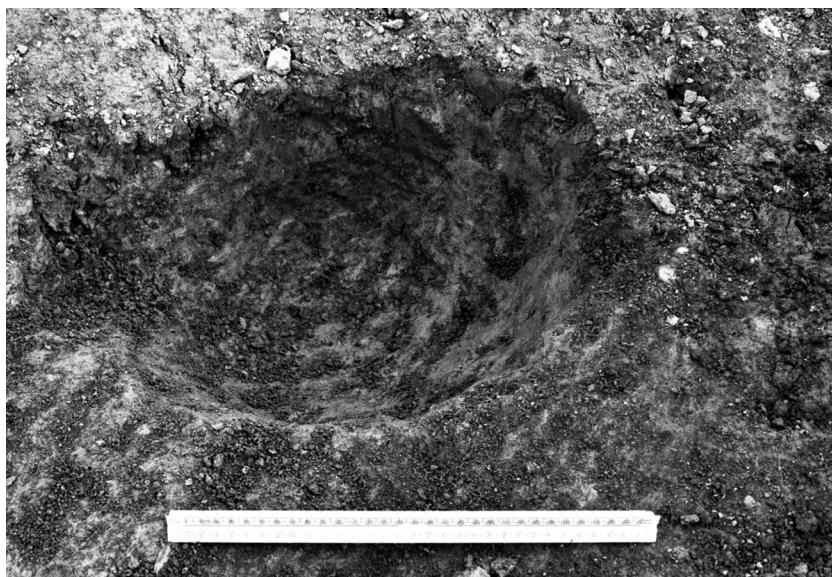


Fig 2 Pit [126], facing north; 30cm scale

may have extended into prehistory through the use of yew as a material for anthropogenic figurines (Coles 1998 164, 168).

The association of quartz pebbles is also of interest as they are a recurring feature within Neolithic and Early Bronze Age pits and at Cornish ceremonial monuments (Jones and Reed 2006; Miles 1975). Their inclusion, together with the unusual yew charcoal, might suggest a degree of deliberation in the material that was selected, or perhaps that the remains of ritualized activities using these materials were gathered together and tidied into the pit.

Ditch [180] (SW 86027 74021)

Close to the western boundary of the field at the western end of the pipeline, adjacent to Treyarnon, a large ditch [180] was uncovered. The ditch was 2m wide and 0.65m deep with steep sides and a flattish base (Fig 3). It followed a north-south alignment, paralleling the prevailing field pattern, thought to be of medieval origin. The ditch contained four fills, (181), (182), (183), and (184), and showed signs of being re-cut after fill (184) had been deposited. Fill (184) fill contained a piece of waste flint. One of the upper fills, (182), contained a large number of water-worn pebbles as well as several stones identified as tools (Thorpe in Taylor 2007) and two flints (Lawson-Jones, below). Unfortunately, no charcoal was available from short-lived species (Challinor, below), which meant that the feature could not be radiocarbon dated.

Although the ditch shared an alignment with the extant field system, the artefactual assemblage and the size of the ditch all suggest that it was a prehistoric feature, perhaps forming part of a large enclosure extending towards the shoreline to the west. However, further investigation is needed to confirm this.

Trevar enclosure (SW 872 736)

A large sub-rectangular crop-mark feature at Trevar enclosing an area of 0.6 ha was identified from aerial photographs by the National Mapping Programme close to the eastern end of the pipeline (Figs 1 and 4). Three sides were defined by crop-mark ditches, but the fourth, south-western, side had presumably been removed by the road to Trevar Farm, which is likely to be of medieval origin.

The enclosure is unusual in that it was low-lying and had a stream running though its south-eastern corner. Given the unusual setting, and its form and size, it was thought likely that it would prove to be of prehistoric date. The earliest feature found within this field was ditch [169], a V-shaped linear feature that crossed the trench north east – south west. The ditch, 1.6m wide and 0.8m deep, held six fills, (170), (171), (172), (173), (174), and (175) (Fig 5). One of these, (171), contained material tentatively identified as prehistoric pottery or burnt clay. Another, (173), contained a broken quartzite pebble that may have been utilised. The ditch lay at the top of a break of slope in the middle of the field and seems likely to be part of the crop-mark enclosure.

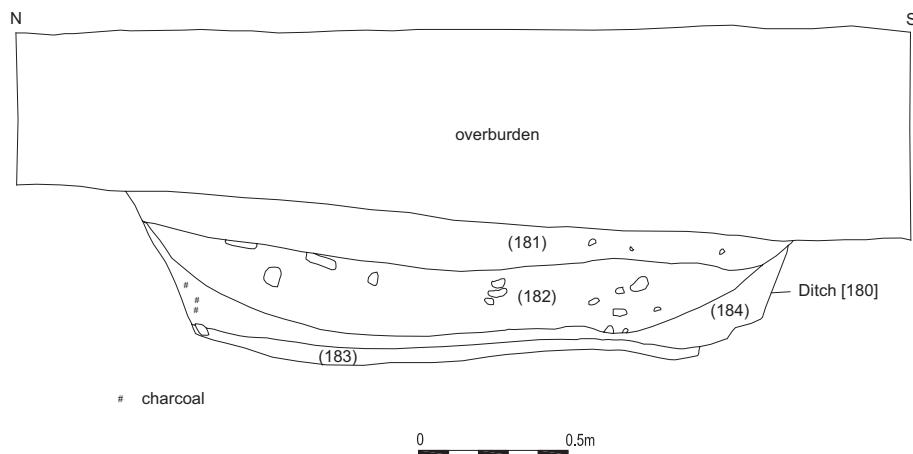


Fig 3 West-facing section through ditch [180]

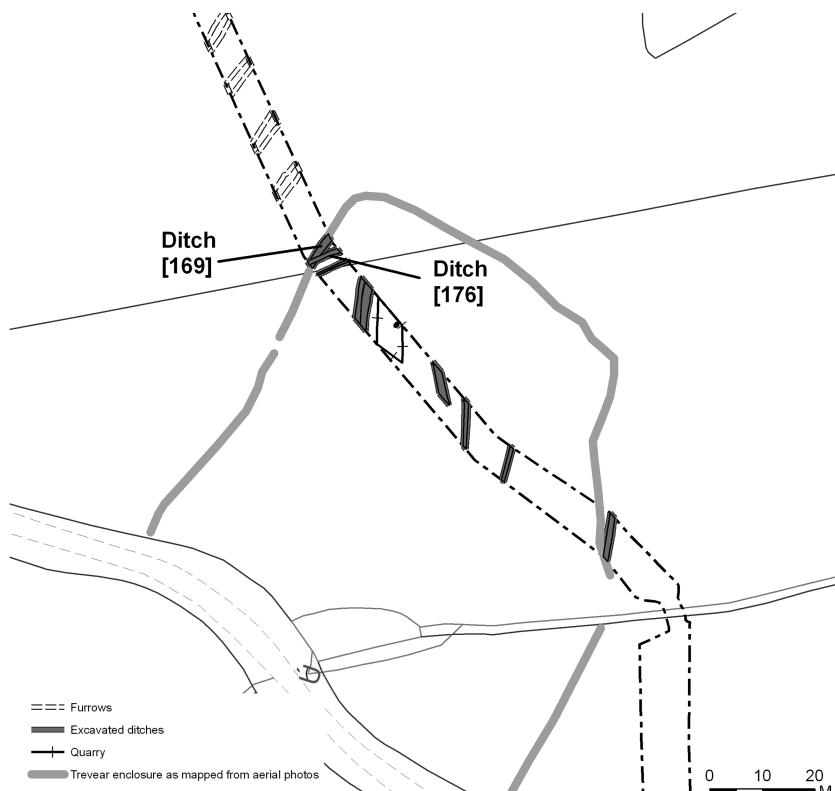


Fig 4 Enclosure and other features at Trevar

The enclosure was cut by ditch [176], which ran east-north-east – west-south-west. This was much shallower and more irregular than ditch [169]. Parallel to this feature, 2m to the south, was another shallow gully, [141], associated with posthole

[144]. Given their proximity and shared alignment these two linear features are likely to be related to one another, but no stratigraphic relationship could be established and no artefacts were recovered from them. A number of shallow linear features ran

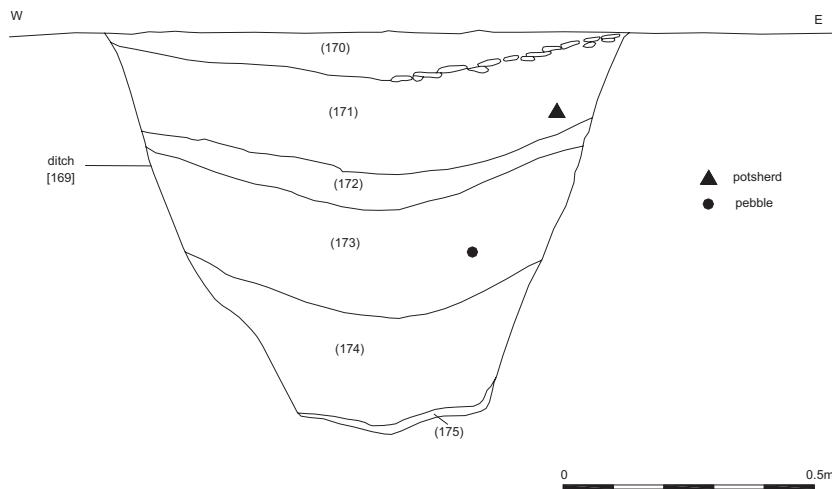


Fig 5 South-facing section through ditch [169]

across the centre of the site but these are likely to be of medieval or later date (Taylor 2007).

The eastern side of the enclosure shown in air photographs was covered by a layer of colluvium, the top of which coincided with the maximum depth of machining. It is possible, indeed likely, that this layer masked features pre-dating its deposition, in particular the eastern side of the enclosure.

There was no suitable short-lived species charcoal available for radiocarbon dating from any of the features in this area (Challinor, below).

The date and function of the enclosure was not resolved by the project. However, the absence of diagnostic artefacts from either the enclosure ditch or the interior; especially those of the Romano-British period, which tend to be comparatively common, may indicate a prehistoric date. Furthermore, the low-lying situation suggests that the function of the enclosure was not primarily a defensive one. The setting is comparable to later Neolithic enclosures found in the Kennet Valley in Wiltshire and the Walton Basin in the Welsh Borders (Whittle 1997, 54–86; Gibson 1999, chapter 1). However, in these examples, the enclosure circuits were more curvilinear and comprised of postholes, rather than as at Treyarnon, a continuous ditch. On balance, although the evidence from the Trevear enclosure was limited, we would suggest that the site is probably of later prehistoric date

Ridge and furrow (SW 872 736)

Of additional archaeological interest within the same field as the enclosure was the survival of medieval ridge and furrow, visible in low light across much of the field. On level ground at the top of the slope to the north west of ditch [169] were four wide shallow, linear cuts, [150], [152], [154], and [156], all between 1.2m and 2.1m wide, 0.1m to 0.15m deep, and spaced between 7m and 9m apart (Fig 4). This is comparable with the 6.5m to 8m intervals between furrows excavated at Harlyn Bay (Exeter Archaeology 1997).

Finds from the fills of these features were restricted to flint and stone artefacts of prehistoric date (Thorpe in Taylor 2007; and Lawson-Jones, below). However, these artefacts are residual since the furrows are part of a medieval 'ridge and furrow' cultivation regime. This conclusion is supported by the survival of these features as earthworks in the lower part of the field, following the same alignment as the excavated furrows (north east to

south west). Similar features have been identified by the National Mapping Programme from aerial photographs in a field 850m to the west (Fig 1).

Charcoal

Dana Challinor

Five samples were submitted for charcoal analysis from pits, ditches, and a posthole. They were initially assessed by scanning at low magnification to determine the potential of the material. Two samples were subsequently analysed with the aim of providing a species list and examining the selection of wood for fuel.

The charcoal was fractured and sorted into groups based on the anatomical features observed in transverse section at X10 to X45 magnification. Representative fragments from each group were then selected for further examination using a Meiji incident-light microscope at up to X400 magnification. Identifications were made with reference to Schweingruber (1990), Hather (2000) and modern reference material. Classification and nomenclature follow Stace (1997).

Results

Three contexts, (161), (174) and (184), produced flots with many roots and small or comminuted charcoal fragments. Single fragments of *Quercus* sp. (oak) and *Prunus* sp. (cherry type) were noted in context (184). Contexts (125) and (127) produced more abundant charcoal with a range of taxa, which were divided and analysed in full. The results are presented in Table 1.

The assemblages from pits [124] and [126] were similar: the same species were present in both although the quantities of each taxon varied. There was a fair amount of small diameter roundwood fragments, although these were not complete enough to age and no significant growth ring patterns were noted. The charcoal was generally very friable and infused with sediment. The following taxa were positively identified: *Taxus baccata* (yew), *Quercus* sp. (oak), *Alnus/Corylus* (alder/hazel), *Prunus spinosa* (blackthorn), *Maloideae* (hawthorn group), *Ilex aquifolium* (holly). The alder/hazel could not be distinguished as the condition of the charcoal obscured the perforation plates. It is quite likely that the *Prunus* sp. fragments were those of *P. spinosa*,

Table 1 Results of the charcoal analysis from pits [124] and [126].
r= roundwood.

| Feature | | [124] | [126] |
|---------------------------|-----------------------------------|-------|-------|
| Context | | (125) | (127) |
| % flot identified | | 25 | 50 |
| <i>Taxus baccata</i> L. | yew | 38r | 1 |
| <i>Quercus</i> sp. | oak | 5 | 6 |
| <i>Alnus/Corylus</i> | alder/hazel | 6 | 1 |
| <i>Prunus spinosa</i> L. | blackthorn | 16r | 17r |
| <i>Prunus</i> sp. | cherry type | 2r | 3r |
| Maloideae | hawthorn, apple, pear, service | 21r | 43r |
| <i>Ilex aquifolium</i> L. | holly | 1 | 10r |
| Indeterminate | | 12 | 9 |
| Total | | 101 | 90 |

whose presence was confirmed on the basis of ray width, but the diagnostic characteristics were not conclusive.

Discussion

Pit [124] produced a quantity of Beaker pottery. Although no pottery was recovered from [126], its proximity to [124] and the similarities in charcoal assemblages suggest that it was contemporary. There is a strong suggestion of hedgerow-type components in the charcoal, with taxa such as hawthorn group (*Maloideae*) and blackthorn (*Prunus spinosa*). Holly grows as a woodland tree, but is also common in hedgerows. Notably, there is little oak. The quantity of yew (*Taxus baccata*) in pit [124] is quite unusual. Yew will itself grow in most conditions but since it provides dense cover it would not be found in direct association with light-demanding species such as blackthorn. Moreover, given the toxicity of yew to animals, it is unlikely to have been tolerated in hedgerows maintained for grazing animals.

Yew has reasonable burning properties, although it can be explosive if not well seasoned (Gale and Cutler 2000). It is found in archaeological charcoal assemblages of Late Neolithic – Early Bronze Age date in other regions (for examples in Somerset see Smith 2002), but it tends to be in low quantities, suggesting that it was not favoured as a fuel-wood. Possible explanations for the quantity of yew recovered from pit [124] at Treyarnon range from accidental to ritual. The purpose of the fire from which the fuel remains derive may have been significant and/or there may have been mixing of several burning events. With the exception of the

yew wood, the taxa recovered are consistent with domestic-type fires in this period.

Given the comparative scarcity of Beaker sites in north Cornwall, the charcoal from Treyarnon represents an important, albeit small, record. There was insufficient evidence to infer woodland management, nor for the oak-hazel woodland which dominated Cornwall throughout the Neolithic period (Wilkinson and Straker 2008). The charcoal from other Late Neolithic – Early Bronze Age sites in the region indicates that oak-hazel woodland was most commonly utilised for fuel-wood, with hedgerow and heathland areas also being exploited (Cartwright 1988; Gale 2006; Challinor, forthcoming). In conclusion, the charcoal from Treyarnon indicates the use of hedgerow-type species for fuel wood; gathering practices that are consistent with a reasonably cleared landscape in the immediate vicinity.

Beaker pottery

Henrietta Quinnell, with petrography by Roger Taylor

Description

All the sherds came from fill (125) of pit [124]. Eleven sherds weighing 18g came from three different vessels on petrological grounds but all of gabbroic clay mixed with local material.

P1 (Fig 6) Seven sherds weighing 14g from the rim and zone immediately below. The fabric contains moderate coarse inclusions. Sherds are moderately abraded and have suffered some recent damage, suggesting that more of the vessel might have been present. The rim appears to top a straight-walled vessel, the rim itself varying from a slightly rounded top to a degree of expansion. Overall the vessel is irregular and poorly made. It is generally oxidised 5YR 5/4 reddish brown, with irregular patches of reduction on the exterior and in the core 5YR 4/1 dark gray. Decoration immediately below the rim is a simple herringbone impressed with a three-toothed stamp. Below this is a narrow, slightly thickened, plain band with indications of finger tip/nail decoration in a horizontal band.

P2 (Not illus) Three sherds, weighing 3g, moderately abraded. 5YR 4/2 dark reddish gray.

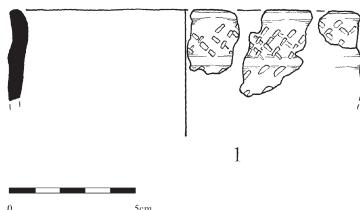


Fig 6 Beaker pottery from pit [124]. Scale: 1:3. (Drawing: Carl Thorpe.)

Small rim similar to that of **P1** and body sherd with cord impressions 8mm apart.

P3 (Not illus) Sherd weighing 1g, colour as **P1**. Two lines of comb-stamped decoration 7mm apart.

Petrology

P1 *Rock fragments* – slate, soft silvery grey, micaceous, tabular cleaved and sub-rounded fragments, 0.5–5mm; sandstone sparse, fine-grained and micaceous fragments, 1.5–5mm. *Quartz* – translucent colourless angular to sub-angular, 0.1–1mm; rare rounded grains 0.3mm. *Amphibole* – sparse medium grey cleaved elongated grains, 0.2–1.1mm. *Feldspar* – sparse of soft off-white sub-angular grains, 0.3–0.5mm. *Mica* – muscovite as a scatter of cleavage flakes up to 0.25mm. *Magnetite* – sparse black, glossy, angular, magnetic grains, 0.5mm. *Limonite* – soft black to dark brown rounded grains, 0.1–1.5mm. *Matrix* – finely micaceous and silty. *Comment*. A gabbroic admixture fabric with a subordinate gabbroic content.

P2 *Quartz* – angular translucent to white grains 0.1–1 mm. *Rock fragments* – micaceous slate, a scatter of silvery brown oblate fragments, 0.2–3 mm. *Feldspar* – sparse altered off-white angular fragments, 0.8–2 mm. *Amphibole* – sparse greyish fibrous grains, 1.5 and 2mm. *Mica* – muscovite cleavage flakes, and rare biotite 0.8mm. *Magnetite* – black glossy magnetic grains, 0.1–0.5mm. *Comment*. A gabbroic admixture fabric with subordinate gabbroic content.

P3 *Quartz* – sparse transparent to translucent grains 0.1–0.3mm. *Magnetite* – black, glossy, sub-angular, magnetic, two grains, 0.5mm. *Rock fragment* – micaceous slate, silvery buff tabular fragment, 1mm. *Comment* The sherd is too small to provide a more detailed assessment but it contains components pointing to a gabbroic admixture fabric resembling that of **P1**.

Clay fragment: soft pinkish-buff clay, possibly slightly burnt, 11 mm long. *Quartz* as sparse angular to sub-angular grains, 0.1–0.3mm. *Rock fragments* – rare tabular slate or siltstone, 0.8mm. The mineralogy does not particularly link this clay to the fabric of the pottery.

General comment. A group of sherd from more than one vessel but all with a similar admixture fabric in which the gabbro component is rather less than the clay component derived from the weathering of local rocks. The gabbro addition appears to have a low feldspar content and the overall content is generally quite low.

Comment

The Treyarnon Beaker sherd have no precise parallels in Cornwall. They belong in the general style of ‘domestic Beakers’, usually found as fragments (cf Gibson 1982). Fingernail decoration has been noted on a vessel from the barrow at Carvinack (Dudley 1964, fig 5) and on sherd from a pit at Scarcewater (Jones and Taylor 2010) but neither in conjunction with comb-stamped decoration. However, a mixture of fingernail and comb impression has been noted on the sherd from a barrow at Farway in East Devon (Jones and Quinnell 2008) as well as sherd from a pit at Little Dartmouth in South Devon (Quinnell 2009). Other Beaker sherd from St Merryn parish, from a probable midden at Harlyn Bay (Jones and Quinnell 2006, table 8), are of uncertain character.

The recent recognition of widespread deposits of Beaker sherd in contexts other than barrows in Cornwall (Jones and Quinnell 2006) has demonstrated how much variation there is in decorative styles. The radiocarbon determinations, centring on c 2200 cal BC (68 per cent) are broadly comparable to those from the pits at Scarcewater and Nancemere referred to above: the date from the former is 3784 ± 33 BP, 2290–2190 BC (45.2 per cent) (Wk-21846) and from the latter 3698 ± 34 BP, 2140–2030 cal BC (68 per cent) (Wk-21358).

The most interesting feature about the Treyarnon Beaker sherd is the use of mixed gabbroic and local clays in their manufacture. This implies that gabbroic clay, here a minority component, was transported to the area and mixed with local clay before potting. This transport and mixing of gabbroic clays with local material has been previously identified in the Beaker sherd from

Nancemere, Truro (Jones and Quinnell 2006) and has also been found in prehistoric material ranging in date from Grooved Ware at Tremough (Quinnell 2007) to Middle Iron Age pottery at Scarcewater (Jones and Taylor 2010). Dr Roger Taylor considers it likely that re-examination of sherds from other Beaker sites, as well those of other dates, would establish the practice of transport of gabbroic clay as extremely widespread.

Flint

Anna Lawson-Jones

A small collection of 16 worked flints was found along the pipeline (Fig 7). Where discernible, all are made of pebble flint, probably of local beach origin. There is nothing to suggest that the remaining non-corticated pieces are not from the same source. Ten of the flints were found in

stratified contexts, six were unstratified. The field with the Beaker pits produced eight flints, several of which are diagnostic of a Late Neolithic to Early Bronze Age date; four of these were found in association with Beaker pottery.

Discussion

The assemblage, although meagre given the length of the pipeline, typifies the range of prehistoric flintwork found in Cornish fields. The collection spans over a thousand years, with nothing diagnostically earlier than the Middle Neolithic (*c* 3400–3000 cal BC). The flint-work is not marked by post-depositional wear and tear, suggesting that the majority has seen little disturbance. This will in part be a reflection of the stratified contexts from which most of the material was excavated. Although some of the pieces may have been originally included within fills as residual finds, for example the fields with, ditch [180], and

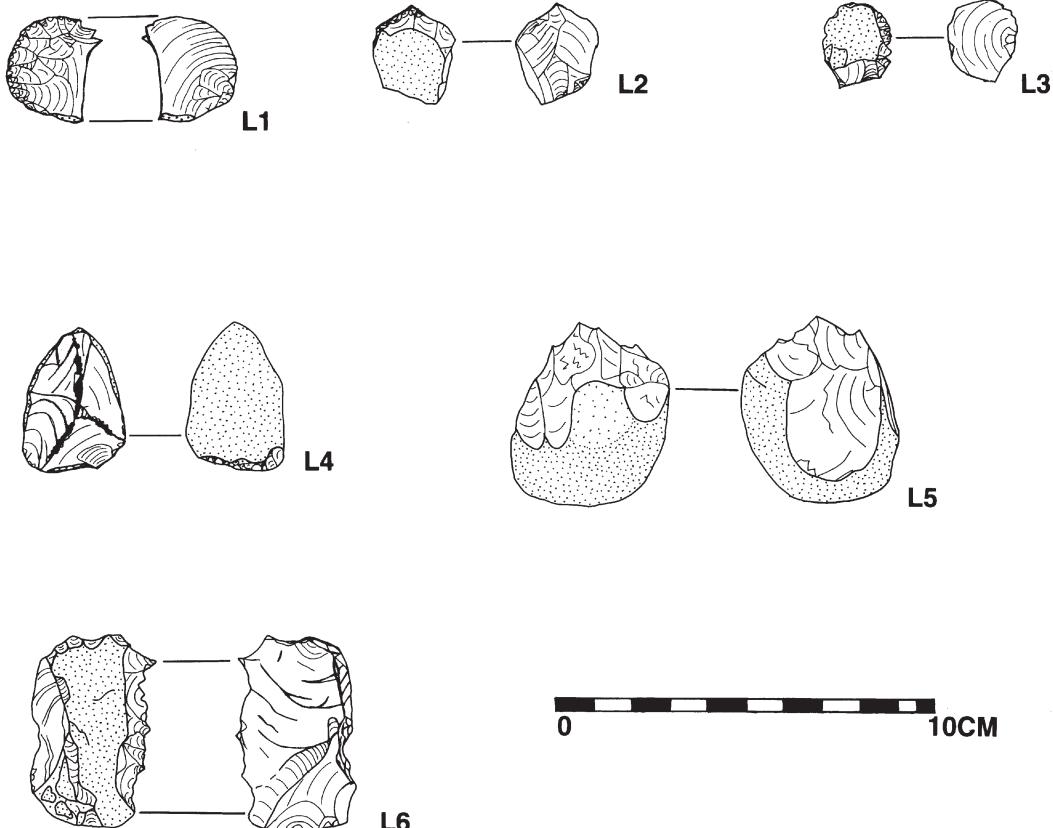


Fig 7 Flints (L1-6). Scale 1:2. (Drawings: Anna Lawson-Jones.)

furrows [152] (**L5**) and [156] (**L6**) in, others are contemporary with the features in which they were found.

The most significant flints are those from pits [124] and [126]. These features were in close proximity and undisturbed. Pit [124] contained Beaker pottery, yew charcoal and four pieces of flint, including three scrapers of different types (**L1**: broken discoidal; **L2**: squat, slightly nosed scraper; **L3**: small round, thumbnail-like scraper), a core rejuvenation piece and a number of quartz pebbles. Pit [126] contained two markedly less diagnostic pieces: a split pebble and a waste flakelet. In keeping with the Beaker ceramics, the most diagnostic flints from these pits are of a broadly Early Bronze Age character.

The concentration of three different scraper forms and another flint with the Beaker pottery implies that the flint, together with the pottery and the charcoal, were specifically selected for inclusion in the pits. Although the association of scrapers with Beaker pottery is not in itself unusual, it is probable that the contrasting scraper forms found in pit [124] reflect different functions and this may have been part of the reason for their inclusion. It is also possible that marked differences in colouration and possibly the amount of time spent in manufacture (between **L1** and **L2**/**L3**) was of relevance. The dark, near black **L1** is a visually more pleasing, balanced piece and was

also apparently deliberately broken prior to its inclusion within pit [124].

Radiocarbon dating

Only two features produced charcoal suitable for radiocarbon dating. Charcoal from the Beaker-associated pits, [124] and [126], was submitted for accelerator mass spectrometry (AMS) dating at the Scottish Universities Environmental Research Centre (SUERC). Both were derived from a short-lived cherry-type charcoal (Table 2).

Results

The radiocarbon determinations from pits [124] and [126], 3810 ± 30 BP, 2350–2130 cal BC (SUERC-19975) (at 93.9 per cent) and 3795 ± 30 BP, 2340–2130 cal BC (SUERC-19976) (95 per cent), are very similar and suggest a tight phase of activity with the weight of probability at 68 per cent falling in the years around the turn of the twenty-second century cal BC (Tables 2 and 3).

Conclusion

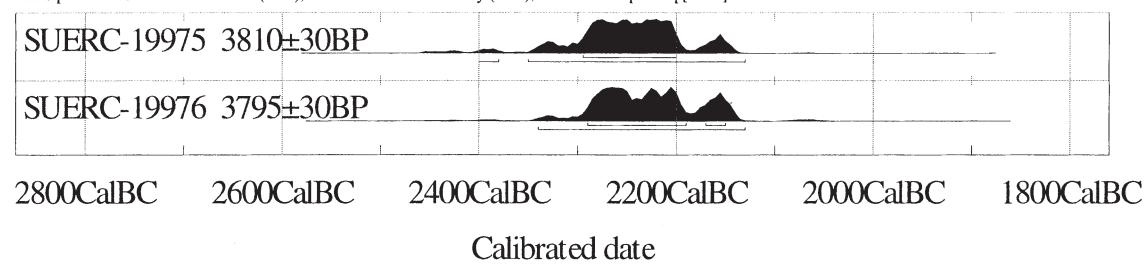
Fieldwork along the Treyarnon pipeline uncovered a scatter of archaeological sites, predominantly

Table 2 Results from the radiocarbon dating

| Feature | Context | Lab. no | Age BP | Material | Calendrical years 68% | Calendrical years 95% |
|-----------|---------|-------------|---------------|-------------------------|---|--|
| Pit [124] | (125) | SUERC-19975 | 3810 ± 30 | Charcoal Cherry type | 2295–2200 BC 2350–2130 BC (at 93.9%) | 2400–2380 BC (1.5%) 2350–2130 BC (at 93.9%) |
| Pit [126] | (127) | SUERC-19976 | 3795 ± 30 | Charcoal Cherry type | 2290–2190BC (60.1%) 2170–2150BC (8.1%) | 2340–2130 BC |

Table 3 Radiocarbon dates from Beaker pits [124] and [126]

Atmospheric data from Reimer et al (2004); OxCal v3.10 Bronk Ramsey (2005); cub r:5 sd:12 prob usp[chron]



of the later prehistoric and medieval periods. The project identified a focus of prehistoric activity at Treyarnon in the form of pits containing Beaker pottery, with a second focus of prehistoric and medieval activity near to Trevear. The enclosure at Trevear was not securely dated; however, it is likely to be later prehistoric.

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Mesolithic-Neolithic anthropogenic impacts on the upland environment of Bodmin Moor, south-west England: a re-investigation of the pollen record from Rough Tor South

EMMA-J HOPLA and BENJAMIN R GEAREY

This paper describes the pollen analyses and associated radiocarbon dating of a sediment core from Rough Tor South, Bodmin Moor. Previous palaeoenvironmental study at the same location had suggested possible evidence for human impact on local woodland and scrub during the Mesolithic, with clearer palynological indications of environmental changes associated with farming and settlement in the Neolithic. The new analyses confirm that mixed hazel-oak woodland became established during the early Holocene, but comparison with the previous analyses shows some pronounced differences in the representation of certain taxa. It is hypothesised that these differences reflect highly localised variation in vegetation on the sampling site. Evidence for changes in vegetation and specifically reductions in hazel and increases in grasses are attributed to natural processes connected to the growth of the mire. It is concluded that there is no clear evidence for human impact on the environment during the Mesolithic but that small increases in ribwort plantain in the Neolithic confirm other archaeological and palaeoenvironmental data demonstrating that this period saw the beginning of significant human interest in the Rough Tor area.

Bodmin Moor is the largest of the Cornish granite uplands and has rich and well preserved archaeological remains (Johnson and Rose 1994). Despite detailed study of the early Holocene vegetation record (Brown 1977; Simmons *et al* 1987), little palaeoenvironmental work had been carried out until the last decade to investigate the associated timing, nature and extent of human impact upon the environment. This situation has changed with pollen-analytical study of deposits from areas associated with some of the densest concentrations of multi-phased archaeological sequences on the moor at Rough Tor and East Moor (Gearey *et al* 2000a; 2000b) and subsequent

integrated archaeological and palaeoenvironmental investigations of the Rough Tor area (Tinsley 2004–5; Jones 2006) and also at Leskernick (Waller 2007).

