

CORNISH ARCHAEOLOGY

No 31 1992



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No 31 1992

EDITOR
SARNIA BUTCHER

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Editorial

Much to everyone's regret Daphne Harris has resigned as editor of *Cornish Archaeology*; the Society should be aware of how much she has achieved in producing a series of volumes, including several major papers, with accuracy, efficiency, and timeliness.

The present volume contains a range of papers amongst which it is hoped that all members will find something to interest them. There are excavation reports, notably that of Reawla, one of relatively few Roman-period sites excavated in the county, and there are records of finds and surveys, but there are also discussion articles. With the decline in resources for excavation it is timely that earlier discoveries should be re-assessed, as in Rachel Maclean's article on the fogous. Simon Timberlake deals with the recent discoveries of evidence for prehistoric copper-mining, and while these come from other areas of Britain they are highly relevant to what Cornwall might be expected to produce: Adam Sharpe puts them into the local context.

Inevitably as the years lengthen we shall lose pioneer members of the Society; we should perhaps avoid the inclusion of obituaries as a matter of course, but the record of its characters is part of the history of archaeology. There can be no doubt that Vivien Russell was a rare character, both in her way of life and in her achievements; the value of her work is underlined by the references to it which occur - quite without any memorialising intention - in several articles in this volume.

Ploughing up gatherer-hunters. Mesolithic and later flints from Butterstor and elsewhere on Bodmin Moor

PETER HERRING and BARRY LEWIS

Mesolithic flint artefacts have been collected on Bodmin Moor since the late 19th century, but due to the lack of extensive ploughing in this area of upland grazing few opportunities have arisen to search systematically for concentrations which could be identified as 'sites', whether home-base camps, short-term camps, kill or butchery areas or places where implements were manufactured (see Berridge and Roberts 1986, 22-3). The quantities of Mesolithic and later flints found around Dozmary Pool may be explained by the unusual natural waterbody being a focus for hunting, but large numbers of flint scatters, some of them also Mesolithic, have been found along the eroding shorelines of the modern artificial reservoirs at Crowdy, Siblyback and Colliford. The finds along these waterlines, which in archaeological terms provide arbitrary slices through the moorland soils, suggest that such concentrations are widespread on the Moor (see Berridge and Roberts 1986, 28-29. Wymer 1977 and Jacobi 1979 give references to several early flint collections made at Dozmary Pool and elsewhere on Bodmin Moor). Finds made in other randomly distributed patches of disturbed ground - gateways, tracks, molehills, archaeological excavations etc - reinforce this impression (see below for examples, and the Cornwall Sites and Monuments Record, held by Cornwall Archaeological Unit, for details).

A rare opportunity to closely examine an area of Bodmin Moor presented itself in 1983 when Economic Forestry deep-ploughed, in preparation for afforestation, the southern and eastern half of Butterstor Downs, a rounded hill in St Breward parish typical of many in the rolling downs at the heart of the Moor. Part of the ploughed ground was carefully field-walked in the winter of 1983-4 by Peter Herring and Jacky Nowakowski (see Fig 1).

To produce the low ridges into which the conifers were planted, the plough created flat-bottomed furrows 0.25 m deep, 0.5 m wide at their tops, and 0.45 m wide at their bottoms. As the furrows were 2.0 m apart only 20% of the ground was exposed. The forestry company also left unploughed a 6 m wide central track and a number of firebreaks from 3.0 to 7.0 m wide. Furthermore the plough only penetrated the covering of peat to reach the gravelly soil on the mid-slopes; elsewhere it simply turned over surface peat, free of all stones, including flint (see Fig 1). The forestry company's ploughing therefore provided a sampling strategy which allowed a larger overall area, c 10.5 hectares, to be examined fairly quickly of which 5.3 hectares showed the exposed gravelly soil in which flints were found. Although only c 15% of the 5.3 hectares was available for field-walking (see above) the furrows were close enough together for the fieldwalkers to be confident that all but the smallest flint scatters would be detected.

Thirty-six concentrations of flint were located in the study area, together with a "general scatter" of individual flints (34 in all) which included two arrow-heads, one leaf and one barbed- and-tanged (Types Ogival 4A and Sutton a respectively - see Green 1980, 68, 117) (Fig 2), two microliths, possibly also elements of lost or mislaid projectiles, and a scraper. The concentrations (of 2 to 32 flints) were extremely tightly confined; none exceeded 5 m across and most were less than 3 m. The finding of a refitting core and flake (Fig 2) in close proximity at site 19 indicates that the ground had been little disturbed since prehistoric times. Each scatter was carefully searched without the forestry company's trenches and beds being disturbed; all non-granite stone was collected - mainly flint but also including two flakes of greensand chert and scraps of phyllite, sandstone and sedimentary rock as well as the two pebble tools noted below.

Eleven concentrations included at least one microlith, three more had microburins and a further

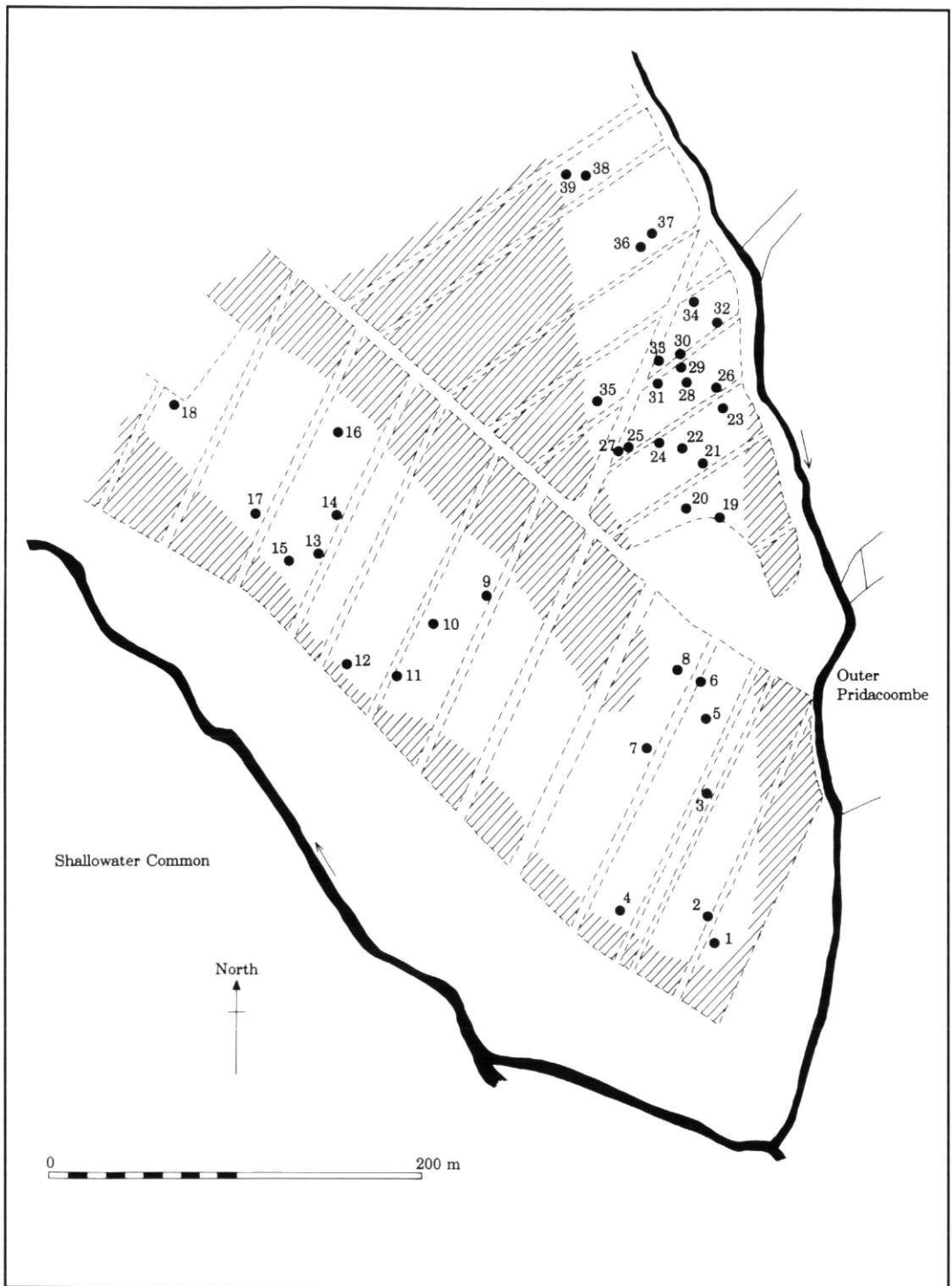


Fig 1
 Distribution of flint scatters at Butterstor. Shaded areas have deep peat not fully penetrated by the plough. Forestry tracks and fire-breaks shown.

Table 1
Implement types from Butterstor

Site Number	Flakes	Blades	Cores	Spalls	Core Rejuvenator	Irregular pieces	Microliths	Microburins	Piercers	Retouched flakes	Scrapers	Pebble tools	TOTAL
1	1	7											8
2	8	5											14
3	23	7	2									1	33
4	1	1	1										2
5	1	3											4
6	1	3											4
7	3	1											4
8	8	1							1				10
9	1	1	1				1						4
10	2		2										4
11			1				2						3
13	4	9	1			1	1	1					17
14	3	4											7
15	11	6		3	2		2						24
16	3					1							4
17	1	2	1					1					5
18	1						1						2
19	5	1	1						1				8
20	3	3	1										10
21	13	3	2	3	1		1			1			21
22	10	4	4	1	1			1					21
23	3												3
24	3	1											4
25	16	1		2			1	4					24
26	12	2		2			1						17
27	11	1		2									14
28	4	6											10
29	5	2					1						7
30	14	12					1						27
31	1						1						2
32	3	2		4									9
34						1					1		2
35	11	4	2										17
36	4	6	2										12
37	2	1										1	4
39	3	3											6
General Scatter	12	16	1				2				1		32
TOTAL	207	117	22	17	4	3	14	8	1	2	2	2	399

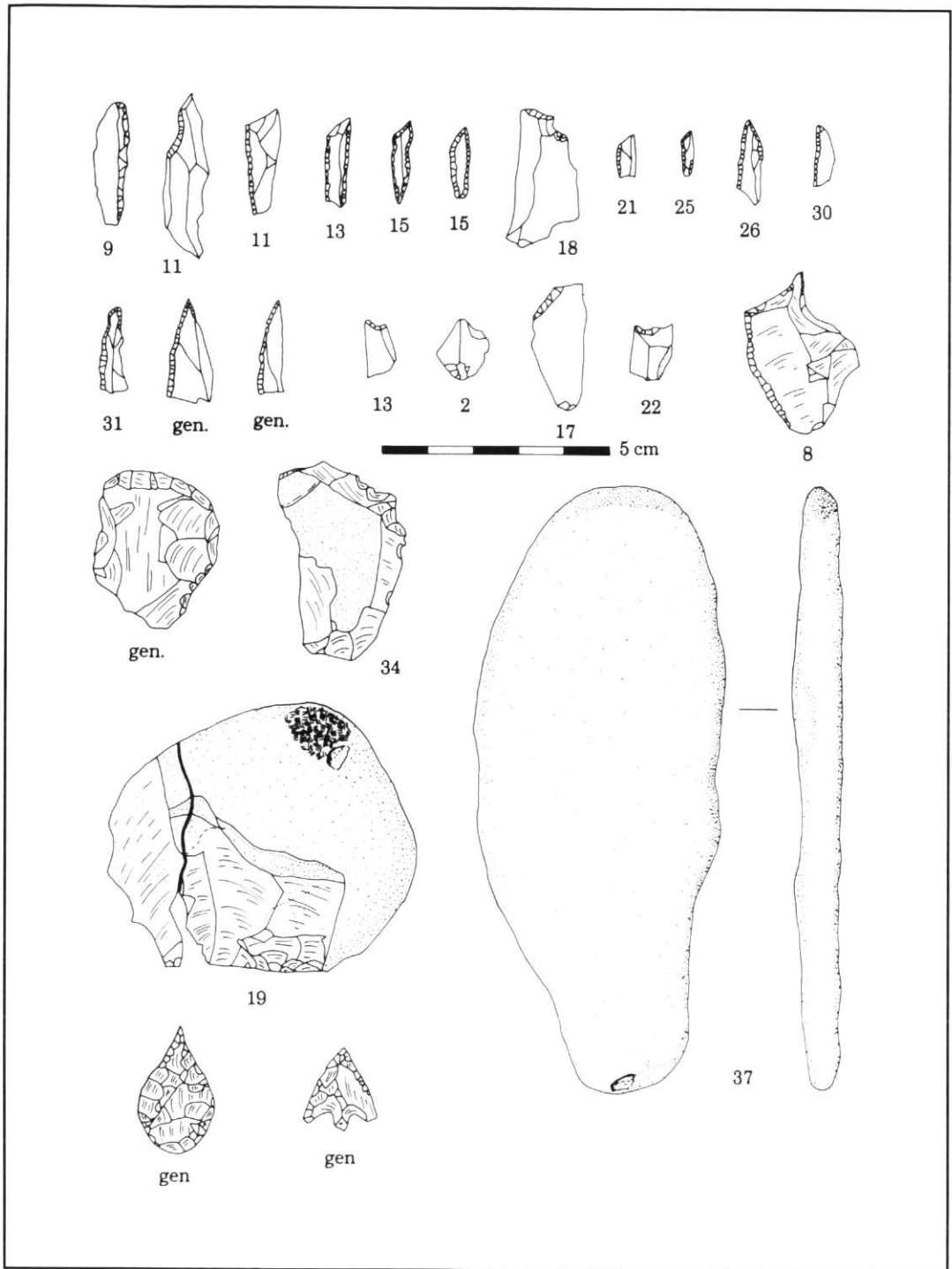


Fig 2

Selected flints and bevelled pebble from Butterstor. Numbers refer to scatters shown on Fig 1 and described in table 1. First fourteen are microliths, then four microburins, a piercer, two scrapers, the re-fitting core and flake and two arrow-heads from the general scatter.

two had pebble tools. Sixteen of the 36 sites (44%) appear, then, to be Mesolithic and it is likely that most or all of the others were also Mesolithic, judging from the smallness of the blades found on them. Four scalene triangles, two obliquely blunted, two straight-backed, one crescent and five unclassifiables made up the microlith collection (see Fig 2 and table 1).

The pebble tool found at site 3, with a distinct facet at its narrow end (Fig 3; in the possession of Mr G. Wilson, Outer Pridacoombe, Altarnun), and the bevelled pebble tool from site 37 (Fig 2), very similar to those found at Ponsongath on the Lizard (Smith 1987, Fig 8), are of particular interest as they spoil an otherwise exclusively coastal distribution of such artefacts in Cornwall and clearly further undermine their interpretation as either limpet scoops or limpet hammers (see also Smith and Harris 1982, 51-52 and Berridge and Roberts 1986, 20).

The function of the Mesolithic sites is possibly indicated by their small scale, both in terms of area and quantities of flints, and the finding of microliths with few other implements. Only three scrapers were found in the area (one in the general scatter). It will also be recalled that a refitting core and flake were found close together at site 19 (Fig 2) and noted, from table 1, that no less than 371 of the 400 flints collected (ie 93%) were waste pieces, mostly flakes (207) and narrow blades (117). On each site a small number of flint or green-sand chert beach pebbles was reduced to produce the tips and barbs of projectiles in an area where upland summer hunting was taking place. The two discarded or lost pebble tools appear likely then to have been used during flint implement manufacture. Unlike some Mesolithic sites in Cornwall, such as Poldowrian and Trevoise Head (Smith and Harris 1982; Johnson and David 1982), these scatters certainly do not represent home base camps (or semi-permanent habitation sites). Brief, single episode or single season use of these sites, for a few minutes, hours or days, makes less surprising their dense pattern, c 7 per hectare of exposed gravelly soil, or one every 0.14 hectares. Even if all 36 are accepted as Mesolithic, this part of Butterstor need not have seen people pausing in their movements to perform the tasks which left the flints described here more than once every 50 to 100 years.

If the density of sites is representative of the whole Moor, and there is no reason to believe that the southern end of Butterstor would have been especially attractive, or unattractive, then we should expect several thousands of such scatters to exist on Bodmin Moor, an astonishing 140,000 if the 20,000 hectares of the Moor has a density equal to that recorded at Butterstor! That it may well do so is suggested by the numbers of Mesolithic flints found in the other random soil exposures.

Modern rigorous excavations of later sites, Bronze Age to post-medieval, provided other opportunities for archaeologists to examine Bodmin Moor's soil, collecting artefacts from all periods, not just those under immediate examination. The locations of these later sites would not, of

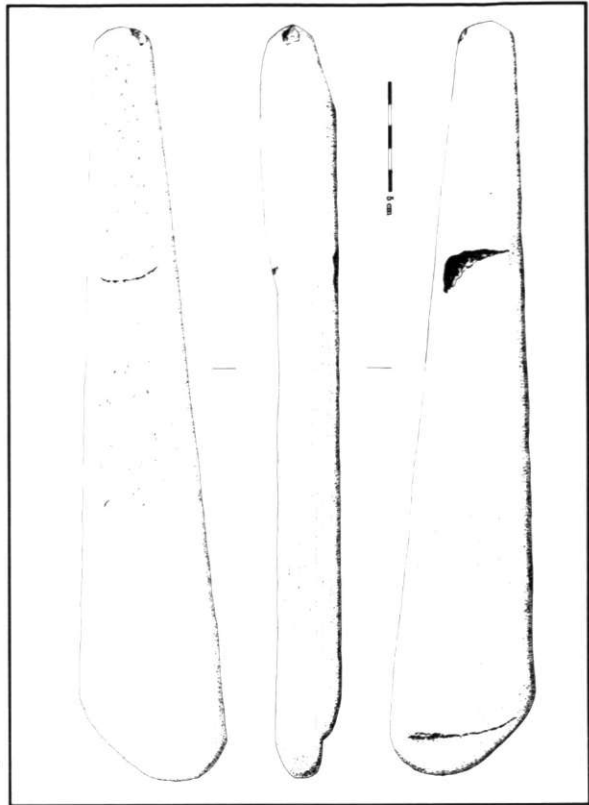


Fig 3
Pebble tool from Butterstor site 3.

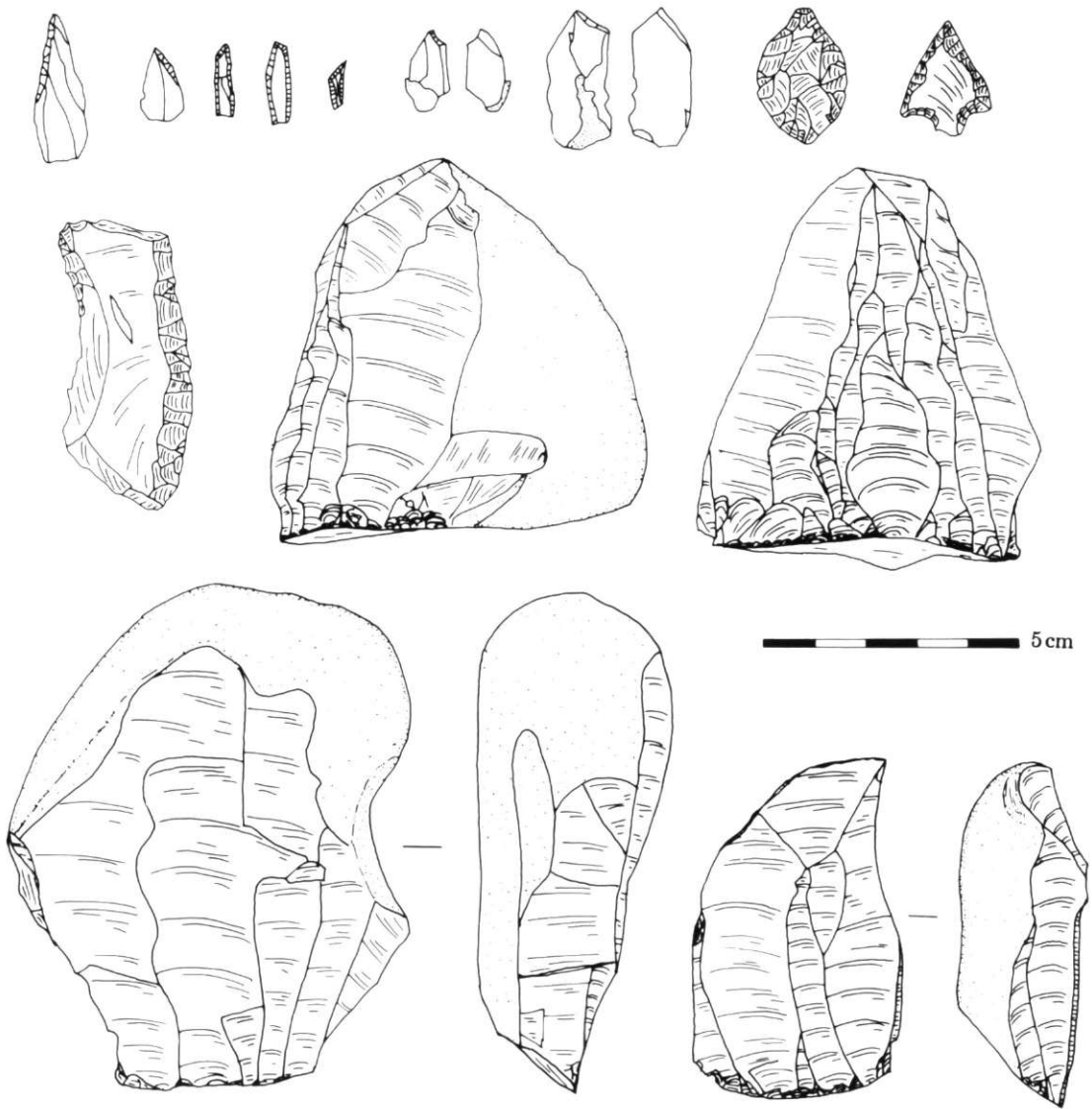


Fig 4

Selected flints from Bodmin Moor flint scatters. Five microliths (first from Carkees, the rest from Brown Willy East), two microburins (Brown Willy East), leaf and barbed-and-tanged arrowheads (both Butterstor Ford), knife (Butterstor) and the cache of three cores from Druglets.

course, have been influenced by Mesolithic flint scatters and their excavation therefore provides another form of random sampling. It is striking how many of the dozen or so adequately published excavations, mostly of ritual and burial cairns and usually involving very small exposures, have yielded Mesolithic flints as incidental finds. So many microliths were discovered around a typical cairn near Crowdy Marsh that the excavator even wondered whether it was built in the Mesolithic period as no Bronze Age artefacts were found (Trudgian 1977a, 19). Each of the three barrow excavations conducted in advance of the construction of the Colliford reservoir produced a geometric microlith (Griffith 1984, 78-9) and a microlith was also found in one of the tiny trenches dug at Stannon in 1991 to examine later prehistoric field boundaries in advance of a South West Water pipeline (Ratcliffe, forthcoming). It should also be recalled that microliths were found on five out of the six Bronze Age cairn excavations undertaken by the Cornwall Archaeological Society under the direction of Henrietta and Trevor Miles in the Hensbarrow granite uplands, a landscape simi-

lar to Bodmin Moor (Miles and Miles 1971, 20; Miles 1975, 20, 40, 48 and 55).

Observant farmers and walkers often find flints in small exposures of disturbed ground on Bodmin Moor, around fords and gateways, along tracks and in collapsed turf hedges. To an eye accustomed to granite stones, granite gravel and granite-based soil a piece of flint or chert is intriguingly alien. Most people also appreciate that flint had to be brought to the Moor, either deliberately in prehistory or unintentionally as broken beach pebbles spread with the sweetening seasand of improving farmers since at least the 16th century AD. Recorded examples of the latter are as yet rare but molehills in a 19th century field near Higher Tober, Altarnun (SX 1724 7731) yielded 18 irregular flint fragments lacking the bulbs of percussion of human intervention. It is the former - prehistoric cores, flakes and blades with some carefully finished implements and projectile points and barbs - that form most of the valuable collections, often built up over many years, which are held by various individuals living on or around the Moor. Many of these collections have never been examined by archaeologists, their findspots recorded, their contents described, classified, dated and interpreted, their details placed in publicly accessible reports or archives. If they ever were we should expect tens or even hundreds of new sites to be added to those already recorded and a large number of these would be Mesolithic.

A number of flint scatters were located in north-west Bodmin Moor by chance as one of the authors (PH) walked around the area between 1981 and 1984 while working on another archaeological project (recording aspects of the medieval farming landscape). Soil exposures are very rare in the extensive heathy pastures of St Breward, Blisland and Altarnun and yet 17 scatters were spotted here, essentially in passing. Seven were in vehicle or animal tracks, five in gateways, two at fords, one was in the earth core of an eroding Cornish Hedge (the late Peter Trudgian also found Mesolithic flints in the fill of a hedge at Crowdy - 1977b, 22) and one was in a run of molehills (see Appendix for details). So far only two of these scatters can be shown to be definitely Mesolithic - Carkees and Brown Willy East - but many of the others may eventually yield the distinctive microliths, microburins, denticulates, core axes/adzes, or pebble tools (see Smith 1987, 17) and only one, Butterstor Ford, is certainly later (Neolithic and Bronze Age). It is important, of course, to return regularly to these and other exposures as erosion and weathering continually reveal more flints and diagnostic pieces may eventually be found.

Thirty-one flints were collected from the site on the lower south-eastern slopes of Carkees Tor including an obliquely blunted microlith. Located beside a small stream, near its spring, this relatively large scatter which also includes a convex scraper appears to have been a more substantial site than those recorded on the Butterstor afforestation survey. The Brown Willy East scatter, also very close to a spring, is even larger (though more rigorously searched) with its 104 flints including four microliths (two scalene, one obliquely blunted and one unclassifiable) as well as two microburins. These large scatters, both found in very small exposures of animal and vehicle tracking, may have been short-term or even home-base camps, equivalents of George Smith's "larger occurrences" of the Lizard, also overwhelmingly in streamside locations (Smith 1987, 65). Groups may have regularly or periodically returned to these sites, in sheltered positions close to water and with a varied fauna (fish, fowl and mammals) and relatively rich, lush vegetation which would have included woodlands (Caseldine 1980, 9-10). The likely number of such Mesolithic camps on Bodmin Moor cannot be estimated with confidence although there are of course scores, even hundreds of similarly sheltered, even idyllic, streamside spots.

The number of smaller sites, estimated above, on the basis of the Butterstor density, must now be brought into perspective. Our chronology of the Mesolithic is still uncertain (see Berridge and Roberts 1986) but we may reasonably see the period lasting between 2000 and 4000 years. If the Moor was used seasonally as part of a cyclical movement through central Eastern Cornwall, perhaps in the mid to late summer following Roger Jacobi's model based on likely red-deer migrations (1979), gatherer-hunters may have been here for about three months or 100 days each year. This would give us between 200,000 and 400,000 days in which the projected 140,000 small sites would have been created. As these are likely to have been mainly either implement manufacture

sites or kill/butchery sites, the figure may even be regarded as low when we calculate that, on average, implements were being made or an animal was being dealt with somewhere on the Moor only once every 2 or 3 days. Such a low site-creation rate, if supported by future research, and assuming it is even through the two to four thousand years might also suggest that very few bands (just 3 or 4?) were patrolling these 200 square kilometres. The implications for our understanding of Mesolithic population levels in eastern Cornwall are obvious and profound and make the nature of the Mesolithic/Neolithic transition even more problematic (see Mercer 1986 for a stimulating and persuasive recent analysis).

The later Mesolithic incipient domestication described or envisaged by Mercer should lead to an expectation of a rising population, more or larger bands, more intensive exploitation of Bodmin Moor's resources, and an increasing site-creation rate towards the end of the period. Although the detail of Roger Jacobi's microlith-based chronology has been questioned (Jacobi 1979; Berridge and Roberts 1986) and the numbers of microliths found on the small Butterstor sites are low, it may be significant that Jacobi's suggested later forms, in particular scalene triangles, do dominate.

Bodmin Moor, with several apparently early Neolithic hill-top enclosures - Roughtor, Stowe's Pound (Mercer 1986) and De Lank (Herring 1988 and p166 in this volume), and possibly also Berry Castle (St Neot), Tregarrick Tor and Notter Tor (Dave Hooley pers.comm. for the last) - and a growing number of recognised long cairns - Bearah Tor, Catshole, Louden (Mercer 1986), Kilmar - is clearly an important area for studying the transition between the Mesolithic and the Neolithic, between the apparently free-ranging bands who left the Butterstor flint scatters and the uncertainly settled groups who imposed their claims on the landscape by decorating the most beautiful and dramatic hill-tops with simple stony defences.

Now may be the time to encourage anyone who has or knows of a matchbox, hatbox or loosebox of flints collected from Bodmin Moor to get them looked at by the Cornwall Archaeological Unit and their details put into the County Sites and Monuments Record.

Appendix

Notes on flint scatters recorded (by PH) on Bodmin Moor, 1981-1984

Brown Willy East SX 1648 7930

In animal tracks around a now-closed hunters' gate, within 10 m of head of stream. Exposed area c 25 m across. Mesolithic.

104 flints: 4 microliths (1 obliquely blunted, 2 scalene, 1 unclassifiable) (Fig 4); 2 microburins (Fig 4); 2 crested blades; 1 retouched blade; 1 blade core; 28 blades; 49 flakes; 17 spalls

Carkees Tor SX 1433 7630

In animal tracks c 15 m to west of the head of a small stream. Exposed area c 15 m across. Mesolithic.

31 flints: 1 microlith (obliquely blunted) (Fig 4); 1 convex scraper; 1 crested blade; 11 blades; 17 flakes

Butterstor Ford SX 1479 7801

In animal tracks immediately east of ford through De Lank river between Butterstor and Garrow Tor. Exposed area c 25 m across. Neolithic and Bronze Age.

72 flints: 1 leaf arrowhead (Type Ogival 4A, after Green 1980, 68) (Fig 4); 1 barbed-and-tanged arrowhead (Type Sutton a, after Green 1980, 122) (Fig 4); 1 discoidal scraper; 3 convex scrapers; 1 end scraper; 1 serrated blade; 1 retouched blade; 1 retouched flake; 8 blades; 56 flakes

Druglets SX 1443 7625

In animal tracks to west of small stream. All found within 0.2 m of each other. Appears to be a cache of cores; two are very large for Bodmin Moor. One is of Greensand Chert.

3 pieces, all cores (Fig 4)

Brown Willy West SX 1543 7911 to 1520 7950

Found over several years along main farm track and in adjacent areas of animal tracking. No

clusters; all individual finds. Three flints show nodular cortex (ie not beach pebbles).

30 flints: 1 side scraper; 2 convex scrapers; 4 retouched flakes; 3 blades; 20 flakes

Shallow-water Common SX 1453 7630

In vehicle/animal tracks. Exposed area c 20 m across.

11 flints: 1 convex scraper; 2 serrated blades; 2 crested blades; 1 blade; 5 flakes

Fernacre SX 1515 7990

In erosion around modern ford. Exposed area c 10 m across. Includes one small perforated slate disc (broken).

4 flints: 1 piercer; 1 retouched flake; 1 burnt flake; 1 blade

Louden Hill SX 1419 7979

In vehicle track. Exposed area c 15 m across.

8 flints: 1 convex scraper; 2 cores (one a trial piece with a few flakes taken off one end); 3 blades; 2 flakes

Middle Pridacoombe SX 1663 7653

In molehills over area c 50 m by c 100 m.

24 flints: 4 cores; 1 retouched blade; 8 blades; 11 flakes

Pridacoombe Downs SX 1651 7815

In eroding hedge fill. Exposed area c 2 m across.

21 flints: 1 convex scraper; 1 core; 19 flakes

Leaze SX 1338 7683

In gateway.

1 flint: 1 convex scraper

Torhouse SX 1557 7068

In cattle track within a prehistoric round-house settlement.

1 flint: 1 end scraper

Butterstor SX 1508 7868

In gateway. Exposed area c 5 m across.

4 flints: 1 convex scraper; 2 crested blades; 1 burnt flake

Outer Butterstor SX 1572 7804

In gateway. Exposed area c 5 m across.

4 flints: 3 blades; 1 flake

Carkees SX 1442 7633

In vehicle/animal track. Exposed area c 5 m across.

3 flints: 2 blades 1 flake

Lord's Waste SX 1671 7398

In gateway. Exposed area c 4 m across.

4 flints: 4 blades

Butterstor SX 1576 7675

In area disturbed by forestry

4 flints: 1 blade; 2 flakes; 1 knife; (Fig 4)

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Jenny McLynn processed these words and Cathy Parkes improved the sense of them.

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Prehistoric Copper Mining in Britain

SIMON TIMBERLAKE

At a recent archaeological meeting the discovery of prehistoric copper mines in Wales and Ireland dating from the second millennium BC was described as one of the major recent discoveries in Bronze Age archaeology. Over the last few years five 'primitive mines' have been excavated, yielding tools of stone, bone and wood, as well as numerous radiocarbon dates. A further 30 or so possible sites have also been identified on the basis of a residual presence of stone cobble hammers. All this suggests local exploitation of copper resources during the Early Bronze Age on a previously unsuspected scale.

This paper examines some of the evidence for prehistoric mining in Britain and also what we know of the technology, skills and quality of life of some of its protagonists. Since there is a strong probability that the ores of Cornwall would have been exploited at this period the evidence described here is an indication of what should be sought in the county.

The paper was read at the Plymouth meeting of the British Association for the Advancement of Science, August 1991, and was discussed at the joint symposium of the Cornwall and Devon Archaeological Societies in October 1991.

Introduction

The last few years have seen a number of exciting and well-publicised discoveries relating to the antiquity of metal mining in Britain. However the origins of this industry, so essential to the technological development of all civilisations, past and present, has in this country had a tradition of folktale, conjecture and controversy.

Within such areas as the Peak District, Wales, and Shropshire, popular guide-books have often speculated upon the Roman origin of their local lead, copper, or tin mines. This assumption is based on little more than the fact that there was a Roman presence, and that they were thought to be the first people who either could, or would have desired to, exploit the local ores.

Prehistorians have often looked at the concentration of Bronze Age (2000-800 BC) field monuments and trackways within the metal-bearing regions of Britain and speculated upon the activity of roving copper prospectors (Burl 1976); in almost all cases it has been assumed that this was a matter of hypothesis and impossible to prove.

Other archaeologists have argued that there could have been little British copper production in prehistory, on the grounds either that suitable ore deposits were lacking (Muhly 1987) or that the inhabitants lacked the technology to mine those which were present, scavenging what little was needed from the surface (Briggs 1988). Furthermore, it has also been claimed that trade routes and immigration from the more advanced metal-working cultures within known mining regions on the continent were already well-established, and that these obviated the need for local exploitation. Certainly, superficial similarities between some bronze compositions have led to many assumptions being made regarding the use of Irish or continental sources of copper during the British Bronze Age (Coghlan and Case 1957). In fact there is little hard evidence to link the copper, tin, or lead in British bronzes to any source whatsoever. This is particularly the case for the Early to Middle Bronze Age (2000-1400 BC): a period for which there is much data on the composition and types of bronze artefacts, but very little information on the sources of the alloy; nor does the archaeological record provide evidence for its smelting or smithing.

Perhaps however, we are going about this in the wrong way and should first look for the evidence of mining; the rest of the story may then follow. This is infinitely preferable, I think, to continually working backwards, trying to unscramble a wealth of existing, but misleading, statistics.

The fact that so few discoveries of these early (prehistoric) mining sites have been made, or that little serious attention has ever been given to this research, deserves some explanation. In this country the study of metal mines has been the province of geologists, mining historians and industrial archaeologists, whose interests have understandably led them to concentrate on the comparison and identification of mining remains which have produced buildings and other visible structures, many of which can be related to existing historical records or statistics. As a rule, therefore, the prehistoric origin of such workings has rarely been considered, and furthermore, the slim evidence for primitive mining artefacts has not been appreciated for what these might represent.

Similarly, archaeologists have been far too ready to leave the study of mining to the industrial archaeologist. For instance, a rather dangerous assumption is often made that mining, by its very nature, will always destroy the traces of its own origins, and that therefore no evidence would survive. Consequently the prehistoric archaeologist, whose subtle techniques alone would have been able to reveal the evidence, and even to date it, was not initially attracted to the scene. Fortunately however, history is made by energetic individuals who have steadfastly trod the unpromising path. One such figure was Oliver Davies. In 1935, following the publication of his great work *Roman Mines in Europe*, the British Association for the Advancement of Science appointed a committee, with Davies as its secretary, to investigate early mining sites in Wales. The committee included Childe, Fleure, Fox, and other notables, but Davies was its driving force. He looked at most of the primitive mining sites we know of today, basing his research on the recorded presence of stone tools or other primitive artefacts. Following this he carried out a number of rather limited excavations at the mines of Cymystwyth, Nantyreira, Parys Mountain, and on the Great Ormes Head in North Wales. He concluded, in the absence of any definitely datable objects (and of course without the benefit of radiocarbon dating) that the mines were probably of the Roman or 'Old Celtic period' (Davies 1947). This pioneering work laid the foundation for the modern discipline of mining archaeology in this country; a study which has produced such sensational findings from the very sites which Davies first investigated. In this article I shall first outline those areas in Britain and Ireland where the remains of prehistoric metal mining have been uncovered, and also the likely location of other sites. Secondly the technical differences between the exploitation of copper and that of gold and tin ores in antiquity will be examined. Finally I will discuss some of the questions which recent discoveries raise in relation to our understanding of primitive mining and Bronze Age peoples.

Recent discoveries of prehistoric mining sites

We can gauge the possible extent of Bronze Age prospecting and mining activity by plotting the field finds and recorded occurrence of stone mining tools within the various metalliferous regions of the British Isles (Fig 1).

In Ireland up to 31 small 'primitive mines' (short fire-set drift workings) have now been identified on the eastern and southern slopes of Mount Gabriel on the Mizzen Peninsula, Co Cork (Jackson 1968, O'Brien 1987). These mines were excavated at points of apparent copper enrichment in a horizon of 'copper-bed mineralization' within the local Devonian (Old Red Sandstone) rocks. A radiocarbon date from a trial excavation of one of the waste tips in the 1960s provided the very first evidence for prehistoric metal mining in the British Isles. More recently Dr Billy O'Brien has excavated one of these mines and the site has produced finds of tooled fire-wood, withy handles (for hammer stones), an alder shovel, many hammer stones, and charcoal. Processing areas have also been identified. Thirteen radiocarbon dates are now available from excavations within these mines: these all suggest a date of exploitation between 1800 and 1600 BC (the Early Bronze Age). It has been suggested that the prospectors moved inland to exploit the lower grade copper sulphides and carbonates on Mount Gabriel after first exhausting the more easily accessible and richer outcrops of oxidised ore on the coast.

Other sites of probable Bronze Age exploitation in southwest Ireland, where stone tools have been found, include the mines of Horse Island, Ballyrisode, Derrycarhoon (vein deposits) and

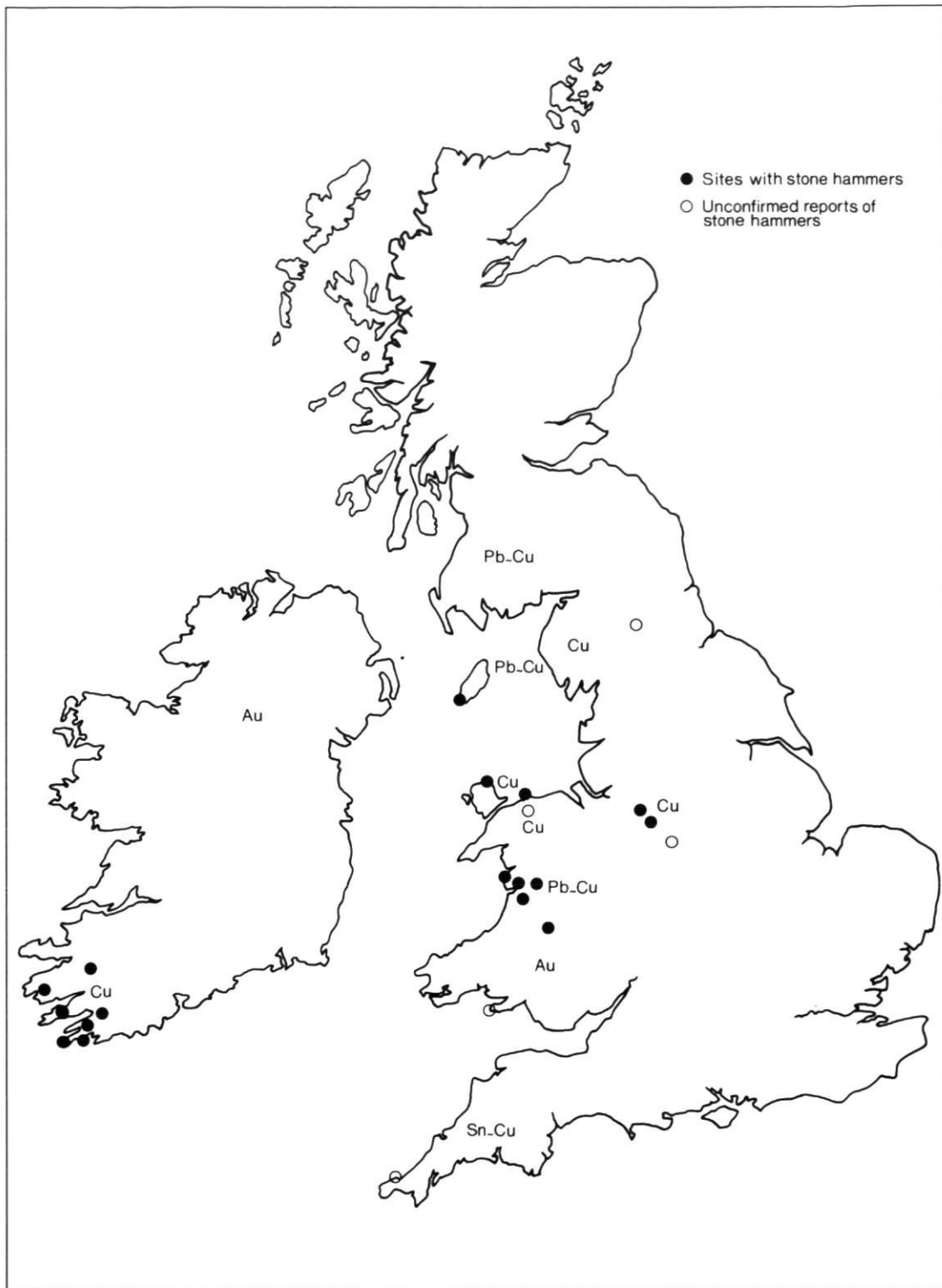


Fig 1
Distribution map of finds of stone hammers from mine sites within the British Isles

Ross Island, Killarney. The latter site has produced distinctive grooved (shallow pecked) mining hammers.

Parys Mountain in the northeast corner of Anglesey was the site of one of the largest copper mines in Europe during the eighteenth and early nineteenth centuries AD. Late eighteenth century miners recorded the discovery of stone tools within the ancient surface workings on the top of the mountain. In 1937 Oliver Davies excavated an ancient dump north of the summit windmill and this site was re-excavated by the Early Mines Research Group in 1988 (Timberlake 1990a). Three radiocarbon dates associated with finds of buried stone tools have suggested an Early Bronze Age date of about 1900-1800 BC. It seems possible that there were once fairly extensive prehistoric workings here which were removed by eighteenth century mining.

Great Ormes Head near Llandudno has attracted much attention following the uncovering of a large and fairly spectacular buried landscape of probable prehistoric workings (Dutton 1990). These consist of criss-crossing opencuts: working veins containing copper carbonate ore (malachite) (Fig 2). Within this area is a suggested entrance to an underground Bronze Age mine in which prehistoric stope workings (galleries in which the vein has been removed) have been observed at depths of more than 30m below the surface, cut by nineteenth-century shafts and levels. Some bronze fragments, possibly from the burred end of a bronze pick, have recently been found in this mine, along with numerous large and formless stone hammers, quantities of worked bone, and some antler fragments. The dolomitised limestone at the surface is rotten and soft enough to have been worked with bone points and scrapers. Four radiocarbon dates, from charcoal



Fig 2

Great Ormes Head, Llandudno, prehistoric opencast working. Beds of dolomitised carboniferous limestone intersected by veins bearing calcite and the copper ore malachite. The small hollows represent enriched pockets of malachite removed during the Early Bronze Age exploitation

and bone tools, suggest a lengthy period of working, which probably falls within the dates 1700 to 600 BC. The site now has a visitor centre and is open to the public.

Nantyreira Mine is situated at about 500m above Ordnance Datum on the eastern slopes of Plynlimon, at one of the most isolated locations in Wales. When the old workings were reopened here in 1859 a number of 'ancient' mining tools were discovered. Oliver Davies dug a trench into the old tips in 1937 and found charcoal and a number of stone tools. The Early Mines Research Group also excavated here in 1988 and radiocarbon dates *c* 1800-1700 bc were obtained from sealed fire-setting debris (Timberlake 1990a). The mineral veins carry copper pyrites and lead ore.

At Cwmystwyth in mid-Wales ancient surface workings crown the top of Copa Hill at an altitude of 420m above OD. The Comet Lode is a copper-rich lead vein (containing a small percentage of copper pyrites) within an area of 17th to 20th century (AD) lead mine workings. Where this outcrops on the brow of the hill it has been exploited by an opencut approximately 20m long and of unknown depth; this is now eroded and infilled. Down the slope three tips extend for a distance of almost 100m; these are partly grassed over and remain largely undisturbed, with many hundreds of stone tools have gradually eroded out. The paucity of later workings on this spot has preserved many of the features of this primitive mine, which makes it rare for mainland Britain. The presence of stone tools was first recorded in 1848 (Smythe 1848), and Davies cut a number of trenches into the ancient tips in 1937. The site was re-examined by the author in 1986 and three radiocarbon dates were obtained which confirmed a Bronze Age date *c* 1500 bc (Timberlake and Switsur 1988). Many stone tools were recovered together with fragments of an antler, possibly a pick.

In 1989 and 1990 the Early Mines Research Group conducted more detailed excavations within the opencast area (Timberlake 1991). This provided evidence for a fairly long and complex abandonment history of the working, suggesting infill with prehistoric mine waste sometime after 1700 BC, then the deposition of organic peat and silts (dating from around 1300 BC), hillwash deposits, and finally the re-use of the infilled working as a hushing reservoir for prospecting the lower slopes of the mountain at some time during the later historical period. Subsequently a

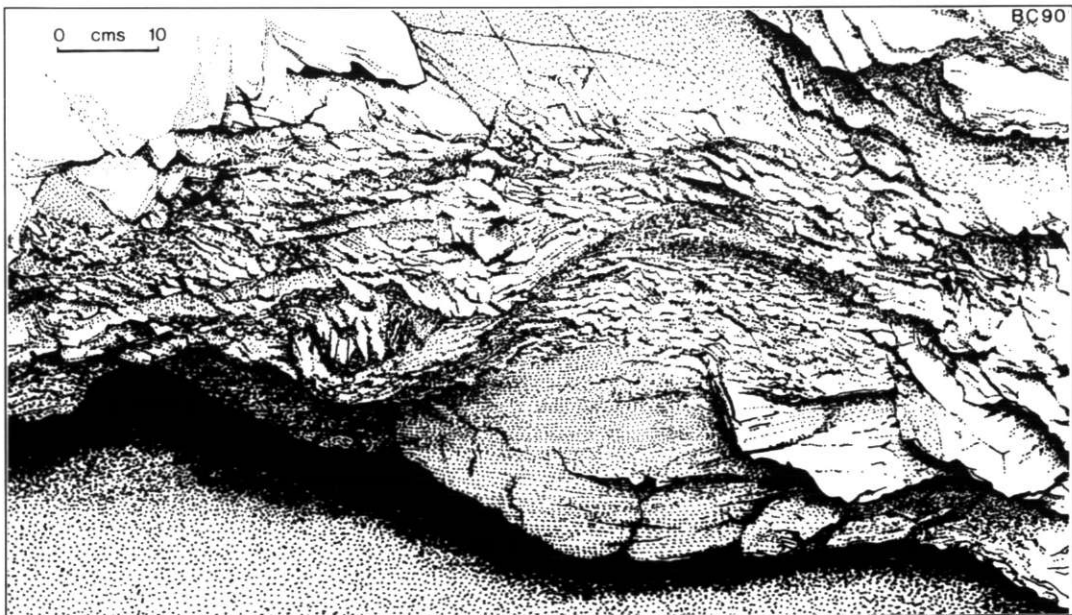


Fig 3

Cwmystwyth, Copa Hill. Entrance to buried mine gallery in the side of the opencast mine. Note the impressions of stone tools in the roof. Drawing by B. Craddock

prospection shaft was sunk through this during the late 18-19th centuries. An investigation at depth of the north-west wall of the infilled quarry revealed the presence of a short fire-set gallery with stone hammer marks in its roof buried beneath 2.5m of scree infill (Fig 3). Waterlogged organic deposits of Late Bronze Age date were encountered on the floor of this, and in sediments infilling the abandoned opencast. There is also evidence for a later backfilled shaft sunk through these deposits, probably also of 18-19th century origin. It is hoped to section this opencast fully in due course and to survey and excavate the surrounding area for any evidence of processing, smelting, or settlement.

Fieldwork and literature searches have revealed the presence of a good number of other sites in Wales where the evidence for primitive mining survives, particularly where this is associated with some form of copper mineralisation. In particular there is an especially high density of such sites within the midWales area around the foothills of Plynlimon, including the mines of Nantyricketts near Nantyreira, a group of mines north of the Rheidol: Nantyarrian, and Twll y Mwyn; and lastly a coastal group of mines to the north and south of the Dyfi estuary, plus Corbet Dovey and Pant Eidal near Aberdovey (Pickin 1990). A recent find of hammerstones has been reported from the old Nantymwyn mine near Llandovery. All these sites have provided either visible field evidence or good circumstantial evidence for the discovery of stone tools and ancient workings.

Isolated finds from the remainder of Wales include the record of stone tools at a lead mine near Trecastell, Conway, stone hammers from the copper working of Pant Y Gasseg near Amlwch, Anglesey, and the possibility of others from a mine at Brandy Cove, near Bishopston on the Gower peninsula. According to John Pickin (1990), there are some 26 mines in Wales from which stone hammers have been recorded.

Of the Later Bronze Age or Iron Age copper mining we know next to nothing. Many of those hillforts and settlements which so changed the landscape during the first millennium BC have produced some evidence for copper and bronzesmithing workshops and this suggests a continuing tradition of some form of indigenous copper production in Wales. Were such sites as the Great Orme worked continuously or should we look towards other ancient mines such as Llanymynech in the Welsh borders, reputedly a Roman mine though showing much evidence of native working (though without the use of stone tools), for later prehistoric production? In fact the nearby Breidden hillfort has produced some evidence for local copper smelting (Thorburn 1988). In mid-Wales the Darren hillfort lies so close to some ancient opencut workings (copper/lead) that one wonders how it could have been built without the discovery of such a mineral vein. Investigation of this site could prove very rewarding.

The Alderley Edge and Mottram St Andrew copper mines in Cheshire have a long tradition of claims to being Roman or prehistoric workings. Classic grooved stone mauls (mining hammers) from these sites have found their way into many museum collections. In 1874 William Boyd Dawkins excavated a number of shallow pit workings on the Alderley Edge veins, in which he found hammers, charcoal, and possible evidence for smelting (Boyd Dawkins 1875) (Fig 4). He tentatively described these earliest workings as Bronze Age. Archaeological surveys were carried out by a number of others during the 19th and early 20th centuries, and more recently (1986) by David Gale of Bradford University. At present the early mineworkings remain undated, but by inference they would certainly appear to be prehistoric. Renewed excavations are planned by Bradford University Department of Archaeological Science. The ores worked at Alderley Edge were principally the copper carbonate minerals malachite and azurite, which here impregnate the local Triassic sandstones.

At Bickerton, 16 miles south-east of Chester, copper has been worked from a similar deposit, certainly from the late 17th century onwards. Although stone tools have not been found here recent excavations at Beeston Castle, 2 miles to the north, have revealed the remains of a substantial Bronze Age copper workshop overlain by an Iron Age hillfort and medieval castle (Blick 1991). Consequently there has been some speculation that the Bickerton ores were also worked in prehistory.

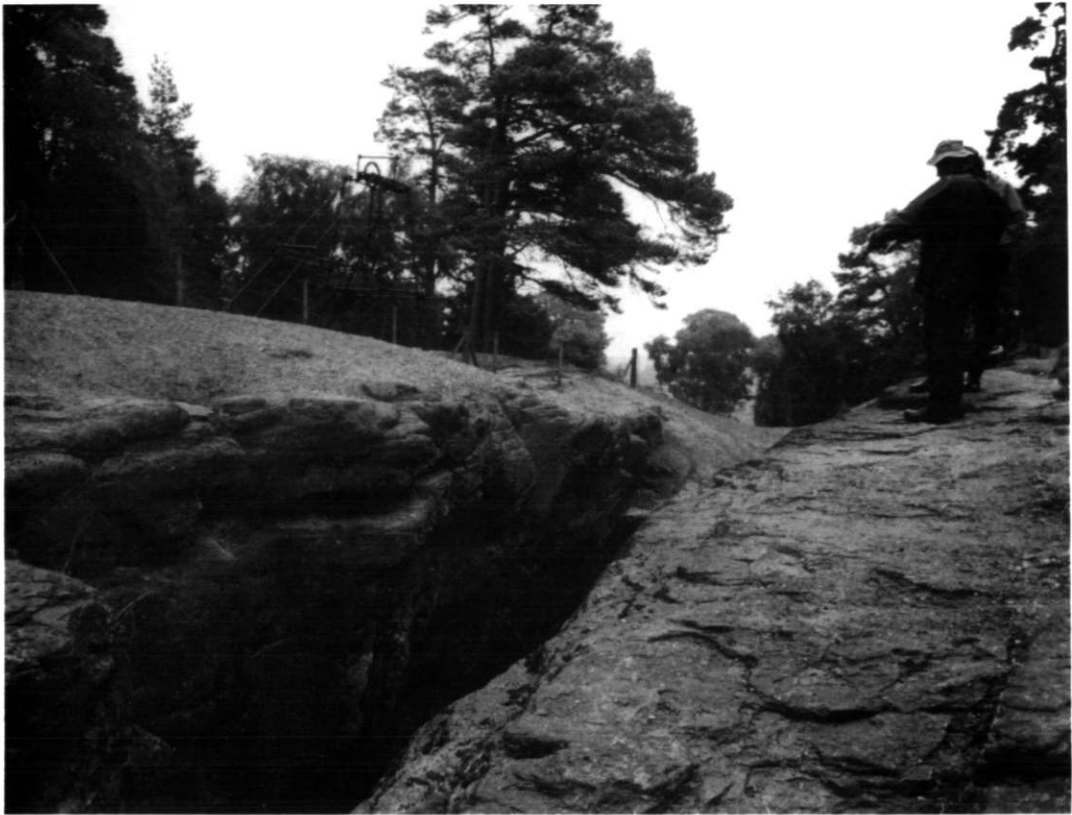


Fig 4

Alderley Edge, Cheshire. Shallow pit workings with evidence for use of stone tools, preserved in sides of the Engine Vein opencast

Finds of stone tools have recently been made at the copper mine of Bradda Head on the Isle of Man (Pickin and Worthington 1989). Copper veins outcrop along the sea cliffs of the Head, and it would not be surprising if these attracted the attention of prospectors at an early date (Fig 5).

As one might perhaps expect, the evidence for prehistoric mining within the south and north Pennine orefields, which carry a predominantly lead/zinc mineralogy, is conspicuous by its absence. The occurrence of stone mining tools has however been recorded from within old copper workings at Stone Mine on Ecton Hill, Staffordshire (information from the late Dr Nellie Kirkham). There is also a rather obscure documentary reference to the discovery of such tools in a mine at Tyne Green, on Alston Moor, Cumberland (information from John Pickin, Bowes Museum).

Perhaps we should also pay some attention to some of those other major or minor copper-producing areas of Britain from which we have, as yet, no hard evidence for 'primitive mines', or for their related stone tools.

In the Lake District, the rich copper deposits of Coniston would probably have been both visible and accessible during the prehistoric period. Whilst old surface workings have been noted there is no reliable account of any find of stone tools; such tools do exist at the Keswick museum, but have no certain provenance (information from John Pickin). Considering the intensity of prehistoric settlement and activity in the area, it is difficult to imagine that such deposits could have been ignored.

A similar situation pertains to the copper deposits of Snowdonia, North Wales. Whilst there are no confirmed reports of the discovery of stone tools from these mountainous mine sites, one would



*Fig 5
Bradda Head, Isle of Man.
Opencut workings on a
copper vein exposed in the
cliff face. Photograph by
courtesy of Dr David
Jenkins*

have expected prehistoric prospectors to be active in this area. Some of the 'earliest' copper workings appear to have been within the Nantlle valley. Pebble hammers or pounders very similar to our mining tools have been found within the general vicinity of some of the Snowdonian mining areas, either as stray finds or at non-mining sites of the Bronze or Iron Ages (*Archaeol Cambrensis* 8, 1908, 403-4).

In Scotland copper deposits have been worked in a number of places. Coastal outcrops are not uncommon (eg around the coast of Galloway and Dumfries), and copper is also present within the Wanlockhead/Leadhills area, the scene of gold workings probably of considerable antiquity (cf the accounts of finds of bronze picks from surface workings in the Leadhills: Blick 1991, 99). Scottish museum collections contain many stone hammers similar in appearance to mining tools (Roe 1967); some of these may well have come from Bronze Age mineworkings.

Historically the most important copper mining area in Britain has been on the south-west peninsula. Copper occurs on Exmoor, where it has been exploited since medieval times, around the south-western margins of Dartmoor, and throughout the mineralised belt of Cornwall. Whilst vein mining of copper would not have been easy within the granite and hardened slate hinterland prior to the introduction of iron tools, the many copper lodes which outcrop around the Cornish coastline would have been easy to see and accessible to work (without problems of drainage or removal

of overburden) by the Bronze Age miner.

These mineralised areas of the south-west peninsula appear to have been fairly densely populated throughout the prehistoric period. In addition there is a good deal of circumstantial evidence to suggest that the alluvial tin deposits were being worked during this time. In the light of this, the absence so far of any hard evidence for prehistoric copper mining may be significant. Most coastal outcrops would have eroded back considerably over the last three and a half thousand years and primitive workings may well have disappeared, along with the evidence for their associated stone tools. As in the other mining areas cited above some tools, including those with a suggested mining function, do exist within museum collections. For instance I am aware of at least one stone hammer recorded as having been found within an old tin or copper gunnis working in West Penwith (information from Cornwall Archaeological Unit). Indeed, I imagine that the most promising areas to examine would be amongst some of the old opencut workings of known medieval or post-medieval date which now extend inland from those very same coastal outcrops where the most accessible lodes would have been found in prehistoric times. Perhaps some of the more profitable areas to examine for evidence of early (prehistoric) mining would include the following: along the cliffs and inland areas of the Lizard peninsula where native copper has been found and worked within steatite veins in the serpentine; copper lodes which outcrop along the cliffs in Penwith, at Botallack and Cape Cornwall; Cligga Head; the coves and gunisses around St Agnes harbour (Fig 6); the old Zennor mine and surrounding area; Penberthy Crofts, St Hilary; and around the South Caradon and Phoenix Mines on the edge of Bodmin Moor.

It should be clear from all this that there may well be important discoveries to be made by the diligent researcher and field walker within the various metal mining regions of the British Isles. By concentrating fieldwork within those likely environments and areas suggested I predict that archaeologists, both amateur and professional, will almost certainly push back the frontiers of our knowledge over the next five to ten years. When one thinks of the number of Neolithic axe-factory sites discovered by survey and field-walking over the last 20-30 years, there appears to be great potential for the discovery of further sites of Bronze Age mines.

The evidence of prehistoric mining

Sifting through the remains of thousands of tons of mine waste produced and deposited during the historical period, or else scanning the literature for references to the opening up of the 'old men's workings' during the last 200 years, we are basically looking for the evidence of a pre-iron technology (and only such evidence as would have survived in a far from ideal preservational environment): we are seeking the most primitive and utilitarian of tools - those that would be used as simple battering or picking instruments against the hard quartz or carbonate of the copper veins, and also those which would have been most quickly superseded by the introduction into common circulation of the harder metal alloys of bronze and iron.

Stone pebble hammers or 'mauls', some un-modified and chosen on account of their shape and weight, others slightly notched or else pecked around the centre to facilitate hafting within rope or wooden handles, are invariably examples of the earliest known metal-mining tools (Figs 7-9). In Europe and the near East such tools are associated with well-authenticated sites dating from the Copper Age to the early Bronze Age (4000-1500 BC): Tylecote 1987, 601. Stone tools undoubtedly survived the introduction of bronze. This metal was relatively ineffective against the hard ore-bearing rocks (compared to the later use of wrought iron), and its scarcity would also have precluded its general usage, at least until much later on in the Bronze Age. At most sites stone pebbles would have been readily available, and furthermore used in a quite utilitarian way. Nevertheless, the distinction must be made between the pebble hammers that would have readily broken in use, and therefore would have been fairly quickly superseded by iron, and other stone tools such as handheld mortars or querns which are commonly found associated with post-medieval mines, and which were there most probably used as crushing anvils in conjunction with iron hammers (Thorburn 1990). However, the use of pebble hammers as mining tools has not been substantiated with-



Fig 6

St Agnes, Cornwall, Wheal Coates. Opencast workings in the cliffs; probable pre-eighteenth century trench workings, costean pits and shafts inland.

Photograph by Cornwall Archaeological Unit

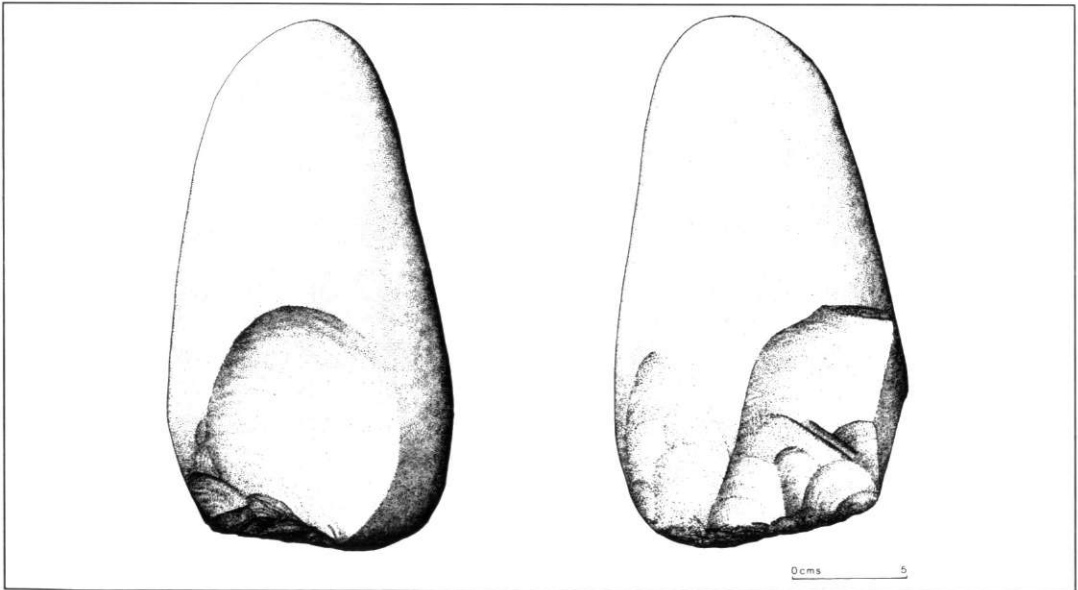
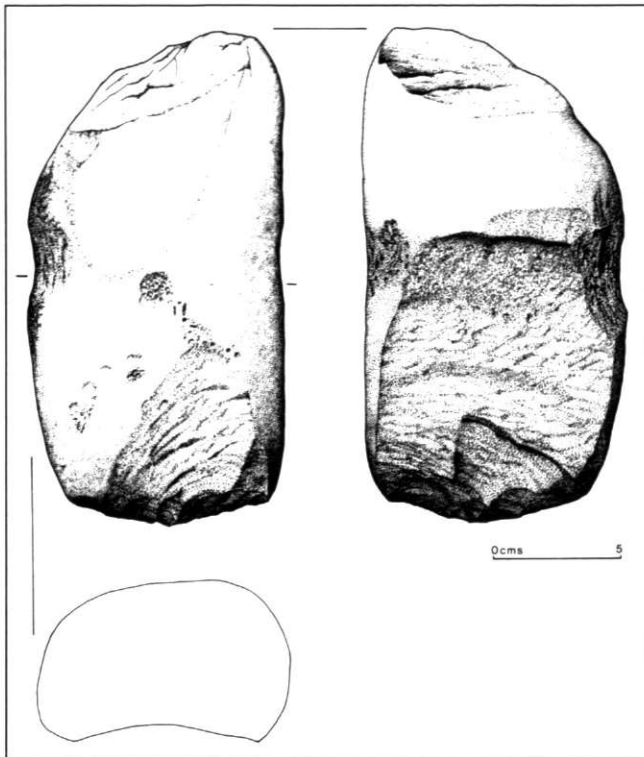


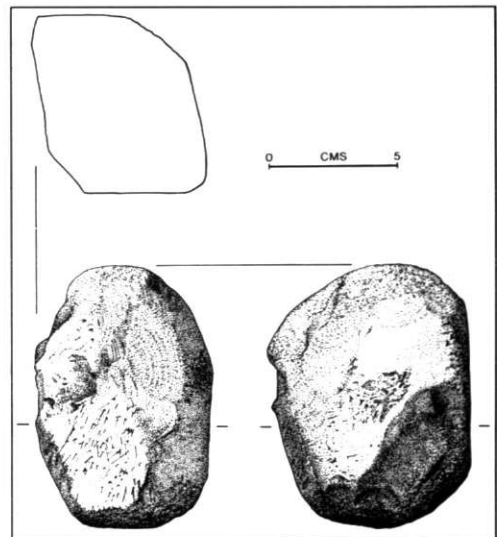
Fig 7

Unmodified pebble hammer from within prehistoric opencast mine on Copa Hill, Cwmystwyth.

