

**CORNISH
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No 34 1995



**HENDHYSCANS
KERNOW**

COVER: *A crosshead recently discovered at Constantine. Details about the discovery and description of this cross are reported in this issue by Andrew Langdon. The drawing is by Morwen Morris. The selection of this drawing for the cover is particularly appropriate as the one hundredth anniversary of A. G. Langdon's "Old Cornish Crosses" occurs in 1996*

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CORNISH ARCHAEOLOGY

No 34 1995

EDITORS

CHRISTOPHER DUNN and MARGARET DUNN

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Rocks as resources: landscapes and power

CHRISTOPHER TILLEY

Summary

This paper considers relationships between archaeological sites and monuments and topographic features of the landscape from the Mesolithic to the end of the Bronze Age on Bodmin Moor. It emphasises the importance of rock outcrops (Tors) as symbolic resources and the manner in which prehistoric populations developed, through time, alternative strategies of capturing, appropriating and controlling the power of the rocks. It argues that access to these sacred places became more and more restricted during the Bronze Age as local elites developed, reproducing their power, in part, through controlling access to knowledges of the landscape.

Introduction

This paper is an exploration of the relationship between topographic features of the landscape and agency and power in small-scale societies. In it I argue that topographic features of the landscape constitute a series of symbolic resources of essential significance in the formation of personal biographies and the creation and reproduction of structures of power. I attempt to explore these ideas through a discussion of the prehistoric landscapes of Bodmin Moor from the Mesolithic to the end of the Bronze Age, c8,000-c500 bc. The interpretative basis of the account rests on four main propositions:

First: Landscape is a holistic term. It may be defined as a set of relationships between named locales (Tilley 1994; 34). The latter are specific physical settings for social interaction (eg forest glades, rocks, monuments, rooms, dwellings, settlements) which presence material and symbolic potentialities on which actors draw in the conduct of their activities. Locales have individual and particular embedded meanings and are of vital significance in the formation of the existential self. A concept of landscape, by contrast, transcends the particular meanings of locales, signifying a set of conventional and normative understandings through which people construct and make sense of their cultural world. Locales stand, then, in relation to landscapes as parts to wholes.

Second: Landscapes are relationally constituted as embedded sets of space-time relations. They are experienced and known through the movement of the human body in space and through time. The meaningful spaces of landscapes are constructed through the temporalities of historical acts, forming both the medium for, and outcome of, movement and memory. Past actions, events, myths and stories 'colour' landscapes. An important aspect of the experience of landscapes is the directness or indirectness of experience—locales that are close at hand or far away, those which are familiar or unfamiliar, visited daily or only on special occasions, those that have been seen and those that exist in the imagination. Knowledges of particular locales previously encountered set up structures of expectation and feeling affecting the interpretation and 'reading' of others.

Third: Particularly in small-scale non-industrialised societies learning about the landscapes acts as a primary medium of socialization. Knowledge of it is intimately bound up with knowledge of the self. Knowing 'how to go on' in a landscape involves a practical mastery of space which is simultaneously a process of finding oneself and one's social world. Landscapes empower, they form personal biographical understandings of an agent's place. While people create their landscapes these landscapes recursively act back so as to create the people who belong to them. Consciousness works on an always already socially objectified landscape that in turn affects it. As a shared set of socially mediated conventional understandings landscapes can be claimed

to be an extension of the social self providing a series of principles and norms for living, relating to others and the past.

Fourth: Precisely because the landscape plays such an important role in the constitution of self-identity, controlling knowledge of it may become a primary resource in the creation and reproduction of repressive power or structures of social dominance. Since landscapes are experienced by the individual as preexisting external social realities they cannot be understood by introspection. Their meanings and significance must be taught by some and learnt by others. The paradox of landscapes, the double bind, is that while they are produced culturally they may be typically experienced as something other than a human product. And along these lines networks of power may be legitimised, appear natural and beyond challenge.