The nature of Holocene environmental change on the uplands of England has attracted much attention from palaeoecologists over the years (see Simmons 2003 for a recent review). A particular focus has been on the precise character of the early vegetation cover, the timing of prehistoric human activity and its role in the manipulation of the vegetation and in subsequent environmental changes such as soil deterioration and the development of blanket mire. The presence of

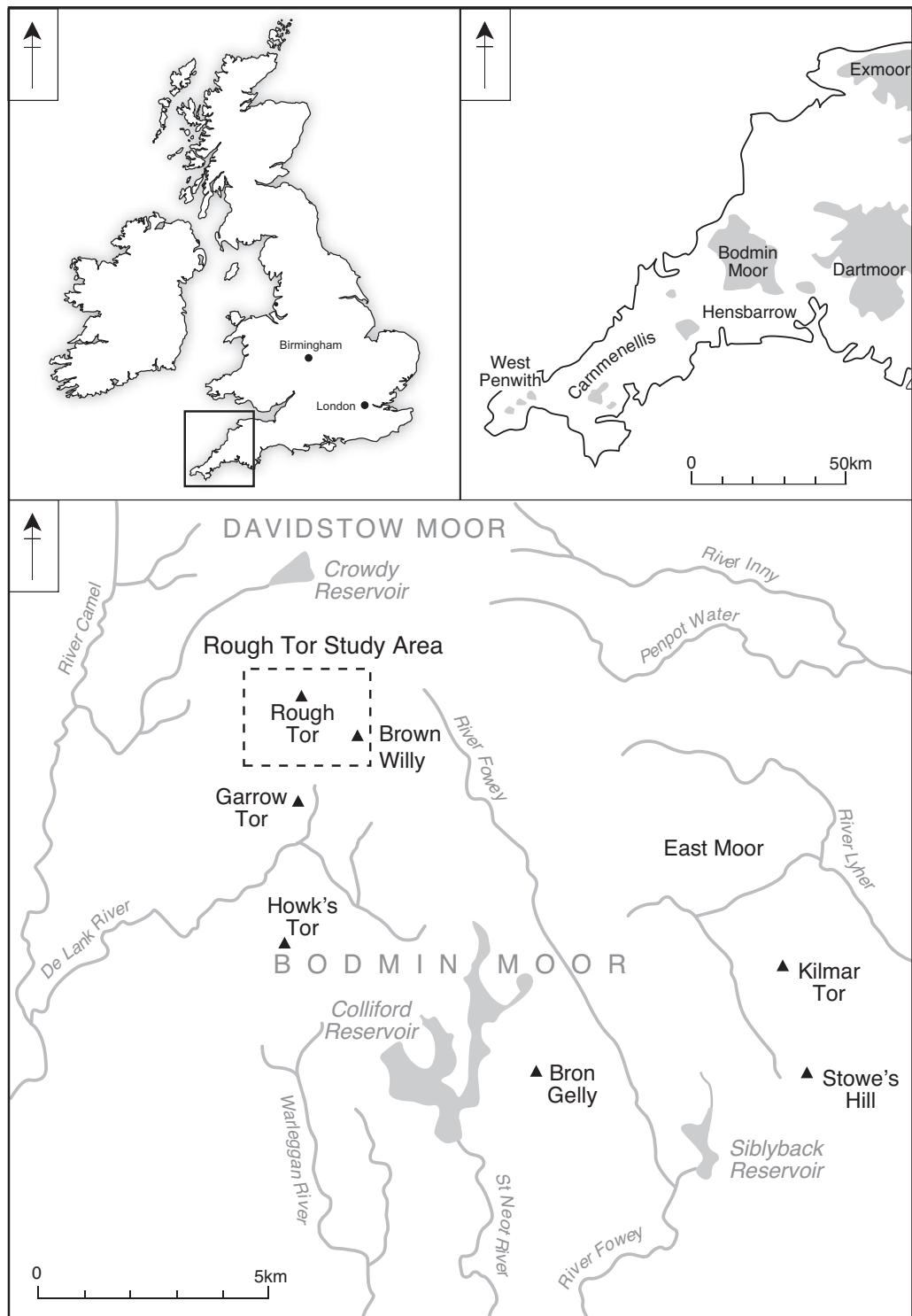


Fig 1 Location of Bodmin Moor and the Rough Tor study area

often well-preserved archaeological remains in close proximity to peat deposits suitable for pollen analytical study provides excellent opportunities for close comparisons between palaeoenvironmental and archaeological records for different periods, also illustrated by work on the other uplands of south-west England. This includes work on Exmoor (for example, Fyfe *et al*

2003a; 2003b; 2004) and Dartmoor (for example, Fyfe *et al* 2008; Caseldine and Hatton 1993; 1996a; 1996b). The role of Mesolithic peoples in particular has been much discussed, with hypotheses that human communities were manipulating vegetation from relatively early in the Holocene (Simmons 2003; 1964; Simmons *et al* 1983). The character of the mid-Holocene vegetation on Bodmin Moor

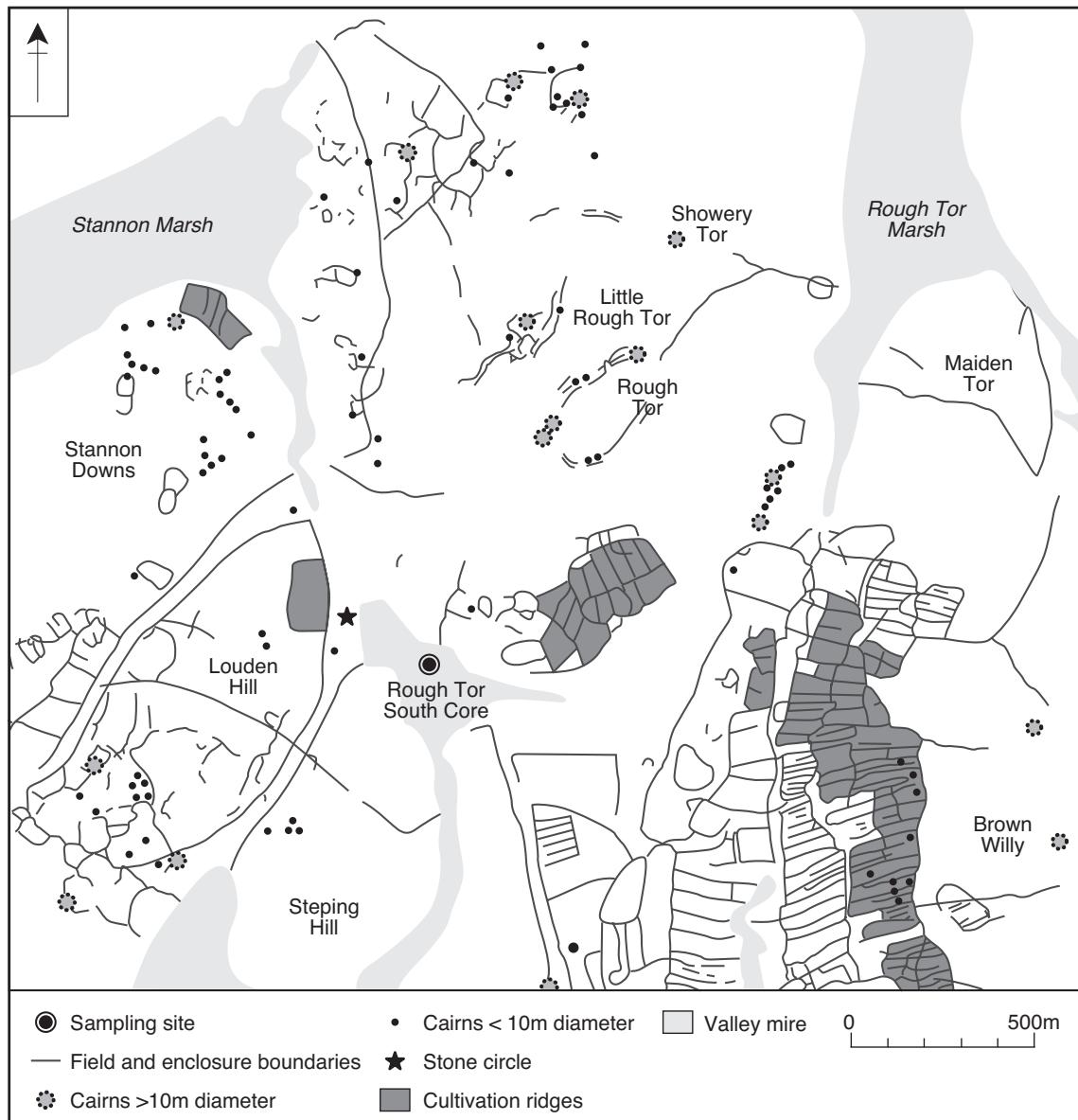


Fig 2 Sample site location and main archaeological sequences at Rough Tor, adapted and redrawn from Gearey *et al*, 2000a, after Johnson and Rose 1994, map iii

has also been invoked in debates regarding so-called 'post processual' approaches to landscape archaeology (for example, Bender *et al* 1998; Chapman and Gearey 2000).

Gearey *et al* (2000a) suggested that the first palynologically detectable human impacts at Rough Tor may have begun during the later Mesolithic – early Neolithic. In particular, it was hypothesised that an apparently early (pre-Neolithic) but insecurely dated decline in *Corylus* (hazel) may reflect the deliberate clearance of scrub by human communities. However, there were issues associated with the interpretation of aspects of these data, with relatively broad sub-sampling intervals preventing a full understanding of the precise inferred nature and timing of the evidence for human activity during early prehistory. Despite this, certain hypotheses from this work regarding the impact of human activity on the moors have since been reported in synthetic accounts of prehistoric human activity on the uplands of England (Simmons 2003).

This paper reports on the re-assessment of the palynological sequence from the Rough Tor South area and in particular that part of the palaeoenvironmental record which appeared to contain clear evidence for human impacts on local vegetation during the later Mesolithic – earlier Neolithic periods. The Neolithic is a key period for understanding the archaeological record of Bodmin Moor and Rough Tor in particular, with several monuments – specifically the Louden long cairn and the enclosure on Rough Tor itself – attributed to this period (Johnson and Rose 1994). Other remains include extensive hut circles and field systems, which recent excavations indicate as dating to the Bronze Age (Jones 2004–5; 2006).

Methods

Sampling site and sample collection

The sampling site was a small area (70m across) of topogenous mire which has accumulated around a spring which rises on the south-western slopes of Rough Tor (Figs 1 and 2). The mire had previously been surveyed and investigated stratigraphically (Gearey 1996), demonstrating a maximum depth of approximately 3m of peat. The deposits consisted of a thin basal layer of organic mud overlain by very well humified herbaceous peat with little

stratigraphic variation apparent. A core 2.8m deep was extracted using a standard pattern Russian corer from close to the deepest part of the mire, within 10m of the original sampling site. The core was extruded into plastic tubing and wrapped in tinfoil for transport and storage. Sub-sampling focused on that segment of the core which the initial analyses (Gearey *et al* 2000a) had suggested contained the earliest evidence for vegetation changes connected to human activity. Sub-samples of 1 cu cm were thus extracted from between 1.75 and 2.8m of the core at intervals of 0.04m, reduced to 0.02m between 2.06m and 2.26m. Sub-samples were prepared using standard procedures including acetylation and HF treatment (Moore *et al* 1991). Counting was carried out on an Olympus Nikon Eclipse microscope and a total land pollen sum of at least 300 total land pollen (TLP) was attempted for each sample.

Radiocarbon dating

Three samples were submitted to Beta Analytic, USA, for radiocarbon dating using the AMS method. No identifiable macrofossils were present and hence bulk sediment samples were dated.

Results

Radiocarbon dating

The radiocarbon dates (Table 1), including those from Gearey *et al* (2000a) have been calibrated using Ox-Cal 4.0, using data from INTCAL in Reimer *et al* (2004), with endpoints rounded out to the nearest decade in the form recommended by Mook (1986).

Pollen analyses

The results are given as a percentage pollen diagram produced using TILIA and TILIA*GRAPH (Fig 3) (Grimm 1991). The diagram has been divided into five local pollen assemblage zones. These zones and corresponding interpretations are summarised in Table 2. The original pollen diagram from Rough Tor South (Gearey *et al* 2000a) is also provided in Figure 4 and summarised in Table 3. To avoid confusion, this will henceforth be referred to as Rough Tor South core 1 (C1) and the new sequence as Rough Tor South core 2 (C2).

Discussion

Correlating the records

Correlating the two records is problematic due to the erroneous basal radiocarbon dates for both sequences (Beta-238132 and OxA-5945), with these dates considerably younger than would be anticipated for what is evidently an early Holocene phase of landscape development. This suggests that the basal deposits have been affected by 'younging', perhaps related to rootlet penetration from the overlying humified peats. Additionally, the date from 2.2m depth (8410 ± 90 BP, OxA-6010) in the C1 diagram appears to be too old.

The C2 diagram clearly records the rise in *Corylus* (hazel) (RTSC2-1 to 2) which has been dated to 8500 cal BC at Dozmary Pool (Brown 1977). This suggests that the base of this sequence is slightly earlier than that of C1, since *Corylus* is already established in the lowermost zone (RTSC1-1). The RTSC2-2 to -3 boundary is undated but the rise in *Alnus* (alder) and Poaceae (grasses) which marks the RTSC2-3 to -4 boundary is dated to 5940 ± 70 BP (Beta-238131; 4950–4730 cal BC). It seems likely that this is equivalent to the RTSC1-1 to -2 boundary.

The radiocarbon date from 1.75m in C1 of 4710 ± 80 BP (OxA-6009, 3650–3340 cal BC) is statistically inseparable from the date of 4770 ± 40 BP from 1.77m in C2 (Beta-238130, 3640–3380 cal BC). This implies that RTSC1-2 can be correlated with RTSC2-4. It can thus be tentatively concluded that the four zones of the C2 sequence are equivalent to the lowermost two zones (RTSC1-1 and -2) of the C1 sequence. The C2 diagram has been sampled at higher resolution (0.04–0.02m) than C1 (0.1m) and therefore resolves the phases of vegetation development during the Mesolithic–

Neolithic (*c* 9000–3600 BC) in much more detail than C1.

Interpretation: the early vegetation at Rough Tor

Certain aspects of the implied vegetation records are in broad agreement. The pollen spectra from both diagrams indicate that the early Holocene vegetation initially consisted of *Corylus* (hazel) with *Quercus* (oak) and *Betula* (birch) also present locally and perhaps some limited populations of *Ulmus* (elm). The C2 diagram indicates that *Corylus* expanded into an open grassland landscape. Some *Salix* (willow) was present, probably on the wetter soils around the sampling site. This wood–scrubland was relatively dense locally at least, with low values for herbs and total tree and shrub percentages accounting for 90–95 per cent TLP in both diagrams.

The new data therefore reinforce the impression of a generally wooded rather than an open landscape in this part of the moor, following the expansion of trees and shrubs in the earlier Holocene. The extent or precise structure of the woodland in the wider landscape remains unclear. The herbs that are recorded such as Apiaceae (carrot family), *Filipendula* (meadowsweet), *Succisa* (devil's bit scabious) and *Ranunculus* (buttercup) suggest more open vegetation communities, probably on the damper, more acidic soils around the sampling site. Pteropsida (fern spores) were abundant at this time, indicating a damp, shady environment in the close vicinity, with species such as *Polypodium vulgare* (common polypody) probably growing as epiphytes on the woody vegetation.

Both records show gradual declines in *Corylus* (RTSC1-1 and RTSC2-2 and -3) but a significant difference between the diagrams is a pronounced

Table 1 Radiocarbon dates from the two Rough Tor pollen diagrams. Bracketed dates have been rejected as inaccurate.

| Sample depth (m) | Laboratory code | Radiocarbon age years BP | Calibrated age $+2\sigma$ |
|---|-----------------|--------------------------|---------------------------|
| Rough Tor South C1 (Gearey <i>et al</i> 2001a) | | | |
| 1.15 | OxA-6007 | 1675 ± 45 | cal AD 245–530 |
| 1.50 | OxA-6008 | 3275 ± 50 | 1680–1440 cal BC |
| 1.75 | OxA-6009 | 4710 ± 80 | 3650–3340 cal BC |
| 2.20 | OxA-6010 | (8410 ± 90) | 7590–7190 cal BC |
| 2.80 | OxA-6011 | (5945 ± 65) | 4990–4690 cal BC |
| Rough Tor South C2 | | | |
| 1.77 | Beta-238130 | 4770 ± 40 | 3640–3380 cal BC |
| 2.05 | Beta-238131 | 5970 ± 40 | 4950–4730 cal BC |
| 2.73 | Beta-238132 | (3380 ± 40) | 1770–1530 cal BC |

increase in *Salix* to a maximum of about 60 per cent in RTSC2-3. In the C1 diagram, *Corylus* shows a less pronounced reduction and *Salix* is only recorded at trace values (maximum 1–2 per cent). A peak in *Hedera helix* (20 per cent) in C1 (RTSC1-1) is not recorded in C2, where this species is present only at low values (1 per cent) despite the closer interval sampling.

It is unlikely that these differences are solely a result of the different sampling resolution used in C1 (0.1m). The period of relatively high *Salix* values is apparent over some 0.35m of sediment in C2, for example, and should thus have been apparent even if as an isolated 'spike' in the C1 diagram. In this respect, it is perhaps significant that both *Hedera helix* and *Salix* are insect pollinated taxa (for example, Waller *et al* 2005) that are generally regarded as significantly underrepresented in pollen diagrams.

In particular, *Hedera helix* is often very poorly represented palynologically (see Bottema 2001) and this species must have been growing in very close proximity to the C1 sampling site to account for the high values of this species. Likewise, high percentages of *Salix* probably represent the local presence of male plants close to, and probably on, the C2 sampling site (*cf* Waller *et al* 2005). Although both sequences were sampled within about 10m of each other, it can be hypothesised that the sequences are reflecting spatial variation in the vegetation structure, with *Salix* dominating at the C2 site and *Corylus* at the C1 sampling site. These differences may reflect an edaphic gradient between wetter and drier areas of the mire, or perhaps the proximity of the C2 sampling site to the wetland-dryland edge. *Corylus* would be anticipated to be prevalent on the better drained slopes with *Salix* on the damper soils of the mire. The herbs recorded (*Filipendula*, *Potentilla*, *Apiaceae*) in both diagrams are typical of communities on wetter contexts, although drier habitats are suggested by the peak in *Pteridium* at the opening of RTSC2-3.

The final zone of the C2 sequence (RTSC2-4) demonstrates a pronounced reduction in *Salix* and *Betula* at a date of 5970 ± 40 BP (Beta-238131; 4950–4730 cal BC), coinciding with rises in *Alnus* and *Poaceae*. These changes reflect *Alnus* out-competing *Salix* and *Betula* on the damper soils around the sampling site (see, for example, Brown 1988). Previous studies (for example, Chambers and Price 1985) have suggested that human

activity may have facilitated the establishment of *Alnus*, but there is no clear evidence for anthropogenic vegetation disturbance at this point. The rise in *Poaceae* recorded in both diagrams is clear evidence for the expansion of open habitats, but this may be reflecting the spread of wetland grasses such as *Phragmites australis* (common reed) or *Molinia caerulea* (purple moor grass) on and around the sampling site as the mire accreted laterally and vertically.

This zone is regarded as comparable with RTSC1-2 in the C1 diagram. It can be observed that values of *Corylus* remain fairly steady in the C2 diagram after the *Alnus* rise; in clear contrast to the C1 diagram where *Corylus* shows a marked reduction (from approximately 60 per cent) coincident with the rise in *Alnus* and *Poaceae* (RTS-2). However, similar values of *Corylus* of 20 per cent are recorded in both diagrams following the *Alnus* rise. This implies that the fall in this taxon in the C1 sequence at the opening of RTSC1-2 is perhaps again reflecting a highly localised change in vegetation. In other words, the C1 diagram reflects a reduction in *Corylus* in the near vicinity of the sampling site, rather than a contraction in this taxon in the wider landscape.

Early human impact?

The appearance of the herb *Plantago lanceolata* in pollen diagrams is often regarded as an indicator of human impact since this species is typically found in open, pastoral contexts and rarely in closed woodland (Behre 1981). Low but continuous percentages of *P. lanceolata* are recorded in the C2 diagram above the depth of 2m in RTSC2-4, between the radiocarbon dates of 5970 ± 40 BP (2.05m, Beta-238131; 4950–4730 cal BC) and 4770 ± 40 BP (1.77m, Beta-238130; 3640–3380 cal BC). A simple linear interpolation between these dates gives an estimated sediment accumulation rate of $1\text{cm } 38\text{ years}^{-1}$ and indicates that the *P. lanceolata* curve began c 3580 cal BC, during the early Neolithic. Estimating the equivalent date for this event in the C1 diagram (RTSC1-2) is difficult given the inaccurate radiocarbon dates from the basal zones, but it can be observed that the *P. lanceolata* curve begins at the same depth (2m).

The appearance of *P. lanceolata* suggests the presence of open grassy environments somewhere in the pollen source area and likely to be associated with the impact of human settlement or farming

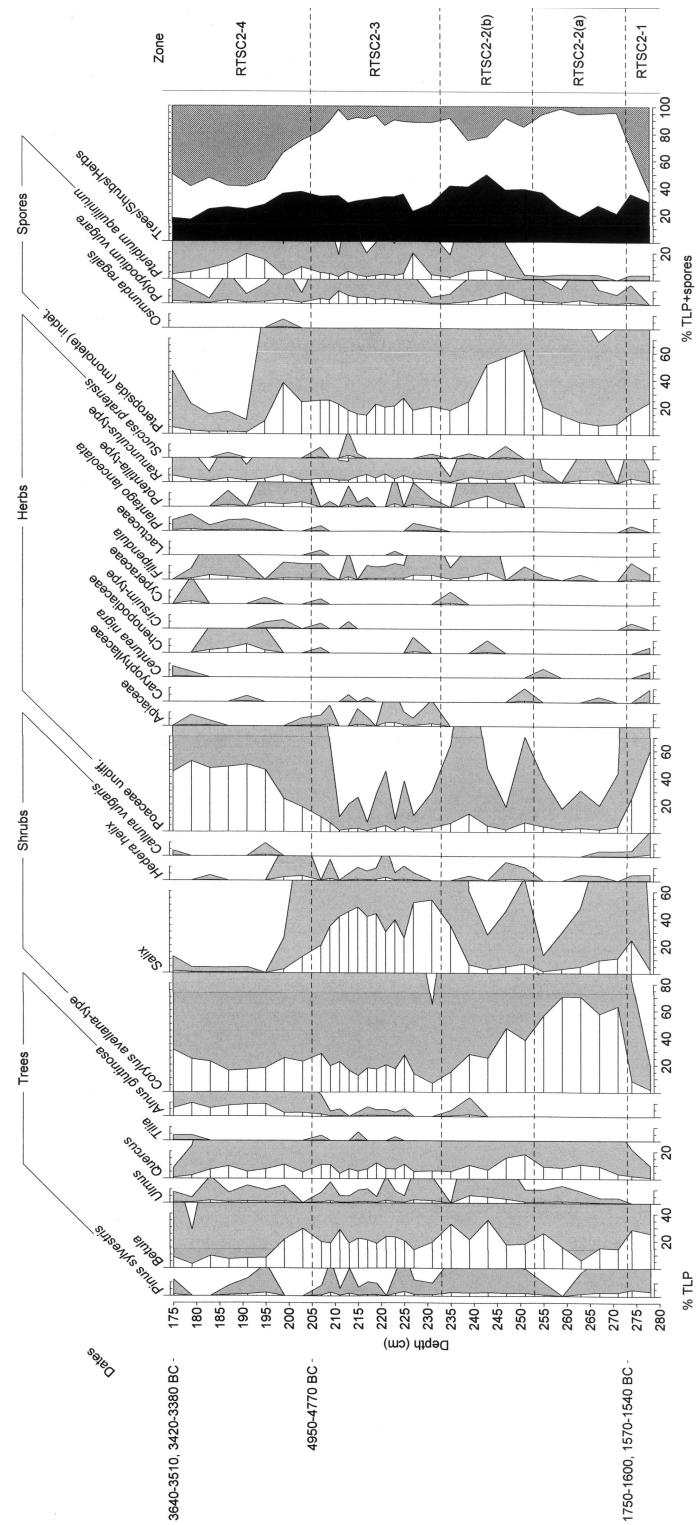


Fig 3 Rough Tor South core 2 pollen percentage Shading = exaggeration $\times 10$

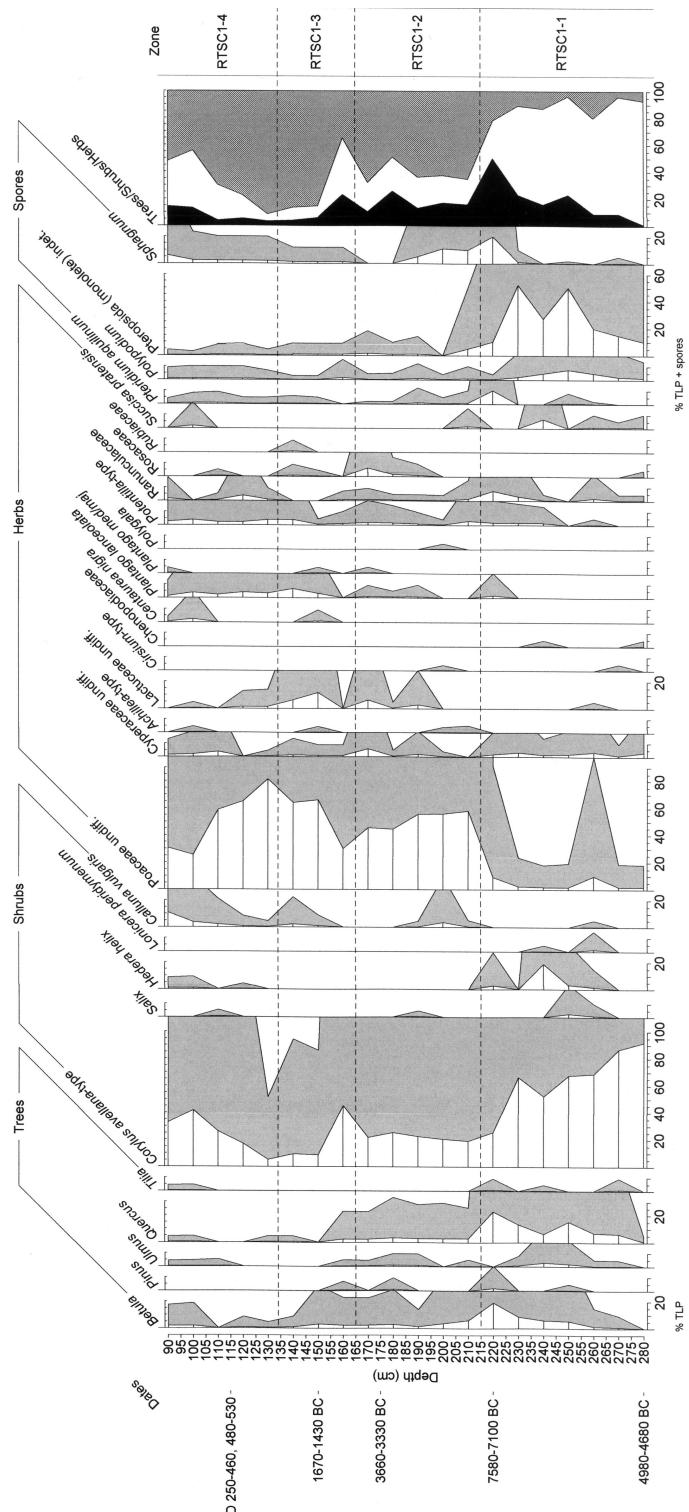


Fig 4 Rough Tor South core 1 pollen percentage. Shading = exaggeration $\times 10$

activity. However, it is by no means clear if the record of this herb can be directly connected with the same processes that led to the rise in Poaceae and reductions in *Corylus* in C1 (RTSC1-2) and *Salix* in C2 (RTSC2-4) at a date of around 4950–4730 cal BC. The beginning of the *Plantago* curve is not concurrent with but shortly *after* the increase in Poaceae in both diagrams. Percentages of *Plantago* remain very low (maximum 1 per cent) in both diagrams indicating either very small scale disturbance to the vegetation locally or more extensive open areas at a greater distance from the sampling site.

Given the evidence discussed above for the highly localised nature of the pollen record in the sequences from Rough Tor South, it is possible that the appearance of *P. lanceolata* in both diagrams at this time was connected in part at least to taphonomic factors. Specifically, increased

deposition of pollen from extra-local or regional sources following the demise of the local *Salix* and *Corylus* cover would be anticipated, due to the removal of both the physical screening effect of this woodland and the contribution of these local taxa to the pollen record. The relatively slow rate of the decline of *Salix* may indicate vegetation changes related to autogenic changes in the mire rather than the effects of human clearance.

Few other ‘anthropogenic indicators’ (*sensu* Behre 1981) are evident in either diagram during the Mesolithic – Neolithic. Increases in *Filipendula* and *Chenopodiaceae* (fat hen family) are recorded in RTSC2-4. The former was probably growing on the wetland, whilst the latter can include taxa associated with ruderal habitats (for example, *Chenopodium album*, fat hen), but interpretation is hindered by the lack of knowledge of the species involved. There is also a rise in *Pteridium*

Table 2 Summary of Rough Tor South C2 pollen diagram

| Zone / depth (cm) | Dates | Main species | Interpretation |
|-----------------------|--|---|--|
| RTSC2-1 280–272 | | Poaceae – <i>Betula</i> – <i>Salix</i> | Open grassland landscape |
| RTSC2-2(a) 272–253 | 272cm – 1750–1600, 1570–1540 BC | <i>Corylus avellana</i> -type – <i>Betula</i> – <i>Quercus</i> – <i>Salix</i> | Expansion of hazel, birch and oak woodland with some willow on the wetter soils around the sampling site |
| RTSC2-2(b) 253–233 | | <i>Corylus avellana</i> -type – <i>Betula</i> – <i>Quercus</i> – <i>Salix</i> – Poaceae | Hazel, birch and oak woodland |
| RTSC2-3 233–205 | | <i>Salix</i> – <i>Betula</i> – <i>Corylus avellana</i> -type – <i>Quercus</i> – Poaceae | Expansion of willow close to and on the sampling site |
| RTSC2-4 205–175 | 205cm – 4950–4770 BC 175cm – 3640–3510, 3420–3380 BC | Poaceae – <i>Corylus avellana</i> -type – <i>Alnus</i> – <i>Quercus</i> – <i>Betula</i> | Expansion of alder on and around the sampling site replacing willow. Expansion of the mire with wetland grasses becoming established locally |

Table 3 Summary of Rough Tor South C1 pollen diagram

| Zone / depth (cm) | Dates | Main species | Interpretation |
|----------------------|--------------------------------|--|--|
| RTSC1-1 280-215 | 290cm – 4980–4880 BC | <i>Corylus avellana</i> -type – <i>Quercus</i> – <i>Betula</i> | Closed woodland. |
| | 220cm – 7580–7100 BC | | |
| RTSC1-2 215-165 | 175cm – 3660–3330 BC | Poaceae – <i>Corylus avellana</i> -type – <i>Alnus</i> | Open grassland landscape. |
| RTSC1-3 165-135 | 150cm – 1670–1430 BC | Poaceae – <i>Corylus avellana</i> -type – <i>Lactuceae</i> – <i>Plantago lanceolata</i> – <i>Alnus</i> | Further expansion of grassland and decline in oak and hazel. Increase in charcoal – local burning activity. |
| RTSC1-4 135-90 | 115cm – AD 250–460, 480–530 | Poaceae – <i>Corylus avellana</i> -type – <i>Alnus</i> – <i>Plantago lanceolata</i> | Open grassland but some recovery of hazel and alder. |

aquilinum (bracken) in RTSC2-4 at an estimated date of c 4150 cal BC. This species was probably growing on the better drained slopes at Rough Tor South, although it may also have been growing on the drier areas of the mire system.

It thus seems likely that the *P. lanceolata* curve indicates the beginning of palynologically detectable impacts of human activity at Rough Tor South during the later Neolithic, but this appears to have been of low intensity. There is no evidence for the clearance of substantial tracts of woodland at this time, with values for tree and shrub pollen remaining generally stable across RTSC1-2 and RTSC2-4. *Quercus* percentages show a steady fall towards the top of RTSC2-4 but interpretation is hindered as the diagram terminates at this point. Overall, it would seem that any woodland clearance or settlement activity during the Neolithic was therefore either at some distance from the sampling site or was of lower intensity in the closer vicinity.

Clearer palynological evidence for human activity at Rough Tor South, in the form of pronounced reductions in tree and shrub pollen and increases in *P. lanceolata* are recorded in C1 (RTSC1-3). These data suggest significant woodland clearance and pastoral farming during the Bronze Age. It is clear from the palaeoecological data from Rough Tor South that by around 1670–1430 cal BC, the *Corylus*–*Quercus* woodland cover of the earlier Holocene had been largely cleared and replaced by open grassland, dominated by herbs typical of pastoral habitats (Gearey *et al* 2000b). Other palaeoenvironmental data suggests cultivation on the fringes of the moor during the earlier Bronze Age, but with generally pastoral habitats on the high moorland (Jones 2004–5; 2006). The precise structure of the woodland remains less clear, but recent palaeoenvironmental work at the nearby site of Leskernick suggests the persistence of scattered oak-hazel woodland into the early Bronze Age (Waller 2007). Jones (2004–5; 2006) has demonstrated something of the spatial variability in vegetation across the adjacent Stannon Down, with patches of *Corylus*–*Quercus* woodland, *Alnus* on damper soils and open, acid grassland communities on the higher slopes during this period.

The absence or low quantities of cereals from the excavations at Stannon may signify seasonal use of the settlements as part of a transhumance strategy (Jones 2006; Mercer and Dimbleby 1978) and it would seem highly probable that human activity

and grazing animals were instrumental in creating and maintaining the open, grassy landscape of the later Bronze Age and the resulting degradation in soil quality. Quite how these processes might relate to broader patterns of land use and possible changes in human activity during the later prehistoric period remain unclear.

Conclusions

The new analyses at Rough Tor South confirm certain aspects of previous palaeoenvironmental work at this location. The early Holocene environment was clearly one of *Corylus*–*Quercus* scrub – woodland rather than open heath or grassland (*contra* Brown 1977), with *Alnus* later expanding onto the damper soils. It had previously been postulated that the Rough Tor South pollen record might reflect major landscape disturbance during the earlier Neolithic (Gearey *et al* 2000a). The new analyses at this sampling site reported in this paper indicate significant differences in the pollen records from two locations some 10m apart. It would appear that the effective pollen source area (Jacobson and Bradshaw 1981) of the small topogenous mire at Rough Tor South was very localised, hence spatial variations in vegetation growing on and close to the sampling sites has resulted in marked differences between the two pollen records.

This variation has implications for interpreting and understanding the nature of vegetation changes at Rough Tor South during the Mesolithic and Neolithic. The new pollen data from C2 suggests that the decline in *Corylus* recorded in RTSC1-2 was likely to have been a result of hydrological changes associated with the spread of peat on and around the sampling site, favouring the expansion of *Alnus* and excluding *Corylus* to the better drained slopes nearby. Likewise, the rise in Poaceae in RTSC1-2 and RTSC2-4 can probably be attributed to natural processes, perhaps reflecting the spread of wetland grasses such as *Phragmites* or *Molinia caerulea* as the mire accreted vertically and laterally. There is no unequivocal palynological evidence that the *Salix* decline in RTSC2-4 or the *Corylus* decline in RTSC1-2 were connected directly to the activities of Mesolithic human communities (*contra* Gearey *et al* 2000a, 437).

The flint scatters found on Bodmin Moor have been interpreted as suggesting a very low population

density during the Mesolithic (Todd 1987). There is no evidence of a Mesolithic presence at Rough Tor itself, but lithics finds at Crowdys reservoir (Trudgian 1977), Louden Hill and Brown Willy (Herring and Lewis 1992) indicate activity in the wider area. Jones (2004–5) identified tentative palynological evidence for Mesolithic woodland disturbance at Stannion Down but there is no clear palaeoenvironmental evidence from the re-analysis of the Rough Tor South sequence that these communities were manipulating the vegetation cover in a manner that has been suggested for other uplands of the south west such as Dartmoor (for example, Simmons *et al* 1983; Caseldine and Hatton 1993; 1996). Whilst it would appear that human disturbance to the vegetation began during the Neolithic, the pollen record at Rough Tor South suggests that this was on a small scale. The precise nature of human manipulation of the environment at this time remains somewhat elusive.

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A Time Team evaluation at Roughtor, Bodmin Moor, Cornwall

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An archaeological evaluation by Channel 4's Time Team at a site on the western slope of Roughtor, Bodmin Moor, Cornwall (NGR 214081 81735), investigated the remains of a Bronze Age roundhouse settlement and a bank cairn, a possible Neolithic ritual monument. The aims of the evaluation were to re-examine previously excavated roundhouses, to investigate an undisturbed structure and to confirm (or otherwise) the presumed Bronze Age date of the structures. The evaluation provided a definitive Middle Bronze Age date for the use of the buildings. This occupation may have been seasonal, with the structures only being used when the higher slopes of the tors could be used for animal grazing. The bank cairn was seen to comprise an extensive structure formed by two parallel dry-stone walls bounding a central area filled with rubble, further rubble being placed on the outer side of the dry-stone walls to create a linear stone mound.

In October 2006 geophysical survey and evaluation trenching was undertaken at Roughtor, Bodmin Moor, Cornwall, centred on NGR SX 14081 81735, by Channel 4's *Time Team* television programme and local archaeologists. The site is situated in the north-western part of Bodmin Moor, approximately four miles south east of Camelford and 15 miles north west of Liskeard, on the western slope of Roughtor at a height of approximately 288m OD. The underlying geology comprises microgranite, granite and slate and the area also includes a worked out deposit of china clay (British Geological Survey 1994, sheets 335 and 336).

The archaeological remains targeted by the investigation are considered to be of national importance and are Scheduled. These comprise a large bank cairn (Scheduled Monument (SM) 15548) to the south of Roughtor, mapped and identified as a boundary by the Bodmin Moor survey (Johnson and Rose 1994). The bank cairn, which differs substantially from the several single course and rubble stone boundaries in the area, was subsequently re-interpreted as a linear cairn by Peter Herring and Graeme Kirkham, who have

also carried out a detailed survey (Herring and Kirkham, forthcoming). It had not previously been excavated. The bank cairn may have been in use during several periods and appears to relate to the Roughtor peak itself. At least two distinct construction phases have been identified. A probable prehistoric settlement (SM 15584) to the west of the bank cairn has also been surveyed (Johnson and Rose 1994). Several individual houses were investigated by Dorothy Dudley during the 1950s (unpublished). These structures are presumed by analogy to be Bronze Age, but until now no date for them had been confirmed by excavation.

The project aimed to ascertain the date, character, condition and extent of the underlying archaeology, looking particularly at the bank cairn and a number of roundhouses belonging to the prehistoric settlement (Wessex Archaeology 2007).

Geophysical survey

A geophysical survey was undertaken (GSB 2006) prior to the evaluation. Areas of increased

magnetic response corresponded to the remains of the roundhouses in the settlement. The area to the south of the bank cairn was positioned over a postulated pear-shaped enclosure identified during survey of the bank cairn (Herring and Kirkham, forthcoming); however, the magnetic results showed no evidence for this. A handful of pit-type anomalies may represent natural variations within the soil. The bank cairn clearly shows in the geophysical survey (Fig 1) but no other detectable archaeological anomalies were noted in this area.

A magnetic susceptibility survey over the earthwork enclosure and roundhouses clearly showed areas of higher readings which correlate with the individual roundhouses; however, there is no obvious zonation within the enclosure as might be expected if specific areas were used solely for stock.

Evaluation trenches

As the site contained a number of Scheduled Monuments investigation occurred largely at points of previous disturbance (modern breaches through the bank cairn and Dorothy Dudley's excavation trenches) (Fig 1). Five evaluation trenches of varying sizes were excavated.

Trench 3 was positioned at the westernmost of two modern breaches through the bank cairn. It was excavated into the west-facing, angled section of the breach and cut back to provide a vertical section, to show the construction of the monument.