Drawing by B. Craddock



*Fig 8
Partially grooved pebble hammer
from ancient tips on Copa Hill,
Cwmystwyth. Drawing by B
Craddock*



*Fig 9
Small well-used hammer stone, possibly used for
ore-dressing, from Copa Hill, Cwmystwyth.
Drawing by B Craddock*

in any securely dated Iron Age or post-Iron Age mining context.

When citing the incidence of pebble hammers as evidence for local Bronze Age mining one must be very careful to consider only those tools found at, or within, the mineworkings themselves, and preferably only those intimately associated with the debris produced. There are many examples, throughout the prehistoric period, of very similar tools being used for quarrying, smithing, metal working, and stoneworking, along with a variety of other functions within the domestic context.

The occurrence and mode of outcrop of an easily workable copper ore is a further critical fac-

tor in permitting the operation of 'primitive mining'. The ore needs to be simple enough to process and smelt, and present in sufficient quantity at the surface. The presence of oxidised ores would attract the prospectors, and typically this would be where the vein or outcrop was exposed in a well-drained elevated position, and one with little overburden to be removed. Such workings are often highly eroded, shallow, open quarries or trench mines, and are situated above the water table where only the richest parts of the lode have been removed. The later practice of opencasting the lode across country along its strike (outcrop) does not seem to have been followed at all in the earliest mines, and invariably these workings are of very restricted extent. Within the buried quarry workings one may also find rock faces containing preserved areas of pounding and pitting marks from the use of stone tools. The original tip material is coarse, highly degraded, and overgrown (where not disturbed) and is invariably hand-picked clean of the sought-after mineral, yet associated with discarded hammerstones and their splintered fragments. Beneath the tip surface charcoal may be ubiquitous, and sometimes deposited in defined layers or lenses. Bone or antler tools and/or wood may sometimes be preserved.

The charcoal is derived from 'fire-setting' - a technique of lighting fires against the rock face and then allowing these to cool, either naturally or else through dousing with water, to crack it. This technique is difficult to date, for fire-setting has had a very long currency of use in mining (Timberlake 1990d). Nevertheless the preserved charcoal from these fires has allowed us to use radio-carbon dating where early mining has been suspected. This is probably the single most important technological development, which has made the recent re-examination of such mining sites worthwhile.

Documentary evidence for the finding of stone tools during the course of later re-working of mines, particularly over the last few centuries, is important where such remains no longer exist or are inaccessible. The finding of such remains, 200 years or so ago, in conjunction with the local miners' and surveyors' comments as to their antiquity, provides a useful indication that the use of such tools did not in fact have any contemporary parallel, contrary to the claims of one or two scholars of this subject.

One of the earliest documentary accounts concerns the re-opening of the old Twll-y-mwyn mine, near Talybont in mid-Wales, by Lewis Morris, the Crown Mineral Agent and antiquary, in 1744. Morris describes the probable method of use of these tools and suggested that the mines were 'wrought before man knew the use of iron' (Morris 1744).

Primitive methods of extracting and working the ore

Boulders containing veins of copper ore are occasionally found within the glaciated landscape of Great Britain, and almost certainly these would have been scavenged at an early date by metal-hungry man. However, the restricted geological distribution of British copper ore deposits, coupled with an even greater scarcity of outcrops, would have meant that such erratic boulders, where these survived at all, would have ended up very widely dispersed within the landscape. These could never have sustained any consistent production. More importantly, copper ores oxidise quickly to secondary minerals which would not have survived residually for long, once removed from the outcrop in small pieces.

Copper ores will not therefore form alluvial deposits, unlike tin ore (cassiterite) and native gold, both of which are resistant to oxidation and heavy, and therefore would survive residually within the surface environment. Indeed, these latter minerals are concentrated by the action of gravity and water to form viable economic deposits. Whilst tin and gold deposits would have been fairly easy to exploit, and within these islands probably were, from the end of the third millennium BC onwards, the winning of copper presented the first big problem to newly metal-conscious man. Underground mining however, was nothing new. Many of the techniques used by the neolithic flint miners of southern England, as well as by the stone quarriers of axe factory sites within the mountain areas of the west and north of Britain, where fire-setting was used in some applications (Claris and Quartermaine 1989), were already well tried and tested. In fact, there is every reason to believe

that by the beginning of the second millennium BC, Bronze Age miners were already able and willing to tackle a variety of different types of ore deposit, within a variety of different host rock environments. From the available evidence it appears likely for instance, that quartz veins containing unoxidised ores (copper pyrites) were already being exploited in Wales.

Access to the deepest of the vein-workings, or 'trench mines', would probably have been by way of footholds cut in the rock, or possibly by notched tree-trunks, or hand-cut and bound sapling ladders. Ore would probably have been removed in baskets carried over the shoulders of the miners, or else in leather bags; the remains of such baskets were found during the clearing out of the old Esgairwyn mine in the 1750s (Morris 1756).

The method of working the opencasts, I suggest, would have been to remove as much of the waste material as possible. However, as with underground mining of a more recent period, there is evidence that the miners within the subterranean galleries of the Great Orme carefully stacked their waste (known in mining parlance as 'deads') within the worked-out caverns and fissures underground (James 1990).

In some mines it may have been possible to work down to the water-table, and perhaps slightly lower: a slow steady influx of water could have been removed from the mine by using leather bags, passing these from one person to the next, or else by emptying them into dams at successive short intervals, and bailing from one to the other up to the surface. Where the host rock of the mine was free draining, perhaps due to the natural underground fissures which may have existed in limestone areas such as the Great Orme, primitive mining could have reached much greater depths. Invariably these would have been the more successful mines, with the greatest duration of working. Pre-historic workings have been found at a depth of over 30 metres on the Great Orme (Duncan 1990), although I suspect that a maximum depth for most of the 'trench mines' would have been between 5 and 10 metres.

There appears to be plenty of evidence for the use of timber. Where this has been preserved, such as in the waterlogged conditions at Cymystwyth and Mt Gabriel, there is evidence for cut and split firewood for fire-setting, and at the latter site for wooden tools.

The demands for fire-setting would have been much higher where quartz veins in hard slaty rocks were exploited. Recent experimental work carried out on-site in Wales suggested that the ratio of wood required to waste rock produced was at least 1:2, even where mining in fairly well cleaved slates (Timberlake 1990d). The ratio may have been much lower in a more compact silica-rich rock. Fire-set rock can be effectively broken up using hand-held or hafted stone hammers, and then prised away with such tools as antler picks. The latter have proved to be highly effective, even against rather hard quartz-veined rocks (Craddock 1990). In this fashion the Bronze Age miners would have worked short galleries, - perhaps no more than one or two metres long - removing only the richest copper-bearing parts of the vein and leaving behind almost everything else.

Undoubtedly, most of the ore lumps would have been hand chosen and separated within the mine. This involved breaking the larger lumps with stone pounding tools, and then crushing some of the hand-picked ore nuggets on shallow stone hammer/anvils. There is some evidence to suggest that the ore may have been hand-picked to the smallest (finest) possible grade, with a final dressing upon a mortar stone of saddle-quern type, an example of which has been found at Cymystwyth (Timberlake 1988). It is not certain whether water would have been used in washing and separating the waste rock from the ore. The evidence suggests that some sort of washing may have been carried out: e.g. a possible washing area on the Great Orme (Lewis 1991).

To fulfill the needs of mining substantial amounts of wood would have been required, though perhaps over an extended period of time. Such a demand may imply the need for coppicing for firewood, and some sort of management of woodland. The use of hammer stones, as suggested by recent experiments, has implications for the repeated repair of these tools. Either Bronze Age miners were skilled at repairing their own hammers, or else they would have required a skilled repairer within each mining team, along with a plentiful supply of fresh pebbles. Unflawed pebbles of the right weight and shape are not easy to find, either on river beds or on coastal beaches. Such a

selection as found on the tips at Cymystwyth implies a high degree of choice in collection, as well as thousands of man hours to transport them up to the site (Figs 7-9).

The social role and productivity of Bronze Age miners

Any commentary upon the social organisation of 'primitive mining' is bound to be speculative. However it does help to try to add flesh to the bare bones of archaeological statistics, and also to construct some sort of picture for the benefit of the interested layperson. For those of us who spend our time digging up the evidence it helps to focus our ideas and think of the implications of what we find.

For instance, who were the miners? Was mining carried out by itinerant copper prospectors who would have had the skills and knowledge to recognise the tell-tale signs of mineralisation, and perhaps the ability to train and organise mining teams. Could they also have arranged for the distribution of the concentrate (unsmelted yet enriched ore) or locally smelted copper product to the nearest bronze workshops or smith, or otherwise along distant trade routes? Alternatively, was mining carried out on a fairly ad-hoc basis within local tribal areas, by people who were basically arable or pastoral farmers, and who worked 'up at the mine' during the slack season? Would whole family groups have worked together in different areas of the mine, involved in all the operations from fire-setting and winning the ore to the production of the final pre-smelt concentrate, or was there a predetermined division of labour throughout the process?

What was the link between the miners - the producers of the ore - and the bronze-smiths who commanded the skill and power to alloy tin and copper and the other metals together and to cast them into objects of obvious economic value and social prestige, and how involved were these metalworkers in initiating mining itself? What was the value of the raw processed ore, compared to copper metal, and to the bronze ingot or artefact?

The lack of any evidence for pottery or metal tools from the mining sites may reflect the poverty and low status of the miners, although this explanation seems a little difficult to credit. Certainly there is no reason to suppose that slave or convict labour was involved, as in the mines of Classical Greece and Rome (Healy 1978).

When faced with the interpretation of such bleak, yet spectacularly situated mining sites today, there is still very little firm evidence. It is difficult to offer more than a guess at the importance of these sites three to three and a half thousand years ago. How much ore did they produce, and how much did each contribute to the pool of available copper, and therefore by inference bronze, within the Early Bronze Age 'metal market'? Whilst one might look at the size of the excavations and the volume of tip material removed in an attempt to answer this sort of question, one must also remember that the depth of infilled workings is often difficult to estimate, and that the size of these tips only tells us the volume of material thrown away. Further, where economy of labour, or time, is not a particularly limiting factor, and where all the ore used is hand-picked, a reasonably low grade or even a very minor deposit may be perfectly viable. Such deposits could have been worked successfully, even over a very long period of time. The criteria for assessing what may or may not have been a workable deposit in prehistory are thus very different from those which we might use today.

Some earlier claims for the production of copper from 'primitive Bronze Age mines', such as that of 146 tonnes of smelted finished metal made for the really quite small Mt Gabriel mines in Ireland (Jackson 1980) now appear somewhat extravagant. A more recent estimate produced for Cymystwyth (Timberlake 1990d) suggests that from the extraction of an estimated 4800 metric tonnes of material from the opencast perhaps as little as 2-4 tons of copper metal were produced. In fact community mining may have produced no more than one or two baskets of hand-picked cobbled ore per day.

Processing the ore

Mention has been made of the lack of contemporary smelting evidence in the vicinity of any of

the Welsh or Irish prehistoric mining sites (Craddock and Gale 1988). This is a thorny problem, and a number of explanations have already been offered. Firstly, we must not forget that the study and excavation of these sites is still in its infancy; little detailed investigation has yet been made of the surrounding areas and the evidence for smelting or processing sites may yet be discovered. Secondly, we have already suggested that mining need not have been carried out at a very intensive rate, or on a very large scale, at any one time. The small amount of ore may very well have been carried down the mountain at the end of each working day and taken back to the local settlement for further processing or smelting (Timberlake 1990d). Finally the ore may have been smelted in very small, simple, and ephemeral furnaces, and in such a way that slag may never have been produced. It has been found by experiment that by first roasting and then smelting the ore under poorly reducing conditions, the copper ore (copper pyrites) can be reduced to the native metal, whilst the iron remains as an oxide, thus never entering the slag phase. Hence we have a smelting operation that would leave very little in the way of permanent remains (Craddock 1990). This is an interesting idea: if metal was smelted in a simpler and quite different way from that shown to have been used in continental Europe it may suggest that metal working and bronze-smithing could have developed independently, to some degree, within the British Isles.

An even more bizarre explanation has been offered for the lack of smelting evidence (unpublished discussion, Early Mining Workshop, Snowdonia study centre, 1989): at some of the mines, notably the Great Orme, Alderley Edge and Mt Gabriel, it appears that only malachite (green copper carbonate) may have been sought. There is much evidence to suggest that malachite was a highly prized body pigment in prehistory (Lindow Man, the unfortunate garrotted victim of an Iron Age ritual sacrifice, whose remains were recovered from a peat bog in Cheshire in 1985, had his skin painted in malachite ochre). Perhaps these were, at least for a while, pigment mines? However, it is rather more difficult to explain how sites such as Cymystwyth or Parys Mountain could have functioned in this way, for here Bronze Age man was probably mining primary sulphide ores.

Bronze artefact analysis suggests that during the early part of the Middle Bronze Age there was a significant local production of high-lead bronzes in North Wales: the Acton Park industry (Tylecote 1986, 27, and Burgess and Northover forthcoming). It has been suggested that several percent of lead was intentionally added to improve the casting qualities of the bronze. Whether or not the dating of this industry is correct, it is interesting to note that many of our proven Bronze Age mines, particularly those in mid-Wales, are actually as rich, or richer, in lead as they are in copper, the ores being intimately mixed. Perhaps Bronze Age prospectors were also looking for lead? Alternatively the increase of lead in the bronze may merely reflect a fortuitous combination which was not fully understood, yet was perpetuated through continuing to exploit the same sources. Until rather more thorough research has been carried out on the metal provenancing of British bronzes, including the sampling of ores from known prehistoric mines, we will probably have few new answers to our questions.

Supply, trade, and patterns of power

This section considers how the mines might have fitted into the social and political map of peoples, settlements and monuments during the second millennium BC.

Bronze Age mines can be compared with Neolithic stone-axe factories: both produced items of high utilitarian, symbolic (ritual or prestige), and economic value. Similarly, both were restricted to very specific, yet widely dispersed and exceedingly limited outcrops of rock or mineral, usually in quite isolated, mountainous locations. Furthermore, at the actual sites of these factories or mines little survives in the way of associated settlements, work places or well defined processing areas. There is also little in the way of material culture surviving: domestic or personal artefacts which might otherwise help to ascribe some sort of status to the workforce. Yet in both cases we have some evidence (even if circumstantial) for the existence of complex trade routes away from the sources.

The parallel between axe-factory and Bronze Age mine seems to falter when one looks for the

evidence of a regional importance for such sites by plotting the density or distribution pattern of associated field monuments. The density of henge monuments and stone circles during the later Neolithic in North Wales and in Cumbria has been ascribed to the prestige, economic and ritual or symbolic importance of the major axe factory sites such as Graig Llwyd and Langdale (Burl 1976). No direct correlation has been made so far between known Bronze Age mines and the distribution of Bronze Age monuments. South-west Ireland has many Bronze Age monuments, though the distribution bears no obvious relationship to that of the known mines (O'Brien 1990). Furthermore mid-Wales, with the greatest number of potential mining sites, has a relatively low density of field monuments. Nevertheless, the simple presence or absence of Bronze Age monuments can never be used as an argument either to prove or disprove Bronze Age mining; rather we should try to examine some of the possible contributory factors for such an apparent discrepancy.

For instance, within the Ystwyth valley and surrounding area of mid-Wales there are few recorded Bronze Age monuments, and yet we know from recent pollen studies that there is vegetational evidence suggesting human activity during the Bronze Age at Cymystwyth (Mighall 1990). Furthermore, recent fieldwork in the vicinity of the mined area has revealed what appears to be a destroyed cairn and cist on the hill immediately opposite, in full view of the ancient open-cast workings (Timberlake 1991). The apparent deficiency of recorded monuments or settlements within this terrain might in part be explained by the lack of any systematic and intensive field-walking of these areas, and also by the thick peat cover which has since obscured many of the earlier landscape features.

However, the contrast remains: axe-factory sites appear to have high status, whilst copper mining sites apparently do not. This could be the result of the difference in time-span, and the different peoples and cultures involved, but on the other hand it may be something to do with the product. During the later Neolithic, axes traded from different axe-factory sites would have been instantly recognisable amongst those skilled in such matters, and easily identifiable with their original sources. It is not impossible, therefore, that such objects, fabricated from natural material which clearly possessed a prestige, economic, and perhaps even magical value, would confer a similar status on the sites and regions where they were produced.

Copper or bronze, on the other hand, being artificial products and of the same appearance in the processed state regardless of where their components originated, may not have engendered the same relationship with their sources. In fact the relationship may have been strictly economic. The many stages of trade, smelting and re-smelting, may even have confused the bronze-smiths themselves as to the origin of the metal. Bronze artefacts might then, as today, have been identified with the 'industry' which produced them, rather than with the original source of the metal. The sources, in fact, may have been at the other end of the country, as was almost certainly the case with the tin from south-west England.

Nevertheless, Bronze Age copper mines would almost certainly have commanded some economic importance, if only to the tribes who controlled the territories they were in. But it is questionable whether a few small copper mines within an otherwise infertile mountain terrain would command any greater political or economic importance than an equivalent sized area of productive and agriculturally rich lowland.

It is clear that we cannot look at any aspect of prehistory in isolation, and all the various possibilities need to be addressed. We can only guess as to how prehistoric mining was organised or what status or importance it contributed to the economy of the upland and coastal areas of western Britain during the earlier part of the Bronze Age.

A number of the major Welsh sites are coastal, such as those of Parys Mountain and the Great Orme, and most of the mid-Welsh sites are located either within the five-mile coastal strip or 15 to 20 miles inland along easily accessible river valleys. Nantyreira and Nantyrickets mines, on the other side of the mountain divide, are in fact the exceptions. The dates that we have for the workings suggest that these sites were all discovered and worked within a fairly short time of each other. With such a distribution along the west coast it is not unreasonable to look towards Ireland,

where there is purported evidence for a well-established metallurgical tradition, for the origin of prospection and mining in Wales. Prospectors may have come either before, or with, itinerant metal workers. Gradually these groups might have worked their way inland, making contact with local peoples, together with whom they might have surveyed the hillsides looking for outcrops of quartz veins and the telltale signs of copper mineralisation. There are one or two lead mining sites in mid-Wales which appear to be more or less copper free, yet which have produced isolated finds of stone tools at the outcrop. Such evidence may suggest that prospecting was widespread, and that any exposed vein was explored.

When more of these mid-Welsh sites have been investigated, and some dates for the very earliest workings obtained, it would be interesting to see what pattern emerges regarding the changing focus of prospection and mining, as well as its spread inland and along the coast during the course of the second millennium BC. Perhaps we will also get a better idea of who these people were: they may have been part of an indigenous (Welsh) metal-working tradition, or itinerant Irish bronze-smiths, or perhaps even the tail-end of the original 'Beaker' prospectors.

Another question concerns the cause of an apparently abrupt cessation of copper mining within the upland Wales and Ireland at the beginning of the Middle Bronze Age: 1400-1300 BC. Perhaps most of the easily accessible surface deposits workable with stone tools had been exhausted, or the contemporary climatic deterioration may have been at least partly responsible. Drainage problems would make these primitive mines difficult to work, while the miners, who were quite possibly agricultural peoples, may have been driven from the uplands by deteriorating conditions and the encroachment of blanket bog. Another reason may have been connected with events taking place many hundreds of miles away. We can only surmise some of the possible causes or influencing factors, which might have included the following: a changing balance of political and economic power, largescale movements of peoples, the opening of different trade routes and access to more distant yet perhaps cheaper or purer sources of copper or bronze. However, until we have a much better idea of the timescale and extent of this early exploitation of copper it will remain difficult to interpret the real causes of its growth and decline.

Of course it is possible that indigenous mining never ceased altogether and that later prehistoric mining is just not being recognised in the field. The increased availability of bronze and the development of a harder alloy may have meant that metal mining tools replaced stone during the Late Bronze Age. If bronze picks superseded stone hammers (and presumably would not be discarded on site like the latter) how easy would it be to differentiate workings of this period from those of the later Bronze Age, or indeed any of the those 'early' mine workings that we already lump together as Iron Age, Roman or Medieval? None of these later workings show much in the way of culturally identifiable artefacts.

Conclusion

The development, use and trading of bronze artefacts are perhaps the key activities to which we may relate all the other attributes of the period and peoples that are collectively referred to as 'the Bronze Age'. At the root of all these activities is the ability to find, extract and process the raw materials of bronze, i.e. tin and copper.

This paper has presented a body of evidence for a well-developed indigenous British copper mining (and presumably bronze-working) industry from the very beginnings of the Bronze Age, suggesting a great deal of local self-sufficiency of supply and perhaps of innovation in metal-working. In all probability the metal extraction carried out on the Welsh uplands, the Great Orme, and at other sites during this period had a major, yet unrecognised influence on the development of Bronze Age technology, and by inference, upon the course of Bronze Age society in Britain.

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Footprints of former miners in the far west.

ADAM SHARPE

Evidence for mining in prehistory has now been established on a number of sites in Wales and Ireland, but no site has been identified in the south west. The reasons why this might be the case are considered, and some thoughts about the basis for a programme of research and fieldwork to correct this deficiency set out.

In considering the likelihood of prehistoric mining in the south-west (this volume pp15-34) Simon Timberlake has highlighted an area of enquiry which has been the concern of archaeologists in Cornwall for many years. Thanks to Roger Penhallurick (Penhallurick, 1985), the Phoenician myth has, I trust, finally been laid to rest. In its place, however, assertions that 'the Cornish mining industry has been in place since the Bronze Age' (or alternatively, 'for the past 2000 years') have begun to appear with increasing frequency in popular histories, and even in the press (for instance in articles about the demise of Geevor Mine). Yet on the basis of what evidence have these apparently authoritative statements been made?

To my rhetorical question, the sad answer is that not one securely-dated prehistoric mining site has yet been found in the south-west, despite considerable efforts to locate them. This is not to suggest that they did not exist, nor that they will not be found in the future, nor, more importantly, is it to say that there is no evidence whatsoever that prehistoric exploitation of ore deposits did not take place. Besides debunking old myths, Penhallurick also presented a very wide range of artefactual evidence, albeit almost all from residual, or at best, imprecisely identified stratigraphic contexts which suggests the opposite. Some of this evidence takes the form of 'primitive' mining tools of wood or antler, some consists of ingots of tin of apparently 'early' form, whilst the remainder is an assorted assemblage of undoubtedly prehistoric artefacts - chisels, knives, spears, pins, palstaves - items with no direct connection with the activity of mining. All these artefacts, however, were recovered during post-medieval tin-streaming operations, and many appear to have come from well-sealed, if disturbed contexts within river bed deposits.

The inference is that they must have either a) been incorporated into the river gravels by chance, or b) through acts of ritual disposal in prehistory (cf Bradley's thesis in Bradley, R., 1990), or c) were placed, left or lost within active Bronze Age to early medieval tin streamworks, perhaps a proportion of the tin mined was being 'returned to its source' as a propitiatory act. The number of such artefacts reported is large, and Penhallurick makes it plain that many more would either have been missed, or would have been salvaged for scrap (rather than reported to antiquarians). Furthermore, given the depth at which some of the objects were found - nine metres from surface in the case of the Middle Bronze Age spearhead found at *Loath-to-depart* streamwork in 1803, for example, it is difficult not to be convinced that Penhallurick makes a very strong inferential case for pre-medieval, and almost certainly prehistoric tin streaming. On a few settlement sites (eg Trevisker and Goldherring), cassiterite pebbles or smelted tin have been found in apparently secure prehistoric contexts, further substantiating Penhallurick's case for tin mining in prehistoric Cornwall.

We would be very lucky to locate undisturbed prehistoric tin streaming evidence these days, however, given the well-documented re-exploitation of these sites over the past 500 years. In view of the fact that these were the preferred sources of tin ore until at least the early 16th century in Cornwall, it is probably safe to conclude there is unlikely to have been any significant mining of lode tin prior to that date, thus the likelihood of finding prehistoric tin mines of any description is remote.

But tin is only half the story. What of copper? Whilst Penhallurick makes a strong mineralogical case for the likelihood of prehistoric exploitation of some of Cornwall's abundant and in many cases both accessible and very visible copper lodes, artefactual evidence of the quality presented to support the contention that tin was streamed in antiquity is conspicuous by its near absence: the only examples presented - three flat axes and two fragments of a copper ingot - are typical of the secondary working of copper, rather than of primary extraction. His (almost certainly correct) interpretation of the finding of Middle Bronze Age palstaves in a *coffin* (interpreted as the dialect term for a lode worked opencast from surface) at Godolphin mine may prove to be significant (Penhallurick 1986, 152).

It has long been assumed that the scale of exploitation on copper deposits which took place during the Cornish copper boom of 1750 to 1850 must inevitably have eradicated any traces of small-scale early workings, but the evidence emerging over the past few years from Wales (most particularly from Parys Mountain and the Great Orme, where, in the first case, exploitation was on a massive scale) must surely give the lie to this. It is possible, it seems, that even on the largest mines, prehistoric evidence might survive intact.

Given the detailed archaeological evidence emerging from dated Welsh and Irish prehistoric copper mines, we might have thought ourselves rather better informed about the evidence for early lode mining that we might also expect to find in the south-west and the form those early sites might take. Yet we have still to identify a single site which has produced strong enough evidence to warrant further detailed investigation. Why?

The first problem concerns the means through which potential sites were identified in Wales - principally through reports of later miners breaking into 'old mens' workings' which contained artefacts apparently of extreme antiquity or of recognisably primitive form. It was such reports which led Oliver Davies (and subsequently Simon Timberlake *et al*) to concentrate on a group of mid- and north Welsh sites all of which had produced substantial numbers of primitive mining tools. Whilst occasional reports of 'old men's workings' do very occasionally turn up in Cornish mining literature, they were, it seems, rarely significant enough to warrant more than a cursory mention (except to express disappointment that a promising area of the lode had already been worked out) and were never, it seems, accompanied by finds worth reporting.

This is compounded by the second problem: that in contrast to the Welsh sites, where stone mining tools in substantial quantities are the virtually ubiquitous indicator of the antiquity of the mine, local museum collections are notable for the almost total absence of such artefacts found in mining contexts, let alone from the mining districts in which they lie. There are a few hammerstones in local collections, but the number is very small (Gale, 1990 and pers comm). Most are unprovenanced, or have been found in contexts where they appear unlikely to have been used in primary extraction, as they clearly have in Wales, or Ireland. A find from Penberthy Croft (Camm and Merrey, 1991), however, might hold some promise.

Now it might be that Cornish miners were, by nature, simply less curious about the operations of their forebears, less inclined to report the unusual, or simply not aware of the significance of these objects - in other words, hammerstones existed, but were not recovered or reported. Lacking documented finds, however, we must choose one of four conclusions.

The first is that there was little or no lode mining in antiquity - it was not recorded by antiquarians because it was not there to be recorded. If this is the case, then the copper lodes of Cornwall must, either through ignorance or as a deliberate policy, have remained unworked during a period when those around the Irish Sea were being quite intensively exploited. The reasons advanced to support this contention have been a) due to a lack of geological or technological know-how - in other words Cornish miners did not know how to find and work copper deposits. The inference is that the requisite knowledge was the preserve of a particular group operating in mid-Wales/Southern Ireland, perhaps a culturally distinct group of specialists working in that area; b) mineralogical - ie Cornwall possessed the wrong kind of ore deposits - but Embrey and Symes (1987) suggest the opposite; c) technological - the available extractive technology was ineffective faced with the

obdurate parent geology in Cornwall; or d) economic - the argument runs that Cornwall did not produce copper because it produced tin, and could thus trade for other minerals in what might have become a glutted market, perhaps even that copper was not worked as part of a national 'trade agreement' on metal production.

A second interpretation of the lack of artefactual evidence is, as indicated above, that evidence for the activities of earlier miners was not reported because it was not perceived to be of interest - yet as Penhallurick shows, many finds were reported from tinworks, and local antiquarians, who would presumably have been well aware of finds elsewhere in Britain would have been keen to report discoveries from the area.

The third possibility is that sites directly comparable to those in Wales do exist, but have yet to be located. In view of the intensive re-working of Cornish copper mines, this seems very unlikely. It is possible that coastal erosion has removed the sites as has been suggested by O'Brien for the earliest Irish mines (O'Brien, pers comm), but to argue from the absence of evidence seems dangerous, to say the least. It is also possible that the mineralogy favoured by early miners (principally oxide or carbonate sources) might have been economic on a small scale in prehistory, though were not thought worth re-working later. If this were the case, then we would need to look outside the more obvious mining areas, but with the exception of the Lizard, this scenario seems unlikely. It is not the case elsewhere in Britain.

The final possibility is that stone tools are, for some reason, not diagnostic of Cornish sites. This has been proposed by Simon Timberlake in an attempt to explain the dearth of finds comparable to those from elsewhere in Britain, his tentative conclusion being that in an area rich in the two minerals necessary to make bronze, metal tools were used in preference to stone from a very early period (Timberlake pers comm). These would necessarily have been recycled, and could not be expected to survive. If this were the case, the absence of stone tools would not exclude sites of otherwise potentially early date, suggesting that we should be looking for an entirely different range of tooling marks. Unfortunately these might be virtually indistinguishable from those left by miners of later periods, so other criteria will also be important.

Nevertheless, it seems to me that this lack of documentary or artefactual evidence does not add up to conclusive and convincing proof that prehistoric copper mining never took place in the south-west. On the contrary, the growing body of evidence from elsewhere in the British Isles makes it increasingly likely that it did, and we might quite reasonably conclude that we are either looking in the wrong places or that we are using the wrong search criteria. Given that the weight of evidence remains balanced in favour of prehistoric copper mining in the south west, we must consider how we might locate evidence for it.

Where should we look for our early mines? I would suggest that all of the principal areas of copper mineralisation in Cornwall are reasonable candidates - whether around St. Just and St. Ives, in the band stretching eastwards from Hayle (Wheal Alfred), around Mounts Bay (Roseudgeon), near Mullion, between Camborne and St. Day (the Central Mining district), between Porthowan and Perranporth, fringing St. Austell Bay, on south-east Bodmin Moor (Minions) or in the Tamar Valley around Gunnislake and Devon Great Consols. Given the nature of the Cornish coastline, and the predominantly east-west orientation of copper mineralisation, the highest density of out-cropping lodes are found in the St. Just district, though they are also spectacularly visible in other areas - the St. Agnes-Perranporth area perhaps being most notable. A coastal location is not a *sine qua non* for early mining, however, since all of the Welsh sites are inland. Nor, as mentioned, should we make the mistake of thinking that substantial 19th century exploitation would necessarily have destroyed all evidence. Some of the most spectacular evidence to date has come from the Great Orme, where 19th century activity levels were comparable to those on many Cornish mines at their height, whilst no mining site in Cornwall has suffered the massive landscape disturbance which was inflicted on Parys Mountain. Finally, it should be borne in mind that some of the Welsh ore deposits were found and worked in areas which always appear to have been remote from population centres: areas far more inhospitable than anywhere in Cornwall could have been,

indeed evidence for settlement or other Bronze Age activity has been conspicuous by its absence at Copa Hill, Nantyreira or other elevated sites in Wales.

What should we be looking for? Logically enough, early mining seems to have taken place on lode outcrops. Whilst many workable veins in local cliffs remain plainly visible to this day, prehistoric miners were quite capable of locating potentially suitable deposits where this was not the case, presumably by using dowsing, distinctive vegetational indicators or some form of predictive geological science. The positions of the outcrops of most lodes are now mapped, thanks to the surveys of geologists and miners, and can be located in the field. We can assume, additionally, that those deposits where substantial oxide or carbonate mineralisation was present (ores which could be fairly simply smelted) would be favoured above those where the deposits were primarily of sulphides, though experiments have shown that simple one-step smelting of sulphide ores (those principally mined during the 18th and 19th centuries) is not impossible, as had hitherto been thought.

The diversity of prehistoric mine forms now identified across Britain is wide indeed, though related to local geological conditions. In softer rocks (particularly diffuse disseminations of carbonates amongst sandstones as at Alderly Edge or Mount Gabriel), shallow and relatively extensive pits or shafts seem to have been used - a form of exploitation we would not expect to be common in Cornwall. In north Wales, the free-draining rotted dolomites of the Great Orme allowed these simple mines to develop into primitive shaft and gallery systems of considerable depth and complexity - the workings being distinctively narrow and winding, the positions and profiles of the excavations closely linked to the richness of the mineral deposits. No equivalent geology exists in Cornwall, although the softer rocks immediately to the west of Perranporth might have permitted such approaches to have been tried to some degree. In mid-Wales, in contrast, the rock was considerably harder, and fire-setting seems to have been a necessary part of the excavation process. In that region, where the geology is in some respects comparable to our slate beds, *openworks* appear to have been the predominant mine form, and it might be profitable to re-examine examples of this form of mine in Cornwall, where they have always been assumed to be post-15th century in date. The effects of fire-setting on local granite have not been studied, but might produce distinctive profiles or appearances on work faces. A programme of experimental trials of this technique on local rocks would readily determine this.

To reiterate the point made by Simon Timberlake, we should be searching for sites showing evidence for the use of 'primitive and utilitarian' technologies. We might expect relatively shallow and small-scale work areas on outcrops or closely following lodes, whose walls we might expect to preserve evidence for fire-setting (though this technique was documented in Cornwall well into the 18th century). These should be accompanied by indications of battering with stone mauls or marks consistent with copper alloy picks and chisels. We should expect low, well-vegetated dumps of relatively highly comminuted spoil, perhaps containing remnant charcoal and baked stone fragments, possibly incorporating broken hammerstones, and perhaps nearby, evidence for small-scale ore dressing on stone anvils. Stratification of any of those features below material of demonstrably later date would be significant, as would evidence underground of intercutting by mine workings of more recent form - in other words, clear phase relationships.

Whilst no early mines have yet been located here, the extent of mineralisation in Cornwall gives us a large reservoir of sites to explore. Some areas seem, on reflection, to be worthy of particular inspection.

Within the St. Just mining district, the most obvious candidates lie on or near the coast stretching from Cape Cornwall to Boscawell cliffs, including lodes worked by St. Just United, Botallack and Levant. In Priests's Cove (to the south of Cape Cornwall) or near Wheal Hazard at Botallack can be seen massive irregular stopes worked into the cliffs from outcrops, whilst below Wheal Cock and Levant, many of the *zawns* show traces of similar working.

Whilst mining at these sites is documented from at least the 16th century, it was almost exclusively for tin, the phase of copper working being almost entirely during the late 18th and early 19th

centuries. Given the levels of technology available during this later period, it seems unlikely that these coastal lodes would have been worked in this fashion at that time. These coastal stopes clearly represent primitive mine forms, though not necessarily prehistoric ones.

In the St. Agnes - Perranporth area, Wheal Coates contains at least one similarly extensive open-work developed from the cliff, whilst below the well-known engine houses, pre-industrial exploitation has certainly taken place on an outcrop eroded into a sea cave at beach level. Here, however, the workfaces seem to have been so heavily weathered that no obvious toolmarks survive. To the east, between Cligga Head and Perranporth, narrow openworks running in from the cliff are of unknown date, but again, are potential candidates, whilst to the west, there are abundant cliff workings at Wheal Prudence, off Trevaunance beach (Wheal Luna) and along the coast towards Portreath. At Perranporth (below Droskyn Point) are some extremely small scale workings on copper deposits, which include a rock-cut tunnel cut at a level which is now submerged at every high tide, and which might, arguably, date from a period when sea-levels were much lower.

To the east of these areas, or inland, it is difficult to suggest where a search for early mining evidence might most profitably be concentrated. Lode outcrops in the central mining districts often lie in areas subsequently very heavily mined in recent centuries. In some (particularly north of Carn Brea), re-working, redevelopment for housing and industrial estates or recent Derelict Land reclamation have probably removed all of the evidence. In the United Downs-Consols mines around Gwennap and St. Day, despite the obliteration of a massive area of the former United Mines by a County waste disposal site, extensive areas of mining landscape remain. The difficulty is knowing where to begin a search, though there might be some potential above the Wheal Maid Valley, or near Poldice. In the Tamar Valley, attention might usefully be focused on the sites of outcrops around Gunnislake, though most have now been built over.

It might be particularly profitable to re-examine the surviving copper outcrops on the Lizard. Re-exploitation of these areas in the 19th century was limited, and it is possible that here we might have our best opportunity of finding a relatively undisturbed small-scale early copper mining site.

Finally, we should not forget that reference by Penhallurick to Bronze Age artefacts in an open-work at Godolphin. The district contains a number of sites whose careful re-exploration is long overdue, and at this mine, alone, we seem to have that connection, albeit tenuous, which may prove our best starting point.

Acknowledgements

The conference that took place at Plas tan y Bwlch, Snowdonia, in Autumn 1989 was important in that it brought together most of the researchers in the field of early mining in Britain, and was notable for the quality and length of the discussions that lasted well into the early hours. I would be remiss if I did not acknowledge the contribution of those discussions in the writing of this article, particularly those with Simon Timberlake and David Gale, who have continued to show a strong interest in early mining in the South-West, and with Peter Crew, without whom the conference could not have taken place. I must also thank the Trustees of the University of Exeter Kemp Scholarship, who have helped to fund my own fieldwork and research. Finally, my thanks are due to Jacky Nowakowski who patiently edited more than one draft of this text.

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The Fogou: An Investigation of Function

RACHEL MACLEAN

The Cornish fogou has long been the subject of much academic discussion, not least regarding its possible purpose within Later Iron Age society. However, it has in general come to be known as an 'enigmatic' structure and its probable function has never been considered in a detailed manner. The author, therefore, undertook just such an investigation, considering the three proposed theories of storage, ritual function, and refuge. It is hoped that a theory regarding the use of the fogou can be suggested which is supported by fact, rather than supposition.

The Theory of Storage

The theory that fogous were used for storage remains the most popular explanation of their function, alluded to and generally accepted by many authors, but no detailed study of the idea has ever been published. Only Tangye has considered the nature of the goods which might be stored in such structures, in his 1973 article on hulls— recent structures which were certainly used for storage purposes in Cornwall. When, however, one considers the products of Iron Age agriculture which would potentially have been available for storage it is clear that few, if any, would have suited the damp conditions of a fogou. When one adds to this the ingeniously devised inaccessibility of fogous, it really does seem very unlikely that they were designed with the intention of using them for storage.

Tangye, after identifying 'many basic similarities' between the modern hull and the prehistoric fogou (1973, 40), tentatively suggests 'that hulls might therefore appear to be, in conception and use, a direct ethnic survival of the fogou tradition' (*ibid*).

The similarities he outlines are as follows:

1. both are found in the granite uplands of West Cornwall;
2. both have entrances constructed of granite uprights and lintels;
3. 'the plans and dimensions of both hull and fogou are in some cases practically identical' (*ibid*);
4. side chambers are common to both;
5. granite interior walling is sometimes found in hulls, though only for a few feet immediately inside the entrance;
6. both are found in close proximity to the dwelling site.

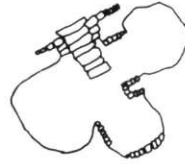
These similarities, however, are not a convincing argument for direct ethnic survival. That both structures have entrances of uprights and lintels is not a strong point for similarity of function, and proximity to a dwelling site is a characteristic which can be shared with bread ovens and latrines, amongst others. The claim that the plans and dimensions of the two kinds of structure 'are in some cases practically identical' is not really borne out by the plans which Tangye gives; and considering the difficulty in entering and planning a hull as described by Tangye himself (*ibid*, 31), it is presumed that the plans given represent the bulk of the available material. A comparison can be seen in Fig 1.

Tangye also mentions differences between the two: the method of construction and the number of entrances. Hulls were not lined as fogous were, but were dug straight out of the granite. They only ever had one entrance, whereas fogous were thought to have two (though following Christie's excavation of Carn Euny it is now doubtful whether all fogous were originally constructed with two entrances). Despite the known use of the single-entranced hull as a place of storage, Tangye accepted that the double entrance of the fogou was deliberately constructed in order to provide a through draught (*ibid*, 40).

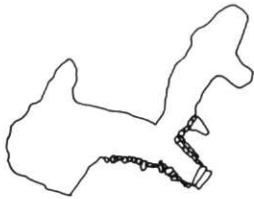
HULLS (After Tangye, 1973, 37)



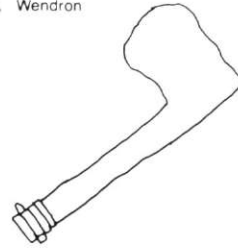
Bolenowe Camborne



Hendra Farm, Wendron

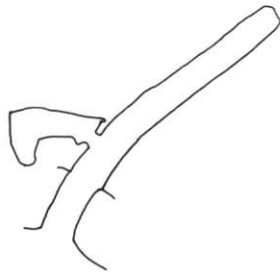


Gregwartha, Wendron

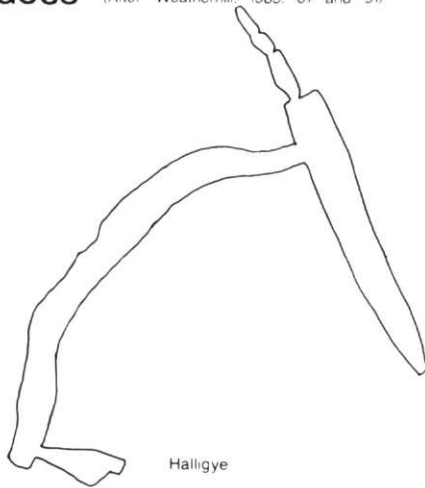


Manhay Farm, Wendron

FOGOUS (After Weatherhill, 1985, 61 and 91)



Boleigh



Halligye

Fig 1 A comparison of the plans and dimensions of fogous and hulls

It is not at present possible to date accurately the various surviving hulls, but no finds have been recovered from any hull that date earlier than the Victorian period (*ibid*, 43). Tangye suggested a much earlier date for some hulls, based upon a thirteenth century place name, 'Boswarthogo' ('ogo' denoting the presence of a cave), which he assumed derived from a hull, rather than a fogou or natural structure; but there is really no solid evidence provided to date hulls before the eighteenth or nineteenth centuries (*ibid*, 43-44). Tangye quotes Tonkin's eighteenth century description of 'a cellar of the ancient Dukes of Cornwall' (Hitchens and Drew, 1824, 672), and concludes that this structure was undoubtedly a hull, though of 'far superior workmanship than any other' (*ibid*, 43); but the structure described could just have well have been a cellar. The gap of over 1700 years between the two separate traditions of hull and fogou is a real difficulty for the theory of 'direct ethnic survival' of a single tradition (*ibid*, 40).

Hulls were basically used as stores or cellars for domestic or farm use, constructed partly as a result of the scarcity of timber in certain areas (*ibid*, 38). The pollen analysis of the Iron Age site at Carn Euny seemed to indicate an environment more wooded than at present, hence a more readily available source of timber (Dimpleby, 1978, 428). Tangye reported that the farm examples were used mainly as dairies, storing the butter, milk, cream and eggs intended for the market (1973, 38). Hulls associated with cottages were mostly used for storing milk, cream and potatoes. Other root crops were occasionally stored. Some of the smaller hulls were excavated primarily as pens for livestock.

The nature of the Iron Age economy must be considered before any serious conclusions can be drawn. The basis of our evidence for the economy of this period comes from both excavation and documentation (Reynolds, 1979, 47), although the former is non-representative and the latter is of doubtful value. Work in experimental archaeology, such as the Butser Farm Project, has greatly aided what little information these two sources have provided. It is true that the evidence for the Iron Age economy comes from areas well outside Cornwall but, if we grant that the economy of this period in Cornwall included mixed farming, the basic principles of storage of meat, grain and other plant products must be the same.

It is not necessary to identify individual animal species which may, or may not, have been present on the Celtic farm, nor to consider the nature of animals which could have provided wild game. It is sufficient merely to state that meat would have been an integral part of the Iron Age diet (Fowler, 1983, 188). Lady Fox is quoted as describing the fogou as possessing conditions ideal for the storage of meat (Tangye, 1973, 40), but the author, having entered subterranean fogous, really cannot agree with this description. Decay of meat is caused by micro-organisms which require moisture to survive (Pyke, 1968, 24) and the subterranean fogous are essentially damp environments. Even above-ground fogous may not have been dry enough to store meat for any length of time, as they can possess drainage channels (e.g. Porthmeor, Carn Euny). Fresh meat would quickly deteriorate in these conditions. Although Tangye appears to agree with Lady Fox, he does not record the use of any hull as a meat store in his 1973 article.

A far more effective method of storing meat is to preserve it by ensuring that it contains insufficient moisture for the process of decay to begin (Pyke, 1968, 25). There are two techniques which can be employed; drying or pickling/salting. The simplest method of drying meat is to expose it to the sun and wind (Fisher and Bender, 1975, 136), though a more satisfactory method is to smoke the meat. Smoking has the added benefit that wood smoke deposits chemicals on the surface which act as preservatives. Ideally, if only the surface is dried, a protective coat is formed around the meat (*ibid*, 137).

The second technique, that of salting or pickling, actually acts in two ways to prevent the process of decay. A strong salt solution will ensure that whatever moisture there is in the foodstuff will not be available to the micro-organisms (Pyke, 1968, 26). Additionally, the salt not only prevents the growth of harmful organisms but permits the growth of other organisms that are able to ferment the carbohydrate in the food into lactic acid. Just as micro-organisms cannot grow in the absence of moisture, they cannot grow in the presence of acid (Fisher & Bender, 1975, 137).

These techniques can of course be used on all types of fauna, and fish and birds can also be easily preserved if necessary. During the BBC experiment 'Living in the Past', the volunteers who spent twelve months living on an 'Iron Age' farm used the techniques successfully to preserve their meat supply. Joints of meat were packed into barrels of salt; blood, mixed with flour and seasonings and stuffed into old underwear, was preserved as black puddings through the addition of salt; and oddments of meat were stuffed into intestines and smoked as they hung from the rafters (Percival, 1980, 107-108).

Evelyn Clarke suggested that the 'stone-lined floor' at Pendeen Vau indicates the storage of grain upon a dry floor in the gallery: 'bags of grain could have been forced through the narrow entrance' (Clarke, 1961, 136). It is not a convincing idea. The 'stone-lined floor' appears to be merely a collapse of an inner, and later, skin of dry stone walling. A storage structure into which the products had to be forced is really too poorly designed to be plausible.

Fowler suggests that the fogou was used for storing grain (Fowler, 1983, 185). He points to the absence of pits in the fogou's area of distribution, and concludes that, due to the competence of potters in this region (influenced by Gallo-Roman prototypes), the grain surplus was stored in jars placed in the fogou. Again, this is not a wholly convincing argument. Fowler earlier states that storage pits 'do not appear in the settlements of Cornwall and Devon', yet he sees the fogou, a phenomenon restricted to the relatively tiny area of the Lands End peninsula, as filling this gap. When the distribution of the two phenomena is considered (see Fig 2), this argument is seen to be somewhat ambitious.

Considering the damp nature of the fogou, it again seems an unlikely environment to be constructed for storage purposes. The conditions required for successful grain storage are similar to those needed for the storage of meat, and a low moisture level is essential to inhibit microflora activity (Reynolds, 1974, 119). Before grain is harvested it should have a moisture content of less than 20%, and if it is stored in a moist condition bacteria and moulds will grow and cause the temperature of the bulk grain to rise, thus greatly damaging its quality (Pyke, 1968, 40). Ideally, grain should be stored with a moisture content of approximately 13% (*ibid*). If grain is stored in a sealed container (e.g. a storage pit) then it will continue its respiration cycle and, using up all available oxygen, will create an anaerobic atmosphere (*ibid*). A fogou, however, is really much too big to be considered a sealed grain container, far bigger than the largest storage pit. Total sealing of a totally filled fogou is the only condition under which grain could be stored in a fogou. Otherwise, the damp fogou environment is one that the grain must be protected from, not an advantageous construction. Grain in completely sealed pottery containers could be stored anywhere.

If the BBC experiment is again considered, alternative, and less complex, methods of grain storage can be seen in use. Above-ground granaries, based upon the general interpretation of the four-posthole arrangements commonly found on Iron Age sites, proved an ideal method of storage. The one serious problem faced by the villagers was the infestation of rats, to whom they lost a fair proportion of their unthreshed grain, but, as the black rat is not known in England before the third century A.D., and the brown rat not before the eighteenth (Rackham, 1986, 46-47), this cannot be considered as a potential problem. Once threshed the grain was stored securely in wooden barrels or hung in sacks from the rafters (Percival, 1980, 108-109 and 115).

To return to Tangye's discussion concerning the use of hulls, obviously the potato was not a food crop in the Iron Age, only appearing in the sixteenth century, therefore we must consider the storage of other root crops that may have been available. The wild parsnip (*Pastinaca sativa*) is known to have been a native of Britain since the Cromer Forest Bed series (Godwin, 1975, 227-228), and still grows abundantly on the slopes below many Celtic hill forts (Percival, 1980, 49). There is also evidence that the onion couch (*Arrhenatherum elatius var tuberosum*) was collected in prehistory (Pennington, 1969, 89). About fifty tubers were discovered in a Late Bronze Age ditch on Rockley Down, Wiltshire (Godwin, 1975, 404), in association with barley grains, and the absence of seeds of cornfield weeds leads to the conclusion that these tubers were deliberately collected. Therefore, tubers were almost certainly a part of the Iron Age diet.

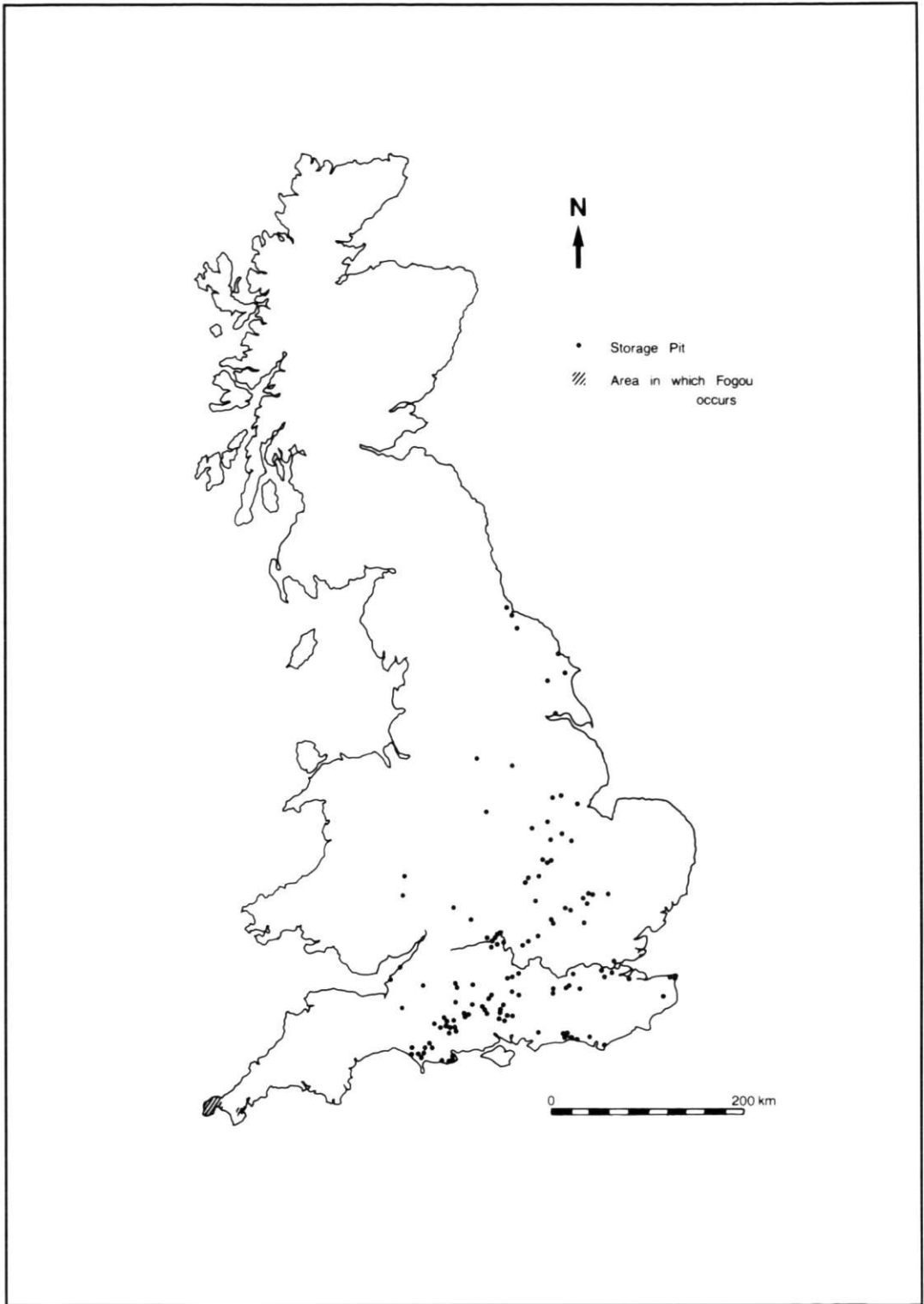


Fig 2 A comparison of the areas of distribution of fogous and storage pits (after Gent 1983, 251)

Root vegetables, or tubers, can be stored in 'root cellars', but again the cellar must be 'a good dry' structure (Seymour, 1973, 197). A very common practice which still persists today, is to store root vegetables in 'clamps'; piled in a long pyramidal heap, they are covered well with straw or bracken (a foot thick at least), which is in turn covered with earth. Little straw chimneys and side vents allow air to escape. 'Most roots don't like the frost, and the clamp protects them from it . . . Parsnips don't mind frost . . . leave them out where they grow and dig them as you want them' (Seymour, 1973, 197). A further disadvantage with the root cellar or indoor store is that a build up of spores can occur after a year or two, which attack the roots kept there (*ibid*).

Onions, or similar plants such as the onion couch, need to be dried for a week or two in the sun before storage. They can then be hung in strings, preferably on the southern side of the building 'or else hung in an airy shed, or a big kitchen' (*ibid*, 198). A dry atmosphere is again essential. Alternatively, onions can be pickled.

Other plants known to have been available in the Iron Age includes peas and beans (Percival, 1980, 49); and green vegetables such as charlock (*Sinapis arvensis*) (Godwin, 1975, 131) and fat hen (*Chenopodium album*), the seeds of which are not only found preserved in earthenware pots (*ibid.*, 157), but were actually part of the last meal of Tollund Man (Hatfield, 1969, 3). Peas and beans are stored dry, and must be left in the sun and wind for some time, occasionally being turned, and then either hung in bunches from the rafters or formed into a rick (Seymour, 1973, 198). Once threshed they can be stored in dry bins or crocks (*ibid*). Again, there is no need to construct a particular storage environment, and a damp environment is positively harmful. Green vegetables are usually eaten as they are harvested, as it is possible to have fresh vegetables all year round (*ibid*, 196), hence storage is not a problem. However, the most successful method of storing green vegetables is to pickle or salt them, though they can be dried.

Various fruits, nuts, and fungi must also have been seasonally available. Fruits can be preserved both with, and without, drying (*ibid*, 202-203), but in either case must be kept at 'an even temperature well above freezing and with ventilation' (*ibid*, 202) and stored 'in a dry place' (*ibid*, 203). They can, alternatively, be used for wine making. Nuts require no special treatment to enable their preservation, but must be kept 'very dry, for damp and mould can easily permeate nutshells and rot the kernel' (Mabey, 1972, 29). Fungi are preserved by drying, either whole or as a powder (Seymour, 1973, 203).

According to Tangye, the main use of the Cornish hull was for storing dairy produce (Tangye, 1973, 38). This appears to be the one area in which the fogou would have provided an adequate storage environment. Fresh milk will keep for only a few hours unless it is chilled (Fisher & Bender, 1975, 116), therefore the slightly cooler temperature of the fogou would prove advantageous, whilst the damp atmosphere would not prove to be a problem in this particular case. However, cheese-making, and to some extent butter-making, were developed as methods of storing the summer flush of milk for the winter (Seymour, 1973, 57-62). If butter has been correctly made it will store in barrels well into the winter, packed hard between layers of salt (*ibid*, 60-61). Cream cheese does not keep for any period of time, therefore it must be eaten soon after it has been made (*ibid*, 61) but hard cheese will keep for at least a year (*ibid*, 63). Indeed, some cheeses are left to mature for a whole year before they are considered ready to be eaten. The fogou is not an ideal storage environment for either butter or cheese, and its construction for this purpose seems extremely unlikely. It is, of course, impossible to know the quantity of milk regularly produced by the Iron Age settlements of western Cornwall. Hence, no conclusions regarding the amount of milk that may have needed to be stored can be drawn. Similarly, the quantities of milk consumed as milk, or turned into storable products such as hard cheese, cannot even be guessed at. However, it seems most improbable that the quantities of milk produced were so great that they required the construction of a fogou for their necessarily brief storage. It seems far more likely that milk would be kept fresh through 'total or partial immersion in a stream or well, a method still used in some parts of Cornwall' (Tangye, 1973, 38), if not simply drunk immediately or turned into cheese, its natural storable form.

Eggs will store for periods up to nine months if kept at a temperature of -1 to 0 degrees C. (Pyke, 1968, 95). However, it seems improbable that the occupants of an Iron Age farm would have wanted to preserve their eggs for such a long period and, as with milk, eggs must surely have been consumed fairly soon after production. No special environment would thus have been necessary, and in actual fact a damp environment can lead to mould growth (*ibid*, 96).

The two more unusual uses of the hull, as a store for livestock and tools, can be quite easily dismissed. The entrances, creeps and passages of the fogous are too small to allow the entry of any but the smallest animals, and there is absolutely no obvious reason for storing livestock in a damp, dark, and airless hole in the ground. Metal and wooden tools would both decay if kept in a damp environment; iron would rust and wood would rot.

A final product for which the fogou might have been used as a storage facility appears to have been neglected in previous works. The fogous may have been used as a 'beer cellar'. It is well known that the Celts enjoyed their drink; Diodorus Siculus, probably using earlier work by Posidonius, wrote; 'the Gauls . . . concoct a drink out of barley called zythos (beer) . . . They are exceedingly fond of wine and sate themselves with the unmixed wine imported by merchants; their desire makes them drink it greedily and when they become drunk they fall into a stupor or maniacal disposition', Diodorus Siculus, *Library of History*, V, 26 (Tierney, 1960, 249). Homebrewed beer, if kept in an airtight container, will keep for at least a year (Seymour, 1973, 158). The stronger the beer (eight gallons from one bushel of malt is very strong indeed), the better it will keep. Considering the Celtic enthusiasm for alcohol, it must surely be unlikely that their beer was stored for any length of time. However, the conditions of the fogou are not detrimental to the storage of beer; the damp in this particular case would have little effect and the cooler temperatures would be beneficial. The size of the entrances and passages of the fogous would necessitate the use of rather small storage containers, but, in this particular case, it would not be inherently detrimental to use the fogou as a storage facility.

Finally, one of the most important arguments against the construction of the fogou for storage purposes applies to all the various objects which it has been suggested were stored in them, whether foodstuff, livestock, or tools. The deliberate and ingeniously contrived inaccessibility of the interior of the fogou surely discounts the theory that it was initially constructed as a storage facility. The storage conditions of the fogou, whether desirable or not, could surely be constructed in a far more accessible form. A chamber with an entrance only 0.6m wide and 0.5m high (Pendeen Vau) can hardly have been intended as a storage chamber. The deliberate inaccessibility of the fogou quite decisively weakens the theory that they were built for storage.

The Theory of Ritual Function

The second theory is that fogous were built to be used for a ritual (or religious) function. It is obviously impossible strictly to prove, or disprove, any argument regarding the religious practices of a vanished, illiterate culture. However, if one considers the evidence which has led to proposals of a ritual function, and the nature of Iron Age religion itself, then it should be possible to suggest whether such a function is more likely or less.

Clark was first led to suggest a 'religious usage' (Clark, 1961, 62) after the discovery at Boleigh of a carved figure upon a granite orthostat on the western side of the main entrance, by Dr E.B. Ford in 1957. She considered the two-chambered creep and the curved northern end to be further evidence of a non-utilitarian function (*ibid*, 61-62). The carving, which Radford thought was 'probably of the Romano-British or pre-Roman Celtic period' (*ibid*, 60), was seen by Clark as being 'a symbol of a fertility cult . . . or alternatively . . . an object of veneration, the curved apse-like end of the fogou being dedicated as a shrine for the worship of a deity represented by the carving' (*ibid*, 62). Unfortunately the carving, which was 'worn and somewhat blurred' when discovered (*ibid*, 60), is now virtually invisible. In fact, it is now possible to see the 'figure' only with the aid of one or other of the published diagrams (see May, 1989 and Weatherhill, 1981) and a good deal of imagination. A photograph reproduced in Clark's book *Cornish Fogous* (plate 11) seems to suggest a

vague resemblance to the surprisingly detailed description given by Clark, yet without prior knowledge of the carving it is doubtful whether any figure would be seen. Even if the existence of the carving is allowed, Clark describes it not only as being unfinished but as being reused, which she deduces from the amount and pattern of weathering.

Unfortunately, the very existence of this carving must be considered to be of the most subjective nature. Certainly, it is now impossible to distinguish the detailed figure described by Clark in 1961 (*ibid*, 60). Perhaps this is a result of the corrosive effects of acid rain, which has had such a destructive effect in the last thirty years; but then again, perhaps not. It must be concluded that the carving of the 'deity' at Boleigh fogou is simply not sufficient to be used as evidence of any 'religious usage' (*ibid*, 62).

The curved northern end of the fogou at Boleigh and the two-chambered creep are seen by Clark as indicating a non-utilitarian function, for the reason that they are not features found in any other fogou (*ibid*, 61). This cannot be taken as proof of a ritual function. The other Cornish fogous are also all unique structures, as Christie recognised: 'like all man-made structures, certainly in pre-history, no two are quite alike' (Christie, 1979, 210). Clark was only led to this conclusion because of the discovery of the 'carving'; she happily recognises unique features in other fogous without making any claims regarding their possible ritual nature.

Patricia Christie, although she also uses the carving and the two-chambered creep at Boleigh in support of her arguments for a non-utilitarian function (1979, 191), puts more emphasis upon her excavations at Carn Euny. Recognising that her discovery that the long passage at Carn Euny was originally only accessible through the creep rendered the theory of fogous as cellars of little practical sense, she suggested that such inaccessibility might be an indication of religious purpose (*ibid*, 210). The possibility of the round corbelled chamber being roofless was also seen as suggesting 'that this fogou at least . . . may have had more than a purely utilitarian function' (1978, 332). The other evidence mentioned by Christie in her discussion is the discovery of small fragments of cremated bone below the paving of the round corbelled chamber and at the base of the construction trench for the chamber (*ibid*, 431).

Christie, in recognising the impracticality of the fogou for storage purposes, made an important contribution to the study of these enigmatic structures. However, it is far from clear that the original inaccessibility of Carn Euny (and, indeed, other fogous) is necessarily an indication of a non-utilitarian nature. Inaccessibility can be a desirable element deliberately built into a construction with a more down-to-earth function, as will be discussed later.

The possibly unroofed state of the round corbelled chamber is interesting. Christie claims that it would be 'well-nigh impossible in view of the size of the blocks already existing in the surviving upper course' for the chamber to have been roofed by a corbelled dome of the beehive type (1978, 330). Her argument is indeed a convincing one, particularly as there appear to have been no fallen roofing stones discovered in the corbelled chamber; yet there is no proof that the chamber was left unroofed, rather than roofed using organic, perishable materials. Christie acknowledges this possibility by stating that the structure 'would either have been open to the sky, or roofed with timber and thatch (or turf) around a central post' (1978, 330). Indeed, Christie uses the fact that organic materials 'would have perished long ago' to explain the absence of any cult objects within the chamber (*ibid*, 332). However, she does propose that the chamber did remain unroofed (*ibid*, 332) and that this suggested that 'here at least a non-utilitarian function may be admitted' for the fogou (1979, 210). It is not strictly possible to prove either that the chamber was built unroofed, or that it remained unroofed. This very seriously weakens the argument that the roofless state of the chamber is evidence of a ritual purpose.

The discovery of two small amounts of cremated bone 'associated with the Round Chamber and its construction trench' (1978, 332) was also hinted at as possibly having been connected with some ritual activity within the structure ('Without wishing to invoke analogies from the Aegean, the fragments of cremated bone . . . provide tantalizing lines of thought' (*ibid*)). However, in his report on the bone, Cornwall was not sure that either bone deposit definitely contained human

remains and, in one case, concluded that the bone probably represented 'burnt food remains rather than human cremation' (1978, 431). Even if it is accepted that these deposits did contain cremated human bone, the question arises of why were single human cremations found only in the construction trench of the structure and under the paving of the structure? If these were deposits of a ritual nature, why were they found only in the construction phase and not from any period of the chamber's actual use? It is more plausible to interpret the deposits as small animal sacrifices made during construction, to ensure success in the building and use of the structure. We see echoes of this practice in many societies, the ritual laying of foundation stones by local dignitaries in our own society being an example. It does not imply a primary ritual purpose for the building.

Now that the evidence used to support the theories of a ritual function has been discussed, the nature of Iron Age religion should also be considered. There are three main sources of information which will be used: archaeology; contemporary comments of the Classical observers; and the later Celtic documentation of the Early Christian period. Archaeology is perhaps the most important source, being both more extensive than, and without the biases of, the contemporary written sources. Despite the conservative nature of Celtic society, the written sources produced in the Early Christian period must be treated with care, not only because of the considerable time lapse involved, but also because of the geographical restrictions of the available documents.

A first interpretation of 'ritual function' might be to suppose that some fogous were a form of shrine or temple. It therefore seems only sensible to examine first the evidence for shrines and temples in the Iron Age. A limited number of 'non-domestic structures' have been identified as shrines or temples, and a summary and synthesis of the evidence, including sixteen structures from twelve sites, was published by Drury in 1980. It is clear from the Classical commentaries that the Celts did worship at temples and sanctuaries (Diodorus Siculus, V, 27: Tierney, 1960, 249) and at temple-enclosures, as well as sacred lakes (Strabo, IV, i, 13: Tierney, 1960, 262), and that some of the structures were roofed (Strabo, IV, iv, 6: Tierney, 1960, 269-270). It must be noted that all the above comments describe activities in Gaul, not Britain, and therefore can only be treated in a very general manner. However, it is possible to say that the idea of temple structures was not alien to the Celtic religion.

The archaeological evidence for pre-Roman shrines or temples in the British Iron Age is limited and of poor quality. Wait identifies four problems that have affected the evidence: partial excavation; poor reporting of results; inadequate evidence for accurate dating; and the absence of any explicit or 'a priori' definition of what constitutes a shrine or temple (Wait, 1985, 156). The result of this is that possible shrines have been identified only relatively recently and on a largely intuitive basis. Three criteria have been used implicitly, to a lesser or greater extent, to imply a possible ritual nature for a structure:

1. the absence of artifacts associated with domestic activities;
2. differing design or method of construction from normal domestic structures;
3. positive association with artifacts of a ritual nature (Wait, 1985, 156).

The rather baseless assumption of the second criterion has unfortunately led to the conclusion that the more rectilinear a building, the more ritual its function; and equally, to a reluctance to identify possible circular shrines. However, using these criteria twenty-four structures on sixteen sites had been identified when Wait produced his study of shrines in the pre-Roman Iron Age (1985, 156).

Perhaps unsurprisingly, all the shrines identified were above-ground structures, 70% of which were rectilinear. Three of the sites did not produce any structural remains. They varied in size, though were generally small and unimposing in nature, and showed a tendency to be easterly orientated. Three different construction techniques were used: bedding trenches containing the impressions of uprights; postholes reconstructed as uprights framing infilled walls; and dry-stone walling. Dry-stone walling only occurred once, in the foundations of the circular shrine at Maiden Castle, Dorset. Over 90% of the shrines were found to have been spatially separated in some way from the domestic sites, either by a temenos or a large open area, 'Celtic shrines are rarely, if

ever, found near to domestic sites; instead, they are always separate' (Wait, 1985, 171-172).

Already, a lack of correlation between known Celtic shrines and the fogou becomes apparent: in situation, construction, orientation and essential form. The fogou is generally subterranean, of dry-stone walling, with no obvious orientation and is essentially a mycoform (fungal), rather than a simple geometric structure. Furthermore, in many cases the fogou is definitely associated with domestic structures (e.g. Carn Euny, Porthmeor, etc.), whereas not only were 90% of the Celtic shrines associated with occupation sites spatially separated from the domestic area, but 40% of the shrines had no known associated settlements (Wait, 1985, 173). Whilst the shrine appears to be deliberately set apart from the domestic area, the fogou is deliberately incorporated. It is also interesting that all the structures are thought to have been roofed, excepting Frilford, Oxfordshire (*ibid*, 172). This is of note in light of Christie's suggestion that the round corbelled chamber at Carn Euny may have been unroofed, and hence, of a non-utilitarian nature (1979, 210). It seems that the fogou could not be described as part of the general pre-Roman Iron Age tradition which produced the shrines discussed above. Thus it now becomes necessary to discuss other religious structures and ideas of this period.

Subterranean structures do have a place in Celtic religion: wells, pits and shafts have all been used for the deposition of votive offerings (Ross, 1967, 24). There are several sources of evidence for the belief in the magical properties of wells. Ross draws attention to a shaft-well found at Ashill, Norfolk, which contained layers of 'fairly perfect' urns embedded in hazel leaves and nuts. There is a repeated association of the hazel nut with wells in early Irish literature. One story tells of Connla's Well at which the hazels of wisdom grew; their magical nuts fell into the water and were eaten by the sacred salmon which lived in the well, and who thus acquired their supernatural wisdom (*ibid*, 28-29). Wells on the Isle of Skye were believed to have properties of healing and fertility, at least until the end of the last century; their names (e.g. Toothache Well) and surviving oral traditions still bear testimony to the old beliefs in their powers (Ross, 1968, 257).

It is thought that the Celts made extensive use of shafts and pits for ritual purposes, and their existence is well documented throughout southern Germany and in the Marne and Seine areas of France (Schwarz, 1962, 22-77; 1975, 342-360; Zurn, 1971). Dr. Ann Ross and Richard Feachem have studied the ritual shaft phenomenon in Lowland Britain, although, as in the case of Celtic shrines, their work has a largely intuitive basis. Wait further analysed their results, in his study of Iron Age ritual and religion, and attempted to give the subject a more scientific character (Wait, 1985, 51-52). The evidence seems to support strongly the construction and use of pits and shafts for religious purposes; deliberate layering, the use of linings, the recurrence of objects which could not be described as rubbish (e.g. complete pots, jewellery, human bones), all indicate deliberate deposition. As votive offerings are a recognised element in Celtic religion (Ross, 1986, 19-20) there should be little difficulty in accepting the existence of the ritual pit and shaft.

However, despite the subterranean nature of wells, pits and shafts, they bear little resemblance to the fogou, either structurally or conceptually. The fogou is not designed as a simple receptacle; it is not merely a vertical shaft with a lining of clay or timber into which objects can be thrown or deposited. The fogou is a far more complex, dry-stone construction of an essentially horizontal structure composed of several elements: passages, chambers, doorways, drains. It is obviously designed to be entered, even if it is not possible to say by whom. In the case of the 'magical' well it is the water which is the focus of belief, not the well structure. The fogou simply cannot be connected with such a belief. At Northfleet, Kent, an interesting variation of the simple shaft was discovered at a cement works. The shaft itself was destroyed by the workings, but, at a depth of about 11m, an oval chamber was discovered measuring 8m by 6m and 2m high, and containing groupings of dismembered animal bones. Pottery in the infill of the chamber was of mid-first to mid-second century A.D. date (Ross, 1968, 270). At Purberry Shot, Surrey, the shaft widened at the base 'as if to form a small chamber at the bottom' (*ibid*, 271). These structures possess a superficial resemblance to the fogou idea, but probably represent a variation of the shaft tradition, rather than any connection with that of the fogou.

The somewhat limited evidence for Iron Age burial practice will be briefly considered, as there is the possibility that the small bone deposits discovered at Carn Euny were human. A distinctive south-western inhumation form has been recognised, following the chance discoveries of small cemeteries and isolated burials around the coast of Cornwall and on the Isles of Scilly in the nineteenth and early twentieth centuries. The rite is characterised by 'the use of a grave lined and covered with rough granite boulders or flat slate slabs and conventionally described as a cist' (Whimster, 1977, 320). The cemeteries of Harlyn, Trevone and Stamford Hill were all in operation 'by at least the second century B.C.', as an analysis of the grave goods has shown (Whimster, 1981, 72), though it is not possible to say with any certainty whether or not the bone deposits at Carn Euny were contemporary with this burial rite. However, there is absolutely no evidence of any cremations in Cornwall from the Early or Late Iron Age. If the bone deposits uncovered at Carn Euny were human then they are without precedent or parallel.

Finally, it is necessary to consider Celtic beliefs and ideology, albeit through the possibly distorted medium of the later Celtic literature of the Early Christian period. It must be recognised that there are spatial, temporal and stylistic limitations on the interpretation of Irish and Welsh vernacular literature, and only general concepts will be considered. Possibly the only concept to which the fogou has any similarity is that of the Sid mounds, 'the prehistoric long barrows and hills with caves all across Ireland' (Wait, 1985, 226). The Sid mounds are liminal places providing access into the Otherworld. This idea occurs in both Irish and Welsh stories. Three times did Etain attempt to meet Ailill on the mound above his house, but it was Midir she met while Ailill was cast into a magical sleep (Gantz, 1981, 50-51). Similarly, in the Mabinogion, Pwyll meets Rhiannon at Gorsedd Arberth, the mound of Arberth, after he travels there to see what wonders will occur (Gantz, 1976, 51-55).

However, if it is presumed that the Sid mound is originally the prehistoric tomb or barrow, or perhaps even a natural feature, then it must be recognised that this idea is an attempt to explain an existing phenomenon, not an incentive to create a new one. The fact that the fairy mound is well-known in every Celtic country and may still be carefully avoided today (Matthews, 1989, 69) surely indicates that the Sid was the focus of an extremely powerful belief. The nature and power of this belief is irreconcilable with the concept of the deliberate construction of an artificial Sid. Whilst claiming a possible religious function for the fogou, those who support this view have not identified any elements within Celtic belief, as so far known, with which the fogou structure can be associated. It does not appear that it is possible to make such an association.

The Theory of Safe Refuge in Times of Attack

Finally, it is surely time to reconsider the theory that fogous were constructed primarily as places of safety, for either people or goods, during times of attack. Indeed, this was by far the most popular explanation of the enigmatic structures until, in the latter half of the twentieth century, it is now considered to have been 'virtually discounted' (Weatherhill, 1985, 24). There have, however, been no recent discussions of such a theory and, in consequence, no conclusions which actually dismiss its credibility. Its validity as a theory must therefore remain until such a discussion has taken place — it cannot simply be dismissed as unfashionable. Therefore the nature of the fogou, the nature of society in the Later Cornish Iron Age, and the very nature of defence and refuge itself will be considered in an attempt to reach a more reasoned judgement of this proposition.

The fogou essentially provides inaccessibility and concealment to whatever is placed inside it. Christie's excavations at Carn Euny produced evidence 'for a long passage, closed at both ends originally and accessible only through the creep' (Christie, 1979, 210). She also suggested that other Cornish fogous 'Lower Boscawell, Halligey and others' may have been constructed initially with closed passages, only being opened up at a later date (*ibid*). Startin's excavations at Halligey did indeed support Christie's suggestion. The long curved passage and its associated creep could be entered only through the low doorway which led from the long straight passage (Startin, 1982, 185). The original entrance was discovered to be at the north end of the straight passage, into

which an inner 'sleeve' was added to make the entrance/exit narrower and longer, and thus more tortuous' (*ibid*). It thus appears, at least from the evidence of the more substantial of the remaining fogous, that these structures were initially constructed to be deliberately inaccessible.

Secrecy and inaccessibility are not inherently indicative of non-utilitarian nature. If it is further considered that the fogou is totally integrated into a settlement, then it must be recognised that some practical reasoning could possibly lie behind the deliberate incorporation of such a feature. If the theory of the fogou as refuge is returned to, then it is quite clear that defensive structures, places of safety, must be inaccessible to whatever threatens them. Hence, the massive, complex defences of the Medieval castle and the off-shore siting of the Early Christian crannog ensured their inaccessibility to raiders. Places of refuge, if they are to be successful, must be primarily inaccessible.

The second element which the fogou provides is that of concealment. Recently, the idea that the fogou would have been totally hidden from sight has been questioned. The fact that not all fogous are subterranean, and the fact that even those which are could possibly have been covered by at least a low mound, has led to the dismissal of the refuge theory on the grounds that the fogou would not have been invisible:

'it seems almost certain that the straight passage would have been visible within the settlement as, at the very least, a low mound. This lack of disguise militates against the suggestion of its use as a refuge' (Startin, discussing Halligye, 1982, 186).

'Where [the drain ends] matter that had been carried in it was fanned out like a delta extending nearly five feet forwards . . . The delta proves that when the drain was in use the outer wall was fully exposed to view and that the secrecy of the fogous usually believed to be essential did not apply in this case' (Hirst, discussing Porthmeor, 1937, 51).

The above statements reveal an assumption that, in order to provide any degree of concealment, the fogou must be completely hidden. This is not necessarily so. The minimum degree of concealment which will successfully provide the level of safety required will vary according to the threat to that safety. There does appear to have been a deliberate attempt to provide as great an element of concealment as possible. Those fogous which have been built above ground — Porthmeor, Bosporthenis — occur in areas in which the granite lies very near the surface (Hirst, 1934, 48-49), and hence underground construction would not have been possible with the tools then available. It must therefore be concluded that there was a conscious desire to construct the fogou below ground, and that this was always the case unless, through a combination of the unsuitability of the ground and a lack of good iron tools, the builders were forced to do otherwise.

Furthermore, it must be concluded that the primary motivation behind such an action was a desire for concealment. For, if examined, those fogous which are of necessity above ground reveal a separate attempt at disguise. The fogous at Porthmeor, Lower Boscawell and Pendeen Vau (the latter two being semi-subterranean) are all covered by massive and ancient stone hedges. Stone hedges cover the Cornish landscape, and they were certainly in widespread use as field boundaries during the Iron Age (Weatherhill, 1981, 32), if not earlier. Those which cover the fogous have been shown to be an original part of the structure (Hirst, 1937, 47). Additionally, the beehive hut, or above-ground fogou, at Bosporthenis is placed at the junction of two hedges, its rectangular chamber being surrounded by the remains of a yet more massive stone wall. It is surely therefore more than probable that those fogous which had to be constructed either wholly or partly above ground, were covered by what would have appeared to be nothing more than yet another stone wall in an area in which the dry-stone wall was nothing if not ubiquitous. Perhaps it should not be forgotten that sites such as Carn Euny and Porthmeor were only discovered relatively recently, and that even now it is only because a fogou is known to exist at a certain location that it can be found without too great a difficulty. It can surely be concluded that the builders of the fogou made a conscious attempt to provide it with a definite degree of concealment.

Finally, the claims that drains or low mounds rob the fogou of any element of secrecy must be briefly considered. To suggest that the builders of such accomplished structures would not have

been capable of disguising a drain outlet with a few rocks if the occasion arose is not really convincing. Startin's claim that the straight passage at Halligye would have been 'visible within the settlement as, at the very least, a low mound' (1982, 186) is based only on surmise. For the excavation was only able to determine that at the southern end of this passage the ground level was raised during a rebuilding to a height of three feet above the construction surface. It was not possible to tell whether it was ever raised above the occupation surface. However, the presence of a low mound in a settlement does not automatically indicate the presence of a man-made structure, and certainly not the presence of a fogou.

It appears therefore that the very nature of the fogou is clearly compatible with a defensive function. It now becomes necessary to consider the nature of Iron Age society, in order to discover whether any apparent need for the provision of a structure of such a nature can be discerned. There can be little doubt that Celtic society (and, indeed, the society that preceded it) was violent. The evidence from archaeology, the contemporary Classical observers and from later Celtic literature all support such a conclusion.

If the appearance of hillforts in the Later Bronze Age is accepted as being a reflection of an increasingly violent society, it is surely highly probable that the sudden change in hillfort construction at the beginning of the Later Iron Age is a reflection of a similar development. In the fourth century BC many of the earlier hillforts were abandoned and never reoccupied; in some cases new sites were established, whilst in others existing sites were elaborated and extended (Darvill, 1987, 137). Rampart construction techniques also changed. The timber-laced, or 'wall-and-fill' ramparts of the earlier structures were replaced by glacis, or 'dump' ramparts, and this development is paralleled by an elaboration of the entrance (Avery, 1986, 216-222). There also appears to have been a deliberate use of existing slopes and natural features to exaggerate, or enhance the scale of the defences (Darvill, 1987, 137).

It has been argued by Cunliffe that these developed hillforts reflect an increasingly stable population and that they can be interpreted as urban centres, or pre-Roman towns (Cunliffe, 1974, 275-282). However, he also recognises that, 'a strongly defended hillfort implies two things: coercive power in the hands of society's leaders and the need to protect the community from attack . . . there can be little doubt that the siting and the construction of the forts was carried out with a firm eye on the defensive potentialities of the situation' (*ibid*, 277-278). Avery has argued that the development of the entrance is a response to the more widespread adoption of the tactics of 'stoning and fire' (Avery, 1986, 222-226).

In Cornwall the adoption of more substantial defences can be seen at several levels of settlement type, as the open-plan settlements of the Early Iron Age begin to be replaced by other forms of settlement after about 400 BC (Darvill, 1987, 147). The round, a variant of the hillfort, appears. Usually considered to be single farmsteads fortified with a bank and ditch, they must surely be seen to reflect an increasing need for defence, if only of a somewhat limited character. Larger, multiple-enclosure forts also appear, their single entrance and massive ramparts indicating the same conclusion. And around the coast were built the cliff castles which, set on spurs or promontories, maximise the defensive possibilities of the region. Such a change in the nature of settlement types is most logically attributed to a change in the nature of society, for whatever reasons, resulting in an increase in aggression, or a perceived increase in aggression. It must surely be accepted that there is a very real emergence of a desire to provide settlements with defensive features in this period in south-west Cornwall.

Figure 3 shows the distribution of all known hillforts, rounds and cliff castles in relation to the remaining, and destroyed, fogous. For the purposes of this map, cliff castles have been included in the general hillfort category; and similarly, as to draw a distinction between the hillfort and the round is of necessity a rather subjective judgement, such a distinction has not been made. The information for this distribution map was drawn from several sources; A.H.A. Hogg's *British Hill-Forts: An Index* (1979), N. Johnson and P. Rose's *Defended settlement in Cornwall — an illustrated discussion*, (1982), and Vivien Russell's *West Penwith Survey* (1971). As the survey pro-

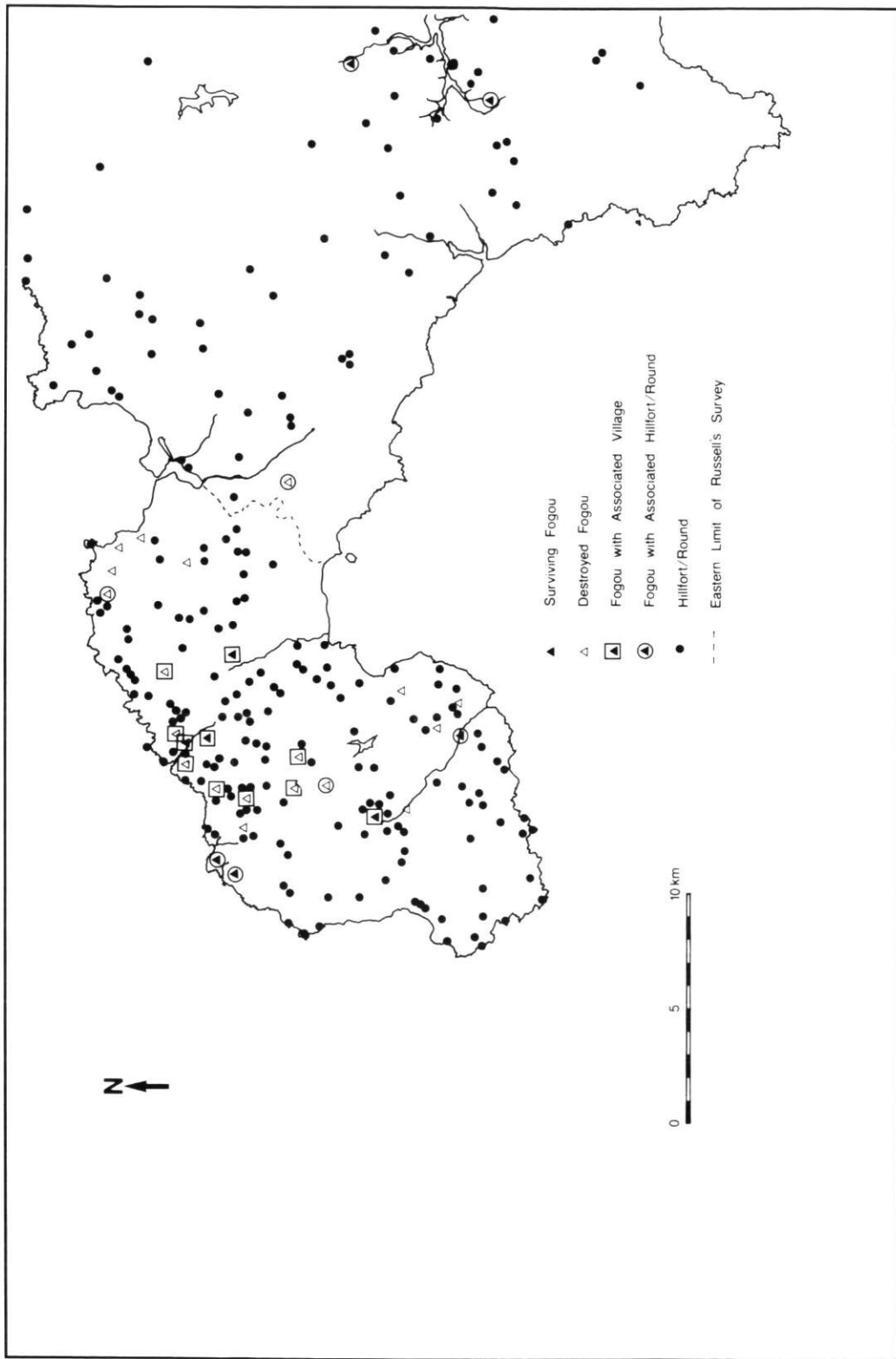


Fig 3 The distribution of fogous, hillforts and rounds in west Cornwall

duced by Russell was far more intensive and included sites which, due to their small size, could not be included in the two more wide ranging surveys, then the resulting map obviously possesses a distinct bias towards West Penwith. The limits of the area examined by Russell are therefore indicated. If this map is considered, the extremely dense nature of defended settlement in Later Iron Age Cornwall is immediately apparent. A universal, not a particular phenomenon is being observed; and further fieldwork in the more easterly part of the region shown would almost certainly reveal a similarly dense pattern to that revealed by Russell in West Penwith. It is within this scenario of generally defended settlement that the appearance of the fogou must be considered.

It is possible to reconstruct a general picture of Celtic attitudes to warfare from the contemporary Classical literature, a picture which correlates well with that gained from the later Celtic literature. As, excepting Caesar's description of his reception on British shores, the majority of accounts describe the inhabitants of Gaul rather than of Britain, and as these writings obviously contain a degree of bias, such a picture can only be a general one. However, both societies were essentially Celtic in nature and there is evidence that both were in close contact, so that it is not unjustifiable to extrapolate from one to the other in order to gain this generalised view.

Strabo describes the Gauls as warlike, passionate, disputatious and quick to be provoked, but easily defeated by stratagem. When he was writing (in the first century AD) the Gauls formed the flower of the Roman cavalry. He also tells us of the Celtic custom of head-hunting; victorious warriors riding home with the heads of their fallen foes dangling from their horses' necks, much as Cuchulain drove back to Emania with the heads of his enemies hanging from his chariot-rim (Rolleston, 1986, 39-41).

Caesar made his expeditions to Britain in the first century BC. He describes his reception on British shores where his men are met by cavalry and warriors in chariots armed with spears and javelins; hostilities which he claims are 'without provocation when they had of their own accord sent envoys to me on the continent asking for peace' (*de bello Gallico*, IV. 24-27). It appears that the Britons treated warfare as an integral part of their life, for Caesar tells us that the chariot warriors trained daily (*ibid*, 33), and that, upon his return in 54 BC, they retreated to a defensive position that 'they had prepared previously for some war amongst themselves' (*ibid*, V. 9). Such a conclusion is also supported by his description of an attack on Cassivellaunus' oppidum:

'I set off there with my legions and found that the site has excellent natural defences and was very well fortified. Nevertheless we proceeded to attack it on two sides. After putting up brief resistance, the enemy were unable to hold out against our men's onslaught, and they rushed out of their oppidum on the other side. Many of these fugitives were captured and killed. Inside the fortress we found a great quantity of cattle' (*ibid*, V 21).

From this extract it is possible to conclude that in the first century BC hillforts were still constructed as primarily defensive structures. Moreover, the fact that a massed force of Britons could only hold out for a very brief period against the Roman attack seems to support the theory that Celtic warfare most commonly took the form of the raid, usually for cattle, and that neither the defensive structures, nor the warriors, were able to cope successfully with siege-warfare. The comment that the fort contained a 'great quantity of cattle' also supports this theory. The later Celtic literature is full of references to cattle raiding, which the de Paors describe as 'so common a form of warfare that it must be regarded as no more than a violent and bloody sport, a test of manhood and aristocratic status' (De Paor, M and L, 1964, 77). The use of cavalry and chariots also seems to imply a 'hit-and-run' form of warfare, rather than the heavier tactics of the Romans.

It appears therefore that society was considerably turbulent at this time. The emergence of so many new forms of defended settlement in the Later Iron Age indicates that the perceived threat of aggression was increasing throughout this period. Certainly, in the first century BC Caesar gives the impression that British society was constantly at war, even if only on a rather petty scale. He also gives the impression that raiding may have been the most common form of Celtic warfare, a theory which is supported by the later literature. Within such a society, the construction of the fogou as a refuge seems to be a logical reaction to the perceived threat. If that threat is local raid-

ing, then it will be sudden and short-lived in nature. Such a structure as the fogou, which provides initial concealment and inaccessibility, is ideal under the circumstances described. It may not be invisible, but such an extreme should not be necessary, as a raiding party depends upon speed for its success, and could not waste time in digging out whatever lay within the fogou.

Furthermore, it has been suggested that fire and sling stones were two of the more common weapons of the time (Avery, 1986, 216). Supporting evidence for such claims include burnt hill-forts and Classical accounts of the use of fire by Celts (Rivet, 1971), in particular Caesar's description of the attack on the oppidum Bibrax (*de bello Gallico*, II 6). The discovery at Maiden Castle, Dorset, of 'countless slingstones' in the later phases of the site (Wheeler, 1943, 49), seems to provide some evidence of the use of sling warfare, and, interestingly, during the excavation of Porthmeor, 'several hundreds' of sling stones were found, some of which showed signs of having been burnt (Hirst, 1937, 44 and 64). The use of such methods of attack would also support the construction of a fogou for primarily defensive purposes, for it would provide greater protection from both of these weapons. The buildings of the settlement, although possessing stone walls, would certainly have been roofed with organic, and hence flammable, materials. The fogou, being completely of stone, and in some cases subterranean, would have been both fire-proof and missile-proof, acting as a form of 'air-raid-shelter' against any sling stones used by an attacking band.

Having considered both the nature of the fogou structure and the nature of Iron Age society; and having concluded that the theory of the fogou as refuge is compatible with both, it only remains to consider the very nature of defence and refuge itself. The inherent inaccessibility of a defensive structure has already been discussed, yet cannot be stressed too strongly for it is absolutely fundamental to the success of such a structure. The only reason for deliberately designing and constructing an inaccessible structure, for deliberately designing and constructing small doorways and hidden passages, must be in order to keep something out. What that something was is indicated by the conclusions of the previous paragraphs.

Throughout history, those who have been forced to provide themselves with hidden refuges have not only utilised natural caves and tunnels, but have constructed artificial versions if the condition of the terrain has allowed. Many French castles possess their own 'souterrains', in which not only the Lord's immediate household, but also his vassals and property, could be protected. These structures could be considerably elaborate, incorporating granaries, kitchens and other facilities (Kempe, 1988, 182). In Britain, Nottingham in particular is riddled with man-made caves, constructed for many different purposes. The caves on the 'old way to the gallows' were used as refuges by Roman Catholics in the time of Elizabeth I and James I, and by Dissenters during the reign of Charles II (*ibid*, 185). The Civil War produced many stories of the use of existing caves as refuges. Reynard's Kitchen in Derbyshire, and Botter Rock and Sheep's Tor in Devon have all sheltered unhappy royalists in their time (*ibid*, 197-198).

Closer to the present day is the example of an underground refuge constructed in a typical small settlement of eight or nine European families in the American mid-west of the late 19th century. On receipt of the first warning of a rising by Ute Indians, the men of the settlement being away on a distant cattle-drive, the women retired every evening to a hastily provisioned small underground chamber. This was some 3.5 metres square, 2 metres high, with a thick earth-covered wooden roof slightly raised above the surface but impossible to fire. The chamber, large enough for twelve or fifteen people, was connected to the largest log cabin in the settlement by a narrow passage, some 4 metres long and a little more than 1 metre high, sloping slightly up towards the cabin (Warner, 1980, 93-94; Thayer, 1888, 259).

The Irish souterrain, which bears a distinct resemblance to the Cornish fogou, has been considered at some length by Warner (1979; 1980). In a discussion of the possible purpose of the souterrain, he concluded that these structures were built primarily for defensive purposes and, in support of this view, he presented many contemporary references to the use of souterrains for just such a purpose.

The construction of 'caves' for refuge purposes is a common solution to the threat of sudden

aggression, just as the use of natural caves for similar purposes is common in areas in which they occur. It cannot be seen as a purely modern solution. Indeed, Plutarch wrote that the Characitanians, in times of war or danger, descended into their caves with their valuables in order to protect themselves and their goods (*Life of Sertorius*). Tacitus too, writing in A.D. 98, describes similar behaviour amongst the Germans;

'They are wont also to dig out subterranean caves, and pile on them great quantities of dung . . . And should an enemy approach, he lays waste the open country, while what is hidden and buried is either not known to exist, or else escapes him from the very fact that it has to be searched for' (Tacitus, *Germania*, 16).

Finally, it is interesting to consider the uses which have been found in more recent times for the Cornish fogous. The author has come across no mention of the use of a fogou as a 'cold store' for any farming produce, which, as these structures are essentially unsuitable for such a function, is no great surprise. The fogou at Boleigh is at present used as a form of temple, although this practice only began in the 1970s and can in no way be considered to have any connection with local Iron Age ritual. However, Boleigh was used as a refuge in March, 1646, for it 'was so large and perfect in the time of the Great Rebellion, that Cavaliers were for some time concealed there; where like the prophets of old, they were fed by Mr. Levellis of Trewoof, until opportunity offered them to return to the King's army' (Borlase, W.C., 1868, 163). Boleigh was also used by smugglers in the eighteenth century for the purpose of concealing their spoils and their persons from the authorities (May, 1989, 6-7).

If it is accepted, as it surely must be, that the fogou was primarily constructed as a refuge in times of trouble, then various further questions arise. How can the limited distribution be explained? What exactly was the fogou designed to protect? Only nine fogous now remain; however, Russell identified an additional eighteen possible fogou structures in the West Penwith area, now destroyed, and the existence of a nineteenth example in Treveneague, St. Hilary Parish, is well attested (Hencken, 1932, 143-145). A similar survey in the Falmouth area to that conducted by Russell in West Penwith might well reveal a similar increase in the number of possible fogou sites. However, this phenomenon does seem to show a real clustering in the extreme south west of Cornwall, and an attempt to explain such a limited distribution should be made.

The construction of artificial caves as refuges, although a universal and common reaction to the threat of sudden violence, also appears to be individually limited to very small geographical areas (Kemp, 1988, 180-200). It is not a national characteristic, but a reaction of a single group to this particular threat. It is also limited to areas in which naturally occurring caves are not immediately accessible. In the same period in which the fogou was constructed in Cornwall, there is considerable evidence that natural caves were being used for a similar purpose in other parts of the country.

H.E. Balch excavated several caves in Somerset which produced evidence of Late Iron Age occupation (Balch, 1911; 1913; 1928). Wookey Hole, the most extensively excavated of these caves, appeared to have been used for a considerable period as an actual dwelling — the pre-Roman occupation debris was at least four feet deep in places (Balch, 1913, 338). Soldier's Hole, in Cheddar Gorge, also contained Late Iron Age deposits and its extreme inaccessibility and concealed nature indicate that it was almost certainly used as a refuge (Balch, 1928, 204). Also in the Cheddar Gorge, Read's Cavern (Palmer, 1920; Tratman, 1932), Gough's Old Cave (Tratman, 1960), Sun Hole (Tratman and Henderson, 1928), and Cooper's Hole (Fox, 1958, 60), all produced pottery dating to the Later Iron Age. Further caves producing evidence of some form of occupation at this time can also be found outside Somerset, including Kent's Cavern, Torquay, Devon (Fox, 1958, 59).

The knowledge that, in other parts of the south west of England, natural caves were being used for habitation and, in at least the case of Soldier's Hole, for refuge purposes, may help explain the limited distribution of the fogou. Different tribal and regional groups would obviously respond in various different ways to the threat of attack; — as can be seen from the regional differences in hill-

fort construction (Darvill, 1987, 133). In areas where natural caves occurred they were indeed utilised; a common action. In the Land's End peninsula natural caves did not occur at the settlement sites; therefore, any such refuge had necessarily to be deliberately constructed. It certainly cannot be suggested that the use of caves in Somerset and Devon 'fills the gap' of fogou distribution, but evidence of this behaviour surely indicates that such a practice was not alien to the inhabitants of south-western Britain in the Later Iron Age, and that regional reactions to existing troubles can be greatly limited by both geographical and cultural differences.

It is also possible to suggest an answer to the second question, what exactly was the fogou designed to protect? The amount of effort required to build such structures obviously indicates that whatever they protected was of great value. Despite the likely threat of cattle raiding, the fogou cannot have been designed to protect livestock for the entrances are far too small to admit any but the smallest beasts. It would also be impossible to maintain any degree of secrecy, as livestock forced into such a strange and frightening environment would doubtless not remain silent.

The fogou was designed to be entered by people, therefore it will be concluded that it was designed to protect people. A small community would surely be most concerned to ensure the safety of those not able to aid the defence of that community. The work involved in the construction of the fogou is not excessive if it results in providing the required degree of safety, whether preventing injury or death, or preventing capture and enslavement. Obviously, those sheltering within the fogou could take the community's more valuable portable possessions with them, but it must be concluded that the fogou was primarily constructed to protect people.

Conclusions

The construction of the fogou for the purposes of storage is at present generally accepted as the most likely explanation of its purpose. However, the actual conditions of the fogou, and the conditions necessary for the storage of the various commodities which it has been suggested were stored in these structures, have, until now, not been seriously considered. Unfortunately, it appears that very few products could be successfully stored in the damp environment of the fogou.

Only milk and beer would not be harmed by these conditions, and, only if protected from the damp in a sealed container, could grain be stored. Therefore, there appears to be no obvious reason for the deliberate construction of the fogou for purposes of storage. It fulfils no need that can be seen today. The very inaccessibility of the fogou argues against such a consideration. Whilst admitting that these structures could well have been used for the short-term storage of milk and beer, it must be concluded that fogous were not constructed primarily as a method of storage.

After considering both the nature of the evidence which has been used to support the theory that the fogou was constructed and used for ritual purposes, and the nature of pre-Roman Iron Age ritual, it is now possible to draw some conclusions. The actual evidence discussed by Clark and Christie is not impressive, and certainly not conclusive. As the carving at Boleigh is not now clearly visible it cannot be used alone as evidence. Similarly, the inaccessibility of Carn Euny cannot by itself be used as evidence for ritual activity. A consideration of the nature of the Celtic shrine and subterranean Celtic ritual structures, in so far as we know them, reveals a lack of convincing parallels. In each case the two classes of structure are essentially different. In addition, the possible unroofed nature of the round corbelled chamber at Carn Euny appears to have no obvious parallel amongst the Iron Age shrines. The evidence for burial rites is not adequately dated, yet it is not reasonable to suppose the bone deposits (which were not definitely identified as being human) from Carn Euny are possible cremations. Finally, it is surely necessary to identify some elements of Celtic belief which are not incompatible with the fogou structure if a religious nature is to be assigned to it. This does not appear to be possible.

The nature of the fogou structure, its qualities of inaccessibility and concealment, indicate that it was designed to protect a particular commodity from a particular threat. An examination of society in the Later Iron Age reveals the ever present threat of raiding from which both people and goods needed to be protected. Under raiding conditions the mere existence of a fogou would act as

a deterrent. The use of existing caves, for the purposes of refuge when faced with a sudden attack, is a well attested historical phenomenon; it even appears that natural caves in the south-west were being used as refuges in the Later Iron Age. Indeed, the descriptions by Tacitus of the construction of what were essentially 'fogous' in Germany, at the very time that the courtyard house villages were occupied, and his description of their use as refuges, cannot be ignored. Such a theory used to be and, I suggest, still is the only really plausible explanation for the initial construction of the fogou and for its primary purpose within a settlement.

The Nine Remaining Fogous

- 1 Boleigh (SW 437 252)
- 2 Bosporthenis (SW 437 360)
- 3 Carn Euny (SW 403 288)
- 4 Chysauster (SW 472 350)
- 5 Halligye/Halligey (SW 713 239)
- 6 Lower Boscaswell (SW 377 348)
- 7 Pendeen Vau (SW 384 355)
- 8 Piskey Hall (SW 728 300)
- 9 Porthmeor (SW 434 370)

General information and plans of the fogous can be found in the following books:

- Clark, E., 1961 *Cornish Fogous*, London, Methuen & Co.
Weatherhill, C., 1981, *Belerion*, Penzance, Alison Hodge.
Weatherhill, C., 1985 *Cornovia*, Penzance, Alison Hodge.

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Treryn Dinas: cliff castles reconsidered.

ADAM SHARPE

Cliff castles, or promontary forts are relatively common around the coasts of Cornwall. Generally held to have been places of refuge or trading sites, they may have a much longer pedigree, and have always been important focal centres in the prehistoric landscape.

Some aspects of Treryn Dinas on the southern Penwith coast are well known. The story of the displacement and re-instatement of the Logan Rock that crowns its summit was widely publicised at the time, and remains part of the attraction of the site for tourists to this day. In spite of the presence of the National Trust plaque where the footpath runs down onto the headland, however, few of these visitors are particularly aware that they are entering an archaeological site, and fewer still will have much idea what a 'cliff castle' might be - but do we, as archaeologists, either?

At school I was taught that these sites were places of refuge during the Iron Age - a time of social tension and potential violence. On these defensible headlands the local population could lock themselves, their families and the cattle safely away behind massive ramparts, whilst marauding raiders fumed helplessly outside, contenting themselves with burning down the village, and helping themselves to the odds and ends left behind. That model seems rather out of date these days, and now I more often hear cliff castles explained as enclosed trading centres - used on an intermittent or seasonal basis by local traders and coasting merchantmen - far from being for defence against violent assault, the ramparts were to protect high value goods and to symbolise the status of the traders within.

As I have come to know more and more of the local sites, however, I have become increasingly uncomfortable with both of these models. Whilst the ramparts at the Rumps, the Dodman or Bolt Tail in South Devon enclose fairly extensive areas of more or less level ground (and could therefore have sustained a small population and its animals in time of threat, who in their right minds would retreat to Treryn Dinas, Kenidjack Head, Giant's Castle off Salakee Downs on St. Mary's, Scilly, Gurnard's Head, or worst of all, Tubby's Head near St. Agnes? In each of these cases (and members will be able to think of other comparable examples in their own areas) the ramparts enclose little more than areas of rock outcrop, and in the last case, the interior of the cliff castle is strategically totally indefensible, lying as it does at the base of a cliff-slope which completely overlooks the whole of the site.

These sites at least, are clearly entirely unsuitable as places of retreat for a local population. As trading centres, too, there must have been far more suitable locations - unless it was important to carry out business on small grassy ledges surrounded by tors and rock outcrops. Now these practical drawbacks certainly do not apply to the group of cliff castles (like the Rumps) which do enclose relatively large areas of roughly level ground behind substantial ramparts, and one could envisage them being both defensible against external threat and also suitable as enclosed maritime market places - particularly if it were livestock that were being traded.

Perhaps, then, (and this would not have been for the first time) we have been treating as a single group a collection of sites which have no more in common than their location and apparent form - in this case headlands enclosed by ramparts of one form or another.

These thoughts on cliff castles were prompted by a chance find when out for a walk on the St. Levan coast a little while ago. I hadn't been to Treryn Dinas for a while, and had forgotten how complex and odd the site was. The outermost rampart is indeed impressive - a massive ditch and earth bank which bears comparison with the defensive earthworks of many hillforts; this encloses a moderately level area of ground, within which can be seen the rather spread remnants of a pair of much slighter ditches and banks - the ramparts being mounds of stone and earth rather than mas-

sive earthworks; beyond these inner defences, the ground slopes quite steeply down to a natural neck in the headland, beyond which is the craggy outcrop on top of which stands the Logan Rock. Curiously, however, this far end of the headland is partitioned off from the inner area of the cliff castle by a further boundary feature - a rather low stone faced earth wall crowning two deep disconnected sections of ditch; at its centre is a clear entrance way. But what is the purpose of this last 'line of defence' since there is scarcely any level ground beyond this point?

Antiquarians noted the traces of two round houses tucked in behind this inner rampart flanking the entrance, but little more beyond. Some cursory exploration out towards the headland on the western side revealed the sites of at least two more small houses - one a true hut circle defined by stone facing in which could be seen a well-made entrance way, the second a levelled 'stance' cut into the cliff edge. Based on this evidence (and my search was by no means exhaustive), Trrern Dinas began to look rather more like Gurnard's Head or Kenidjack Head, where similarly small (2.5m - 3.5m internal diameter) house platforms have been found within the innermost rampart, set on what are now the cliff edges (we should not discount the effects of erosion in reducing the availability of levelled areas fringing these headlands). Below the southernmost of these stances, a fine Iron Age rim sherd had eroded out of the path, apparently confirming a late prehistoric occupation of the site, an occupation perhaps based on these small house sites.

Climbing up a gully leading towards the Logan Rock, however, I began to revise my opinions. In a clearly residual deposit of soil and rab mixed with large boulders towards the top of the gully, I found another sherd of almost identical Iron Age pottery, and next to it a large sherd which was clearly much earlier in date - indeed, which was part of a plain Bronze Age bucket-shaped funerary urn. What were these doing here, and what sites upslope could they have derived from?

The source of the Bronze Age sherd was perhaps not a problem. One cist had been noted rather further inland (Russell 1971, 49), and there seemed no reason why there should not have been additional small cairns set along the summit of the headland. On the basis of other prominent hilltop and headland sites, we would surely expect to find Bronze Age funerary sites crowning the skyline. Erosion or vandalism might well have erased all traces of the sites of such features - or perhaps (as Jacky Nowakowski suggests) the vessel had been deposited in a cleft in the rock - a natural cist - perhaps representing a burial form so far unrecognised in the south west. Amongst the rab and earth in the gully were fragments of cremated bone and pieces of charcoal.

But what was the Iron Age sherd doing here? It had clearly derived from upslope, and the find spot was nearly at the summit. There could surely never have been a house site this high up the outcrop. Perhaps something hitherto unrecognised was going on at this site.

It is clearly dangerous to speculate on the basis of a single residual sherd, so what follows is more a throwing out of ideas for further discussion by members of the society than a developed thesis. I'd like to return to the the whole notion of cliff castles. What are they? Are they all the same sort of site? Have they been adapted over time? Are current models about their likely use adequate? Are they really solely Iron Age sites?

My speculations centre on the sub-group of cliff castles which consist, in the main, of enclosed rocky headlands, and spring from recent research into a different, but I suggest, linked group of sites - the tor enclosures or defended hilltops. Mercer's excavations at Carn Brea (Mercer 1981) and, more recently, at Helman Tor have firmly established Neolithic use of these sites, although the former certainly also has later prehistoric components. Similar sites at Roughtor and Stowe's Pound, or the Dewerstone and Brentor in West Devon are apparently similar whilst recent research (Herring and Hooley, pers comm.) have suggested equivalent enclosures at De Lank (see pp000), Carn Galva, Tregarrick Tor, and perhaps St. Michael's Mount. Beyond Cornwall and Devon, similar sites are now being found in the Prescelli Mountains in south-west Wales (James and Thomas pers.comm), and in the Peak District (Barnatt, pers comm.). That curious site, Bartinney Castle, may also fall into this group, and it seems likely that additional sites will be confirmed as research continues.

Taking some of the better known examples - Carn Brea, Stowe's Pound and Roughtor, for exam-

ple, it can be seen that many (though not all) have at their core, earth or stone banks tightly enclosing prominent areas of tor (at Carn Brea, the tors in the western summit enclosure were quarried away in recent centuries, as within the 'pound' at Stowe's Pound. The only difference between these sites and the 'rocky' cliff castles, it seems to me, is the absence of the sea. The similarity - the enclosure of prominent natural rocky landmarks, however, is rather striking.

I would like to suggest that we should see all of these enclosure sites within the context of a wider range of demarcated natural features that appears to range (in order of scale) from the 'kerbed boulders' first identified by Quinnell on Craddock Moor (further sites have been located nearby, and now on Dartmoor by Gerrard), through the tor cairns (Showery Tor on Bodmin Moor being the most dramatic example) to these tor enclosures. In each case the constructional vocabulary is similar - a prominent natural feature whose special significance is indicated by the addition of a constructed encircling ring of stone - the differences being principally of scale. Perhaps, to continue this line of speculation, we might extend the range still further to include entirely artificial monuments which share some of the same characteristics - cairns with kerbs or enclosing banks, and even stone circles where, perhaps the bounded special place did not require a natural outcrop as central focus. In the lowland, we might expect earthwork or timber equivalents. A date range from the Neolithic to the early Bronze Age seems indicated, though with re-adoption of established sites being relatively common throughout prehistory, and perhaps, over time, a move towards the construction of artificial sites rather than the use of tors, outcrops or, as I would like to suggest, headlands.

To speculate about the reasons which underlie activities undertaken more than 3000 years ago, particularly when our available information is so slight, is risky indeed - but is this not the core of our task as archaeologists? If this group of sites have anything discernible in common, however, it is that they are, in a sense, *landmarks* - often distinctive, often highly visible identifiable points in the landscape - ranging from the 'regional' to the 'local' and perhaps the 'family' or 'personal'.

We use landmarks today far more than we might recognise - they help us to navigate our way around the countryside, but they also form reference points within that landscape - to take an analogy, a parish church tower is more than just a receptacle for its bells, it is often also a highly visible structure - the landscape indicator of the parish as a whole. On a small scale, we use street names, particular features in our local landscape and so on, to identify where we are - in a sense, our identification with an area is dependent on the degree to which we know it through recognised features.

It seems to me that we should consider these landmarks which were demarcated in prehistory - often in quite complex fashions - as in some way equivalent. The larger examples are, if you like, truly *central* places - so that the people of south-western Bodmin Moor might well have thought of themselves as 'the people of Stowe's Pound'. The enclosure on the summit might have acted as a cultural, administrative and religious centre (though I doubt that the distinctions between the categories were apparent in prehistory). In a landscape which was unmapped (in the sense in which we can 'know' through maps, areas of which we have no direct knowledge) and in which obscuring vegetation and individually relatively sedentary members of the community would make such contextual geographical knowledge unlikely, the importance of defined central places as socially cohesive constructs would have been particularly important, as would the smaller 'local' landmarks. People need to know who they are, to which group and area they belong. A range of identifiable symbols of some sort is important.

If physical features were the key to this, then inland, lofty hills would have served well; for littoral populations, prominent headlands would have been obvious candidates. If some cliff castles are the maritime equivalents of enclosed tors, we should be beginning to think about them as initially Neolithic sites. But not only Neolithic - these are also amongst the sites where we find prominent cairns and barrows - so it seems that their importance did not diminish - though it may have been transmuted, or perhaps was appropriated by particular groups within society (if this had not already been the case previously). The re-use of some of these sites within the Iron Age may point

to a continuation of the importance of these particular places within the landscape - indeed it may have been particularly important to lay claim, in some fashion, to these places in particular, and we should not discount their continued use in re-affirming local identity and group affiliation. The continued practice of 'beating the bounds' of a parish might be an appropriate parallel.

If all of this sounds a little far fetched, think of the medieval history of Tintagel Island, whose site appears to have been selected for the construction of a key Norman site because of the legend of legitimate Cornish kingship attached to it, rather than its geographical or strategic advantages, or the particular symbolism of the Stone of Scone - the specific locus of Scottish kingship, which was appropriated and physically incorporated into the British throne, or even the symbolic importance of Westminster as the seat of Government (would a relocation of parliament to Crowlas be credible?) and the strong connection between *place* and *power* that can exist comes into perspective.

In the space of a few hundred words, we have come rather a long way from my initial observations on the chance find of a couple of bits of pottery picked up during a Sunday stroll, and I freely admit that most of this article has been almost entirely speculative.

I return, finally, to my sherds of Iron Age pottery, and to Treryn Dinas. Whilst I repeat that these thoughts remain embryonic as yet, I would like to suggest that Treryn Dinas, like some of the sites which we categorise as 'cliff castles' may have a rather longer pedigree than we might have hitherto thought. Such sites may have persisted as important focii within the landscape for a very long time, serving as cultural centres right into the Iron Age, and perhaps beyond. These sites may have had an extraordinary longevity - many high places have an association with St Michael who battled the serpent of paganism across the high places of the world, subduing ancient beliefs, or at least subsuming them into new Christian structures of power and belief. The sherds, perhaps, are a hint at activities focussed on the Logan Rock itself, part of a re-affirmation of the importance of this craggy headland within the life of the local community.

Places of defence? Trading centres? Does the evidence sustain these ideas still? Is it time seriously to consider the whole subject of cliff castles afresh? These are not new ideas, merely ones which have not been considered for a while. It is now over a century since Robert Hunt wrote (of Logan Rock):

'Nothing can be more certain that through all time, passing on from father to son, there has been a wild reverence of this mass of rock...the mass of rock on which is poised the Logan Stone has ever been connected with the supernatural'. (Hunt, 1865, 330).

Crowlas

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Excavations at a Romano-British round; Reawla, Gwinear, Cornwall

NIC APPLETON-FOX, with contributions by LESLEY and ROY ADKINS,
JUSTINE BAYLEY, VANESSA STRAKER, HENRIETTA QUINNELL

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Summary

Limited excavations in 1987 in advance of building work showed the site to be a Romano-British univallate enclosed settlement or 'round' of the 2nd to early 4th centuries AD. A Phase 1 enclosure (0.4 ha), probably early 2nd century AD (but possibly Iron Age) was replaced, probably during the 2nd century, by a larger more strongly defended Phase 2 enclosure (1.1 ha). Associated with the Phase 1 enclosure was a sub-circular ring gully, interpreted as a house site (House D).

In Phase 2 this was overlain by a well defined 'working area': three successive hearths formed the focus of three subphases of activity (probably 2nd-3rd centuries), associated with pits, post-holes and lesser hearths. One of the functions was probably smithing; smithing slag, hearth bottoms and tuyère blocks came from this and the following phase. A lead ingot from the working area, with marks of pieces being cut off it also gives the impression of a low-key 'farm workshop' level of activity. Adjoining the working area and broadly contemporary with it were three probable houses (A, B and C), in each case a large shallow hollow only partly within the excavated area. House A was 2nd century, houses B and C probably 3rd century. In the late 3rd century and perhaps early 4th centuries, this part of the site was used for the dumping of rubbish (Phase 3) both in the house hollows and over the working area. These midden layers produced most of the artefacts (pottery, stone objects, iron fragments, glass) and most of the environmental and technological samples. Dating for the site came from radiocarbon dates and the pottery evidence. The pottery was overwhelmingly local gabbroic wares with a small proportion from South-East Dorset, South Devon and elsewhere. Iron objects though poorly preserved suggest the general use of iron implements. Stone objects included a bowl, a weight, a shale spindlewhorl, part of a rotary quern and pebbles showing signs of use, perhaps for food processing, leather and cloth finishing. Fossil pollen did not survive but charred plant remains gave an impression of the crops available - barley and wheat - and provide an indication of the contemporary environment and land use. Although appearing to be basically a farming settlement, with evidence of crop production and basic smithing activity, the site is thought, because of the drastic change in the size of the enclosure and the scale of the defence, and because of aspects of the pottery evidence, to be of a relatively high status.

Introduction (Fig 1)

The Round at Reawla (SW 605 363) is part of a dense distribution of settlements of Iron Age and Romano-British date in this part of West Cornwall, reflecting a quite intensive agricultural system and a well populated countryside; its nearest neighbours are at Goneva (SW 604 370) 800 m to the north and at Gear 1.2 km to the east (SW 617 364). The situation may not have been dissimilar to that found in the medieval period with many documented farms and hamlets scattered through this same area, mostly at intervals of 500-800 m.

The site is at 79 m OD (260 feet) on slightly sloping ground on the north west crest of a south-west-north-east ridge of killas of the Mylor series. A slight rise obscures the view to the east, but there would have been good views to the west. The nearest surface water is found 330 m to the north-west. Immediately north of the site runs the medieval pilgrim road to St Michael's Mount (Thomas, 1967, 18, 62-3). The name Reawla, first recorded in 1342, is believed to be derived from the Norman French for "Royal place" (Gover, 1948, 588).

Originally recorded on the Tithe Map of 1840 as "Ancient Fort" it is represented as having two enclosing banks. The inner is on the line of what is now known to be the outer rampart, whilst the second possibly represents a counterscarp bank, the presence of which can be inferred from the silting of the outer ditch. Since then the round has been twice described before coming to the notice of Cornwall Archaeological Unit (CAU) in 1976. R. Thomas (1851) describes it as "the remains of a circular entrenchment". By the time of Henderson's visit in 1917 most of the ramparts had been levelled, only remaining, as today, in the south-east where it is preserved as a hedge, said to have been up to 3.6 m high with a ditch 2.1 m deep.

After a long period as pasture the field was put under the plough during the Second World War, and was restored to pastoral use in 1953. Since its purchase by Penwith District Council in the 1970s the land was left untended and has been the site of frequent fires and domestic rubbish dumping. (H. Laity pers. comm.) The south half of the field was partly stripped in the mid 1970s in preparation for an unsuccessful self build project, at which time a magnetometer survey undertaken by the Department of the Environment (now English Heritage) Ancient Monuments Laboratory (Bartlett, 1978) disclosed a hitherto unsuspected inner ditch and rampart. Following the granting of planning permission for a housing development in May 1987, an excavation was undertaken by

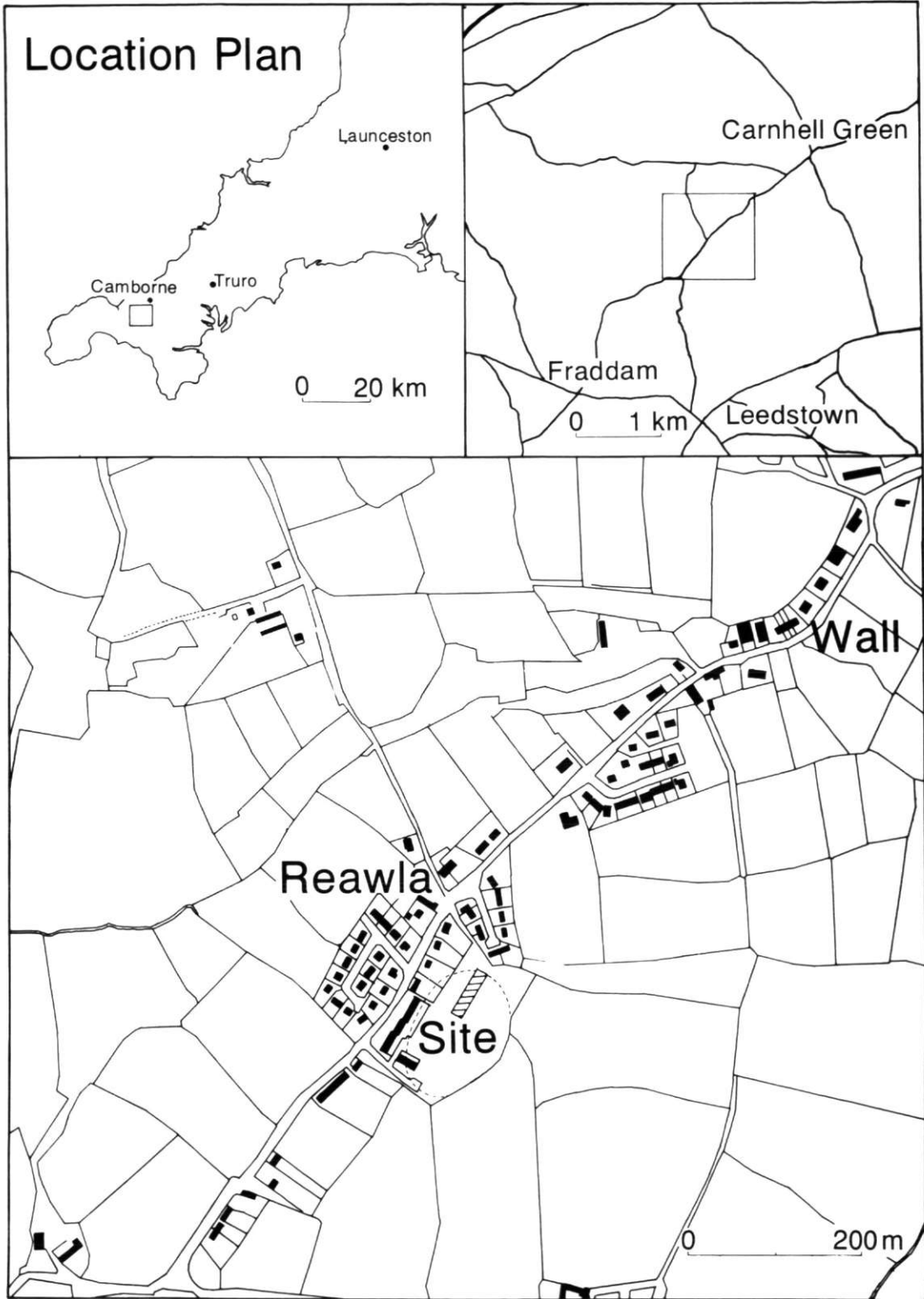


Fig 1
Reawla: location

the CAU in the autumn of that year funded by English Heritage. The majority of the site has subsequently disappeared beneath a housing estate, apart from a strip on the north-west side which remains under grass, approximately a quarter of the area.

The earthwork is oval in plan, approximately 140 m x 100 m. A portion of the rampart survives in the south-east as a hedge up to 2.0 m high and 4.0 m wide. The line could be traced further north by a slight scarp and depression following the line of the ditch. The site was presumed to be a 'round' i.e. an Iron Age or Romano-British univallate enclosed settlement. It encloses an area of approximately 1.1 ha putting it towards the larger end of the scale of sites discussed by Johnson and Rose (1982). The discovery of an inner ditch, through the magnetometer survey, raised the possibility that the site was not a univallate round but a strongly defended multiple enclosure, and therefore probably of Iron Age date. However the apparently slighter character of the inner ditch suggested that the form of the site resulted from two univallate phases, due to either shrinkage or more probably expansion of the settlement, as at the excavated site of Trevisker (ApSimon and Greenfield, 1972). The inner rampart enclosed an area of 0.4 ha (80 x 60 m internally), placing it closer to the middle of the size range of rounds, though still above average. Subsequent phosphate and enhanced magnetic susceptibility surveys, discussed below, suggest the possible presence of a third, presumably earlier, enclosure, possibly the source of the residual Iron Age finds, but in view of the land abuse mentioned above, and the lack of supporting evidence, this interpretation must be treated with caution.

The excavations

The objectives of the excavation were governed by the available resources. The overall internal organisation of the settlement, the form and arrangement of structures and other features, and its development over the centuries, are aspects that could only have been tackled by examining most of the site. Instead the project was restricted to a sampling exercise to recover a basic minimum of information, in particular to establish the date range and to investigate the sequence of the defences to determine the site's classification: was it a strongly defended multiple enclosure or a two phase round? The retrieval of environmental data was another priority, in particular flotation sieving of bulk samples to retrieve charred grains and seeds; little such work had previously been undertaken on Iron Age or Romano-British sites in Cornwall.

Funded by English Heritage, excavation was begun in October 1987, initially with a team of ten for six weeks and then with reduced staff until Christmas. A trench 60 x 15 m, around 10% of the site, was opened, the topsoil being removed by mechanical digger. The topsoil was on average 0.35 m deep and probably represents medieval as well as more modern ploughing. It came down directly onto the top of the Romano-British midden layers, where they survived, and undisturbed subsoil everywhere else. This made stratigraphic relationships impossible for the outlying features, House B and the outer ditch [Context 5], whose position in the development of the site has to be inferred from other evidence. All other features excavated had stratigraphic links so their sequence is certain, though current knowledge of the dating of ceramics in the South-West only allows broad date ranges to be suggested.

The trench was positioned to include both defences, the area between them and a ring ditch in the inner enclosure picked up by the magnetometer survey. A particularly wet autumn caused frequent problems with flooding but all features uncovered were investigated, though the ditches not as fully as had been originally hoped. Two small further sections were cut to investigate the nature of the rampart where surviving as a hedge.

In summary there proved to be a strong correlation between the results of the magnetometer survey and the features found. The two ditches proved not to be contemporary, the smaller enclosure being the earlier. Three main phases of Romano-British activity were discovered, the first dating to the 2nd century AD, or earlier, the second spanning the 2nd-3rd centuries, and the third continuing into the early 4th century AD. A few residual Iron Age sherds suggested earlier occupation in the vicinity and post-medieval pits had been dug in the area of the outer rampart.



Fig 2

Reawla: general view looking north, showing the Phase 1 ring gully [3] and Phase 2 working area (centre). The strip of grass along the side remains undeveloped

All excavated features and deposits were recorded by context numbers. These are used throughout this report, enclosed in square brackets [] where necessary to distinguish them from other numerals.

The finds and archive are lodged with the Royal Cornwall Museum, Truro.

The Late Iron Age

A few diagnostic Iron Age sherds, dating anywhere from the 3rd century BC to perhaps the 1st century AD, were found as residual material in later contexts. In conjunction with the possible third enclosure suggested by the phosphate and magnetic susceptibility surveys these finds hint at a pre-Roman use of the site, but no direct evidence for Iron Age occupation was found in the excavated areas. Another possibility is that the Phase 1 round is not Romano-British, as interpreted here, but Iron Age (see below). Whatever the character of this early activity the site would then seem to have been abandoned until probably the 2nd century AD when the Romano-British settlement was founded without regard for earlier structures.

The Romano-British Period

Phase 1 (Figs 2 and 3)

Within the trench this phase was represented by four features, the inner ditch [Context 41], two drainage gullies [Contexts 204 and 308] and House D [Context 3]. The few finds include residual Iron Age sherds and sherds of Roman type not closely datable; later features date this phase to the 2nd century AD or earlier. The possibility should not be ruled out that Phase 1 is Iron Age, thus providing a more obvious context for the handful of Iron Age sherds. Against this is the evidence noted below that the inner ditch was kept cleaned out until it was backfilled; this is difficult to reconcile with the idea of an Iron Age enclosure abandoned for a hundred years or so before reoccupation in the 2nd century (Phase 2). It therefore seems more likely that Phase 1 is a short-lived 2nd century phase, presumably at the beginning of the century.

Phase 1

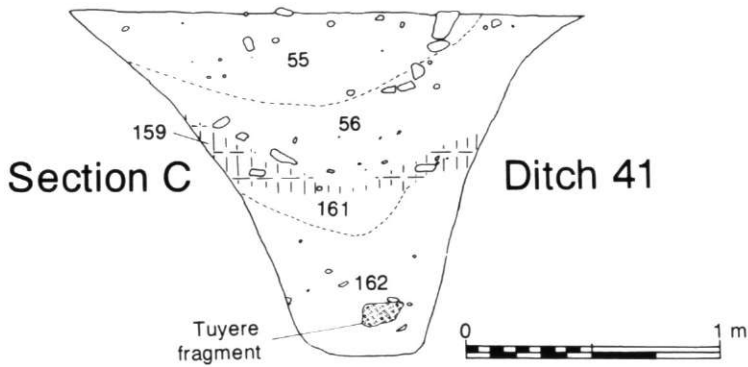
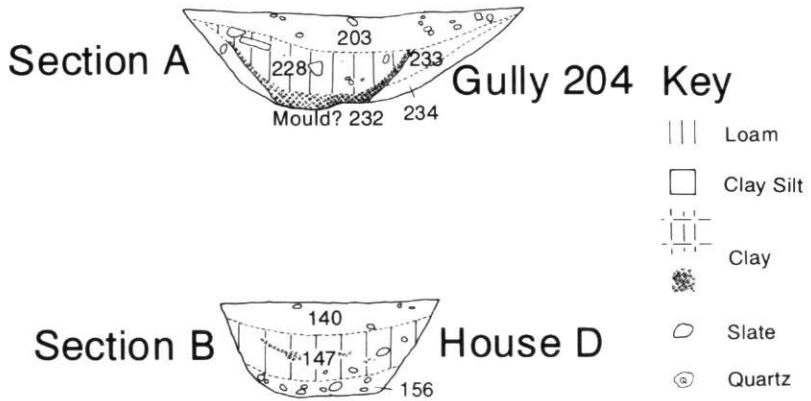
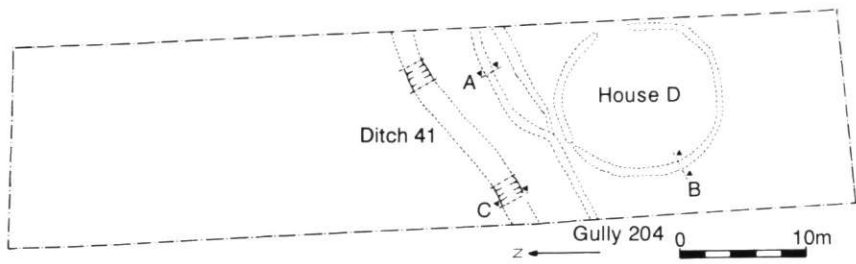


Fig 3
 Reawla: Phase 1

The ditch [41] (Fig 3)

Two segments, totalling 4 m in length, were excavated out of the 18 m within the trench. Both showed a ditch of "U" profile with near vertical sides and flat base, 1.6 m deep, 1.9 m wide reducing to 0.5 m at the base. With the aid of the magnetometer survey it could be traced for a length of 250 m enclosing an area of 0.4 ha. The evidence of the filling showed that it had been kept cleaned out prior to backfilling as there was no silting at the base. A gap of 3.2 m on the inner side of the ditch before the drainage gullies marks the presumed position of the rampart. None of this remained, the material having been used to backfill the ditch. This made it very difficult to detect on the surface. A large piece of tuyère block was recovered from the lower filling of the ditch, suggesting that the working area, essentially a second phase activity, was in use before it was back-filled. The absence of postholes and the presence of above average numbers of stones in excess of 0.15 cm suggests that the rampart was of dump construction with possibly a stone reveted outer face presumably with a palisade or wall on top.