Overlying the natural substrata (rab derived from the decayed underlying granite), was a dark brown silty loam deposit, possibly a buried topsoil. Set directly above this were two parallel dry-stone walls approximately 1.8m apart and 0.5m high constructed of unworked granite. The internal space bounded by the walls was infilled with granite rubble and deposits of rubble appear to have been deliberately banked externally against the walls. A small assemblage of worked flint, broadly datable to the Late Neolithic or later, was recovered but no closely datable material was found that could indicate the construction date of the bank cairn.

Trenches 1 and 2 were targeted on two roundhouses previously partially excavated in the 1950s. The building (Cornwall and Scilly Historic Environment Record (HER) PRN 3291.17) investigated in trench 1 was approximately 8.5m

in diameter and comprised dry-stone walls 0.66m wide that survived to a height of 0.16m. These were laid directly onto the former ground surface, the topsoil within the structure having been removed to reveal the underlying natural substrata. The entrance, represented by two granite orthostats, lay on the southern side of the structure.

Inside, the earliest floor surface comprised a layer of re-worked natural rab, cut by several stake- and post-holes implying the presence of wooden structures or supports; however, no discernible structure could be identified. No clear hearth setting was identified within the floor surface, although a small fire pit, perhaps single use, was identified and a single sherd of Trevisker-ware pottery recovered from the fill. The floor was sealed below a possible occupation deposit, from which two sherds of Middle Bronze Age pottery were recovered. Wood charcoal and a single hazelnut shell fragment were also recovered. The occupation deposit was sealed below a surface comprised of small granite fragments but no occupation layer was identified overlaying it.

Approximately 1.3m to the west of the roundhouse there was a roughly north – south stone alignment, comprising unworked granite slabs on average 0.5m high, which formed part of the walled enclosure of the settlement. No chronological relationship between the enclosure and the roundhouse was discerned, although the entrance to the roundhouse lay outside the enclosure, possibly indicating that construction of the enclosure may have utilised its existing walls.

Both the roundhouse and the enclosure wall were sealed below substantial rubble deposits, but it was unclear if these represented the collapse of the structures or the remnants of a cairn. Examples of small cairns overlying roundhouses have been identified on Bodmin Moor and Dartmoor, and have been interpreted as being part of an abandonment ceremony, associated with the deliberate clearing out and demolition of structures (Peter Herring, pers comm).

The structure investigated in trench 2 (HER PRN 3291.03) comprised a circular dry-stone wall, approximately 8m in diameter, which survived up to two courses high. This was constructed directly upon the natural substrata. Two stake-holes and a single post-hole were recorded within the roundhouse; although no coherent structure could be identified they probably represent internal divisions. These were sealed below a probable

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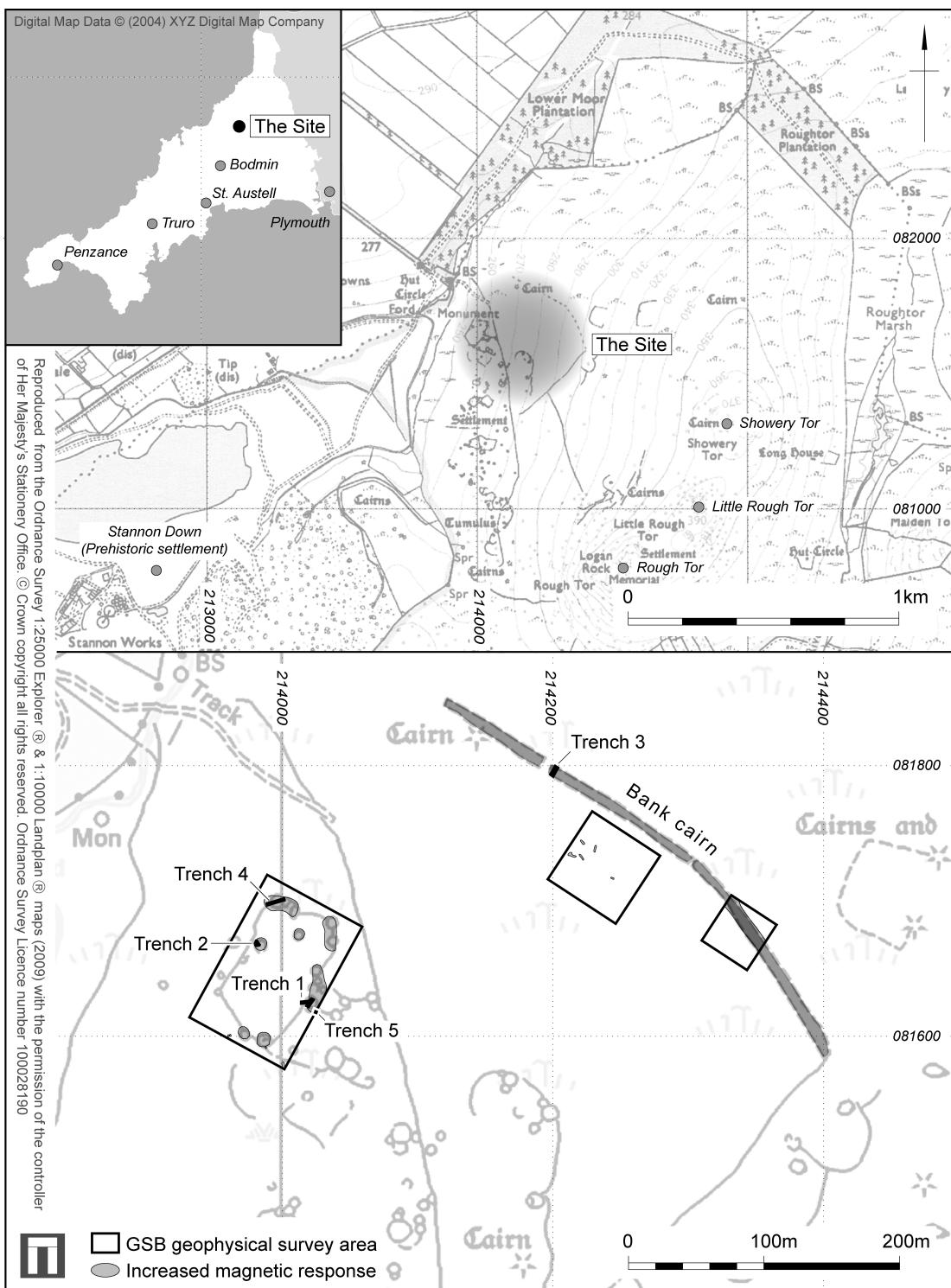


Fig 1 Location map

occupation deposit from which a small assemblage of Trevisker-ware pottery was recovered. This was, in turn, sealed below a surface of flat granite stones which appeared to have been deliberately placed rather than representing randomly fallen rubble. A second occupation deposit of charcoal-rich material covered the stone floor and was itself sealed below natural silting deposits representing the abandonment of the building.

Trench 4 was positioned to investigate a structure (HER PRN 3291.01) that had not been excavated previously and where a relatively high magnetic response was identified in the geophysical survey. The structure appeared to be roughly rectangular, approximately 12m long and 8m wide. The earliest remains identified comprised the dry-stone walls of the structure that were between 0.9m and 1.2m wide. Overlying the natural substrata within the structure was a grey silty loam deposit, which could represent anthropogenic activity or a natural silting episode. This was cut by a shallow stone-lined pit, over 1.3m long, 1m wide and 0.05m deep that contained a very charcoal-rich fill. A sample of this contained numerous fragments of hazelnut shell and several grass seeds of cat's-tail (*Phleum* sp.) and some possible roots or tubers, together with large quantities of wood charcoal. Magnetic susceptibility survey indicated that there was no *in situ* burning and the fill is likely to represent a dump of material burnt elsewhere. A small assemblage of Trevisker ware pottery was also recovered from the pit fill.

The pit was sealed below natural accumulations of material washing into the structure. Partially overlying these was a thick rubble deposit concentrated over the eastern wall. This was interpreted as a possible cairn overlying an earlier structure.

The nature of the structure within trench 4 is unknown and there was nothing to imply that it was indeed a building as no entrance way, occupation layer, flooring or definite hearth was discovered. However it may have been a store or animal shelter. An alternative interpretation may suggest an unusual form of ring cairn overlain by a later cairn.

Trench 5 was excavated outside the settlement to record the natural soil sequence, which comprised a colluvial deposit derived from the rab further upslope, overlain by humic subsoil that was in turn overlain by the modern topsoil. No archaeological features were found in this trench.

Discussion

The search for definitive dating evidence from the bank cairn proved unsuccessful, although flint recovered could date from the Late Neolithic onwards; dating may be inferred by comparison to other similar monuments (below). A radiocarbon date on charcoal recovered from a possible buried soil horizon between the two walls produced a determination of 800 ± 40 BP (Beta-22967), calibrated to cal AD 1170–1280. Thus, either the bank cairn is not of Neolithic date, as its monumental form and the apparent parallels with linear monuments of that period would suggest, or extensive disturbance occurred during the medieval period, resulting in the sealing of a later land surface or deposition of organic material within the structure of the cairn. The latter is considered more likely.

Extensive survey undertaken on the bank cairn (Herring and Kirkham, forthcoming) further examined the monument within its wider landscape setting. They found that the monument was divided into five or six segments. The structure of the monument varies along its length, presumably using whatever raw material was closest to hand. It appears to be largely constructed of material banked around a central dry stone structure.

Trench 3 provided a full section through the monument and revealed it to be constructed of two parallel dry-stone walls infilled with stone rubble, with additional rubble placed against the outer faces of the walls to act as further revetment. This also gave it a more rounded profile and the appearance in places of an earthen bank. Whether or not there are variations in this basic construction method along its length is unknown. Erosion and the robbing of stone for use in later periods has diminished the structure at a number of points along its length. Where it was examined in trench 3 it is possible that its dimensions are close to those of its original construction.

There are no comparable sites on Bodmin Moor but parallels can be made with monuments further afield in Dorset and Scotland. The closest comparisons to the bank cairn in form and possible function are cursus monuments and bank barrows. Though the form of such monuments can differ, the function may have been consistent, directing the movement of people through the landscape, with reference to natural features, the solar calendar or earlier man-made structures or monuments (McOmish 2003; Loveday 2006).

The bank barrow at Maiden Castle in Dorset, one of three such monuments in south Dorset, is, at more than 500m, rather longer than the Roughtor bank cairn, and appears to have been built in three separate sections. Although marking a continuation of the long barrow tradition, burial seems to have had little or no influence in its construction, and it is instead interpreted as forming a symbolic barrier (Sharples 1991, 255–6).

Classification of the bank cairn as a monument type remains ambiguous. This structure potentially had multiple functions, which can only be surmised but probably included that of directing the local population to points within the landscape, and enabling access to them, or as a landscape division.

The evaluation examined two previously investigated roundhouses and a third which had not been excavated. At Stannon, to the west, activity from the Neolithic to the Iron Age has been identified. Re-assessment of Mercer's (1970) work at Stannon, combined with further excavation of structures initially believed to be roundhouses has shown them to be cairns, a number of which were multi-phase (Jones 2004–5; 2006).

The partial excavation of the structures at Roughtor revealed limited information and definitive answers are only likely to be achieved through complete excavation of the individual structures. It is possible that structures in both trenches 1 and 2 were multi-phase. Here rammed earthen floors within the buildings were overlain by occupation debris. The rammed earth floor in trench 2 was replaced by a stone one, although it is unclear how much time elapsed between these phases.

It was from these organic occupation layers that the answer to one of the main objectives of the work at Roughtor came, with the recovery of sherds of *Trevisker*-ware pottery. Previously the settlement had been tentatively dated to the Bronze Age by comparison with the site at Stannon Down and sites on Dartmoor, but the recovery of Middle Bronze Age pottery now provides definite dating evidence from stratified deposits within the roundhouses, albeit not very precise because *Trevisker* ware was in use for most if not all of the second millennium cal BC.

It has been proposed that some of the settlements on Bodmin Moor were associated with transhumance (Herring and Rose 2001, 22) and the environmental evidence here may support seasonality. Despite the quantity of wood charcoal

and the presence of other seeds, no charred cereal remains were recovered from any of the samples. Cereal remains have been recovered from other Middle Bronze Age sites in south-west England (for example, Straker 1990; 1991; Clapham 1999), and their absence at Roughtor may indeed signify that the site was used seasonally and cereals were not brought to, or processed at the site. However, the occupants may have relied on processed grain and animal products (such as meat, milk and blood) which would leave no trace in the archaeological record. It may be of note that evidence for cereal cultivation was found in a pollen core dated to 1880–1630 cal BC in the De Lank valley to the west (Dudley 2005, 19).

Trench 4 was excavated to examine what was thought to be an undisturbed roundhouse. Evidence recovered, however, suggests that the structure may have been a multi-phased cairn. An earlier structure – either a building or a ring cairn – was later overlain by another possible cairn. The outer walls appeared to form a sub-rectangular building. The majority of the houses on Bodmin Moor are roughly circular, although a number of sub-rectangular structures which appear to be buildings have been identified (Johnson and Rose 1994, 53). These structures are mostly square or rectangular in plan with rounded corners, and are often attached to enclosure walls. They have been interpreted as possible store houses, animal houses or tool stores. The position of this structure at the north-western corner of an enclosure fits with these findings.

The fact that no definite central hearth was identified does not necessarily rule out an interpretation as a building and the lack of occupation debris is also ambiguous. The erection of a secondary, decommissioning cairn over the earlier structure may also have involved the clearance of the final occupation debris within the building.

In conclusion, the prehistoric settlement is still only partially understood. More details of form and use were extracted from two roundhouses previously investigated, while one structure initially believed to be part of the settlement may in fact be part of the ritual landscape of Bodmin Moor. Further excavation work is needed to resolve the remaining questions.

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The archive is currently stored at the offices of Wessex Archaeology under the project code 62500 and site code RT 06. It will in due course be deposited with the Royal Cornwall Museum, Truro under the accession numbers TRURI: 2006.23 (trench 3: the Bank Cairn) and 2006.24 (trenches 1, 2, 4, 5: the settlement).

Since this article was written Vaughan Birbeck has sadly died.

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An excavation beside the motte ditch of Launceston Castle

ANDREW J PASSMORE

Excavations within Eyre's Building, Castle Dyke, Launceston, in 2000 exposed a previously unrecorded length of the outer edge of the ditch that separates the motte of Launceston Castle from the town. The upper part of its profile and upper ditch fills were recorded; the ditch proved to be appreciably smaller than expected. Fragments of overlying buildings, probably dating from the seventeenth and eighteenth centuries, and a Victorian mineral water manufactory were also found.

In 2000 Exeter Archaeology undertook a watching brief at Eyre's Building, Launceston (SX 3316 8464), as a condition of planning permission for the conversion of the building into flats. The site lies within the historic core of Launceston; it fronts Castle Dyke, a lane which marks the boundary between properties on High Street to the east and the motte of Launceston Castle to the west (Fig 1).

The excavated area extends behind the rear yard of 4 High Street, a large property close to the centre of the historic town. The house on its frontage is probably of late sixteenth century origin; in the seventeenth century a structure known as the 'Judge's Kitchen' was built behind it. Further buildings were added to the north and east in the seventeenth and eighteenth centuries, creating the footprint of the present site. Eyre's Building was constructed in the first half of the nineteenth century as a mineral water manufactory and warehouse, incorporating the 'Judge's Kitchen' at its south-eastern corner. Other seventeenth- and eighteenth-century buildings were demolished when the factory was built, although some eighteenth-century fabric is thought to survive in the south wall (Berry 1996).

Results

The outer edge of the motte ditch was found approximately 3m behind the street frontage of Castle Dyke (Figs 2 and 3). The ditch fills were recorded in the northernmost part of the site where a foundation trench exposed a section of ditch which was not disturbed by later features (Fig 4; trench 1, section 1). It had a gentle profile, and was exposed to the base of the trench at 0.90m below the natural ground surface; the ditch continued below this depth, and under the western wall of the building. It was infilled with thin bands of silty clays containing fragments of shale, mortar and animal bone (including contexts (515) – (519) in section 1), overlain by a layer of stony clay containing roof slate and mortar fragments, bone and shell (514). The small amount of pottery recovered from this layer and from one of the underlying fills – (511) in trench 2, not illustrated) – consisted of various local south-west English coarsewares, only broadly datable to between 1500 and the eighteenth century, although the absence of industrial wares favoured a date before c 1750. A report by L Higbee on the 24 animal bone fragments recovered from contexts (511) and (514) is deposited in the site archive.

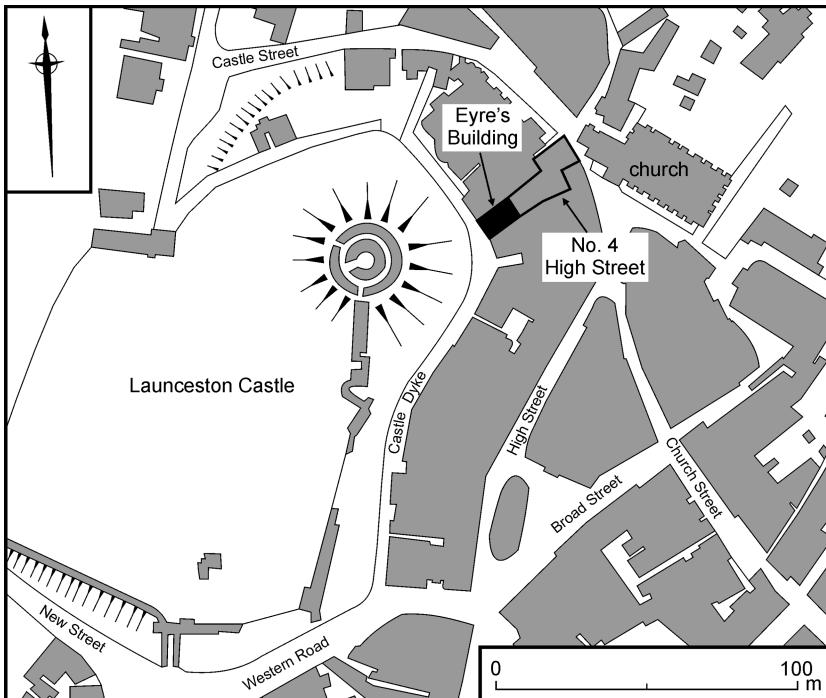


Fig 1 *Eyre's Building, Launceston: location*



Fig 2 *Interior of the building during groundworks.*
(Photograph: Exeter Archaeology.)

Within the area examined, two walls aligned roughly east–west – 505 and 510 – and an associated slate flagstone surface 504 were exposed. One of the walls (510) had been built over the earlier fills of the ditch. Both were cut by Eyre's Building; they therefore pre-dated the

early nineteenth century and probably relate to seventeenth- and eighteenth-century buildings demolished when the mineral water manufactory was built.

Below-ground features associated with the mineral water manufactory consisted of

AN EXCAVATION BESIDE THE MOTTE DITCH OF LAUNCESTON CASTLE

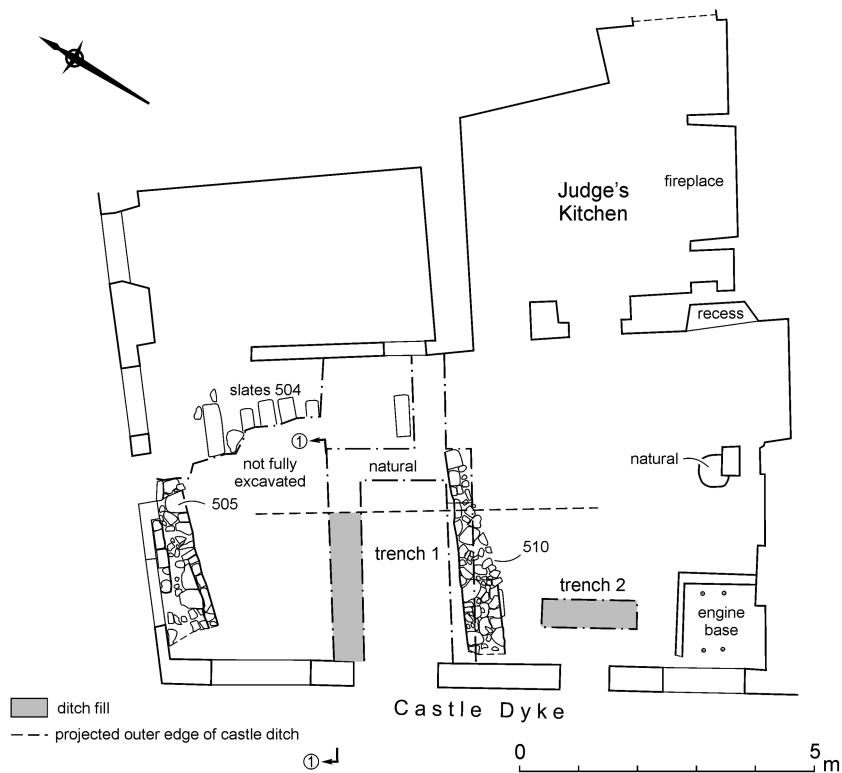


Fig 3 Location of trenches and other features

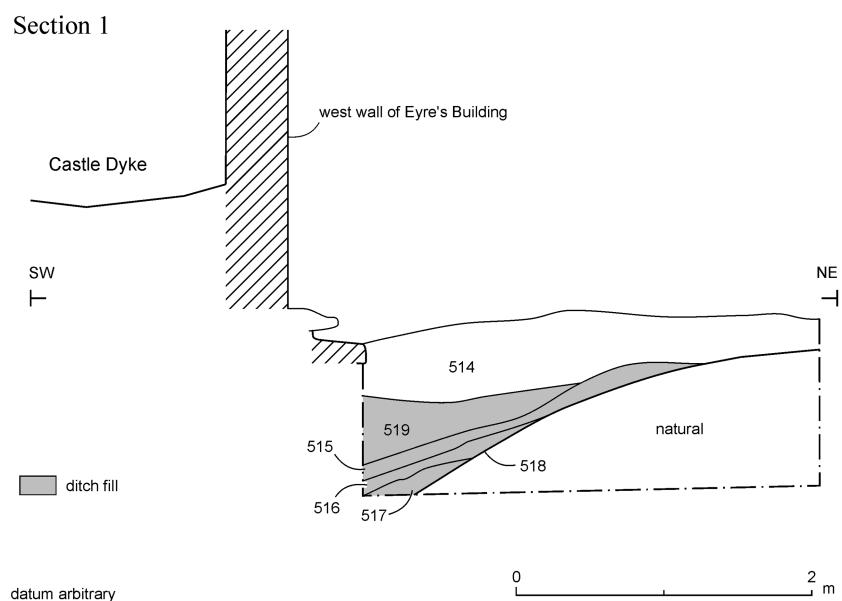


Fig 4 Section across the outer edge of the motte ditch

fragmentary remains of brick walls (not illustrated) and a concrete-lined engine base, onto which huge numbers of mineral water bottles had been dumped (Fig 5).

Discussion

The most significant result of the watching brief was the recovery of evidence that establishes the position and form of the outer edge of the motte ditch of Launceston Castle. This is of some interest, since the excavations at the castle were confined to the area within the ancient monument; that is, the interior of the castle (Saunders 2006). Much, therefore, is known about the bailey defences, but little about areas outside the monument. In 1989 Cornwall Archaeological Unit demonstrated that deeply buried deposits survive outside the north gate of the castle (*ibid*, 242–4), but the motte ditch has not previously been examined. In publishing the castle, Saunders presumed correctly that there would be a ditch separating the motte from the

town, but envisaged (reasonably enough) that it would be similar in scale to the impressive defences on the other sides of the castle; a notional reconstruction suggested a ditch of the order of 20–25m wide (Saunders 2006, 13, fig 1.9). In fact the ditch edge excavated at Eyre's Buildings lies only about 12m from the western side of Castle Dyke, which appears to represent the inner edge of the ditch. A projection of the profile recorded under Eyre's Building would produce a relatively shallow depth for the ditch of about 3m. It is likely that the ditch profile steepens towards its base but nevertheless, given the great size of the other major earthworks of the Norman castle, both the width and depth of the ditch appear to be rather more modest in scale than might have been expected.

The ditch fills and the overlying layer (514) are broadly datable to c 1500–1750. The top of the ditch, with its rock-cut face, was therefore exposed at least as late as c 1500. A possible context for infilling the ditch is the Civil War of the mid-seventeenth century, when the castle went into decline.



Fig 5 Examples of post-medieval mineral water bottles recovered from the site. (Photograph: Exeter Archaeology.)

Prior to the infilling of the ditch, the rear boundaries of the properties fronting High Street probably ran along the edge of the motte ditch; this was, for example, the line of the south-west wall of the Judge's Kitchen (Fig 3). After the ditch was infilled, a street (Castle Dyke) was laid out over its course, and new buildings were erected on the new street frontage. The overlying walls 505 and 510 probably formed parts of seventeenth- or eighteenth-century buildings, and may have been associated with 'Mr Medland's Yarn House', documented in 1764 (Berry 1996).

Acknowledgements

The work was commissioned by Mr D Bass at the request of North Cornwall District Council. I am

grateful to Tony Ives of Exeter Archaeology for his work on the figures.

The site archive and finds from this project, including an example of each type of bottle found, have been deposited at the Lawrence House Museum, Launceston

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Pottery and tiles from Godolphin

JOHN ALLAN

with contributions from MICHAEL HUGHES and CYNTHIA CRAMP

The collection of ceramics from Godolphin House includes late fifteenth- or early sixteenth-century maiolica from Montelupo, Tuscany; arista tiles and a lead-glazed lebrillo from Seville; sgraffito-decorated pottery from Beauvais, France, four series of Low Countries tin-glazed tiles spanning the late sixteenth to early eighteenth centuries, and North Devon floor-tiles, probably of seventeenth-century date. The paper discusses their attribution and dating; Inductively Coupled Plasma-Atomic Emission Spectrometry is used to establish the places of production of some pieces. The finds illustrate something of the exotic material culture of the house in the sixteenth and seventeenth centuries.

When the National Trust bought Godolphin House (NGR SW 601 318; Fig 1) in 2007 it also acquired its miscellaneous collection of ceramics and other artefacts, gathered over many years in the course of excavation in the gardens and conservation of different parts of the building. In advance of the preparation of a Conservation Plan for the house, the writer was invited to comment on these objects by Shirley Blaylock, the Trust's Regional Archaeologist for Devon and Cornwall. Among them are various classes of finds which are either rare or otherwise unknown in Cornwall. The paper offers a catalogue and discussion of this material.

Montelupo maiolica (Fig 2)

1a, 1b. Found in the 'King's Garden' by John Schofield. Two maiolica sherds, both with a fine pale buff fabric lacking obvious inclusions: one from the centre of a flat rim whose upper surface is painted with a rich blue floral pattern within an oval frame, the other from the inner face of the vessel at the junction of the rim with the wall, also with rich dark blue painting, with a single horizontal band of orange between blue lines. Visual examination alone could not determine whether one or two vessels are represented; Dr Hughes' analysis

(Appendix 1) shows that two vessels are almost certainly present.

The sherds come from a form of Italian maiolica dish with a deep central well, a broad flat rim and a hollow base (Berti 1998, 414: '*piatti scudelliformi a larga tesa con piede umbonato e piano*'; profile of an example from Paul Street, Exeter, shown here, Fig 2, 1c). The rim is painted with part of a band of ovals enclosing rhombs, one of the most popular patterns of the Montelupo kilns in the period c 1480–1520 (Fig 2, 1d; *ibid*, 121–2, type 26, *fascia con ovali e rombi*).

Since the *ovali e rombi* pattern was also produced at Montelupo in the late sixteenth and early seventeenth centuries (*ibid*, 358, group 53, no 269), the possibility should be considered that the Godolphin vessels are of later date, but this can probably be dismissed. Dishes in this later style were certainly imported into south-west England, as the finds from Castle Street, Plymouth, illustrate (Gaskell Brown 1979, 77, fig 26, nos 200–1 and sherds from at least three other vessels; for their dating see Allan, forthcoming). The painting of these later vessels is, however, generally sketchy, with washy blues, pale oranges and black outlines; the Godolphin vessel does not show these features.

Although Montelupo-type maiolica arrived in some quantity in south-west England in the period

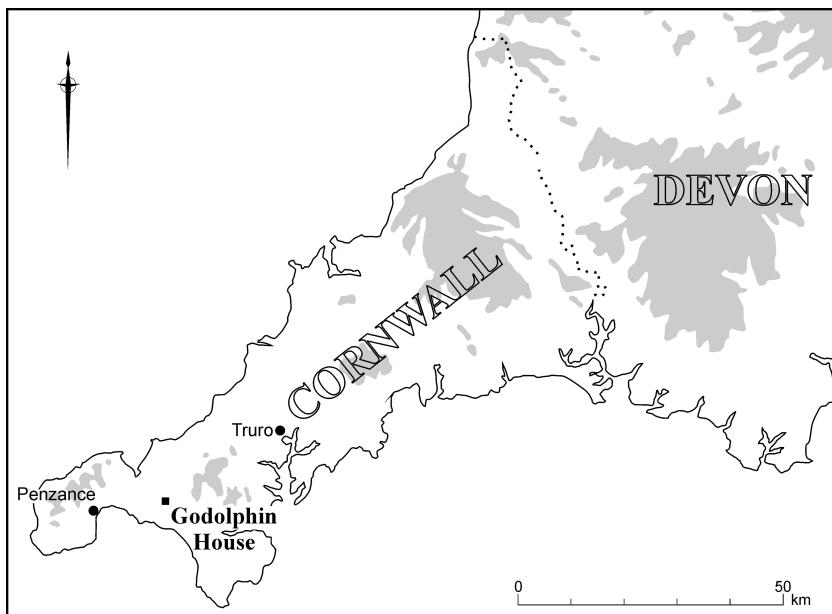


Fig 1 Godolphin:
location

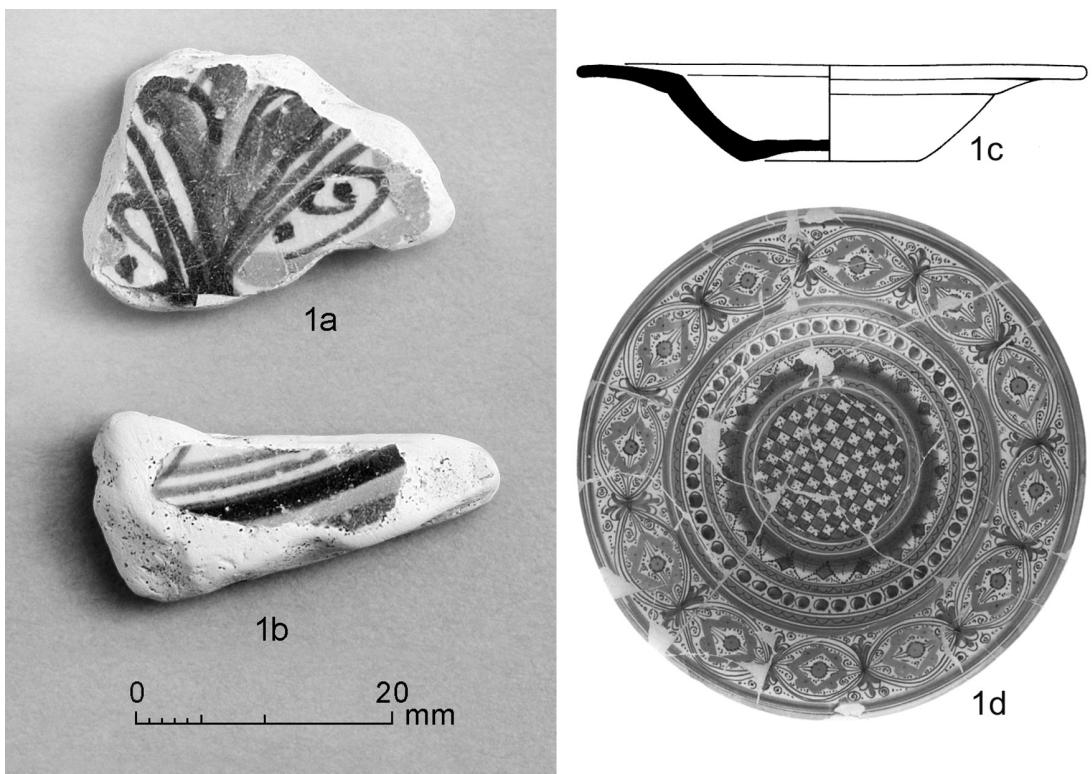


Fig 2 Montelupo dish: (1a) rim sherd; (1b) wall sherd; (1c) vessel form represented; (1d) an example of this style of painting from Montelupo. (Photographs (1a) and (1b) Gary Young; (1c) drawn by Jane Young; (1d) courtesy of F Berti and the Museo Archaeologico e della Ceramica di Montelupo.)

1570–1630, earlier finds are less common, and this is the first example recorded from Cornwall. Elsewhere in the south west, early sixteenth-century Montelupo sherds have been recorded from Plymouth, Polsloe and Exeter in Devon, and from the abbeys of Glastonbury and Cleeve in Somerset (Allan, forthcoming).

Chemical analysis by Dr Hughes (Appendix 1, samples 1 and 2) demonstrates that both sherds show a chemical composition ‘entirely consistent’ with typical Montelupo wares.

Spanish *arista (cuenca)* tiles from Seville (Fig 3)

2–3. Two examples, both with pale pink-buff fabrics, no 2 unworn, the front with central floral motif, the main leaves with green glaze alternating with small diagonally set leaves painted manganese purple, all on a white ground, the lozenge-shaped frame with an inner pale blue band, a middle honey-brown band over relief decoration, and a purple outer band; green and yellow-brown corner motifs; the back with spots of green glaze. The rear shows traces of bedding in a mortar with sand inclusions. J Schofield’s pencilled note on back reads ‘from King’s Garden, NE corner, fill, 2' 0" [0.61m], drain, 6' 9" [2.05m]’. He recalls that the fragment came from a small hole dug for drainage in the corner between the west range (King’s Room Porch) and stables (J Schofield *in litt* to the author, 25 January 2011). No 3 worn smooth; found by J Schofield ‘in the apron beneath the east window

of the entrance hall, behind the dado panelling of the embrasure ... reused in a context of c. 1790’ (*ibid*).

These tiles are firmly attributable to Seville, since a waster of this design was found on a site in the Calle Pureza, in the city’s potting suburb of Triana, where the immigrant Italian potter and tile-maker Niculoso Francisco operated (Pleguezuelo 1992, fig 16). Francisco (*alias Pisano*) was a major figure in the history of ceramics in Spain, best known for his maiolica tile panels (Ray 2000, 111, 357–62; Graves 2002, 34–5, 56–65). A complete tile found in the River Frome and a fragment from St Werburgh’s church, Corn Street, both in Bristol, are mould matches to the Godolphin pieces; both are now in the collections of the Victoria and Albert Museum (Ray 2000, 369, no 917). Further examples are recorded from All Hallows church, Lombard Street, London (Ray 2010, 88). The design is datable to the period c 1520–38; by the latter year a variant of the design was employed in a tile panel in Seville’s Casa de Pilatos (Ray 2000, 369).

Tin-glazed tiles of this type are not commonplace objects in Britain. In his survey of Spanish tiles imported into England, Bruce Williams (1995, 336) recorded their presence on ‘about 30’ sites in the entire country. Many of the finds are in Bristol and London, but the list also included King Charles’s Castle, Tresco, Isles of Scilly, and Luxulyan church, Cornwall (the last probably a mistake). A high proportion of the sites in England from which such tiles are recorded are ecclesiastical: monastic houses, parish churches or chapels in country houses. For example, at least nine of the 15

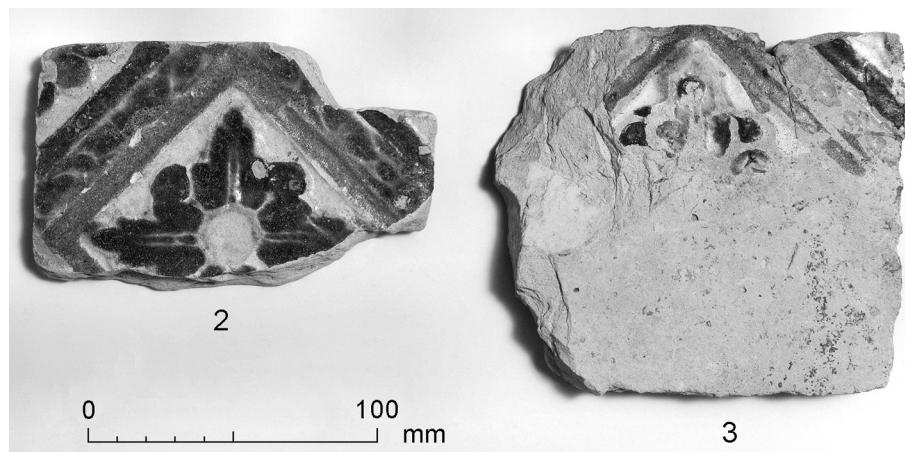


Fig 3 Arista tiles from Seville. (Photograph: Gary Young; reconstruction: Jane Read.)

places with these tiles in an updated list of south-west English finds are ecclesiastical (the churches of Haccombe, West Anstey, Frithelstock and Mary Major, Exeter (Devon; for the last see Allan 1984, no 2933), Glastonbury Abbey (Somerset) and the Lord Mayor's Chapel, the churches of St Werburgh, St Mary-le-Port and the Greyfriars at Bristol). There are also two of unknown status: River Frome, Bristol; Exeter (Williams 1995, 336; for the last see Allan 1984, 228, no 2934). By contrast, only four are from secular sites (King Charles Castle (above) and Star Castle, Isles of Scilly, Barnstaple and Dung Quay, Plymouth (for the last see Allan and Langman 2003, 57, no 83)). Since Godolphin had a chapel, that is a likely context for the tiles.

In view of the Godolphins' connections with London and the royal court, it may be noted that tiles of this type, in common with maiolica tiles from Antwerp, are found in the context of wealthy courtier households. A famous example is The Vyne, Hampshire, where *arista* tiles still survive in the chapel. (This writer concurs with Hurst (1999, 97) in believing that the tiles were probably installed in the house in the early sixteenth century rather than being introduced there in the eighteenth, as suggested by Blanchett (2000).)

The presence of such tiles at King Charles Castle, Tresco, raises a different possibility: that the Godolphin tiles represent re-used monastic spoil. At Tresco the *arista* tiles were found alongside medieval floor-tiles which clearly pre-date the construction of the castle in 1548–54 and must therefore have been re-used there (Miles and Saunders 1970, 27–9). The Spanish tiles are probably about 10–30 years older than the castle (above); they too, therefore, may have been re-used there. If so, their most probable source is a dissolved monastic site, the most obvious candidate being Tresco Abbey, although another possibility is Glasney College, the roofing lead from which is known to have been re-used at Charles Castle (*ibid*, 2). Thomas Godolphin was the Captain of Scilly when the Charles Castle was built (*ibid*, 2); in view of his involvements both at Tresco and Glasney, it is conceivable that the tiles at Godolphin, like those at Charles Castle, were acquired second-hand by him from a dissolved monastic house.

The results of chemical analysis by Dr Hughes (below, samples 3 and 4) are consistent with the attribution to Seville and indicate that these two tiles probably come from a single batch.

Seville *lebrillo*

4. Not drawn: two sherds, 19–20mm thick, from the wall of a large bowl with steeply sloping sides. Pale buff fabric with vesicles and sparse mica inclusions, rich internal copper-green glaze, exterior unglazed. The type, which has a characteristic flanged rim and string marks on the exterior, is attributable to Seville; modern examples are used for washing clothes (Hurst *et al* 1986, 65).

Lebrillos are uncommon in the British Isles: Gerrard *et al* (1995a, 285, 291) listed them on 15 sites in the British Isles, mostly single vessels. An example from Plymouth shows that the type was already arriving in south-west England by the mid-fifteenth century (Allan and Langman 2003, 52, no 9) but the main period of their export to Britain seems to have been the sixteenth and seventeenth centuries (Hurst *et al* 1986, 65).

Beauvais sgraffito-decorated slipware (Fig 4)

5. Base of a vessel with a fine white fabric, the upper surface with brown slip and weathered remains of both line and combed sgraffito (the latter including four concentric rings and three curving fragmentary lines radiating from the centre), with no surviving glaze; the back unglazed. Probably from a dish with floral decoration (*cf* Fay 1973, 28–32; Hurst *et al* 1986, 108–16, nos 160–4; for Southampton examples of the type, Brown 2002, 64, fig 26, nos 26–7). The type dates to the end of the fifteenth or early sixteenth century (*ibid*).

Further examples of this type of imported ware have been found in west Cornwall in recent years at Crane Manor, Camborne (Fig 4; I am grateful to Richard Anderson, the excavator, for showing me this vessel in 2007) and at Glasney College, Penryn (excavations by Cornwall County Council Historic Environment Service in 2003).

Late sixteenth-century Dutch tiles

According to John Schofield, whose family formerly owned the house, the tile group 6 (colour plate 11) and tiles 7–9 (Fig 5) were certainly found at Godolphin by his father Sydney before the 1970s; he does not recall their precise provenance. His father acquired the house in 1937.

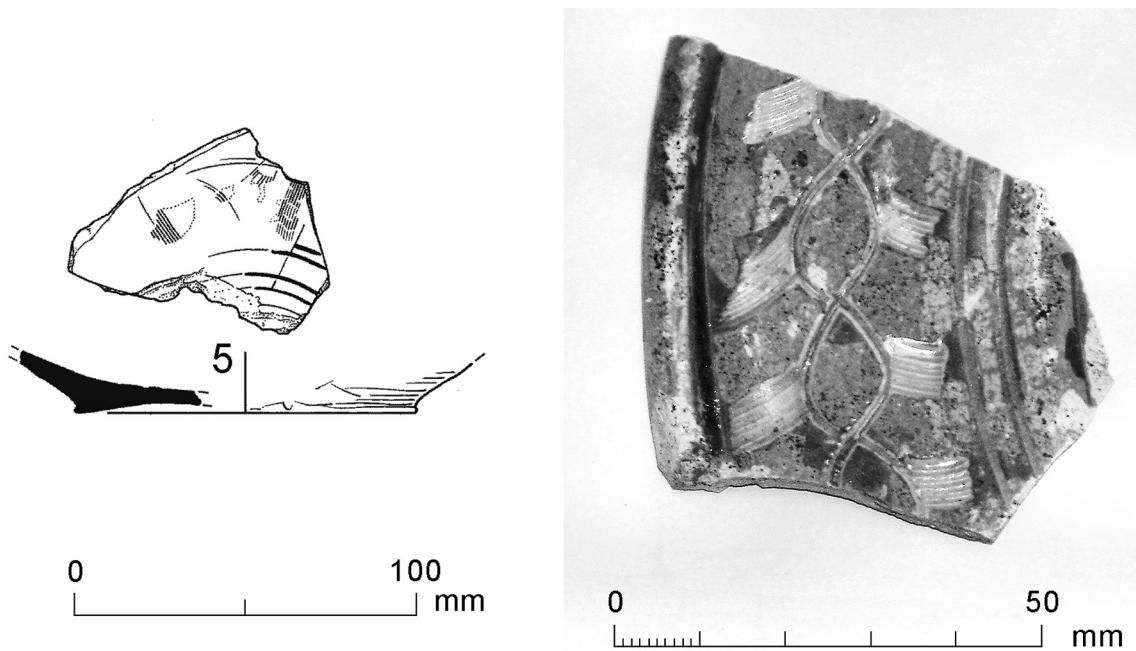


Fig 4 Beauvais single-slipped sgraffito dish, with (right) a similar find from Crane Manor, Camborne. (Drawing: Jane Read.)

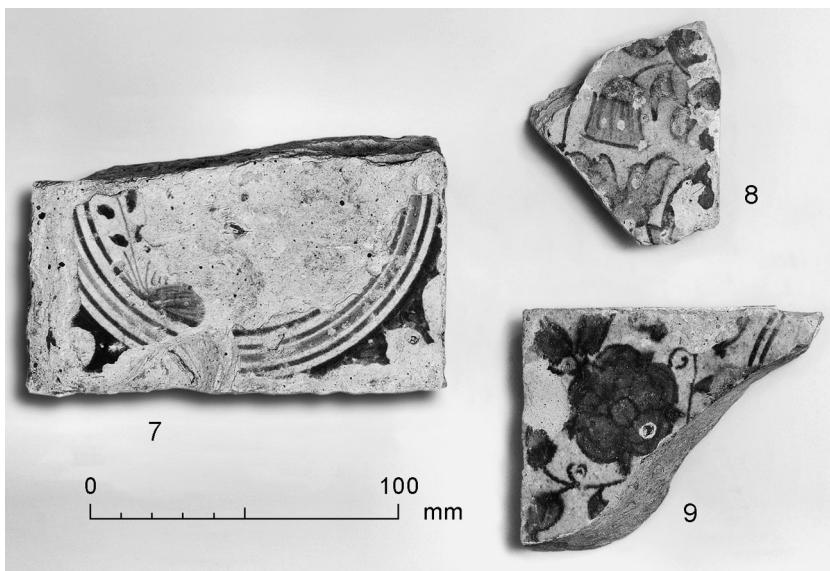


Fig 5 Anglo-Dutch tile medallion and floral pattern, early seventeenth century. (Photograph: Gary Young.)

6. Fragments from at least 10 tiles with buff fabrics, painted with dark blue octagons and outlines, ochre diagonal strapwork and green crosses. The pattern, copied from Spanish tin-glazed tiles, uses motifs in combination to

form a repeating sequence of octagons and crosses (colour plate 11).

Tiles of this type were made at various centres in the Netherlands between c 1560 and c 1620 (Pluis 1998, 200; the nearest match is his design

A.01.02.14 dated *c* 1560–1600 but *cf* A.01.03.25 dated 1580–1600 and *ibid*, 113, panel 2, *c* 1570–1600). Frank Britton suggested that such tiles may also have been made in London (Britton 1986, 174, no 194), and firm evidence that they were indeed produced in the capital has been recovered in recent excavations by the Museum of London at the Pickleherring pothouse in Lambeth (Tyler *et al* 2008, 54–5, D5, D12) and at the Rotherhithe works in Southwark (*ibid*, 84, D1/1–1/3).

The thickness of the Godolphin tiles (14–17mm) is an important factor in considering their date. Between *c* 1570 and the 1630s the typical thickness of delftware tiles in the Netherlands was progressively reduced from about 19mm to approximately 12mm (Pluis 1998, 71). The Godolphin tiles belong somewhere around the middle of this range. A date around 1600 is likely. ICP-AES analysis of two fragments by Dr Hughes (samples 5 and 6) demonstrates that they come from the Antwerp area (below).

Anglo-Dutch medallion tile, early seventeenth century (Fig 5)

7. Fragment 17mm thick, the fabric of mixed white and pink clays (some red streaks), corners painted blue ‘in reserve’ (Pluis 1998, 535), with one orange and three blue concentric bands, the central motif largely lost but a sprig of blue foliage and blue ground lines remain. Nail holes at both surviving corners. Traces of bedding in pure lime putty and sooting round the edge indicate use in a fireplace surround.

Medallion tiles of this style were produced in the Netherlands in the period *c* 1570–1625; a wide range of animals, birds, portrait busts and other motifs was employed in the central motif (de Jonge 1971, pls 9, 12, 21; Pluis 1998, 401, 521, 541–2). They were also made in London (Noël Hume 1977, 55, fig 1, nos 1–3; Tyler *et al* 2008, 54–6, D14/2, 14/3). Again the problems of attribution cannot be resolved on stylistic grounds alone. The results of Dr Hughes’ analysis demonstrate that the Godolphin find comes from the Antwerp area (Appendix 1, sa 8). Further examples of tiles of this type have likewise been recorded only occasionally in Devon and Cornwall. The finest series known to the writer, from Downhorn Farm, Plymstock, Devon, was shown briefly at Plymouth Museum in 1992; its present whereabouts is not known to the writer.

Anglo-Dutch quadrilobe tiles, early seventeenth century (Fig 5)

8. Fragment 18mm thick with fine cream-yellow fabric forming one quarter of a quadrilobe with central floral decoration outlined in blue, the foliage green, the fruit reddish-brown, with orange marigolds, as de Jonge 1971, pl 16c from Delft; Pluis 1998, 207, 279, A.01.03.20–1, A.01.21.01–2, *c* 1600–40.

9. A second piece, 17mm thick, with blue outlines, green leaves and red-brown floral tile with rosette, possibly the same type.

Dutch tiles from the fireplace of the Godolphin Room

10–21. A set of loose tiles showing castles, cottages, windmills and houses on waterfronts, the corners with ‘spider’ (*spin*) motifs, *c* 1700–50. Found during conservation work behind and around the nineteenth-century grate within the fireplace. For their attribution to the Netherlands see Kusters 1981, pl 36–7; van Dam 1991, 101; for examples imported into London, see Betts and Weinstein 2010, 132–5, nos 226–30, 234. Fragments of at least six others are not shown.

22–4. Tiles with houses on waterfronts without corner motifs, context as above (Fig 7).

25. Tile with whale, context as last. One of the series of sea creatures, but the treatment of the corners different from the rest (Fig 7; *cf* colour plates 10a and b).

Colour plates 10a and 10b show the series of tiles now reset at the front of the Godolphin Room fireplace, with fish, walruses and mythical sea creatures: mermaids, unicorns, tritons and others; barred ox-head motifs at the corners. Dutch, *c* 1700, *cf* Van Dam 1991, 81, nos 93–4. As John Schofield has pointed out, the choice of sea creatures would have been especially suitable at Godolphin: the family’s crest was a dolphin.

Many of them were found on the same occasion as nos 10–25 above; they were pieced together and reset at the front of the fireplace, with the best-preserved ones at the top (J Schofield *in litt* to the author, 25 January 2011).

Although the tiles are reset, the fireplace provides a splendid illustration of the visual impact of a chimney piece of this sort (Fig 8; colour plate 10a). It seems likely that both the sea

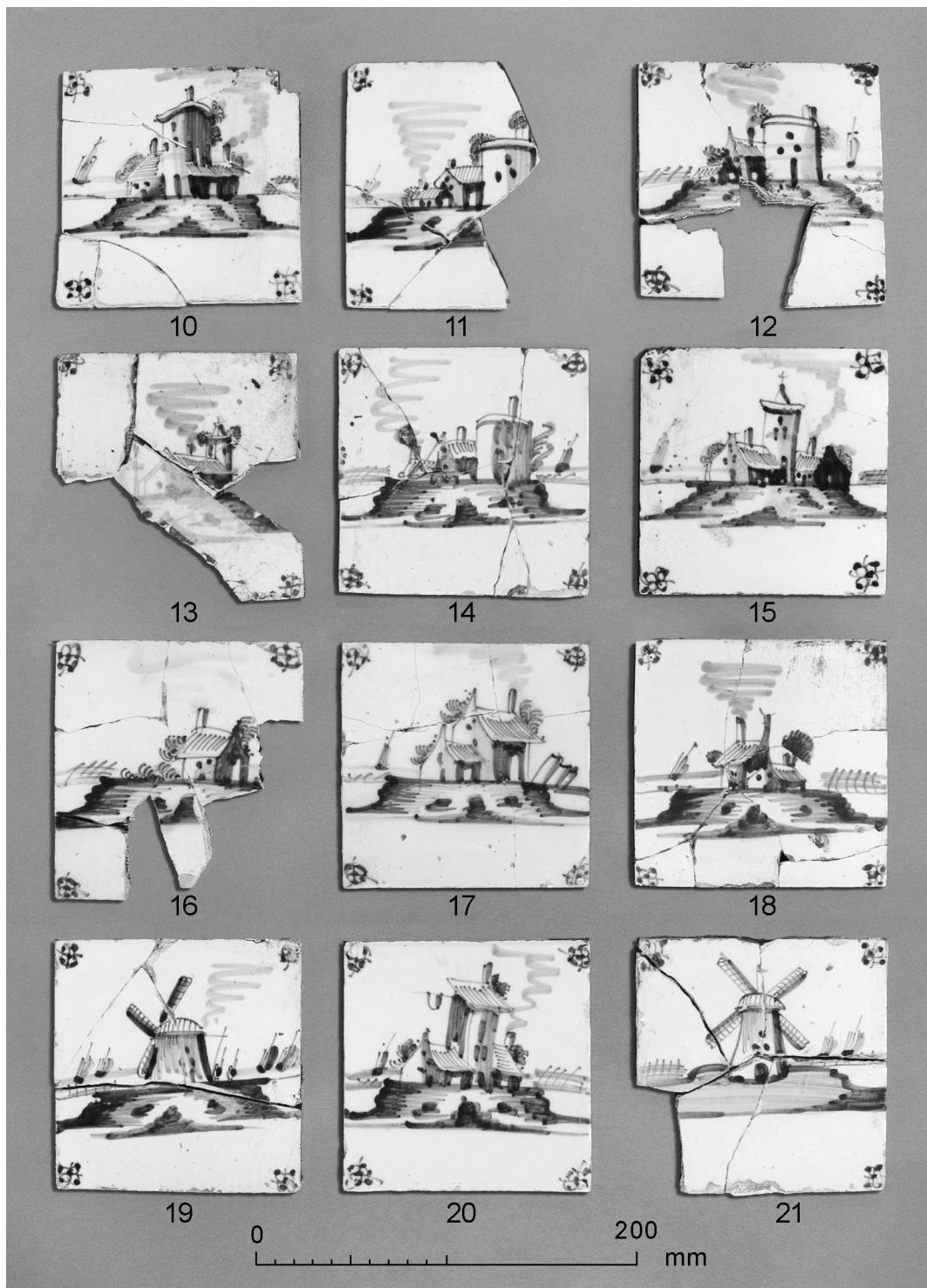


Fig 6 Dutch wall-tiles of c 1700–50. (Photograph: Gary Young.)

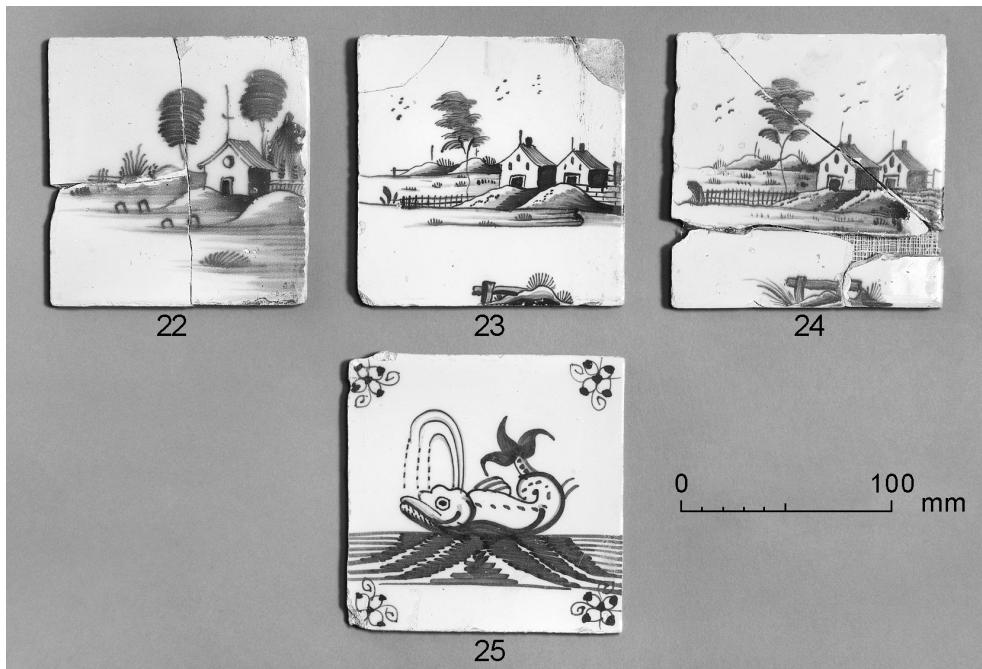


Fig 7 Dutch wall-tiles of c 1700–50. (Photograph: Gary Young.)



Fig 8 The Godolphin Room, Godolphin: the fireplace. (Photograph: David Garner, © The National Trust.)

monster tiles and the landscapes are contemporary with the bolection-moulded fireplace surround of c 1690–1720; there would have been sufficient to line the back and jambs of the original opening. Many of the tiles were broken and were used as rubble when the grate was inserted in the nineteenth century.

Frechen stoneware

Not drawn: rod handle from a bottle, bigger than most. A common import.

North Devon floor-tiles

26–9. Thirty-eight North Devon gravel-tempered tiles and tile fragments (Fig 9). Some, now marked ‘below F14 floor’, were found re-deposited under a late nineteenth-century floor of the entrance hall (as no 4 above). The others, forming the bulk of the collection, were found when a drain was installed in the late 1950s or 1960s and had been dumped in the make-up of the round lawn at the front of the house (J Schofield *in litt*, 25 January 2011). The upper surfaces are almost lost but a few

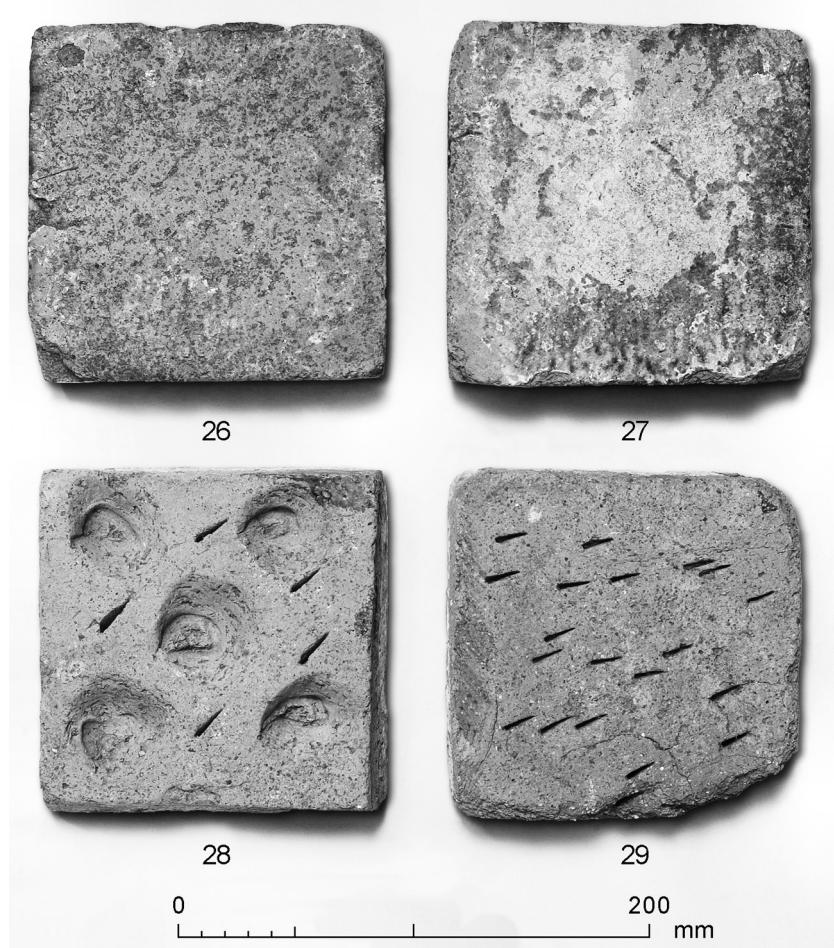


Fig 9 North Devon gravel-tempered floor-tiles: fronts (nos 26–7) and backs (nos 28–9). (Photograph: Gary Young.)

retain traces of slip and yellow glaze and others preserve traces of slip and copper-green glaze (especially where these have run onto the sides, which remain unworn); they could therefore have been used in chequer patterns. Most of the backs show a combination of five keying scoops and knife stabbing, but one tile is simply knife-stabbed. Lengths 148–154mm, thicknesses 33–35mm, bevelled edges, one trimmed diagonally, perhaps lain against a diagonal fireplace.

These finds belong to the series of North Devon gravel-tempered tiles published by Keen (1969), which has been the subject of much recent work by Cramp (2005; 2007). Most are relief-decorated, but a few are plain; for example, at Marwood church, north Devon. Yellow-glazed slip was occasionally employed on relief-decorated tiles (as for example at Bradworthy church: Cramp 2005, 199, fig 22c)

but the use of copper-green in the North Devon potteries is a most unusual feature. These tiles are also appreciably thicker than is usual in relief-decorated tiles; concern that this might cause firing problems may account for the additional stabbing on the back, alongside the five keying scoops normally employed.

Hitherto, the relief-decorated tiles in Launcells church, much closer to the production centres of north Devon, have been the only examples of the series recorded from Cornwall. Plain gravel-tempered tiles were already in production by the early sixteenth century (Allan and Keen 1984, 236, series 2) but the Godolphin tiles, with the remains of their copper-green and yellow glaze, may be of seventeenth-century date or later.

The parallels for these finds are discussed further by Cynthia Cramp (Appendix 2).

Ridge tiles (Fig 10)

30a-c. North Devon gravel-tempered ridge tile fragments, probably seventeenth- or eighteenth-century.

31-2. Ridge tiles of Cornish coarseware, probably seventeenth- or eighteenth-century.

Coarse pottery (Fig 11)

In total, some 108 sherds of coarse pottery dating between the sixteenth and nineteenth centuries were examined, alongside a scatter of sherds of Staffordshire-type white ware. Since they are unstratified they do not merit individual publication. The collection includes 99 sherds of Cornish granite-derived coarsewares from perhaps 50+ vessels; by contrast, there are only

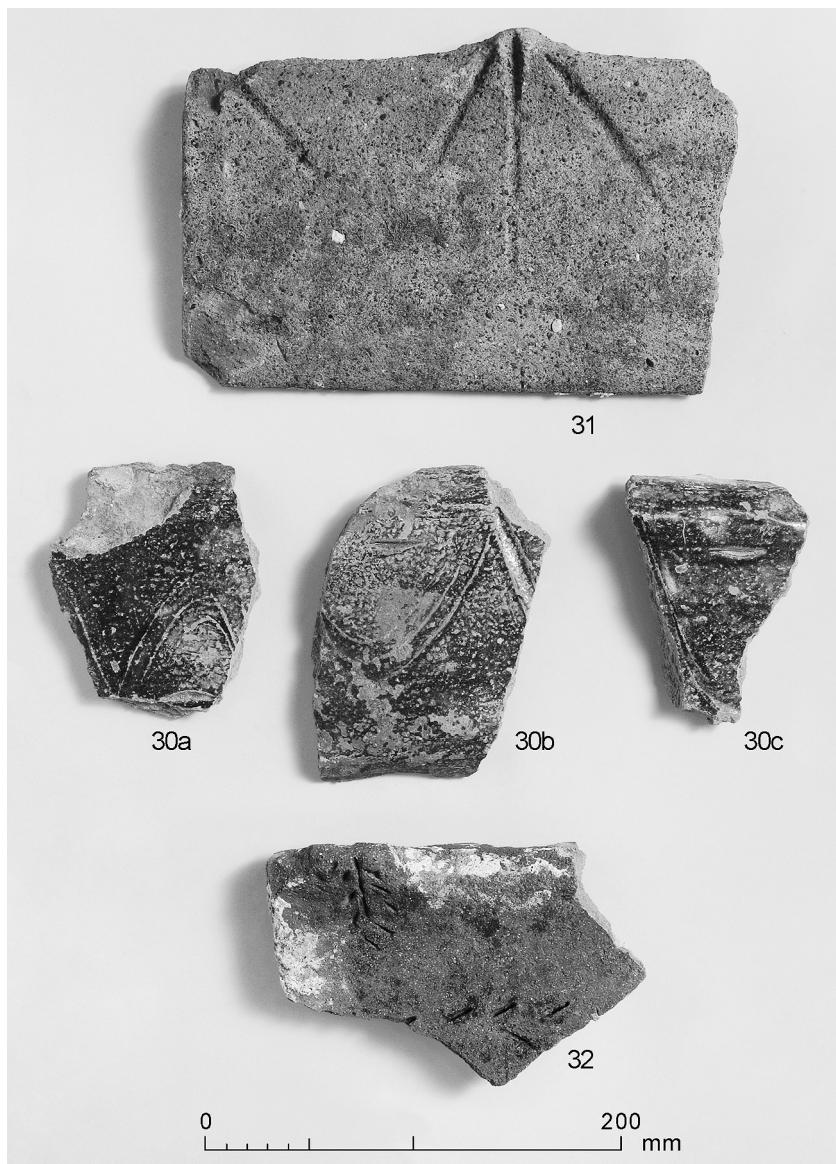


Fig 10 Ridge-tiles from North Devon (30) and Cornwall (31-2). (Photograph: Gary Young.)

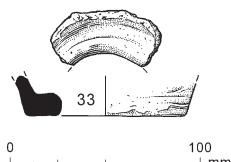


Fig 11 Cornish coarseware rim or base.
(Drawing: Jane Read.)

nine North Devon sherds from eight vessels. It appears, therefore, that local kilns provided most of the coarse pot used at the house. They may have been made in the documented kilns of Truro, Constantine, Mawgan-in-Meneage, Penzance, or elsewhere, but are not specifically attributable to any individual kiln. One sherd is of specific interest:

33. Unglazed rim or base of Cornish coarseware. The form is unfamiliar to this writer; it may have been a flat rim designed to seat a vessel on top, such as an alembic used in distilling.

Appendix 1: Inductively Coupled Plasma analysis of tin-glazed pottery and tiles from Godolphin House

Michael J Hughes

The aim of this project was to identify the place of production of various types of tin-glazed ceramics found at Godolphin House. The samples submitted for analysis comprised two sherds of pottery and six maiolica tiles; three comparative samples were also examined, making a total of 11 samples. The two sherds had been identified (by JA) as wares from Montelupo/the Lower Arno Valley, Italy (samples 1 and 2; hereafter Montelupo). The six tiles selected for Inductively-Coupled Plasma Spectrometry (ICPS) analysis represented examples of each of the types represented at Godolphin. They comprised two *arista* tiles believed to be from Seville (samples 3 and 4); two Dutch/London tiles of the end of the sixteenth century (samples 5 and 6); a seventeenth-century floral tile (sample 7); and one with a circular medallion (sample 8). For the purposes of comparison, two further examples of Spanish tiles from south-west England – an *arista* tile (sample 9) and a *cuerda seca* example (sample 10), both from Exeter – were sampled with the Godolphin samples, alongside another recent

maiolica find from Crediton, Devon. Reference is also made to further examples of tin-glazed pottery from south-west England which have also been subject to recent analysis; these are from Polsloe and Exeter (both Devon), Glastonbury Abbey and Cleeve Abbey (both Somerset).

Analytical techniques

Chemical analysis of the fabric of pottery using ICPS gives a chemical fingerprint and thus information on its source, reflecting the clay from which it was made. For this project, a combination of two versions of ICPS was used: Inductively-Coupled Plasma Atomic Emission Spectrometry (ICP-AES) and the mass spectrometry version of ICP (ICP-MS). The atomic emission version of ICP analyses all the major elements in the ceramic (except silicon), plus a good range of trace elements. The mass spectrometry version complements this with accurate analyses of trace elements present at very low levels in the ceramics which cannot be measured by the atomic emission version, including all the rare earth elements, plus important alkali metals rubidium and caesium, and other important elements such as uranium and thorium. While earlier work on identifying the origins of tin-glazed pottery from London, the Low Countries and Italy used neutron activation analysis (NAA) (Hughes and Gaimster 1999), NAA is effectively no longer carried out in the UK for archaeological projects. However, ICP, especially the combination of the two versions used on the same sample, covers almost all the original chemical elements previously analysed in tin-glazed pottery by NAA except hafnium, plus a much larger range of other major and trace elements, about double the number originally analysed by NAA. Conclusions drawn from the use of such a wide range of elements on each pottery sample are significantly more secure when there are so many elements to take into consideration. This form of analysis also lessens considerably the risk that pottery of different origins but made from clays of similar age and mineralogical make-up could be confused by chemical analysis. In the case of ICPS analysis of tin-glazed pottery from London, the Low Countries and Italy, it has proved important to have the elements measured by the mass spectrometry version available when interpreting the analysis results, as a number of the distinguishing elements previously recognised as

such in the NAA project can only be analysed by the mass spectrometry version.

ICPS analysis

Powdered samples were obtained from the 11 sample items by drilling with a 2mm or 3mm diameter tungsten carbide drill. In addition, the samples sent for ICP analysis included several portions of a Certified Reference Material (NBS679 Brick Clay, produced by the US National Institute for Standards and Technology, Washington DC) spaced out in the analysis batch but without identification to the laboratory as such; these acted as analysis quality control samples. The analysis results on these control samples gave entirely satisfactory results. The powdered samples were analysed at Royal Holloway, Department of Earth Sciences, University of London, using their standard techniques for ICP-AES and ICP-MS. All the ICP results are given in full in Table 1, arranged according to presumed place of production, and including the averaged analyses for selected comparison groups.

Detailed interpretation of the analyses was carried out with multivariate statistics, which simultaneously considers the concentrations of many elements in each sample. For this investigation, Principal Components Analysis (PCA) and Discriminant Analysis (DA) were used (Tabachnick and Fidell 2007); descriptions of their application to archaeology are given elsewhere (for example, Baxter 1994; 2003; Shennan 1997). The SPSS version 15 statistical package was used for this work (Pellant 2007).

Results and discussion of the analysed samples from Godolphin House

A principal component analysis showed that the 11 samples appear to fall into several chemical groups, as follows:

Montelupo – Lower Arno Valley, Italy: Godolphin samples 1 and 2

Visually these two sherds could have been from either one or two vessels, but their ICPS analysis shows clear chemical differences between them, and it is almost certain that they represent two vessels. Sample 1 has consistently lower amounts of practically all chemical elements compared with

sample 2, except lime which is higher in sample 1 (19 per cent calcium oxide, compared to 12.5 per cent in sample 2). Table 1 compares these two analyses against the average composition of a range of typical Montelupo sherds (including some examples from the ICPS analysis of tin-glazed pottery from Glastonbury). Both samples are entirely consistent members of the typical Montelupo composition.

Recently, a maiolica jar with grotesque decoration from New Street, Plymouth, has been analysed and compared to two samples typical of the workshop of Cantagalli in Tuscany (Curnow, forthcoming). The average composition for the three Cantagalli items analysed differs only very slightly from the average composition of the Montelupo sherds, namely in slightly higher potassium (average 2.36 per cent as against 1.74 per cent), lithium (66ppm / 46ppm), vanadium (117ppm / 82ppm), rubidium (108ppm / 83ppm), caesium (7.1ppm / 5.1ppm), but very similar concentrations for 29 other elements. Three of these elements which differ are alkali metals (potassium, rubidium and caesium), which tend to follow each other in the natural environment. The similarity between the Cantagalli and Montelupo average is not unexpected, given the close geographical proximity of the two centres and assuming that each derived its clay for tin-glazed wares locally at the respective site. No other samples analysed from Godolphin House had a clay chemistry consistent with an Italian origin.