The drainage gullies [Contexts 204; 308] (Fig 3)

These ran roughly parallel, mirroring the curves of the outer ditch across the eastern half of the trench, before the inner one [308] either stops or merges with the outer in an area much confused by later features. The outer gully apparently marks the inner face of the rampart. It curves to avoid the ring gully [3] and was obviously inserted at a slightly later date when drainage proved to be a problem. The function of the inner of the two is less certain but was possibly dug to replace a section of [204] which had been filled by slumping of the rampart. A series of clay lined pits had been dug into the partly silted gullies at a later date. Both varied around 1.0m wide and 0.4m deep with sloping sides and rounded base.

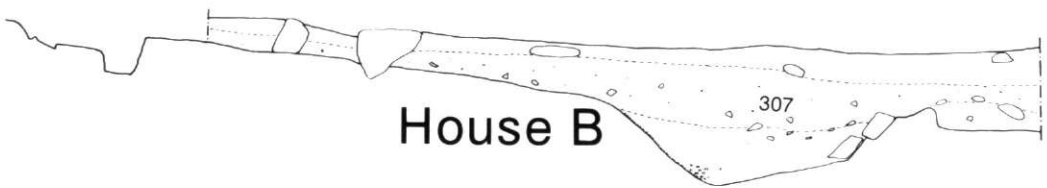
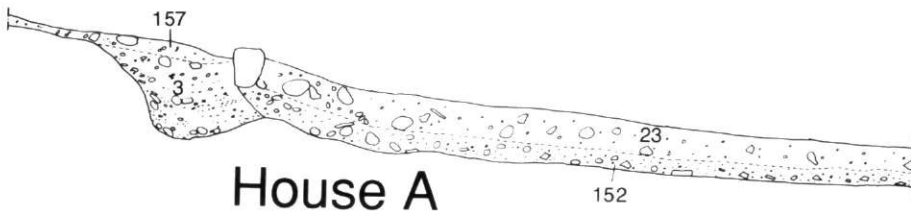
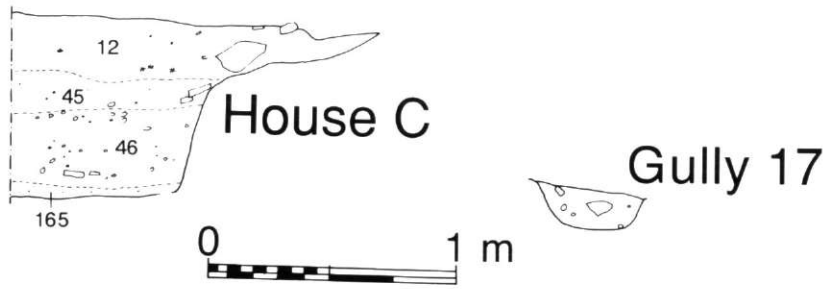
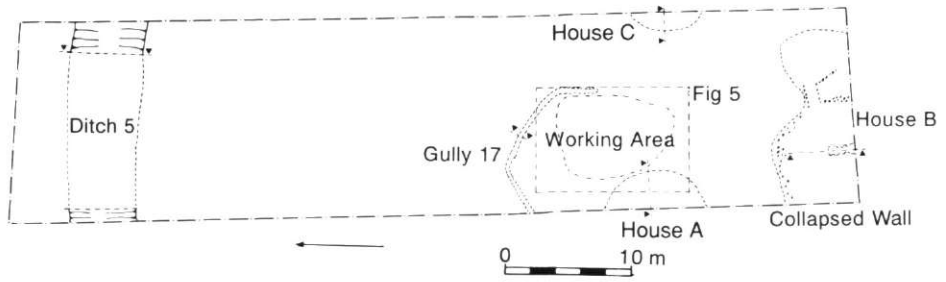
The ring gully - House D [Context 3] (Fig 3)

A sub-circular gully with a maximum diameter of 13 m enclosed an area of just over 100 sq m. The width varies from 0.6 m to 0.85 m but the depth, except where cut away, is fairly standard at around 0.65 m. It has near vertical sides and a flat base. Two breaks make a drainage function unlikely; one, facing due east and about 3.0 m wide, is obviously the main entrance. The second faces due north and is only 0.5 m wide. The upper filling of the southern sector contained a lot of burnt material, suggesting backfilling during the use of the working area. The northern portion has a purer soil fill, still obviously backfill, possibly derived from the back of the rampart and suggesting earlier and more thorough backfilling. The interior was largely cut away by later features, but where remaining was an uneven surface of compacted clay with outcropping quartz veins.

Curving gullies have been identified on a number of sites in the county, mostly of Iron Age date. At Threemilestone, Trevisker (structure Z1) and St Mawgan (early gully 1) the gullies have been interpreted as defining houses (Schwieso, 1976; ApSimon and Greenfield, 1972; Threipland, 1956); at Threemilestone the gullies were thought to be for drainage around the house whilst at Trevisker the gully was believed to have taken a timber wall. At Carngoon (McAvoy *et al*, 1980) a drainage gully surrounded three sides of a Roman period structure used for industrial purposes; a 2 m wide gap between the gully and the internal features - pits, hearths, stakeholes, post-holes - was interpreted as the site of a turf or earth wall, totally destroyed. At Trevinnick (Fox and Ravenhill, 1969) two similar enclosures averaging 7 m in diameter were interpreted as stock enclosures: the ring gullies were thought unlikely to represent houses as they appeared unsuitable as the base for a wall and defined areas within which there was no evidence for contemporary features. Both gullies had wide main entrances with a narrow side entrance a quarter of the way around the circumference, as at Reawla.

Interpretation of gully [3] at Reawla as a house is made difficult by the absence of contemporary internal features, coupled with the nature of the filling of the ditch. No inner ring of postholes was found for roof supports, and none of the hearths found was positioned in a place suitable for use if the structure was roofed. The problem with the gully fill is that it is obviously backfill and no

Phase 2



The Houses

Fig 4
Reawla: Phase 2, the houses

post pipes or holes were visible either through the filling or in the base. Several authors have pro-
pounded theories to explain away the absence of certain elements essential for house construction
in similar features excavated. In his report on the excavations at Little Waltham, Essex P.J. Drury
(1978) covers most of them. However at Reawla it is not just one element that is missing but sev-
eral. Ring gully [3] is presumably intended to act as an enclosure for some particular activity but
the nature of this activity was not securely identified. If the enclosure had been used for stock one
might expect churning and hollowing of the interior. A house site is more likely, the enclosure
being of suitable size and shape to contain a large circular or slightly oval structure. However there
is no evidence for the structure itself. This may be due to destruction of the evidence by Phase 2
activity but it may also reflect the nature of the structural evidence, as there was a similar lack of
internal features at Threemilestone where the numerous gullies can reasonably be interpreted as
house sites. Gully [3] is therefore provisionally interpreted as a house enclosure (House D), but not
dogmatically. Alternative functions for the enclosure remain possible (eg a rickyard) and we
should approach future excavation of such features with an open mind.

Phase 2 (Fig 4)

Most of the structural evidence within the excavated area belongs to this phase, dated by pot-
tery to the 2nd to 3rd centuries. Three main components were identified: a working area of hearths,
pits and gullies; parts of three features thought to be houses (A, B, C); and the outer defence. The
working area can be divided into three subphases (2.1, 2.2, 2.3). The houses cannot be closely tied
to those subphases, though House A probably coincides with Subphase 2.1 and Houses B and C
may overlap 2.2 and 2.3. The outer defence cannot be closely dated but is likely to be early in the
sequence, when the inner ditch went out of use.

Phase 2 — The Working Area (Figs 5-8)

Activity was intensifying during subphase 2.1, reaching its peak in 2.2 then declining until it
had completely ceased before Phase 3. Finds of slag, hearth bottoms and tuyère blocks suggest that
the activities included basic farm smithing (see Justine Bayley's report, below), though hardly any
of the material is associated with the working area features; there is some smithing slag from two
pits in subphase 2.3 ([432], [278]), and a hearth bottom in the fill of a post-hole [396]. A large frag-
ment of tuyère block had been included in the lower backfill [162] of the inner ditch, and is thought
to derive from the subphase 2.1 working area. Most of the slag etc was found in the later, Phase 3,
midden material (late 3rd to early 4th centuries), including the fills of Houses A and C (smithing
slags, fuel ash slag) and especially in midden layers overlying the working area: [148], [157],
[158], [168], [1] (smithing slags, fuel ash slags, three hearth bottoms); some of this may have
derived from the working area but otherwise it presumably indicates late working elsewhere on
the site.

Subphase 2.1

The inner rampart was still standing and the drainage gullies were not completely filled. Only
one of the seven features ascribable to this overlap period produced datable finds, which were of a
late 1st/early 2nd century AD date.

Activity in this subphase was initially centred on a hearth [368/9] (Figs 5,6) positioned just
within the north-west area of the fully backfilled ring gully. Three isolated postholes and three pits
all fell within a radius of 4 m from the hearth. This was a twinlobed "peanut" shaped feature with
a clay lining, the western lobe containing a heavy deposit of burnt material. The hearth fill, Con-
texts [367], [371], [372] contained very small numbers of plant macrofossils. Two of the postholes
are very close together, 4m east of the hearth, one possibly acting as a replacement to the other. The
third is by itself 2 m on the opposite side of the hearth. A shallow crescentic pit [179] produced the
only finds, a St Mawgan type E derivative bowl (P42). The other two pits were both shallow oval
features. The larger of the two, positioned 2 m north of the hearth seems to define a working area

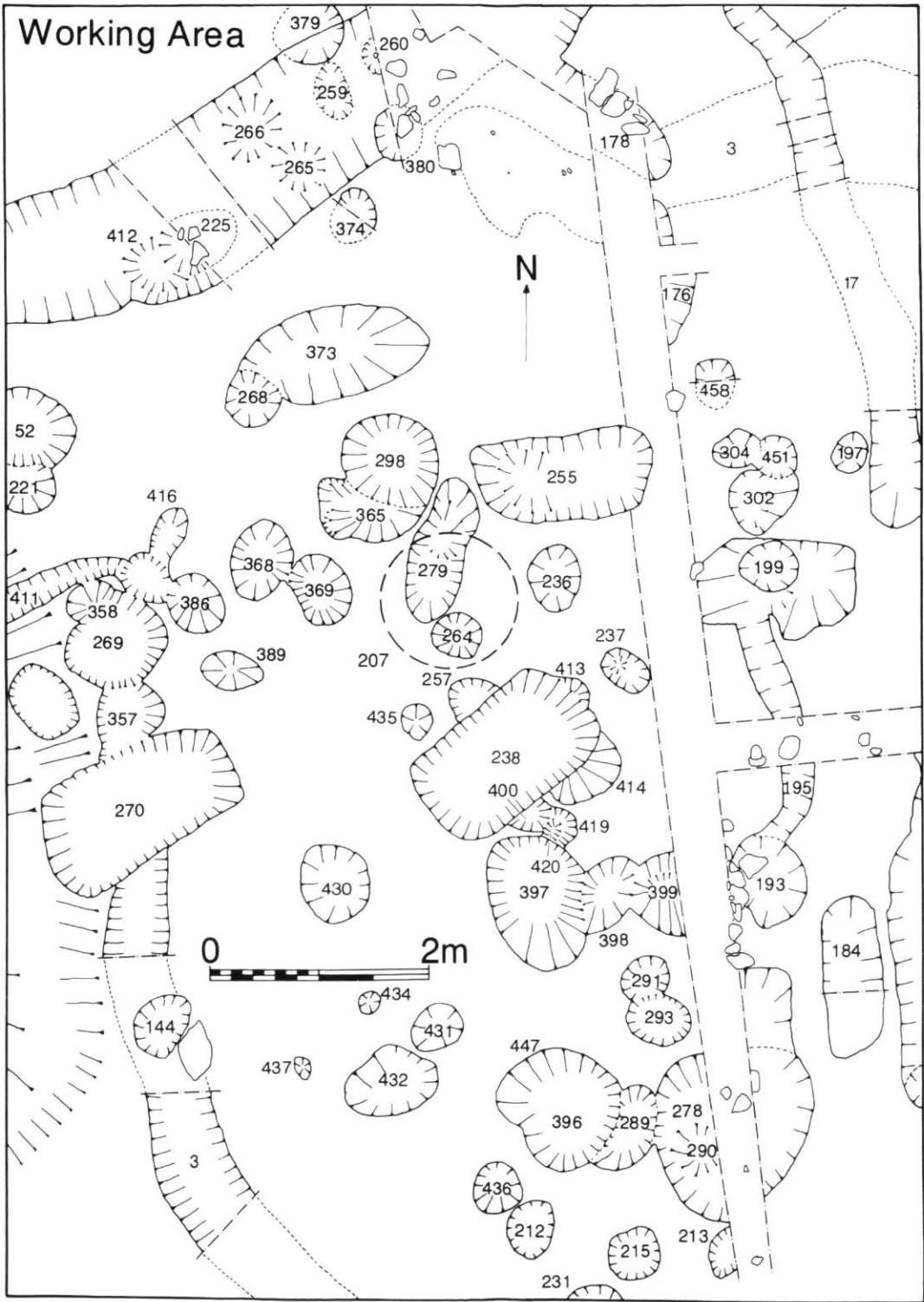


Fig 5
 Reawla: Phase 2 working area, excavated features

Phase 2

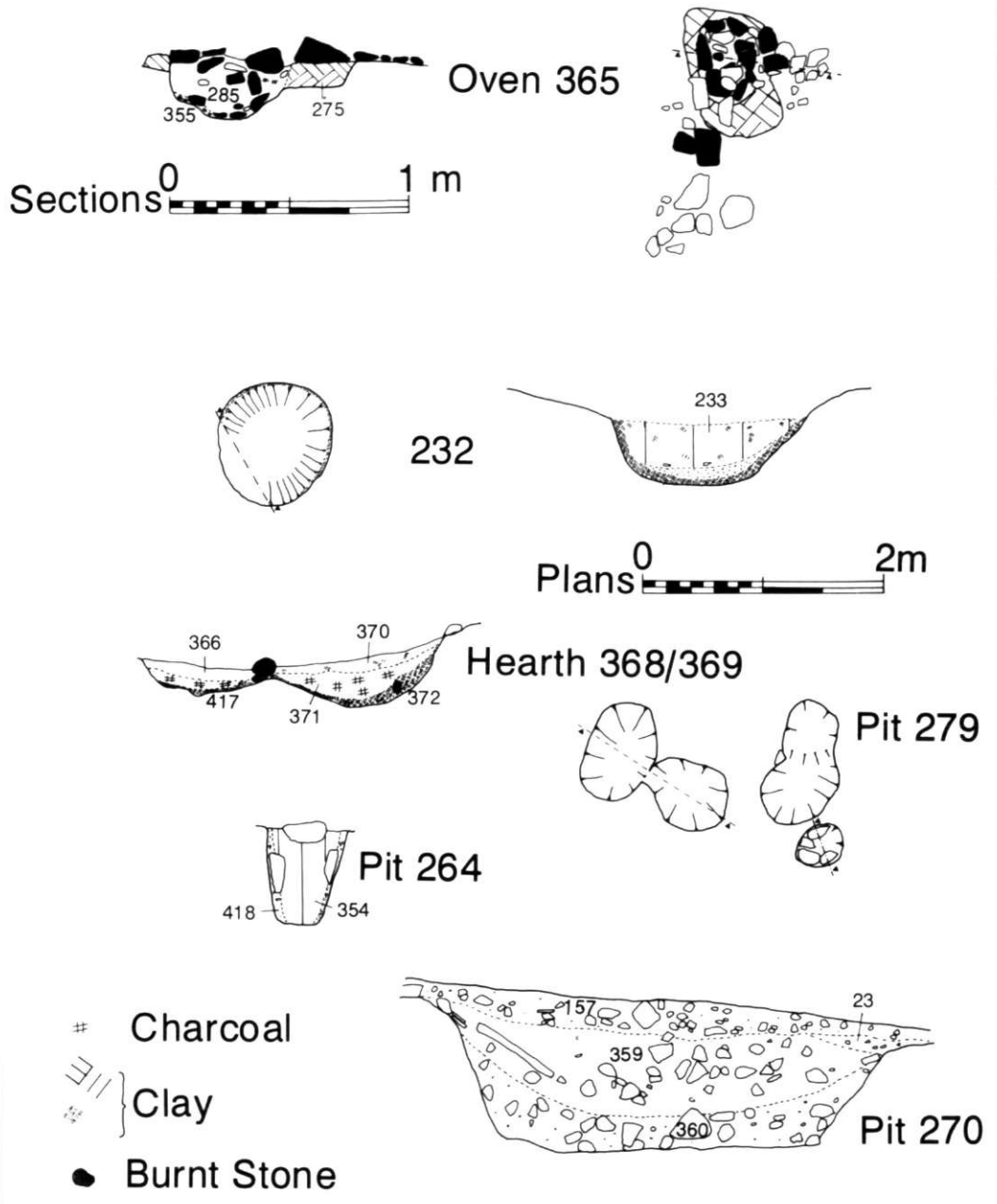


Fig 6

Reawla: Phase 2 working area, plans and sections of features 232, 264, 270, 279, 365, 368/9

6m x 4m around the hearth, which would be appropriate for the function of smithing as proposed by the technological report.

Subphase 2.2

The few diagnostic sherds suggest a 2nd century date for this subphase.

The drainage gully [Context 17] (Fig 4)

A small gully was cut on the eastern side of the working area to divert the run off from the higher ground. It runs north-south and appears to delineate a working area as it divides a dense concentration of features to the west from a light scatter to the east. It then turns north-west through the area of the now demolished inner rampart and drains into a gully cut in the top of the backfilled inner ditch. A break of about 2 m occurs at its southern end, before a gully restarts for a 3 m stretch with the same alignment and dimensions. It is possible that this break represents a length of the same gully which did not penetrate the subsoil, suggesting perhaps that the gully was extended over a period of time and possibly recut at its north end.

The hearth, Context [368/9] fell out of use and the focus transferred to an oven/kiln [365] (Figs 5 and 6). All the features associated with this kiln were contained within the area defined by gully [17] with the exception of a clay lined pit [232]. Oven/kiln [365] was a sub-rectangular stone built structure orientated north-west-south-east set into a clay matrix and showed signs of intense heat. Two pits obviously directly connected with the working of the kiln were placed, one to the east [279] and the other immediately to the north [298]. The latter contained deep deposits of charcoal rich soil presumably from cleanings of the kiln. Plant macrofossils were recovered from fills and layers associated with oven/kiln [365], including a particularly rich deposit, interpreted as crop cleaning waste, from pit [298]. One of the functions of [365] may have been to do with crop processing; or perhaps material from this process was included in the fuel. Three other pits, two just to the west of gully [17] including [184] are associated with these activities as well as eight postholes and three clay lined pits. Shallow pit [184] (Fig 5) was only 0.08 m deep but produced sherds of two diagnostic pots (P6 and 7).

The clay-lined pits, [232] [259] and [260] were all cut into the top of the partly filled Phase 1 drainage gully [204]. One [232] was outside the defined working area to the east of gully [17]. All were oval, but varied in depth from 0.25 m to 0.04 m with pale yellow sandy clay linings. None showed exposure to heat, but a fragment of lead ingot found near [259] could have come from this feature. The ingot was plano-convex (85 mm across) and pieces had been cut from around the edge as required. One of these pieces had only been half cut through when the ingot was lost or abandoned.

Four of the postholes are grouped north of the kiln near the two pits within the area, three more are grouped just west of gully [17] near the apparent break and a solitary posthole was close to the kiln to the north-west.

It would appear that the kiln structure [365] continued in use after the backfilling of the pits and the levelling off of the partially filled gully [204] in which they were cut. About this time four large sub-rectangular pits were dug. Although they have the general characteristics of graves, their position in the stratigraphic sequence and location within the enclosure rules out this interpretation.

These four pits, [205], [238], [255] and [270], (Fig 5) all orientated north-east-south-west, range in length from 1.6m-1.9m and in width from 0.8m to 1.3m. The major variation is in depth, the deepest being 0.9 m deep, the shallowest 0.3m. The largest of the pits [205] falls outside the working area and is cut from the top of the fully backfilled gully [204]. The other three are arranged in a rough semicircle on the southern side of the kiln. After a shallow accumulation of primary silt all four were backfilled. They produced very little in the way of finds. [238] produced a large sherd of 2nd century cordoned ware (P29), [255] the only samian sherd from the site and a narrow mouthed jar (P5 and 8) both 2nd century, otherwise charcoal flecks were the only finds. Five sub-circular pits were scattered to the east of the industrial area including [306], with a further three

inside, and a cluster of eight postholes were found to the south of the kiln.

Subphase 2.3

This subphase produced little or no dating evidence, but it predates the late 3rd century midden layers of Phase 3. The most unusual feature is a carefully constructed circular stone pad [207] (Figs 7 and 8) made entirely from durable quartz stones. This had a diameter of 1.2 m and was roughly centrally placed in the industrial area. Six small pits and postholes were arranged around the south-west half possibly supporting a wind break. Immediately to the north an unused upper rotary quern stone lay upside down on a contemporary surface [274]. A large piece had flaked away from the underside in antiquity, probably during manufacture, hence the unused grinding surface. Three metres further north a single oval pit [225] was also cut into the backfilling of gully [204] and another pit of similar dimensions and plan was situated 3 m west. To the south of the pad a cluster of six small pits and postholes represent the area of main activity associated with this structure. The pits vary in size from [278] an oval pit 1.6 m x 1.4 m x 0.47 m to [213] a circular pit 0.4 m x 0.15 m. They all share a similar history, containing few finds and having been backfilled shortly after being dug.

Most contained only a few flecks of charcoal. The three largest pits are again spaced about 3 m from the stone structure, suggesting a 6 m diameter working area. A further series of sixteen pits/postholes and two hearths are ranged north-south on the western side of the complex, defined at their northern end by a short drainage gully leading into the "sump" created by House A. The two hearths [144] and [430] are only lightly used and lie due west of the stone pad. The southernmost pit [433] was clay-lined and similar to [232] [259] and [260] found in subphase 2:2. Moving northwards two sets of paired postholes [215]/[231] and [434]/[437] bracketed two pairs of pits [212] and [436] both 0.5 m diameter and 0.2 m deep, and [431] and [432] both large oval pits only a few centimetres deep. Then came the two hearths before another pair of pits and the gully. The majority of these pits also were backfilled with a few charcoal flecks mixed in the filling, though three contain burnt material obviously derived from the contemporary activity.

Phase 2 - Houses A, B and C

Three large shallow features falling partly within the excavated area were interpreted as houses.

House A [Context 22] (Fig 4)

An arc of a large shallow scoop projected 2.3 m out into the site from the western baulk immediately west of the working area. It was 7.5 m long at the baulk and 0.2 m deep, the sides sloping gently down to a flat compacted base. Although no internal features were found in the area within the trench the shape of the scoop conforms with that of a house structure. Its use probably corresponds to subphase 2.1 of the working area. The resulting depression was backfilled by a gradual accumulation of rubbish containing pottery which ranged from the 2nd century AD ([152]) to the



Fig 7
Reawla: Stone pad [207], working area, Subphase 2.3

Phase 2

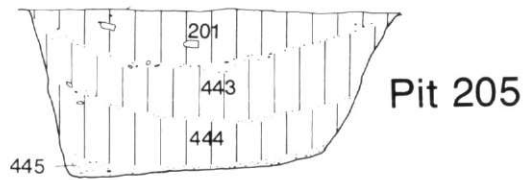
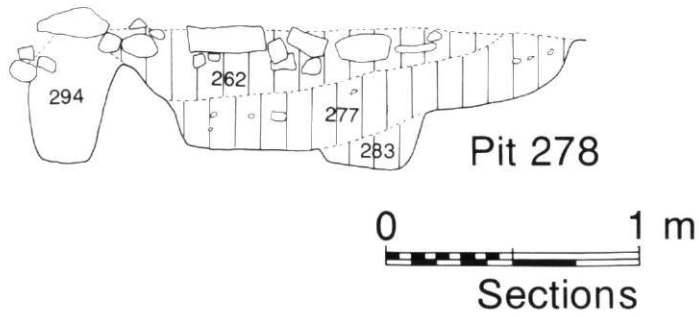
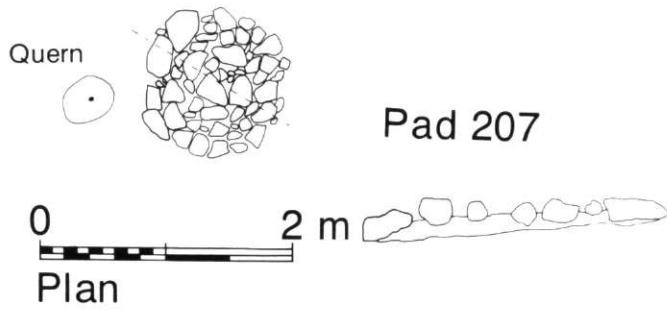


Fig 8

Reawla: Phase 2 working area, plans and sections of features 205, 207, 278



Fig 9
Reawla: House B, wide early entrance looking east

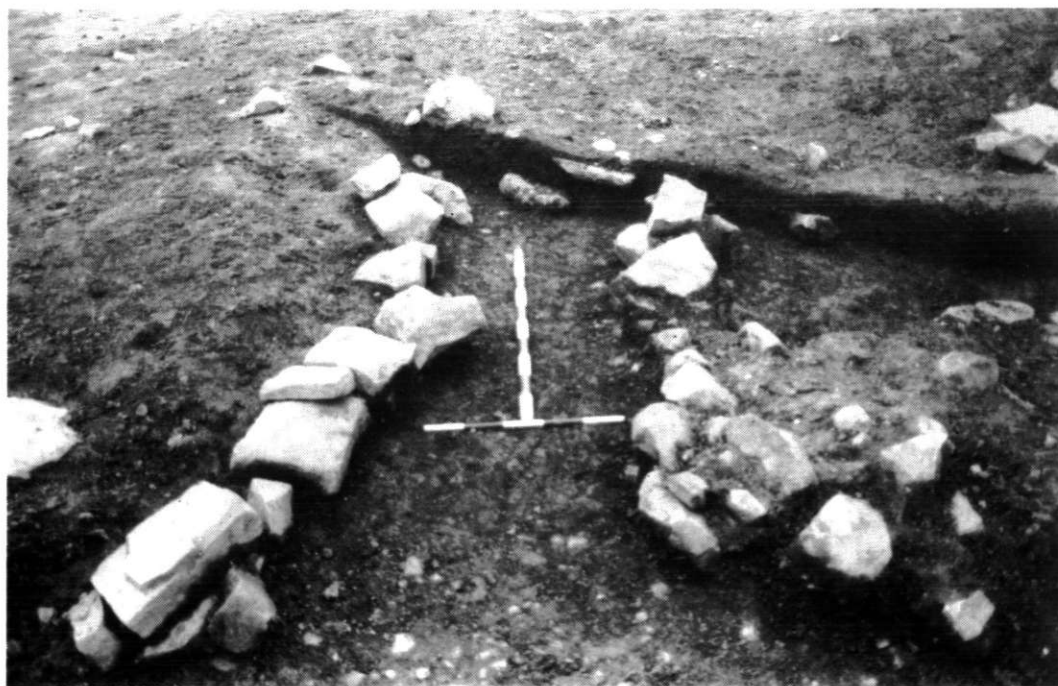


Fig 10
Reawla: House B, narrowed entrance looking east

2nd-4th centuries (midden [23], Phase 3). The depression was used as a sump during Phase 2.3 of the industrial activity.

House B [Context 300] (Figs 4, 9 and 10)

Situated in the extreme south-west corner of the trench, about 10 m south of the working area, House B was an oval structure with a funnel shaped porch on the eastern side. Its own internal sequence cannot be directly related to that of the industrial area but a series of four hearths suggests a longish occupation. Pottery from around the hearths, and a radiocarbon date (UB 3180) from hearth [340], are consistent with a 3rd century date for the occupation, whilst pottery and radiocarbon date (UB 3181) suggest a late 3rd or early 4th century date for the midden infill. Its use may therefore correspond to the working area subphase 2.3, or possibly 2.2.

The house projected 6 m out from the southern baulk and 8 m from the western; the south and east walls fell outside the trench. No sign of a construction trench remained for the northern wall but a dense scatter of stones, pushed inwards, represented the collapse of this wall. At the junction of this and the eastern wall was an elaborate porch structure. This had a well laid gravel surface and was originally 1.5 m wide where it passed through the wall, before opening out in a broad funnel defined by kerbing stones (Fig 9). A posthole [312] took the door support. Later the entrance was narrowed to 0.75 m by continuing the east wall over the gravelled surface (Fig 10). One of the stones used in the narrowing was a piece of a fine elvan bowl (Fig 19,1). This wall was set into a substantial construction trench and was made up of large pieces of killas. No facing remained and the wall appeared to have been robbed to ground level. The filling of the depression left by the house contained two fragments of a fine glass bowl with linear decoration (Fig 23, No 1).

These contexts ([26] and [307]) produced 3rd century pottery whilst the glassware, though it could be as late as the 3rd century, is thought more likely to date to the late 1st-early 2nd century AD. If so it may reflect the long survival in use of prized 'exotic' pieces.

The four hearths and the oven all intercut one another and obviously form a continuous

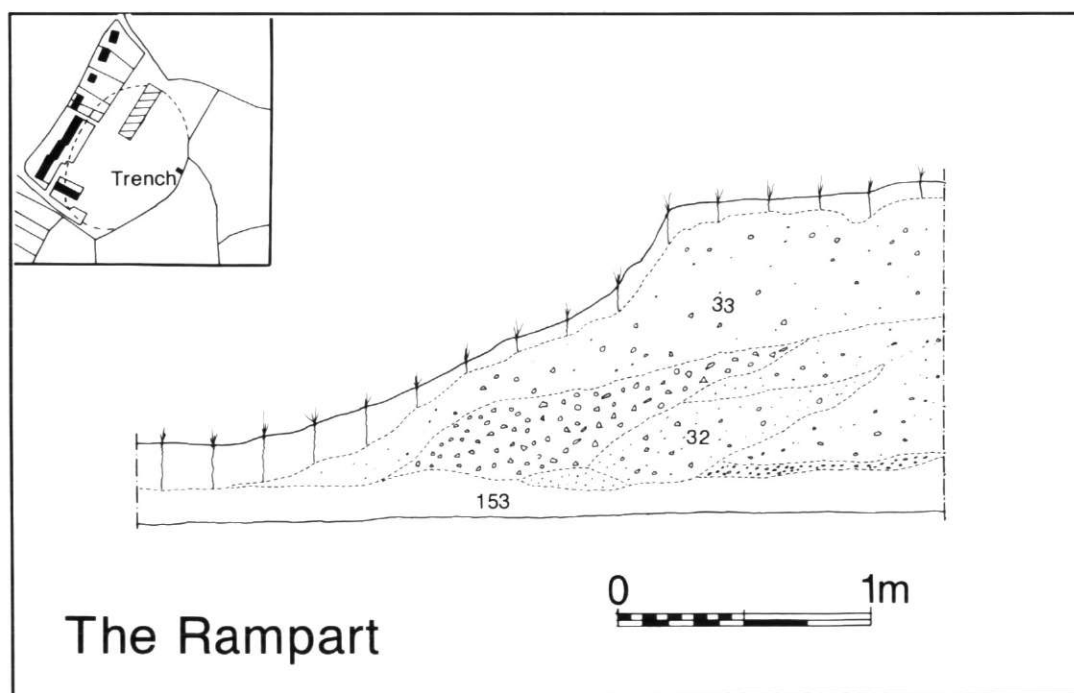


Fig 11
Reawla: the rampart

sequence of use. All are aligned east-west, the oven [332] and hearth [453] appear to be the earliest and probably contemporary. The three remaining hearths do not directly interrelate, but all cut these two early features, with [334] cutting them both. Common to all the hearths was an oval plan and clay lining. Excluding [336], whose dimensions are unknown owing to the position of the trench edge, they ranged in length from 1.0 m to 1.8 m, width from 0.45 m to 0.6 m and depth from 0.1 m to 0.3 m. A posthole [338] was situated immediately north of the hearth complex which seems associated, and four very shallow pits, three of them only 0.08 m deep, lie to the north and west. The deepest [318], 0.18 m deep contained burnt daub. It lay just to the north of posthole [338] and [343] a peanut shaped pit. This contained stones up to 0.65 m in length but they showed no signs of burning. Only two other postholes were found within the area of the house and both stood in isolation. Small quantities of plant macrofossils came from three of the hearths, [324], [334], [336] and a nearby pit [318].

House C [Context 11] (Fig 4)

Projecting out 1.6 m from the eastern baulk was an arc of an oval/circular feature up to 0.22 m deep and 5.8 m wide. The edge sloped gently down to the baulk. With so little of the feature falling within the trench positive identification is impossible, but despite the absence of internal features, the most likely interpretation is that of a house. It was cut at about the time House A fell out of use and may be its replacement. After use the resulting depression was filled with humic midden deposits [12], probably in the late 3rd century.

Phase 2 - The Defences: outer ditch [5] (Figs 11 and 12)

The outer ditch was far more substantial than the one it replaced. It curved east-west across the site just inside the northern edge of the trench. There is no direct evidence to date closely the construction of this defence. A Roman period sherd from the old land surface [153] beneath the outer rampart confirms a Roman date, while a radiocarbon date from the lowest of the deliberate back-

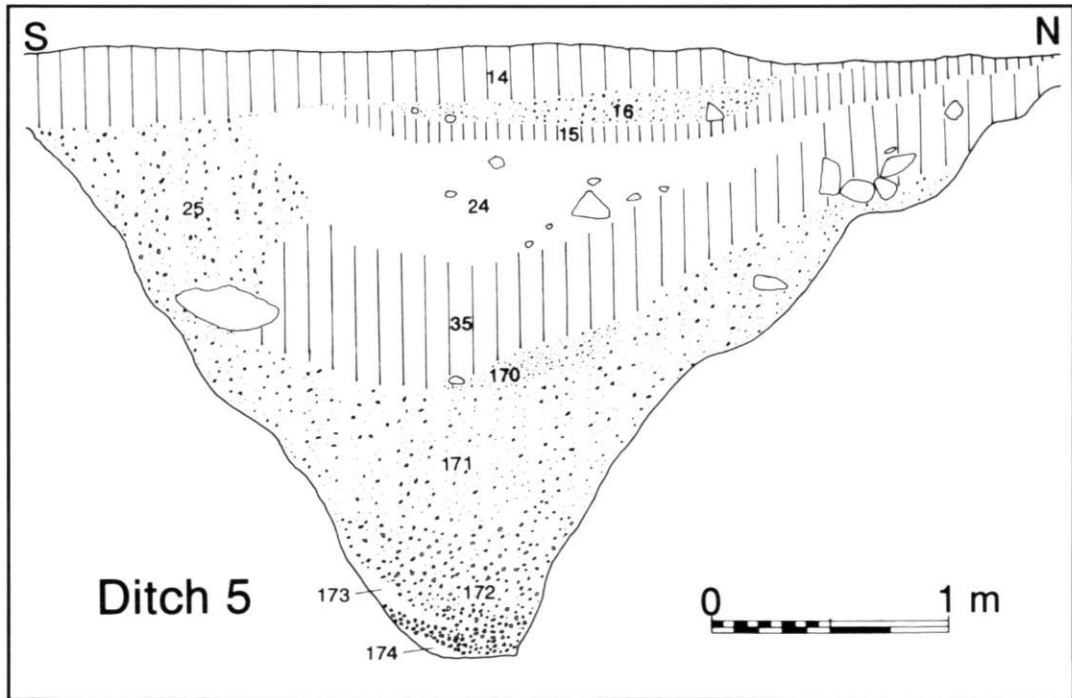


Fig 12
Reawla: the outer ditch [5]

fill layers (UB3184 [Context 35] around the 6th century AD) suggests that the ditch remained open to the end of the site's occupation. Because the outer ditch is far more substantial and because the inner ditch is known to have gone out of use early in the history of the site, it is suggested here that the outer rampart was constructed to replace the inner, which appears to have been backfilled in or by the early 2nd century AD.

No part of the rampart remained extant within the area of the trench, though where preserved, as a hedgeline in the south-east quadrant of the field, it stands up to 2.0 m high and 4.0 m wide. Two 2.0 m wide segments were cut halfway through the standing feature (Fig 11). No evidence of revetment in any form was discovered in these, the rampart, on the inside at least, appearing to be of dump construction. The course of the ditch could be traced by a shallow depression in the topsoil, particularly marked where the rampart was still standing.

After the topsoil strip the line of the ditch was less clearly marked but a layer of small stones [19] defined the inner edge. Two segments were dug through the ditch, the first 1.0 m wide being a continuation of the sondage through the post-medieval pits (see below). This uncovered a "V" shaped ditch (Fig 12) cut 2.3 m into the subsoil and 5.0 m wide, a classic defensive ditch. This segment produced no finds. A second segment 2.5 m wide was dug against the eastern baulk. This produced a section showing the same characteristics as the first, 2.4 m deep, 4.8 m wide reducing to 0.35 m at the base. Finds were recovered from the top filling [14], [16], of 19th and 20th century date, indicating that the field must have come under the plough some time during the last century when the depression of the ditch was much more distinct. The only other finds came from the first deliberate backfill layer [35], and consisted of a piece of burnt clay and charcoal sample (UB3184). This effectively leaves the ditch undated and its position here made by inference. The internal history of the segments was however consistent. Both show the initial silting as divided almost equally between the inner and outer edges with a slight emphasis on the former [Contexts 172-4]. After that, the next deposits, about half a metre deep, come from the outer edge [Contexts 170-171], suggesting either the presence of a counterscarp bank, built up by numerous cleanings, or agricultural activity in the form of ploughing right up to the lip of the ditch. Deliberate backfilling accounts for the majority of the rest of the filling [Contexts 24; 25; 35]. The early backfill layers contain numerous large stones suggestive of a stone revetment in parts at least. A shallow step 2.2 m wide existed on the inner lip and suggests a berm between rampart and ditch.

Phase 3

With the end of the industrial activity the area within the trench was no longer used for occupation, and having previously been kept very clean was used as a general rubbish dump. House C was filled with late 3rd century rubbish, Context [12] and House B with late 3rd-early 4th century rubbish. The gradual accumulation of midden [23] in House A, as noted above, continued into the 4th century but the majority of finds came from midden [148] over the industrial area. Quinnell (below, p103) interprets this as a short-term deposit of the early 4th century, and perhaps, because of the pottery types represented, from a high status context. The dumping appears to have taken place in three separate phases. The earlier layers show various degrees of abrasion, some obviously having been trampled during the deposition of later material. The intermediate phase is represented by two pits [52] and [222] cutting the initial midden deposits. The layers comprising the final phase contained medieval sherds and showed obvious signs of having been disturbed by ploughing. Most probably the apparent third phase merely represents the upper portions of the initial deposits dragged across the tops of the two pits by the ploughing as there are many cross joins between sherds recovered from both third and first phase midden layers. Radiocarbon dates from both [148] (UB 3182) and [23] (UB 3183) are later than the pottery suggests, probably as a result of this disturbance.

Agriculture, as exhibited by the evidence for ploughing, seems to have been the only use made of this area throughout the post-Roman and medieval periods and it is only in the post-medieval

period that any other activity takes place. This takes the form of a series of pits dug in the area beneath the low, largely levelled, outer rampart.

The Post-Medieval Pits

After topsoil removal this complex was visible as an homogenous layer 13 m long projecting 7.2 m into the site from the western baulk, situated just inside the inner lip of the outer defensive ditch. Initially a 1.0m wide sondage was dug through this layer against the baulk. It was from this that the majority of finds were recovered. These were few and far between and of a consistent post-medieval character.

From the sondage evidence the layer sealed a complex made up of in excess of eight pits. Two further segments were opened, excavated by context, but produced little in the way of finds. Generally the pits were large, irregular in plan, up to 0.8 m deep with sloping sides and usually a flat-tish base. They were frequently cut by a series of smaller steep-sided pits. All the features excavated had been deliberately backfilled soon after being dug. Extensive tree root disturbance was discovered, particularly at the south end of the complex.

The area the pits occupy would have been beneath the rampart of the outer ditch during the Romano-British period. The number of large stones found in the fillings of the complex, whilst not great, was above the average in the surrounding soils and suggests the rampart may have been stone reveted. If this were so and the rampart was still standing as a stony mound it is possible that both phases of activity could be explained by the following hypothesis. The digging of the pits seems to have consisted of shovelling the earth from one hole and using it to backfill another. This method would only have been efficient if the purpose of the pits was to extract something from the soil. Perhaps the initial phase of activity was to grub up a tree(s) rooted in the degraded bank remaining from the rampart in preparation for taking further land under the plough. The second phase activity could then be explained by robbing for building stone, the earlier pits having allowed the revetting material to penetrate below the general level of the subsoil. The paucity of finds shows that whatever the function little activity other than the actual digging attended these pits.

After the medieval and possible post-medieval ploughing the field was returned to pastoral use before the visit of Thomas in 1851, and ploughed again before 1917 when Henderson's visit confirms that the ramparts were largely levelled as suggested by the upper fills of both the outer ditch sections. Between the wars pastoral use again took over before the land was ploughed from the 2nd World War to 1953, in pastoral use to the mid 1970's and then derelict until development as a building site in 1988.

The surveys — geophysical, geochemical and auger (Fig 13)

Three surveys were carried out on the site. A magnetometer survey was conducted in 1978 by Alis-tair Bartlett of the Ancient Monuments Laboratory, English Heritage (then Department of the Environment). This proved to be very accurate, picking up the inner ditch and the ring gully, but for the majority of the interior the readings are too erratic for meaningful analysis.

The phosphate and enhanced magnetic susceptibility surveys were carried out after the excavation by Rick Walker of CAU in 1988 (report with archive). Several problems were encountered with these surveys. Firstly, being taken after the excavation the excavated strip and areas under the spoil heaps were not available for sampling. Secondly, having been partially stripped in the 1970s differing levels of topsoil remained. Thirdly, having been left derelict since the failure of the 1976 self build project the site had been used for dumping household/garden rubbish and for fires. Lastly the method of stripping by machine can produce anomalies of its own.

Samples for these two surveys were taken at 2m intervals across the available field area. The finds show most of the features picked up by the magnetometer survey, with some interesting omissions, plus a large number of others. Numbers 1,11,12,14,19,20,31,32,38 correlate exactly whilst Nos 8 and 9 coincide with an uninterpretable area of enormous fluctuations of the magnetometer. The most important omission is that of the inner ditch, picked up elsewhere as 12, in the north of the site. This ditch was

The Surveys

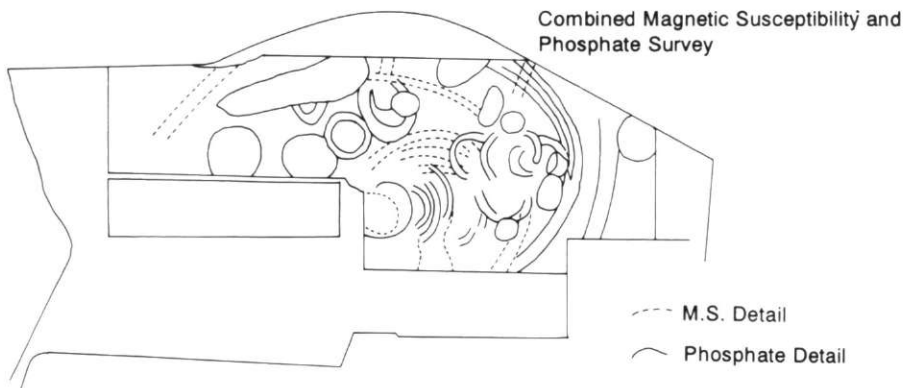
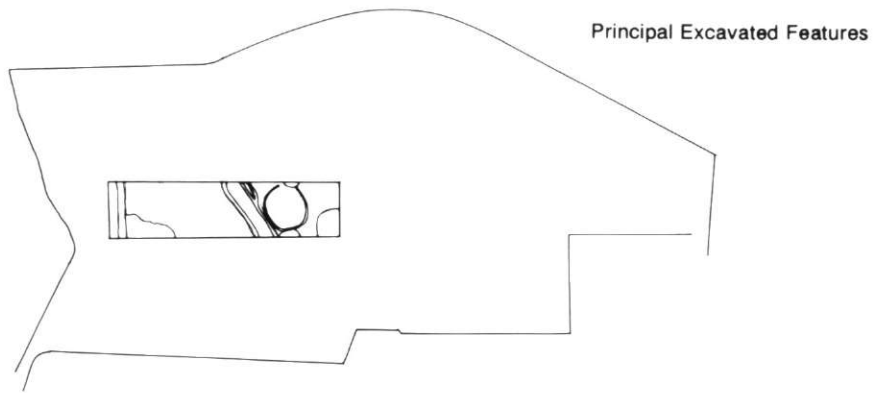
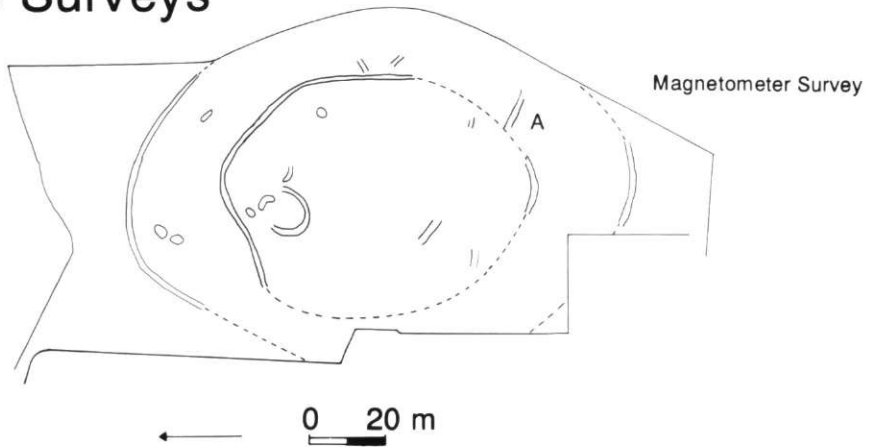


Fig 13
Reawla: the surveys, simplified plans

practically invisible within the excavated area, and only after the excavation of a gully cut into its top did it become obvious.

The surveyor, combining his results with those of the magnetometer survey, suggested that an earlier enclosure, perhaps the source of the residual Iron Age pottery and as obscure as the inner ditch, runs between the two identified enclosure ditches. This possibility cannot be ruled out, though the area between the ditches was thoroughly cleaned in the search for any activity to explain the enclosure of so much land during the Roman period occupation.

These surveys also suggest the possible sitings of about a dozen houses, some with rebuilds, and associated features. Remarkably few fall outside the original enclosure leaving unanswered the question of why the increase in size. The suggested level of occupation density is not unreasonable and would relate well with that of Trethurgy (Quinnell forthcoming(a)) which had five in a much smaller area. During watching brief visits, however, when over 200 m of footings and drains were inspected criss-crossing the area no signs of any features were observed and so the survey results remained unconfirmed.

It must be remembered that the interpretation of phosphate surveys at such a detailed level is still at a very early stage, and not well understood, and that the conclusions given above must be regarded as tentative. However, in view of the high levels of correlation between the tried and tested magnetometer technique and the two survey methods newer to archaeology, a series of trials using these methods before excavation on future sites is well worthwhile. The results can be tested and thus widen the data-base for survey interpretation.

A further survey using a power auger was carried out in November 1988 by Matthew Canti of the Ancient Monuments Laboratory, with Rick Walker and Nigel Thomas of the CAU (report by R. Walker in archive). This followed the identification, during a watching brief, of a ditch located on the magnetometer survey. Four transects were augered to establish the relationship between this ditch (A) and the inner ditch and to confirm the line of the inner ditch in this area. The probable course of the inner ditch was located in two transects, but not in a third. This may have been an entrance into the enclosure. Ditch A, approximately 2.5 m across and at least 2.3 m deep, appeared to end on the inner ditch. It may therefore represent part of an outwork attached to the Phase 1 enclosure, but presumably post-dated by the outer ditch. It is possible that geophysical survey in the field to the east would provide clarification.

Charred plant macrofossils by Vanessa Straker

Introduction

The survey of palaeoenvironmental work in South-West England published by Bell in 1984 emphasised that virtually no studies had been made of the history of crop plants in Cornwall from their macroscopic remains. Since Bell's review was published, the picture has not altered for sites of Roman date and therefore any information from well-stratified and dated deposits is an important contribution.

The soils at Reawla are of the Manod series which are generally of a well drained fine loamy or silty nature developed over Devonian slates, mudstones or siltstones. They are intermediate between brown earths and podzols and are often strongly leached showing iron accumulation in the subsoil (Curtis *et al.* 1976, 66). A sample from the soil buried beneath the outer bank was examined for its pollen content, but unfortunately no pollen was preserved, which is most probably because conditions were not sufficiently acid.

Bulk samples from hearths, layers, pits, postholes and a gully were collected from 3rd and 4th century contexts at Reawla in 1987. The samples were sieved on site, the residues being retained on a 500 micron nylon mesh and the floats collected in a 250 micron sieve. All the floats were examined and all but two of the residues were sorted to check on the efficiency of the flotation. No charred plant remains other than small charcoal fragments were found in the residues. Plant macrofossils were found in 26 of the 36 samples. The macrofossils were identified with the aid of a binocular microscope and reference collection housed at the Department of Geography, University of Bristol. Appendix 1 gives general details of the contexts processed for plant remains and the identification of the plant macrofossils is given in Tables 1-4. Taxonomy is according to Clapham *et al.* (1975).

The context of the samples

Plant macrofossils were recovered in small quantities from Phase 2 and 3 contexts. Small amounts came from the late (Phase 3) midden layers ([148], [151], [158], [216], ?[254]; some came from House B (Phase 2) in three hearths and a pit fill near the hearth. Most, however, came from the Phase 2 working area: a very small amount from Subphase 2.1 (fills [367], [371], [372] in hearth [368]/[369]); a tiny sample from Subphase 2.3 (fill [208] in hearth [430]); but mostly from Subphase 2.2. Many of the samples from this subphase were associated with hearth [365], namely hearth fill [285], and associated layers [274] and [251]. The latter lay over and around pit [298] and was interpreted by the excavator as perhaps spillage of materials taken from hearth [365] to [298]. The fills of pit [298], namely [364] and [352] (the richest sample of macrofossils) were interpreted as cleanings from the hearth.

Results

The cereals and weeds

Grains of hulled barley (*Hordeum sativum*) and wheat (*Triticum sp.*) were recorded in low numbers. A few oats were also present, but in the absence of the floret bases it is not possible to say whether they were wild or cultivated. A number of cereal grains could not be identified to genus level. The closer identification of the wheat relies upon the glume bases which constitute the vast majority of the cereal chaff. Emmer (*T. dicoccum*) and spelt (*T. spelta*) are present in roughly equal quantities (20.5% and 18.5%) and the rest (61%) cannot be identified to species level. In practice, they are most probably either emmer or spelt. Barley chaff is usually less frequent than that of hulled wheat and is not present at all at Reawla, but with such small samples it would be unwise to comment on the relative importance of wheat and barley. The weed flora was very limited and of this *Bromus* (brome) possibly *Sieglingia* (heath grass) and *Chenopodium/Atriplex* (goosefoot/orache) are most likely to have been arable weeds. *Prunus spinosa* (sloe); *Corylus avellana* (hazel) and *Rubus fruticosus* (blackberry) are all scrub or hedgerow species with edible fruits or nuts.

An unexpected find was the charred remains of gorse spines (*Ulex sp.*) and fruits of heather (*Calluna vulgaris*) in pit fill 352 and hearth 333. These plants are typical of acid heaths. Heath grass (*Sieglingia*) is today often associated with acid heaths but has been found associated with arable assemblages in other archaeological contexts such as at Cefn Graeanog where Hillman (1981) considered that it continued as an arable weed as a result of using an ard rather than a mouldboard plough which would have favoured annual rather than perennial weeds. Heath grass also grows, though more rarely, on more basic soils (Etherington, 1981, 284). The *Carex* (sedge) could have also been a component of the relatively poor nitrogen-depleted heath vegetation, but sedges grow in a variety of habitats including wet grassland or even poorly drained arable land. The sorrel (*Rumex*) and clover/medick (*Medicago/Tri-folium*) could also have grown in a variety of habitats.

Discussion

The crops are all common on Roman sites, though Jones (1981) noted that moving from east to west in Britain, an increase in emmer in relation to spelt is discernible on Iron Age sites. This statement has not yet been put to the test as very few Iron Age and Roman sites have been excavated in the South-West in the last ten years. However, despite the small assemblage from Reawla it is of interest that the wheat does indeed include a high concentration of emmer.

Unfortunately as the samples are so small it is not possible to make any definite statements about where the crops were grown but all the arable weeds could have tolerated the local soils. The ratio of wheat grains to glume bases (1:16 for the layers; 1:26 for the pits and 1:9 for the hearths) and generally low numbers of grain suggests that the charred remains are mainly those of crop cleaning waste. The weeds are all small and this combined with the presence of glume bases, lack of large chaff such as culm nodes and bases and only occasional presence of grains is consistent with the cleaning waste from a late stage in the processing of hulled wheats (Hillman, 1981).

There are no important differences between the assemblages in the different types of features (layers, pits, hearths and postholes). Layers usually contain only low concentrations of plant remains except in exceptional circumstances. The richest sample is one of the pit fills, context [352], and is composed of crop cleaning waste mixed with what is most probably ash and fine charcoal from a hearth.

The heathland taxa are of interest as the soils at the site are unlikely to have been acid enough to support this type of vegetation and these plants may have been brought in as fuel or perhaps as animal bedding from more acid soils such as those on the edge of the granite uplands.

Table 1 Reawla: Charred plant macrofossils from layers

Taxon		Contexts						
		148	151	158	216	251	254	274
<i>Triticum spelta</i>	spelt, glume base	7			1		2	
<i>T. dicoccum/spelta</i>	emmer/spelt, grain	1						
<i>T. dicoccum/spelta</i>	emmer/spelt, glume base	2					1	
<i>Triticum sp.</i>	wheat, grain	1	1					
<i>Triticum sp.</i>	wheat spikelet fork	3					1	
<i>Triticum sp.</i>	wheat, glume base	7					2	
<i>cf. Triticum sp.</i>	wheat, grain		+					
<i>Hordeum sativum</i>	barley, grain	2	1				2	
<i>Hordeum sativum</i>	barley, hulled, straight, grain		1					
<i>Hordeum/Triticum sp.</i>	barley or wheat, grain							1
<i>Avena sp.</i>	oats, grain		1		+	+	2	
<i>Cerealia</i>	ind. cereal, grain	+		2		2+		
<i>Chenopodium/Atriplex sp.</i>	goosefoots/oraches					1		
<i>Medicago/Trifolium sp.</i>	medick/clover	1						
<i>Corylus avellana L.</i>	hazel	+						
<i>Sieglingia decumbens (L.) Bernh.</i>	heath grass			1				
<i>Bromus sp</i>	brome	1+				4	+	
<i>cf Bromus sp</i>	brome	1						
<i>unidentified seeds</i>			2		1			
<i>unidentified buds, charred</i>			2		1			1
TOTAL		26+	8+	3	3+	7+	10+	2
LITRES SOIL		20	10	15	5	15	10	10
ITEMS/LITRE		1.3	.8	.2	.6	.47	1	.2

Table 2 Reawla: Charred plant macrofossils from pits

Taxon		Contexts									
		233	240	262	277	305	319	320	352	364	393
<i>Triticum dicoccum</i>	emmer, glume base		1						17		
<i>Triticum spelta</i>	spelt, glume base	1							6		
<i>T. cf. spelta</i>	spelt, grain								1	1	
<i>T. dicoccum/spelta</i>	emmer/spelt spikelet fork								1		
<i>T. dicoccum/spelta</i>	emmer/spelt, glume base			1					30		
<i>Triticum sp.</i>	wheat, grain			1						1	
<i>Triticum sp.</i>	wheat, glume base								36		
<i>Triticum sp.</i>	wheat, brittle rachis internode								9		
<i>Hordeum sativum</i>	barley, grain						1		1		
<i>cf. Hordeum sativum</i>	barley, grain							1			
<i>Hordeum/Triticum sp.</i>	barley or wheat grain					1			1		1
<i>Cerealia</i>	ind. cereal grain		2+								
<i>Cerealia</i>	cf. ind. cereal grain				1						
<i>Rumex sp.</i>	dock				1						
<i>Calluna vulgaris (L.) Hull</i>	ling, heather, fruit								1		
<i>Carex sp.</i>	sedge								3		
<i>Cyperaceae</i>					1						
<i>Gramineae</i>	ind. grasses								1		
<i>unidentified seeds</i>				+	1	1					1
<i>unidentified buds, charred</i>					1						
<i>Ulex sp.</i>	furze, spines, charred								16		
TOTAL		1	3+	3+	3	2	2	1	123	2	2
LITRES SOIL		5	10	5	5	5	5	10	10	5	5
ITEMS/LITRE		.2	.3	.6	.6	.4	.4	.1	12.3	.4	.4

Table 3 Reawla: Charred plant macrofossils from hearths

Taxon		Contexts							
		208	285	317	333	335	367	371	372
<i>Triticum dicoccum</i>	emmer, glume base				2				
<i>Triticum spelta</i>	spelt, glume base								1
<i>T. cf. spelta</i>	spelt, grain								1
<i>T. dicoccum/spelta</i>	emmer/spelt, glume base		2			1			
<i>Triticum sp.</i>	wheat, glume base				3				
<i>Hordeum sativum</i>	barley, grain		1						1
<i>cf. Hordeum sativum</i>	barley, grain								
<i>Avena sp.</i>	oats, grain		2						
<i>Avena sp.</i>	oats, awn		(2+)						
<i>Cerealia</i>	ind. cereal grain		+		4+				
<i>Rubus fruticosus</i> agg.	blackberry				2				
<i>Calluna vulgaris</i> (L.) Hull	ling, heather, fruit				1				
<i>Carex sp.</i>	sedge				1				
<i>Sieglingia decumbens</i> (L.) Bernh	heath grass				1				
<i>Bromus S. Eubromus</i>	brome		2						1
<i>cf. Bromus sp.</i>	brome			1	2+				
<i>cf. Gramineae indet.</i>	ind. grasses	1							
unidentified seeds			1				1		
<i>cf. Prunus sp.</i>	bud, charred				1				
<i>Ulex sp.</i>	gorse, spines, charred		1		3+				
TOTAL		1	11+	2	20+	1	1	1	3
LITRES SOIL		5	10	10	5	5	5	5	5
ITEMS/LITRE		.2	1.1	.2	4	.2	.2	.2	.6

Table 4 Reawla: Charred plant macrofossils from postholes

Taxon		Contexts
		450
<i>Prunus spinosa</i> L.		+
unidentified seed		1
TOTAL		1+
LITRES SOIL		5
ITEMS/LITRE		.2

Key: + = fragment; () = number; macrofossils are 'seeds' unless otherwise stated

Radiocarbon dating by Henrietta Quinnell

Five samples were submitted by D. Jordan, Ancient Monuments Laboratory, English Heritage, for dating at the Radiocarbon Dating Research Unit, School of Geography, Archaeology and Palaeoecology, The Queen's University of Belfast. Detailed data provided by Dr G.W. Pearson of the Research Unit is filed with the archive. All samples used charcoal, but no species identification was attempted because most was comminuted.

Following current practice outlined by Stuiver and Pearson (1986) the dates are first presented in years BP. They are then calibrated at one and two σ in two ways. The first, the intercept method, records the points where the 1σ and 2σ ranges intercept with the calibration curve. The second, probability, method takes account of the Gaussian distribution of the radiocarbon age and weights the several calibrated ages which may occur because of peaks and troughs in the calibration curve and assesses their relative probability. Good descriptions of these methods are provided by Bowman (1990, 43-49) and Aitken (1990, 98-107).

UB3180 from context [340] a hearth in House B/[300] 1744 \pm 46 BP. This calibrates by the intercept method at 1σ AD 232-344 and at 2σ AD 140-406. By the probability method calibrated dates at 1σ are AD 230-347 and at 2σ at AD 146-167 (0.03 probability) and AD 179-400 (0.97 probability). Pottery from midden dump [307] above hearth [340] probably dates to the later 3rd century AD. Sparse pottery from contexts presumed contemporary with hearth [340] would be consistent with use during the 3rd century AD. Ceramic and radiocarbon dating appear consistent.

UB 3181 from context [307] midden after disuse of House B/[300] 1708±39 BP. This calibrates by the intercept method at 1σ AD 250-303 and 315-393 and at 2σ AD 233-417. By the probability method calibrated dates at 1σ are AD 258-296 (0.39 probability) and AD 321-384 (0.61 probability); at 2σ at AD 242-411. Context [307] is stratified above the context for UB3180, but the difference between the two dates is statistically insignificant. Context [307] has been dated to the later 3rd century AD on ceramic evidence, but the range of the calibrations suggests that it might be wise to consider extending the date range of the ceramics into the 4th century AD.

UB 3182 [from context 151 from midden 148] 1619±45 BP. This calibrates by the intercept method at 1σ AD 394-446 and at 2σ AD 267-275 and AD 336-546. By the probability method calibrated dates at 1σ are AD 384-462 (0.71 probability) and AD 478-525 (0.29 probability); at 2σ at AD 266-278 (0.02 probability) and AD 334-548 (0.98 probability). Context [151] forms part of a large midden, below ploughsoil, the pottery in which had been dated to around AD 300. The date as calibrated suggests a date range one or two centuries later. As small quantities of intrusive medieval and post-medieval material have been found among the ceramics, later disturbance may account for the discrepancy between the ceramic-derived and radiocarbon dating (but see below).

UB 3183 [context 23 midden in hollow] 1523±41 BP. This calibrates by the intercept method at 1σ AD 449-596 and at 2σ AD 425-624. By the probability method calibrated dates at 1σ are AD 456-483 (0.22 probability) and AD 508-594 (0.78 probability); at 2σ at AD 430-610. Context [23] is a gradual accumulation, within a hollow below ploughsoil, containing ceramics dating from the 2nd to the 4th centuries; there has been some medieval/post-medieval disturbance. UB3183, as calibrated, cannot be reconciled with the ceramic data, and the difference is almost certainly due to intrusive material (see below).

UB 3184 [context 35, the lowest of the deliberate infill layers in the Outer Ditch] 1496±42 BP. This calibrates by the intercept method at 1σ AD 539-608 and at 2σ AD 438-64. By the probability method calibrated dates at 1σ are AD 531-627 and at 2σ at AD 447-636. The context represents collapse with some burnt material, or possible deliberate demolition, of rampart material into the defensive ditch around the site; it lies above some depth of silting and possible earlier collapse. There is no independent dating for the sequence of infilling of this ditch. There is no way of checking whether the date, as calibrated, reflects the real date of the collapse episode. Ceramic evidence suggests that the site was abandoned during the earlier 4th century AD. Rampart collapse could well have been two or three centuries later.

General Comments

These dates, together with UB 3250-3255 from a similar enclosed site at Trethurgy, are the first series to be obtained from Roman period settlements in Cornwall. Both series considered together suggest that the ceramic sequence proposed for Roman Cornwall is reasonably secure in broad outline. Dates such as UB3181 are as consistent with the ceramic evidence as can be expected. This confirmation is important because the local Cornish ceramic series for the period is *sui generis* and the implications of ceramic material imported from outside the county were uncertain. These remarks apply only to contexts, from both Trethurgy and Reawla, where there are deposits including ceramic material of reasonable size. The relationship between ceramic and radiocarbon dating for Roman Cornwall will be further discussed in Quinnell (forthcoming a).