COMPARISON WITH SAMPLES FROM OTHER ANALYSED FINDS FROM SOUTH-WEST ENGLAND

Recently, six examples of ‘Low Countries / Italian’ sherds found in south-west England have been analysed by the same ICPS method. Three were from Polsloe Priory, Devon, two from Queen Street, Exeter, and one from Preston Street, Exeter (Allan 1999, 160, corpus numbers 1–6). Quite remarkably, all six share a very similar clay chemistry signature, very distinctive, and unlike any tin-glazed pottery made in London or the Low Countries. Visual inspection shows that these six do not share exactly the same chemical analysis as Godolphin House samples 1 and 2. In fact they appear to be further examples of the ‘Italian’ version of tin-glazed pottery, first identified in 1999 by chemical analysis (Hughes and Gaimster 1999). Since that initial publication,

Table 1 List of samples from Godolphin House and full set of ICPS analyses obtained in this project, compared with averages of ICPS analyses on ceramics from Montelupo, Seville and South Netherlands Maiolica.

| Sample | cat/ find no. | Al_2O_3 | Fe_2O_3 | MgO | CaO | Na_2O | K_2O | TiO_2 | P_2O_5 | MnO | Ba | Co | Cr | Cu | Li | Ni | Sc | Sr | V | Y | Zn | As | Rb | Zr | Nb |
|---|---------------|-----------|-----------|-------|-------|---------|--------|---------|----------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|------|------|------|
| Montelupo: | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa1 Montelupo | RA15 | 13.9 | 5.20 | 2.11 | 18.96 | 0.60 | 1.16 | 0.39 | 1.55 | 0.14 | 392 | 13.2 | 92 | 64 | 35.1 | 61.2 | 13.1 | 708 | 76 | 30 | 93 | 80 | 73 | 138 | 25.6 |
| sa2 Montelupo | RA16 | 17.1 | 6.68 | 2.15 | 12.54 | 0.73 | 0.83 | 0.68 | 4.12 | 0.13 | 489 | 154 | 122 | 74 | 32.3 | 61.0 | 774 | 83 | 36 | 118 | 36 | 36 | 58 | 58 | 8.6 |
| mean (Montelupo) | s.d. | 13.8 | 5.48 | 2.55 | 19.9 | 0.53 | 1.62 | 0.56 | 1.62 | 0.13 | 454 | 14.7 | 94 | 101 | 45.7 | 60.1 | 13.3 | 702 | 76 | 30 | 105 | 32 | 85 | 96 | 12.4 |
| Spain (Seville): | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa3 Arista tile | RA17 | 13.7 | 5.90 | 2.75 | 15.23 | 0.68 | 2.53 | 0.71 | 0.65 | 0.11 | 490 | 152 | 69 | 55 | 58.2 | 39.0 | 14.0 | 430 | 85 | 25 | 97 | 27 | 95 | 94 | 7.2 |
| sa4 won Arista tile | RA18 | 13.8 | 5.16 | 2.97 | 16.63 | 1.17 | 2.20 | 0.72 | 0.20 | 0.10 | 478 | 14.5 | 71 | 60 | 51.1 | 37.7 | 12.4 | 442 | 73 | 24 | 93 | 26 | 92 | 86 | 7.1 |
| sa9 Exeter 293 Arista tile | RA21 | 11.1 | 4.65 | 2.76 | 18.86 | 0.93 | 2.16 | 0.58 | 0.20 | 0.08 | 379 | 12.1 | 59 | 48 | 46.7 | 30.5 | 10.8 | 389 | 59 | 22 | 80 | 12 | 101 | 76 | 8.6 |
| sa10 Exeter 2934 cuerda seca | RA24 | 14.0 | 5.69 | 2.39 | 4.53 | 0.54 | 2.56 | 0.79 | 0.18 | 0.08 | 450 | 14.3 | 78 | 37 | 32.0 | 37.0 | 13.0 | 207 | 60 | 23 | 85 | 11 | 87 | 99 | 11.6 |
| mean (Seville) | s.d. | 12.4 | 4.84 | 2.83 | 17.3 | 0.81 | 1.93 | 0.58 | 0.50 | 0.08 | 356 | 13.3 | 87 | 65 | 40.5 | 32.6 | 11.9 | 41.5 | 79 | 21 | 86 | 11 | 69 | 64 | 9.5 |
| Low Countries: | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa5 tile | RA19 | 14.4 | 6.59 | 2.04 | 17.8 | 0.29 | 2.61 | 0.74 | 0.37 | 0.08 | 308 | 32.2 | 83 | 40 | 78 | 58.8 | 15.5 | 426 | 107 | 35 | 98 | 17 | 108 | 125 | 11.6 |
| sa6 tile | RA21 | 13.1 | 5.98 | 1.84 | 19.5 | 0.30 | 2.14 | 0.67 | 0.25 | 0.06 | 263 | 21.2 | 68 | 38 | 65 | 47.7 | 13.5 | 42.4 | 84 | 31 | 100 | 27 | 96 | 136 | 8.1 |
| sa7 floral tile | RA22 | 12.5 | 5.60 | 1.81 | 21.4 | 0.32 | 2.39 | 0.64 | 0.13w | 0.07 | 257 | 24.2 | 80 | 33 | 67 | 48.4 | 12.8 | 41.3 | 117 | 29 | 85 | 18 | 98 | 127 | 4.7 |
| sa8 circular medallion | RA23 | 11.3 | 4.99 | 1.11 | 21.6 | 0.42 | 2.18 | 0.62 | 0.10 | 0.08 | 314 | 29.8 | 72 | 50 | 38.9 | 10.8 | 43.1 | 90 | 23 | 78 | 17 | 85 | 100 | 10.1 | |
| Cretion Vicrange 1991 45 S | RA26 | 3.01 | 20.7 | 0.17 | 1.28 | 0.50 | 1.81 | 0.12 | 0.12 | 0.12 | 331 | 9.1 | 85 | 42 | 24 | 24.4 | 6.9 | 32.5 | 39 | 16 | 58 | 10 | 50 | 57 | 9.4 |
| North Maiolica (South Netherlands Maiolica) | 11.3 | 4.63 | 1.52 | 18.5 | 0.58 | 1.72 | 0.57 | 0.60 | 0.07 | 319 | 14.7 | 69 | 58 | 43 | 34.9 | 10.9 | 416 | 79 | 23 | 107 | 13 | 86 | 86 | 10.4 | |
| mean (South Netherlands Maiolica) | s.d. | 2.4 | 0.96 | 0.66 | 3.3 | 0.32 | 0.51 | 0.11 | 0.45 | 0.02 | 73 | 6.7 | 15 | 48 | 17 | 12.8 | 2.7 | 91 | 23 | 5 | 65 | 5 | 35 | 41 | 3.3 |
| sample cat/ find no. | | | | | | | | | | | | | | | | | | | | | | | | | |
| Montelupo: | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa1 Montelupo | RA15 | 0.4 | 0.2 | 2.4 | 5.7 | 0.37 | 17.78 | 0.4 | 9.4 | 5.1 | 38.9 | 64.8 | 8.0 | 35.4 | 6.04 | 1.34 | 5.89 | 0.89 | 5.03 | 1.07 | 3.11 | 0.44 | 2.73 | 0.40 | |
| sa2 Montelupo | RA16 | 0.3 | 0.0 | 1.5 | 5.7 | 0.23 | 49.1 | 0.2 | 9.5 | 2.2 | 35.3 | 66.7 | 7.7 | 33.4 | 5.71 | 2.22 | 5.22 | 0.77 | 4.08 | 0.79 | 2.35 | 0.35 | 2.11 | 0.30 | |
| mean (Montelupo) | s.d. | 0.5 | 0.1 | 11.7 | 5.1 | 0.6 | 247.3 | 0.3 | 9.6 | 2.8 | 37.0 | 67.3 | 7.9 | 34.4 | 5.84 | 1.23 | 5.51 | 0.83 | 4.5.5 | 0.92 | 2.77 | 0.41 | 2.52 | 0.36 | |
| Spain (Seville): | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa3 Arista tile | RA17 | 0.5 | 0.1 | 2.6 | 5.7 | 0.54 | 1034 | 1.6 | 9.8 | 5.5 | 34.5 | 64.2 | 7.4 | 33.2 | 5.54 | 1.20 | 5.14 | 7.9 | 41.7 | 0.82 | 2.47 | 0.37 | 2.22 | 0.32 | |
| sa4 won Arista tile | RA18 | 0.5 | 0.1 | 2.5 | 5.7 | 0.23 | 1042 | 1.6 | 9.6 | 5.4 | 34.0 | 64.9 | 7.5 | 32.4 | 5.62 | 1.17 | 5.22 | 0.78 | 4.16 | 0.85 | 2.46 | 0.37 | 2.21 | 0.33 | |
| sa9 Exeter 293 Arista tile | RA21 | 0.3 | 1.2 | 6.0 | 0.19 | 36.7 | 0.7 | 8.7 | 2.3 | 30.9 | 58.4 | 6.8 | 29.4 | 5.09 | 1.04 | 4.66 | 0.71 | 3.99 | 0.75 | 2.26 | 0.34 | 2.04 | 0.30 | | |
| sa10 Exeter 2934 cuerda seca | RA24 | 0.3 | 1.2 | 5.6 | 0.31 | 958 | 0.3 | 10.8 | 2.1 | 38.9 | 73.1 | 8.5 | 36.6 | 6.21 | 1.26 | 5.65 | 0.81 | 4.19 | 0.80 | 2.36 | 0.35 | 2.06 | 0.30 | | |
| mean (Seville) | s.d. | 2.9 | 0.2 | 2.5 | 4.7 | 0.4 | 3622 | 20.9 | 9.5 | 2.6 | 32.9 | 60.4 | 7.2 | 31.7 | 6.01 | 1.23 | 5.19 | 3.57 | 7.2 | 1.99 | 1.77 | 2.6 | 1.77 | 2.6 | |
| North Maiolica (South Netherlands Maiolica) | 5.4 | 0.1 | 3.5 | 0.9 | 0.6 | 2117 | 27.1 | 0.9 | 0.6 | 2.5 | 4.6 | 0.7 | 2.2 | 0.44 | 0.10 | 0.61 | 0.40 | 0.08 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.03 | |
| Low Countries: | | | | | | | | | | | | | | | | | | | | | | | | | |
| sa5 tile | RA19 | 0.4 | 0.1 | 2.1 | 7.9 | 0.15 | 177 | 0.1 | 9.2 | 2.2 | 42.0 | 92.3 | 9.2 | 40.4 | 6.86 | 1.47 | 6.79 | 0.98 | 5.40 | 1.08 | 3.18 | 0.46 | 2.79 | 0.41 | |
| sa6 tile | RA21 | 0.4 | 0.1 | 5.8 | 0.20 | 279 | 0.1 | 8.8 | 2.3 | 38.1 | 67.4 | 8.4 | 36.6 | 6.21 | 1.31 | 5.99 | 0.90 | 4.98 | 0.99 | 2.97 | 0.43 | 2.64 | 0.39 | | |
| sa7 floral tile | RA22 | 0.1 | 30.3 | 7.1 | 0.13 | 98 | 0.5 | 8.5 | 2.1 | 38.3 | 81.4 | 8.4 | 36.9 | 6.22 | 1.33 | 5.98 | 0.92 | 4.98 | 1.02 | 3.04 | 0.44 | 2.70 | 0.40 | | |
| sa8 circular medallion | RA23 | 0.6 | 0.1 | 0.6 | 4.8 | 0.20 | 272 | 0.1 | 8.2 | 2.1 | 33.3 | 92.5 | 7.5 | 32.9 | 5.72 | 1.19 | 6.20 | 0.82 | 4.42 | 0.87 | 2.63 | 0.39 | 2.41 | 0.35 | |
| Cretion Vicrange 1991 45 S | RA26 | 0.2 | 3.4 | 2.5 | 0.26 | 1278 | 1.6 | 6.9 | 2.7 | 26.3 | 49.6 | 5.7 | 23.7 | 3.96 | 0.76 | 3.37 | 0.55 | 2.94 | 0.58 | 1.84 | 0.29 | 1.73 | 0.26 | | |
| mean (South Netherlands Maiolica) | s.d. | 0.6 | 0.2 | 7.9 | 5.9 | 0.4 | 1349 | 0.8 | 9.5 | 2.3 | 34.9 | 68.7 | 7.5 | 33.2 | 5.92 | 1.17 | 5.21 | 0.77 | 3.96 | 0.80 | 2.30 | 0.32 | 2.10 | 0.32 | |
| sample cat/ find no.: | sa1 | 0.3 | 0.2 | 14.1 | 2.2 | 0.4 | 2075 | 1.2 | 1.9 | 0.5 | 7.0 | 16.7 | 1.6 | 7.1 | 1.17 | 0.25 | 1.28 | 0.19 | 1.07 | 0.22 | 0.68 | 0.11 | 0.59 | 0.08 | |

one analysed sherd from Cleeve Abbey, Somerset, has also been identified as having the typical 'Italian' chemistry (Hughes 1998) and another from a ceramic assemblage on the seabed near Kinlochbervie, Scotland, has been identified by ICPS (Vince 2004). The average for these six has also been given in Table 2, and while it has many chemical features very similar to the Montelupo average, it does differ slightly in a small number of chemical elements. From this we conclude that they do not share the typical clay chemistry of Montelupo tin-glazed pottery but do have close chemical similarities. Further investigation of this problem will include standardising the original NAA database of Italian tin-glazed pottery and the 'Italian' sherds identified by Hughes and Gaimster (1999), and then carrying out a statistical analysis to see how these six new analyses by ICPS (and the new ICPS analyses of Montelupo sherds) now compare. One of the sub-groups within the original samples identified as 'Italian' has a clay chemistry fairly similar to comparison sherds of tin-glazed pottery from Siena, and it is possible that the six new ICPS analyses are closer to the Siena chemistry than Montelupo. Others in the original NAA project were linked to various parts of the Arno valley.

The newly analysed samples from Glastonbury Abbey should also be mentioned here. One is a Montelupo net dish pattern (sample 3, P20) whose chemistry is quite consistent with other Montelupo ceramics and therefore matches the origin identified on visual grounds. Two other samples from the abbey also seem to have Italian clay chemistry (Montelupo / Lower Arno Valley bowl P94A/1 sample 1 and P94B sample 8) and are quite similar in clay chemistry to each other and to the Montelupo reference ceramics. All the other samples analysed from Glastonbury have proved to have clay chemistry consistent with the Low Countries (below). Although some definite examples of medieval Spanish ceramics are also present at the abbey, no further examples were present among the newly analysed sherds.

Spain: Godolphin tile samples 3 and 4, and comparison tile samples 9 and 10

These four tiles all share the same general clay chemistry. In each case the presumed origin is Seville; the chemical similarity of all four supports their common origin. There exist a

significant number of previous analyses by ICPS (by the combined emission spectrometry and mass spectrometry version) of tiles and pottery from Seville, including tiles from Woking Palace (Hughes 2008b). Statistical comparison of the four samples analysed here shows that the two Godolphin tiles (samples 3 and 4) have a very similar clay chemistry, suggesting very similar production (in place and probably also time); they could well have been made in the same production batch. The *cuerda seca* tile from Exeter is quite similar in chemistry to them, while the *arista* tile from Exeter is a little different: it has more lime than samples 3 and 4 but is systematically lower in the concentration of many major and trace elements compared to the other two, and to the *cuerda seca* tile, sample 10. The *arista* tile from Exeter may contain significantly more of a diluting temper – probably quartz – compared to the others. Although the *cuerda seca* tile is very similar to the other three tiles in many elements, it contains only a small percentage of lime (4.53 per cent calcium oxide) compared with the other three (15–19 per cent). However, all four tiles fall well within the chemical range found for Seville tiles and pottery previously analysed by ICPS; for comparison the average is quoted in Table 1.

Low Countries: Godolphin tile samples 5–8 and comparison pottery sample 10

These four tiles share a similar general chemistry which, however, is unlike that of the rest of the Godolphin samples analysed; that is, they do not have the chemical characteristics typical of Italy or Spain. The results of analysis of these four tiles were also compared with the ICP-AES and ICP-MS analyses of the London pothouses (Hughes 2008a); the four were very different in chemistry, so none are London products. The comparison sample 10 from Crediton Vicarage – a sherd of South Netherlands Maiolica – shares all their chemical characteristics. The four tiles (samples 5–8) are therefore indicated by ICPS analysis to be Low Countries products and fall within the range for Antwerp ceramics quoted in Table 1.

Discriminant analysis of a combined dataset consisting of the analyses of delftwares from five London pothouses, all the Low Countries reference sherds and tiles, and the Montelupo and Italian maiolica previously analysed by ICPS, showed that the four tile samples 5–8 and the Crediton

Vicarage sample 10 were all closest chemically to the Low Countries reference group, confirming the visual comparison of their analyses against such reference groups.

This was followed with a comparison using Principal Components Analysis (PCA) between the analyses of the Godolphin samples and those of all the earlier ICPS analyses available of South Netherlands Maiolica from various projects. These latter analyses had been carried out with ICP-AES without the benefit of the extra elements from mass spectrometry, so involved a comparison based on a smaller number of elements than used for the Godolphin samples alone. The results of this analysis are plotted in colour plate 13, which shows the second and third Principal Component. Individual samples are identified below. This PCA analysis confirmed that all four tiles 5–8 (= RA19, 21, 22 and 23 in colour plate 13) fall in the centre of the chemical range of typical Low Countries products. Specifically, they are very similar to Antwerp products analysed previously, including decorated tiles from Hill Hall, Essex (Hughes 2009; filled red circles in colour plate 13), two tiles from Jeffrey Street, Edinburgh, which have definite physical characteristics of Antwerp products (colour plate 13, JSE19 and 21; Hughes, forthcoming), a Herkenrode-type tile from Abbey Rameyen, Belgium (R1 in colour plate 13) and a sherd from Cleeve Abbey (deposit 534, = colour plate 13, CA1, below R1) identified as an Antwerp product (Hughes 1998). The sherd from Crediton Vicarage (colour plate 13, RA26), analysed as a reference ceramic to compare against the Godolphin samples, was also close to the four analysed tiles from Godolphin. The close similarity in clay chemistry of the four tiles may indicate that they belong to the same production batch.

The results on the four Godolphin tiles were compared visually to previous analyses from the NAA project on Low Countries ceramics (Hughes and Gaimster 1999). The average NAA composition was calculated for ceramics (biscuit wares) from three production sites in Antwerp, and from Haarlem, Amsterdam and Utrecht. These NAA averages were then converted to be equivalent to ICPS analyses, using analyses of two standard clays which have been repeatedly analysed by both NAA and ICPS and so provided factors for inter-conversion between the two analysis methods (unpublished results). For the

15 or so elements measured in common by NAA and ICPS, the Godolphin tiles were most similar to the average for the Antwerp production site wares.

It is interesting to reflect on previous analyses of Low Countries tiles and pottery. Analyses by neutron activation (NAA) of a selection of ten tin-glazed tiles found in London proved them to have the clay chemistry typical of Antwerp (Hughes 2010). The analyses of all ten tiles were very similar, and a Principal Components Analysis comparing them with reference biscuit sherds from three production sites in Antwerp (Gaimster and Hughes 1999) showed them to be similar to but not overlapping with biscuit wares from a production site at the National Museum of Navigation (NMN), Antwerp (*cf* Hughes 2010, 48, fig 11). It has been possible to convert the NAA data into the equivalent of ICPS analyses. Comparison of the adjusted NAA data with the four Godolphin tiles showed them to be quite similar in clay chemistry to the NMN ceramics for the elements potassium, barium, cobalt, chromium, scandium, rubidium, caesium, thorium and uranium; they are slightly higher than the biscuit wares in the rare earth elements but lower in iron. They are thus not an exact match to the NMN biscuit wares, and neither do they match exactly the ten tiles found in London (they are lower in iron). In addition, five tiles from Broad Arrow Tower in the Tower of London were analysed by neutron activation (Gaimster and Hughes 1999) and also proved to be Antwerp products, but they were lower in iron than the Godolphin tiles. Like the ten London specimens, three of the Broad Arrow tiles proved to be very similar in clay chemistry, while all five fitted within the NAA range for Antwerp products. The sherd from Crediton Vicarage analysed by ICPS with the Godolphin tiles does have a clay chemistry close to the groups of ten tiles from London, the tiles from Broad Arrow Tower, and two stove tiles also found in London; it is closer chemically than the four Godolphin tiles to the production site at the NMN, Antwerp. In summary, where numbers of Antwerp tiles have been analysed, they seem to form relatively 'tight' chemical composition groups for tiles from the same location, or of similar type, but the groups all have slightly different chemistries. These groups would be consistent with production batches at one or more kilns in Antwerp, or perhaps at different chronological periods, each group

having its own chemical signature. The fact that some of these groups do not overlap chemically with the products of the three kiln sites so far studied (Hughes and Gaimster 1999) suggests that other kiln sites may be found in Antwerp with products which match chemically some of these groups identified by analysis. As more analyses by ICPS become available from consumer sites (for example, in the UK), then the patterns of chemical groups may become more apparent. Even in the original NAA project it was clear that definite Antwerp products (pottery and tiles) showed a range of clay chemistry for Antwerp beyond that of the three production sites studied by NAA. It is possible to see an analogy with the recent chemical 'signatures' of different London delftware pothouses (Hughes 2008a).

The new results from the analyses of Glastonbury samples should also be mentioned here: one (a Malling jug P25/3 sample 7 = colour plate 13, RA9) also displays a close similarity to the four Godolphin tiles, to the comparative items mentioned, and to the sherd from Crediton Vicarage (RA26). This is of interest, since it is known that Malling jugs were made in Antwerp. Among the other six samples are two further groups which also seem to be Low Countries products; these will be discussed elsewhere (Hughes, forthcoming b).

General points: some continuing questions

We can identify Low Countries products by their clay chemistry, and many of the finds from consumer sites in the UK are assigned by this means to Antwerp. The NAA database of Low Countries ceramics now needs to be converted to be equivalent to ICP analyses, so that direct comparison can be made between ICP results and this database. Only summaries of the NAA data have so far been converted for this purpose. At the moment, most comparisons of new ICP results are made against the much smaller number of Low Countries ceramics which have been analysed by ICP. There is a limitation to using the NAA database: it has about 15 elements in common with ICP analyses, whereas when we compare ICP results with an ICP database, there are more like 30 elements to compare.

Appendix 2: Plain North Devon floor-tiles in Devon churches

Cynthia Cramp

The Godolphin tiles are unusual among North Devon floor-tiles, not only in being plain but in being slip-decorated and glazed copper-green. Definite examples of plain North Devon tiles (whether plain lead-glazed or slip-decorated) are found far less commonly than the better-known relief-decorated examples: in contrast with the thousands of relief-decorated tiles in the county's churches, only a few are known. The principal examples noted by the writer are described below; all parallels are in north Devon unless stated otherwise.

Perhaps the most relevant parallel is the interesting group in Marwood church, recorded by the writer in 1995 but subsequently closely covered by a fitted carpet; they include several small tiles, among them red-, white-, yellow-slipped, yellow/green- and one red/green-glazed. Four yellow/green-glazed plain tiles, 22mm thick, were also recovered beneath the nave floor of Weare Giffard church in 2009, and several small white slip-coated tiles and others with traces of yellow glaze are to be seen at Poughill church, near Tiverton.

Plain tiles with a simple lead glaze survive at Landcross church, where two such tiles and part of a third are present among relief-stamped tiles. All the relief designs here are thought to be among the earliest and they include some made from stamps which were also used for tiles with inlaid decoration. One whole plain North Devon tile and a large fragment of another are also displayed among artefacts in the small museum in the Priest's Room, or 'Pope's Chamber', above the north porch of St Nectan's Church, Stoke, near Hartland. They are about 140mm square and 25mm deep; the reverse of the complete tile has four large keys, and it is possible that there is another in the centre, covered by plaster. Both tiles also have many small round holes randomly punched into the reverse, some impinging on others.

The other unusual feature of the Godolphin tiles is their great thickness. Such thick tiles were occasionally employed when unusually large tiles were produced, such as the example found by builders at Witheridge church in 1998. Three large fragments of what had been a double tile with four relief stamps, two each of two designs. The

tile would therefore have been four times bigger than usual, measuring 290–300mm square with a depth of 35–40mm. The tiles were initialled, and are believed to have been made by two individual potters, known to have worked together. A second example of such thicker (approximately 35–40mm) North Devon tiles is a small corner fragment with no apparent surface design found among many fragments recovered during repairs to a window sill in the chancel at Westleigh in January 2010.

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The barrack block at Picklecombe Battery, Plymouth Sound

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In 2003 Exeter Archaeology undertook a survey of the barrack block of Picklecombe Battery prior to its conversion to flats. The block was built in 1845–8 and was incorporated into Fort Picklecombe in 1860–4. Although a military building, its exterior was designed in Gothic style to form part of the picturesque landscape of the Mount Edgcumbe estate; by contrast, the interior was Neo-Classical in style. The rooms had been stripped of most fittings, but some retained evidence of their former functions. Differences of finish and detail distinguished the soldiers' quarters from those of the officers.

Picklecombe Battery (SX 4554 5161) and Fort Picklecombe (SX 4555 5153) are two of the most impressive survivors of the formidable group of Victorian defences that protected the naval base of Plymouth. They stand on the western (Cornish) side of Plymouth Sound, overlooking Cawsand Bay, in the ecclesiastical parish of Maker (Fig 1). The fort is positioned on the shoreline, the battery on the steep hillslope about 10m above it (Fig 2). The battery was built in the 1840s; the fort was added in the 1860s.

Both the battery and the fort ceased to be used by the Ministry of Defence (MoD) in 1956. Although the fort underwent a dramatic conversion to modern flats in the 1970s, the battery remained empty until 2003, when it was converted to the same use (Fig 3; colour plate 10). Prior to the conversion, an archaeological survey of the barrack block was undertaken by Exeter Archaeology in order to record the surviving architectural features, surfaces, fittings and other evidence of the building's former use, since much of this evidence would inevitably be lost in the conversion.

Although the barrack had received consideration in the Plymouth Defences Survey in the 1990s, access to its interior had not been possible at that stage (Pye and Woodward 1996). A fuller account

of the structure was therefore prepared, paying particular attention to the interior. It took the form of an architectural description accompanied by a photographic record and annotations to the architect's plans. A record of each room was presented at that stage (Passmore and Parker 2003). This report provides a briefer summary of the principal findings, describing the building as it was in 2003. The structure, like the other nineteenth-century defensive remains on the site, is Listed Grade II.

Historical background

The historical background to the establishment of Picklecombe Battery has recently been described (Pye and Woodward 1996, 43–7; Woodward 1998, 77–86); a brief summary of these accounts is presented here.

Following the completion of the Breakwater across The Sound in 1844, the Inter-Service Committee on Harbour Defences recommended the construction of three new batteries: Picklecombe Battery on the western side of the breakwater, Staddon Point Battery on the eastern side, and Prince of Wales Redoubt (Eastern King) that covered the channel between the

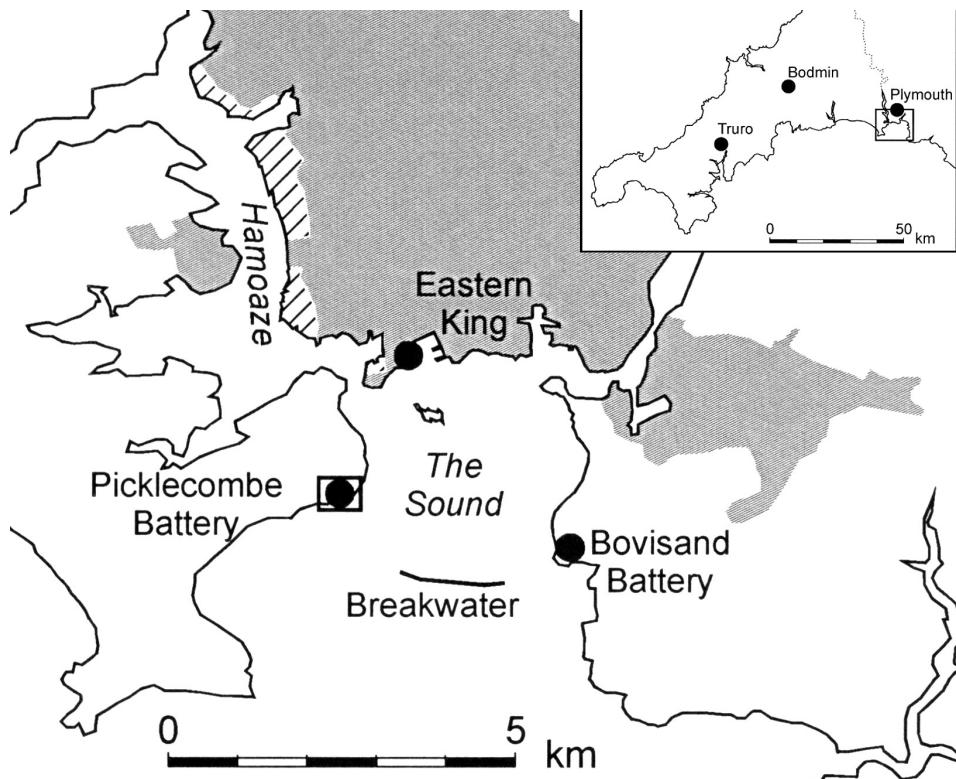


Fig 1 Location of Fort Picklecombe

Hoe and Drake's Island (Fig 1). Construction of Picklecombe Battery had begun by December 1845, when it had 'two towers and soldier's quarters surrounded by a ditch, with an indented armament of three 56-pdr guns and six 32-pdr guns on traversing carriages, with a shot furnace' (Pye and Woodward 1996, 43). A datestone rebuilt into a later entrance gives the date of completion as 1848.

The battery was superseded by Fort Picklecombe, a new two-tier casemated battery constructed on a curved plan close to the shore. The construction of the new fort, which started in 1861–2, may have removed an earlier gun battery sited on a terrace south of the barrack block. The new fort was designed to mount up to 60 guns and would also have contained accommodation.

The barrack block continued in use as officers' quarters and hospital facilities until the release of the fort by the MoD in 1956. The west tower is thought to have been used as a Royal Observer Corps post in the Second World War.

Building survey

The accommodation of soldiers and officers

A military map of 1896 provides information that is fundamental to a general understanding of the building: it labels the main range and west wing as containing soldiers' quarters, with officers' quarters in the east wing (Fig 2; PRO WO 78/2314/17, reproduced in Pye and Woodward 1996, 46, fig 21). This distinction is evident both in the elevations and in the internal construction of the building; it is clear, therefore, that it was intended from the outset. The division is clearly shown in the differing sizes of windows: the eight big windows lighting the south side of the officers' quarters are much the largest in the building. Within, the distinction is evident in the separation of the two areas by a dividing wall on each floor. It is also apparent in the treatment of the internal wall surfaces: those of the soldiers' quarters in the main range and west wing are faced in rough local stone

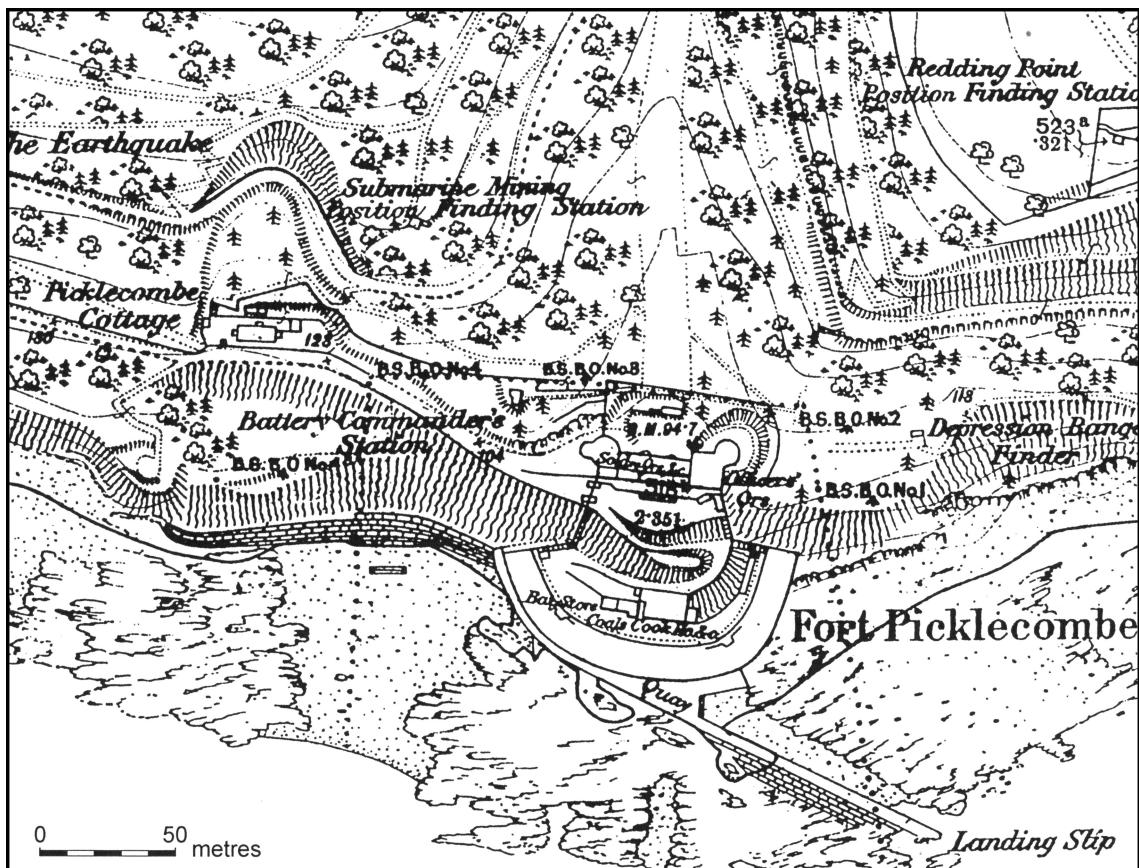


Fig 2 Detail from a military map of 1896 showing Fort Picklecombe (PRO WO 78/2314/17, reproduced in Pye and Woodward 1996, 46, fig 21)

covered in whitewash, with brick being used for structural features such as doorways and ceilings. By contrast, the officers' quarters in the east wing are faced entirely in brick, giving a smooth finish. They too are covered in whitewash, but also with a later thin concrete render which has mostly been removed.

General description

In contrast with the functional character of the fort, the barrack block is designed in the castellated Gothic style, reputedly on the insistence of Lord Edgcumbe, in whose Mount Edgcumbe estate the fortifications were built. It consists of a long narrow two-storey range with projecting wings at the east and west ends and three-storeyed towers attached to the outer corners of the wings (Figs 3–5). The plan is asymmetrical: the more generous space

given to the officers' principal rooms is expressed by projecting this wing forward, and the contrast is emphasised by towers of different form, the eastern one octagonal, the western one circular.

The battery is orientated precisely east-west; the placing of the main windows in the south wall created the maximum light within. An arched veranda extending the whole length of the central section of the building, with an open first-floor balcony or gallery above, also took advantage of the southern aspect. Access to both is from a high terrace, approached by central steps from a broader, lower terrace that probably represents the site of the battery itself.

The outer faces of the building are constructed in local grey Devonian limestone with tooled window and door jambs and drip moulds. The windows have square-headed mullioned frames of stone; to the south the subsidiary internal timber



Fig 3 Modern aerial view in 2009, following conversion of the barrack block. (Photograph: Historic Environment, Cornwall Council; F89-119).

frames have pointed-arched heads, whereas many of those to the north merely conceal narrow vents. The roofs are flat and were originally bounded by crenellated parapets, many of which have been altered.

North elevation

The main range has a central ‘gatehouse’ feature consisting of a central doorway under a chamfered four-centred arch, flanked by slim turrets (Fig 5). The fenestration between the turrets is asymmetrical and may have been altered: a three-light and a two-light window, probably of twentieth-century date, appear to have been inserted into a group of slit windows.

In the west wing a string course separates a row of eight first-floor slit windows from three much larger three-light mullioned windows on the ground floor. The latter are in fact false; they conceal four narrow angled vents within the thickness of the wall. The elevation to the east of the ‘gatehouse’ now appears exceptionally plain, having five slit windows only, but it is rendered and additional openings or detail may have been removed or

obscured. The projecting officers’ accommodation in the east wing is distinguished by groups of large three-light mullioned windows on each floor. The central ones are also false. At roof level the parapet wall is crenellated and at the western corners of the east wing are imitation *guérites*.

South elevation

This has similar details (Fig 6). The large officers’ rooms of the east wing are expressed by very large three-light windows, especially on the ground floor, whereas the soldiers’ rooms in the west wing have a variety of two-light and slit windows, some of which are false. The recessed central section is very austere, with an unbroken flat parapet.

The flanking towers and stairwells have a cordon at first-floor level, with the walls below this battering outwards. The shell of the east tower survives complete and has a crenellated parapet with bold artificial machicolations surrounding a flat roof with an internal brick dome. The tops of the west tower and associated stairwell have been removed. A photograph (Fig 7; first published as Woodward 1998, 83, pl 35), probably dating to the

THE BARRACK BLOCK AT PICKLECOMBE BATTERY, PLYMOUTH SOUND

Picklecombe Battery, Barrack Block
Ground Floor: Plan

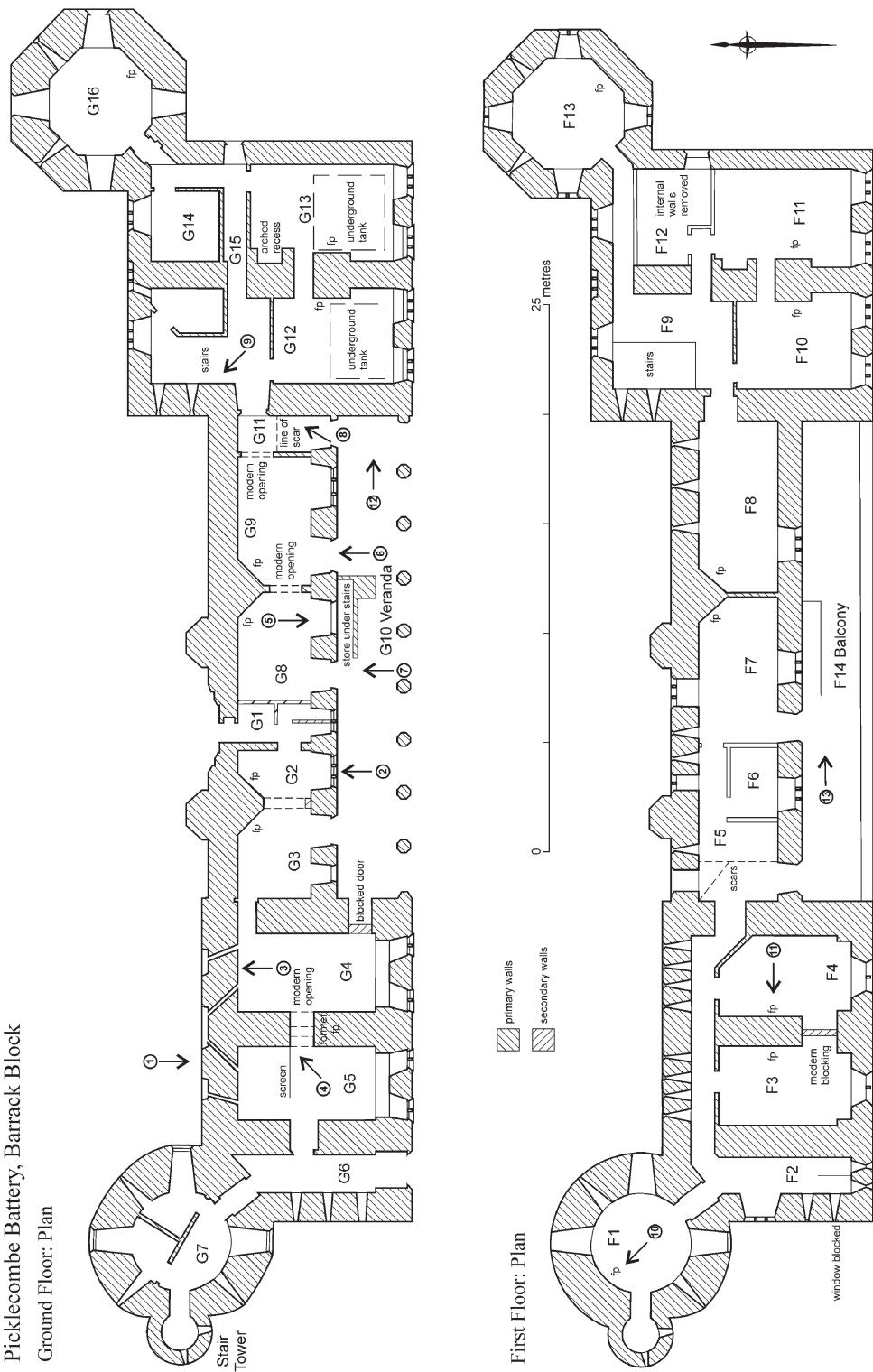


Fig 4 Ground- and first-floor plans, based on initial plans by Keith Cook



Fig 5 The north elevation, (above) looking south east, (below) looking south west. (Photographs: Gary Young.)

second half of the nineteenth century, appears to show the west tower as having a fourth floor, with similar crenellations and false machicolations, the stair turret rising even higher and containing an observation post at roof level.

The eastern end of the building is covered in thick concrete render. This continues across the first floor of the south elevation of the main range,

although the central section has fallen away. This may date to the Second World War.

Interior

Many of the interior floors and staircases have been removed. With one exception (Room G6, replaced in concrete), the floors were constructed

THE BARRACK BLOCK AT PICKLECOMBE BATTERY, PLYMOUTH SOUND



Fig 6 The south elevation. (Photograph: Gary Young.)



Fig 7 Early photograph, prior to demolition of the top of the western tower (courtesy Dennis M Quarmby).

of softwood planks on joists, those at ground level resting on stone piers (visible in Room G12), but some have been removed. With the exception of two casemented rooms which are vaulted in brick (Rooms G4 and G5), the ground-floor ceilings are constructed of closely nailed laths supporting cement render, painted white.

All the main rooms were heated from fireplaces. Only a few (for example, in F1 and F4) retain their cast-iron surround with the inscription 'VR', but many similar fireplaces survive loose throughout the building. The sole intact ceramic fireback (in F3) is inscribed 'ABM STANDARD BRITISH MADE' and features the ABM logo.



a



b

Fig 8 Windows in the guardrooms G2 and G8: (a) in G2, showing original timber frames; (b) the partially blind window in G8. Scales 1m. (Photographs: Gary Young.)

Very few internal fixtures and fittings remain *in situ*. The best preservation occurs in the first- and second-floor rooms of the western wing where some moulded skirting boards, cornices and panelling survive in place. The exterior doors remain *in situ* and are of varying dates and interest, but all the original internal doors have been removed.

GROUND FLOOR

Entrance

The building is entered through a doorway at the centre of the north wall. It has been suggested (Pye and Woodward 1996, 44) that this would have been approached on a drawbridge over a ditch running along the northern side of the building. No structural evidence or fittings for such a feature are present.

G1, G2 and G8: possible guardrooms

The first three rooms entered (G1, G2 and G8, the last two formerly a single room) initially formed a separate unit within the central range, leading only to the balcony to the south, but in the recent past the walls to the west and east have been broken through to provide access to the adjoining spaces G3 and G9. Since both soldiers and officers would necessarily pass through these rooms, they may be presumed to have been guardrooms. They are each lit by a window in the south wall, the one in G2 containing a wooden frame with pointed-arched lights (Fig 8a), the one in G8 with small square windows to the north (Fig 8b).

Rooms G3–5: barracks

On the west side of the range lies a series of rooms, each with independent access from the veranda (Fig 9). Rooms G4 and G5 are vaulted casemates

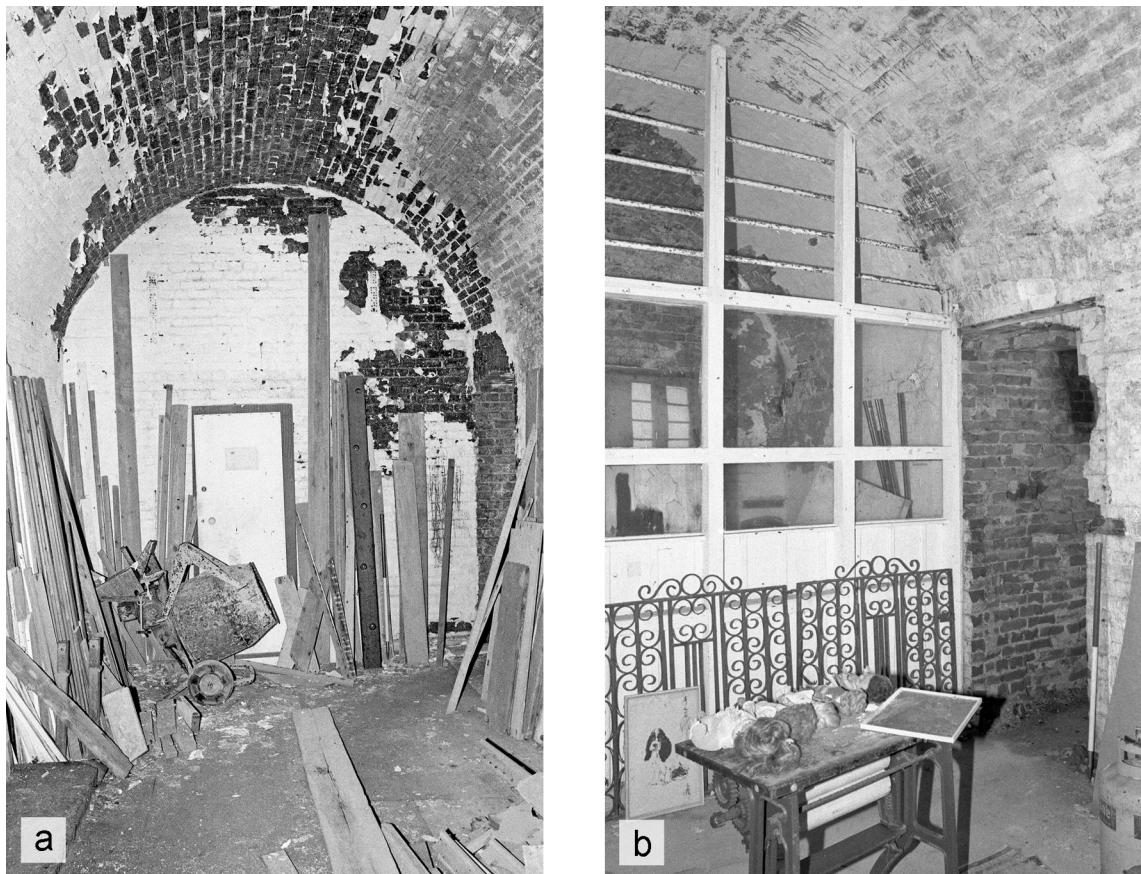


Fig 9 Brick casemates: (a) Room G4 (note blocked vent slits high in the rear wall); (b) Room G5. Scales 1m. (Photographs: Gary Young.)

with walls and ceilings of brick, each with a pair of two-light windows in the south wall and a pair of vertical ceramic vents to the north (visible as loops on the outer face: Fig 10). A projecting step along the south wall of each room may represent a firing platform, later converted into shelving. The wall separating the two rooms was designed with a pair of fireplaces backing onto one another; it was later broken through to form a passage.

Western tower and lobby G6–7: possible former kitchen

The passage G6 is entered via a modern door from the veranda and is lit by three high-level loops. It leads into the ground floor of the west tower G7, which is faced in brick and is divided into three spaces: a corridor to the south and two small rooms to the north, each with a high-level two-light

window and loophole. It is possible that the area was originally a large room (possibly a kitchen) with the walls being inserted to create smaller stores. From G7, a circular newel staircase with a cast-iron handrail rises to the first floor, lit by loops at regular intervals. The stair treads of limestone are grooved on their upper surfaces. There is evidence of shelving brackets under the stairs.

G9: barrack room

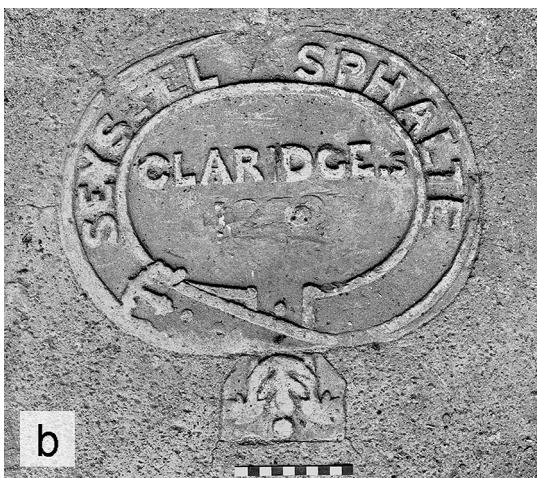
To the east of the central entrance lies a separate room with window and fireplace, also entered from the veranda. Its double doors bear the lettering 'TWIN SIX SECTION OFFICE' (Fig 11a), relating to the later use of the site between 1898 and 1956, when Fort Picklecombe housed (at various times) two 6-pdr quick-fire breech-loading guns (Pye and Woodward 1996, 45).



Fig 10 Partially blind windows in the north wall of the men's barracks, showing vents from G5. Scale 1m. (Photographs: Gary Young.)



Fig 11 The veranda: (a) door into room G9 with lettering 'TWIN SIX SECTION OFFICE'; (b) ceramic sign. (Photographs: Gary Young.)



G10: veranda and terrace

The veranda forms a walkway between the two projecting wings. The balcony above is supported on eight limestone columns linked by four-centred arches. Access to the first floor is by granite steps with a cast-iron handrail. The area beneath the steps was designed as an outside store. The base of

this area is surfaced and incorporates a damaged ceramic sign which would originally have read 'SEYSSEL ASPHALTE // CLARIDGE.s' [number not legible] (Fig 11b). Claridge's Seyssel asphalte [*sic*] was a commercial product based on a mix of limestone and bitumen patented in the late 1830s and widely used in the 1840–50s.

The terrace to the south runs the length of the entire building. It appears to contain some garden features, including raised flowerbeds. Only short lengths of railings survive; they would have been supported by stays set into granite corbels projecting from the wall top.

G11–16: officers' rooms

From the veranda the suite of officers' rooms is entered through a lobby (G11) leading into the large and spacious Rooms G12 and G13, which

probably served as officers' mess retiring rooms. Each of these is heated from a fireplace in the spinal wall between them and is lit by a pair of large three-light windows in the south wall. Their higher status is evident in their superior details: the doorway from G11 to G12 is the only internal opening in the building with chamfered limestone jambs (Fig 12a), and remains of a moulded cornice survive on parts of the east and west wall. In G12 a near full-height arched recess contains sockets for an unknown fixture, with a vent above. Below each floor is a water-storage tank, with a pipe entering from the western side. To the north, an L-shaped corridor (G15) leads into a smaller room (G14) which evidently acted as a service room; fixings for a shelf and a sink suggest that this was a scullery.



Fig 12 The officers' quarters: (a) entrance from G11 into G15 showing chamfered door jambs and change to brick-lined walls on entry to the officers' quarters; (b) site of stairs in G15 showing panelling. Scales 1m. (Photographs: Gary Young.)

Eastern tower G16: possible kitchen

The base of the eastern tower, entered from corridor G15, was lit by four windows (now blocked), with two loops on the northern side. The northern window has a curved recess on one side. The room also contains a fireplace and a cast-iron stove or oven, as well as water pipes and brackets for what appears to have been a sink.

G12: stairwell and latrines

To the north end of room G12 are the remains of a staircase of two flights leading to the first floor (Fig 12b); this must once have been an imposing feature. The lower flight has been removed, but the panelling beneath has been retained. The stairs had an open string, the area beneath each tread being decorated with ornamental brackets resolving into



a frieze of Greek wave ornament across the edge of the landing.

The area under the stairs and the small room to the east both contain water and waste-water pipes and appear to have been used as latrines. They are lit by a narrow loop forming one third of a partially blind three-light window. The water was supplied from a small water tank on the first floor.

FIRST FLOOR

Western tower F1: barrack room

The stair turret in the western tower leads to a room (F1) lit by three two-light windows and two blocked or blind loops (Fig 13). The doorways have moulded architraves, and the windows contain their original wooden frames as well as timber panelling; the northern window also retains its side-opening shutters and a timber step below the window to facilitate their opening and shutting. Against the south loop is a dresser or washstand.

F2: latrines

This brick-vaulted room, which communicates with Rooms F1, F3 and F4, is lit by a three-light window and four narrow loops in the south and west walls, one of which has been blocked. Its original function is uncertain, but latterly it served as latrines, with a partition, since removed, close to the northern end of the room and two cubicles to the south.

F3–6: barrack rooms

There follows a sequence of brick-vaulted rooms (F3–7) which probably served as soldiers' barracks (Fig 14). The two-light windows in the south wall of Rooms F3–4 preserve their original wooden frames. Lath-and-plaster walls divide these rooms from the corridor to the north.

F5–7: barrack rooms

Rooms F5 and F7 were initially lit by three-light mullioned windows on the south and smaller windows and loops in the north wall. One loop visible from the outside of Room F5 and another outside Room F7 are blind and not visible inside. There is a scar to the east of the door from the balcony, indicating that the room was further subdivided by partitions which have now been removed. The corridor section contains a stove vent in the north wall and shelving in the north-east corner.

Room F6 is a later subdivision of F5, its walls being of wooden panels on wooden framing, the western side displaying evidence of fire. The room appears to have been used as a latrine, with ceramic tiles on the walls, sink fixings and a water pipe.

F8–12: officers' barrack rooms

To the east is a separate suite of brick-vaulted rooms (F8, F10–12, and F13) which served as officers' barracks. Their rooms did not communicate with the balcony but were instead accessible from the stairs rising from their mess rooms below. Rooms F10–11 were formerly of high status; they are each

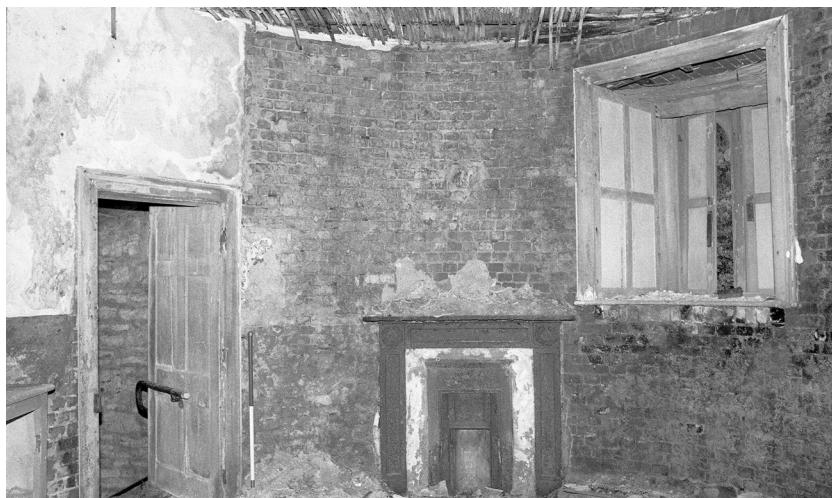


Fig 13 The tower Room F1 showing fireplace and window panelling. Scale 1m. (Photograph: Gary Young.)



Fig 14 Room F4 showing fireplace and cupboard containing blocked door. Scale 1m. (Photograph: Gary Young.)

lit by two three-light windows in the south wall and heated by a fireplace in the spinal wall between them, each with an arched recess and a high-level vent above. Room F12 was formerly a separate room from F11 but the dividing wall between them has been removed.

F13 (eastern tower): barrack room

F13 contains the remains of a two-flight wooden staircase that gave access to the second floor. There is a fireplace in the south-east wall and a number of sockets under the stairs for an unknown fixture.

F14 – balcony

The balcony is approached by an external stair from the covered veranda below (Fig 15a). Since it formed the main means of access to the first-floor rooms F5, F7 and F8 but not to the officers' rooms, it seems to have been designed for the use of soldiers. It is supported by elaborate cast-iron girders resting on eight limestone columns and arches (Fig 6), and upon a metal plate in the south wall of the main building. A surface of stone slabs was then laid over the girders to support the surface of the balcony (Fig 15b).

SECOND FLOOR AND ROOFS

Barrack room (eastern tower)

Timber stairs rising within the eastern tower give access to a room ceiled with a polygonal domed brick vault, with a fireplace in the south-east wall. A door in the south-west wall opens onto the roof.

Barrack room (western tower)

The equivalent room in the soldiers' quarters is entered from the stair turret attached to the western tower (Fig 16), from which a door gives access to the roof. The doorway from the stair turret is panelled and the southern window also retains its internal shutters. The wall contains two openings, probably lamp niches, and a small cast-iron fireplace with a shelf above. The ceiling of this room is a modern replacement following the truncation of the tower.

The stair turret continues upwards, but has been entirely removed above roof level. Like the eastern one, the tower may formerly have had a conical brick vault, concealed within the crenellated parapet.

Roofs and parapet

The roofs are approached by doorways from the two towers. The one over the main building is flat and on a split level, with the part above the eastern rooms at a higher level than the western section. A number of the crenellations in the parapets have been blocked, including those adjacent to the piers surrounding the northern door. The parapet on the east and south side of the raised section has been rebuilt in concrete.

The lower terrace and gun battery

On the southern side of the barracks, steps (Fig 17) lead down to the lower terrace, which was probably more extensive prior to the construction



a



b

Fig 15 The balcony: (a) stair rising from ground floor, with openings in south elevation of main range and a guérite on corner of east wing; (b) underside showing stone flags supported on cast-iron girders. Scale 1m. (Photographs: Gary Young.)



Fig 16 Second-floor room in west tower, looking north west. Scale 1m. (Photograph: Gary Young.)



Fig 17 Lower terrace showing steps to upper terrace. Scale 1m. (Photograph: Gary Young.)

of Fort Picklecombe in the 1860s. This area was originally defined by two flanking walls, the western one described by Pye and Woodward as being 'shown on the c. 1850 print as containing an arched entrance similar to that existing today and three loopholes to the south of it' (Pye and Woodward 1996).

Changes in the fabric of the west wall indicate that its northern section flanking the veranda was retained during the alterations of the 1860s but that the rest was rebuilt at that time, incorporating the earlier 1848 datestone, 'VR' sign and crown over the arch (Fig 18a). Further loops were added, as well as a sentry box inside the gate, which has a small loop on the south side and a brick vaulted roof.

The eastern flanking wall is generally of original 1840s fabric and is continuous with the south wall of the veranda (Fig 18b). Although their relationship is clear, the development of this area is complex, since at least three demolished structures appear to have stood here. First, the remains of a small structure with a flat roof in the north-east corner of the lower terrace appear to be contemporary with the terrace walls. Corbels and

joist holes above the flat roof level may represent an earlier roofline.

Second, the scar of a lean-to with a corrugated iron roof can be seen in the retaining wall of the upper terrace further to the west; an area rebuilt in red limestone within may represent a former lower roofline, and small group of projecting corbels may indicate another early roofed structure.

Finally, beyond this point to the west, the wall retaining the upper terrace turns to project in front of the south wall of the barrack, but the wall has collapsed and is heavily overgrown. An 1870s photograph of this area (Woodward 1998, 83, pl 35) seems to show the top of a large opening – possibly the entrance to an underground magazine beneath the terrace.

After 1896 a new entrance archway was inserted in the eastern flanking wall. Later, concrete lintels were inserted under the arched heads of both the eastern and western openings, allowing their inner ring of voussoirs to be removed and the arches to be raised (Fig 18b). This alteration may have been made to allow access by larger vehicles, perhaps during the Second World War.

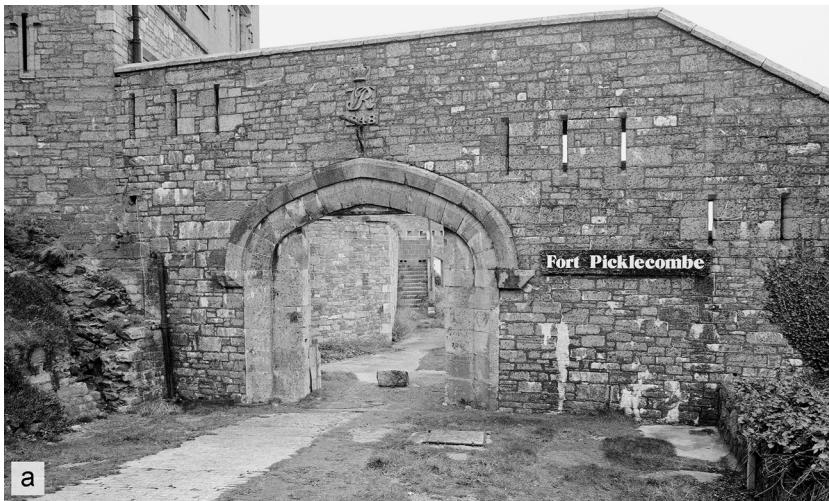


Fig 18 The flanking walls: (a) west (rebuilt), showing entrance to gun battery; (b) east, showing inserted concrete archway. (Photographs: Gary Young.)

Discussion

The barrack block was constructed between 1845 and 1848 to accommodate the soldiers and officers serving the battery, who may have numbered around 80 men (Pye and Woodward 1996, 43–7). The battery itself has been lost, but it is likely that it was broadly similar to the contemporary Staddon Point Battery on the opposite side of Plymouth Sound. This has two accommodation blocks, corresponding with the barrack block at Picklecombe, arranged in tiers above the battery. There were also two towers at Staddon but they were placed beside the battery, rather than being attached to the barracks. As at Picklecombe, the

Staddon barracks are approached by central steps from the main gun platform or *terreplein* below, and the whole complex forms a series of terraces descending the hillside. The original battery at Staddon was superseded in the late nineteenth century by a curving, casemated battery (Fort Bovisand Battery A) but, as at Picklecombe, the earlier buildings were retained and modified as accommodation (Pye and Woodward 1996, 209–10). The hierarchy of the accommodation at Staddon is expressed in the quality of the masonry-facing alone, whereas at Picklecombe this is expressed through the greater size and more elaborate fenestration of the officers' wing in comparison with that housing the men.

The two batteries differ most strongly in their architectural treatment; the contrast is instructive. Staddon is an austere building in no particular historic style, with square-headed window openings surmounted by semi-circular relieving arches. Prior to their partial demolition, its two towers were massive oval or D-shaped structures whose elevations and parapets were entirely unadorned (Woodward 1998, 40, pl 17). By contrast, at Picklecombe the medievalism is full-blooded, although largely ornamental. Its towers, unlike those at Staddon, appear not to have had a significant defensive function. The Gothic treatment of Picklecombe was apparently intended to satisfy the Earl of Mount Edgcumbe, designed to form part of the parkland landscape of his estate (Pye and Woodward 1996, 209–10). The provision of dummy windows in the northern front has no practical explanation and probably represents an effort to present a less severe prospect to those viewing the barrack block from the estate. In particular, it would have been visible from the celebrated carriageway around the estate, from which visitors could enjoy spectacular prospects. The use of towers of differing heights introduced a lively and picturesque skyline of the sort admired in the Gothic Revival. It has been suggested that the building was designed in imitation of Warwick Castle to please Lord Edgcumbe (Pye and Woodward 1996, 43–4; Woodward 1998, 45). Although we have not traced

the source of this statement, this seems entirely credible: the polygonal form of the eastern tower with its machicolations and three superimposed windows is indeed similar to Guy's Tower at Warwick, while the circular form of the western tower at Picklecombe with its machicolations and its projecting stair turret, formerly rising to a higher storey, is strongly reminiscent of Caesar's Tower. The circulation of engravings such as Paul Sandby's view of Warwick (Fig 19) may have been the way in which that castle's features had become familiar to Lord Edgcumbe and could have been readily imitated by the architect.

In contrast to the Gothic exterior, the interiors at Picklecombe maintained the restrained Neo-Classical styling of the early nineteenth century. The stairs featured a Greek wave ornament and the window and doorway embrasures in the better-appointed rooms had elegant shutters and panelling. The fireplaces had simple cast-iron surrounds bearing the monogram 'VR'. Comparable fireplaces were inserted in the nineteenth century into the late eighteenth-century barracks on Drake's Island in Plymouth Sound (Watts and Parker 1999, 7). The hierarchy of the accommodation extends to the interior: rooms within the soldiers' quarters were decorated simply by whitewashing the rough stone and brick walls, whereas the walls in the officers' quarters were entirely faced in brick, which gave a smoother finish for the whitewash and render and

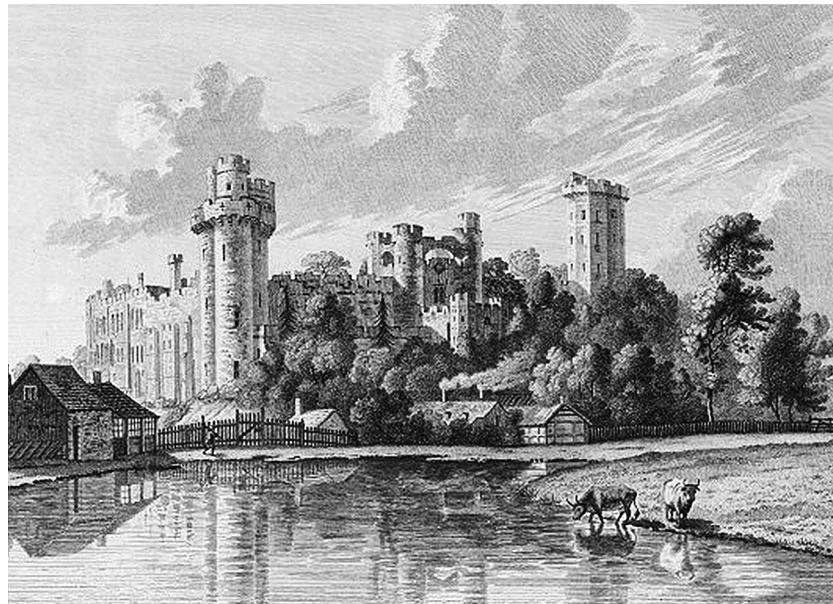


Fig 19 *View of Warwick Castle* by James Fittler, after Paul Sandby, c 1780

allowed the addition of moulded skirting boards and cornices.

The barrack block is a fine example of the use of the castellated style for an essentially utilitarian building. Nevertheless historicism in military architecture was a tendency which increased rather than diminished as the century wore on, culminating in the 1860s in the Neo-Norman gateways of Crownhill Fort, Woodland Fort and Austin Fort, and the late medieval detail of the gateway at Stamford Fort. The barrack block at Fort Picklecombe is an early example of this trend and is a fine, picturesque composition in its own right. It is unfortunate that the architect is not known.

Suggested identifications of the functions of rooms have been presented above. Those in the officers' quarters are easier to identify, especially the well-appointed ground-floor rooms, which through their close association with a probable kitchen and service rooms can be identified as the officers' mess. Many other rooms must have served as accommodation, but the functions of several, especially in the soldier's quarters, have been more difficult to identify, and may have changed over time. It has not been possible, for example, to identify with certainty the site of the original latrines or the original kitchen or cookhouse, which is likely to have been a separate building. The rooms in the towers are also enigmatic; they seem to have been fitted for high-status accommodation, with shutters and panelling to the reveals, yet they also appear to have served as routes to other parts of the building.

Other components of the original group of buildings have been lost. A shot furnace was intended as part of the original battery, but there is no evidence of any such feature in the barracks; it may have occupied a site further south. Likewise, there is no trace of the original cookhouse, whose site is unknown.

In the 1860s, when Picklecombe was enlarged by the addition of the new casemated battery below, the garrison may have been increased to 300 men (Pye and Woodward 1996, 209–10). Some will have been housed at the older barracks, although it is probable that many were accommodated in

the new battery. A replacement cookhouse was constructed behind the new battery at this time.

Later alterations to the building appear to have been minor. In the twentieth century some of the windows were enlarged and replaced, the detail of the parapets simplified by infilling crenellations with brick, and some ornamental *guérites* were removed. The eastern part of the building was then covered with render, possibly to conceal alterations to the stonework. The most significant loss in the twentieth century has been the removal of the upper storeys of the circular western tower; it is uncertain when and why this demolition occurred.

The fort was released by the MoD in 1956 (Pye and Woodward 1996, 43). An unsuccessful attempt to convert it into residential accommodation in the 1990s (*ibid*, 47) seems to have involved breaking down internal walls to improve access through the building. The interiors were partially stripped at that time and remained in this condition until 2003; the barrack was derelict at the time of our survey.

Acknowledgements

The project was commissioned by Keith Cook (Chartered Architect) on behalf of the Fort Picklecombe Syndicate and administered by K Cook and P M Stead (EA). Following an initial site visit by R W Parker, the building recording was undertaken by A J Passmore and G Young (photography). We are grateful to Steve Hartgroves of Cornwall Council Historic Environment for Figure 3. John Allan prepared the text for publication.

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Romano-British activity at Gerrans

FRANCIS SHEPHERD and ANDY M JONES

In January 2010 Historic Environment Projects, Cornwall Council, was funded by ROK to carry out archaeological monitoring at a 1.53 ha former allotment site in Gerrans, in advance of construction of an affordable homes development on the eastern side of the village (centred on SW 87475 35295). The archaeological recording followed an assessment (Lawson-Jones 2009) which identified that although the development was set within an area which in recent times had been used as allotments, it had formerly been medieval farmland and had the potential to contain buried archaeological remains of earlier periods. Full details of the archaeological recording are presented in the archive report (Shepherd 2010).

Archaeological investigations during the soil stripping revealed the remains of several infilled ditches close to the northern edge of the site. Two were aligned north – south and another east – west. They were focused upon what appeared to be a natural hollow measuring approximately 9m by 8m (centred on SW 87441 35336). All of the ditches were truncated and none survived for more than 3m beyond the edge of the hollow. Their lack of conformity with the medieval field system suggested that the ditches may have been of later prehistoric or Romano-British date. It is probable that they had survived in this area because the hollow had protected them from later episodes of cultivation.

The ditches were evaluated by small sondages (small hand-dug trial pits) at the points where they entered the hollow. A small assemblage of sherds of pottery of Iron Age or Romano-British date were recovered from these. It was found that the ditches were well-preserved and survived to a depth of 0.65m. However, the excavation also revealed that there was a greater number of north – south aligned ditches than initially thought. Nonetheless, it was

evident that the ditches were converging upon the hollow.

It was considered that there was the potential for further settlement-related remains, such as a structure, to be located within the hollow. However, the hollow was within a part of the development which was to become a garden and the only impact was to be the construction of a soak-away. It was therefore agreed to preserve the archaeology *in situ* and relocate the soak-away outside the hollow. The site was covered with geotextile which was overlain by layers of subsoil and topsoil.

Following the completion of the fieldwork, carbonised residue was observed on the inside of one of the sherds of pottery and this was sampled and submitted for radiocarbon dating. A radiocarbon determination of 1865 ± 30 BP, 70–230 cal AD (SUERC-29740) (95.4%) was obtained from the residue. This date places activity at the site in the first half of the Romano-British period.

In summary, the archaeological monitoring at Gerrans revealed a complex of ditches that is likely to have been used during the Romano-British period. It is possible that an associated structure of a similar date may have been located in the unexcavated portion of the ditch complex within the hollow. Although there are no known open settlements or enclosures in the near vicinity, it seems likely that there is a later prehistoric or Romano-British settlement nearby. Although the site was only partially excavated these results are significant because they demonstrate the presence of Romano-British settlement activity in an area where it was previously unknown.

The small number of artefacts from the project and the paper archive will be deposited with the Royal Cornwall Museum. The accession number is TRURI: 2010.35.

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The West Cornwall Railway and Cornwall Railway at Highertown, Truro

JOHN R SMITH

The West Cornwall Railway (WCR) opened from Redruth to a temporary station at Highertown, Truro, on 25 August 1852. On 16 April 1855 the branch to a terminus at Newham on the Truro River was opened, and passenger and goods services were transferred there until the opening of the new joint station at Highertown shared by the West Cornwall and the Cornwall Railways on 11 May 1859, accessed by the WCR through the Highertown Tunnel just to the west of the present Truro station. The Newham line was retained by the WCR for goods traffic only, although two passenger trains a day continued to use it until 1863 (Clinker 1963, 9).