The complexity of calibrations involves difficulties in conceptualising and discussing these dates. As a form of shorthand it is suggested that each of the Reawla dates be discussed with reference to the 1σ probability (the greater probability range being used where two apply).

UB 3180 [340 hearth in House B/300] 1744±46 BP. AD 230 - 347

UB 3181 [307 midden above House B/300] 1708±39 BP. AD 321 - 384

UB3182 [151 from midden 148] 1619±45 BP. AD 384 - 462

UB3183 [23 midden in hollow] 1523±41 BP. AD 508 - 594

UB3184 [35 lowest deliberate infill in the Outer Ditch] AD 531 - 627

UB 3180 and UB 3181 calibrated to AD 230 - 347 and 321 - 384 provide reasonable confirmation for the broad dating framework for the site based on ceramics; the only proviso must be that these deposits may have been dated rather too early. UB 3182, AD 384 - 462, and UB 3183, AD 508 - 598, can not be easily reconciled with the ceramic evidence, which indicates, by comparison with Trethurgy (Quinnell, forthcoming a), that the site was not occupied far into the 4th century. UB 3183 also rais-

es the possibility of 6th century occupation but, because the deposit contains intrusive medieval material, is probably best discounted. Both UB 3182 and UB 3183 come from contexts just below recent agricultural levels where some intrusive material might be expected. UB 3184, AD 531 - 627, could be an acceptable date for rampart collapse into the ditch; there is no other data for this episode. There is no obvious evidence for disturbance or intrusion. If UB 3184 were a correct indication of actual date this would imply activity on the site involving burning and levelling which left no artefactual record. The artefacts most appropriate for this date would be sherds of post-Roman imported pottery. While such sherds occur on a wide range of sites in west Cornwall, they are not usually common, and insufficient is still known about their distribution for their absence to be definitely regarded as significant. If UB 3184 is regarded as acceptable, activities, presumably agricultural, which need not have involved ceramics, may have continued after the domestic abandonment of Reawla and account for UB 3182-3 rather than disturbance and intrusion.

The pottery by Henrietta Quinnell

The assemblage is typified by the three features usual for Roman period pottery groups from Cornish sites: (1) the majority of the fabrics are gabbroic; (2) dating is difficult because Cornish sites do not generally produce good stratified sequences, types appear to change slowly, and associated datable artefacts are rare; (3) changes in forms and in the proportions of fabrics in circulation reflect to some extent what was happening at Exeter.

The fabrics present are shown in Table 5; identifications are supported by examination by Dr D. F. Williams, whose full report is filed with the archive. The numeration and descriptive terminology employed for material from Exeter (Holbrook and Bidwell, 1991) have been used wherever appropriate. The illustrations are by Rosemary Robertson.

Table 5. Fabric percentages based on sherd counts

<i>Fabric</i>	<i>Sherd numbers</i>	<i>Percentage</i>
Samian	1	0.05
Rhenish?	1	0.05
Oxfordshire	12	0.6
Rough-cast beaker	5	0.2
Other colour-coat	1	0.05
South-East Dorset BB1	31	1.5
South-East Dorset BB1 Variant	143	7.0
Exeter Micaceous Grey ware?	1	0.05
Other Micaceous Grey ware	1	0.05
South Devon	84	4.0
Hard fired South Devon	26	1.2
Local granitic	9	0.34
Gabbroic (including coarse)	1787	85.6
(Coarse gabbro)	(210)	(10.1)
	2089	100

Note: sherds smaller than one cm across omitted. A table based on minimum vessel numbers gives similar results and is filed with the archive.

South-East Dorset BB1 (Exeter 31) are black-burnished sherds similar in all respects to the fabric commonly referred to as BB1 (Williams archive report). It is now used for Exeter (Holbrook and Bidwell, 1991, 16) to distinguish fabrics produced in the Poole Harbour area from those produced in west Dorset (fabric 40) termed South-Western BB1; the latter do not occur at Reawla. South-East Dorset BB1 gradually becomes the main fabric in use at Exeter during the 3rd and 4th centuries AD. It is generally more frequent on Cornish sites at these dates than in earlier periods, and all the diagnostic examples from Reawla are of these later two centuries. At Trethurgy South-East Dorset BB1 formed about 4% of the assemblage (Quinnell, forthcoming a). Where the type numbers devised by J.P. Gillam are referred to they derive from those published in 1976, the latest in the series of studies of BB1 by this author.

South-East Dorset BB1 Variant. This fabric is similar to South-East Dorset BB1 but includes many large fragments of rounded shale and is regularly slipped on cooking-pot exteriors and rim interiors, all over plain-rimmed dishes and bowls, beneath burnish. Most vessels are reduced, a dark grey rather than

black. Some oxidised examples are almost cream-coloured throughout. Williams (archive report) has previously noted scattered inclusions of shale in 'waster' sherds from a number of likely production sites in the Wareham - Poole Harbour area of Dorset and considers the fabric to be a Dorset product. This variant has not so far been distinguished on other Cornish sites or at Exeter (pers. comm. N. Holbrook) or Dorchester (pers. comm. J. Draper).

South Devon Ware (Exeter 5). A granitic fabric probably made in the Dart valley (Bidwell and Silvester, 1988; Williams archive report). It scarcely appears at Exeter until the 3rd century, but during the 3rd and 4th centuries is the only common ware apart from South-East Dorset BB1. In Cornwall South Devon Ware occurs in reasonable quantities at the late Roman occupation at Carwarthen (unpublished; material in County Museum) and forms 5.5% of the Trethurgy assemblage which ranges from the second to at least the 6th centuries AD (Quinnell, forthcoming a). At Kilhallon (Bidwell, 1982) and Carvossa (Bidwell, 1987), sites which appear to terminate in the 3rd century, there are only a few sherds present. *Hard-fired South Devon Ware*. A granitic fabric, with much smaller grits than South Devon ware. Black-coated, fired to a reduced grey. Very hard, with obvious traces of wheel-throwing on cooking-pots, the only vessels represented. N. Holbrook states that this fabric occurs in later contexts in Exeter. It may be a variant of South Devon Ware, the cooking-pots in which are wheel-thrown, an identification supported by Williams (archive report).

Local Granitic Fabrics. A few sherds appear to be granitic and contain a great deal of small-sized grit including mica. These may relate to the granitic fabrics in use in West Cornwall during the Iron Age, but which apparently die out early during the Roman period or possibly before (Elsdon, 1978). Sherds submitted to D.F. Williams were too small for petrological comment.

Gabbroic. This conforms in all respects to the Cornish fabric so described (eg D.F. Williams in Carlyon, 1987). It was probably made from clays weathered from rocks in the St Keveve area of the Lizard (Peacock, 1969a), who has recently (1988) refuted suggestions for alternative origins as based on erroneous petrological identifications. Potting in gabbroic clays continued without break from the Iron Age through the Roman period, although no manufacturing sites have yet been located (Quinnell, 1987; Smith, 1987). During the Roman period it usually represents between 80% and 85% of pottery used in Cornwall, eg 81% at Carvossa (Carlyon, 1987) and 82.5% at Trethurgy (Quinnell, forthcoming a).

Sherds from Reawla show definitive marks of the vertical fingering typical of manufacture by hand. Authorities have previously differed as to whether gabbroic pottery was wheel- or hand-made. Some bases at Reawla show internal fingering which would be consistent with starting a pot on a turntable. The evenness of the rim forms also suggests the use of a turntable to finish vessels. The process, clearly documented by Peacock (1982, 23) for various current and recent industries in Europe, was probably much as described by Farrar (1973) for the Dorset BB1 industries, basically hand-made but employing turntables to start and finish.

Gabbroic pottery varies considerably in appearance. It contains a large quantity of white, angular grit (felspar) and smaller quantities of other grit such as amphibole and tourmaline (black). Peacock's original description emphasises that this mineral filler is composed of monomineralic fragments (1969a, 44); this also commented upon occasional large fragments of quartzite. At Reawla, when quartzite occurs, it is noticeably rounded and worn. It is not yet established whether the pottery was made from clays selected for the amount of grit present, or whether grit filler was added. The pottery also varies in the degree to which the clay body had been prepared; this can vary from very compact with few air spaces, usually when the filler is fine, to very rough with large grits and many air spaces. The normal firing method seems intended to produce oxidised products, reddish-brown in colour, although some reduced vessel were made. The colour distinguishes products of the full Roman period. During the Iron Age more vessels were reduced, and those oxidised tend to have a buff surface, a tint which probably died out in the 2nd century AD; these changes must relate to firing practices not yet understood.

The majority of vessels had a black coating over their exterior, and often on the inner side of the rim. This may have been produced by a smoking procedure after drying but before firing, with the coating often roughly burnished (cf the recent Balkan practice described by Peacock (1982, 17)). On most vessels any coating and burnishing has usually been worn away around the girth. Quality burnishing is a feature of Iron Age potting and its use gradually declines in the Roman period, probably finally ceasing in the 2nd century AD. Vessels which have both a well-compacted fabric with fine grit and good burnish are distinguished as well-made. Vessels with an open fabric, large grits, rough finish and a markedly red oxidised fabric throughout are described as coarse. In this report all gabbroic pottery is of the most

common type unless described as well-made or coarse. Several coarse gabbroic vessels were of fabric (confirmed by D.F. Williams) and form similar to briquetage from Trebarveth (Peacock, 1969b, 57) and Carngoon Bank (E. Morris in McAvoy, 1980) both about 20 km away from Reawla. This material may either represent briquetage from salt making, or the use of thick-walled gabbroic vessels for some other special purpose.

A few vessels were initially classed as micaceous gabbroic, as their outer surfaces appeared to be micaceous. This appearance is deceptive, caused by some method of preparation and surface finish which concentrates small glittering particles of amphibole on the surface (Williams archive report).

Other Fabrics. These are described under vessel number.

For Dating use is made of the report on Trethurgy (Quinnell, forthcoming a), now in typescript, as this covers all the available evidence in some detail, and incorporates data from an extensive unpublished study by Carlyon (1985). Some specific trends in gabbroic ware deserve comment.

Some types of Cordoned Ware are now recognised as continuing into the 4th century, notably the large roll-rimmed jars St Mawgan Type H (Quinnell, 1986), although the fabric changes to the typical Roman variant of gabbroic. Large storage jars, in coarse gabbroic fabric, often with decorated rims, appear to copy the large storage jars current in the Exeter area and beyond in the 3rd and 4th centuries and to be of this date.

Both cooking-pots and bowls form typological sequences. In the cooking-pot sequence those with upright rims eg P2, often well-finished, continue a common Iron Age form, probably into the 2nd century. They are replaced by simple, slack-profiled forms eg P41; at Trethurgy an example was sealed in a context probably datable to the later 2nd century. Such forms continue to be common into the 5th century. It is not clear how far the upright-rimmed and slack-profiled forms overlapped. Cornwall produces some well-associated groups up to the early 2nd century eg Carvossa (Carlyon, 1987) but there seems then to be something of a hiatus for the rest of the century, most sizeable assemblages apparently belonging to the 3rd and 4th centuries. Another general trend with cooking-pots is that overall size increases through time (Quinnell, forthcoming a, Table). For bowls, combining the data summarised in the Carvossa and Trethurgy reports, bowls with grooved rims relating to St Mawgan Type R may be the main late 1st to mid-2nd century type (these are absent from Reawla); bowls with simple flat out-turned rims eg P34 may be the main 2nd century type; bowls with slight flanges may start around AD 200; those with pronounced or drooping flanges start during the later 3rd century. The relationship of Cornish ceramic change to that elsewhere is fully considered in the Trethurgy report, which concludes that only general trends were reflected and close comparisons, eg with BB1 typology, were not helpful. It will be apparent that it is easier to establish the beginning than the end date of forms, a problem related to unresolved questions of the duration of special forms, and the continued presence in soil of early sherds.

The pottery is presented by Phases. Some key pieces are related to the subphases of Phase 2 but the sequence of presentation within the phase follows that used in the archive stratigraphic report, which has been re-arranged for publication.

PHASE 1

Inner Ditch [41] No finds.

Drainage gullies, Contexts [204] and [308] contain a few gabbroic sherds of Roman period type and a local granitic sherd.

Ring-ditch [3] contexts [46] lower silt, [140] [146] upper silt. (Fig 14)

P1 (SF no 322) Gabbroic decorated body sherd La Tène/Glastonbury style, well-made, buff with black-burnished outer surface, part of geometrical design of broad incised lines. Slightly eroded. Style dates from perhaps 300 BC into at least 1st century BC, perhaps 1st century AD (Quinnell, 1986, 120).

Also three local granitic sherds, small sherds from two gabbroic cooking-pots with upright neck, fabric and finish similar to those on Iron Age forms (cf P31); a few small gabbroic sherds of Roman type.

PHASE 2

Upper fill [152] of 'House A' [22] (Fig 15) contains South-East Dorset BB1 bowl sherd and gabbroic sherds, all fairly fresh and likely to have been deposited soon after breakage, probably within the 2nd century, including

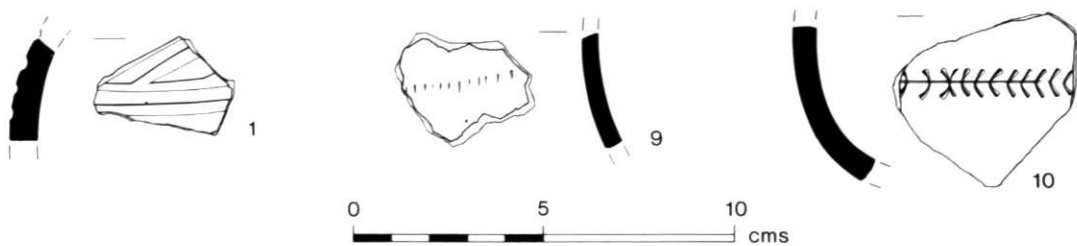


Fig 14
Reawla, pottery: P1, ring ditch [46]; P9, pit [306]; P10, upper fill [227] of inner ditch. All gabbroic. Scale 1:2

P2 (SF nos 371 645) gabbroic, large cooking-pot, fairly upright rim, thick, finished with distinct outer roll; body sherd from this vessel, roughly burnished and decorated with zone of heavily burnished/incised right-angled lattice. Right-angled lattice occurs on South-East Dorset BB1 in the decades around AD 200 (Holbrook and Bidwell 1991, 96). It is not known whether this comparison is relevant, but the form of the rim suggests a 2nd century date.

P3 (SF no 342) gabbroic jar with roll-topped rim and girth cordon. Compact buff fabric verging on well-made variant. Small version of St Mawgan type H. Finish and fabric makes a date no later than 2nd century probable.

P4 (SF no 341) gabbroic bowl with flat, out-turned and slightly drooping rim, buff fabric; type starts during 2nd century and on fabric this example not likely to be later.

Old Land Surface, Context [153] beneath Outer Rampart.

Gabbroic sherd, Roman period, local granitic sherd. (No material in body of rampart).

Outer Ditch.

No material in main fill. Sherds from *Context [14]* include gabbroic cooking-pot rim of 3rd/4th century type.

Pits, Contexts [232], [184], [302], [365], [205], [306], [397], [255] (Subphase 2.2) (Fig 15) contained a little material; samian P5 was the only non-gabbroic sherd; most material accumulated in the tops of the pits after use.

P5 (not illus.) Samian foot-ring from Central Gaulish platter of form Dr 18/31; Antonine. In good condition for a Cornish site. *Context [255]*

P6 (SF nos 586, 52, 510) gabbroic cooking-pot with heavy rolled rim approximately same diameter as girth; incised groove below neck, double groove on girth; grooves give effect of slight cordons. Cooking-pots with girth grooves occur occasionally: cf No 54 from Trethurgy in 4th century context, No 176 from Carvossa, uncontexted (Carlyon, 1987, fig 6), No 30 from Kilhallon in context dated mid-2nd to mid-3rd (Carlyon, 1982 fig 3). *Context [184]*

P7 (SF 378) gabbroic lid from [183], groove around edge. Lids occur sporadically throughout the Cornish Roman period from St Mawgan (Threipland, 1956, fig 30) through to 4th century contexts at Trethurgy. *Context [184]*

P8 (SF no 654), gabbroic, narrow-mouthed jar with rim rolled back to form narrow beading. From evidence summarised for Trethurgy unlikely to be much later than c. AD 300 and probably 2nd/early 3rd century. *Context [255]*

P9 (Fig 14) gabbroic, body sherd with black interior coating. Close-set but irregular line of incisions through coating. ? sherd re-used in some way. *Context [306]*

Fill [227], upper fill of Inner Ditch over pits [232] etc. (Subphase 2.2) contained two South-East Dorset BB1 and two South Devon sherds and gabbroic material including:

P10 (Fig 14) (SF no 591) gabbroic body sherd; line of stamped decoration centred on slight girth groove, stamp curved with projecting ends, part of stamps curved in one direction, part the other. Sherd eroded and not obviously either of Iron Age or Roman fabric type. Girth decoration common on Roman period jars but usually incised; No 32 from 2nd - 3rd century group at Kilhallon (Carlyon, 1982, fig 36) with double row of stamps unusual. Actual form of stamp, and arrangement along shallow groove, exactly paralleled by No 71 at St Mawgan (Threipland, 1956, 63), perhaps deposited c. AD 100; this

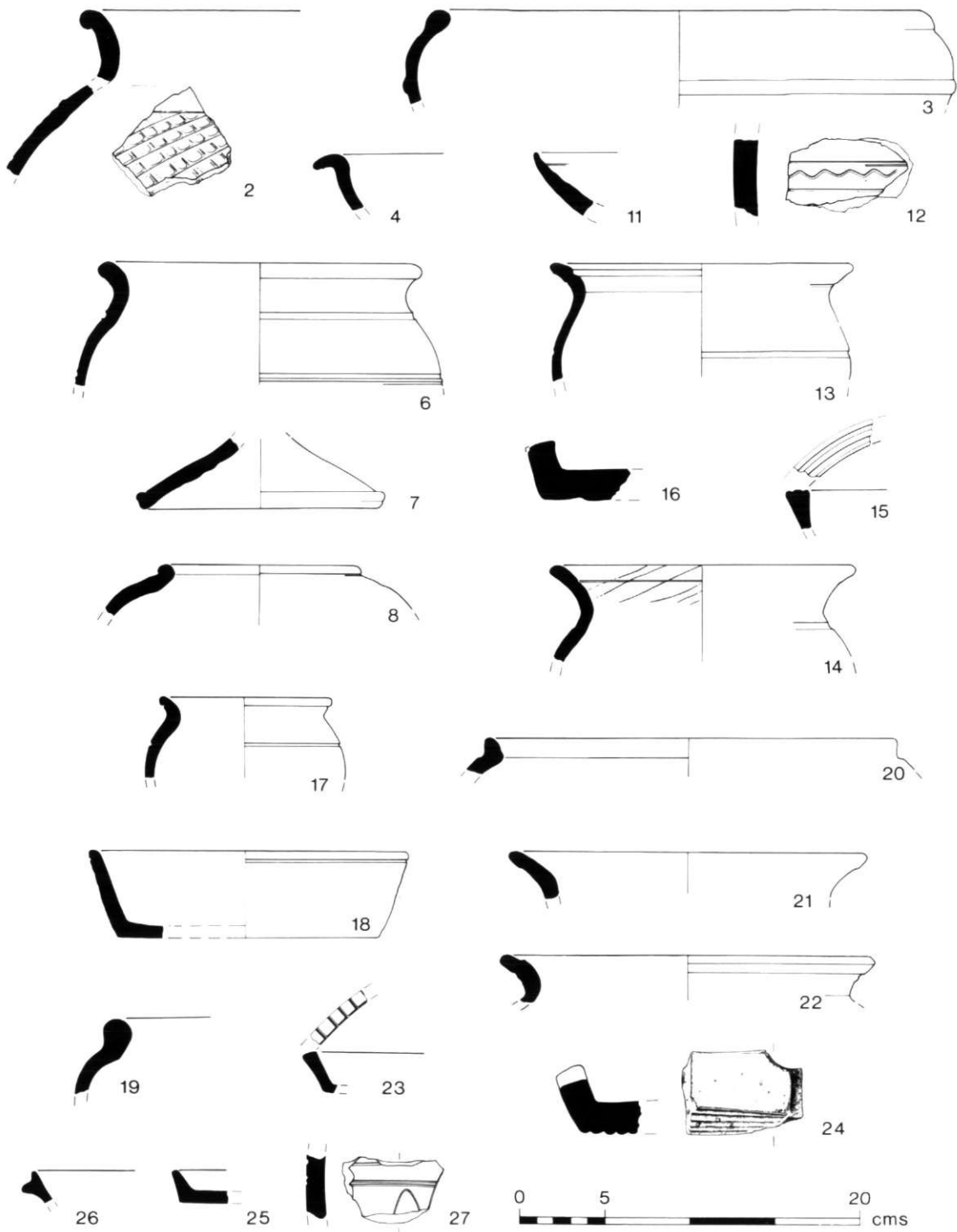


Fig 15
 Reawla, pottery: P2-4, fill [152] of hollow/House A; P6-8, early pits in working area; P11, upper fill of inner ditch; P12-16, use of House B [300]; P17, House B [341] infill; P18-24, House B lower infill; P25-27, House B, upper infill. All gabbroic except P18, BB1 variant. Scale 1:4

stamp was related to the various 'duck' stamps found occasionally on Later Iron Age pottery in Cornwall. On balance probably residual Iron Age.

P11 (Fig 15) (SF no 299) gabbroic, curved wall of dish, well made, exterior heavily black-coated and burnished. Possibly a copy of a Terra Nigra form cf Nos 130 - 132 from Exeter (Bidwell, 1979, Fig 640); if so most likely late 1st or early 2nd century.

Gulley, Context [9] A few gabbroic sherds from forms comparable to pits of Phase 2.

HOUSE B

Context [300] (Fig 15)

Context[316] *floor of house*. Sherds of large coarse gabbroic storage jar; as *P12* but girth decoration differs, consisting of a zone of haphazard criss-cross incisions defined on upper and lower edge by incised horizontal line.

Context [324] 'hearth pit'.

P12 (SF nos 406 324), coarse gabbroic, rim and body sherds from large storage jar simple rolled rim; girth decorated with wavy incised line between two straight ones. Large storage jars with heavy rims, but with decorative detail not deriving from cordoned ware traditions, appear 3rd/4th century in Cornwall (Quinnell, forthcoming a). *P12* compares with unpublished examples from Porthmeor.

Pit Context [318] South Devon SF no 691 rim from plain-rimmed dish as *P44* from [23] but with trace of scribbled decoration.

Occupation layer Context [307] The material is in good condition and less comminuted than might be expected if trampled into a floor; it may represent a midden tip after abandonment, perhaps dating to the later 3rd century. Radiocarbon determination UB 3180 which calibrates on probability distribution to AD 230 - 347 (1σ) from hearth [340] just below this layer and UB 3181 which calibrates (1σ) probability 0.39 to AD 258 - 296 and probability 0.61 to AD 321 - 384 are as good a 'match' for the ceramic dating as this method is likely to provide.

South-East Dorset BB1 conical flanged bowl; much eroded but probably of Gillam (1976) type 46 of the later 3rd/4th centuries. BB1 variant plain straight-walled platter rim; as *P52*.

P13 (SF nos 695 704 706 710), gabbroic, cooking-pot with simple slack out-turned rim and shallow groove on its top, incised line around girth; cf Trethurgy *P55* or Porth Godrevy No 2 fig 9 (Fowler, 1962); type probably current from 2nd to 4th centuries.

P14 (SF no 634), gabbroic, cooking-pot with simple out-turned rim, slight interior rim groove and tooling marks. Wide date range.

P15 (SF no 627), gabbroic, straight-sided bowl; broad flat-topped rim has double groove. No obvious comparanda but possibly relates to St Mawgan-in-Pydar type R (Threipland, 1956).

P16 (SF no 630), coarse gabbroic, part of shallow flat-bottomed rectangular vessel; another featureless chunk probably forms part. Likely to relate to briquetage or some industrial use; the best parallel is No 15 from Trebarveth T3 (Peacock, 1969b, fig 19, 58) described as a shallow tray or lid. See *P24*.

Construction trench infill Context [341] probably post-dating use of House B.

BB1 variant (SF no 287) cooking-pot base decorated with rough squiggles; (SF no 518) part of platter/dish base with incised looped decoration.

P17 (SF nos 329 332), gabbroic, joining sherds of small cooking-pot with simple everted rim above upright neck, and incised girth groove; well-made compact fabric. See comments on *P13*, but the rim form and fabric together suggest a 2nd century date.

Note: the group in [341] does not relate to [181] the midden above; 3 distinctive vessels are represented, none of which occur in the [181] midden.

Midden infilling House B hollow: contexts [321] [187] [182] [181] [175] There are a number of joins from different contexts in the midden which totals about 230 sherds. Virtually all vessels are gabbroic and variants of those shapes illustrated; single South Devon and hard-fired South Devon sherds. A date between the mid-2nd and mid-3rd centuries is probable; if this dating is correct the group is a useful representative for a period in which associations are rare.

P18 (SF no 696), BB1 variant, dish with groove below rim; wiped rather than burnished exterior; also sherd from dish without groove. A type in production from c. AD 150 onward (Holbrook and Bidwell, 1991, 99).

P19 (SF no 503), gabbroic, roll-rimmed bowl, buff fabric throughout. Form derives ultimately from types P/Q St Mawgan (Threipland, 1956, 65) and seems to go on in coarser simpler versions at least into 3rd century (Quinnell, forthcoming a). Another similar vessel.

P20 (SF no 508), gabbroic, neat slightly out-turned rim, probably from ovoid jar, well-made fabric; cf Trethurgy No 90 (Quinnell, forthcoming a) where a 2nd century date is discussed.

P21 (SF nos 289 356 584 380), gabbroic, rim sherds from typical slack-profiled cooking-pot with out-turned rim.

P22 (SF nos 358 583), gabbroic, cooking-pot with upright neck out-turned at top, with slight groove on rim top; a common later type (Quinnell, forthcoming a).

P23 (SF no 357), gabbroic, straight-sided shallow dish, angular flat-topped rim decorated with slash marks. Shallow dishes have been assumed to be a post-Roman type, as those West Cornish sites on which they occur have previously provided evidence for occupation into the 6th century (see discussion in Smith, 1980 on Carngoon Bank); if however the type occurred occasionally in the Roman period, it would provide a precursor for the post-Roman form and so perhaps simplify the situation at Carngoon Bank; shallow dishes seem to be a form which did not spread beyond west Cornwall.

P24 (SF no 585), coarse gabbroic, part of shallow, flat-bottomed, rectangular dish; rim either cut or ground down after breakage but retains part of original depression or lip; part of vertical groove along break; heavy ridging on base may result from impressions formed while vessel was undried. Fabric similar to briquetage, but complex shape suggests some special use.

Soil over midden [182] etc over House B: contexts [26] [48] [4]. About 150 sherds, nearly all gabbroic, similar vessels, with some joins, to those in [182] midden. Single sherds of South-East Dorset BB1 and BB1 variant (probably part of P66 in [1]. This soil may be regarded as the disturbed top of midden [182] as there is some intrusive medieval and post-medieval material.

The sequence of deposits [307], [182] etc and [26] etc would appear to have been in place, and [300] completely infilled (apart from intrusive material) before the material in midden levels [148] etc was discarded perhaps in the earlier 4th century; the proportion of non-gabbroic fabrics is much lower than in the [148] midden, although the group is small for definite statements, and there are no cross-joins between the two. A date of around AD 300 could therefore be tentatively suggested for the completion of this sequence.

P25 (SF no 269), gabbroic, shallow platter with simple rim; see P23 in midden [175] but P25 gives the impression of being a rectangular tray rather than a circular dish.

P26 (SF no 271), gabbroic, small bowl or dish with moderate flange and upstanding rim; diameter c. 200 mm. In BB1 fabrics flanged bowls and dishes with rim forms similar to this occur from around AD 100 and continue until the development of the conical flanged bowl in the later 3rd century (Holbrook and Bidwell, 1991, 97).

P27 (SF no 465), coarse gabbroic, body sherd from large 3rd/4th century storage jar; girth decoration of horizontal incised lines defining zone of loops.

Later pits, Contexts [205] [238] [255] [270] [216] and post-hole [296] (Fig 16) All this material is appropriate for the 2nd century.

P28 (SF no 341), wall of thick vessel, coarse gabbroic, straight-sided, flat-topped, probably rectangular in shape. ? briquetage cf examples from Trebarveth (Peacock, 1969b, fig 19). Briquetage apparently not so far recorded away from coastal sites - possibly connected with industrial activity at Reawla. [205] (Subphase 2.2)

P29 (not illus, SF nos 713 696), gabbroic, large joining pieces of one single sherd; from body of large cooking-pot with at least three girth cordons. Well-finished buff fabric. The general look of the vessel suggests an early date within the long cordoned ware range, no later than 2nd century AD and perhaps earlier; similar cooking-pots in later Roman contexts tend to have coarser grits and be redder, more oxidised. [238] (Subphase 2.2).

P30 (SF no 325), gabbroic, upper part of cooking-pot; short well-defined neck and out-turned rim; rough burnish; form typically 2nd century AD. [238]

P31 (SF nos 56, 55), gabbroic, joining sherds of cooking-pot with upright neck and out-turned rim,

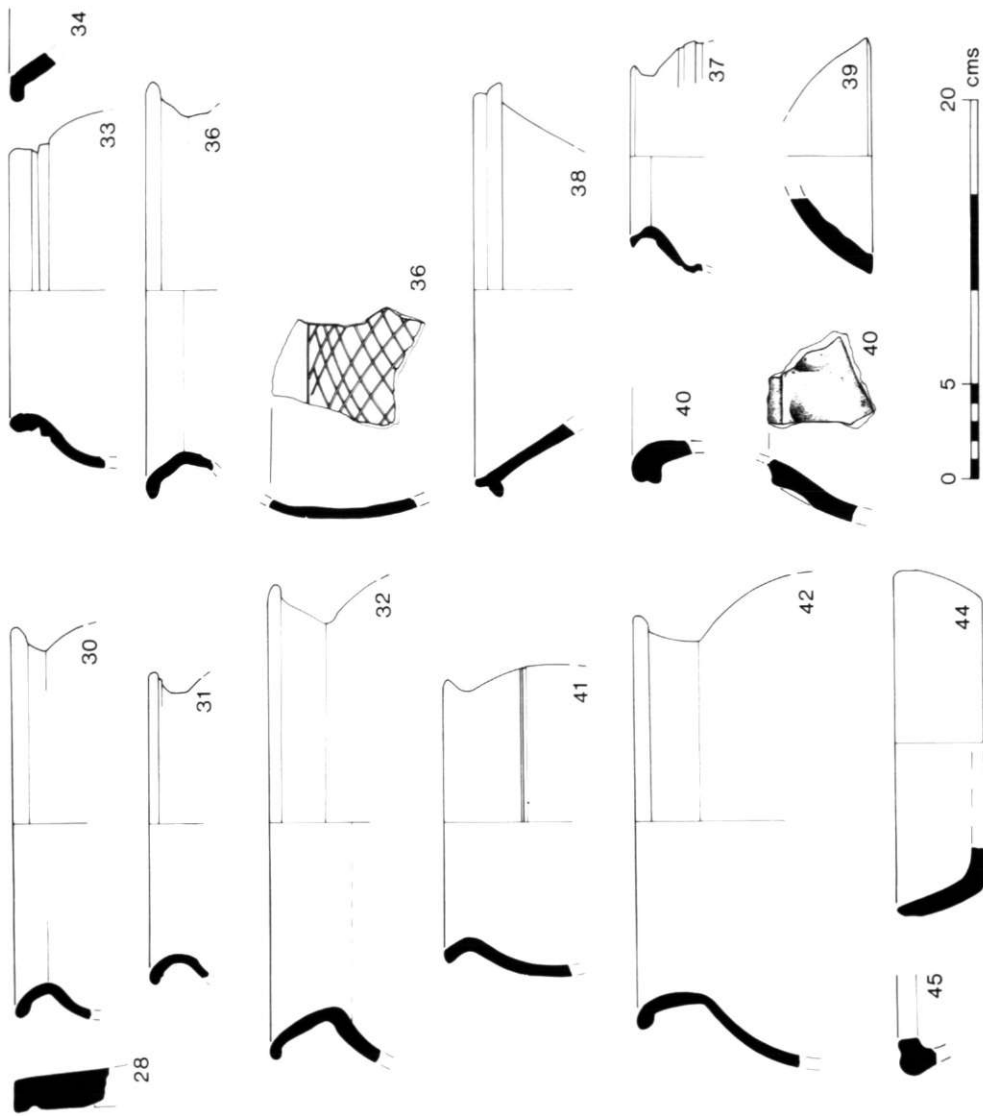


Fig 16

Reawla, pottery: P28-31, late features in working area; P32, soil [216] in working area; P33-4, soil [180] over working area; P36-40, infill [12] in hollow/House C; P41, gully [17] in working area; P42, gully [178] in working area; P44-5, midden [23] in hollow/House A. Gabbroic except for P32, BB1 variant, and P44 South Devon. Scale 1:4

well-made fabric, with good burnish on black coating. Unlikely to be later than 2nd century. [296]

Soil , Context [216] around setting [207] (Fig 16)

P32 (SF no 419), BB1 variant, cooking-pot rim of 2nd/3rd century type (Cf Gillam 1976, types 8, 9) joining sherds in midden [148].

Soil , Context [180] over parts of working area (Fig 16) 61 sherds including four BB1 variant; remainder gabbroic, several as P33, P31, one as P26 and one plain-rimmed dish as P52. The group appears to belong to the 2nd to 3rd centuries.

P33 (SF no 506), gabbroic, simple upright jar rim formed by neat roll with deep groove beneath. Derives from St Mawgan type P; vessels of this class occur eg at Castle Gotha (Saunders and Harris, 1982, fig 13) and at Trethurgy eg No 93 ; it appears that type P derivative forms are 2nd or 3rd centuries, not 4th.

P34 (SF no 362), gabbroic, open dish with simple out-turned, flat-topped rim. In BB1 industries Gillam (1976, 68) regards this as a 2nd century type but its date range in Cornwall needs clarification.

Fill , Context [12] of House C [11] (Fig 16). 121 sherds including scraps of South-East Dorset BB1, BB1 variant and South Devon. Gabbroic material includes bead-rims and slack-profiled cooking-pots. Material of various dates, obviously some residual,; later pieces unlikely to predate late 3rd century.

P35 (not illus) body sherd of beaker; fine, virtually grit-free cream-buff fabric; external dark brown slip; broad groove. Possibly 'Rhenish ware' originating in Central Gaul (Greene, 1978, 18) late 2nd or 3rd centuries.

P36 (SF nos 237 242 231), gabbroic, out-turned cooking-pot rim; one of several. Body sherds with right-angled incised lattice around girth defined by groove on upper edge; black coated; decoration possibly derived from that on BB1 cooking pots in the decades around AD 200. The rarity of this decoration in Cornwall (cf No 63 from Trethurgy) probably relates to the wear in use on cooking-pot girths, particularly through use in cooking fires, and not to its actual frequency.

P37 (SF nos 301 250 247), gabbroic, (non-joining) upper part of small jar; rim only slightly out-turned, deep grooving around top of girth. Probably an early type no later than 2nd century. Should derive from St Mawgan Type F (1st century) cf Carvossa No 120 (Carlyon, 1987, fig 4).

P38 (SF no 239), gabbroic, conical flanged bowl; flange set well below rim and slightly drooping; reduced with black coating on exterior. Type unlikely to predate later 3rd century. One of several.

P39 (SF no 249), gabbroic, simple lid ? Finger marks from modelling very clear on interior. The thick rough fabric and finish and the steep profile suggest some specialised ? industrial use as for the ? briquetage pieces, rather than a domestic lid.

P40 (SF no 244), coarse gabbroic, rim from large storage jar, groove on outer edge; indentations ?finger nail on inner edge. SF 307 body sherd with broad thumbbed depressions around girth probably same vessel. Basically 3rd or 4th century type (cf Trethurgy, Quinnell, forthcoming (a)) and occur with a wide variety of rim decoration on all Cornish sites of this date.

Gully Context [17] in working area (Fig 16) Small quantity of gabbroic material includes rim as P60 in midden.

P41 (SF no 512), gabbroic, cooking-pot with simple slack-profiled out-turned rim and girth groove. Cooking-pots with simple girth grooves quite common cf Nos 53 and 54 from Trethurgy with discussion; probable long date span from 2nd to 4th centuries.

Crescentic Pit Context [179] (Subphase 2.1) (Fig 16)

P42 (SF no 502), gabbroic, cooking-pot with tall almost upright rim finished with smooth roll; well-made and finished fabric. Type derives from St Mawgan type E (Threipland, 1956, 58). No good parallel from any other site. Probably late 1st/early 2nd century.

PHASE 3

Midden , Context [23] in hollow 'House A' [22] (Fig 16). 256 sherds, many very eroded; mixed date material suggesting gradual accumulation from 2nd to 4th centuries. Radiocarbon determination UB 3183, calibrating to the 5th and 6th centuries, probably relates to the long accumulation of the deposit and to contamination from the overlying ploughsoil.

Small sherds from Oxfordshire ware bowl P46 in midden [148]; also from Oxfordshire mortarium P96 in [1].

P43 (not illud) rough-cast beaker (SF no 551) rim fragment and three other scraps in fine orange fabric with brown slip on both surfaces; appears similar to variety described by Swan (in Bidwell, 1979, 189) from Exeter, source unknown.

South-East Dorset BB1 sherds probably from P47 in [148].

P44 (SF no 282), South Devon, simple, thick plain-rimmed dish; black-coated and burnished though no decoration. Also cooking-pot rim and other sherds.

Hard-fired South Devon sherd.

P45 (SF no 452), gabbroic, rim from large bowl, formed by heavy roll flattened so that it projects internally, with groove on top. Several others similar. These seem to be a variant or derivative of St Mawgan type R (Threipland, 1956, 66), but type R variants with internal overhangs seem uncommon, the only good published examples being from Trebarveth T1 St Keverne (Serocold and Maynard, 1949, fig 6) which appears 2nd century.

Other gabbroic material includes upright and slack-profiled cooking-pot rims, simple plain-rimmed dish rims; a few coarse gabbroic sherds.

Midden [148] over industrial area; [148] comprises contexts [151] [157] [158] [168] [169] (Fig 17) : total about 500 sherds. One Oxfordshire vessel, rough-cast beaker, two South-East Dorset BB1, nine BB1 variants, six South Devon, two hard-fired South Devon, over 30 gabbroic and coarse gabbroic vessels including body sherds with cordons. Also sherd of unidentified colourcoat and of Micaceous Grey ware.

This midden is remarkable for the size of many of the sherds and the freshness of most breaks. It would appear a short-term deposit in a suitable hollow, unlike [23] with eroded sherds which accumulated gradually. Most of the distinctive BB1 variant sherds from the site come from it, and unusually for Cornwall about 40% of the fabrics are non-gabbroic. The midden could represent material from some atypical, perhaps high status context. The dating is difficult. All the material could be present by around AD 300, with the possible exception of Oxfordshire ware P46, but it is not known how long non-Cornish vessels remained in circulation. (Late 4th to early 5th century South-East Dorset BB1 forms (Holbrook and Bidwell, 1991, 103) have not yet been identified in Cornwall and may never have reached the area.) In comparison with Trethurgy there are at Reawla, both in this midden and on the site as a whole, far fewer large slack profiled cooking-pots which are probably mainly 4th century. There are also a number of gabbroic forms such as P56 which are unlikely to have been in production even in the later 3rd century. On present knowledge a date early in the 4th century is suggested, but can only be regarded as tentative. Radiocarbon determination UB 3182 calibrates to centre on the 5th century with the earliest end of the calibration range overlapping the suggested ceramic dating. It would be unwise to dismiss this completely as skewed by contamination; it is just possible that it indicates a later date for the deposit than the early 4th century.

P46 (SF no 218), Oxfordshire ware bowl, eroded sherds. Young's form C51 imitating samian Dr 38. Fine, slightly micaceous pink fabric, grey core, multi-coloured grits, red slip surviving in base angle. C51 is the most commonly occurring Oxford ware type so far recognised in Cornwall, though not surviving at Trethurgy. The basic date range is c. AD 240 - 400 but because of the wider distribution of Oxfordshire wares in the 4th than in the 3rd centuries it is considered that the Cornish examples probably are 4th (Young, 1977, 239). Oxfordshire wares may have reached Exeter just before the end of the 3rd century (Holbrook and Bidwell, 1991, 81).

Rough-cast beaker sherd probably from P43 in [23].

P47 (SF nos 277 278 666), South-East Dorset BB1, out-turned rim from cooking-pot, Gillam type 12, probably circulating in the South-West from the mid-3rd century (Holbrook and Bidwell, 1991, 95).

P48 (SF no 198), South-East Dorset BB1, conical flanged bowl rim with distinct bead and drooping flange; 'arcade' decoration of overlapping loops on exterior. Gillam Type 46, which appears around c. AD 270 with the possibility that its start could be a quarter century earlier (Holbrook and Bidwell, 1991, 99).

P49 (SF nos 224 257), BB1 variant, cooking-pot; a second similar vessel. These would appear to have a girth wider than the rim and be therefore of 3rd rather than 4th century date.

P50 (SF no 204), BB1 variant, upper part of small thin-walled cooking-pot with out-turned rim; profile appropriate to late 3rd or 4th centuries; three similar vessels; body sherds with distinctive late

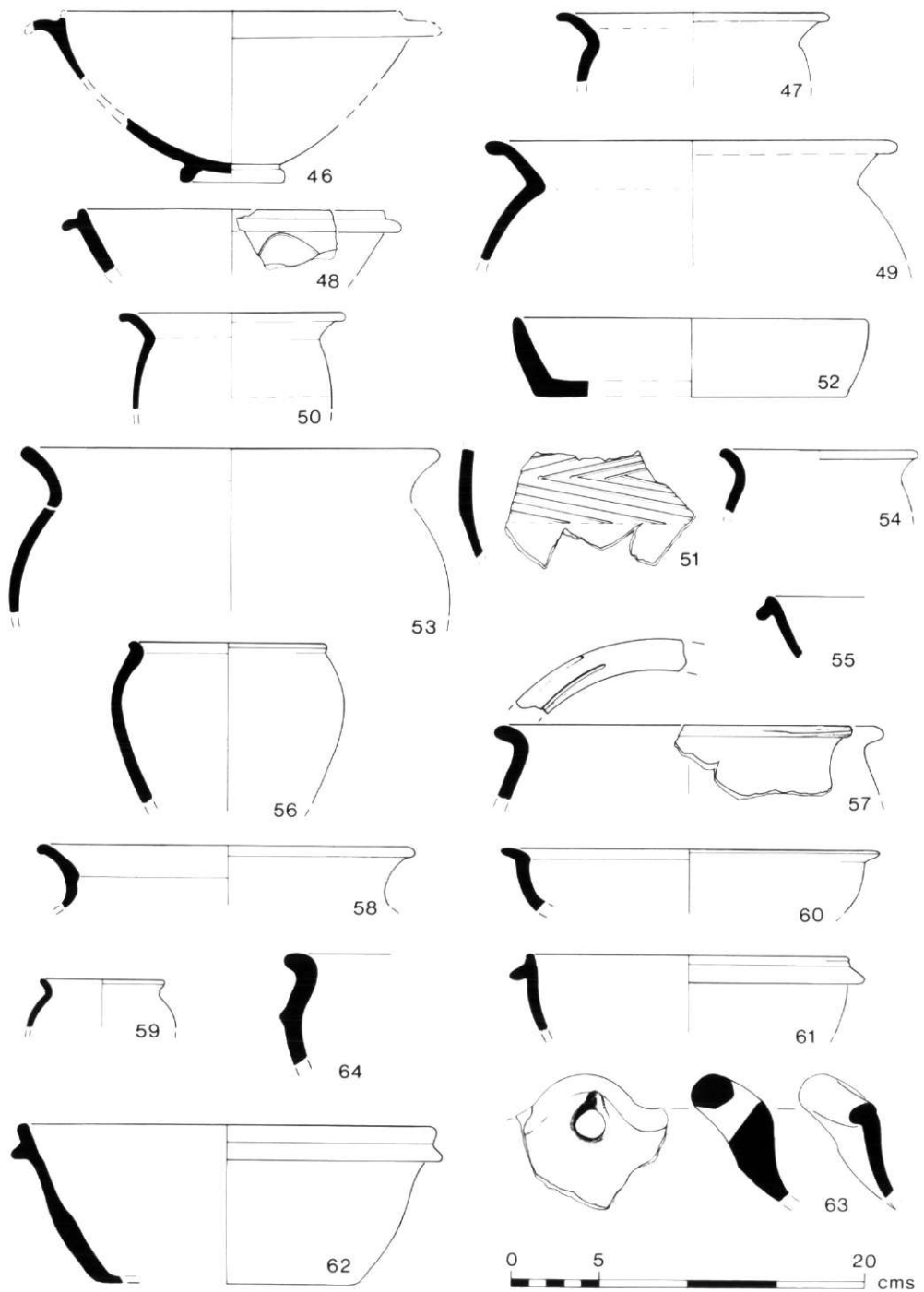


Fig 17
 Reawla, pottery: P46-64, midden [148], Gabbroic except for P46, Oxford ware, P47-8, BB1, and P53-5, South Devon. Scale 1:4

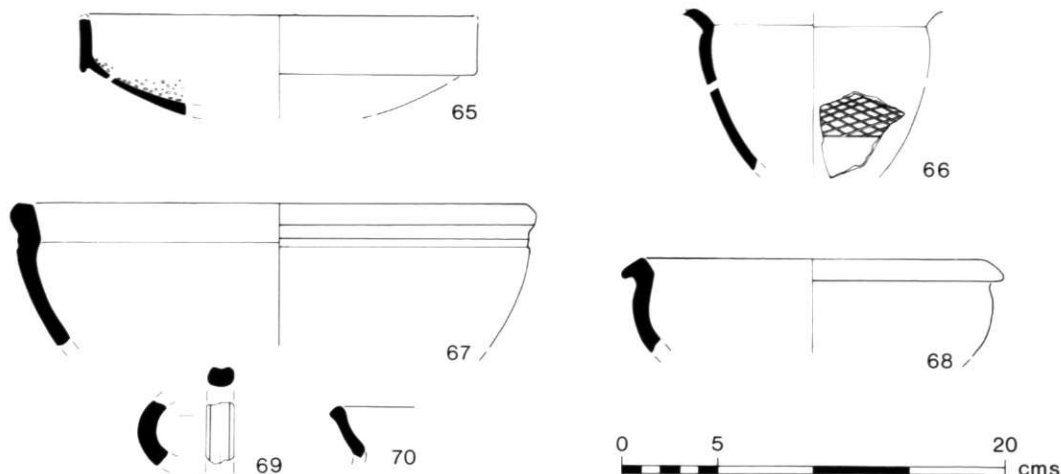


Fig 18

Reawla, pottery: P65-70 midden upper levels [1]; Gabbroic except for P65 Oxford ware. Scale 1:4

3rd/4th century oblique lattice from the above or similar vessels. Also part of P32 from [216].

P51 (SF nos 571, joins 314 from [1]), BB1 variant, body of cooking-pot; central zone decorated by bands of incised lines at oblique angle to each other, but not overlapping sufficiently to form diamond shapes; compare Type 20.2 from Exeter late 3rd/4th centuries (Holbrook and Bidwell, 1991, 103).

P52 (SF no 386), BB1 variant, plain-rimmed dish, no decoration. A second identical to P18. These dishes were in production from the Antonine period until the end of BB1.

P53 (SF no 222), South Devon, rim and other sherds of cooking-pot with everted rim; not closely datable. Two others similar.

P54 (SF no 216), South Devon, small cooking-pot with everted rim; not closely datable. A second similar.

P55 (SF no 213), South Devon, rim from conical flanged bowl, very eroded. Another similar.

Plain-rimmed dish. South Devon, as P44 in [23].

Two rim sherds, hard-fired South Devon, from cooking-pots with profiles appropriate to late 3rd/4th centuries.

P56 (SF no 267), gabbroic, small jar with bead rim, compact well-made fabric with rough burnish. Form deriving from St Mawgan type P and occurring occasionally in 2nd or 3rd century contexts eg No 91 at Trethurgy. Such small jars in well-made fabrics seem likely to be residual or survivals, rather than being manufactured in the 3rd/4th centuries.

P57 (SF nos 345 336), gabbroic, cooking-pot with simple out-turned rim; tooling marks form possible rough pattern; occasional parallels eg No 70 from Carngoon bank (Smith, 1980, fig 18). Several other slack profiled cooking-pot rims.

P58 (SF no 373), gabbroic, rim of out-turned cooking-pot, profile appropriate to 3rd or 4th centuries. Another similar.

P59 (SF no 220), gabbroic, thin-walled small jar with simple rim. Type derives from St Mawgan type N (Threipland, 1956, 64); end date unclear as such jars not common after 2nd century and do not occur at Trethurgy. A second larger version.

P60 (SF no 375), gabbroic, bowl with curved sides and simple flat-topped rim; another three similar vessels.

P61 (SF no 275), gabbroic, flanged bowl with curved wall, by far the most common late bowl form in Cornwall (see Carlyon, 1987, 117) and discussion in Trethurgy report (Quinnell, forthcoming a).

P62 (SF nos 388 387 379, also 87 101 102 from [1] 238 245 from [12]), gabbroic, conical flanged bowl. Late 3rd/4th century type. Unusual for gabbroic flanged bowls to have straight sides, more usually curved. Rims from four other vessels, sides either straight or curved.

P63 (SF no 404), gabbroic, rim with upright lug or handle with wear groove inside top of perforation; form derives from St Mawgan type C (Threipland, 1956, 57) and appears in most sizeable Cornish pottery collections including Trethurgy, but not at Porthmeor or Carwarthen which are largely 4th cen-

tury; possibly current until c. AD 300.

P64 (SF no 389), coarse gabbroic, carinated bowl with flat-topped rim. Unusual form, closest parallel probably at Carvossa (Carlyon, 1987, fig 4 No 129). Diameter c. 400 mm.

Upper midden levels [1] over [148] etc. (Fig 18) Unsealed. Date range as [148] but more disturbance; contains sherds from many vessels in [148].

P65 (SF no 96), Oxfordshire ware, mortarium; fine orange fabric with grey core; multi-coloured trituration grits. Other sherds in 23 (2) and unstrat. (2). Young (1977, 329) type C97, likely to be late 3rd or 4th centuries in Cornwall. An Oxfordshire C97 came from contexts of the late 4th century and later at Trethurgy (Quinnell forthcoming a).

P66 (SF nos 192 114 148 442), South-East Dorset BB1, non-joining sherds of cooking-pot with oblique lattice late 3rd/late 4th centuries.

Part of *P32*, BB1 variant cooking-pot, in soil [216].

Exeter Micaceous Grey ware (fabric 125) sherd (N. Holbrook pers. comm). Produced late 1st century to c. AD 200.

P67 (SF no 184), gabbroic, bowl with rim formed by flattening rolled top, slight groove beneath. Closest parallel *P81* Trethurgy, and other examples at Chysauster and Trebarveth T1 (unpublished) but none in 2nd century assemblages.

P68 (SF no 152), gabbroic, bowl with simple sharply down-turned rim; eroded and may have originally been slightly grooved on its top; discussion of Trethurgy examples (Quinnell, forthcoming a) suggests date from AD 200 onward.

P69 (SF no 186), gabbroic, narrow vertical handle with slight external groove. Handles occur occasionally on Cornish sites eg No 72 from Carngoon Bank (Smith, 1980, fig 18) but no indication of date range.

P70 (SF no 438), early medieval cooking-pot rim in gabbroic fabric; style may relate to Sandy Lane Style 2 with a date centring on the 12th century AD (Thomas, 1964, 49).

Stone objects by Henrietta Quinnell

Geological information has been provided by A.J.J. Goode BSc, British Geological Survey, Exeter. The illustrations are by Rosemary Robertson.

Cornish mortar S1 (SF No 632 from context [307], midden material of probable late 3rd century date within House B[300]). (Fig 19). Mortarium, 280 mm diameter, 28 mm thick. Simple chamfered rim and slight footing. Exterior finished with rough pecking, interior worn smooth by long usage; the worn smoothness increases towards the base. The underside of the base is much worn, as though the mortar had been regularly used on a stone surface and movements during use had caused abrasion.

The rock used is elvan with small euhedral quartz phenocryst up to 4 mm long; rather soft due to alteration and/or weathering. Similar elvan occurs in a dyke within 100 m of the site. Elvan was widely used for stone artefacts in Roman Cornwall, and only it and greisen were used for mortaria.

The simple form of the rim suggests a 3rd/4th century date, earlier rims being usually more complex. The size is appropriate for a plain mortar with a simple spout. Such mortars have been termed 'Cornish mortars', the less common examples decorated with skeuomorphic handles and of larger size 'Trethurgy bowls' (Quinnell, forthcoming b). Stone mortaria of both types occur regularly on Cornish Roman-period sites; pottery imports are rare and the form was never made by the local gabbroic industries.

Weight. S2 (SF No 712 from context [402] (fill of pit [397] Phase 2, area [200], of probable 2nd century AD date). (Fig 19). Part of perforated stone weight, badly fractured after burning. Width c. 100 mm, thickness at least 65 mm, height probably c 100 mm (possible facet of base survives). Hour-glass perforation 9 mm across, worn fairly smooth indicating use before breakage. Weight in excess of 680 gm.

The rock used is an altered igneous rock, possibly a lamprophyre or even an ultrabasic rock, which now consists mainly of what appears to be secondary mica; possible sources occur within 2 km of the site. About a dozen well-finished perforated stone weights have now been identified in Cornwall. All those with contexts are of the Roman period, the few datable examples eg that from Trethurgy belonging to the 3rd or 4th centuries. The closest parallel in shape is an unpublished weight from Zennor parish

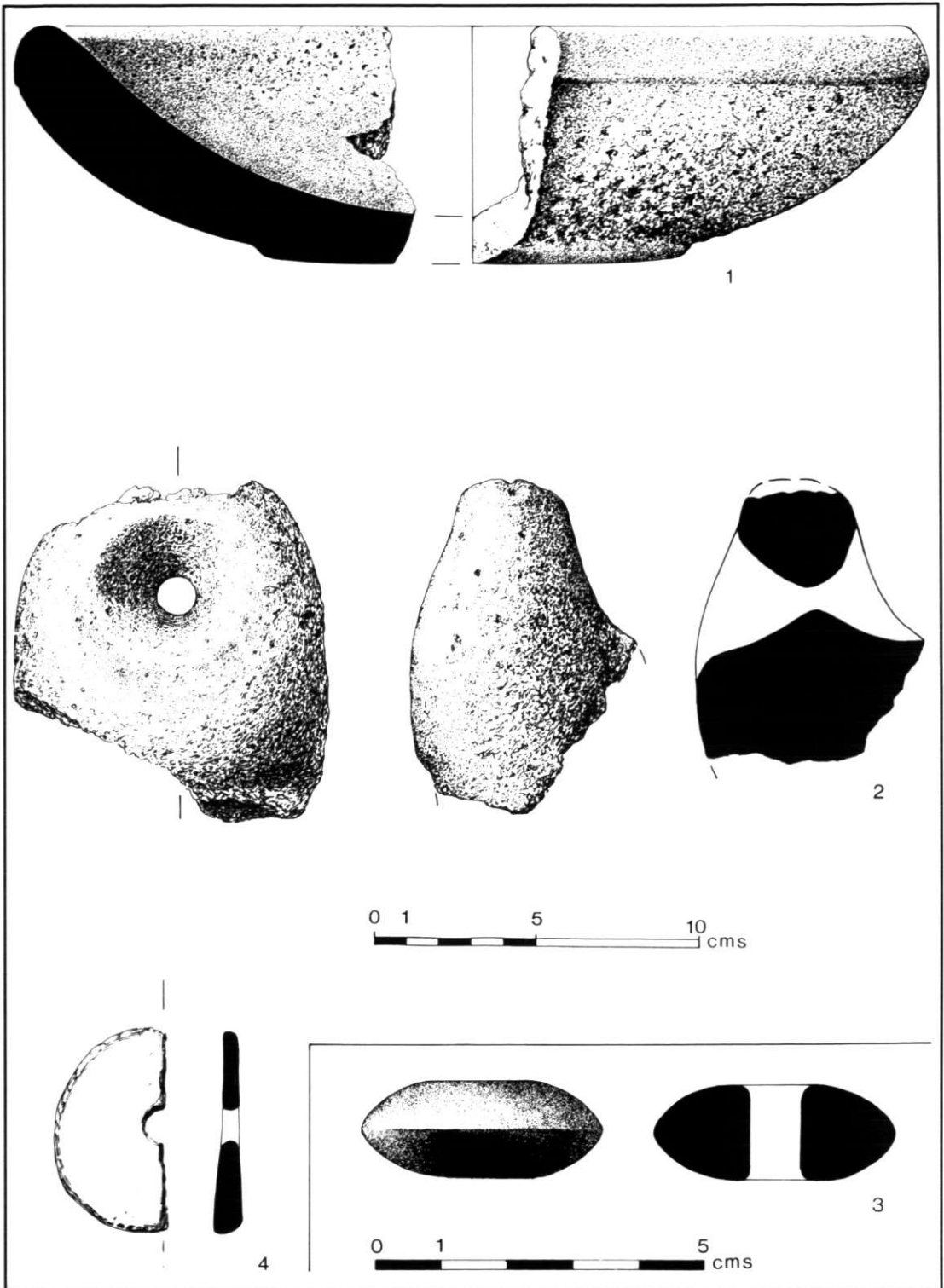


Fig 19

Reawla, stone objects: 1, Cornish mortar; 2, weight; 3, spindle whorl; 4, perforated disc

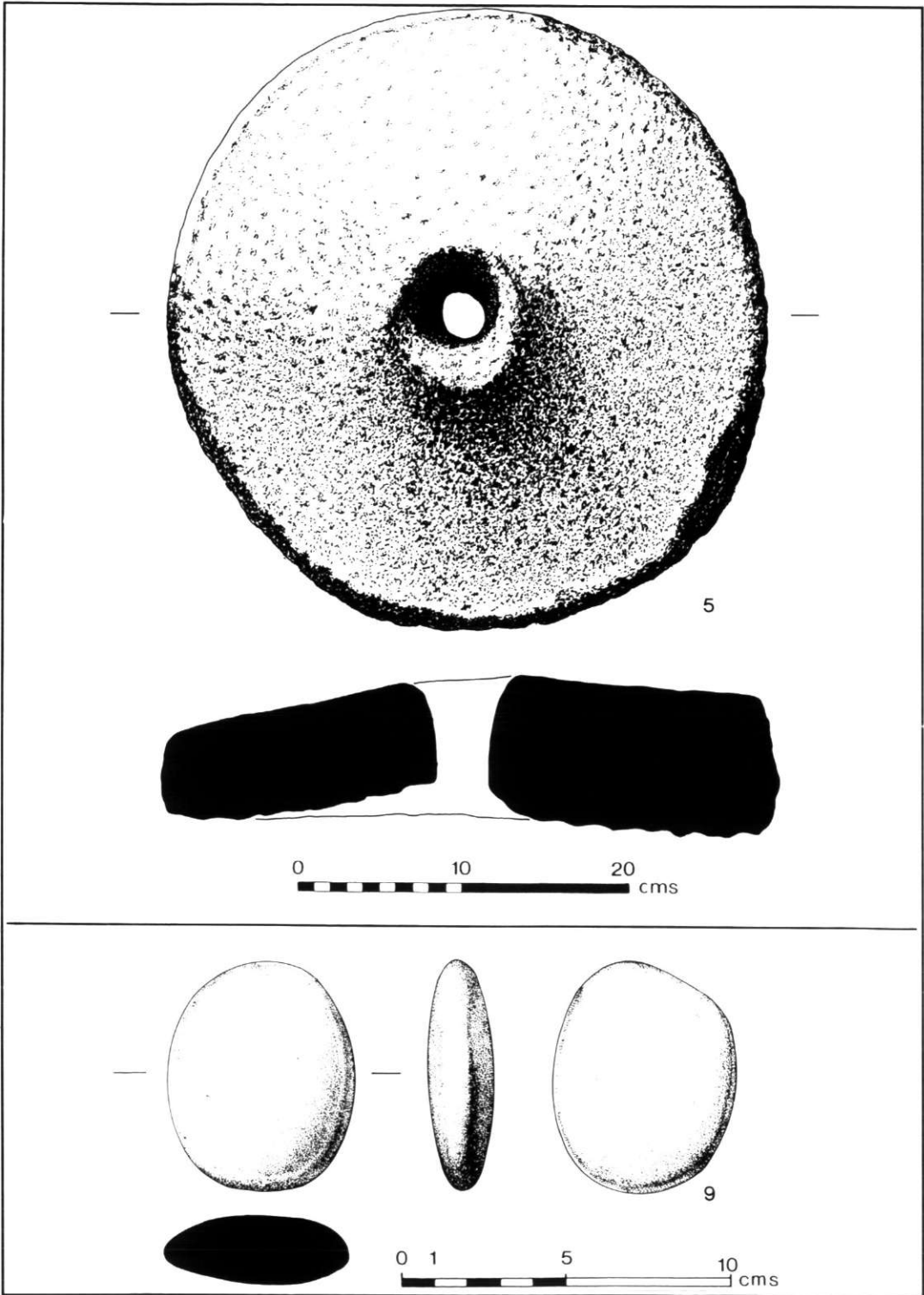


Fig 20
Reawla, stone objects: 5, quern; 9, utilised pebble

(no further findspot recorded) in the County Museum. These weights are unlikely to be loom weights, because they occur singly or in occasional pairs of very different size. They are also much better finished than is usual with loom weights. They may have been used with a balance. Parallels with the Cornish weights have not so far been located elsewhere in Britain at this period, the more sophisticated system of graded stacking weights apparently being adopted. Weights comparable with the Cornish series have been recognised from the pre-Roman Iron Age at Danebury and Winklebury, Hants, (Brown, 1984, 412), where they correlate reasonably well with the suggested 309 gm 'Celtic pound'. The Cornish examples correlate less well, but most examples are eroded. (see Quinnell, forthcoming (b) for full discussion and illustration of the Zennor weight).

Spindle whorl S3 (SF No 8 unstratified). (Fig 19). Whorl with flattened biconical profile, tubular perforation. 38 mm diameter, 17 mm thickness. Of shale, presumably from Kimmeridge in Dorset. Weight at present 12 gm but the shale has dried out a lot. Kimmeridge shale spindle whorls occur only occasionally on Roman period Cornish sites eg Trethurgy S27 (Quinnell, forthcoming (a)). Shapes, as with S3 from Reawla, tend to be simple, as found with whorls made from local Cornish materials.

Perforated disc S4 (SF 29, from context [277], fill of pit [278] of probable second century date). (Fig 19). Broken disc, 163mm diameter, 9 mm thick, perforation 12 mm across. Roughly shaped, probably from a naturally fractured slate. The edge has been worked first by chipping and then by grinding. The perforation may have been of hour-glass type and appears worn. Of silty laminated slate showing traces of metamorphic spotting; probably Mylor slate, the local Devonian bedrock.

Discs of this size or rather larger, with or without perforations, are common finds on Iron Age and early Roman period sites in Cornwall (eg St Mawgan-in-Pydar (Threipland, 1956, fig 37)). They are often interpreted as potlids, the perforation, where this occurs, to hold a wooden handle. Recent study linked to the finds from Trethurgy (Quinnell, forthcoming, a) suggests that these discs are less common in the 3rd and 4th centuries AD than at earlier dates.

Quern S5 (SF No 385 from context [151], midden material [148] etc of c. AD 300 date). (Fig 20). Unfinished upper stone from rotary quern. Irregular, maximum diameter 390 mm, maximum surviving thickness 110 mm. Central hole also irregular, maximum diameter about 40 mm. The quern split during manufacture because of a flaw in the rock used; the split is at an angle to the intended grinding surface, which it has entirely removed. The perimeter and upper surface had been pecked to an even but not smooth finish; the central hole had been bored, its sides smooth, but the top rough and unworn. The break must have occurred after the quern had been fully worked into shape but before any final finishing; most rotary querns from Cornish sites which have been used are more smoothly finished.

The rock used is 'partly altered or greisenised granite consisting mainly of secondary white mica and quartz ? Tregonning Hill'.

Both rotary and saddle querns were in use in Roman Cornwall; both are regularly found on courtyard house settlements of Roman date, eg Porthmeor (Hirst, 1937, 62) or Carn Euny (Christie, 1978, 388), and occur throughout the use of Trethurgy round (Quinnell, forthcoming, a). Examples are usually much worn and the only other example of breakage during (presumably) on-site manufacture occurs at Porth Godrevy (Fowler, 1962, 55, fig 14 No 22). Rotary querns are usually made of locally available rock; the only non-Cornish rock identified is at Trethurgy. The furthest distance so far recorded for Cornish rocks is 15 km for a quern from Carngoon Bank (MacAvoy, 1980, fig 24 No 5). S5, if of Tregonning greisen, would be about 6 km from source. There are however minor outcrops of greisen closer to Reawla. Tregonning greisen appears to have been regularly used for a wide range of artefacts such as mortaria, weights and moulds (Quinnell, forthcoming b). It is unfortunate that S5 can not be definitely assigned to the Tregonning greisen source.