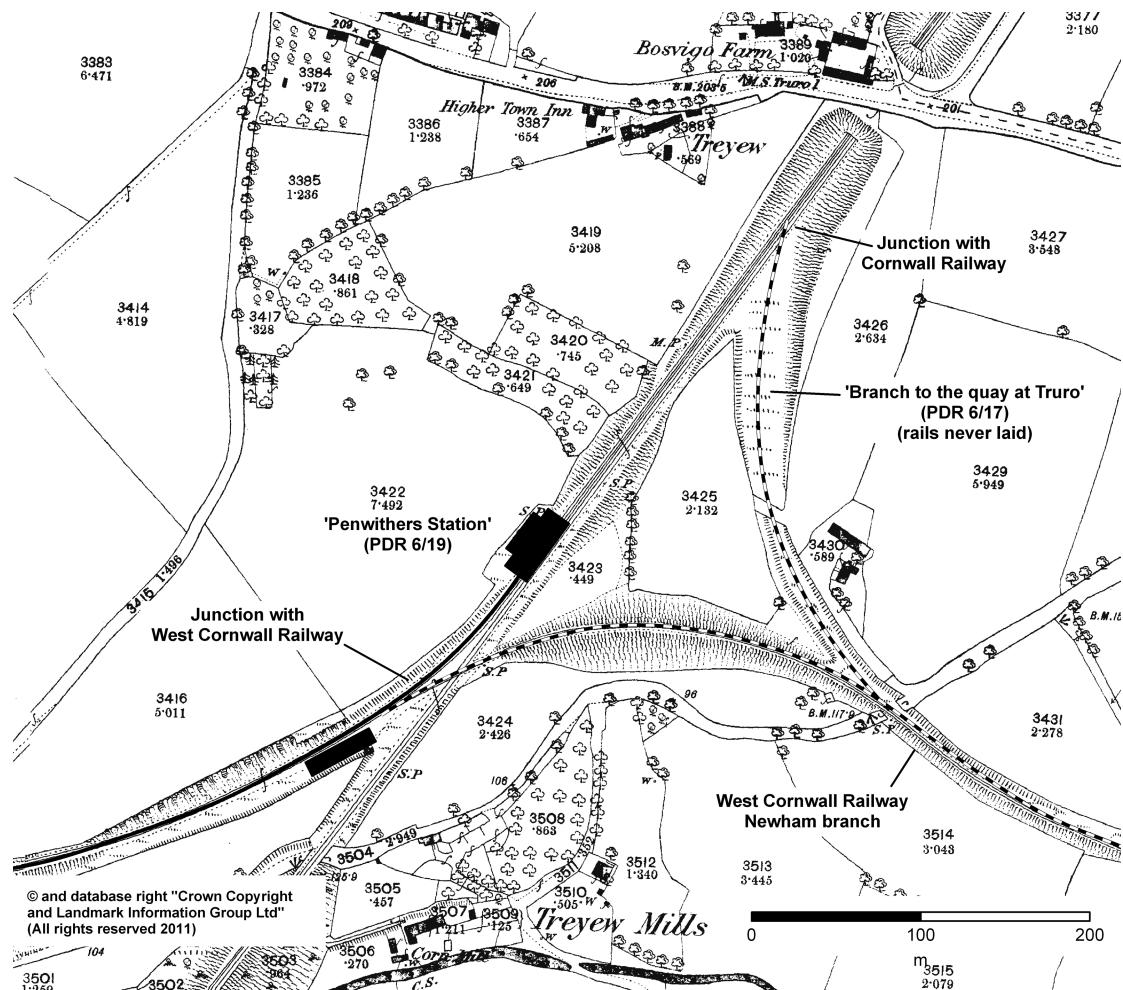
Penwithers Junction, as the place where the WCR Newham branch diverged was known, remained a complex site as the junction both for this line and the Cornwall Railway (CR) Falmouth branch when that was eventually opened for traffic on 24 August 1863 (*ibid*). The line to Newham closed to all traffic in 1971 and has since been converted to a footpath over most of its length. Both the Truro-Redruth and Truro-Falmouth lines remain in use by Network Rail.

Although this historical outline is clear, two aspects of the story have puzzled railway historians and archaeologists alike. Where was the physical site of the temporary WCR station at Highertown, and what was the purpose of an abandoned earthwork cutting and embankment to the east of Penwithers Junction? Documentary research and fieldwork during the spring and summer of 2009 has shed new light on these questions.

Highertown terminus

Several authors make reference to the temporary Highertown terminus, but none gives a precise location. Clinker (1963, 9) notes that 'Only light goods traffic was dealt with at this temporary station . . . owing to difficult road access.' The site of the WCR temporary station had been provisionally identified as NGR SW 81018 44402, based on the 1st edition Ordnance Survey (OS) 1:2500 map. Although the station itself had long been closed by the time the map was published *c* 1880, a rectangular deviation of the railway fence to the west of the line at this point suggested that a platform may have been located there. There was no supporting evidence, however.

Cornwall Record Office (CRO) holds a series of deposited plans for various nineteenth-century railway schemes. These are the copies of the surveys and books of reference which had to be deposited with the Clerk of the Peace for Cornwall in order to be accepted for the Parliamentary session of the following year. In addition to surveys for the Cornwall Railway itself, there are two which are relevant to the Highertown site, CRO QSPDR/6/17 and QSPDR/6/19, both of which are plans for the West Cornwall Railway branch to the quays at Newham, Truro. Although dated in the CRO catalogue for the sessions of 1852 and 1853, the surveys were carried out a year earlier in each case. Both sets of plans depict essentially the same information, but 6/19 is the more useful for this study, having been deposited in November 1852 and drawn up in the same year by I K Brunel and his engineering surveyors.



CRO QSPDR/6/17 shows the WCR line from Redruth as built, and the station is in fact recorded on the site provisionally located from the OS mapping. It is identified on the 1852 survey (CRO QSPDR 6/19) as 'Penwithers Station' and depicted as a rectangular building which covered the line of rails and was approximately 40m in length. On the north-west side of the structure is a smaller rectangular addition. Another rectangular building is shown adjacent to the railway line to the south west; this is not identified and its purpose is unknown.

The eastern loop

To the east of the present Penwithers Junction is an earthwork cutting and low embankment which

would, if rails were laid, connect the Cornwall Railway main line running west out of Truro to the WCR Newham branch. This trackbed was first recorded on the 1st edition 1:2500 OS map of about 1880 and is also depicted on the 2nd edition published *c* 1907. No rails were shown on it in either survey. The cutting and embankment survive intact, although grown-in with semi-mature trees and scrub to the south. Almost midway is an occupation crossing which gives access to the meadow in the middle of the triangular junction. The northern section is now a wildlife reserve. To the south east, at SW 81233 44308, is a bridge which carried the Newham branch over the public road. The present plate girder bridge is not the original but the existing stone abutments and historic mapping indicate that a much wider bridge

once occupied the site. It may well have been a wooden queen-post structure.

This loop is barely mentioned in the standard books of reference relating to Cornwall's railway history. MacDermot is the most authoritative: 'A curve, which may still be seen, to enable trains from Truro to run direct into Newham was formed by the West Cornwall Company but never completed, neither was a broad-gauge rail ever added to the Newham Branch' (MacDermot 1964, II, 150). However, he cites no sources or dates.

Both of the CRO surveys, 6/17 and 6/19, confirm that this eastern loop was an integral part of the original plan for the Newham branch. In the 1851 survey the section for the 'Branch to the Quay at Truro' starts at the Highertown Tunnel 'Junction with Cornwall Railway' and is continuous to Newham, whereas the southern loop and embankment is presented separately as the 'Junction with West Cornwall Railway'. In the 1852 Preamble bound-in with the survey, the WCR sought authorisation to enter into legal agreements with the CR for the working of the branch. An agreement was in fact made with the CR in 1853, as the 27 August Cornwall Railway report to the half-yearly meeting makes plain:

'Satisfactory arrangements having been made with the West Cornwall Railway for the use of their Newham Branch, the bill introduced into Parliament by this Company has therefore been withdrawn, as your Directors believe that all the objects contemplated by it will now be attained' (CRO CN 2733/5).

Newspaper reports of the CR shareholder's meeting earlier in 1853 refer to the Newham Branch as 'The Extension Railway' and the eastern loop has its own title of 'The Junction Railway' (*Royal Cornwall Gazette*, 1 July 1853).

Conclusions

The Highertown terminus of the WCR was located at SW 8100 4440, and Clinker (1963, 21) lists it under the name 'Truro Road'. The WCR timetable for 1852 uses the same title (*Royal Cornwall Gazette*, 13 August 1852). The ground plan on the CRO surveys is precisely the same as the passenger station building erected at Newham in 1855, so it seems reasonable to assume that the Highertown building was similarly a wooden train shed covering the track, with offices and stores to the road face. No road or trackway to the station is recorded on 6/19 or the OS 1:2500 maps, and it would seem that there may have been only a temporary path across the field from the lane to Highertown. As it was a wooden structure, the entire station building may have been bodily removed to Newham and re-used there.

The eastern loop at Penwithers Junction was surveyed for the WCR as part of the Newham Branch in 1851 and 1852, and built under Brunel's supervision in 1854 to 1855. For some reason which remains obscure, the intention to lay rails on it and work the branch jointly with the CR was never realised, although the trackbed and bridge were completed and ready for the permanent way. It has remained unused for over 150 years. Both this and the station site are important historical monuments in the landscape, which bear witness to the earliest days of the building of the trunk railways through Cornwall and are particularly significant because they comprise part of the complex infrastructure where the two companies met.

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Recent work in Cornwall, 2007–10

2007

Historic Environment Service (HES), Cornwall County Council

Landscape surveys

As part of the HEATH Project, carried out in partnership with Natural England (reported in *Cornish Archaeology*, 45, 132–4), two further surveys were completed for Predannack airfield and Lowland Point, and a series of ‘Heathfest’ events – walks, talks, meetings – were undertaken in an outreach project.

Property surveys were completed for the Duchy of Cornwall at Restormel Manor and for the National Trust at the Valency Valley (Boscastle), the Dodman (Gorran) and Mount’s Bay.

A walk-over survey carried out for the Exmoor National Park Authority identified sites potentially affected by works undertaken by the Exmoor Mires Restoration project intended to re-water peat deposits.

Maritime projects

HES was commissioned by English Heritage to establish a methodology for assessing the historic character of the marine environment – Historic Seascapes Characterisation – which could then be applied nationally. This pilot study covered the area from Scarborough to Hartlepool.

Industrial heritage

MINERAL TRAMWAYS PROJECT

Consultancy and recording continued during conservation and access works organised by Cornwall County Council (previously reported in *Cornish Archaeology*, 47, 190). Works were completed at Betty Adit tin stream works. Shaft capping was completed at Thomas’ Shaft and Taylor’s whim shaft and was in progress at Taylor’s pumping shaft.

HOLMAN’S SHEDS, SOUTH CROFTY, POOL

These industrial buildings were surveyed for Kerrier District Council in advance of demolition. They had originally been constructed in the final phase of the Dolcoath Mine dressing floors, but had been dismantled and moved during World War 2 to provide additional covered space within which Bartle’s Foundry of Carn Brea could undertake fabrication and erection activities as part of their war work.

TAMAR VALLEY MINING HERITAGE

PROJECT

Ongoing work for West Devon Borough Council in developing this conservation project included liaison with engineers over applications for Scheduled Monument Consent, impact assessments for two mines and limited watching briefs during continuing work on trails.

WORLD HERITAGE SITE, OUTSTANDING UNIVERSAL VALUE

An updated statement was produced for the Cornish Mining World Heritage Site, specifying in more detail its importance and identifying the components that contribute to its Outstanding Universal Value.

Excavations and watching briefs

RESTORMEL CASTLE

Small-scale watching briefs and excavations were undertaken from 2006 to 2008 for English Heritage during improvements to visitor facilities. Substantial walling located in the bailey may be part of a thirteenth-century great hall. (This work will be the subject of a future report in *Cornish Archaeology*.)

SENNEN TO PORTHCURNO, SWW PIPELINE

This project included the discovery of a small structure or building associated with Beaker pottery, an exceptionally rare site both regionally and nationally. (A report will be published in a future volume of *Cornish Archaeology*.)

ST AGNES, SCILLY

The bases of two Bronze Age urns were found in two small pits during monitoring of works to create a builders' compound at Kallimay Point in 2007, as part of the Duchy of Cornwall's Off-Island Quays refurbishment project. (To be published in *Cornish Archaeology*.)

PENRYN COLLEGE

A Romano-British settlement was discovered and recorded during development work by Cornwall County Council. Two small enclosures contained structures and there were also traces of a field system. Finds included a rare example of a Roman chatelaine or toilet set and a small group of pits was found to contain Late Neolithic Grooved Ware. (This work will be the subject of a future report in *Cornish Archaeology*.)

CONSTANTINE ISLAND, ST MERRYN

An eroded cairn and cist were excavated for the National Trust in October 2007 (see full report in this volume).

TRELISSICK, FEOCK

Early medieval Grass-marked pottery was found near Treliwick House (Taylor and Thorpe 2008).

Conservation works

SCHEDULED MONUMENT MANAGEMENT (2005–7)

Completion of this project, previously reported in *Cornish Archaeology* (47, 187–8) included interpretation boards and an education day at Trevelgue Head cliff castle, Newquay, publication of a booklet on the 2005 excavations at St Piran's church, Perranzabuloe (Cole 2007), and development of the Access to Monuments website giving details of 50 archaeological sites in Cornwall (online via www.historic-cornwall.org.uk).

BODMIN PRIORY

Walling of the priory, excavated in 1984, was conserved by Cornwall County Council with advice from the Historic Environment Service.

LESCUDJACK CASTLE, PENZANCE

The acquisition of this site by Penwith District Council was reported in *Cornish Archaeology* (45, 132). On behalf of the Council, the Historic Environment Service oversaw a programme of management works to improve access.

Publication

The results of excavations at Tremough, Penryn, in 2002–2004, were published in the British Archaeological Reports series in November 2007 (Gossip and Jones 2007). The site included Late Neolithic pits containing Grooved Ware, Early and Middle Bronze Age post-rings, and a Romano-British settlement.

2008–9

Historic Environment Service (HES), Cornwall County Council

Landscape surveys

A self-guided trail leaflet and two booklets on the history and archaeology of west Cornwall's rough ground were produced for the HEATH Project, for Natural England (Dudley 2008; Kirkham 2008).

An archaeological assessment of the Barrowfields, Newquay, provided Restormel Borough Council with guidance on the management of this cliff-top land containing three extant Bronze Age barrows and the sites of possibly 14 more.

Industrial heritage

MINERAL TRAMWAYS PROJECT

Engine houses were conserved at Condurrow and Cusvey and a shaft capping programme completed at Neame's Shaft (Condurrow), Wheal Fortune, Cusvey, and Taylor's whim and pumping shafts. An assessment was completed for engine houses at Taylor's and Davey's Shafts, Consols, Gwennap.

GEEVOR, PENDEEN

Historic buildings consultancy during a major programme of HLF-funded works by Cornwall County Council (reported in *Cornish Archaeology*, 47, 191), was completed in October 2008. This included innovative repairs to twentieth-century structures incorporating corroding iron and crumbling concrete.

TREWAVAS ENGINE HOUSES, BREAGE

Following acquisition by the National Trust the two spectacular cliff-edge engine houses were conserved between October 2008 and May 2009, with historic buildings consultancy provided by HES.

HEARTLANDS PROJECT, POOL

Two recording projects were completed for Kerrier District Council, on artefacts and buildings, in advance of buildings conservation and demolition at Robinson's Shaft.

EAST CORNWALL REGENERATION PROJECT

Historic buildings recording and consultancy during conservation works by Cornwall County Council was completed, including engine houses at the Prince of Wales Mine, safety and access works at Holmbush, building conservation work at Drakewalls Mine and a watching brief at Drakewalls visitor centre.

WHEAL TOM, LUCKETT

Conservation of engine houses on this small mine was funded by Natural England through a Higher Level scheme, and co-ordinated by HES.

Building surveys and urban surveys

Surveys included analysis of Trerice House, St Newlyn East, for the National Trust, a photographic survey of Hayle Brewery, an assessment of Bartle's Foundry, Pool, photographic surveys of Metherell Baptist Chapel, Trenewan Chapel and Lanivet former Wesleyan Sunday School, and recording of the lower bridge at Boscastle in advance of demolition.

A survey of Lostwithiel for the Lostwithiel Forum Development Trust Limited included an historical review and analysis of its character and development, from planted medieval borough of the Earls and Dukes of Cornwall to industry and expansion in the nineteenth century (Berry *et al* 2008).

Excavations and watching briefs

CAMELFORD SCHOOL

An Iron Age settlement identified by geophysical survey was excavated for Cornwall County Council in June to August 2008. As well as roundhouses enclosed by ring gullies a small ceremonial enclosure was recorded.

TREMOUGH, PENRYN

Archaeological monitoring was undertaken on three sites during further development of the campus. Early Neolithic pits were excavated on the Tremough PAC site.

PEDNANDREA MINE, REDRUTH

An engine house and other mining remains were exposed and recorded during a watching brief on a housing development site.

PORTH, NEWQUAY

The line of the uncompleted eighteenth-century St Columb Canal was recorded on a South West Water pipeline.

WATERGATE BAY, NEWQUAY

Prehistoric flint scatters were identified during a watching brief on a South West Water pipeline.

PENWITH COLLEGE

Pits and ditches excavated in January 2009 during development by Truro and Penwith College appear to be part of a settlement, provisionally dated to the Late Iron Age and early Roman periods.

*Conservation works***‘CONSERVING CORNWALL’S PAST’
(SCHEDULED MONUMENT MANAGEMENT
2008–10)**

A two-year programme of conservation works, outreach and access was funded by English Heritage, Cornwall County Council, Cornwall Heritage Trust, the Heritage Lottery Fund and others. Work in the first year included rampart repair and reconstruction drawings at Castle-an-Dinas, St Columb Major; conservation of an eroded barrow at Condolden Beacon; repair of a cross near Tremethick Cross, Madron, which had been struck by a lorry; establishment of a group to look after sites on the Lizard peninsula (the Lizard Ancient Sites Network); work with the Sustainable Trust and Cornwall Archaeological Society to survey Carwynnen Quoit; production of an interpretation board for Glasney College, Penryn; microchipping of crosses to protect against theft; and assessment of ‘monuments at risk’ to guide future work.

LAUNCESTON PRIORY

In Launceston Town Council’s project to conserve the priory ruins HES worked with volunteers to prepare the site, including vegetation clearance and removal and recording of stones (Allan 2008). This was followed by conservation work by Darrock and Brown.

Cornwall aerial survey, 2008–11

A three-year programme of targeted aerial photography was commissioned by English Heritage. Seven flights in 2008–9 (flight numbers F84–90) included Penwith and the Lizard, the north coast, parts of the south coast, western Bodmin Moor, the Plymouth Forts and industrial sites in the west.

Publication

A volume based on major surveys of Bodmin Moor’s industrial archaeology carried out in the 1980s and 1990s was prepared by HES and published by English Heritage (Herring *et al* 2008).

Exeter Archaeology**PERFEX WORKS, HAYLE**

A Passmore of Exeter Archaeology undertook recording and evaluation. The site, at SW 5710 3815, was developed in the mid eighteenth century by the Cornish Copper Company to smelt copper, and housed the company’s farm and a rope works. The copper smelter closed in 1819 and was replaced by an ironworks that supplied machinery to local tin mines. Remains of a pond-keeper’s cottage and ropewalks survived, the latter constructed using blocks of cast copper slag. Most deposits associated with the copper smelter and ironworks had been removed, but walls and deposits relating to the ropewalk and farm buildings survived. (Exeter Archaeol. Reps 07.74 and 08.23.)

**TRELOY FARM, RIALTON ROAD, NEWQUAY
(SW 8589 6242)**

G Young (Exeter Archaeology) recorded the substantial nineteenth-century granite buildings of this farm, loosely arranged around an irregular yard. The earliest was probably the bank barn with ground-floor cattle stalls and feeding passage, and with loading doors for the first-floor hayloft. An L-shaped mill with a date stone of 1840 retained its wheelpit and some gearing; a stable added to the mill, a possible shippon, formerly two-storeyed, and a cart shed were also recorded.

**LOWER WIDEMOUTH FARM, POUNDSTOCK
(SS 202 012)**

R W Parker (Exeter Archaeology) recorded the farm buildings of this late nineteenth-century ‘model’ farm, ascribed by local tradition to ‘Squire’ Charles Mucklow (1821–1906), son of a Lancashire gentleman and an owner of dye and fabric printing works. A cart linhay, covered dung pit, stables, barns, shippon, and possible forage store, arranged round a square courtyard, were recorded. The quality of materials used by Mucklow has been described as ‘legendary’: the slate animal stalls, built of grand slate slabs over 1m high, are a particularly fine feature.

DUPORTH, ST AUSTELL (SX 0315 5124)

M Dyer and others (Exeter Archaeology) recorded the gardens of this former mansion, designed by Charles Rashleigh around his house of 1779–81. Clearance of dense vegetation enabled many

garden features to be seen and recorded. The Lady's Bower, terraced garden, dark house, lower grotto and lower pool probably belonged to the earliest phase of the gardens, the design of which was almost certainly influenced by the gardens at Heligan, the former home of Rashleigh's wife.

2009–10

Historic Environment Projects, Cornwall Council

'Conserving Cornwall's Past' Project

The second year of this programme of conservation works, outreach and improvements to access included close working with a range of local groups – the monitoring of sites on the Lizard with the newly-established Lizard Ancient Sites Network; conservation work and photographic survey at Kennall Vale with the Cornwall Wildlife Trust and volunteers; development of a management plan with the Tregargus Valley Trust; investigation at St Piran's Oratory with the St Piran Trust; support for a book of reconstruction drawings by Jane Stanley, *A brush with the past* (2009). The Roman milestone at Trethevy near Tintagel was conserved and moved to a more accessible location by a footpath. Two crosses at Paul churchyard were conserved, including a pre-Norman cross shaft recently discovered in the wall of the church. A survey and recommendations for management were produced for the Jewish and Congregationalist cemeteries, Falmouth.

A30 Fraddon-Indian Queens excavations

Following agreement from the Highways Agency a programme was started to report on significant excavations carried out in the 1990s, including an Early Neolithic structure at Penhale, an Early Bronze Age barrow at Gaverigan, Middle Bronze Age settlements at Penhale Moor and Penhale Round, and the Iron Age and Romano-British round and field system at Penhale Round, St Enoder.

Lowland Cornwall Project

This project is funded by English Heritage to test how evidence for below-ground archaeology can

be compared with historic landscape character to help predict the occurrence of significant archaeological remains. This can feed into the planning process and proposals for conservation management. An overall assessment of Cornwall has been completed and sample areas are being characterised in detail.

Maritime projects

Two projects were completed for English Heritage: monitoring of the registered wreck the *Royal Anne Galley* and a review of the use of magnetometer techniques on submerged archaeological sites.

The first season of fieldwork on the Lyonesse Project, investigating the submerged landscape around Scilly, was successful in locating and sampling submerged old land surfaces.

A late nineteenth-century wreck in the Camel Estuary, thought to be the *Antoinette*, was recorded for English Heritage in advance of clearance by the Royal Navy.

Mineral Tramways Project

This was one of the largest and longest running industrial heritage projects in the UK, beginning in 1989 and completed in 2009–10. The Historic Environment projects team assisted with archaeological recording and historic buildings consultancy throughout.

Archaeological excavations

Major work in 2009–10 included the North Cornwall sewage treatment scheme and pipeline (for South West Water), recording a medieval cemetery, Bronze Age roundhouse (Trevalga) and Bronze Age field system. Work at Penwith College, Penzance, and Penmayne, Rock, revealed Iron Age settlements and prehistoric occupation was recorded on an affordable housing site on St Agnes, Scilly. Outside Cornwall, a medieval blowing house for smelting tin, a prehistoric roundhouse and other features were excavated on the Avon pipeline, near Plymouth, for South West Water.

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Obituaries

PAUL ASHBEЕ

1918–2009

Paul Ashbee was one of the most significant British prehistorians to have emerged since the Second World War. He became a leading practical exponent in the study of Neolithic and Bronze Age burial practice and its interpretation. In an unusually vigorous archaeological career which spanned more than 55 years, he excavated more than 30 burial sites, researching and promptly publishing his often immensely important and always interesting findings. In addition, he wrote five significant books of synthesis and submitted a stream of shorter papers, reviews and comments on the subject he had loved since boyhood. His last book, *Kent in prehistoric times*, came out in 2005 and a review article on the Rillaton cup in our journal in 2008 (Ashbee 2006).

Ashbee's professional interests were not restricted to barrow excavation. He was as deeply concerned with the structural remains of settlements, both prehistoric and early Christian; in this field, especially, he made a significant contribution to our knowledge of ancient Cornwall and the Isles of Scilly. Probably because of his love for the south west, which had grown through fascination for its archaeology as well as for its special kind of beauty, he became a dedicated servant of the Cornwall Archaeological Society and found time to be its loyal President from 1976 to 1980. In this he – and we – enjoyed the devoted and immensely efficient support of his wife Richmal.

Paul (he had no second name) Ashbee was born in Bearsted, near Maidstone, Kent. He was

the only boy in an essentially female, single-parent household. At school he struggled to cope, finding mathematics so hard that he failed to achieve a School Certificate and left without any qualifications. But he enjoyed history. And thanks to the characteristic encouragement of Norman Cook, Assistant Curator at Maidstone Museum (later director of the Guildhall Museum and then of the Museum of London), he learned to appreciate the significance of the prehistoric flint implements which he was adept at finding in the fields around his home. His moment of schoolboy triumph came in 1933 with the discovery and uncovering of parts of a Roman villa on a farm nearby at Thurnham.

Conscription in 1939 resolved the question of what he should do after leaving school. He served throughout the War, first in the Royal West Kent regiment, then latterly with the Royal Electrical and Mechanical Engineers. He once recalled that, when taking part in the Rhine crossing in 1945, he inhaled smoke which left him with breathing difficulties for several years. His time in Germany, which continued after the War in the Control Commission, also gave him command of its language. This attracted the notice of Professor Gordon Childe when, as an otherwise quite unqualified and hitherto unsuccessful student, Ashbee applied in 1950 to read for the postgraduate diploma in European Archaeology at the University of London Institute of Archaeology. He gained it in 1952.

Ashbee was a dedicated teacher and it became his principal career. He took a diploma in education

at Bristol University in 1953, then an MA at Leicester (which awarded him a D Litt in 1984). His first teaching post was at the Forest Hill school in London as Assistant Master and head of history. Then in 1968 he joined the staff of the University of East Anglia as its first archaeologist. There he remained until his retirement in 1983.

Paul Ashbee's other life, as a field archaeologist, began to emerge in 1949 when he attended a training course at *Verulamium*, St Albans. It was run by Professor (later Sir) Mortimer Wheeler and Dr M Aylwin (Molly) Cotton on behalf of the Institute of Archaeology; many of their students, like Paul (and one of the authors of this memoir) went on to study there. There, too, Paul first met Richmal Disher (born 1929), a young student at Westfield College, University of London, whom he married in September 1952.

Ashbee's natural skill in archaeological excavation had caught the eye of Brian O'Neil, Chief Inspector of Ancient Monuments at the Ministry of Works. Acting on a hunch, O'Neil appointed him to excavate a cist grave cemetery near Hugh Town, St Mary's, Isles of Scilly, in 1949 and again in 1950. Even more presciently, O'Neil arranged for Paul to work in the Ministry's drawing office for a few months. There he developed the considerable skill which enabled him to inform and grace his excavation reports with such noteworthy illustrations. Through O'Neil he had enjoyed his first taste of Cornwall and Scilly.

Ashbee's exceptional work outside Cornwall only requires brief attention here because it has been fully described in a series of comprehensive obituary notices in the national press: *The Times* (30 September and 7 October 2009), *The Guardian* (6 October 2009) and *The Daily Telegraph* (10 October 2009). *The Eastern Daily Press* carried additional detail and a charming photograph in the edition of 10 September 2009. Our Past President, Henrietta Quinnell, summarised his work in the Cornwall Archaeological Society *Newsletter* for February 2010.

The achievement was an exceptional one, bearing in mind that much of the work had to be done during school holidays and university vacations. Paul was always the first to say that it would hardly have been possible without the help of his wife Richmal, who had become a fellow diploma student at the Institute principally, Paul once confided, because he was there. When excavating at Bindon Hill, Dorset, another Institute training dig, in 1950,



Paul and Richmal Ashbee on their wedding day in London, September 1952. (Photograph courtesy of Paul's daughter, Kate Massey.)

Wheeler inveigled Richmal into taking on the site administration when the incumbent, Wheeler's regular helper and friend Theo Newbould, had been called suddenly to London for an operation. Richmal emerged as a natural organiser, as well as a very good literary editor, and she and Paul made a formidable, as well as a very loving team until it was cut short by her death in 2005.

The list of excavated funerary sites outside the south-west peninsula, with their dates of operation and of publication, is formidable: Barnby Howes, East Cleveland, Yorkshire (1951; 1956); Canford Heath, Dorset (1951; 1956); Kildale Moor, North Riding, Yorkshire (1953; 1957); Hindlow, Derbyshire Peak District (1953; 1981); Black Down, Portisham, Hampshire (1955; 1957); Amesbury barrows 58, 61a, 61, 72, Wiltshire (1956; 1984); Fussells Lodge, Wiltshire (1957; 1966); Horslip, Avebury, Wiltshire, jointly with Isobel Smith and John G Evans (1959; 1979);

Amesbury barrow 39, Wiltshire (1960; 1981); the Wilsford shaft, Wiltshire, jointly with Martin Bell and Edwina Proudfoot (1960–62; 1989); Amesbury barrow 51, Wiltshire (1960; 1979); Moor Green, West End, Hampshire (1961; 1976); Sutton Hoo, Suffolk, jointly with Rupert Bruce-Mitford (1965–70; 1975 vol 1). In 1949 Ashbee also assisted Humphrey Case, one year ahead of him at the Institute, when Case excavated two round barrows at Poole, Dorset (1949; 1952). The Hindlow excavation is the only one in which Paul and Richmal were credited jointly.

Ashbee's work on the Fussells Lodge long barrow set new standards in the excavation and interpretation of Neolithic earthen long barrows, as did his joint work with Isobel Smith and John Evans on the three long barrows near Avebury. His early excavations of Wiltshire and other barrows, beneath some of which rings of posts and stakes had been a feature, inspired him to be the first to make and publish a classification of these enigmatic structures (Ashbee 1959).

Nothing in his remarkable career prepared Ashbee or the archaeological world, however, for the outcome of what began as the uncovering of a plough-damaged pond-barrow at Wilsford, near Stonehenge, by Edwina Proudfoot. She was to become his colleague, with Martin Bell, in what followed. Their epoch-making discovery was of a shaft more than 100 feet deep, the mouth of which had at first misled the archaeologists into seeing it as a pond-barrow in the downland turf. Indeed, Charles Thomas and I always felt that Ashbee never quite believed us when we sought to assure him that the pond-barrow which we excavated at Snail Down, Wiltshire, in 1957 was most certainly *not* the mouth of another such shaft!

The Wilsford shaft added a new dimension to our appreciation of the lengths (literally!) to which Bronze Age people (*c* 1200 bc, 1550–1400 cal BC) would go in their efforts, it must be supposed, to please their gods. The excavation called for complex access and safety engineering, provision of air and light, with extraction of water when the bottom of the shaft was approached. In the detailed report, Ashbee graciously acknowledged the important role played by Richmal. Always present on site, her enviable memory, as well as her eagle eye in textual criticism, were vital in preparing the Wilsford shaft report for publication 27 years after the excavations in 1960–62 (Ashbee *et al* 1989). Her 'people skills' may also have helped to smooth

matters in an excavation fraught with personal and operational problems. The Wilsford shaft is one of the most extraordinary prehistoric monuments yet revealed in the United Kingdom and its uncovering was an outstanding achievement by the Ashbees and their colleagues for the Ministry of Public Buildings and works, with the project subsequently completed by English Heritage.

Early in his excavating career Paul Ashbee was called upon to make a rare excursion into a part of England away from the areas with which he had become so familiar. In 1964 Rupert Bruce-Mitford of the British Museum invited him to co-direct the re-excavation of the royal burial mound at Sutton Hoo, Suffolk. Officially, the principal objective was to pick up remains of any of the exceptionally important grave goods and ship fragments which might have been missed by the original excavators during their hectic rescue work in 1939. In fact, Paul especially was concerned with what survived intact of the grave mound. He saw it as a sort of bowl-barrow, the origins of which needed to be established. Considerable traces of Beaker-period occupation and – to Paul – their possible associations with the mound itself, needed explanation. He complained recently to one of us that in the final report this matter of a prehistoric origin for the mound, or part of it, had been, as he insisted, 'air-brushed out'. In conversations during his last months this clearly rankled with him, for his other discoveries at Sutton Hoo had added significantly and satisfactorily to the treasures interred with the illustrious personage buried there.

This personal appreciation of the life and work of such a significant field archaeologist, scholar and teacher has special importance for us in the Cornwall Archaeological Society. Paul worked and studied in the south-west peninsula on and off for 50 years. He served as our President, with Richmal as his consort, for four of them (1976–80). At the end of this review we have attempted a bibliography of Paul Ashbee's excavation reports and other writings related directly to his work in Cornwall and the Isles of Scilly, together with some more general studies which are of significance to this county.

This shows that he excavated only twice on the Cornish mainland, first at Mawgan Porth (1949–52), a key early Christian settlement under threat, where he was site director, and three years later at Tregulland Burrow, near Davidstow, another rescue excavation and the only barrow in Cornwall to receive his attention. Ashbee's contribution at

Mawgan Porth was described in his own personal reminiscence published in *Cornish Archaeology* 37–38 (Ashbee 1998–9). What fails quite to emerge there is his key role in the running of a major excavation whose director, Rupert Bruce-Mitford, was being groomed to undertake the re-examination of the royal mound at Sutton Hoo for the British Museum. He had been entrusted with its definitive publication but his excavation experience was limited.

The scale of the work at Mawgan Porth was massive. The clearance of overburden, for example, necessitated the use of rails and a tipper truck, about whose handling Paul and his team had to learn fast. He confessed that on at least one occasion a tragic accident with a runaway truck was only just avoided.

The masterly excavation of the Tregulland barrow's robbed and plough-damaged mound revealed a triple circle of withdrawn stakes, among other burial features, beneath a mound of two phases, and a series of eight stones of varying shape and size bearing cup marks (Ashbee 1958). It was the uncovering of the stake rings which led Ashbee to write his pioneering study of stake and post circles beneath British round barrows (Ashbee 1959). Tregulland Burrow was the first major barrow excavation to have taken place in Cornwall since the days of Croft Andrew during the Second World War and, before him, W C Borlase.

More than anywhere else, the Isles of Scilly accounted for Ashbee's lengthy involvement in Cornwall's archaeology. This included his research on chambered tombs, centred upon the work at Bant's Carn in 1970 and published in *Cornish Archaeology* (Ashbee 1976). He devoted much thought to their significance within what he usefully came to classify as 'Early' in the islands' original settlement history. In 1982 he courageously argued that their origin might have lain in Mesolithic times (Ashbee 1982).

Ashbee played a leading role in establishing the place of stone burial cists in the history of ancient interment in the islands. He saw that within his Early period, cists could have begun to be used before the megalithic entrance graves. On surer ground, based upon the evidence of pottery, Ashbee proposed a series of cists which were contemporary with the megalithic tombs. And finally came the many cists, often containing Roman-period pots and brooches, which have become known as the Porthcressa series, following upon his excavation of cists at the type-

site in Hugh Town, St Mary's, in 1949–50, the first he ever directed (Ashbee 1954; 1979b).