Utilised pebbles This term is used to cover pebbles which show signs of wear, and which may be presumed to have been used for a variety of purposes, for food processing, leather and cloth finishing and as whetstones. The distinction of the latter category is usually made because of long narrow shape. There appears to be no detailed study, comparable with those carried out on the edges of flint tools, designed to establish the kinds of wear different activities might have caused, nor has there been any systematic analysis of either the types of rock used or of the different shapes selected, and indeed of any correlation between the two. Utilised pebbles are always found on occupation sites of the Roman peri-

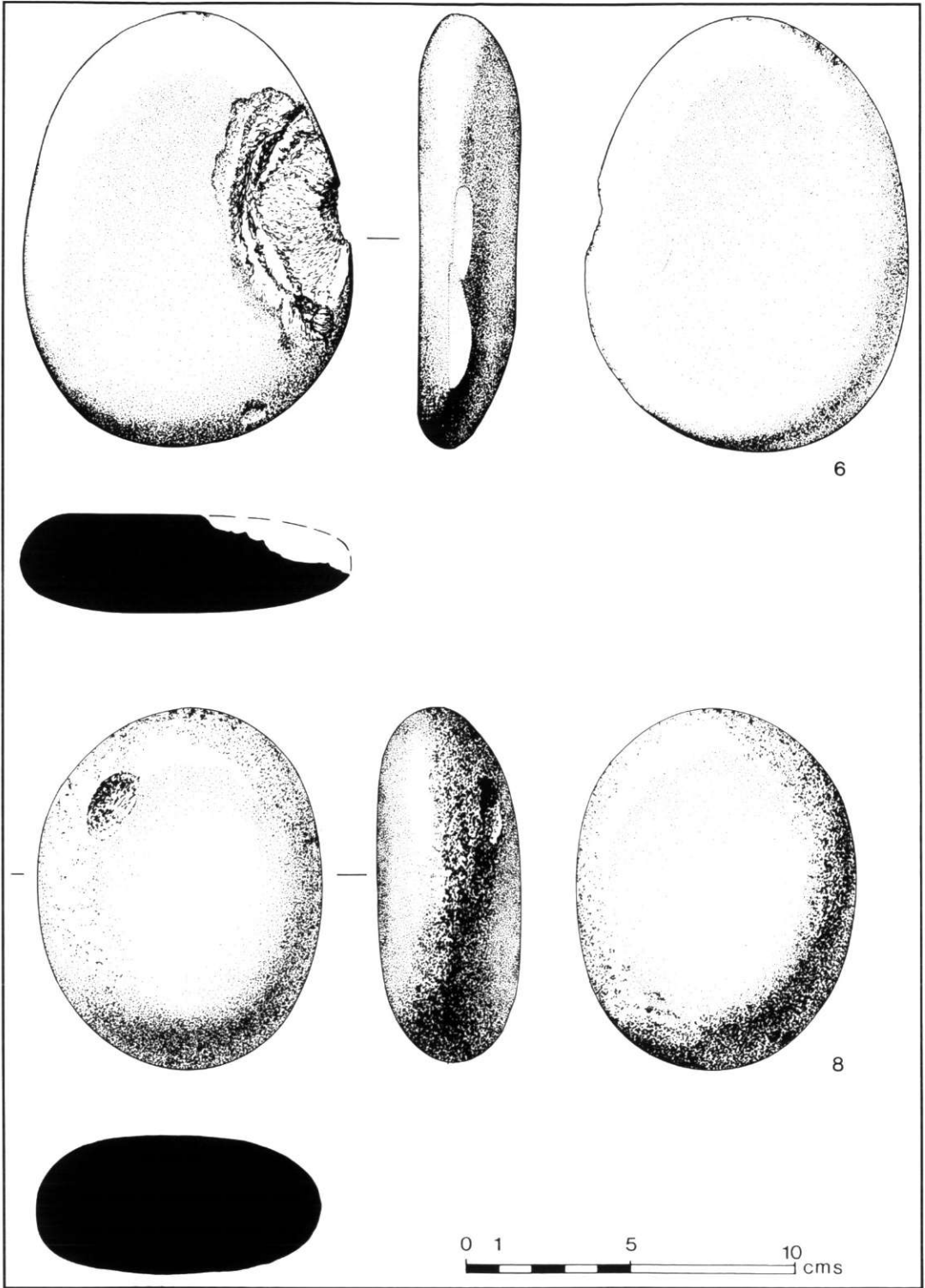


Fig 21
Reawla, stone objects: 6 and 8, utilised pebbles

od in Cornwall. At Reawla, some pebbles used may have come from the stream about 400 m to the north, others from the sea shore 4 km to the north-west in St Ives Bay or 9 km to the south-west in Mounts Bay. Four out of the seven illustrated, S9-12, Figs 20 and 22, come from midden [148], by far the largest rubbish deposit on the site.

One distinctive type has been identified (S6, S7, S10, S12, Figs 21 and 22). This has wear on both faces, one of which is slightly concave, one very worn, sometimes faceted, edge, and one end showing signs of battering. These come both from a Phase 2 pit 306 and the Phase 3 midden [148]. Their use is unknown, but their unusual wear pattern suggests connection with a single, as yet unidentified, activity.

S6 (SF No 698 from context [305], fill of pit [306] of probable 2nd century date). (Fig 21). Oval pebble, maximum dimensions 133 by 98 by 37 mm. Of fine to medium grained sandstone, probably from the Gramscatho Beds on the north Cornwall coast, which outcrop in the length of sea shore nearest to the site. Both flat surfaces worn almost to a gloss; one has a very slight concavity. One long edge worn to several flat and almost glossy facets. The opposite side has a rough scar which post-dates the flat surface wear, which is almost certainly deliberate, not casual damage; the edge of the scar is a little worn and its shape is well suited to provide a grip for intensive use of the other long edge. The narrower end of the pebble is roughened, as though by use as hammer or pounder; only the longer end appears to show the original pebble surface.

S7 (SF No 697, with joining unstratified SF No 16). (Fig 22). From the same context and of the same rock as S6. Part of narrow elongated pebble, maximum surviving dimensions 100 by 40 by 24 mm. Both flat edges worn, one to a slight concavity; both long edges worn, one to two distinct glossy facets. Some slight subsequent traces of use for hammering or some similar use. The similarity in the wear patterns between S6 and S7, from the same pit, is striking on pebbles of such different shape.

S8 (SF No 126 from context 49, related to midden deposit [12] in House C of probable late 3rd century date). (Fig 21). Oval pebble, maximum dimensions 110 by 89 by 37 mm. Coarse-grained intrusive greenstone, gabbroic in character, commonly occurring as beach pebbles between Marazion and Praa Sands. Both flat surfaces worn almost glossy, but not concave; the wear fades off around the sides which may show original pebble surface. One end shows slight traces of pecking. Modern damage scar.

S9 (SF No 535 from context [148], midden layer of c. AD 300 together with context [151]). (Fig 20). Oval pebble, maximum dimension 70 by 56 by 20 mm. Quartzite; Ordovician quartzite is common in the Roseland-Meneage Breccias which may occur offshore in Mount's Bay. Wear, in some places almost glossy, has flattened both sides, and runs evenly around one of the longer sides; the remainder of the edge has been little altered from the original pebble surface.

S10 (SF No 536, context as S9). (Fig 22). Elongated pebble, maximum dimensions 113 x 44 x 22 mm. Medium to coarse grained muddy sandstone (greywacke) veined with quartz, chlorite and iron oxide; typical of the Gramscatho Beds which outcrop on the coast near Hayle, the closest seashore to the site. Both long surfaces worn, one either to a concavity or following the shape of the pebble. Both long edges also worn, one to a flattish facet at right angles to the pebble face, the other at an acute angle to the face. One end used for pecking or hammering. The same wear pattern and complexity as S6 and S7.

S11 (SF No 534, context as S9). (Fig 22). Irregular elongated pebble, maximum dimensions 122 by 60 by 30 mm. Fine grained micaceous hornfels, probably from local Mylor slate. One edge worn, possibly even ground to a flat facet; the natural pebble shape provides a good hand-hold for using this facet. There is possible slight wear over the remainder of the surfaces, but not along the edges.

S12 (SF No 372, context [151] forms part of midden [148], context for S9-11). (Fig 22). Broken irregular elongated pebble, maximum surviving dimensions 137 by 38 by 45 mm. Fine to medium grained sandstone? Old Red Sandstone from offshore source found in raised beach and beach deposits. Fairly even wear over broad surfaces, one of which shows very slight concavity, and on one side; the other side shows the start of a very worn facet. The surviving end has been rough-flaked to a chisel-like edge which shows signs of battering.

Unstratified. Five examples (SF Nos 9, 10, 12, 13, 15) were retrieved. Some may derive from the extensive spread of midden [148], but in view of the disturbances which introduced medieval or later material into this and other contexts truncated by ploughsoil, they need not all be of roman period date. SF 10 and 14 come from the Gramscatho Beds, 9 is a fine grained greenstone, 12 elvan and 13 micaceous siltstone with traces of metamorphic spotting. They show various wear patterns but none are of the distinctive S6 type.

Other pebbles

A further 53 unworked small waterworn pebbles were recovered, 18 unstratified, the rest from a

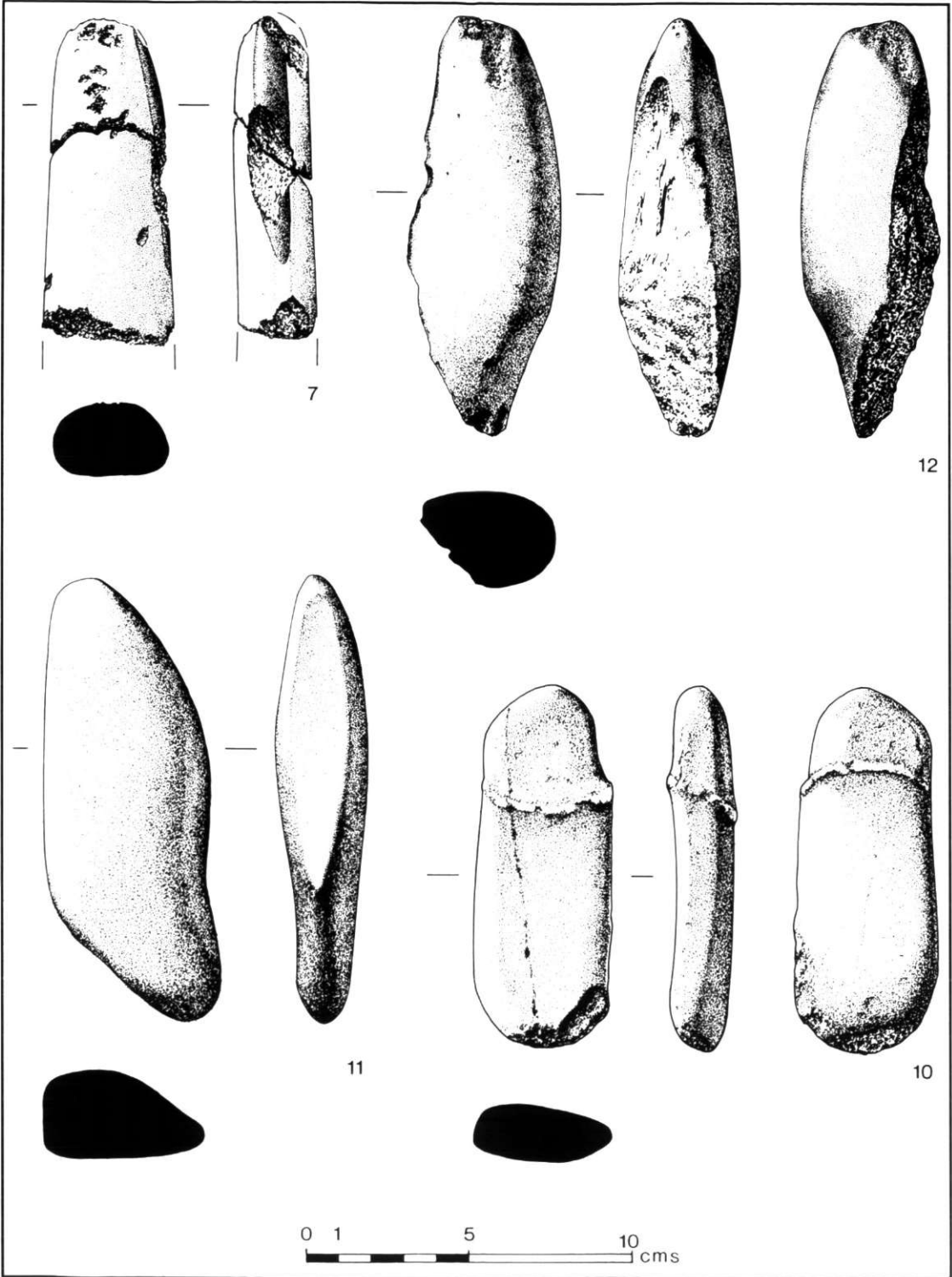


Fig 22
Reawla, stone objects: 7, 10-12, utilised pebbles

range of Phase 2 and 3 contexts. Most are oval or irregular and less than 30 x 20 mm. Of the 35 stratified examples 30 are quartz, seven flint and eight of other stones.

Flint

Three flint flakes were found in Roman period contexts, presumably residual from earlier prehistoric activity in the area (not illustrated). (SF nos. 254, 367, 370, respectively in midden [148], fill [152] in House A, and upper fill of Phase 1 gully [204].

The glass by Lesley and Roy Adkins

Roman

Three fragments of glass of Roman date were recovered, representing two vessels.

1. Blue glass bowl with abraded linear decoration (26 SF260 and 307 SF624). Figure 23:- Two adjoining rim fragments from a vessel with a slightly everted rim. The glass is dark blue at the rim (3 mm thick), but pale transparent blue at the thinnest point (1 mm) showing that the original vessel was transparent pale blue with a dark blue rim. The rim is rounded and thickened, and the outer surface and part of the top of the rim is lightly ground, producing a slightly matt effect, with five shallow horizontal abraded lines, each less than 0.5 mm wide. The inner surface is glossy with some irregular abrasions, probably caused by unintentional contact with a grinding wheel.

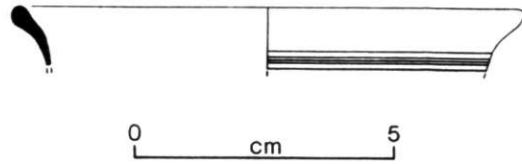


Fig 23
Reawla, blue glass bowl (Sf 260 and 624) from fill of House B. Drawn by L and R Adkins

These fragments are probably from a beaker, cup or bowl, but insufficient of the vessel survives to determine its exact form or date. The vessel which these fragments represent lies within a broad group of cups, bowls and beakers which were made from the late 1st century until at least the 3rd century A.D. This vessel is unusual in that it is coloured and has a rounded rim, whereas the majority of such vessels, and particularly the later ones, are made in colourless glass with rims cracked off and either ground smooth or left rough. The colour and quality of the glass of this vessel, together with its rounded rim, suggest that it lies within the first half of the date-range, perhaps dating to the late 1st or early 2nd centuries AD. (Pottery from this context is of 3rd century date; fill of House B).

2. Colourless glass vessel with abraded linear decoration (157)

A body fragment from a vessel in colourless glass with a pale green tinge. The glass is approximately 1.5 mm thick and both inner and outer surfaces are glossy. The fragment has one shallow horizontal line, just under 1 mm in width, made up of two adjoining abraded lines each less than 0.5 mm in width. The diameter of the surviving fragment is about 50 mm, but the diameter and size of the complete vessel from which it came is uncertain. The fragment is also too small to indicate the form of the vessel, which is most likely to be a cup or beaker. It is impossible to assign a precise date to the fragment, but from the colour and quality of the glass, a 2nd to 3rd century AD date is most likely. (The ceramic evidence suggests that the midden material represented by this context was deposited in the early 4th century; Phase 3).

Modern

Unstratified contexts produced a small fragment of flat glass (probably 20th century window glass), and a body fragment from a late 19th or early 20th century mineral water bottle.

The iron objects

A total of 78 iron objects were recovered. All were in a very corroded state. Twenty-one were identifiable on site, see Table 6 below; the remaining 57 were beyond recognition. Of these a representative sample of 21 pieces was sent to L. and R. Adkins for further study. Their report is appended below. Most of the firmly stratified objects came from the Phase 3 midden layers, but some were found in House B (Phase 2) or associated with the Phase 2 working area (see Appendix 3).

Table 6: Types of iron object

Nail	13	Stake/Peg	2
Stud	3	File	1
Bolt	2	Unidentified	57

The Ironwork by Lesley and Roy Adkins

None of the 21 pieces of iron examined could be precisely identified, and six pieces were completely unidentifiable. Seven other pieces (small find numbers 37, 145, 290, 365, 519, 670 and 701) are probably fragments of rods, and may be the remains of nail shafts. The remaining pieces are:

SF48 A rectangular-sectioned rod, possibly tapering. 230 mm long.

SF283 Possibly a fragment of a blade. 39 mm long, maximum width 23 mm.

SF396 A curved rod with rectangular section. 64 mm long.

SF513 Probably an oval-sectioned strip, broken in three pieces. Approx length 40 mm, width 18 mm.

SF531 Fragment of flat curved strip. Possibly a heavy binding, or cart fitting. 89 mm long, 46 mm wide; thickness 12 mm

SF633 Possibly part of a rectangular-sectioned strip or nail surrounded by corrosion. In several pieces. 49 mm long.

SF669 Fragment of iron, possibly with right-angled or curved section. Possibly part of a bucket handle, gouge or other object of similar shape. 57 mm long.

SF714 Rod. Possibly part of an implement such as a punch or a solid-handled chisel. 86 mm long.

All the pieces examined were badly corroded, and in the case of the unidentifiable pieces, little original iron was left within the corrosion. The authors are grateful to Ralph Jackson of the British Museum for his comments on some of the pieces.

See Appendix 2 for the contexts of the iron objects.

Slag and other technological finds by Justine Bayley, Ancient Monuments Laboratory

Some of the finds examined were slags of types that could be associated with specific processes such as iron smithing, while others were non-specific and could have formed in any high temperature fire. As both types were found together it is likely that most, if not all, were produced in a blacksmith's hearth. The identifications of the individual samples are given in Table 7; the names used have the following meanings:

Smithing slag - iron silicate slag with no specific shape that formed in a blacksmith's hearth.

Hearth bottom - a plano-convex "bun" of smithing slag which derives its shape from the base of the hearth in which it collected.

Fuel ash slag - an alkali silicate slag formed by the reaction of silicate materials (clay, sand or stone) with ash from the fuel in a fire at sufficiently high temperature.

Hearth lining - the clay lining to a hearth that has acquired a vitrified (fuel ash slag) surface from contact with the fire.

Tuyère block - a roughly rectangular block of clay with a perforation (tuyère) where the air blast from a pair of bellows was introduced into the fire. The block was built into the side of the hearth as a replaceable section as the temperature was highest and thus the vitrification most severe in this region.

Ironstone - natural stone that is rich in iron. It could be considered as an ore, though there is no other evidence of smelting so its presence is likely to be accidental.

Iron object - piece of deeply corroded metallic iron.

The total weight of material examined was under 3 kg, and about half of this comprised vitrified clay tuyère block fragments. This is not much on a settlement of this date, but as only a small fraction of the round was excavated there may well be more substantial deposits of slag in the unexcavated areas. The distribution of slag in the excavated area is not likely to help in identifying where metal working was carried out as most of the finds had been deliberately discarded; the bulk of the slag came from Phase 3 midden layers though some was from Phase 2 contexts. The slag that was found suggests blacksmithing. The scale and duration of this activity is unknowable because of the uncertainties already mentioned; if the material recovered was all that existed it could only be interpreted as representing small-scale or intermittent working.

The tuyère blocks are unusual finds, though not unique. The larger fragment (from context 162) has traces of the perforation surviving, suggesting its dimensions when complete were about 250 x 150 x 70mm. It is made of a very poorly sorted fabric which has not cohered well and gives the impression of not being well fired, except near the vitrified surface.

In addition to the slag, a considerable amount of fired clay was submitted for examination. Most were shapeless lumps, lacking any original surfaces. There was nothing which specifically associated any of them with the metal working.

Table 7: List of identified samples

(See Appendix 3 for details of the contexts)

<i>Context</i>	<i>Finds No</i>	<i>Identification</i>	<i>Weight (gm)</i>
u/s	6	smithing slag	50
		hearth bottom 95 x 55 x 50	220
		ironstone	
1	616	smithing slag	20
	103	ironstone	
	105	smithing slag	75
	529	ironstone?	
	614	smithing slag	
12	533	fuel ash slag	
19	635	fuel ash slag & iron object	25
	636	iron object	50
23	620	smithing slag	40
	637	smithing slag?	
26	258	smithing slag	50
30	130	fuel ash slag	
148	197	smithing slag	80
	207	iron object	
	215	smithing slag? (dense)	40
	619	smithing slag, fired clay and two iron objects	30
157	671	fuel ash slag	
158	343	fuel ash slag	
	402	fuel ash slag	
	405	fuel ash slag	
	408	fuel ash slag	30
	409	fuel ash slag	
	410	iron object	
	411	fuel ash slag	
	413	smithing slag	50
	414	smithing slag	30
	423	smithing slag	
	514	hearth bottom 50 x 45 x 10	70
	668	iron object	
	676	iron object	
	677	iron object	
	679	hearth bottom 70 x 45 x 10	80
162	424	tuyère block fragment	c.1000
168	262	smithing slag	20
	270	iron object	
	272	fuel ash slag	
	273	hearth bottom 100 x 65 x 25	150
	274	fuel ash slag/hearth lining	
	422	fuel ash slag	30
	530	fired clay	
180	361	tuyère block fragment	180
211	683	iron objects	
277	684	smithing slag	25
	685	smithing slag? (dense)	
288	682	ironstone	30
296	680	hearth bottom 105 x 60 x 40	240
314	702	ironstone?	
320	686	smithing slag	
349	703	fuel ash slag	

Where no weight was given, the amount was under 20 gm. Hearth bottom dimensions are major x minor diameter x depth in mm.

Boxed together with the slags were a number of metal objects. All were analysed qualitatively by X-ray fluorescence; the results are given in Table 8. The brass fitting is almost certainly modern.

Table 8: List of analysed metal artefacts

<i>Finds No</i>	<i>Object</i>	<i>Elements detected</i>	<i>Metal</i>
36	tack	Cu (Pb Sn)	copper
50	fitting	Cu Zn (Pb)	brass
251	fragments	Cu Sn Zn Pb	bronze
589	ingot	Pb	lead
615	rod/wire	Cu Sn	bronze
643	sheet fragment	Pb	lead

Note: Elements written within brackets only gave very weak signals; they are probably only present at a few percent or so. Cu = copper, Pb = lead, Zn = zinc, Sn = tin

Note: the lead ingot is temporarily unavailable for study but will be the subject of a short note in due course.

General discussion and summary

Excavation has confirmed the site's classification as a univallate settlement enclosure or 'round', and that the main period of occupation for which we have evidence is from the 2nd to early 4th centuries AD. The limited extent of the excavation has meant that questions about the overall layout and character of the site could not be tackled. This underlines the importance of more complete excavation of rounds and until there are many more examples where the interior has been totally excavated, to set alongside Trethurgy, the only example at present, there will not be a sound base for understanding the nature of this class.

It is characteristic of rounds that datable finds directly associated with the use of particular contexts tend to be rare; instead, the material comes mostly from middens filling ditches and abandoned houses (Quinnell, 1986, 126). This is true at Reawla where the site appears to have been kept very clean whilst in use. The problem of closely dating the phases is exacerbated when, as is generally the case, the pottery is only attributable to centuries. We know from the excavated evidence that part of the site was abandoned by the end of the 3rd century and used as a midden whilst other parts remained in occupation. This makes it difficult to know how far the excavated area was representative of the sequence on the site as a whole, and means that some aspects of the dating evidence cannot be firmly resolved: whether there was continuity of occupation from Iron Age to Roman period, whether the occupation continued later than is suggested by the ceramic evidence (as the radiocarbon dates might, doubtfully, hint), and the dating of the defences.

Neither defence has close dating evidence, though from the stratigraphic evidence it seems reasonable to conclude that the larger outer defence replaced the smaller inner one; the inner ditch was out of use by some time in the 2nd century AD, the outer rampart was constructed at some time during the Roman period. Whilst the site may have been left undefended it is more likely that the deliberate levelling of the inner rampart by the 2nd century coincided with the construction of the outer rampart. Although there were few Iron Age finds the evidence allows the possibility that the inner ditch is Iron Age rather than Romano-British, but as the inner ditch was kept cleaned out until backfilled, a Roman date, presumably at the beginning of the 2nd century, is thought more likely. The occupation of the relatively small Phase 1 enclosure may therefore have been shortlived before the drastic remodelling of the settlement as the much larger and more strongly defensive Phase 2 enclosure. This activity, presumably in the 2nd century, may be part of a regional trend as several excavated rounds were established at around this time (Quinnell, 1986, 124).

The position of the entrances was not certainly established, though the power augur survey picked up a likely entrance gap on the south-east of the Phase 1 enclosure. This survey, together with the watching brief and magnetometer survey, also suggested that the Phase 1 'defences' may have been more complex than appears at first, with the probability of an outwork or annexe attached to the south-east of the Phase 1 enclosure, defined by a sizeable ditch.

The Phase 1 and Phase 2 defences are quite different in scale though both fall within the range

encountered at other rounds. At 1.6 m deep the first ditch, scarcely of defensible proportions, is comparable to Threemilestone, Shortlanesend, Trethurgy and Goldherring (all around 1.5 m deep; Schwieso, 1976; Harris, 1980; Miles and Miles 1973; Guthrie, 1969) whilst the second ditch, 2.3 m deep, is similar to both ditches at Trevisker but smaller than the Iron Age ditch at Castle Gotha (3.6 m) and the Romano-British ditch at Grambla (3.0 m) (ApSimon and Greenfield, 1972; Saunders and Harris, 1982; Saunders, 1972). The difference in scale of the two enclosures is clear both from the tripling of the area and from the very substantial increase of the defensive capability of the ditch and rampart. This can also be expressed in terms of the volume dug out to create the ditches, approximately 360 m³ for the first and 1590 m³ for the second, a very different level in the investment of resources. The stratigraphy of the second ditch shows that it was kept cleaned out and the nature of the soil is very slippery, so much so that during archaeological excavation a rope had to be used for excavators to climb out of the section. The height difference from the bottom of the ditch to the top of the palisade (assuming there to have been one) could have been over 6 m (20 feet), making this a considerable defensive structure.

The purpose behind this change in scale is open to speculation but is most probably to do with the site's status, particularly as little use seems to have been made of all the extra land enclosed. This area may have been kept deliberately free from occupation for use as an occasional corral or for other activities which have left no archaeological trace; or alternatively the scale at which the round was rebuilt may symbolise the status of the site and its occupants, rather than their needs in terms of available space.

Too few sites have been extensively excavated to allow us to talk confidently about the status of individual rounds but the investment of labour involved in the construction of the Phase 2 defences may imply a relatively high status. This is supported by the character of the early 4th century midden, which contained a high proportion of non-local wares. Whether the survival of a folk memory led to the coining of the place-name Reawla (thought to be Norman French, 'Royal Place') is impossible to tell. The role and status of Reawla could have been influenced by its position on an important highway. This road, running down the spine of west Cornwall, may have been in use both in the medieval period (Thomas 1967, 18) and earlier, as the general line is marked by a Roman 'milestone' to the east at Gwenap and another to the west at St Hilary. Nevertheless it is doubtful whether Reawla had anything like the status of Carvossa, Probus, where the scale of the site, the range of finds and the evidence for extramural settlement, allows for its interpretation as an important centre for trade and administration (Quinnell, 1986, 122; Carlyon, 1987; Bartlett, 1980).

Apart from the indications of high status the internal organisation of the settlement, its economy and outside contacts appear to be consistent with other rounds. Analysis of the charred plant remains has given an insight into land use in the area. The site was presumably set within its own arable fields, producing wheat (both emmer and spelt), barley and perhaps oats (whether wild or cultivated is uncertain). Weeds found at Reawla, types normally associated with arable land, were presumably brought in with these crops. The charred remains of the wheat may represent a later stage in the cleaning process, conceivably implying that the grain was taken to Reawla after initial processing elsewhere. This might accord with the site's proposed high status, but the sample is too small to be conclusive.

Sloe, hazel and blackberry, also found at Reawla, could have come from nearby areas of scrub or from hedgerows dividing the fields; their presence shows how the area's natural resources were also harvested, as one would expect. Particularly interesting is the presence of a heathland assemblage, including gorse and heather. Charred gorse spines concentrated around oven/kiln [365] in the working area may result from the use of a quick burning fuel in a process requiring bursts of heat. The gorse and heather may have been brought in as fuel and bedding from more acidic uplands, perhaps from the Carnmenellis granite 5 km to the east or from more local areas of downland such as Gwinear Downs 1.5 km to the south or Howe Downs 1.5 km to the south-east. As well as its cultivated fields one would expect the settlement to have access to areas of pasture and rough grazing, including summer pastures. Animal bones did not survive in the relatively acid soils at Reawla but spindle whorls suggest that sheep were kept for their wool, though presumably for their milk and meat as well.

The finds at Reawla reflect a network of contacts in Roman period Cornwall. Some materials would have been collected locally, in particular the stones from sources within 2 km. Simple beach pebbles from St Ives Bay or Mounts Bay, being such commonplace objects, may also have been introduced direct from source rather than by exchange. If so, then we can take it that the seashore would have fallen within the circle of activity of the settlement's inhabitants. Little is known about the process of trade, marketing and exchange in Cornwall at this date but finds from outside the immediate locality presumably came to Reawla indirectly via one or more marketing centres. These include a rotary quern prob-

ably from Tregonning Hill, gabbroic pottery from the Lizard, pottery from Dorset, Devon and Oxfordshire and a spindle whorl of Kimmeridge shale from Dorset.

In societies at a similar developmental level to that evident at Reawla, (subsistence farming with a small surplus), the author has observed journeys on foot of up to a fortnight in order to replace a single item of particular value, though maximum use was made of these journeys to trade and to visit relatives along the way. So it is not impossible that all the items made within the tribal area of the Dumnonii represented in this assemblage were picked up by direct trade at the point of manufacture.

The three probable Phase 2 houses, A, B and C, provided only limited structural evidence as they only partly fell within the excavated area. Houses B and C could be contemporary, both 3rd century AD, but House A was earlier, filling with a midden from the 2nd century onwards. All were defined by shallow hollows, rather like the houses levelled or hollowed into the ground at Shortlanesend and Castle Gotha. Like those houses there was little direct evidence for how the superstructure was supported. House B, the most extensively excavated, contained a sequence of hearths and an oven, though not the pairing of hearth and hearth pit noted at Trethurgy (Quinnell, 1986, 126). This house had been defined by a stone wall but is most notable for its unusual and elaborate porch structure. The earlier ring gully of Phase 1, contemporary with the first defence, is a structure of quite different character, suggesting a different tradition of house building. Curving gullies identified on a number of Cornish Iron Age and Roman period sites have usually been interpreted as defining houses, but sometimes as stock enclosures. Although interpreted here as a house site (House D) the evidence for superstructure and internal features could not be found; it remains quite possible that the gully defines an enclosure used for other functions.

In use at the same time as houses A, B and C (2nd-3rd centuries AD) and only a short distance from them, was the well defined working area, covering around 6 x 6 m and focusing successively, in three sub-phases, on a hearth, an oven or kiln, and a stone-built pad, each with associated pits and post-holes of uncertain function. Slags, hearth bottoms and tuyère blocks dumped in the vicinity are evidence for smithing. This is not major industrial activity, rather small scale smithing consistent with the needs of a farming settlement. Such activity is not unusual at rounds, evidence for smithing on a similar or smaller scale having been found at Shortlanesend, Castle Gotha, Grambla, Trevisker and Goldherring. The distinctive character of Carvossa may be reflected by the much larger quantities of slag, some 36 kg. The iron objects found at Reawla were presumably a product of this smithing. These were a relatively common find (78 pieces), suggesting the general use of iron equipment. Their poor condition has made them mostly unidentifiable but they include nails and rods, a possible blade, a possible punch or chisel, and a bucket handle or gouge. The lead ingot is also likely to reflect small scale workshop activity, and shows the marks where small pieces were cut off as necessary. How such an object came to be discarded is hard to imagine. What is not known is whether the ingot was brought to Reawla via the exchange processes mentioned above, from an area such as the Mendips, the nearest major source known to have been exploited in the Roman period, or whether it came from a more local Cornish source. Copper and tin mines are common in this area. The nearest, Relistian Mine at Wall, 500 m north-east of Reawla (at SW 606 367), an ancient mine recorded by 1502, is known to have produced lead, though in small quantities compared to other ores (CAU Sites and Monuments Record). Further study of the ingot (for example uranium isotope analysis - A. Sharpe pers. comm.) is recommended to identify its source. Although other minerals could also have been exploited in this area, for example alluvial deposits of tin ore 600 m to the east-north-east (SW 610 366; CAU Sites and Monuments Record), nothing was found in the excavation to support such an hypothesis. There are however other finds reflecting minor industrial activity on the site, fragments of coarse pot similar to briquetage (P24, P28), a coarse pottery lid (P39), a stone weight and the utilised stones, presumably used for such purposes as food processing and leather and cloth finishing. On close examination four of the stones were found to share distinctive wear patterns, suggesting they were all used for the same activity.

In conjunction with the various surveys and analyses the excavation has provided a general impression of the character and classification of the site, its date and development, its status and economy. In the long term we can also expect that more complete excavation elsewhere will allow further insights into the results from Reawla, both in terms of interpreting the features falling both partly and wholly within the limited excavated area, and also in giving a better understanding of their likely context bearing in mind the limited picture available of the site's overall internal organisation and development. We may therefore conclude by saying once more that a considerable number of rounds, covering a full range of size, type and distribution, should be totally excavated before we can expect to have more than

a superficial understanding of what they were, how they worked, and their social and economic context.

Acknowledgements

Nic Appleton-Fox: The excavation and publication of this report were funded by English Heritage. Permission to excavate the site and use of a mechanical digger to remove the topsoil were provided by Farkestral Ltd. The excavations were supervised by Patrick O'Hara and Andrew Young with helpful advice from Dermot Bond. Work on the finds was supervised by Tricia Fox. I would like to thank the residents of Reawla and Wall, particularly our neighbour Dr Gendall, for their kindness and generosity in providing the dig house with some of life's comforts. Also all the members of the team, Society members and others, for their efforts. Finally I would like to thank both Henrietta Quinnell and Peter Rose for their help and advice and also their patience in the production of this report.

Henrietta Quinnell: I would thank Dr D.F. Williams for providing the petrological examination and Neil Holbrook for discussion of the non-Cornish fabrics, and most especially Rosemary Robertson for her drawings. Thanks also go to A.J.J. Goode of the British Geological Survey for providing geological identification of stone artefacts.

Appendix 1 Charred plant macrofossils: contexts

	<i>Contexts with macrofossils</i>	<i>Contexts without macrofossils</i>	<i>No. of macrofossils</i>	<i>Total litres soil (approx)</i>	<i>Litres soil with macros</i>
<i>Pits</i>	10	3	141	85	65
<i>Hearths</i>	8	1	40	60	55
<i>Layers</i>	7	3	56	105	85
<i>Posthole</i>	1	2	2	15	5
<i>Gully</i>	0	1	0	10	0

Contexts

- Layers [148], [151], [158], [216]: midden, Phase 3
- Layer [251]: over and around pit [298], associated with hearth [365], Subphase 2.2
- Layer [254]: top fill of pit [238], probably same as [151]; midden, Phase 3
- Layer [274]: associated with hearth [365] and sealing hearth [368]/[369]; Subphase 2.2
- Pit fill [233]: pit [232], clay lined; Subphase 2.2
- Pit fill [240]: upper fill of pit [279]; Subphase 2.2
- Pit fill [277]: pit [278]
- Pit fill [305]: pit [306], cutting gully [308]; Phase 2
- Pit fill [319]: upper fill of pit [318] near hearths in House B, Phase 2
- Pit fill [320]: lower fill of pit [318]
- Pit fill [352]: upper fill of pit [298], perhaps cleanings from hearth [365]; Subphase 2.2
- Pit fill [364]: lower fill of pit [298] (separated from [352] by clay re-lining)
- Pit fill [393]: pit [238], one of four rectangular pits; Subphase 2.2
- Hearth fill [208]: hearth [430]; Subphase 2.3
- Hearth fill [285]: in pit containing hearth [365]; Subphase 2.2-3
- Hearth fill [317]: fill of hearth [324] in House B; Phase 2
- Hearth fill [333]: hearth [334], in House B; Phase 2
- Hearth fill [335]: hearth [336], in House B; Phase 2
- Hearth fill [367], [372]: fills of hearth [368]/[369]; Subphase 2.1
- Post-hole fill [450]: post-hole [451]; Subphase 2.2

Appendix 2 Ironwork: contexts

SF37	Context [19]:	layer on lip of ditch [5], rampart material?
SF48	Context [39]:	from trench through Post-Medieval pits, on lip of ditch [5]
SF106	Context [26]:	upper fill of House B
SF 131	Context [49]:	fill of gully [9], working area Phase 2
SF145	Context [1]:	upper midden layer, Phase 3
SF146	Context [1]:	upper midden layer, Phase 3
SF263	Context [168]:	midden layer, Phase 3
SF283	Context [211]:	fill of pit [432], Phase 2 or 3
SF290	Context [211]:	as above
SF365	Context [169]:	midden layer, Phase 3
SF396	Context [182]:	layer over gravelled entrance to House B
SF513	Context [158]:	midden layer, Phase 3
SF517	Context [211]:	see SF283
SF519	Context [158]:	see SF513
SF531	Context [139]:	pit fill from Post-Medieval pits
SF633	Context [316]:	occupation level in House B
SF669	Context [180]:	layer above subsoil, Phase 2?
SF670	Context [180]:	as above
SF675	Context [211]:	see SF283
SF701	Context [262]:	fill of pit [278], working area Subphase 2.3
SF714	Context [317]:	upper fill of oven [324] in House B

Appendix 3 Technological samples: contexts

[1]:	midden layer over working area
[12]:	fill of House C; Phase 2 or 3
[19]:	layer on lip of ditch [5], rampart material, residual finds?
[23]:	midden layer in House A; Phase 3
[26]:	layer over part of House B
[30]:	fill of post-medieval pit[60]
[148], [157], [158]	midden layers; Phase 3
[162]:	backfill layer in inner ditch [41]; Subphase 2.1?
[168]:	midden layer; Phase 3
[180]:	layer, over part of working area; Phase 2
[211]:	fill, silting in ?pit [432]; Subphase 2.3
[277]:	fill of pit [278]; Subphase 2.3
[288]:	fill of 287, part of ring gully 3, Phase 1
[296]:	fill of post-hole [393]
[314]:	pit, N edge of House B
[320]:	fill of pit [318], near hearths in House B; Phase 3
[349]:	fill of pit [350] in House B; Phase 2

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Two Stone Axes From St. Buryan, West Penwith

JACQUELINE A. NOWAKOWSKI

During the autumn of 1989 two stone axes were found by Peter Pearman and the author while fieldwalking a ploughed field on Pridden Farm (SW41102657) which lies immediately to the north-east of St. Buryan Churchtown. Their discovery adds to an impressive collection of similar Neolithic finds from West Penwith.

The larger of the two items is a hefty greenstone axe 177 mm long and 75 mm wide at its blade end (Fig 1a). At its narrowest (butt) end, which is 53 mm wide, it is badly fractured. One face is very smooth and sports a hardened polished surface which has been slightly scuffed by a plough whereas the other face is roughly chipped and fractured and although it too has suffered some plough damage, this surface would appear to be unfinished. The find probably represents an axe roughout, presumably from a beach boulder source, accounting probably for the polished side.

The smaller item is a neatly fashioned complete stone axe (Fig 1b). This measures 110 mm long, is 62 mm wide at its partly chipped blade end and 30 mm at its rounded butt end. It weighs just over 8 oz (250 g) and is symmetrical in shape. One face is smooth and polished while the other is of rough texture caused perhaps through exposure and weathering. Unlike the larger find, this is a finished item and in section it is neatly proportioned.

Both artefacts were found within 25 metres of one another and their chance discovery is characteristic of that of many similar Neolithic axes found in West Cornwall throughout this century. There were no obvious surface features of a disturbed site at this location. Other stone axe discoveries in the St Buryan area include two from Boscarne and one from Trevider (Russell 1971, 93). These axes were, however, found in a locality within the St Buryan area which houses a particular concentration of late Neolithic and Early Bronze Age ceremonial stone circles, burial monuments and menhirs (Barnatt 1982, esp fig 8.2). This area has long been regarded as one of landscape significance in terms of ceremonial sites.

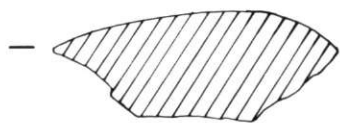
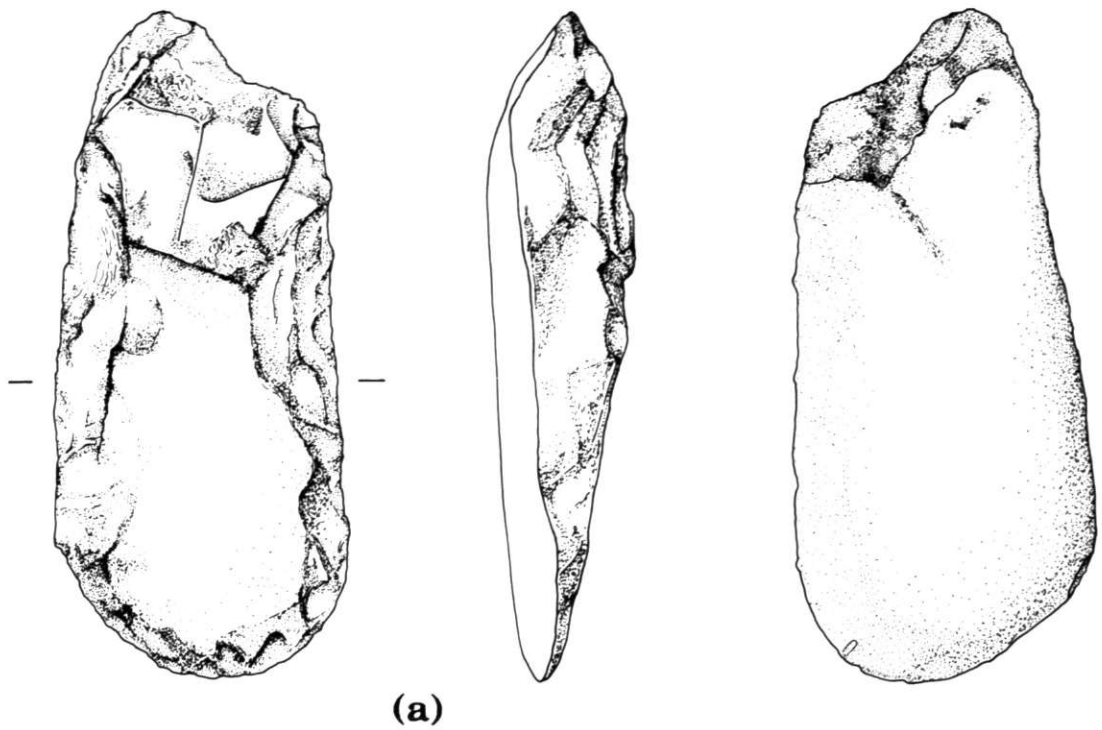
The original contexts of a large proportion of stone axes from West Cornwall are, unfortunately, unknown, so that many listed in the Sites and Monuments Record are no more than isolated discoveries reported by fieldwalkers throughout the nineteenth and twentieth centuries. To date there have only been a few instances where more information about primary contexts exists. Examples of this rather small group include the discovery of an axe from the now unlocated chambered tomb once known as the Giant's Grave (Russell 1971, 11). Another axe was found with a cremation burial on Trink Farm in Lelant (Thomas 1955, 169); others were associated with barrows on Tregeseal Common in St Just (Russell 1971, 93). These examples would seem to link axes to burial sites, although it is clear from a group of stone axes found during excavations of the neolithic settlement on Carn Brea in the 1970s (Mercer 1981, 153-158) that an association with funerary monuments is by no means exclusive. These cases are, however, exceptional making the task of understanding the patterning behind a wide and scattered distribution of such artefacts across the peninsula problematic.

The smaller axe is in the possession of the author while the larger rests in the hands of its finder, Mr Peter Pearman of Churchtown House, Boskenna, Lane, St. Buryan. Thanks go to Peter Pearman for his permission to publish his find and to the farmer at Pridden Farm for access to fieldwalk his field.

Crowlas, Ludgvan, Penzance.

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0 cm 10

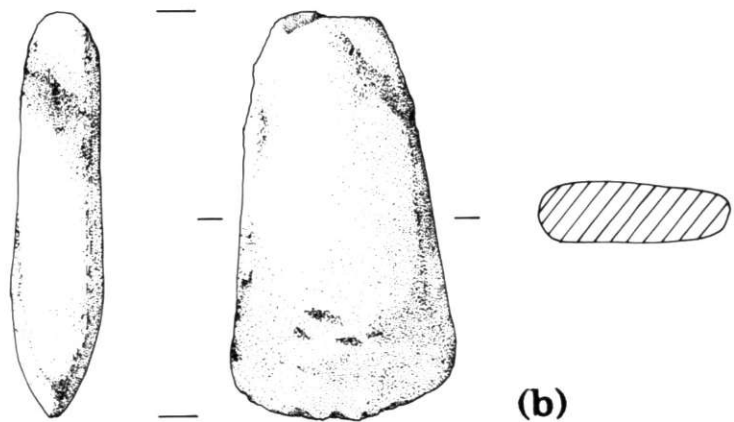


Fig 1
Two stone axes from St Buryan

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A new palstave from St Keverne

STEVE HARTGROVES

A fine Middle Bronze-Age palstave has recently been discovered during building and landscaping work at Pengarrook Farm, near St Keverne on the Lizard. The landowner, Mr Crabb, discovered the axehead lying on the ground at the foot of a hedge close by the farmhouse, near to a spoil-heap resulting from recent landscaping.

Although obviously out of context when found, the circumstances of the discovery indicate that the palstave was originally either in or under the hedge, which in this area is a stone-faced bank revetting a two-metre drop down to the house from the field above.

Given the possibility that the palstave might have been part of a hoard of artefacts, Margaret Hunt, the local CAS Area Correspondent, arranged for the site to be inspected by metal-detector, the hardware and expertise being supplied by another CAS member, Mr Ron Caddy. Although a large area was examined in this way, the search unfortunately proved fruitless.

The palstave is a high-flanged, broad-bladed type with a central rib and stop, and measures 16 cms in length (6½ inches) (Fig. 1). It is a south-western variant of the 'Taunton' phase of the Middle Bronze-Age and should be dated to around 1400-1200 BC.

Axes and palstaves of Bronze-Age date are reasonably common from Cornwall, though few finds have more than a vague indication of their exact provenance and circumstances of discovery. The distribution of finds is most dense towards the west of the county though they are recorded from most areas, and certainly occur on the Lizard, for example, around the Helford river at Mawnan and Gillan, and an axe mould was recovered from the Bronze-Age phase of the settlement site at Kynance Gate.

Although no close parallels to the present type have been recorded on the Lizard, a Middle Bronze-Age unlooped palstave similar to the present example was found in 1909 in Veryan and presented to Truro Museum (Bousfield, 1952,147), and others of Middle Bronze-Age date are recorded from Gerrans also on the Roseland, (Bousfield, as above).

The provenance of axes is quite varied; they are often found in barrows, one is recorded from a pool in St Columb parish, (this perhaps being a ritual deposit), there are records of finds from a streamworks in the Carnon Valley, as hoards, as at St Mawgan in Pydar, and as surface finds. They can occur singly, or in groups of two or three, and often with other artefacts, particularly spearheads.

Given the lack of evidence for Bronze-Age activity at Pengarrook, and the good condition of

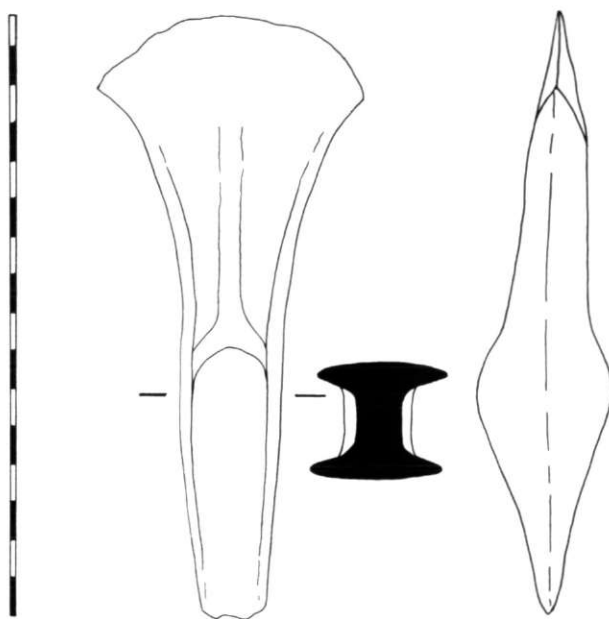


Fig 1
Palstave from St Keverne. Scale of centimetres

the axe, the present find would appear to be a solitary object, either lost or deliberately buried in antiquity. The axe remains in the possession of Mr Crabb.

Reference

Bousefield, P. 1952, 'Late Bronze Age burial at St Just in Roseland' *Journal Royal Institute of Cornwall*, NS1, part 2, 130-148

The Porthcollum project; interim statement

JIM NAVIN

Porthcollum is a small settlement on the north bank of the river Hayle, in the district of Penwith, about one and a half miles from the village of St Erth and six miles from Penzance. It was first documented in 1317. Excavation began in April 1989 in an attempt to date the remains of an 'ancient chapel', documented in the fifteenth century, shown on the OS map at SW 5584 3361, and mentioned in local records. The remains proved to be those of a medieval dovecote, which the available evidence suggested was in existence by the 13th century.

The dry summers of 1990 and 1991 produced crop marks in a field adjacent to the dovecote and in 1991 these were investigated. Two exploratory trenches were dug, 1.5 m wide by 30 m and 20 m long respectively. These revealed a series of gullies or ditches, the purpose of which remains uncertain, possible building trenches, masonry rubble, cob mortar, and other building features. The largest of the gullies or ditches extended to a depth of up to 2 m and contained within its infill quantities of bar-lug, grass-marked, grass-tempered and possibly gabbroic pottery. Preliminary pottery dating would suggest that there was a settlement at Porthcollum by the 8th century AD and possibly earlier. Excavation also produced a pottery sequence from this date down to the 20th century, suggesting continuous occupation. Above all these features and lying below the modern plough-soil was a buried medieval or early modern plough soil containing marks usually associated with an ard or light plough.

Work at the site also produced a number of flints and hammer and polishing stones, possibly indicating a period of prehistoric occupation. Other artefactual evidence included a number of pieces of quern-stone, a substantial amount of worked stone of a geological type not native to the immediate area, a small amount of slag, and a number of metal objects, most of which await identification.

As a result of the 1991 excavation and at the request of the Cornwall Archaeological Unit, a geophysical survey was carried out by the Ancient Monuments Laboratory. This revealed a complex arrangement of ditches or gullies, possible building remains, and a series of large pits within the area in which exploratory excavations had been carried out. The survey also revealed a large rectangular feature, with associated smaller rectangle, to the west of the present excavation, and an elliptical positive feature in the area where the flints had been found.

Work in 1992 consisted of an open area excavation covering some of the features revealed by the 1991 field work and the geophysical survey. The features included gullies or ditches of varying depths, with further pottery evidence suggesting that some of them had been dug by the 8th or 9th century. Adverse weather in August and September 1992 prevented completion of this phase of the excavation, but evidence of several buildings was found.

Porthcollum is one of a possibly large number of early medieval settlements in lowland Cornwall that have so far been largely ignored: little is known of their archaeological potential. With this in mind excavation will continue in 1993.

In 1992 a trial excavation was also conducted in the area of the two rectangular features revealed by the geophysical survey. This also produced building features and some early medieval pottery; the area may be excavated more extensively in the future.

Acknowledgements.

The Porthcollum project would like to thank many people for their support but especially the Rev Tony Neal and the parishioners of St Erth; Dr Robert Higham and the Hen Domen excavation; Exeter University, in particular Mike Rouillard, Sean Goddard, Dr Valerie Maxfield and Professor Malcolm Todd; the Fox Lawrence Fund of Exeter University; Louise and Simon Hall of the Star Inn, St Erth; Anne and Dennis Seager, Carol and Bill Lanyan and Ian and Rosemary Swith-

enbank from Porthcollum; the Cornwall Archaeological Unit, especially Peter Rose; Sir John Nott; Richard Jones, John Saunders, Tom Holmes and Chris Hatton for their supervisory help on site; all the students and other volunteers who worked at Porthcollum; Bookers Cash and Carry, Hayle; Neil Linford of the Ancient Monuments Laboratory, Sally Navin of Exeter University for her work as finds officer and for her catering, organisational and administrative skills; and most of all Mr and Mrs Trevor Rodda, the owners of the site, without whose help and cooperation the excavation would not be taking place.

Department of History and Archaeology, University of Exeter

Tintagel Churchyard Excavations 1991

JACQUELINE A. NOWAKOWSKI
CHARLES THOMAS

A six-week programme of excavation at Tintagel Churchyard came to a successful end in glorious sunshine on May 10th 1991. This work followed an exploratory season the previous year when the discovery of Early Christian graves confirmed long-held suspicions as to the antiquity of Tintagel Churchyard as an ancient burial ground (Nowakowski and Thomas 1990). The 1990 excavations had in addition provided evidence which linked the churchyard to the post-Roman settlement on nearby Tintagel Island (Morris, Nowakowski and Thomas 1990). The main aims of the 1991 season were a further exploration of the character of the Early Christian burial ground as well the clarification of the chronological sequence and the initial interpretations outlined during the first excavation.

Over the past two years, work has centred on the excavation of Mound C - one of several grass-

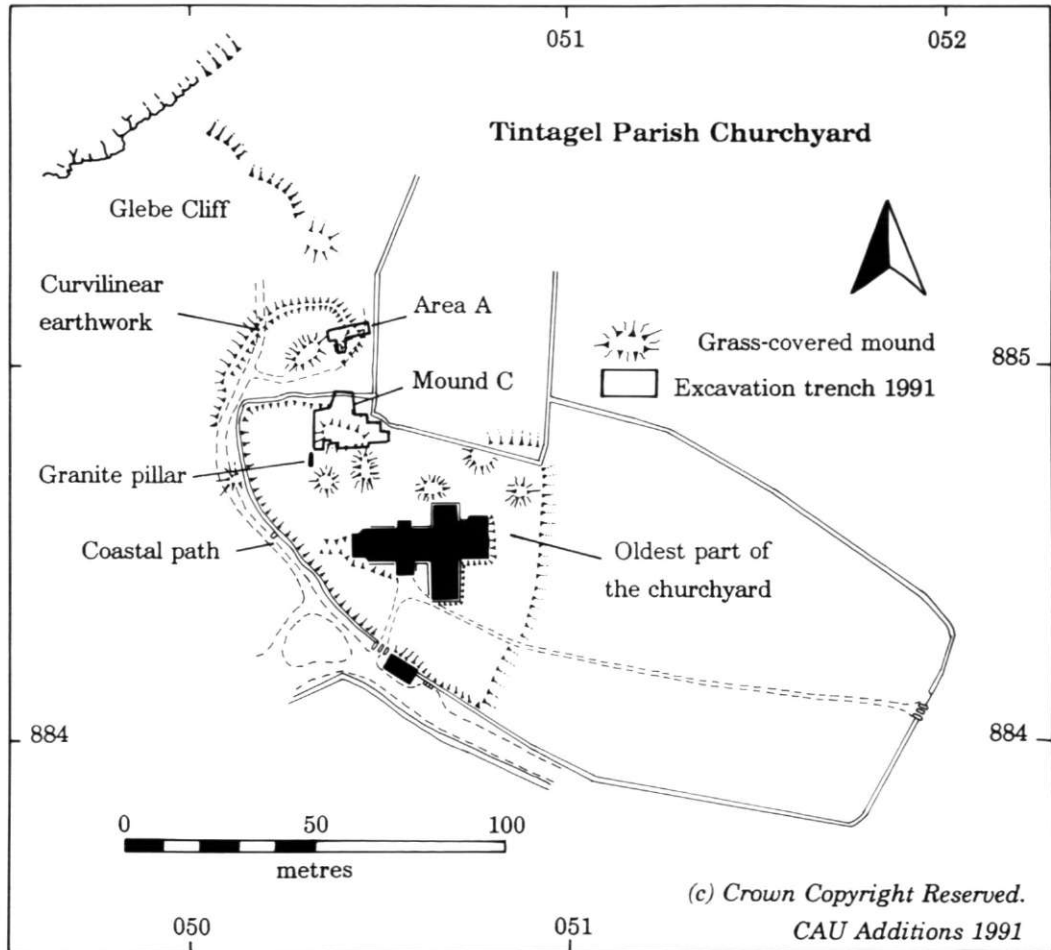


Fig 1

covered mounds which lie on the northern side of the churchyard (Fig 1). The second excavation was more extensive in scope than the first exploratory season which meant that in 1991 a much larger area was examined permitting a wider overview of events in this part of the churchyard. Together these excavations have now shown that as an earthwork Mound C is little more than a post-medieval dump and in itself is of little relevance to earlier historical events in this part of the churchyard. However beneath the dumped material lay fairly well-preserved layers which dated from the 5th and 6th centuries AD and span a history right up to the early post-medieval period (probably the 16th century). This detailed investigation has given us an unexpected and rare insight into the development of a rural Cornish churchyard.

Of particular interest was the discovery of an Early Christian cemetery. The burials of adults and children in cist graves (slate-lined coffins) found alongside one another indicated some organisation in the layout of the early burial ground as well as the maintenance of family plots. Postholes for wooden grave markers were found close to some burials. A fairly large assemblage of imported 6th century pottery - mainly dominated by amphora wares (vessel types Bi, Bii, Biv and Bv), but which also included a small collection of imported coarse wares - provides the main dating evidence for this phase. This early horizon has now been supported by a radiocarbon date 1650 ± 50 BP (calibrated in calendar years to *c* AD 403 - 410; GU-2798). Evidence for graveside fires was also found indicating commemorative funerary customs and together with the imported pottery points to influences and ideas propagated through contact with a distant Mediterranean world. All the early graves shared similar alignments and their common orientation may have not only been governed by Early Christian beliefs but also by a granite pillar which may have been a symbolic marker and a topographical feature within the landscape of the early cemetery. (This was inspected and re-erected in its present position in 1990, see Fig 1). Patches of the earlier ground surface were uncovered and analysis of soils from this identified the seed remains of wild plants which provide some information of the varied local habitat during this early period. Two phases of early burial together with the varied range of evidence suggested intensive use of the place for burial during the 6th century AD. An investigation of two mounded features identified within this area in 1990 and then interpreted as possible 'mound graves' (Nowakowski and Thomas 1991) showed earlier interpretations of these as special graves to be incorrect. Pottery dating to the 10th - 11th centuries AD found in their respective 'mounded' coverings indicated that these features must have been created at a much later date; perhaps during general landscaping of the area when a building was sited adjacent to and above the location of the early cemetery. Very little human bone survived in these early burials - this must partly be as a result of the generally acidic nature of the local soils. There were however signs that many of the Early Christian burials had been disturbed at some unknown time in antiquity.

Of major surprise in 1991 was the discovery of the foundations of a stone building. Part of its southern wall had been uncovered in 1990, though at that time, it had been interpreted as a medieval churchyard wall (Nowakowski and Thomas 1990, 7-8). The ground plan of this rectangular building emerged within the eastern area of the excavation and the lowest foundations of its eastern, northern and southern walls were revealed with a few surviving remnants of a west wall. This appeared to be a small single cell structure which was aligned on a west-east axis and had a southern doorway. Incorporated into its foundations were many pieces of dressed greenstone - many architectural fragments, amongst these the broken fragments of a simple bowl font made of a local volcanic greenstone and for which there are no stylistic parallels in Cornwall. The re-use of the font and other dressed stone for foundation material points to the demolition of an even earlier building, suggesting that the ground plan uncovered in 1991 may represent the second phase of an even earlier building. No excavation took place within the interior of the building so only circumstantial evidence exists for the date of its construction and its overall interpretation. The simplicity of ground plan may suggest that it represented a church building and the font, which resembles one found during excavations at Potterne in Wiltshire and which has been dated to the late Saxon period (10th century) (Davey 1964), may give us some indication of the general period. Furthermore

the discovery of 10th - 11th century pottery from associated layers provides evidence for a period of activity not previously documented for the churchyard. If identified correctly, then this building may be the rare survival of a pre- Conquest church which may have been demolished in the early 12th century with the construction of the Norman parish church. Only future work centred on a detailed investigation of the interior of the building would enable these tentative interpretations to be clarified.

Three well-built 'walled' graves were found surrounding the building. These appeared aligned to the general axis of the building suggesting contemporaneity. This distinctive type of grave is difficult to date closely; the only remotely similar examples are several found during rescue work at Bodmin Priory in 1985 which were dated to the 12th and 13th centuries (O'Hara 1985). It is possible that the walled graves found at Tintagel are earlier versions of this distinctive style of burial.

During the Medieval period this area of the churchyard was used for burial and throughout this time cist graves, unlined ('dug') graves and 'tent' burials (where slates had been placed over the corpse to form a roof-like cover) were constructed. These formed a collective variety of grave types whose study may reveal something of the changing fortunes of the local community, as well as providing detailed insights into little-known funerary practices of the medieval period. A characteristic feature of all the medieval graves was their casual construction and their use and re-use of poor quality slate. Images of animals (a sharp-beaked bird and a turtle) and board games (most commonly the Nine Men's Morris game) found scratched onto many slate fragments give an unusual and fascinating insight into medieval life, and are a reminder of the degree to which the church was an important social centre for local people during this period. A gradual decline in burial is generally perceptible towards the end of the medieval period when this area of the churchyard fell into general neglect. Part of this process is demonstrated by the discovery of a charnel pit which was found in this area.

One final phase of burial however was marked by a children's burial plot which was possibly established within the ruins of the earlier church sometime during the early post-medieval period. The 16th century Parish Registers recorded startlingly high infant mortality during the winter of 1546-47 which may have been the result of a fatal epidemic affecting the local community. It is possible that this burial plot of tiny unmarked 'tent' graves indicates the final resting places of the victims of such a tragedy. From then onwards this area of the churchyard appears to have been truly neglected with the result that it became little more than a dumping ground for the deposition of debris, rubbish and 'dead' soil (the surplus soil created through the digging of grave pits). The mound itself has formed as the result of this activity. Suspicion must now be cast over the supposed contemporaneity of the other mounds lying close by (Fig 1) and earlier theories that they collectively represented 'royal Dark Age burial mounds' are no longer sustainable (cf Dark 1985). However as the excavation of Mound C has shown, these mounds would appear to have assisted preservation, whether by accident or design, and there is an equal possibility that further well-preserved layers lie buried beneath them.

In addition to the main excavation, a small exploratory trench (Area A) was cut across a curvilinear earthwork which lies outside the churchyard on Glebe Cliff (Fig 1). Little is known about the age of this feature which is similar in form to those found at Early Christian sites in Wales and south-west Ireland where they form boundaries around sacred sites. This exploratory trench was cut so that this earthwork could be looked at in some detail and it was hoped that some means of dating it would be found. Our 'keyhole' excavation revealed the earthwork to comprise a massive stony bank which had suffered erosion after a period of some neglect, perhaps during the medieval period. The unstructured although clearly substantial character of the bank in its original form might however be read as a sign of its symbolic purpose, and there being no direct evidence for its construction, its association with the 6th century Early Christian cemetery is implied rather than directly proven. Exactly when it appeared as a boundary feature on the headland is still unknown and this question would clearly benefit from further investigation. The lower courses of a secondary wall were also found in this area, but this would appear to belong to the later, medieval, his-

tory of the area.

Our work in the churchyard has attracted considerable public interest and during just two seasons of work the excavations were visited by some 8,000 people. In 1991 an educational programme attracted around 1,000 school-children from schools all over the county and this gave students the opportunity to view an archaeological excavation at unusually close quarters. It is hoped that a continuation of this educational work will form a major part of any future programme of work in the churchyard, as well as for other CAU projects.

Overall our excavations have provided the chance to explore aspects of historical continuity at Tintagel and has revealed the complex richness of local history. Clearly further work needs to be carried out in the churchyard so that the chronological sequence which has so far been uncovered can be verified. This is especially crucial for earlier history which on present evidence would seem to indicate a gap (of a century or more) in the use of the site, between the Early Christian and pre-Conquest periods. If this apparent break in continuity is genuine then this would further reinforce links between the churchyard and Tintagel Island, where there is similar disuse after the 6th century AD (Thomas 1988). An opportunity to re-investigate the church structure would also be welcome since this is likely to provide some significant information on an obscure chapter of the history of Christianity in the South-West.

The opportunity to continue our exploration of Tintagel Churchyard has rested on the continued financial sponsorship of the project by Mobil North Sea Limited. Integral to the success of our work has been the co-operation, encouragement and help of the Reverend Ivan Gregory, the Parochial Church Council and many local people whose interest has made our work most memorable. Our grateful thanks go to the stalwart excavation team which in 1991 comprised many Society members. A fully illustrated interim report of the 1991 season entitled *Grave News From Tintagel*, is available from the Cornwall Archaeological Unit.

Cornwall Archaeological Unit, Truro (J.A.N.) Lambessow, Truro (A.C.T.)

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Tintagel Island 1991: An interim report

CHRISTOPHER D. MORRIS

The short excavation in March/April 1992, directed by the present writer assisted by Dr Colleen Batey (of Glasgow Museums), was carried out as a follow-up to the small-scale work in 1990 (Morris 1991). Following the demonstration of the existence of the lower terrace at Site C, and the existence of fragments of what appeared to be two walls in the sides of two of the trenches opened in 1990, the emphasis in 1991 was upon area excavation of part of the terrace. Additionally, further work was undertaken on the main ('middle') terrace - both on one of the trenches opened last year, and in a small area immediately to the south of the laid-out buildings there.

On the lower terrace, at the north end, the area between trenches C03 and C04 was opened up as an extension of C03, and C04 was extended as far as the northern limit of the terrace; by the end of the season this was all treated as one area. A second large area, initially separated from C03 by a 1 metre wide baulk, covered the area southwards from C03 to the trench excavated as C02 in 1990. Ultimately, a considerable portion of the terrace was examined, although (in part due to bad weather) none was completely excavated, and further work remains to be undertaken.

In the northern area, the main achievement was the recognition of a small structure defined by fragments of slate walls originally set against the bed-rock face and enclosing an area of approximately 9 square metres. Up to ten courses of the wall were revealed at one point, but neither the northern nor southern wall fragments are continuous, the maximum length being 2.30 metres. A possibly floor deposit has been uncovered and partially examined, together with a small putative fire. At the eastern side a bank has been identified, but requires further examination. On the western side, it is clear that the natural slate bed-rock was not only utilised as the back of the structure, but had possibly also been deliberately cut for this purpose. Fragments of worked slates and several coarse ware sherds were recovered from this excavation area, in addition to imported pottery, comprising 25 find units of heavy amphora (Bv).

In the southern area, less remained of the structural remains, and more of the overlying collapse and tip and scree deposits. However, some examination took place of the exterior of the southern wall, as it survived, for the building, and of a possible surface. Here also there are traces of an eastern bank. Further work remains to be undertaken here. Worked slates, clinker/cinder, and 29 pottery sherds were recovered from C08. Of these, 17 find units were of Bv fabric and 12 of finer fabrics (Bii or iv) or coarse wares.

As an aspect of the overall examination of the terraces, two profile surveys were undertaken as transects across Site C. Additionally, further examination of the deposits in the sides of the trench from the 1930s excavations which had been re-opened in 1990 (C05) was carried out. Several features were uncovered, which had been truncated by the earlier excavations, including a burnt area with carbonised material and a sherd of imported pottery (Bv). Further pottery (mainly Bv) was found in scree tips above these features, and presumably represents secondary deposits. However, this presence was, in itself, significant.

A trial trench (C09) was also opened directly to the south of the Site C complex of buildings in order to examine the apparent remains of a wall protruding from the bed-rock face, to establish the degree of removal of deposits during the 1930s excavations, and to attempt to reveal the relative stratigraphical relationship between these remains and the Site C buildings. In all aspects the work was successful, confirming that there was indeed a wall constructed of neatly coursed flat slabs in a similar manner to others on Site C, and that there were surviving undisturbed deposits. It may be that this wall indicates the presence to the south of a further group of buildings, hitherto unexcavated; certainly there would seem to be an extension of the terrace here, making this feasible.

Worked slates, pebbles, an iron find were recovered, along with imported pottery, which was present in some quantity. Of the latter, 13 are Bv and one is possibly African Red Slipware, but there was a notable absence of later mediaeval pottery here - as on the lower terrace.

In addition to the land-based work, a programme of systematic underway survey of part of Tintagel Haven was scheduled for 1991. Adverse sea conditions truncated the programme, but a sandy channel/pocket was located towards the centre of the haven. No artefacts were recovered from the seabed. It is hoped to follow up this work at a more favourable time of the year. A complete survey of the beach was carried out at low tide, with line-walking in 1 metre strips. A large number of sherds of pottery were recovered, and although many are obviously modern in origin, some may well have fallen into the sea or onto the beach from land slippages, and so all will be examined carefully for the possible presence of earlier material. It was of interest that larger average weights of pottery coincided with the rocky areas of the beach, presumably trapped in rocky crevices, which implies that archaeological remains are more likely to survive where they have become trapped in such crevices rather than in exposed sandy areas. For this reason it would be useful to examine the gully systems underwater around the Iron Gate.

As in 1990, comprehensive sampling was undertaken. Soil samples were taken from every new context excavated, together with selective continuation of sampling of contexts which proved productive in 1990. All material, where possible, was wet-sieved, totalling 47 samples, weighing 1532 kg. Carbonised material was recovered from the 'flots' of 43 samples, and in addition a number of residues from the sieving were noted as containing fairly large pieces of charcoal. As in 1990, animal bone was conspicuous by its absence.

In the light of the public interest expressed during the 1990 excavations, and the popularity of the somewhat incidental site tours, it was decided to make guided tours a more permanent and well advertised feature of the 1991 excavations. Display boards and 5 or 6 tours a day were established. A total of 861 visitors voluntarily joined tours on 11 days, and the tenacity of some intrepid visitors under appalling weather conditions was quite remarkable! There is clearly a desire for more information on the part of the visitors to the site, and an obvious educational role identified here. Certainly, some of the misunderstandings surrounding the site will continue without an educational programme on site. A permanent guide facility during the tourist season would be an ideal solution.

In all, the promise of 1990 was borne out in 1991. The small structure, fragments of which were located rather fortuitously in 1990, on the lower terrace was the major addition to knowledge, together with its clear dating to a 5th-6th century horizon by the presence of imported pottery. The middle terrace work emphasised the potential of the area and the presence of features not recorded by the earlier excavations. Particularly gratifying is the demonstration that there are remaining undisturbed deposits here with artefactual material, including imported pottery. As a follow-up to these earlier excavations, clearly the next phase of work has to be the re-examination of the laid-out buildings on this middle terrace. It is self-evident that there are several structural phases involved with these, and this clearly needs re-examination in the light of the preliminary results of this year's work. The artefactual assemblages from both terraces, again emphasises the absence of material that might be associated with the later usage of the site, while emphasising the presence of imported storage vessels (rather than finer table wares) of the 5th-6th centuries. While no longer adhering to a monastic model, there seems no imperative at present to reject a 5th or 6th century dating for the buildings at Site C in favour of a later mediaeval association. The continuing potential of the site simply re-emphasises the desirability of a wider and longer-term research project here: something of significance not only to the academic archaeological community, but also to those in Cornwall for whom the site is part of their own heritage, and to those who visit the site, whether casual tourist or informed visitor, by the hundred thousand each year: the clients of English Heritage.

As in 1990, the Director owes a debt of gratitude to the Regional Director, P.I.C. Inspector, Ancient Monuments Laboratory staff, Custodial and Maintenance staff of H.B.M.C.E. for admin-

istrative, scientific and depot services. On site, particular thanks are owed to Paul Johnson, Rachel Harry, Norman Emery and Anne Bowman for supervision of various aspects of the work, and to Caroline Richardson who acted as an ever-enthusiastic guide for visitors. Good humour and perseverance of other members of the excavation team and the camaraderie of the members of H.B.M.C.E. staff helped to ensure a successful outcome under less than ideal circumstances. A full report is to be prepared for, and distributed through, H.B.M.C.E.

*Department of Archaeology,
University of Glasgow*

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Bossiney Castle

PETER ROSE

Bossiney Castle is the little known poor relation of a glamorous and famous neighbour, Tintagel. The two sites, lying only 1.5 km apart within the same manor and parish (Fig 1b), are quite different in their origins, role, history and setting. Tintagel Castle, suspended precipitously on the north coast cliffs, is now regarded as the 13th century folly of Richard, Earl of Cornwall, built around 1230 to link his name with a place renowned in international romance for its Arthurian associations and remembered in Cornish folklore as the seat of royalty; a memory which ultimately derived from the remarkable activity on the island in the 6th century AD, as attested by archaeology (Padel, 1988).

Bossiney is a more 'standard' earthwork castle of late 11th or 12th century origin. The main purpose of this note is to record the results of a recent survey which has identified the castle's bailey, to the west of the main ringwork defence.

Located at the south-west of the village of Bossiney the castle was first described and surveyed by MacLauchlan (1852): 'the castle mount is still in existence; this is where the elections for the borough were held'. He shows and describes a circular rampart and ditch, but notes that it has 'more the appearance of an enormous tumulus'. This is still true (Fig 2). Viewed looking south-east from the road the rampart, strongest on this north side, gives the impression of a large mound or motte. Only on entering the site does it take on the appearance of a ringwork, though at the same time giving the impression of a hollowed-out motte. This is consistent with the problem of classification found sometimes in Devon and in Wales where the terms 'motte' and 'ringwork' do not always easily fit the field evidence (Wilson-North and Dunn, 1990, 87). Now within a private garden, the well tended earthworks form a grassy arena punctuated by shrubs, ferns and one large conifer. The ringwork was surveyed and described by Martin Fletcher of the Ordnance Survey Archaeological Division in 1976; up to 46.0 m in diameter it encloses a slightly raised triangular area with a simple entrance gap to the east. The rampart is strongest on the north, up to 5.9 m high externally with a 20.0 m wide ditch, now 0.9 m deep but presumably much silted and infilled. The dimensions of rampart and ditch appear similar on the west, though here the exterior is obscured by dense scrub. On the south side, because the ground is falling away in this direction to a spring and stream, the rampart achieves an external height of 4.2 m with an internal height of only 1.3 m. Here and on the east the ditch can no longer be traced. This sizeable rampart encloses an area of just 16 x 14 m, large enough for one or two buildings including, presumably, a hall, and little else.

Such a site would normally be complemented by a bailey, a defended enclosure providing more extensive accommodation for a hall, kitchen, stables, chapel and other outbuildings and chambers. The position of such a bailey is suggested by the shape of a field west of the ringwork (Fig 2). This observation was confirmed by a field visit. The road and hedge curve outside a low but very broad bank, the ploughed and flattened remains of what must have been a substantial rampart. The earthwork was surveyed at 1:1000 scale in June 1991 by P. Rose and A. Preston-Jones, for the Cornwall Archaeological Unit, by permission of the field's owner, Mr T.J. Dangar. The field is named 'Kear' on the 1842 Tithe Apportionment, that is, Cornish **ker*, 'fort, a round' (Padel, 1985, 50-54). If the earthwork is correctly identified as a castle bailey, rather than being a prehistoric enclosure, then it is unlikely to have been redundant before the 13th century, perhaps rather later, by which date one would expect the field-name to be coined in English. Perhaps 'Kear' or 'Gear', a common alternative, remained widely in use as a dialect word.

The bailey is on a level site with only a slight slope down to the north-east and, like the ringwork, a greater gradient beyond the south side. Most of the bailey lies within a pasture field used as a paddock but an area between this and the ringwork is now occupied by houses and gardens. MacLauchlan's survey records a slight earthwork in the field north-west of the ringwork, now a pasture field. This was presumably a continuation of the bailey but is no longer visible; its approximate position is shown as a dotted line on Fig 2.

On the north, next to the road, the bailey rampart is perceptible only as a very slight scarp, but else-

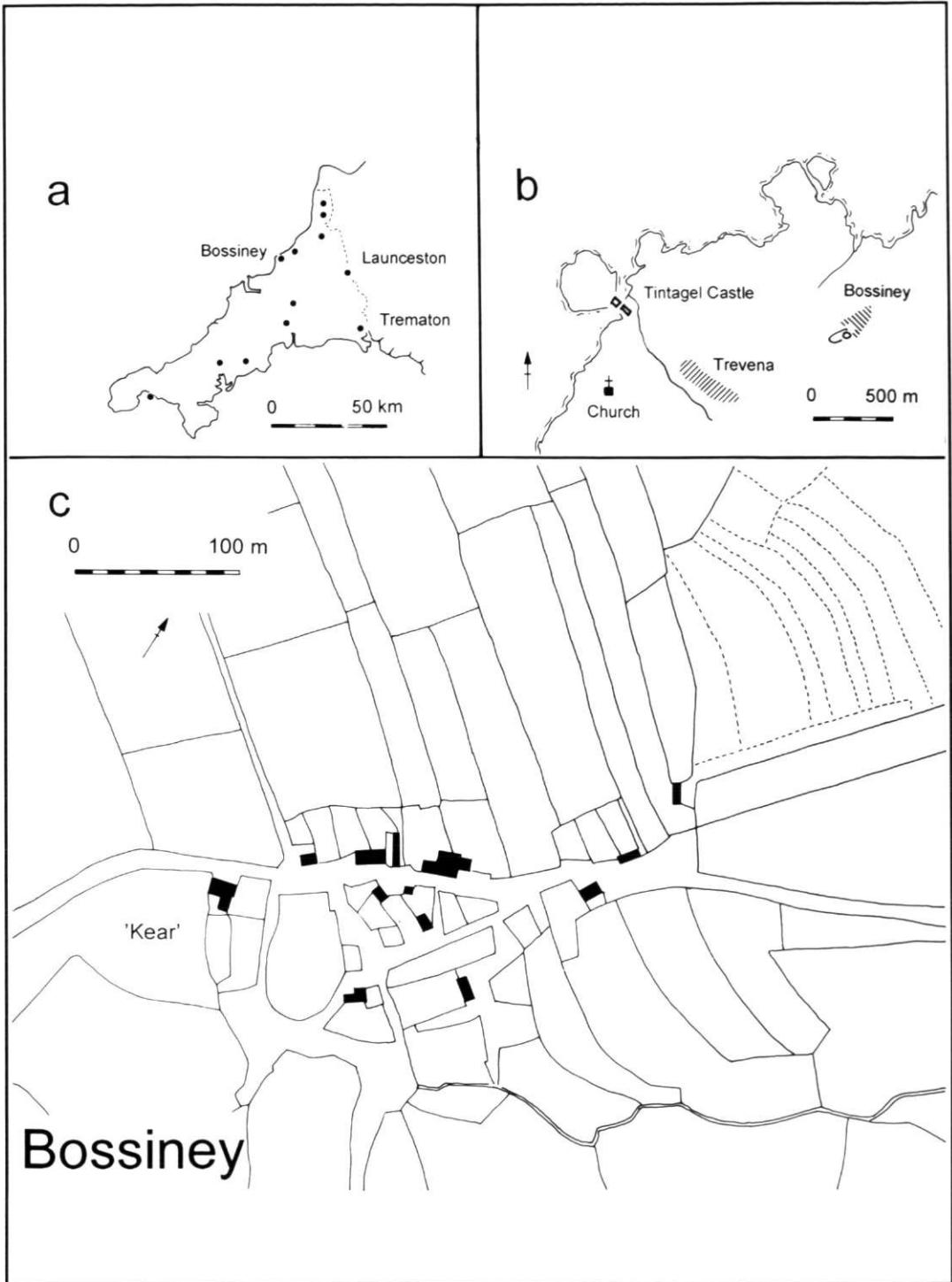


Fig 1

a: Distribution of 11th-12th century castles. b: Location: Bossiney, Trevena and Tintagel. c: Bossiney from the 1842 Tithe Map. Note the strip fields to the north-east; parts of this system survive as lynchets and banks.

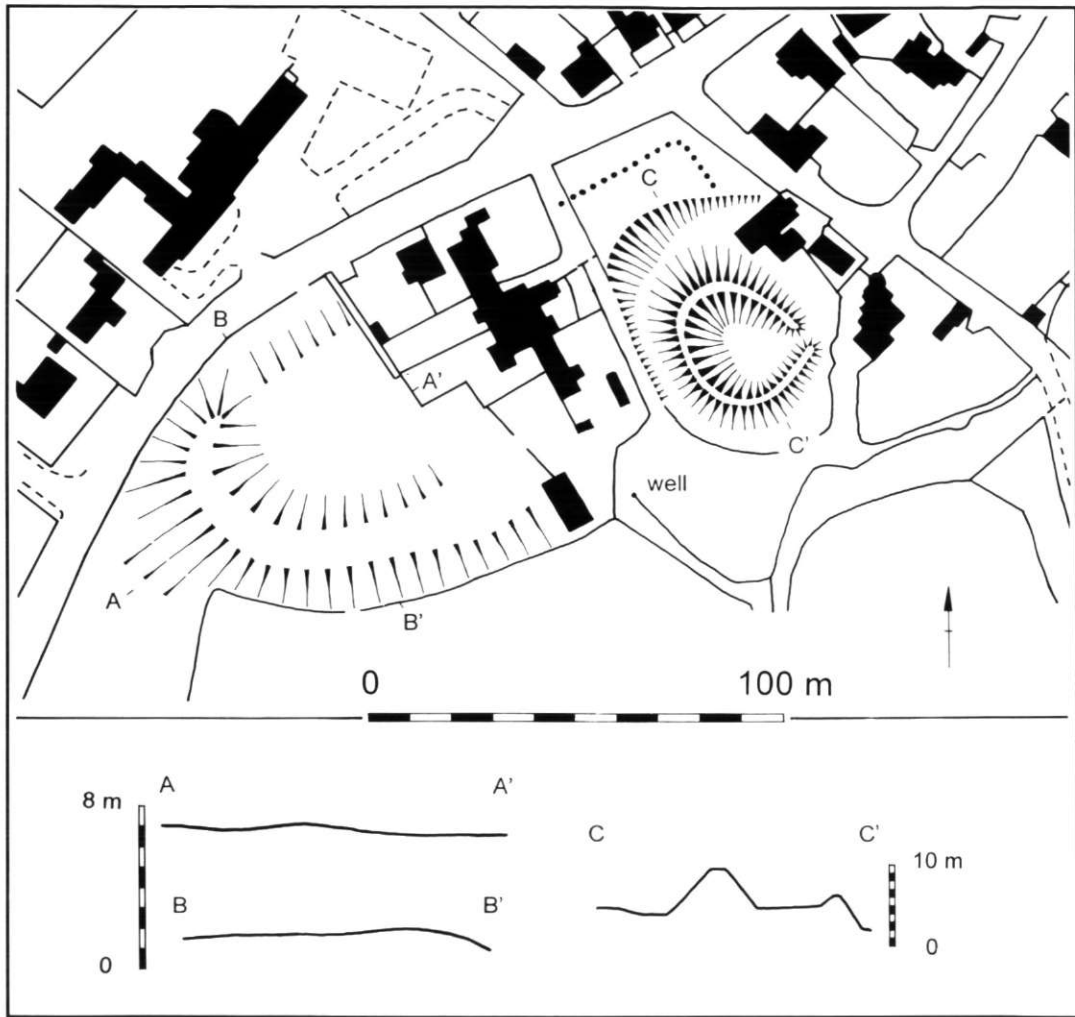


Fig 2

Bossiney Castle, earthwork survey. The plan and sketch profile of the ringwork is as recorded by M Fletcher for the Ordnance Survey in 1976, and the bailey as surveyed by the Cornwall Archaeological Unit in 1991.

The dotted line north-west of the ringwork indicates the position of the bailey shown by MacLauchlan (1852).

where takes the form of a bank nearly 30 m across, 0.5 m high internally. Externally it is a similar height on the south-west side, where the ground is fairly level, but on the south it is enhanced by the natural slope to 1.2 m. Only on the south-west is there a trace of the ditch, 15-20 m wide, 0.25 m deep. The position of the entrance is not apparent but was presumably somewhere along the north-west side. Nor is it clear how access was achieved from bailey to ringwork. Indeed the present entrance to the ringwork, the only detectable break, faces away from the bailey. This is an unexpected arrangement and may suggest that it is a later opening, with the original approach effected by, for example, a bridge from bailey to ringwork.

The bailey encloses approximately 0.39 ha (0.96 acres) in an elongated area approximately 45 m wide and up to 130 m long. This places it in the middle of the size range of baileys recorded in Cornwall, smaller than Launceston or Cardinham (respectively 0.98 ha and 0.64 ha; 2.4 and 1.6 acres), similar to Trematon (0.4 ha, 0.98 ha) and larger than Kilkhampton and East Leigh Berries (0.8 ha and 0.32 ha; 0.44 and 0.79 acres) (Preston-Jones and Rose, 1986, 170).

As Bossiney Castle is not mentioned in contemporary documents, like many other Cornish castles its context and likely date have to be inferred from the framework of the known manorial history. Bossiney's historical background has recently been set out by Padel (1988).

It is not known who built the castle. Possible candidates are Robert of Mortain, the largest landowner in Domesday Cornwall, who in 1086 held Bossiney from St Petroc's; or an unrecorded landowner during the obscure and undocumented first half of the 12th century; or Roger de Mandeville, who held Bossiney in 1166 from Earl Reginald; or Gervase de Hornicote, first mentioned in 1182, who inherited the manors of Bossiney and Hornacott from Roger; or Gervase's son Robert, who succeeded to his father in 1207 and called himself Robert de Tintaioel - 'of Tintagel' (Padel, 1988, 63). Whilst the manor recorded in Domesday Book was neither large nor important it is possible that a castle was built there to control the lands of the north coast and the routeway through them. This castle, together with those recorded in Domesday Book at Launceston and Trematon would have given Count Robert a firm grasp over east Cornwall. It is unlikely that the castle was built by the Hornicotes. Had they done so one would expect to find a site of similar scale at their principal seat, Hornacott in North Tamerton. As no such site is known it is more likely that when the Hornicotes received Bossiney it already contained the castle. We do not know whether the castle continued to be used as the seat of their manor, which seems most likely, or whether another location was chosen.

It is possible that in adopting the name 'de Tintagel' Robert and his son Gervase had already transferred the seat of the manor from Bossiney to Tintagel Island; more probably they were simply exploiting the famous place-name that happened to lie within their manor. By 1230 Earl Richard had his castle on Tintagel and by 1236 he had taken over the manor of Bossiney from Gervase. Although in the 1230s the focus had shifted to Richard's castle, Tintagel, even then it is not unlikely that for practical reasons some of the manorial administration continued to be organised from Bossiney. This could be expected because the new castle was intended as a statement by a player on the international stage rather than as a vehicle for local administration.

Where a lord's involvement in a place extends to the building of a castle one can also expect to find a borough, established by the lord or his successor to maximise his revenue. The situation at Bossiney is complicated because of the shift of the name and focus of the manor towards Tintagel. Tintagel is the name used for the borough in its earliest record, Earl Richard's charter of c 1253; similarly 14th century references are to the borough of Tintagel (Canner, 1982, 13, 17-19; Sheppard, 1986, 67). In later documents from the 16th century onwards the borough is usually called Bossiney (Canner, 1982, 34,38). King James' new charter of 1685, to 'Tintagel, Trevena and Bossiney', presumably reflects, by this wording, the nature of the situation on the ground, namely a single borough with two settlement focuses, one at Bossiney, the old manorial centre, the other at Trevena (nowadays usually called the village of Tintagel) which developed because of the proximity of Tintagel Castle.

The early layout of Bossiney and its relation to the castle have been obscured by the changing fortunes of the town. By the time it was mapped in 1842 (Tithe Map) there were scarcely more than ten houses; its character and extent in the 13th and 14th centuries must have been quite different if a fair proportion of the 93 burgesses recorded in 1338 (Canner, 1982, 19) lived at Bossiney rather than Trevena. The general impression of the layout, however, is that the castle stood at the south-west end of a short street, from which the burgage plots ran off at right angles (Fig 1c). It is possible that the area of scattered houses and small enclosures shown on the Tithe Map immediately east of the castle represents infilling of a large, roughly triangular market place; the broad eastern half of the street, again partly infilled, is another alternative for the market place. The fact that there was a borough here, not just at Trevena, and its close relation to the castle, even though the castle's status had presumably changed drastically when the charter was granted c 1253, allows the possibility that the borough had undocumented origins, presumably in the 12th century, when the castle was still the hub of the manor.

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Week St Mary, Town and Castle

ANN PRESTON-JONES and PETER ROSE

Medieval Cornwall had a large number of small towns and rural markets to provide for local trade, notably the exchange of agricultural produce for manufactured goods; in addition they provided the lord of the manor with a boosted revenue from market tolls and other exactions. Some former boroughs are now no more than villages and may never have been much more than that, always decidedly rural rather than urban in character. One such is Week St Mary in north-east Cornwall (SX237977). Now a village with a fine parish church, a shop, and a small development of holiday chalets, it no longer has any pretence of borough status. Even the stalls for the cattle market have now been cleared, and though there were two pubs in the village in the last century, now the nearest is at Week Green to the south.

Such documentation as there is suggests that in the medieval period Week St Mary was a small town or borough and is noted as such by Sheppard in his 'Historic Towns of Cornwall' (1980) though not described by him there. In filling that gap, this note draws on recent work by the Cornwall Archaeological Unit, namely a survey of the castle earthworks in 1981 and a report to North Cornwall District Council in 1987 (Preston-Jones, 1987). In looking at the topography of the town and its context in relation to the surrounding settlements we aim to draw attention to the need for systematic topographic analysis for all Cornwall's historic towns together with a consideration of the function of both large and small towns alike in the context of their hinterland, and the way in which this is reflected in their archaeology.

Historical background

Although no charter survives, in medieval documents Week St Mary is termed a borough. An example, either late 13th or early 14th century (according to which of two 'Ranulphs' is intended), is a confirmation by Ranulph de Albomonasterio (= Blanchminster) Lord of Wyke, of one acre of land 'in libero burgacio' to the burgesses and their heirs, to hold of himself at a rent of 6d per annum, and of common pasture in his land of Wyke, the boundaries of which were specified (Legg-Weekes, 1913). Sir Ranulph de Albo Monasterio (the second Ranulph), who died in 1348, was seised of the manor and borough of Seintesmariswyke (Lake, 1872, 307; Goulding, 1898, 21a). In the 16th century Week St Mary was important enough to justify the foundation of a grammar school here in 1509 by the local benefactress Dame Thomasine Percival, but not so important that it could prevent Launceston from appropriating the endowment for its own school in 1548. Whilst the reasons given for the appropriation - the decayed state of the school and its distance from any market to provision the scholars - may have been deliberately exaggerated, it does suggest that Week St Mary, though still referred to as a town, can have been little more than a village at this date. (For a full account of the history of the school see Hull, 1973).

Nevertheless, in 1620 Sir Warwick Hele could still be described as holding the manor of Swanacot and burgh of Week St Mary (Lake, 1872, 307), and the tradition of its earlier status persisted into the 19th century, so that according to Lysons (1814) the occupiers of certain fields in Week St Mary were still called burgage holders. Moreover, the custom of electing a mayor was still kept up, even though the post was only a nominal one, conferring no power. In 1820 (Gilbert) it was said that 'according to tradition, there was formerly a weekly market held in the borough'. Hals, writing around 1700, mentions two annual fairs, on September 8th and December 10th (Lake, 1872, 304) which in the early 19th century were mainly for sheep and bullocks (Gilbert, 1820, 536); an additional fair, in June, is recorded later in the century (Lake, 1872, 309) and in 1888 the fairs were on July 29th, September 15th and the Wednesday before Christmas Day (Boase, 1890, 1586). The

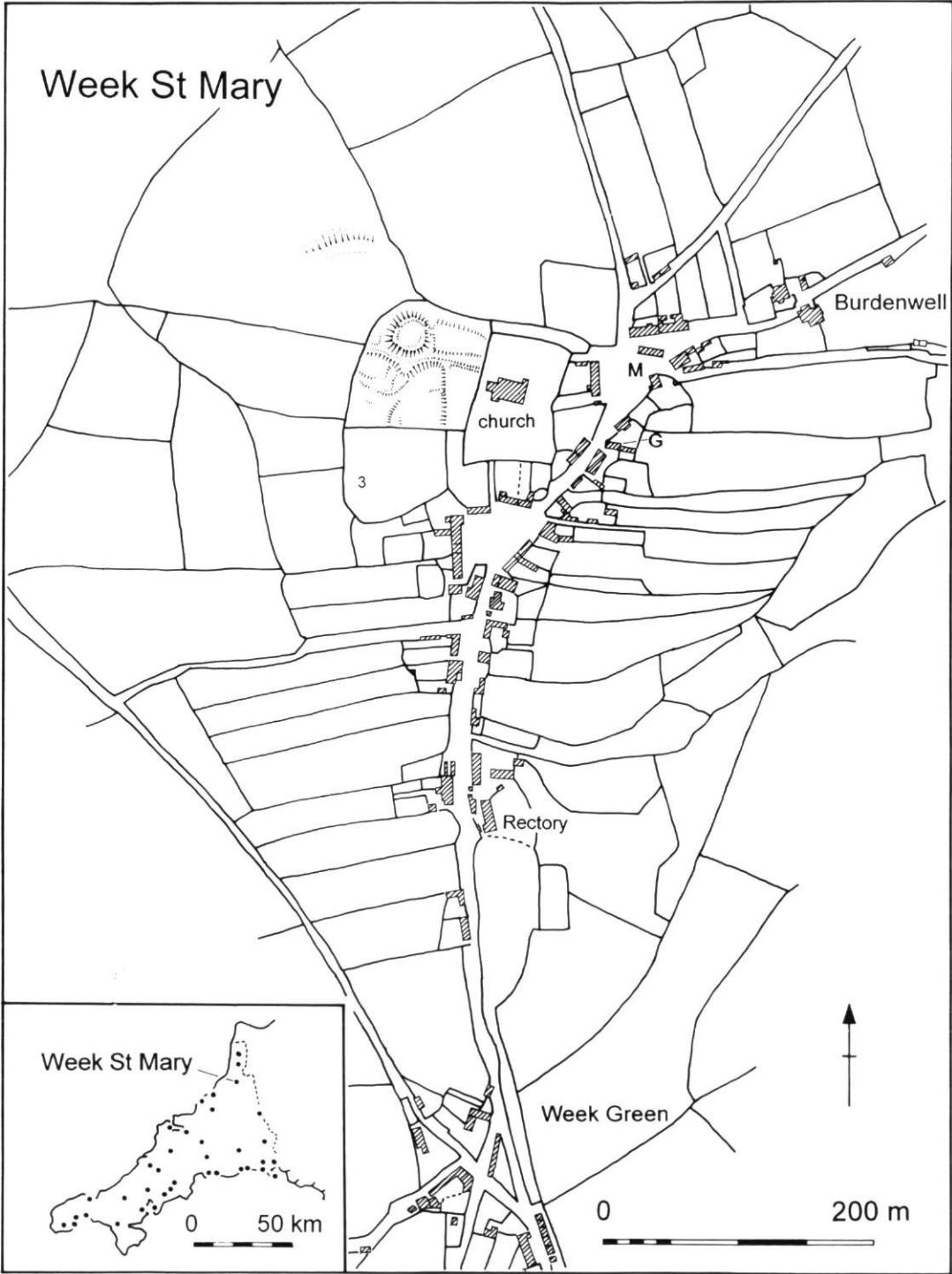


Fig 1

Week St Mary, based on the 1840 Tith Map with the results of the 1981 earthwork survey added. G = Grammar School; M = Market House. Inset: location, showing the distribution of markets and boroughs recorded by the 14th century.



Fig 2
 Week St Mary, aerial view in 1989 (Photo: CAU - Steve Hartgroves).

stalls for the modern cattle market stood until recently to the east of the village square. It is clear from the 19th century census returns how craft, trade and professional functions were concentrated in the village, though there was an equal agricultural element to the settlement (see Appendix).

Week St Mary was certainly not a town in 1086. Domesday Book tells us that the manor of 'Wich' was held by Richard Fitz Turoid and had a recorded population of six 'villagers' and ten 'smallholders' (Thorne, 1979). Richard was Robert of Mortain's steward and one of his principal tenants, arguably the most powerful man in Cornwall after Robert himself. His descendants took the name 'Cardinham' from their main seat, Cardinham Castle. Subsequently the manor was held by the de Wyke family, apparently sub-tenants of the Cardinham, or a branch of that family (Henderson, 1924)¹. In the late 12th century the de Wykes also held the southern half of Scilly. After the mid 13th century Week St Mary passed to the Blanchminster family, probably as a result of the marriage, by 1259, of Isabella, who may have been an heiress of the de Wykes, to Ranulph de Albo Monasterio (Goulding, 1898, 12a; Mr W Picken and Mr O Padel, *pers comm*). The Blanchminsters' principal seat was at Stratton; in 1335 Ranulph Blanchminster had a licence to crenellate at his moated manor house of Binhamy near Stratton (Preston-Jones and Rose, 1986, 173). At the beginning of the century Sir Ranulph was constable of the castle of Ennore on St Marys (Elliot-Binns, 1955, 20; Thomas, 1985, 219; Goulding, 1898, 15a, 21a), the Blanchminsters having taken over the de Wykes' interest in Scilly. By the end of the 14th century the Blanchminster estates went by female descent to the Colshull family, and at the end of the 15th century were fragmented amongst three heiresses (Goulding, 1898, 22a-34a). The principal seat of the Colshulls was at

Tremadart in Duloe parish, though they also had a licence to use their chapel at Binhamy in 1414 (*ibid*, 30a).

Most of Cornwall's small boroughs and rural markets were established in the 13th or early 14th centuries by important lords. In the 14th century it appears equally characteristic for the major Cornish families to establish a market as to crenellate their homes (eg the Dawneys, the Bassets and the Lercedeknes). The borough of Week St Mary was probably established in the 13th or early 14th century, but whether by the de Wykes or the Blanchminsters is not clear.

Layout and components

Major elements in the layout of the medieval small town survive today or are recorded on the 1840 Tithe Map (Fig 1) and the Ordnance Survey maps, in particular the characteristic strip-like fields, presumably burgage plots, and the outline of the market place, but also the earthwork remains of a small castle and what are probably the only surviving medieval buildings, the church

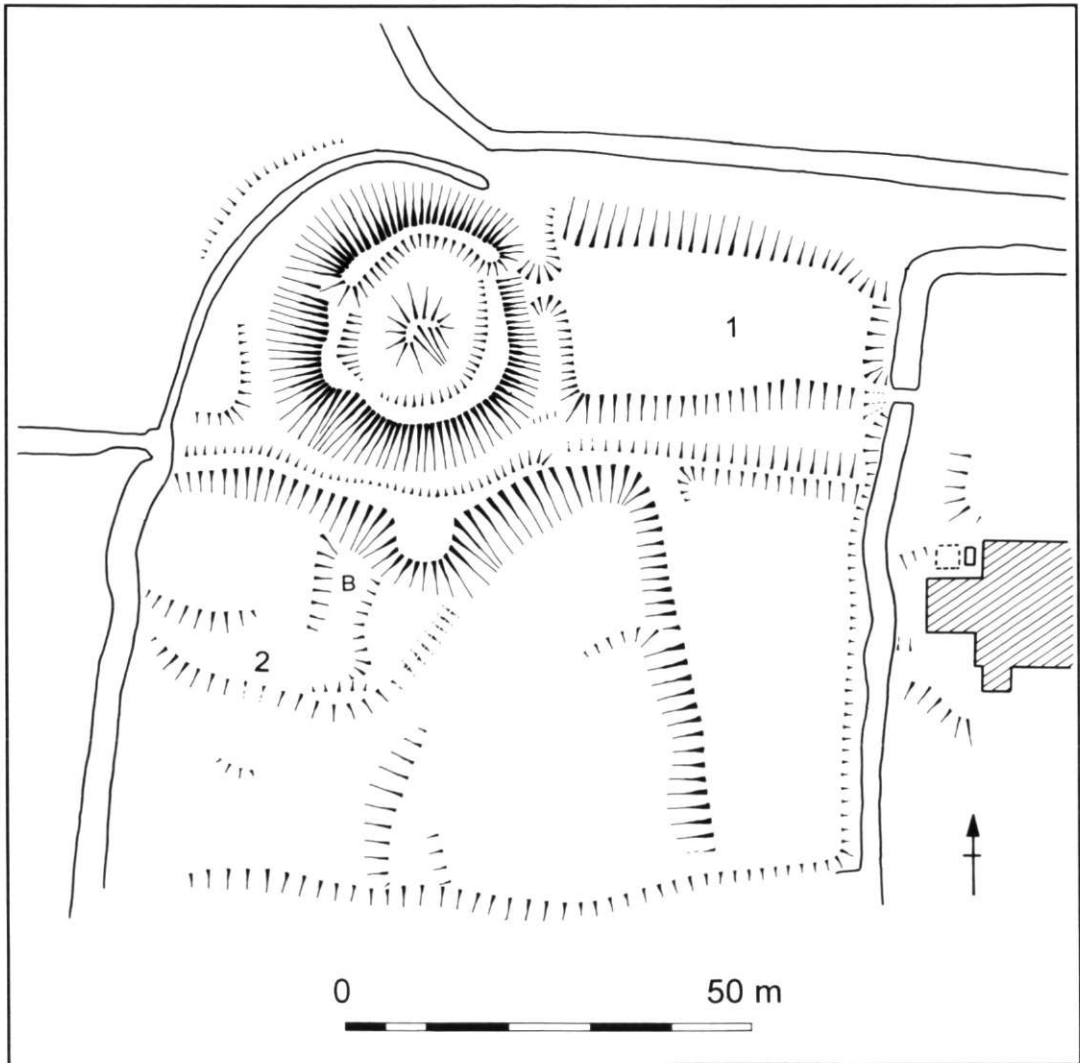


Fig 3
Week St Mary: earthworks west of the church (1981 survey). 1, 2 - possible baileys; B = possible building platform

and the early 16th century grammar school. Many of today's houses are shown on the 1840 Tithe Map but none are known to have diagnostic features earlier than the 17th century and most are probably of 18th or 19th century date.

A notable feature is the close relationship between the castle, church and market place; the market adjoins the manorial centre on which it was dependent, and surrounds or adjoins the church. The church is often sited close to the market, partly acting as a reminder of the sanctity of the contracts agreed (Steane, 1985, 125), but no doubt also reflecting the way in which the church was taken for granted as a focus of everyday life and social organisation. The church at Week St Mary hints at the former importance of the place, being a fine, large building predominantly of the 15th century, though with some 13th to 14th century work; it is likely to have originated as a Norman or pre-Norman manorial chapel, and is first referred to in 1171.

The Castle (Fig 3)

The castle is located immediately west of the church in an area known in the 19th century variously as 'Castleditches' (1840 Tithe Apportionment) or 'Castle Hill' (Lysons, 1814). Lysons referred to 'traces of extensive buildings' in the field adjoining the churchyard, and Henderson (1924) interpreted the site as a Norman castle - 'the donjon mound and bailey with its buildings may yet be clearly discerned and leave no doubt as to the medieval origins of the work'.

The earthworks, surveyed at 1:500 in 1981 (by N Johnson and P Rose), are in a pasture field in an elevated position at 140 metres (470 feet) OD. The castle mound is small and weak compared to most mottes and has some characteristics of a ringwork. It is roughly circular, 32 metres in overall diameter, and forms a platform raised only about 0.8 metres above the outer ground surface to the east but with an overall height of 1.2 m on the south and 2.0 m on the north. Around the rim is a bank, very slight on the south (0.1 m), more substantial on the north (0.4-0.7 metres high), which could have provided the base for a palisade. In the centre of the interior is a platform 11 metres by 8 metres and 0.2 metres high, perhaps the foundations of a building or the base of a tower. The mound is surrounded by a ditch 5 metres wide and 0.4 metres deep, broken on the north east by a causeway.

The castle mound is adjoined by other earthworks in the same field (typically 0.3-0.7 metres high). These are of uncertain origin but probably represent enclosures and building platforms associated with the castle or manorial centre. Alternatively some of the earthworks might result from medieval or later shrinkage of the borough.

There are two or three candidates for the castle's bailey (shown as numbers 1 and 2 on Fig 3 and number 3 on Fig 1).

1. Immediately east of the mound is a slightly raised roughly rectangular area 38 metres by 20 metres. This is the most likely position of the bailey as there is access from here to the mound. Running along the south side of this area is a flat-bottomed hollow which appears to be a hollow way. This continues westward to skirt around the bottom of the mound, where it uses the ditch for its course. The north side is also marked by a trackway, which is in use today.
2. South-south-west of the mound, but separated from it by the ditch/hollow way, is a small curvilinear enclosure 35 metres by 20 metres. This is defined partly by a low bank, partly by slight scarp, and on the west by the modern hedge.
3. A larger area south of the mound (100 metres by 75 metres) is enclosed on the west and south by the substantial 'modern' hedge bank (up to 4 metres wide) and on the east partly by the extant hedge bank, partly by a scarp. The area is bisected by a small stream, above which the ground rises to north and south. (Holiday chalets now cover the southern half). A kink where the hedge joins the line of the second enclosure, and the apparent butting of the south side of the enclosure against the east side, give the impression that this enclosure is not primary.

The possibility of another associated enclosure is suggested by a slight scarp found in the field which slopes away to the north-west of the castle mound (see Fig 1). The east side of this enclosure appears to be perpetuated by the existing hedge bank. No building platforms could be identified

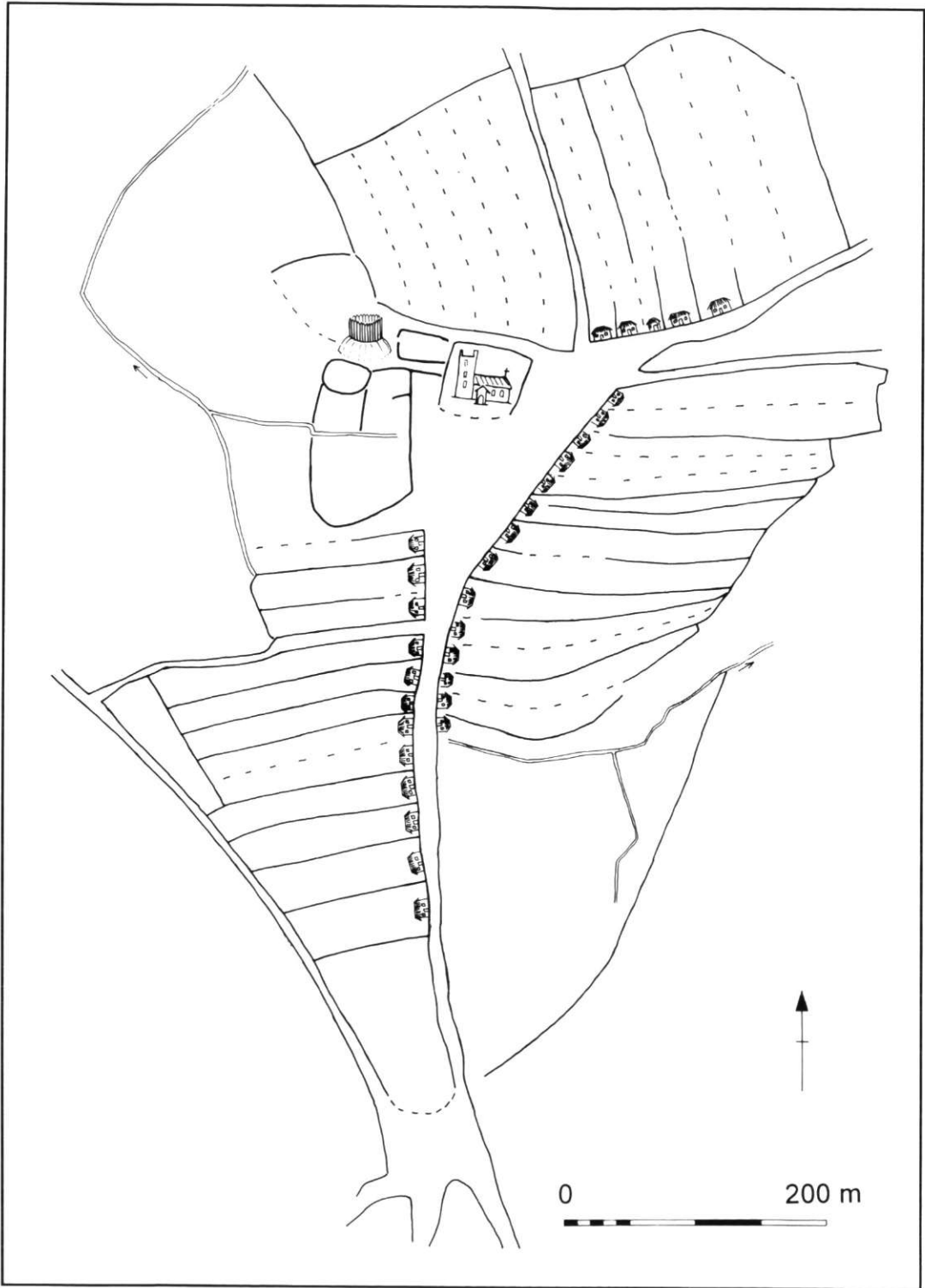


Fig 4
Week St Mary; suggested early layout. Broken lines are hypothetical

with certainty. One possibility is an elongated hollow area in Enclosure 2 marked 'B' on Fig 3).

Enclosure 3 is roughly comparable in size to the baileys at Trematon and Cardinham, but is unusual in being bisected by a stream; and on the east side at least it does not have the appearance of a defensive rampart. The two smaller enclosures are of similar size to the two baileys at Kilkhampton (Preston-Jones and Rose, 1986, Fig. 13), but if they are baileys then either their defences have been well slighted or they were never very strongly defended.

The castle is not mentioned in medieval records; it could have been established by any of the 11th or 12th century holders of the manor. Presumably the site continued as an important manorial centre until the mid 13th century, as the principal seat of the de Wykes. It may have remained in use for some time after this, but perhaps as no more than an administrative centre for Week St Mary alone, with the manor house only occasionally in full use.

In summary, the earthworks probably represent a small 11th or 12th century earthwork castle continuing as a 13th/14th century manorial complex; abandoned in, say, the 14th or 15th century; and no doubt further modified by subsequent agricultural use. The earthwork evidence of the site does more to hint at its potential than to elucidate its development.

Market Place and Burgage Plots (Figs 1 and 4)

It appears that the heart of the town - the market place - was originally laid out adjoining the castle or manor house as an unusually large triangle, enclosing only the church in its north west corner. A similar arrangement can be seen at Kilkhampton (Sheppard, 1980, Fig. 26) though there the triangle is somewhat smaller. Measuring 200 by 170 metres, with an area of 2 hectares (5 acres) the open space at Week St Mary made very generous provision for a weekly influx of traders and in particular could accommodate the herding and tethering of many head of livestock. Only vestiges of this admittedly hypothetical original large market place now survive, as small open spaces at its southern and north-eastern tips; a market house is shown in the latter on the 1840 tithe map. The rest has been infilled at an unknown date by houses and gardens to the east and south of the churchyard, which may itself have been extended. Presumably the market place was increasingly encroached upon as circumstances changed, though it should be noted that the infilling of market places is very common in medieval towns and need not therefore be taken as evidence for decline.

Burgage plot boundaries can be very enduring (Carver, 1987, 70) and it is likely that many of those at Week St Mary perpetuate their medieval course. The presumed burgage plots are particularly well preserved on the east and south west, and from Burdenwell in the north to the Rectory in the south they are still mostly occupied by houses, though there have also been a few empty plots since at least 1840. It is not known whether there were ever strips in the area of the Rectory, or north of the church. At the south, to the west of the road, the strips are fairly regular, being quite broad (19 to 39 metres) though of varying length (110 to 190 metres), and with half a dozen of them close to an acre (0.9-1.08 acres). Those on the east side of the road are more irregular, probably due to a combination of the topography (the ground slopes away to the east) and a more complex history. There is a hint of further strips to the north east of the market place.

The layout of strips and enclosures comprises two components. First, the strip-like enclosures themselves, generally 15-40 metres wide, and up to 210 metres long (though mostly 100 to 200 metres). The larger widths are probably due to the removal of the intermediate boundaries. Second, within this framework of strips there are smaller enclosures and house plots at the street frontage. At larger towns such as Helston, Penryn or Launceston the strips are much more closely packed and are narrower and shorter (see Sheppard, 1981). The broader strips at Week St Mary are more comparable to those at smaller towns such as Grampond and Kilkhampton, though at both there is evidence of more intensive use and subdivision of the frontages than at Week St Mary.

A hypothetical reconstruction of the early layout is suggested in Fig 4; the burgage strips on the north are almost entirely hypothetical but otherwise the impression may be fairly close to the layout as intended, if not as it actually was. In this model it is suggested that in the original layout the strip-like burgage plots, many of them roughly an acre (and this accords with the documentary evi-

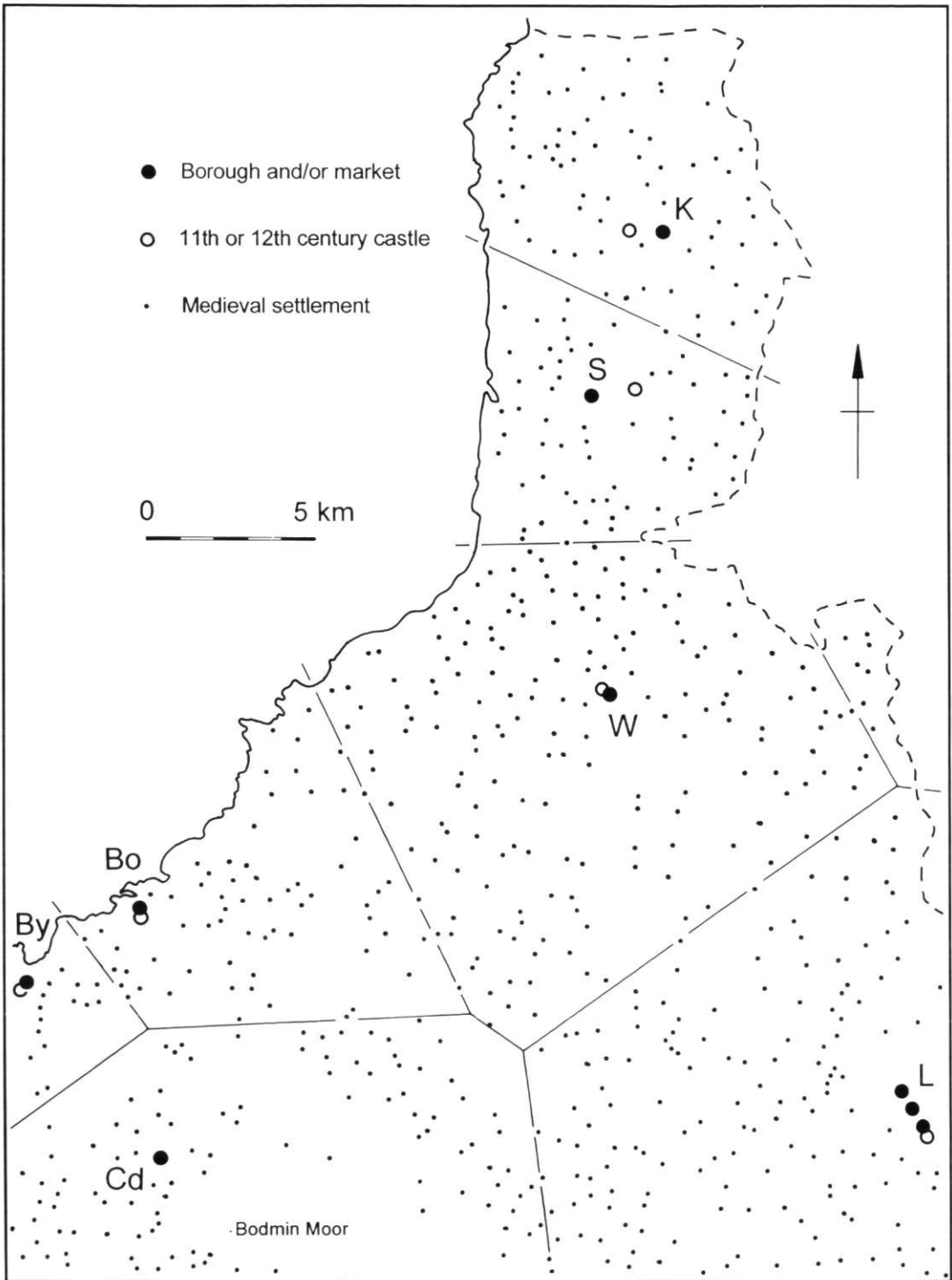


Fig 5

Week St Mary in relation to medieval markets and settlements. K = Kilkhampton; S = Stratton;
 W = Week St Mary; L = Launceston (St Stephens, Newport and Dunheved); Cd = Camelford;
 By = Bossinney; Bo - Boscastle

dence - see above), would each have had a single house placed on or close to the street frontage. The plot would have been used like an allotment, to grow vegetables and keep a few animals such as pigs and chickens. In subsequent centuries most changes occurred along the frontage, with subdivisions, rebuildings, amalgamations, desertions at various times in different parts of the town. If the strips do represent burgage plots then there may have been provision for some thirty to forty burgages at most; the 'town' was probably always of very modest scale, and the lack of development is reflected in the small number of burgage plots and their generous size and lack of subdivision, if one can assume that this is as much a product of its earlier history as of its later decline.

Week St Mary and its hinterland

Fig 5 explores the context of Week St Mary in relation to the surrounding medieval settlements, both market centres and farms and hamlets. The figure derives from the Institute of Cornish Studies Place-Name Index, compiled by Oliver Padel. All documented settlements are shown between Week St Mary and the nearest markets: Stratton, 9 kilometres (5.5 miles) to the north, where a market was granted in 1256; Boscastle, 15 kilometres (9.3 miles) to the west-south-west, a modest sized borough and fishing port with a market recorded from 1204; Camelford, 19 kilometres (12 miles) to the south-west, with a market from 1259; Launceston, in many ways Cornwall's most important town, 15 kilometres (9.3 miles) to the south-east; and Holsworthy, 12 kilometres (7.5 miles) to the north-east across the Tamar. Week St Mary can be seen as a component in a network of markets covering Cornwall and Devon such that by the 14th century few people had a journey of more than six or seven miles to their nearest market (Preston-Jones and Rose, 1986).

It is interesting to note in this part of Cornwall the frequency with which markets are associated with 11th or 12th century castles. This emphasises the link between important seigneurial centres and the establishment of markets and gives the impression that the distribution of markets has more to do with the distribution of castles than a consideration of market forces. Market and castle had a shared reason for their establishment, the enduring importance of a particular handful of manorial centres. Indeed the correlation of the distribution is so close as to encourage the suggestion that the market centres could be more closely contemporary with the 11th or 12th century castles than is apparent from the documentary evidence alone. In the case of Kilkhampton, Stratton and Launceston the history of this important status stretches back well before the Norman Conquest (though only at St Stephens Launceston is there any evidence for early urban status). The medieval importance of Week St Mary, Bossiney and Boscastle probably has more to do with decisions of local Norman lords than with the earlier status of these places, though this raises the question of how and why these decisions were reached.

A hypothetical hinterland for Week St Mary has been constructed on Fig 5 by bisecting the distance between the markets; for all settlements within this area Week St Mary would be the nearest market as the crow flies. This area, covering four complete parishes and parts of nine others (160 square kilometres in total) contains some 180 settlements, none of them more than 10 kilometres (6 miles) distant, and most less than 7 kilometres (4.3 miles). All would have been easily close enough to allow the walk to market and home again within the day. In practice of course the shape and size of the hinterland would be strongly influenced by factors such as the nature of the roads, local custom, and the purpose and requirements of the visit. Presumably folk in the south and east part of Week St Mary's hypothetical hinterland would have been drawn south to Launceston, and no doubt there were in any case those transactions for which only a journey to a major urban centre, rather than a little rural market, would suffice. Indeed for a determined traveller on foot Week St Mary itself was not beyond the range of a single day's journey to Launceston and back, and it may have been in large measure because Week St Mary was always hopelessly overshadowed by its greater neighbour that it failed to develop significantly as a town.

Week St Mary and the surrounding four parishes (Poundstock, Jacobstow, Whitstone and part of Marhamchurch) made up a 'core' area within the hypothetical hinterland, whose inhabitants one would expect to make use of their neighbouring market if at all possible. These 'core' parish-

es cover 76 square kilometres and include 90 recorded settlements. If, as is likely, most settlements were hamlets, then a 14th century population of at least 1800 (and perhaps many more) can be expected within four miles of Week St Mary.

The area would have encompassed the resources of coast and moor, farmland, orchard and wood: fish, grain, poultry, livestock and its by-products - dairy produce, skins, wool, cloth - which could be sold or exchanged at a small market like Week St Mary. Here too might be a concentration of crafts not usually found on the surrounding hamlets, associated with the further processing of these products. Without evidence from documents or excavation the precise character and range of crafts to be expected at Week St Mary is a matter of speculation but might have included butchers, skimmers, tanners, leatherworkers, bakers, tavern keepers, blacksmiths and bronze smiths, carpenters, and perhaps merchants in wool and cloth. Unfortunately local trade tends to be less well documented than international trade (Clarke, 1984, 190). It remains a fundamental question how far a place like Week St Mary was basically rural, its inhabitants depending predominantly on their own agricultural activities, or whether it was largely a settlement of craft specialists and merchants, albeit on a small scale.

Note 1

When Sir Ranulph Blanchminster died in 1348 he held Week St Mary of William Chambernoun, as of his manor of Tywardreath, by knight service (Goulding, 1898, 21a). For this reason, as Tywardreath had been part of the Cardinham fee, it is probable that the de Wykes, in the 12th and 13th centuries, had likewise been tenants of the Cardinhams (Mr W. Picken and Mr O. Padel, *pers comm*).

Appendix: Week St Mary in the 1841 Census

The invaluable details of the 19th century censuses help to document the character of Week St Mary village and how it compared to the rest of the parish. This may also give a general flavour of the nature of the settlement in previous centuries. In the 1841 census the parish had a population of 788. Week village and Week Green formed the main concentration of population with 382 people. Table 1 below gives selected details for Week village and Week Green. A large proportion of the occupations given are directly involved in agriculture: agricultural labourers and farmers. But in Week village and Week Green there is a far higher proportion of craft and trade occupations than in the rest of the parish. The range of occupations is given in Table 2. Of 406 people in the remainder of the parish only twelve had trade or craft occupations, two millers, three drapers, two shoemakers, one each of dressmaker, glover, stone mason, carpenter, and maltster.

Table 1 Week Village and Week Green: general details

	Week Village	Week Green	Total
Population	270	112	382
No of households	67	29	96
Agricultural labourers	19	16	35
Farmers	3	2	5
Servants	18	5	23
Independent	12	-	12
Crafts, trades etc.	36	12	48

Table 2 *Week Village and Week Green: trades, crafts etc.*

Carpenter	6	Merchant	1
Mason	5	Shopkeeper	1
Tailor	4	Butcher	1
Charwoman	3	Draper	1
Innkeeper	3	Cheesedealer	1
Weaver	2	Surgeon	1
Schoolmistress/master	2	Gardener	1
Blacksmith	1	Excise officer	1
Sadler	1	Leather seller	1
Maltster	1	Cordwainer	1
Other	4	Apprentice	6

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Cornish crosses: Recent News

ANDREW G. LANGDON

Trevorry or Sandyway, Lanlivery, Stolen Cross Returned. Figs 1 and 2

On 22 January 1990 the writer received a telephone call from Mr Eric Higgs of Lanlivery, to say that the Trevorry or Sandyway Cross had been stolen in the night. Parishioners travelling to church the previous day had confirmed that the cross was on its site that morning. The whole village was astounded that anyone should attempt to remove the cross, which weighed at least five hundred-weight. The stone would have needed at least two men to move it and would also have required a suitable vehicle for transport. Its site was approximately one mile south of the churchtown, at a road junction (SX 0791 5796). Lanlivery had already lost five crosses over the last century to neighbouring parishes and private estates, leaving only three to protect. To lose one of the remaining three caused an uproar within the village, prompting an immediate search of the whole area, and the start of a long publicity campaign. Mr Higgs and a parish councillor, Mr Howard Roberts, decided that if the theft of the wayside cross was well publicised the monument would be 'too hot to handle' and they appealed for its safe return. The parish council also offered a reward of £100 to anyone who could give them information leading to the return of the monument. The theft was thought to be part of an organised campaign since other granite artefacts had been stolen recently in the county (eg millstones, staddle stones and troughs) and this encouraged the media to take an interest, resulting in reports in local and national newspapers, and also on local television and radio (Bray 1990, Gould 1990, Neale 1990).

This cross had been discovered in 1936 during road alterations at the junction of two ancient lanes. Removal of a hedge revealed it and a large stone with a round socket, which was eventually utilised for the cross base. The County Council re-erected the cross soon after but in 1940, following a collision by an Army lorry, the shaft was fractured. In September 1941 the cross was again re-erected by the Council under the supervision of the Rev. Wynne, Vicar of Lanlivery, but it was now five inches shorter and rested only in a shallow recess in the base stone.

The cross was first recorded by Mr Ashley Rowe who named it the 'Sandyway' cross, after the lane in which it was found, which had been used for generations by local farmers to transport sand from the beaches around Par to spread on their fields as fertiliser (Rowe 1939). Later historians renamed it the 'Trevorry' cross after the nearest farm (Ellis 1956; Henderson 1952-83, 301). The original site of the monument is unknown, and will remain so until the true base stone comes to light. The cross still marks an ancient route running directly to the churchtown, but may also have acted as a bound stone as the parish boundary is only 200 yards from its present site.

Seven weeks after the cross had been removed it was found by the police whilst pursuing another investigation. The people of Lanlivery decided that they would like to have it re-dedicated when it was re-erected and the Bishop of Truro was invited to perform the ceremony. This took place on Monday 4th June: the Bishop, the Rt Rev Michael Ball, and the vicar of Lanlivery, the Rev David Keighley, officiated, in the presence of over one hundred people. Before this the cross was cemented onto its base stone and additional stones were placed behind it and bedded in concrete, underneath which was hidden a 'time capsule' containing a history of the cross and a copy of a poem about it composed by the children of Lanlivery School, with a list of their names.

The round-headed wayside cross was cut from a piece of coarse-grained granite. It displays an equal-limbed cross in relief with expanded limbs which extend to the edge of the head. A small hole can be discerned in the centre of the cross, which may have been used by the mason to strike an arc, forming the round head; the reverse face is similar. The short shaft displays slight entasis on each side, but is devoid of any form of decoration. A likely date would be in the range of late 11th to 13th century.

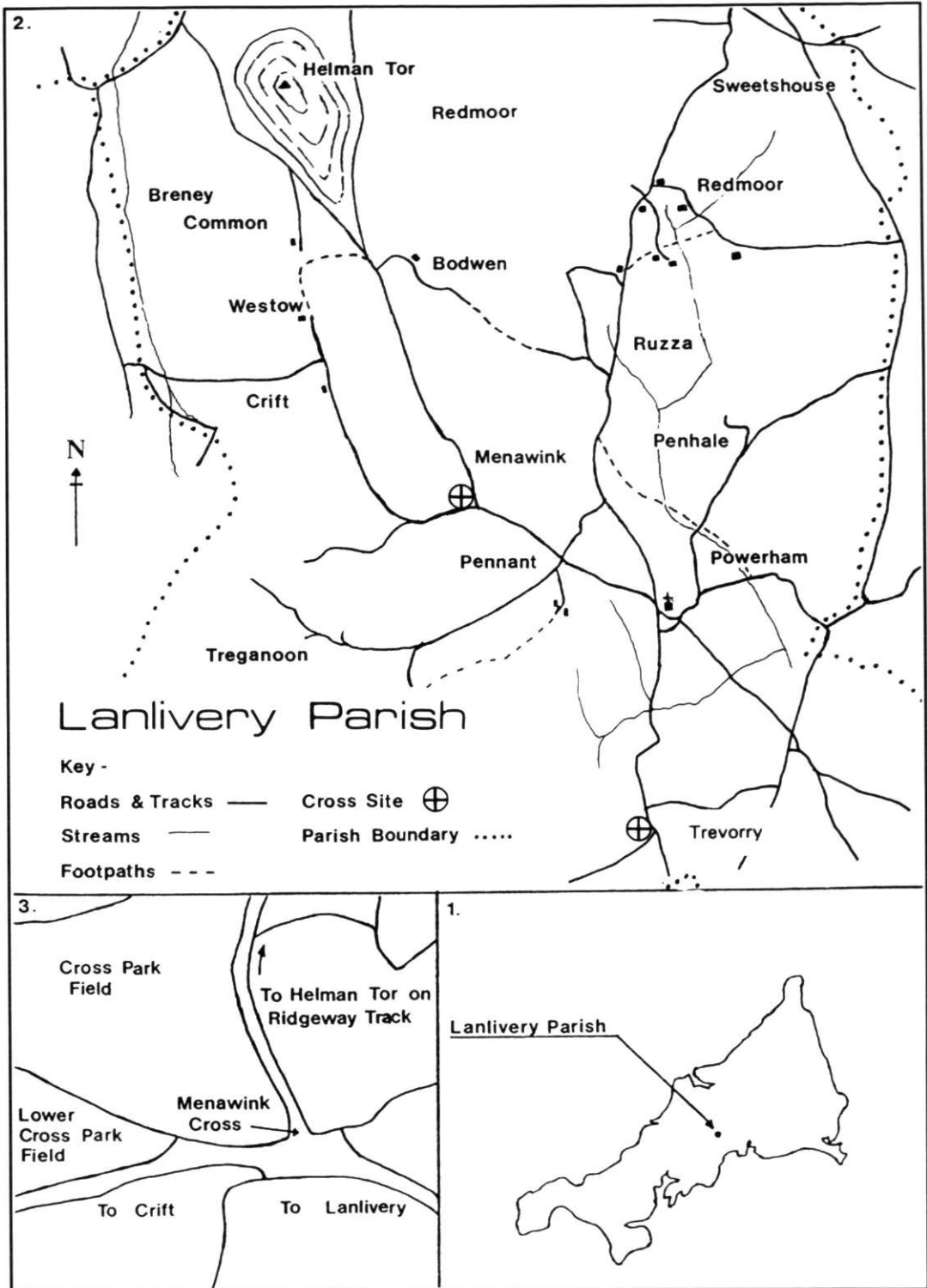


Fig 1
Lanlivery parish: map showing sites of Trevorry and Menawink crosses

Dimensions Height: 1.04m (3'5"); Width of head: 0.43m (1'5"); Width of shaft (at neck): 0.25m (10"); Width of shaft (at base): 0.29 m (11 1/2"); Thickness: 0.18 m (7")

Menawink cross, Lanlivery. Figs 1 and 3

The parish of Lanlivery has had an unfortunate record with regard to its ancient stone crosses. In the past five crosses have been removed, one as late as 1937 (Rowe 1937); they are now preserved in the parishes of Tywardreath, St Winnow, Boconnoc and Lanhydrock. In January 1990 Lanlivery suffered another blow when the Trevorry/Sandyway cross was stolen; luckily this stone was later retrieved and re-erected (see above). It is therefore good news to report the discovery of another cross in the parish, even if it is somewhat mutilated.