Possibly the most significant episode in Ashbee's Scillonian fieldwork was his excavation of the Iron Age and the Roman-period settlements on Halangy Down and at Halangy Porth respectively (Ashbee 1983; 1996). From his immensely important and fully published findings at these neighbouring sites on St Mary's, he was able to contribute to the wide-ranging discussions with Colin Renfrew, Charles Thomas and others on the nature of the colonisation of the islands and the forms of settlement culture which emerged (Ashbee 1973). His ideas crystallised in a defining book, *Ancient Scilly* (1974), perhaps Paul's crowning achievement as a Scillonian archaeologist. In it he became the first to articulate the now widely accepted view that the most significant influence on Scillonian prehistory, following original colonisation, was the introduction of new ideas (seen in the form of settlement remains) which effectively ushered in an Iron Age way of life to the islands. So important was this episode that, as Charles Thomas has written, it was the likeliest moment for the appearance of any language that could eventually have become British and a direct ancestor of spoken Cornish (Thomas 1985, 102–3). It was only fitting that Paul Ashbee was invited to contribute a retrospective survey of achievements and prospects on Scillonian archaeology for the Society's silver jubilee volume (Ashbee 1986).

Throughout his career Ashbee was engrossed in the many different kinds of object which he recovered in his excavations. This exceptional interest in material culture may first have been aroused during his two years at the Institute of Archaeology, where the prehistory diploma was notably object-based. The cup-marked stones from the Tregulland barrow, for example, occupied an important place in Ashbee's excavation report (1958), in the same way that so much care was taken in describing the many well-preserved finds from barrows he had excavated in the chalk country of Wessex and elsewhere. Not surprisingly, Ashbee wrote on one of Cornwall's grandest prehistoric treasures, the so-called Rillaton cup (Ashbee 1977). He also produced for us a useful paper on a silver cup found in 1974 in a barrow in Saint-Adrien, Brittany, which was broadly similar (Ashbee 1979a), and he returned to the whole subject of these several precious cups from western Europe when reviewing the British Museum's



Paul Ashbee (left) showing Prime Minister Harold Wilson (right) and 'minder' the excavations at Halangy Porth, St Mary's, c 1963. (Photograph courtesy of Kate Massey.)

definitive publication on this notable series, in which the Rillaton Cup occupies an important place (Ashbee 2006). Ashbee had already had his say on the Ringlemere, Kent, gold cup, found in 2002, in a perceptive note in the *Newsletter* of the Kent Archaeological Society (Ashbee 2002).

Many of us remember with pleasure Paul Ashbee's four-year stint as our President. He was an assiduous attender and firm chair at committee meetings and Annual General Meetings and, as Henrietta Quinnell has already recalled, he kept closely in touch with the sometimes complex workings of the Society and of archaeological developments in Cornwall (Quinnell 2010). Paul himself spoke to us recently of the great joy and satisfaction he and Richmal had derived from their visits to grapple with Society business. Norwich and Truro were a long drive apart. Sharing the wheel, they would break their journey in Taunton in both directions, putting up at the Castle Hotel. For them both, these duties were a pleasure, not a chore.

The consecutive presidencies served by Paddy Christie, Paul Ashbee and Geoffrey Wainwright, gave the Society three leaders from outside Cornwall who were outstanding field archaeologists, with national reputations that were unrivalled. Their willingness to serve reflected the high regard in which the Society was held by archaeologists beyond the Tamar.

At the Society's AGM in April 1976, Andrew Saunders introduced Paul Ashbee as its new President. Perhaps appropriately, Paul and Richmal were not present: they were hard at work at their Halangy settlement excavation on St Mary's. But

for the next four years they attended these annual gatherings diligently, always making use of the *Newsletter* to invite members to have coffee with them at Truro museum on the morning of each meeting. It became a pleasing ritual, their way of getting to know people from whom they were otherwise so widely separated.

Paul contributed frequently to the *Newsletter* during his time as President. In October 1977 he wrote a piece on the value of archaeological societies in England, at the same time deplored the trivialisation of archaeology on television and its use in the tourist industry. He was suspicious, too, of the growth of bureaucracy caused by the development of archaeological units. Early in 1978 he submitted an obituary for Dame Joan Evans, the medieval art historian and daughter of pioneering archaeologist Sir John Evans.

In Paul's Presidential address for 1979, 'Prehistory in practice: recollection, revolution and reconsideration', he returned to the subject of archaeological societies. Here he paid special attention to the emergence of our own from its progenitor, the West Cornwall Field Club. Turning to an ever-present concern, he deplored the continuing destruction of ancient sites despite a greater public awareness of the nation's heritage. He attributed this to the superficial approach of 'trite nostalgia'. And he thought that the sophistication of new technology was in danger of building a language barrier between those who speak their mother tongue and others who 'mouth astronaut English'. In the *Newsletter* for June 1979 he echoed the Council for British Archaeology's

concern at the development of metal detecting. To have had Paul as our President, a man holding the highest traditional archaeological values, was a priceless acquisition for a Society still in its formative years.

Paul Ashbee was appointed a Vice President in 1980. What also gave him great pleasure was to be informed in 2008 that because he had been a Fellow of the Society of Antiquaries of London for 50 years, he need no longer pay its annual fee. About the same time, incidentally, the authors of this appreciation, old friends of Paul's, were granted the same waiver!

A practice pleasing to obituary writers for *The Times* is the subsequent publication of observations sent in by readers who have something to add. Paul Ashbee's was enhanced by two such comments on 7 October 2009. In the first, Professor Martin Biddle identified himself as the tall eager schoolboy seen chatting to Paul in the photograph of the 1949 training dig at *Verulamium*, St Albans, which had been included with the obituary. In the other, Nigel Tonkin, a schoolteacher colleague of Paul's, told *Times* readers that when he was taking part in the excavations which Ashbee and Bruce-Mitford conducted at Sutton Hoo in the 1960s, it was the diggers' delight, during the last evening of the dig (much beer having flowed), to entice Paul to sing his rendition of that rousing Irish song *The Croppy Boy*, prompted throughout seemingly endless verses by Richmal.

One final observation: when Paddy Christie, then a mature student at the Institute of Archaeology, submitted her doctoral thesis on the barrows of Cornwall with special reference to the unpublished wartime excavations of C K Croft Andrew, Paul Ashbee was her external examiner. Here was an unsolicited link between two great former Presidents. Paul told one of us that in his view the importance of Paddy's thesis to Cornish archaeological research merited its publication.

With the deaths first of Richmal, then of Paul, our good friends, the Society has lost a great archaeologist and leader and his devoted and dedicated amanuensis, whom we shall long remember with gratitude and affection.

Charles Thomas and Nicholas Thomas

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PETER GATHERCOLE

1929 – 2010

Our former President and editor of this journal, Peter Gathercole, was born at Tilney St Lawrence, Norfolk, on 27 March, 1929, to Harold and Vera, who ran a family grocery business. Following early schooling in Ilford, he won a scholarship to St Paul's Cathedral School in 1939, only to be evacuated with it to Truro. His mother moved to Truro to be close to him (he was an only child), while his father reinforced these early and significant links with Cornwall by serving with our county regiment, the DCLI, during the Second World War. In 1943 Peter became a pupil at Clifton College, Bristol, at that time evacuated to Bude. Remembered at that exclusive school for his regular habit of slipping out to buy his *Daily Worker*, he became a Communist Party card holder in 1947. Like a number of young men who went on to a career in archaeology, Peter served in the Royal Army Education Corps for his National Service and spent two years in Egypt as a Warrant Officer.

In 1949, free at last to pursue higher education, he took up his deferred open Minor Scholarship to Peterhouse, Cambridge, to read a joint honours degree in history and archaeology. Although he had enjoyed studying history at school, he became bored with it while reading for Part 1 of his Cambridge degree and changed to archaeology and anthropology for Part 2.

After taking his degree he felt he needed more, in greater depth, even though he had been taught by some of the archaeological giants of the time, Grahame Clark, Miles Burkitt and especially John de Navarro among them. So, in 1952, he enrolled at the University of London Institute of Archaeology, attracted not least by the Marxist thinking of its Director, Professor V Gordon Childe (1892–1957), perhaps the giant of those archaeologically formative decades.

Peter has written about his passionate enjoyment of life at both the Institute and at home with his young wife, Falmai, in their one-room flat in Hackney, although they remained desperately poor (Gathercole 2003–4). Their wholehearted commitment to the Communist Party showed in the work they did, especially for its student branch, which was planning a major Peace Conference during those Cold War days. The birth of Peter's first son in 1953 meant that during his vacations he took on as much paid rescue excavation as he could to help make ends meet. Medieval sites close to Oakham Castle, Rutland (Gathercole 1958) and at St Benedict's Gates, Norwich (Hurst and Golson 1955), and also, perhaps more usefully, Southampton (the Roman *Clausentum*) under Dr M A (Molly) Cotton (Cotton and Gathercole 1958) gave him invaluable experience in the field outside the sorts of prehistoric sites with which his diploma course was principally concerned.

Peter considered enrolling for a doctorate at the Institute of Archaeology, but after a chance meeting with its Secretary, Edward Pyddoke, who was much concerned about Peter's domestic situation, he was urged to put in for the post of Trainee at the Department of Archaeology, Ethnography and Local History, which had just been advertised by Birmingham City Museum and Art Gallery. He was appointed, and began his museum career under the shrewd, benign guidance of its Keeper, Adrian Oswald (1908–2001) (Gathercole 2003–4).

As well as the museum's standard holdings of British material, under Oswald's enlightened approach collections of foreign archaeology were being augmented, both through purchase from dealers and sale rooms and, more scientifically, by subscription to overseas excavations, principally in Egypt and the Near East. Pacific ethnographic and Central and South American objects were also

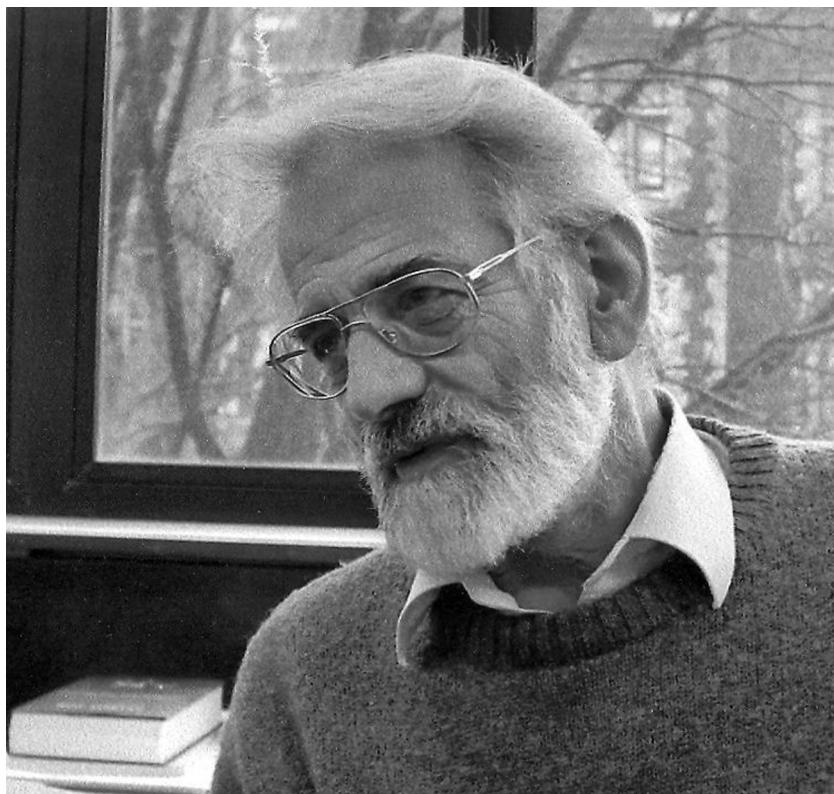
being acquired and Peter's curatorial interests were broadened by this worldwide approach.

Next came a brief but fruitful move to the museum at Scunthorpe in 1957, followed by a joint museum and university post in anthropology at the University of Otago, in Dunedin, in New Zealand's South Island. His remarkable ten years of teaching, curating, field research and university development there had begun. The year was 1958.

Many of our members will have been unaware of the crucial rôle which Peter Gathercole played in the formation of the Department of Anthropology and Archaeology at the University of Otago. Fired by his lifelong interests in ethnography and archaeology, nurtured by Gordon Childe at the Institute of Archaeology and then by his briefly held traineeship at Birmingham, Peter devoted his energies and enthusiasm, often despite a frustrating sense of loneliness and tiredness, to this new department for the teaching of subjects which he loved. Moreover, he managed to find time for fieldwork and excavation. This in a country, remember, that was new to him, his limited knowledge of it derived second-hand from books

and British provincial collections. His writings make it clear that he was touchingly aware of what he felt to be his own limitations, whether in excavation techniques, the teaching and guidance of New Zealand students or of university inter-departmental politics and rivalries. Nevertheless he soldiered on, strongly supported by his wife, Falmai, and by a handful of colleagues in the Otago arts faculty, who believed in him and his vision of what such a department should embrace.

When Peter Gathercole left New Zealand ten years later, exhausted and probably thankful to be going home, he could look back nevertheless with personal satisfaction at what he had created: a growing body of students being taught to full honours degree level, MA courses and research projects in hand and, last but most important, a department whose head was to have professorial status. This post Peter himself declined to apply for, having had enough and feeling increasingly homesick. Shortly before his resignation he had been promoted to Associate Professor, his employers no doubt expecting that he would make application for the new chair. The department



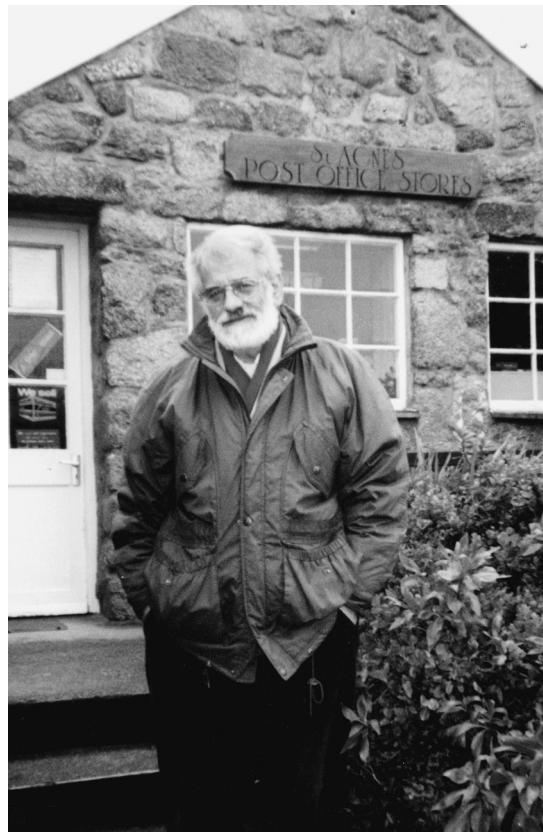
*Peter Gathercole.
(Photograph courtesy of
Peter's partner, Bobbie
Wells.)*

Peter had created in South Island rivalled North Island's similar but older department in the University of Auckland (Gathercole 2000a; 2000b; Spriggs 2011). The foundation of the Otago Anthropological Society was his also.

Back in England in 1968, Peter's career resumed with a period as museum curator, first at the Pitt-Rivers Museum in Oxford, where he also lectured in ethnology with a fellowship at Worcester College, and then across country to Cambridge where he successfully directed its Museum of Archaeology and Anthropology from 1970 until 1981. During this time he played a key rôle in founding the Museum Ethnographers Group, becoming its first Chairman in 1975 and remaining a close supporter for the rest of his life. From the Pitt-Rivers came, too, his abiding interest and academic research into the work of the explorer Captain James Cook.

Finally, Peter returned to academia, appointed a fellow of Darwin, a Cambridge graduate college, in 1977, doing duty as its librarian for many years and serving as its Dean of Students from 1983 to 1987. A visiting lectureship in archaeology and ethnography at the University of Southampton in 1985–6, enabled him to become the driving force behind the first World Archaeological Congress in 1986. Ten years later Peter retired, moving to Cornwall and setting up home in an early house in Veryan.

Peter Gathercole wrote books and articles on many subjects, including an estimated one hundred book reviews (Spriggs 2011). Contributions to our *Newsletter* were made from time to time. Since 1951 he had been attracted particularly by the worldwide archaeological scholarship, the Marxist bias and early political life in Australia of V Gordon Childe, undoubtedly the most significant prehistorian writing in English between and after the two World Wars. Peter's two years of study at the Institute of Archaeology was of particular significance since Gordon Childe was then its Director. He had long aspired to write a comprehensive analysis of Childe's beliefs on the origins of and driving forces within societies, and during the course of its preparation – alas unrealised – he and a colleague compiled and published a bibliography of Childe's writings, an immense task which listed 762 items published between 1915 and 2008 and still counting (Gathercole *et al* 2009). Professor Matthew Spriggs, Australian National University, Canberra, a long-standing friend, has suggested



Peter Gathercole on St Agnes, Isles of Scilly, in 2000. (Photograph courtesy of Bobbie Wells.)

that Peter's own steady output of papers on Childe, numbering 24 at the time of his death, represented in many ways the last word on that towering, shy and kindly scholar (Spriggs 2011).

Our Society was fortunate to have Peter Gathercole as its President for the years 1997 to 2000. Commuting between Cambridge and his new home at Veryan, the work he had to do on our behalf during an unusually demanding time for the Society was somehow managed. To be President involves many meetings of committees and working groups, as well as the frequent chairing our winter lectures. The office can become more than enough for anyone, but to volunteer also as the acting editor of our journal needed particular resolve as well as a special kind of scholarship and expertise. Peter rose to the occasion. The three volumes of *Cornish Archaeology* which he jointly edited and saw through the press, 35 (1996),

36 (1997) and **37–8** (1998–9), were admirably done. Of especial importance was volume **35**, the definitive account of Paul Ashbee's excavations at Halangy Down, St Mary's, Isles of Scilly (Thomas and Thomas, 2009–10). As if the workload of his presidency and editorship was not enough, it was Peter who suggested the topic 'Archaeology and the Media' for the Society's joint symposium with the Devon Archaeological Society in 2003, and who played a major part in its organisation and subsequent publication (Gathercole *et al.*, 2002–3).

Many of our members will remember Peter's personal warmth and kindness, his integrity and his approachability. He became *one of us* – it is not surprising that few realised the wealth of international scholarship which underpinned his unassuming manner. For his exceptional contributions to the health and progress of our Society we owe him continuing gratitude and admiration. To his four children and his partner for many years, Bobbie Wells, we extend our appreciation for the support they gave him and our heartfelt sympathies for their great loss.

Nicholas Thomas

Acknowledgements

The writer is grateful to Jacky Nowakowski for providing him with a copy of the obituary written for the World Archaeological Congress by Professor Matthew Spriggs. He also consulted Henrietta Quinnell and Bobbie Wells.

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Reviews

Goon, hal, cliff and croft: the archaeology and landscape history of west Cornwall's rough ground, by Peter Dudley, 2011. Historic Environment, Cornwall Council: Truro. ISBN 978-1-903798-72-0. Pb £25. xiii + 185 pages.

Managing the historic environment on west Cornwall's rough ground, by Graeme Kirkham, 2011. Historic Environment, Cornwall Council: Truro. ISBN 978-1-903798-74-4. Pb £25. ix + 157 pages.

These two companion volumes produced by historic environment staff of Cornwall Council cover the moorland and coastal rough ground of west Cornwall. One describes the wealth of surviving archaeological features in an area of south-west England that is justifiably renowned for the wonderful richness of its historic landscapes and surviving archaeological sites. The other covers the same archaeological resource but concentrates on how this can be managed for the benefit of future generations.

While Peter Dudley and Graeme Kirkham are the lead authors, the volumes are the product of a collaborative effort, with several others also making contributions: Peter Herring, Oliver Padel, Vanessa Straker, David Earle Robinson, Emily Forster and Zöe Hazell are named co-authors. The work presented is a synthesis of the decades of good archaeological recording and interpretation –

together with management of the resource – that has been undertaken in west Cornwall.

The two volumes have much to recommend them: the presentation is attractive, the texts are well-ordered with good headings and sub-headings that make things easy to find, and the illustrations are plentiful and good. Above all it is the richness of the information they contain that make them worth reading and worth becoming a permanent addition to the library shelves of anyone who cares about the Cornish landscape.

The first volume, *Goon, hal, cliff and croft*, comprises a description of the many aspects of west Cornwall's exceptional archaeological survivals on its rough ground. The location, general character, history of research and methodologies are introduced. There follows a period-by-period review, case studies for Ruan Major, St Agnes and Zennor to illustrate contrasts, and introductions to past environments and traditional vocabularies used in describing rough ground. Then comes a substantive summary of archaeological site types of prehistoric to post-medieval date. This is followed by fascinating sections on the archaeology of livestock farming in the west Cornish unimproved landscape, resources represented by the plants that grow there and the folklore of rough ground. It ends with recommendations for further data collection, research and synthesis.

Goon, hal, cliff and croft is well ordered and a good job has been made of weaving together a complex series of interconnected strands. Nothing

vital (that this author is aware of) is missing, and much thoughtful information is given that widens our understanding of the historic environment well beyond a traditional approach that confines itself to just listing sites within a chronological framework. Also, the texts are lively rather than being written in dry 'local authority speak', with succinct but information-packed and thoughtful descriptions, together with quotes from historic sources to illustrate points. The inclusion of artists' works is a bonus and – speaking as one who started as an artist, not an archaeologist – perhaps an aspect that more could have been made of, with inclusion of a broader range of perceptions that derive from a response to the Cornish landscape which go beyond being descriptive.

Managing the historic environment on west Cornwall's rough ground starts with introductions to the context of the report and the character of the place. There follows a detailed appraisal of all the main aspects of archaeology in west Cornwall, with statements of significance and management recommendations for each. There is then a section on historic landscape assessment, followed by chapters on forces for change, positive management, community involvement and integrated management. At the end there are recommendations for future work and conclusions. This second volume is a clear statement of the varying management requirements of different aspects of the resource, ranging over on-the-ground issues and strategic thinking. It is refreshing to see that readers are not simply given a series of prescriptions for management, but discussion of issues is included and ways of working explored. More importantly for many readers, the volume also gives insights into why parts of the resource are important in terms of significance to our understanding of past peoples, their landscapes we have inherited, and the rarity or otherwise of particular types of historic feature. The volume is far more than a series of 'Dos' and 'Do-Nots'. It will act as a platform for management for the foreseeable future, acting as a guide and as a justification on those occasions when decisions will be questioned.

My own knowledge of Cornish archaeology, gained now several decades ago, and no doubt in some respects outdated, is biased towards prehistory. Reading about what I am familiar with, and finding much in both volumes that was in accord with what I knew, allowed me to read the

rest of the books as an outsider with the confidence that what I was being told was authoritative. No doubt there will be minutiae which those intimately familiar with Cornish archaeology will want to disagree with, or complain that particular details have been omitted or given the wrong emphasis; this is inevitable in the case of works which attempt synthesis or overview. For me, reading about the aspects of west Cornwall's archaeology with which I was less familiar, and in some cases in a state of blissful ignorance, was a joy. One of the real strengths of the volumes, both in terms of a detailed description of the archaeology and how this can be managed, is that they cover the situation in one region so well, allowing comparisons with places elsewhere. I have spent the last 30 years fully engrossed in the archaeology of the Peak District, which has similarly good archaeological survivals, and seeing the differences as well as similarities with Cornwall was exciting. Regional distinctiveness is very real and reading about other regions allows one to gain deeper insights into your own patch by looking at variation and questioning why. Is it the landscape that is different, the ways people chose to do things that is the issue, or are our own preconceptions at fault?

The concept of bringing out two companion volumes, one interpreting what exists, the other making recommendations on how the resource should be sustained for the future, is a good one. It allows different audiences to, on the one hand, access and enjoy the archaeology without being bogged down with 'management issues', while, on the other, those who need to address how to manage particular places, or gain an understanding of what in the historic environment is of special value in west Cornwall, are well served. While in some ways there is a repetition of information between the volumes, they have different purposes and target audiences; the benefits far outweigh the cost of a few extra pages.

It is to be hoped that all who live and work in Cornwall are aware of how well served they are by having such information provided in an attractive and easily-available way. For several decades the county has had an historic environment staff that have been the envy of many of those labouring at recording and managing the archaeological resource in other counties. In most of England, people, particularly in the difficult times we currently find ourselves in, struggle to record and manage on a day-to-day basis without ever realising

dreams of presenting archaeological data to a wide audience; those that have put pen to paper have sometimes had to resort to doing this as a labour of love in their own time. Archaeologists in Cornwall may well also say they would like to do more, and there is always significant valuable future work to do in terms of recording, ongoing management and elucidating new aspects of interpretation, but they start from particularly sturdy foundations. Even in Cornwall there is much more that could be constructively done. While there are published detailed volumes on Bodmin Moor and now west

Cornwall, there are still no doubt people in other parts of the county that eagerly await similarly detailed volumes that will help them interpret the special qualities of their own home patch.

Sustainable conservation is very much about winning hearts and minds, and one important way to do this is to publish authoritative information in an attractive and accessible way; these books succeed on all counts.

*John Barnatt
Senior Survey Archaeologist
Peak District National Park Authority*

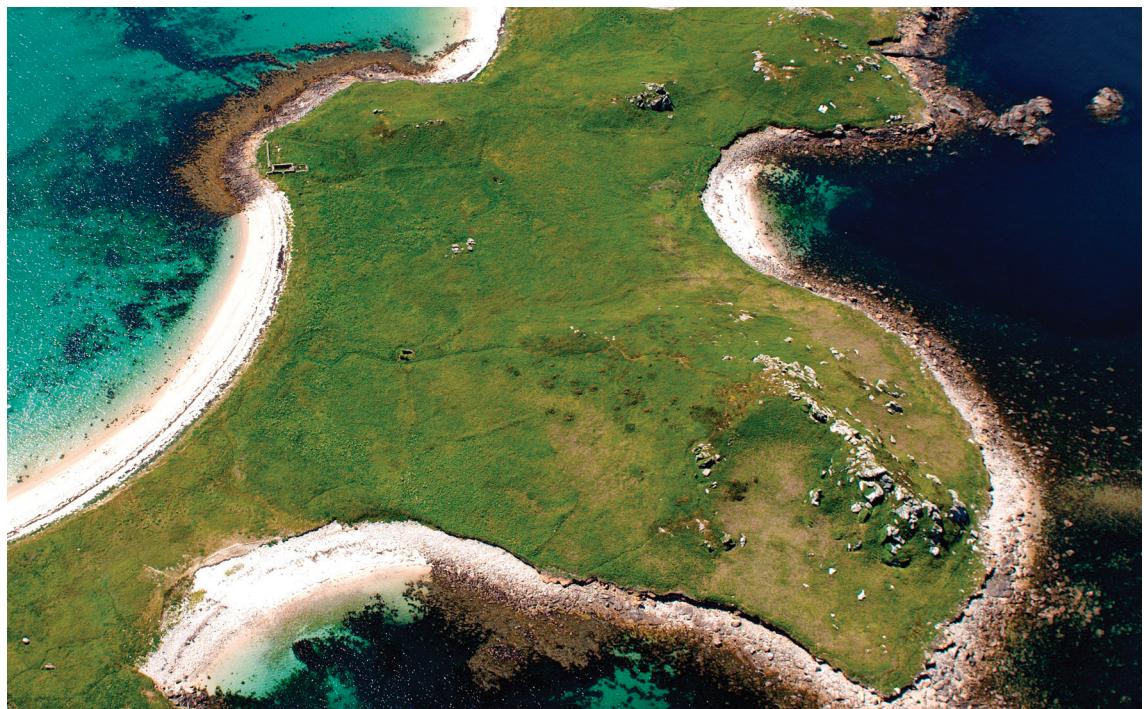


Colour plate 1 *Cist 8 on Constantine Island after excavation, looking north west. (Photograph: Historic Environment, Cornwall Council.)*



Colour plate 2 *A view south east across the site of the Roman-period enclosure at Little Quoit Farm, St Columb Major, in early August 2009, with cropmarks showing the encircling ditch and pipeline corridor. (Photograph: Historic Environment, Cornwall Council, F93-101.)*

*Colour plate 3
Norman Quinnell
surveying on Buckland
Moor, Dartmoor.
(Photograph courtesy of
Henrietta Quinnell.)*



Colour plate 4 Tean, Isles of Scilly, where Norman Quinnell surveyed chambered cairns, roundhouses and field systems over two days in May and June 1978. (Photograph: Historic Environment, Cornwall Council, 2009; F92-237.)



Colour plate 5 Part of a prehistoric field system on the foreshore north of Appletree Point, Tresco, surveyed by Norman Quinnell. (Photograph: Historic Environment, Cornwall Council)

Colour plate 6 An unusual 'boat-shaped' cist or chamber in one of the two cairns on Middle Arthur recorded by Norman Quinnell in 1978: 'To be alone on the Arthurs on a fine June day was a delight only tempered by the problems of surveying from dubious 'fixed' points.' (Photograph: Nicholas Johnson.)



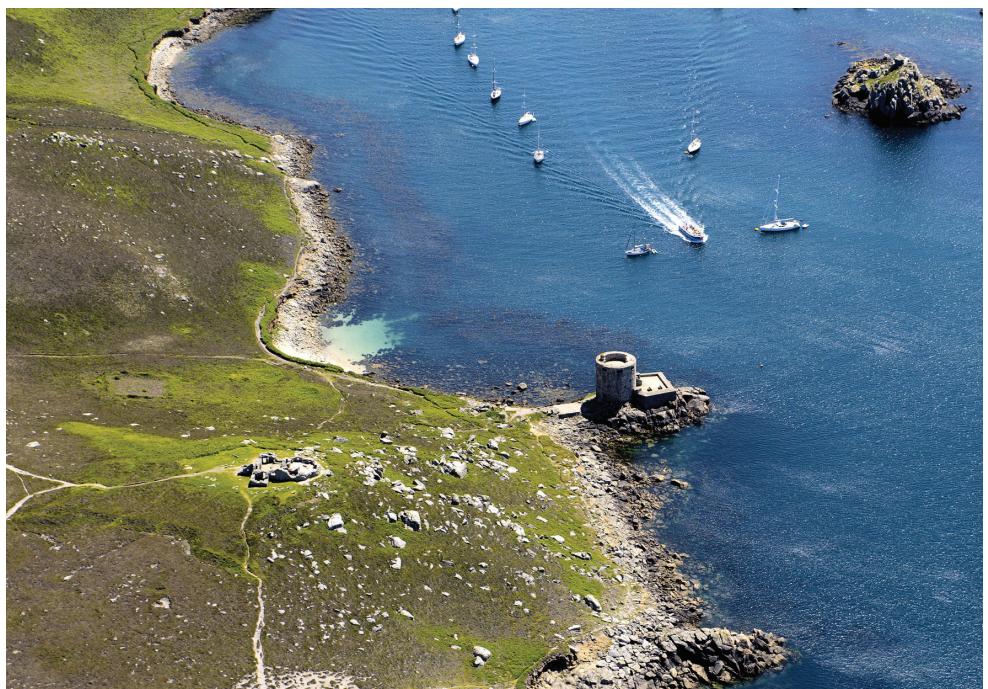


Colour plate 7 Samson, looking south west across Augustus Smith's mid nineteenth-century deer park and the abandoned post-medieval settlement on South Hill. (Photograph: Historic Environment, Cornwall Council, 2009; F92-057.)



Colour plate 8 Cromwell's Castle, Tresco, built in 1651–2 to defend the approach to New Grimsby Harbour, with an eighteenth-century artillery platform added on its seaward side. Behind it, on the skyline, its mid sixteenth-century predecessor, known as King Charles' Castle. The sites were surveyed in 1978 by Norman Quinnell's Archaeology Division colleagues, John Barton and Nick Attrill. (Photograph: Graeme Kirkham.)

Colour plate 9 The same sites viewed from the north. A bastioned earthwork added to King Charles' Castle during the Civil War is visible in the left foreground. (Photograph: Historic Environment, Cornwall Council, 2009; F92-094.)





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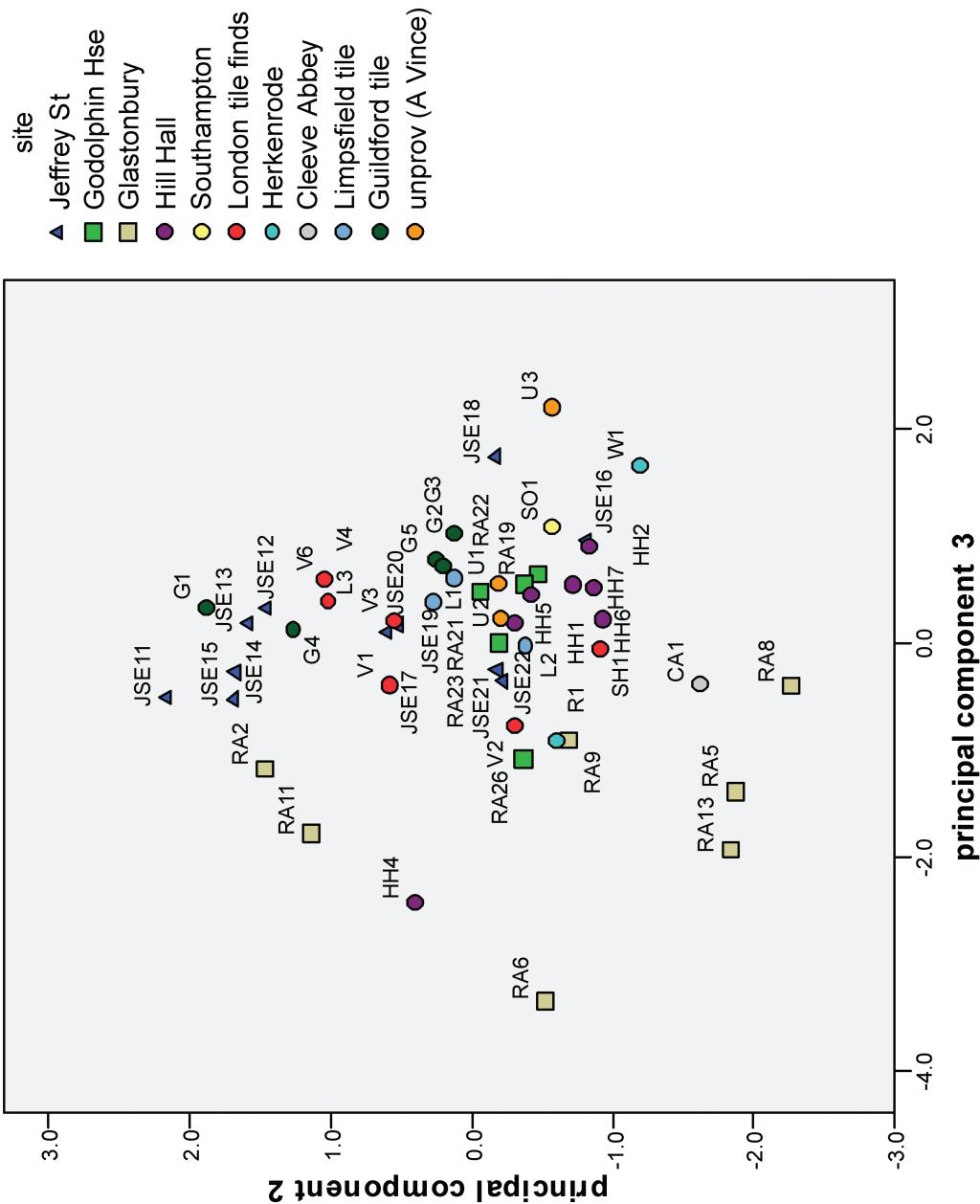
Colour plates 10a and 10b The tile setting around the fireplace in the Godolphin Room, Godolphin, and detail of the tile designs. (Photographs: David Garner © The National Trust.)



*Colour plate 11 Late sixteenth-century Dutch tiles from Godolphin.
(Photograph: Gary Young.)*



*Colour plate 12
Picklecombe Battery and Barracks from Plymouth Sound in 2011. (Photograph: Graeme Kirkham.)*



Colour plate 13 Plot of the second and third principal components arising from all the South Netherlands *Matolica* samples analysed by ICPS in this project, from Godolphin, from Glastonbury Abbey, and from a range of other ICPS analyses from various sites (Principal Components test used only ICP-atomic emission elements).