In October 1990 the writer received a telephone call from Mr Eric Higgs, the local historian, inviting him to examine a gatepost which he suspected was the remains of a stone cross. On examining the post it was apparent that it was a mutilated wheel-headed wayside cross. The stone was in use as a gatepost at SX 0711 5959, half a mile north-west of the churchtown and close to where the old ridgeway track which skirts Helman Tor meets the parish road from Lanlivery to Crift, on the eastern side of Helman Tor. Many crosses have been discovered re-used as gateposts (see also Tregrylls Cross, below), with the cross head usually surviving. In this case the stone had not been inverted and to facilitate hanging a high gate the round head had been hacked off in line with the shaft. The only remains of the wheel cross is the incised outline of the lower limb of a 'cross of arcs', visible on each face of the monument. The stone also displays a narrow bead running the full length of the shaft on each side. One unusual mark on the shaft is an incised 'V' cut just below the neck of the cross.



Fig 2
The Trevorry cross in Lanlivery church after its recovery, 1990

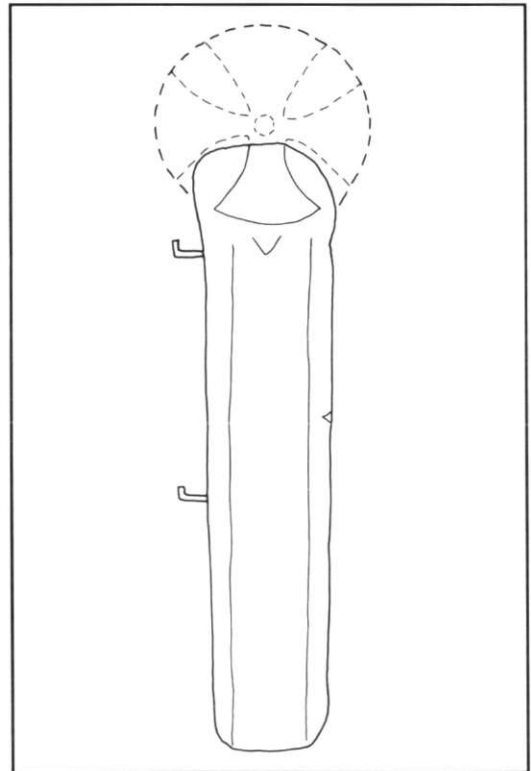


Fig 3
The Menawink cross, Lanlivery; outline drawing

Later in October, after gaining permission from the landowner, the writer and Mr Higgs dug around the bottom of the cross to ascertain whether the tenon was intact. No tenon was found, although we were surprised to discover that the cross was another 2'9" longer, with the bead continuing to the bottom. Mr King, the landowner, stated that the gatepost (cross) was shifted in approximately 1980 from the opposite side of the parish road to its present position, 5 m north.

A few metres up the ridgeway track from the gatepost are some ruined farm buildings, all that remains of Menawink Farm. In 1695 the land was part of the manor of Bodardle and was recorded on the Lanhydrock Atlas; here the tenement of Meniwinck is mapped, recording two fields opposite the farm as Higher Cross Park (8 acres) and Lower Cross Park (5 acres) (Gascoyne 1695, Vol 3.11). By the time the Tithe Apportionment map was prepared in 1841, the field known as Higher Cross Park had been divided into two, Cross Park and Higher Cross Park; all three fields were recorded under Higher Pennant. The cross was discovered in use as a gatepost at the entrance to Cross Park, with Lower Cross Park to the west and Higher Cross Park to the north.

Henderson noted that there were many fields in the county known as Cross Park. In the west of the county the Cornish equivalent is Park-an-Grouse. East of Truro Cross Park, Henderson suggests, is less certainly indicative of a stone cross than the Cornish version. In many cases (in English), Cross Park may only indicate that the field is in close proximity to a crossroads, or that a footpath dissects the field (Henderson 1930). In this instance, these fields may have been named after this old wayside cross, as although there is a road junction there is certainly not a crossroads. In 1850, Hingston Randolph illustrated Bodwen cross on the old ridgeway track near Helman Tor and also stated '.... at almost equal distances from it, on the same road are two similar crosses, buried halfway up in the soil' (Hingston Randolph 1850, 1). The Bodwen cross is now in Lanhydrock cemetery, but the writer believes that the Menawink cross may be one of the two mentioned by Randolph. These crosses would have been erected as way markers, a kind of 'Medieval signpost', marking the route to the parish church and also from Lanivet parish, south to Lanlivery and probably ultimately to the Priory at Tywardreath. The ridgeway track itself is much older and may have existed as early as Neolithic times.

It was decided to remove the cross from its present use, and re-erect it a few metres away at the junction of the ridgeway track, which also doubles as part of the Saint's Way footpath, from Padstow to Fowey (Gill and Collwill 1986, 52). Mr Higgs obtained permission to remove the stone and organised a group of local farmers to help in the project.

On Saturday 3rd November 1990, the writer met Mr Higgs and local parishioners at the cross site; all signed a document outlining the stone's history which was sealed in a time capsule for burying beneath the cross. Local farmer Mr David Chapman, his sons and workmen, with the aid of tractors, digger and concrete mixer, removed and repositioned the cross in less than one hour. While the cross was being lifted out of its former position with the aid of chains, a hole was being dug at the new site. The whole exercise proved remarkably easy, as the farmers are used to replacing gateposts, and shifting heavy stones. Again Lanlivery's marvellous community spirit proved invaluable during this project. Early in 1991, the gate hangings were cut off the cross and a notice placed beside it, stating its known history.

On Good Friday 1991, the monument was re-dedicated by the Rev David Keighley, Vicar of Lanlivery. The ceremony was witnessed by the writer and over sixty local people.

The writer is indebted to Mr A. King of West Pennant, for allowing the cross to be shifted, to Mr Eric Higgs for organising the project and to the Chapman family of Tregantle Farm for all their hard work in shifting the stone.

Dimensions: Height: 1.16 m (7'1"); Width of head (existing): 0.48 m (1'7"); Width of shaft: 0.46 m (1'6"); Thickness of shaft: 0.23 m (9")

Tregrylls Cross, Lesnewth. Figs 4 and 5

The writer was first informed about the discovery of this ancient stone on April 30th 1989 although he had previously heard a rumour that a cross had been found on a North Cornwall farm

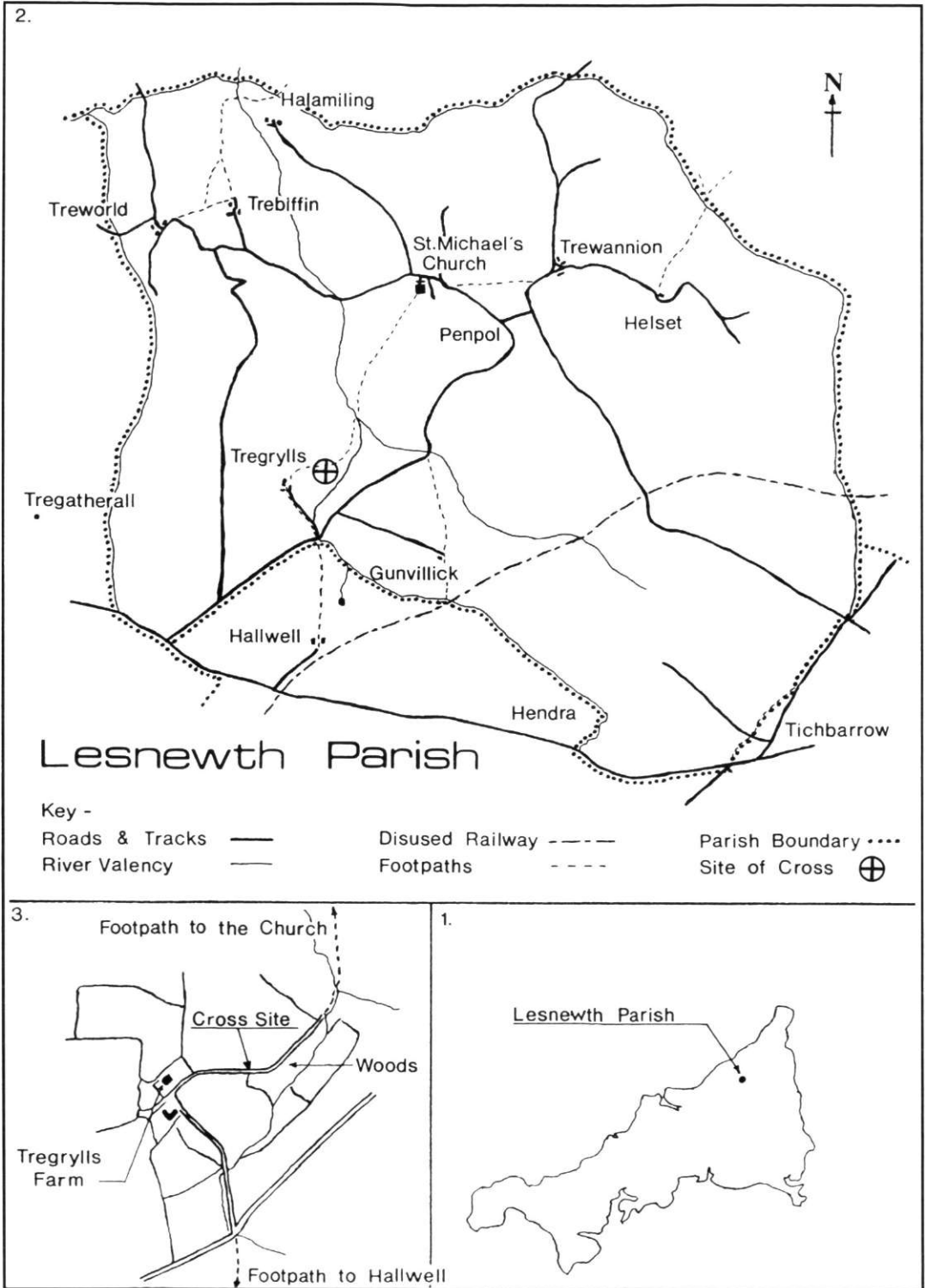


Fig 4
Lesnewth parish: map showing site of Tregrylls cross



Fig 5
Tregrylls cross, Lesnewth, as found

in the summer of 1988, but the name of the farm had eluded him. The missing information (the name of the farm) came in a telephone call from Mr Bernard Hawken of Lanow, St Kew, who knew of the writer's interest in crosses. Mr Hawken had recently been in conversation with Mrs Ruscombe-King of Lesnewth who, while out horse riding, had noticed the stone and on examining it thought it may be a cross. The writer contacted Mrs Ruscombe-King who agreed to show him the stone and after obtaining permission from the landowner, Mr G. Goodman, a visit to the farm was arranged. The stone, located in the ancient manor of Tregrylls, was lying beside the steep slate-bottomed track leading from Tregrylls north towards the churchtown of St Michael's, Lesnewth at SX 1269 8944. On examination it was immediately evident that the large Latin granite cross had, until recently, been in use as a gatepost, the gate formerly crossing the track. Gate hangings were still attached to the stone which had been buried head down in the ground for many years. This was the most common degradation our wayside crosses were subjected to and most of the recent discoveries were also found in use as gateposts, ie Youlstone Farm, Warbstow 1973, Hendra Farm, Menheniot 1984 and Menawink, Lanlivery 1990 (Henderson 1952-83, 1040; Langdon 1988a, 331; 1988b, 204).

Tregrylls lies approximately one mile south-west of Lesnewth churchtown, beside the steeply wooded valley of a tributary of the River Valency. The track is part of the old church path which linked the Manors of Hallwell and Tregrylls en route to the churchtown. The track descends a steep slope from Tregrylls Farm to the tributary, crosses it and then ascends a hill northwards across fields to the churchtown. The writer suggests that the old cross, while in use as a gatepost, was undermined along with part of the hedge which divides the woodland. In the winter water drains off the fields surrounding the farm and runs down the track to the stream below, slowly eroding the hedgerows over the years. On the opposite side of the track from where the cross lies a second gatepost still exists, in line with the hedge.

The Latin cross has stunted upper and horizontal limbs of irregular size and length and its shaft has a massive girth of almost four feet around. The whole of the existing monument is well-preserved, the shaft worn smooth with no sharp edges. One of the horizontal limbs is slightly chipped and the cross is minus its tenon and base stone. There are leaded holes which still scar the shaft in addition to the existing gate hangings, suggesting use as a gatepost over many years.

Dimensions : Height: 2 m (6'6 $\frac{1}{2}$ ""); Width of head (across horizontal limbs): 0.61 m (2'); Width of shaft: 0.38 to 0.4 m (1'3" to 1'4"); Width of upper and horizontal limbs: 0.2 to 0.22 m (8 to 8 $\frac{1}{2}$ ""); Thickness of shaft: 0.15 to 0.22 m (6 to 8 $\frac{1}{2}$ ""); Existing gate hangings: 0.76 m (2' 6" apart)

There are very few Latin crosses in North Cornwall and only one which possesses any similarities to the Tregrylls cross: Lambrenny cross in the neighbouring parish of Davidstow (Langdon 1896, 206). The two monuments are only about four miles apart, both have rounded shafts and stunted limbs, although the limbs of the Lambrenny cross are even shorter.

The most probable reason for erecting this cross was as a medieval guide post to mark the church path, although without discovering the base stone the monument's original site will remain a mystery. Most wayside crosses had a tenon cut on the bottom of the shaft, to be received by a base stone with a corresponding mortice. The base stone would have been a rough piece of moorland stone, with the mortice either cut right through the stone or part way. In the past many crosses were re-used as gateposts but the base stones were normally discarded as they

served no useful purpose to the landowner and if found are, because of their weight, usually close to their original sites. This cross may either have been knocked off its base stone, snapping off its tenon and leaving it still attached to the base stone, or it may have been shifted to its present position, inverted in the ground and had its tenon trimmed off to neaten it up as a gatepost.

The cross may have had a dual purpose; besides being a guide post it may have also acted as a bound stone for the Glebe. In the 1613 Terrier the Glebe is recorded as being bounded by the Churchtown on the north, Penpoll on the east, Treskerdie on the south and Choldon on the west. Later, in the 1622 Terrier, the southern boundary was recorded as Treskedye and in the 1746 Terrier as Garles-Skiddy (Maclean 1876, 404-6). This we can identify as being the local name for Tregrylls; Skiddy, according to Padel's *Cornish Place Name Elements* (1985), may indicate land clearance, coming from the Breton word Skidifi 'to clear land'. An area of clear ground can be seen directly below the farmhouse at Tregrylls and also to the north of the wooded valley. Many wayside crosses in the county had dual functions, marking an ancient track as well as being a bound stone to private ground, the Glebe or the parish. The parish boundary is described in the 1628 Terrier and as well as mentioning Grills Ford and Grills Lane, also records a cross 'from Tettesborough down (Tichbarrow) by the King's highwaie Vnto Hendre corner to the foot of a cross, and from thence over Hender downe.....'. The writer has walked this boundary but has found no evidence of any cross existing near Hendra corner. Ellis (1957, 257) suggested that the cross in the churchyard at Lesnewth may have marked the old church path, via Tregrylls to Halwell. He also suggested the cross may have marked a corner of the Glebe as the Tregrylls cross may have done.

Since the writer's initial visit to Tregrylls, the property has been sold and negotiations with the new owner, Mr J.S. Linington were conducted, with a view to re-erecting the monument. It was finally agreed to erect the cross exactly where it was discovered, as its base stone could not be located and the stone's massive weight and remote situation made it difficult to remove to another site.



Fig 6
Tregrylls cross, Lesnewth, re-erected 1991

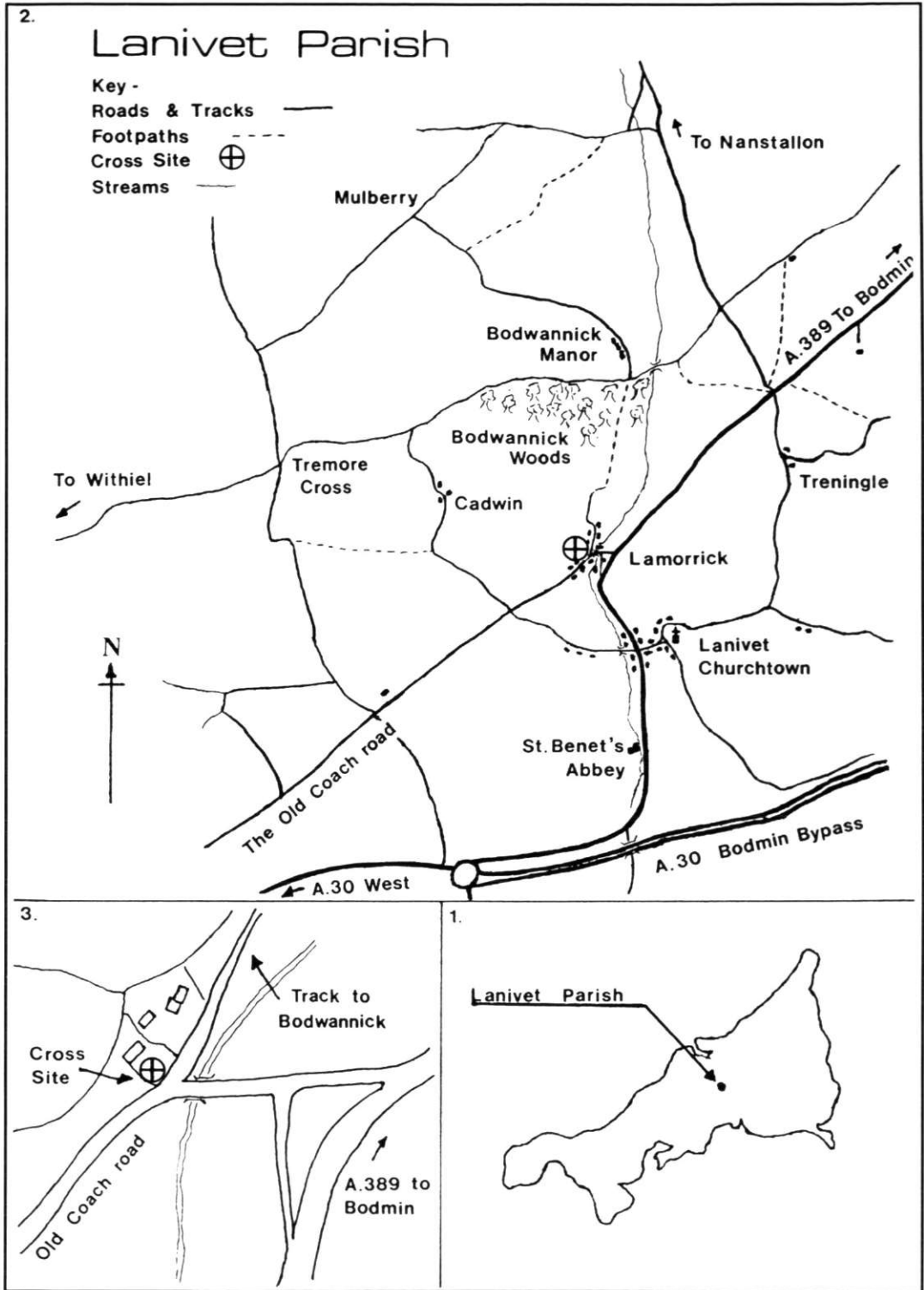


Fig 7
 Lanivet parish: map showing site of Lamorrick cross

On Friday 14th June 1991, the writer assisted by Mr Frank Smeeth, Recorder of Camelford Old Cornwall Society and Mr Ray Burrows of Bodmin, erected the cross beside the old church path. Armed with pick axes, shovels and iron bars, the monument was first turned over, and on examination of the reverse face, the faint outline of a Latin cross in relief could be discerned. Closer examination found that there were traces of a Latin cross in relief on both faces, a feature not noticed by the writer on previous visits. The laws of gravity were introduced to aid the erection of the monument, the ground below the bottom of the shaft was dug away to provide a sloping bank and a stepped hole was dug below this. The stone was then levered with the aid of iron bars down the slope and into the stepped hole, the sheer weight of the stone pulling it upright with a minimum of manual effort. Unfortunately, using this method has reduced the monument's overall height above ground, although it is now secure and there is no threat of it toppling over in the future. The cross was further secured with stones, blocking it below ground level, and the surrounding area cleared of vegetation. The monument now stands 4' (1.22 m) above the ground.

The writer is indebted to Mr J.S. Linington and Mr G. Goodman for allowing him access to the stone and to re-erect it, also to Mrs Ruscombe-King and Messrs B. Hawken, F. Smeeth and R. Burrows for their help in preserving this ancient monument.

Lamorrick Cross, Lanivet. Figs 7 and 8.

On 31st July 1991 the writer was travelling east along the old coach road from the A30 trunk road towards the A389 to Bodmin, a well known short cut to the town, bypassing the village of Lanivet. At the eastern end of this road, at the bottom of a hill lies the hamlet of Lamorrick, a quarter of a mile north-west of Lanivet Church.

On descending the hill and entering the hamlet, the writer was astonished to see a stone cross

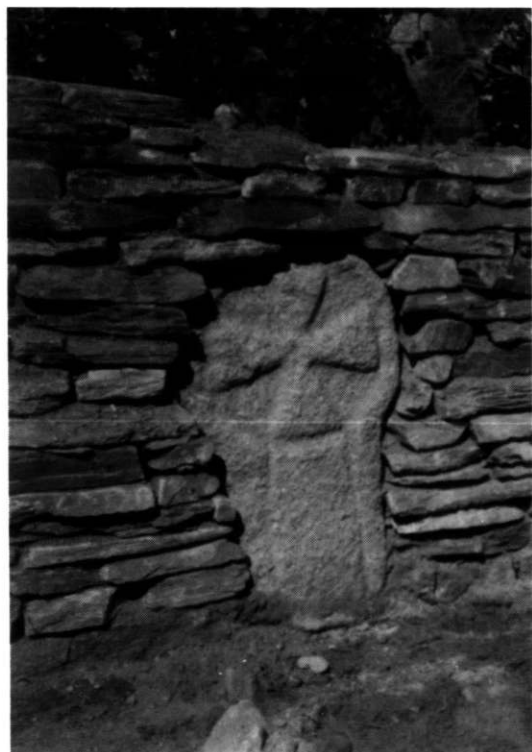


Fig 8

The Lamorrick cross, Lanivet, 1991

lying beside the road amongst a pile of hedging stones. The writer also noticed that a garden hedge had been removed nearby and decided to make enquiries at the adjoining cottage. There he met Mr Philip Burden, the landowner, who said that he had discovered the granite cross lying horizontally in the foundations of his garden hedge the previous day at SX 0357 6460. Mr Burden was in the process of building a new hedge when he found the cross and had already decided to set up the ancient monument in the new structure.

On the writer's initial examination the way-side cross appeared to be identical to the Tremore Cross (Langdon 1896, 71), also in the parish, but on comparing measurements it was found that the head was slightly smaller in diameter. The round cross head and small portion of shaft were in a good state of preservation and displayed a fine equal limbed cross with expanded ends on each face. A narrow bead enclosed the head on both sides, the ends of which ran down the length of shaft. Mr Burden stated that on making the discovery, he immediately examined all the other large pieces of granite in his hedge in the hope of finding the missing piece of shaft; this proved unsuccessful.

Mr Burden's cottage grounds were known as Nettles tenement and have been in his family

since 1935 and, to his knowledge, the garden hedge had not been altered on any previous occasion. The site of the garden hedge is adjacent to a junction between the old coach road and an ancient track which runs due north to Bodwannick Manor. This track, which eventually reduces to a footpath near Bodwannick, was the original church path from Nanstallon via Lamorrick to the churchtown. In the writer's opinion the cross may have originally marked this old path. Another cross was found in 1929 at Hoopers Bridge, near the northern end of this path and is now preserved in the grounds of Bodwannick Manor. The writer has made a detailed examination of all large pieces of granite on this church path, including stiles and gate posts, but has been unable to discover the missing piece of cross shaft or the monument's base stone. This latest discovery has increased the number of Lanivet crosses to twelve and there is documentary evidence to suggest that at least one other cross originally stood in the parish.

Two weeks after the monument was revealed, it had been firmly set up in the new hedge for preservation, within two feet of where it was found (Fig 8). Later, on Sunday 13th October 1991, the cross was re-dedicated by the Vicar of Lanivet, the Rev. Stephen Drakeley with the assistance of the Rev. Brian Coombes, the Deputy Grand Bard of the Cornish Gorsedd. The ceremony was organised by the Bodmin Old Cornwall Society. The writer is indebted to Mr Philip Burden and family for allowing him access to examine the cross and other stones on their property.

Dimensions: Height: (0.94 m) 3'1"; Width of head: (0.56 m) 1'10"; Width of shaft: (0.355 to 0.395 m) 1'2" to 1'3½"; Thickness: (0.19 m) 7½"

Recent News of other Cornish crosses

Hendra Cross, Menheniot (Fig 9)

The writer is pleased to be able to record that the Hendra Cross, recently featured in *Cornish Archaeology* (Langdon 1988a, 204-5), has been renovated and re-erected by the Liskeard Old Cornwall Society. The wheel-headed wayside cross had been discovered buried head down in the ground in use as a gatepost, and had been fractured midway down its shaft. The Society approached the landowner and gained permission to restore the ancient stone. This was later achieved thanks to the skilful work of society members, George Trethewey and Brian Bawden, who with the landowner's assistance drilled, pinned and glued the two portions of cross shaft together. A suitable piece of granite was located for a base stone and the monument set up on a new site outside the farmhouse at SX 2684 6553. On October 2nd 1991, the cross was re-dedicated by the Rev. Paul Mellor, Vicar of Menheniot in the presence of the writer and sixty members of the Liskeard O.C.S.

Altarnun, the St Vincent's mine cross, SX 208793

This was removed to the County Highways depot at Two Bridges, near Lewannick, during roadworks on the A30 trunk road. A number of 19th century milestones and boundary stones were also removed. The writer examined the Latin cross while it was out of the ground and measured its overall height, which was found to



Fig 9
The Hendra cross, Menheniot, 1991

be 1.32 m (4 ft 4 ins). The cross has now (October 1992) been re-erected beside the new lay-by on the other side of the road from its original position (David Hooley, *pers comm*).

Padstow, Prideaux Place. Fig 10

In 1974 a fragment of Hiberno-Saxon cross shaft was recovered by Lynette Olson (H.L. Douch, *pers comm*).

It was partly buried beneath the roots of a large tree in the garden behind the manorhouse. The tree has been felled recently and the writer obtained permission from Mr Peter Prideaux-Brune to dig up the stone, which was placed beside the four-holed cross on the lawn (Langdon 1992, 59). Originally the monument must have been much taller and the remaining portions of shaft may still lie somewhere in the grounds.



Fig 10
Fragment of cross shaft, Prideaux Place, Padstow

Trevadlock, Lewannick

In January 1990 the writer was informed by Mr Frank Smeeth (Camelford Old Cornwall Society Recorder) about a possible cross base at Lower Kernick Farm, in the parish of Helland. The stone, which displays a square socket, leans against a barn outside the farm and can be viewed from the public road (SX 0848 7130). On enquiring of the farmer, the writer was told that he had discovered the stone on land he previously farmed at Trevadlock, Lewannick. Near Trevadlock a track runs south-west to the banks of the Lynher, giving access to some fields. Here, on the Lewannick side, the stone was found resting on the river bank (SX 2606 7872). The river Lynher marks the parish boundary between Lewannick and North Hill here and it is quite possible that a wayside cross may have marked a safe fording place across the river.

There are three crosses on the Trebartha Estate, one of which was found in use as a gatepost on an old track leading from Knighton to Trebartha. This track runs parallel with the river and is directly opposite Trevadlock although proving any connection between these ancient stones may be difficult. In the writer's opinion the recently discovered cross head from Trevadlock Manor (Langdon 1991a) is a much later example and any connection can therefore be ruled out.

The stone is oval in shape and measures 1.150 m (3'9½") by 0.965 m (3'2"); its thickness is 0.305 m (12"). The mortice measures 0.215 m (8½") square

See also Peter Herring's review of Andrew Langdon's 'Stone Crosses in North Cornwall' (1992), pp 174-5

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De Lank, St Breward

In June 1991 the Cornwall Archaeological Unit was commissioned by RMC Technical Services Ltd to undertake an evaluation survey of part of the historic De Lank Dimensional Stone Granite Quarry complex to establish the extent of surviving archaeological remains. The area studied took in the northern end of the tor enclosure (SX 1000 7525) of presumed Neolithic date, identified in 1988 during the Bodmin Moor Industrial Survey (Herring 1988, 212) and the opportunity was taken to confirm its character.

The placename De Lank is itself of interest: it may come from Cornish **din** and **lonk**, 'fort of a ravine', Oliver Padel's uncertainty in 1988 being in part due to the lack of a known hillfort (Padel 1988, 78). When the place was named (in the 17th century or earlier), the enclosure's ruins would have been much more clearly visible; not only would they not have been fragmented by quarrying but the vegetation, now dense gorse, brambles and bracken, would also have been kept down by grazing animals.

The enclosure is best preserved on the ridge's long western side. A broken stony bank thickens and has a partly orthostatic inner face at the southwestern corner. Here a narrow entrance, 1.3m wide and with built stone faces, cuts through the rampart which is c 4 metres wide and nearly 2 metres high externally, and up to 1 metre high internally. Another possible entrance, now partly mutilated, is visible at the northern end of the enclosure, again located at a thickening and improvement (some orthostatic facing) of the rampart. Use is made at both ends (c 280 m apart) of natural tors, and elsewhere natural clutter runs are incorporated into the defences in typical 'tor enclosure' fashion. This, together with the lack of defensive ditches, the irregular plan and the use of rubble banks with occasional orthostats for ramparts, all appear to confirm that this is indeed another tor enclosure to be classified alongside the other possible instances, and, following the Carn Brea and Helman Tor excavations, provisionally given an early Neolithic date (see Mercer 1986).

The site will be the subject of a detailed survey by the Royal Commission on Historical Monuments (England) and we look forward to the results of their thorough examination.

The 1991 survey also confirmed the identification of a pair of menhirs, less than 2 m apart, within the tor enclosure, immediately south of the major roadstone quarry cutting which now gives vehicles access to the working quarry. It also provided more detail of the remains of early 19th century granite extraction scattered over the western side of the hill: stone-splitting pits, proto-industrial quarries and early industrial quarries.

Peter Herring

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Stannon and King Arthur's Hall, Bodmin Moor

In April 1991 excavations were directed by Jeanette Ratcliffe for the Cornwall Archaeological Unit in advance of the cutting of a pipeline trench by South West Water. The line cut through medieval or post-medieval boundaries next to King Arthur's Hall (SX 130 775), and through prehistoric field systems at Stannon (SX 126 799, near the Stannon stone circle) where an early curvilinear field system is cut by a substantial prehistoric pasture boundary. One boundary was found to have been preceded by a wooden fence line of near-continuous posts. These excavations, funded by South West Water, were complemented, thanks to funding from English Heritage, by envi-

ronmental sampling in an adjoining bog. As two of the boundaries run into the bog it will be possible to relate the field systems to a dated sequence of vegetation change, the dates coming from radiocarbon dating, the vegetation history from pollen analysis. A summary of the results will be published in *Cornish Archaeology*.

Peter Rose

Halligye Fogou

During November 1991 CAU maintained an archaeological presence at Halligye fogou whilst English Heritage staff excavated a trench in order to facilitate the shoring and blocking of the entrance at the northern end of the northern creep where backfill from the 1980-81 excavations had subsided and intruded into the passage. Excavation of backfill from the trench revealed three courses of drystone walling including a massive lintel, 1.30 m in length x 0.49 m in depth, over the entrance. It was recommended that the entrance should be blocked with 4" concrete blocks to indicate that it was modern work.

Charles Johns

Carland Cross

CAU was commissioned by Renewable Energy Systems Ltd to carry out an archaeological assessment of the Carland Cross area in advance of the proposed windfarm development. This comprised a search of the Sites and Monuments Record, early OS maps, Tithe maps and aerial photographs. The 'desk-based' search was followed up by brief field visits.

A scatter of six certain and possible Bronze Age barrows were located. These adjoin the Carland Cross barrow group south of the A30 road. Until the 18th and 19th centuries this was downland. Warren Barrow, a prominent barrow, is suggested by Charles Henderson to have been re-used as a beacon. An enclosure named 'Little Garlings' on the tithe award appears from its shape and location to have been an animal pound sited on the hundred and parish boundary. By 1880 this enclosure had disappeared and was replaced by a new pattern of field boundaries, a reflection of the steady conversion of this land to arable use. Other 19th century activity included mining; the workings of Cargoll Mine, Wheal Constance and East Wheal Rose encroach on this area. During the present century the number of field boundaries has again declined, reflecting changes in agricultural practice with the increased use of machinery.

Nigel Thomas

Trevu (Camborne) to St Erth water main

An archaeological assessment was carried out for South West Water, in advance of construction of a pipeline. The preliminary work was followed up by a watching brief during installation.

The pipeline crosses an area where a few prehistoric flints are noted in the Sites and Monuments Record; there are also farms documented in the medieval period, and probable medieval boundaries survive in the landscape. Industrial sites and industrial settlements are also characteristic of this area. A full report will be published in a later volume.

Nigel Thomas

Bodmin, burgage plots south of Fore Street

In October 1991 CAU was asked by North Cornwall District Council (NCDC) to carry out an assessment survey of land to the south of Fore Street, Bodmin, in response to proposals for the construction of an access road and car park on the site of ancient burgage plots. During March 1992 CAU surveyed the plots, excavated 15 test pits and recorded sections through five earthen bound-

ary banks; a medieval/?early post-medieval ceramic assemblage was recovered from the core of one of the banks.

The intrinsic value of the burgage plots lies in their continuity of use as part of the historic fabric of the town. This would be destroyed by the proposed development and CAU have recommended that NCDC consider an alternative site for the car park and that the burgage plots should be maintained as gardens or lightly managed woodland. In the event of development taking place a comprehensive archaeological recording programme will be undertaken.

Charles Johns

Pendennis headland

CAU has undertaken a detailed archaeological assessment and comprehensive management plan for Pendennis headland, sponsored by English Heritage and Carrick District Council. A report will be published.

The St Just Mining District Survey

Work is well in hand on a survey of the mining district centred on St Just in Penwith. Few members will not have heard of Botallack, Levant, Wheal Owles and Geevor, and the Crowns engine houses at Botallack must surely be amongst the most photographed buildings of this type in the county.

Along the coastal strip between Morvah and Sennen, however, there is scarcely a patch of ground that has not been tried during the long history of mining in Cornwall. Evidence for pre-industrial mining (that is, in the days before engine houses) is clearly visible in the many small shafts of Ballowall and Bosorne, the gunnises of Hermon and Letcha cliffs, the lode-back workings of Gribba, Cot and Kenidjack, and the streamworks at Nanjulian or Spearn Moor. Inland, too, streamworks and lode-back works are scattered across the moors and bogs - Bostraze, Tregaseal, Leswidden, Kenidjack and Carnyorth. In the coastal plateau which separates the cliff from the moors recent landscape changes have obliterated much of the evidence, but even here, the thickened hedges, linear overgrown dumps in the fieldscape, or the occasional stump of an engine house, are clear indicators of the former importance of mining in the local economy of this western corner of Britain.

The CAU survey (including a contribution from Cornwall Trust for Nature Conservation) aims to locate and evaluate mining remains from all periods, assessing their present condition and their potential for management and interpretation, whilst setting them in the context of the development of mining in this ore-field. A CAU report will be produced, summarising the results.

Adam Sharpe

Mineral Tramways Engine House survey

Cornwall's engine houses are probably its most distinctive architectural structures, and in the Camborne-Redruth area they seem to be virtually ubiquitous. Yet the truth is that these are the survivors of a far larger original population of such buildings - nearly 3000 in all - and most are under threat of collapse through neglect and slow deterioration.

The CAU Mineral Tramways Project, whose first phase culminated in the publication of a report outlining the enormous potential of the area (Sharpe et al 1990), set in motion a drastic change in approach to the management of derelict mining landscapes in this area, to be overseen by the newly-created Kerrier Groundwork Trust, working in conjunction with District and County Councils, the National Trust, English Heritage, the Department of the Environment, the Countryside Commission, the owners of local estates, the Trevithick Society, Camborne School of Mines, and local business interests. The second phase of the project, the conservation of mining

structures, the management of derelict minescapes and the opening up of mine trails, cycleways, and the development of interpretative facilities, has now begun.

As a necessary preliminary stage in this process, CAU, together with a local firm of structural engineers and the Kerrier Groundwork Trust, have undertaken a survey of the engine houses in the Mineral Tramways area, and the report (Sharpe *et al* 1991) describes all the surviving houses in great detail, as well as setting them in the context of the development and use of steam power in Cornwall. It is hoped that this approach can be applied to the remaining engine-houses in the county, whilst interest has been shown in the methodology developed for this project by organisations in other areas of Britain. A massive fundraising drive is now under way to begin the programme of conservation work.

Adam Sharpe

Sharpe, A., Smith, J.R.S., and Jenkins, L., 1990, *The Mineral Tramways Project*, Cornwall Archaeological Unit

Sharpe, A., Massie, C., and Lewis, R., 1991, *The survey of engine houses: the Mineral Tramways area*, Cornwall Archaeological Unit.

Geevor

By the middle of the nineteenth century, the rapid growth of large-scale copper and tin mining elsewhere in the world was having a dramatic effect on the price for these metals, eroding the market lead formerly held by Cornish mines. The effects of these changes on the local economy, and on society in Cornwall, are well known. By the end of the century only a handful had survived the changed economic climate, and the Cornish mining industry had declined to a shadow of its former self. The twentieth century saw even these former giants - Dolcoath and Botallack, Wheal Busy, Tresavean and Clitters - wither and fade; the short-term successes of a small number of mines in the early decades of the century can be seen, in retrospect, to have been based on special economic conditions.

By the 1980s only four mines of any size were in operation - Mount Wellington and Wheal Jane, South Crofty and Geevor. All worked ore fields which had been exploited over centuries. Their neighbouring mines had become archaeological ruins, their workings flooded, their surface areas empty wastelands.

The tin crash of the 1980s was the last straw. Despite the cushion of government subsidies, first Mount Wellington and then Wheal Jane, both modern mines, failed and closed. The future of South Crofty hangs in the balance.

In the west of the county Geevor, denied government grants, survived for a while on a mixture of economies, fund-raising and tourism. Now the pumps have been turned off, and the water rising in the shaft is slowly drowning over 2000 feet of the interconnected levels of some of the most famous and venerable mines of West Penwith - Wheal Bal, Wheal Carne, Boscawell and Levant. But the cessation of mining has brought into sharp focus the question of what to do with what remains on the surface, in the recognition that a virtually unique collection of machinery and buildings representing mining technology from the early years of the century to the 1970s was in imminent danger of dispersal or destruction. Lacking other means of paying their creditors, it was inevitable that Geevor p.l.c. would capitalise on this resource.

With English Heritage, RCHM(E), County and District Councils, the Trevithick Society, and the National Trust, CAU have been involved in putting together a complex management package which will result in the recording, protection and, it is hoped, the conservation of a representative proportion of the physical assets on site, to form the core of an interpretation centre for mining in Penwith.

Adam Sharpe

Mount Edgcombe Park, the Shell Seat

The Shell Seat, an unusual ornamental summerhouse decorated with geological specimens and sea shells, stands in the Earl's Garden, a former private garden in Mount Edgcombe Park. This Grade II* listed building has recently undergone restoration. CAU was asked to excavate the area around the building to establish contemporary floor levels, the nature of the foundations and to check for traces of any associated features such as garden statuary. The trenches revealed that the Shell Seat, a semi-circular vaulted structure, was built upon the remains of a rectangular building, probably an earlier summer-house.

As the excavations produced no dating evidence, documentary sources provide the only clues to the date when the Shell Seat was built. The Earl's Garden appears to have been laid out in the late 18th or early 19th century, while the Shell Seat is first recorded in 1832. Archaeology suggests that the rectangular summer house was an original feature of the Earl's Garden that was demolished to make way for the Shell Seat. The early summer house probably had a maximum lifespan of about 40 years before replacement by its more exotic successor.

Nigel Thomas

Plymouth defences survey

Work has now begun on both sides of the Tamar in conjunction with English Heritage, Devon County Council, Plymouth City Council, the Fortress Study Group and the Exeter Museum Field Archaeology Unit, to record and evaluate the very large number of military sites dating from the Civil War to the mid 1950s which were constructed to prevent the bombardment of the Dockyard and strategic anchorages in Plymouth Sound, both from the sea and the surrounding high ground.

Over the centuries a series of multi-layered defences was established. At its most extensive, the period of 'Palmerston's Follies', a chain of forts and batteries stretched along the coast from Whitesand Bay in the west to Heybrook Bay in the east, whilst a no less impressive inner defensive ring covered the landward approaches, intended to be virtually continuous from the St German's River through Ernesettle and Crownhill to Laira and Staddon Heights.

This extraordinary defensive system did not come into being all at once, but grew in fits and starts in response to threats of invasion and the emergence of hostile naval powers: the Spanish, the French, and later the Germans. Throughout the second half of the 19th century re-modelling and re-arming of the forts and batteries was virtually continuous in an attempt to keep pace with rapid developments in armaments technology. In the event, few shots were fired in anger, and with the advent of the Second World War it became clear that the greatest threat was from the air and that the days of fixed fortifications were over. In 1957, Coastal Artillery was disbanded, the guns cut up for scrap, and the sites either abandoned or allowed to become derelict. Some have been demolished, many converted (not always particularly sensitively) to other uses. The survey is intended to establish what remains and to consider its management: not simply on a site-by-site basis, but also collectively in recognition of the system as a near-unique and presently under-exploited heritage resource.

Adam Sharpe

St Mawes Battery

Just upslope from the much-visited Henrician castle at St Mawes, the well-preserved remains of a gun battery established in the early years of this century to counter the threat of motor torpedo boat incursions into Carrick Roads are little known. At the request of English Heritage, CAU have now completed a detailed survey of the site, with its four 12" gun positions, underground magazine, and position and range-finding structures. The battery is remarkably complete and in substantially good condition, and it is hoped that English Heritage will be able to make the site accessible to the public in due course.

Adam Sharpe

Fieldwork in Scilly, 1991

During September and October 1991 the Cornwall Archaeological Unit carried out six weeks of fieldwork in the Islands. This constituted the third year in a programme arising from Scilly's Archaeological Management Plan, which English Heritage commissioned the Unit to compile in 1988. As in previous years sites were selected on grounds of priority and a number of different types of fieldwork were involved:

- Detailed survey of two nationally important monuments
- Coastal monitoring of the most vulnerable and archaeologically rich stretches of coastline
- Detailed recording and sampling of two early cliff-face sites
- Sampling of three intertidal peat deposits
- Capital works

Amongst the exotic plants of Tresco Gardens stand the ruins of a church, the only surviving remains of a 12th century Benedictine priory dedicated to St Nicholas. Nearby, on the uninhabited island of St Helen's are the unroofed but otherwise well-preserved remains of a small isolation hospital. Known as the Pest House, it was erected in 1764 following an Act of Parliament decreeing that all plague-ridden ships north of Cape Finisterre should anchor off this island. Though both buildings are scheduled, neither had been adequately recorded prior to 1991, when a detailed photographic record and plans and elevation drawings were made.

Following severe storms during January 1990, a rapid examination of most of Scilly's coastline revealed that erosion had occurred at 46% of known beach, cliff, and intertidal sites. During 1991, after a mild winter, the degree of erosion was found to be much less, which suggests that a complete coastal check every five years would normally be adequate. However, a dozen or so key sites (mainly prehistoric settlements or peat deposits, but also Civil War batteries) should be revisited on an annual basis.

At Halangy Porth and Porth Cressa, St Mary's, the stone walls and interiors of two Bronze Age houses are exposed in the cliff face. At each site the cliff section was drawn, layers and features contexted, artefacts collected and samples taken for radiocarbon dating and environmental analysis (pollen, seeds, bones, soils).

In 1990 samples from intertidal peat deposits on Higher Town beach, St Martins's, and Crab's Ledge, Tresco, produced radiocarbon dates ranging from 5120 BP \pm 50 to 1460 BP \pm 150 (uncalibrated and correct to one standard deviation). As well as monitoring and re-surveying the exposed areas of peat, the aim of fieldwork in 1991 was to assess the feasibility of constructing a plan of the extent of the peat still buried beneath the sand. In the event, wet sand and shingle made systematic auguring impossible. Nevertheless, the results were very exciting, since cores drilled by a powered percussion augur revealed that additional bands of peat underlay the dated exposures.

For the second year running, British Trust for Conservation Volunteers carried out repairs at Oliver's Battery, infilled timber revetments being used to repair the remaining eroded areas of this Civil War earthwork. In addition, the Unit extended its capital works programme to include the uninhabited island of Samson, where archaeological remains of all periods are threatened by a combination of factors, of which visitor pressure and bracken invasion are the most serious. Paths were re-routed, a stile constructed, and the eroded scars of two Bronze Age burial monuments repaired.

Jeanette Ratcliffe

ROMAN FINDS FROM EXETER by Neil Holbrook and Paul T. Bidwell. Exeter Archaeological Reports 4, University of Exeter Press (Exeter City Council and the University of Exeter) 1991, ISBN 0-85989-367-7 313 + xx pp, 138 text figures, 1 microfiche. Hb £40

Isca Dumnoniorum, Exeter, remains the only site so far identified in *Dumnonia* to have developed as a Roman urban centre. Both as a trading centre and as the administrative base for *Dumnonia*, the canton which broadly comprised Devon and Cornwall, fluctuations in its prosperity, interpreted from the archaeological record, should be relevant to Cornwall. Roman sites in the Duchy tend to produce few closely datable artefacts such as samian and coins. Fluctuations in the pattern of traded artefacts from Exeter may be reflected in those from Cornwall; we have at present no other point of reference. Our knowledge of local Cornish ceramic sequences, and so of the changes in settlement patterns and society, is currently very imprecise and a major reference work which should help with chronological problems is to be welcomed. This review presents a summary, rather than a critical analysis, of the volume, which provides detailed studies by expert authorities; it should be essential reading and reference material for all interested in the development of Cornwall as part of a canton of *Britannia*.

The volume is principally concerned with the Roman pottery recovered from excavations from 1971, when the Exeter Museums' Archaeological Field Unit was set up, until 1979. Only one major excavation has so far been published in detail - Paul T. Bidwell, *The Legionary Bath-house and Basilica and Forum at Exeter* (Exeter Archaeological Reports 1, 1979). Exeter Archaeological Report 2 is M. Maltby, *The animal bones from Exeter 1971-1975* (1979) and Report 3 is J.P. Allan, *Medieval and post-medieval finds from Exeter* (1984). Paul Bidwell's volume on the bath-house included a detailed study of the finds but it is impractical to provide comparable treatment of artefacts from the large number of sites (excavated both before and after 1979) which await publication. Bidwell's 1979 publication set out an Exeter Roman fabric series, and showed that the range of both fabrics and forms is comparatively restricted for a Roman urban centre. It is therefore intended that *Roman finds from Exeter* should provide the detailed background to concise summaries of coarse pottery planned for publication in future excavation reports. (Details of fabric analysis of selected pottery groups and lists of stratified contexts are given in microfiche).

The Exeter fabric series has already been used in a number of reports in *Cornish Archaeology*, eg that on Carvossa (Carlyon 1987). These reports drew heavily on the expertise of Paul Bidwell and referred to the volume now discussed as 'Bidwell forthcoming'. The title of the volume was given in a variety of forms but was always referenced as *Exeter Archaeological Reports 4*. Now that the volume is published it should be used to supplement these reports. Since 1979 a number of fabrics have been traced to probable sources and the authors now prefer to use a source name where possible rather than a fabric number; the major exemplar is fabric 5, now known as South Devon Ware from its probable source in the Dart Valley area.

An introductory chapter provides a concise account of the development of *Isca Dumnoniorum*. (Evidence for prehistoric activity is still sparse). Military occupation starts c AD 55-60, probably close to the later end of this range, and continued until the transfer of the Second Legion to Caerleon c AD 74. Civilian occupation began immediately after this, with major construction work in the AD 70s and 80s. The first phase of the town defences, an earthwork and ditch, is dated c AD 160-200, the replacement of the earthwork with the City Wall occurring perhaps around AD 200. The artefact range, especially coinage, indicates that occupation within Exeter was very much in decline by the last decades of the fourth century. By the late fifth century the basilica had been demolished and part of the site used for a cemetery, possibly Christian. There is still no evidence for post-Roman Mediterranean imported wares or any sixth century occupation.

Chapter II summarises the main trends in occurrence of different types of ceramics and other artefacts, against which assemblages from elsewhere in the region can be assessed. It highlights centres of production in West Dorset/East Devon and around Exeter itself, initiated during the military occupation but continuing to supply the town for varying periods of time. The detailed data for these recently recognised production centres is presented in Chapter VI on 'The Coarse Pottery'. Both these initial chapters are very clearly written and provide enjoyable reading for the non-specialist.

Coins are covered in Chapter III. Detailed identifications of some 450 coins and two small hoards by N.Shiel are followed by a discussion by R.Reece, who assesses the significance of the fluctuations in coins throughout the Roman period against national trends. Claudian and Neronian coins occur in large numbers, while those of the Flavian period fall within the national average. Thereafter coins from Exeter, compared to other urban sites, decline steadily to a period with no finds in the mid-third century; in the later third century there is a return to the national average, but a gradual decline during the fourth century with only a single find from the House of Theodosius. This clearly stated pattern could provide the basis for future comparative studies of coins from rural areas of Devon and Cornwall. A final section by G.C. Boon rigorously examines the controversial Greek/pre-Roman and Byzantine post-Roman coins and convincingly demonstrates that they are unlikely to have come from their 'recorded' findspots; this is followed by a catalogue of Byzantine copper coins from the British Isles in which few are accepted as authentic losses. Boon's contribution is useful for studies of post-Roman Dumnonia and should end long-running arguments about the significance of the Exeter finds for the pre- and post-Roman periods.

The samian ware, in Chapter IV: potters' stamps by B.Dickinson, decorated sherds by G.B.Dannell, is presented as a well-illustrated catalogue, but without any general consideration or discussion of undecorated forms; analyses of all forms from selected contexts are presented in a series of tables in Appendix II. Coverage of the fine wares in Chapter V includes more background and comment - by K.Greene (pre-Flavian), D.M.Bailey (lamps), and V.Rigby (Gaulish imports and related wares). A final section by the principal authors on 'other fine wares', based on identifications by V.Swan, contains useful summaries of the occurrence of the commoner fabrics, Nene Valley during the third century, New Forest from the late third through the fourth, and Oxfordshire starting rather later but also continuing through the fourth century. For both New Forest and Oxfordshire wares the incidence is low compared to such sites as Ilchester, a factor related to distance from production centres. This section also includes less common material, especially the *c ramique   l' ponge* from the Bordeaux region.

K.Hartley covers mortaria in Chapter VII, with a useful discussion based on quantification. Up until the early fourth century continental imports are more common than British products, with the Rhineland providing the majority of pieces through the third century. Although the Rhineland industries are usually considered as terminated by the Frankish invasions of AD 258 this material continues to occur at Exeter well into the fourth century. Oxfordshire mortaria do not appear at Exeter before the early fourth century. The catalogue is presented on microfiche. Amphorae are discussed by the principal authors in the same chapter, using identifications by D.P.S.Peacock, S.J.Key and P.T.Bidwell; Italic and Spanish sources provide most material until their production ceased in the late third century, North African vessels becoming gradually more common through the fourth century. This detailed study which recognises fourth century amphorae from a variety of origins makes the absence of imported B ware amphorae both obvious and reliably evidenced.

The concluding Chapters, VIII on the glass by D.A.Allen, IX on 'The Small Objects' by a variety of specialists, and X on building materials, provide useful reference sections.

The core of the volume is Chapter VI on 'The Coarse Pottery', which presents a range of fabrics with petrological analyses, and demonstrates previously unknown production centres in East Devon and adjacent areas. 'Black-burnished wares' have been studied in detail and this has enabled the well-established 'standard' BB1, most of which had been formerly sourced to the Poole Harbour area of Dorset, to be divided into two distinct groups. South-East Dorset BB1 (fab-

ric 31) from the Poole Harbour area has been distinguished from South-Western (fabric 40) with a source probably between the rivers Axe and Brit. South-Western BB1 occurs in substantial quantities during the military occupation, is the dominant fabric during the second century but goes out of production sometime during the third century. South-East Dorset BB1 occurs regularly through the first and second centuries but from the later third is increasingly common, as other fabric centres go out of production, and by the late fourth century supplies some 80% of the pottery in Exeter. Studies of both BB1 fabrics, and of a second-century variant, Fine South-Western BB1 (fabric 60), include valuable appraisals of their major forms and the accuracy of their dating.

Other wares identified have their distributions focused on Exeter. There is a series of 'Fortress wares', produced during the military occupation but probably continuing into the second century. Other wares probably made locally include Exeter Sandy Grey Ware (fabric 151), Exeter Micaceous Grey Ware (fabric 125) and Exeter Gritty Grey Ware (fabric 101), with varying production spans in the first and second centuries. Occasional sherds of some have been recognised on Cornish sites. Gabbroic Ware (fabric 2) the major Cornish pottery of the period, occurs in small quantities at Exeter only in the first and second centuries.

South Devon Ware (fabric 5), on which a detailed study has already been published (Bidwell and Sylvester 1988), begins to occur in quantity by c AD 200, with major increases in the fourth century. The pattern which seems to be emerging is one in which the South-East Dorset and South Devon production centres become predominant during the fourth century, a pattern which appears to be reflected by the impact of their products in Cornwall in the late Roman period.

The authors emphasise that their work is only a beginning, that more fabrics remain to be clearly identified and sourced, and further refinements should be expected in the typology, chronology and distribution of those now well established. Clearer links should also emerge between the distribution of pottery and that of other commodities. They are to be congratulated on the clear analytical presentation of their material. From a Cornish perspective their work provides a reference framework for the varying distribution and dating of ceramics which is lacking within the Duchy itself. Its publication should increase the standard of pottery reports from sites of the Roman period and also stimulate research into other commodities traded in the South West and the relationship of their distribution patterns, in space and time, with those of the pottery fabrics.

Henrietta Quinnell

Bidwell, P.T., and Sylvester, R.J., 1988, 'The Roman Pottery' in B. Cunliffe, *Mount Batten, Plymouth*, 42-9

Carlyon, P.M., 1987, 'Finds from the earthwork at Carvossa, Probus', *Cornish Archaeol* 26, 103-44

STONE CROSSES IN NORTH CORNWALL by Andrew Langdon
Federation of Old Cornwall Societies, 1992
ISBN 0 902660 20 9, 74 + v pp, pb £4.95

Almost exactly one hundred years after the first A.G.Langdon completed his monumental *Old Cornish Crosses* (1896, republished 1988 by Cornwall Books), still one of Cornwall's finest works of scholarship, the second (no relation) publishes the first of what we imagine, and hope, will be a series of substantial regional surveys of the present state of Cornwall's crosses. Andrew Langdon, with the generously acknowledged encouragement of Mary Henderson and the solid and cheerful support of the Old Cornwall Societies, has for over a decade been an energetic and tactfully persistent champion of these beautiful stones. He has regularly contributed articles to this journal recording losses, discoveries and re-erections (see p000 above). In this well-produced and clearly laid-out book 102 crosses are each given a neat half-page; a description and recent history set alongside an illustration, usually a photograph. Another 22 stones - cross-bases and other 'possibles' - are dealt with as short notes.

The need for such a series, to update the original Langdon, is real. Apart from the many discoveries and re-assessments made since 1896, there have been changes to at least 130 of the 360 crosses featured in that first book; movement, repair, damage or, most distressingly, loss. These much-loved monuments, age-worn and lichen-covered, so settled and peaceful in a Cornish churchyard or at a quiet cross-roads, are in fact very mobile and thus worryingly vulnerable. Andrew Langdon's book will, it is believed, help to ensure their survival by increasing local communities' and individuals' awareness of their crosses. Among introductory sections discussing the various types of cross, their possible dating and their uneven distribution through the county, Andrew has an interesting chapter on the role of the Old Cornwall Societies in lifting and repairing neglected or abused crosses over the last 60 years.

The Cornwall Archaeological Society and all those who care for Cornwall's past owe a great debt to the Old Cornwall Societies and to the A.G.Langdons, a debt that will continue to grow as Andrew's series of guidebooks is extended.

Peter Herring

Vivien Russell 1904-92

P.A.S.POOL

It is fitting that Vivien Russell should have died in her home parish of Sennen, which she loved and where she spent so much of her life. Sennen is famous for its First and Lasts, and Vivien was very proud of being the First and Last Bard, and more recently the First and Last Antiquary. By birth, though, she was not Cornish; she was born in 1904 in Bristol, where her father, Cecil Russell, was a house-master at Clifton College. Her parents regularly brought the family to Sennen on holiday, and one of Vivien's earliest memories was of playing tiddly-winks with her brother on the floor of the holiday house. That brother, Harley Raymond Russell, became a casualty of the War in 1915, and his memorial is in Sennen church. Vivien was educated at Clifton High School and St Hugh's College, Oxford; she later continued the family association with Sennen by buying a house there. She never wanted to live anywhere else, and although she was to meet a full share of life's misfortunes, her life was happy in that she spent most of it living where she wanted to live, and doing what she wanted to do.

She became aware of the wealth of antiquities in Cornwall and especially in West Penwith, the study of which became her life's work. She joined the West Cornwall Field Club and worked with them at Maen Castle, a site almost on her doorstep which was her introduction to the craft of excavation. But her studies were interrupted by the outbreak of another war, the whole of which she spent in the WAAF, serving in a very specialised unit at Medmenham which included many archaeologists and dealt with the interpretation of aerial photographs. When she was demobilised her Commanding Officer gave a reference which got her exactly right: 'She has at all times worked hard, almost to excess, and has particular aptitude for any difficult work of a research nature requiring application. She can be trusted implicitly'.

She returned to Sennen and resumed work on the antiquities of West Penwith, digging each year with the Field Club and gradually evolving the project which was to become her most important work, the archaeological gazetteer of the district. But progress was held up by the need to earn money. Her private



Vivien Russell at Nornour, c 1971; photo D Gould

income was insufficient to support even her very modest life-style, and so she became a professional archaeologist, working on rescue excavations arranged by the Ancient Monuments Inspectorate of the then Ministry of Works. Most of these were outside Cornwall, but she was able to take part in Mrs Christie's important excavations on the guardianship site of Carn Euny.

[Her contribution to the many excavations she worked on outside Cornwall in the late 1950s and 60s must not go unrecorded. She assisted John Wachter at Catterick, Ernest Greenfield on numerous sites, including Thistleton, (Rutland), Puncknowle (Dorset), Witcombe (Glos), Feltwell (Norfolk) and Philip Rahtz at Writtle (Essex), Cheddar (Somerset), Hog Cliff Hill and Shearplace Hill (Dorset). Professor Rahtz writes: 'her forte was in recording *what was there*, and this was full, as she was a very good troweller. Her recording was as objective as it could be, and this proved crucial when it came to writing up: there was no colouring of the record by interpretation, and when I wove elaborate tales about what it all meant she was interested but faintly amused: the record was the thing.' He instances particularly Hog Cliff Hill, which Ann Woodward wrote up afterwards, and 'was able to use Vivien's plans and sections to reconstruct a remarkable sequence of which I was quite unaware at the time of digging.'

Vivien was also a great contributor to excavations in the Isles of Scilly, particularly at Normour from 1970-73, where her knowledge of the behaviour of granite-based stratigraphy was invaluable, as was her total dedication to the task in hand, a rather fearsome integrity leavened by her quiet humour. SB]

Vivien was one of those who fall under the mysterious spell of West Penwith, for whom this small peninsula offers all that one asks of life, and who grudge all time spent elsewhere. The area is unique in the number and variety of its ancient sites, and in the number and stature of the scholars who have studied them over three centuries, and whose work is recorded in a vast number of books and manuscripts. It was Vivien's plan, first to record all the sites on the ground and note exactly what had survived, and secondly to check all the printed and manuscript records, both of the surviving sites and of the many which had been destroyed, thus producing a full archaeological gazetteer of the area. Progress was slow; Vivien was a perfectionist, who believed that nothing should be published until it was as good as it could possibly be. Eventually she was persuaded by colleagues that no work, however scholarly, could ever be perfect, and that hers was good enough to make publication not merely possible, but essential. So published it was, first as highly abbreviated parish lists in the Proceedings of the West Cornwall Field Club and its successor, Cornish Archaeology, (which later became routine, but of which Vivien was the pioneer), and then in extended and permanent form as a book, *West Penwith Survey*, published by this Society in 1971. It is hard to exaggerate the importance of this book to students of the area: it meant, simply, that the antiquities of West Penwith were better recorded than those of anywhere else in the country. It was not, of course, the last word on the subject, as further discoveries have been and will be made, but it is the most important work of archaeological record ever published on any part of Cornwall, and a model for those working in other areas. It would have been a magnificent life's work, even if Vivien had done nothing more, but in fact she did more, and a similar work on Scilly was published in 1980. After that, infirmity prevented her from visiting sites in the field, but she continued with historical work, turning to research on the population records of Penwith in the 17th century.

Vivien was a very shy and reserved person who hated the limelight and any form of personal publicity; except for a short period as Secretary of the West Cornwall Field Club she shunned office, avoided committee work, and never joined the local lecture circuit. Perhaps this explains why recognition of her work was sometimes slow in coming: she was made a Bard of the Gorsedd in 1955, an Honorary Research Fellow of the Institute of Cornish Studies in 1972, and a Fellow of the Society of Antiquaries in 1983, a rather tardy but much appreciated recognition from the premier archaeological society in the country.

Vivien, unlike so many scholars, was always generous with her learning. Everything she knew was at the service of any enquirer who shared her devotion to West Penwith and to scholarship. I was one such; she seemingly recognised in me a kindred spirit, and helped enormously with all my

researches and writings. She taught me how to be an antiquary and historian; the importance of clear expression, the evaluation of evidence both on the ground and in documents, and the vital distinctions between proved facts, probabilities, possibilities, and wishful thinking. Together we explored and recorded large areas of Penwith, and made some important discoveries; we excavated, under her direction, such sites as Try longstone (*Cornish Archaeol* 3, 1964, 15-26) and Chapel Jane (*Cornish Archaeol* 7, 1968, 43-53); we tried to solve the mysteries of the St Buryan Charter, but retired defeated like everyone else. More recently, she passed to me her large collection of material on West Penwith field names, representing years of work, and was delighted when I was able to add my own researches and publish the results. Many others were helped in similar ways.

Vivien was a very gentle and considerate person, always willing to believe the best of anyone, except people who damaged ancient sites whom she regarded, rightly, as being beyond the pale. I remember once when we were talking to a farmer whom she suspected of having demolished a cross, and who when questioned became first evasive and then abusive. She hastened out of earshot and then said to me 'what a very *unscholarly* man that was!'. She could think of no harsher criticism than that.

Vivien was unlucky in the final phase of her life, which was protracted and at times disagreeable, but she faced all its problems with extraordinary courage and cheerfulness. In early old age she underwent a series of major operations, and though she recovered a degree of mobility, she could no longer stride over the hills with her previous stamina and agility. Over a period of years she became slowly weaker, and had to make difficult decisions: first to sell her house and move into a sheltered tenancy, and later to give that up and move into a home for the elderly. Fortunately both moves were short ones, and she was able until the end to remain part of the community in Sennen. But she lost her sight and then, tragically, the use of her legs, and recently she would say quite openly that her life had become a burden to herself and to others and that she wanted to go.

To the end, Vivien remained the scholar. When she realised that her researches were over, she asked me to sort through her papers and pass all her archaeological notes and records to the Library of the Royal Institution of Cornwall, so that her work will be available for her successors to build on. She will be remembered by all who knew her as a delightful and courageous person, and by scholars as a worthy successor to the great antiquaries who worked in this area in the past: the two Borlases, Richard Edmonds, John Blight and Frederick Hirst. That is how she would have wanted to be remembered.

Based on an address given at Sennen church, October 1992

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