Topography and place

Bodmin Moor is a brown, treeless, windswept and rain-sodden boss of granite, around 200sq km in size, situated near to the eastern county boundary of Cornwall in south-west England (Fig 1). It is today one of the best preserved upland 'fossil' prehistoric landscapes of southern Britain, and is exceptionally rich in archaeological remains. Despite much 18th and 19th century clearance in the centre of the Moor, and in the south-west of it, large areas of the land remain rough pasture land, unenclosed and 'unimproved' and hence, unlike lowland areas of Britain, traces of prehistoric settlement and large numbers of cairns and other monuments have not been obliterated. Modern settlement is confined to the edges of the Moor and this pattern seems to have altered little for around one thousand years apart from a brief period of medieval occupation in central areas, now abandoned. Unlike most lowland areas in Britain where the evidence for different classes of archaeological sites in the same area is extremely fragmentary, on Bodmin Moor there is still well preserved a wide variety of different types of archaeological remains: ceremonial monuments (stone circles and stone rows), barrows and cairns, numerous hut circles, settlement areas and field boundaries. The area has recently been the subject of one of the most comprehensive and meticulous archaeological landscape surveys undertaken in Britain (Johnson and Rose 1994) and the results of this fieldwork provide an invaluable basis for the interpretative work presented here.

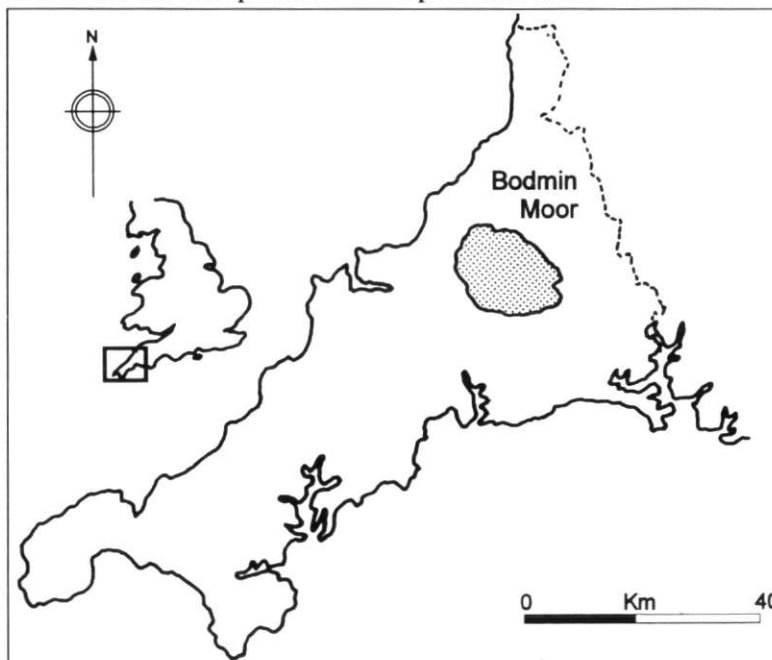


Fig 1 The location of Bodmin Moor, Cornwall

The granite boss of Bodmin Moor is intruded through sedimentary rocks of Devonian and Carboniferous age. It is divisible into three parts: (i) those areas most solid and free from cracks and joints forming ridges, hills and Tors of outcropping rock stacks; (ii) the main mass of granite more or less decomposed at the surface forming the more smoothly rounded profiles of the land visible today over much of the area, giving rise to rotted brown subsoil (rab or growan); (iii) areas of more easily eroded kaolinized granite, forming hollows (Reid *et al* 1910, 1911).

The Moor is a dissected plateau, the highest points being near its edges, crossed by sluggish streams, associated with extensive marshy areas. Between these, rounded grass and heath-covered hills and ridges are interspersed with high granite rocky Tors (see Fig 3) rising to 420m above sea level at the highest point, the summit of Brown Willy. Cornwall's only natural inland lake, Dozmary Pool, lies in a saucer-shaped depression in the centre of the Moor under the shadow of the Brown Gelly ridge and is of late-glacial origin (Brown 1977). The hardest granite capping the hills and ridges is built up of lenticular blocks of granite resting horizontally on each other, with the individual sheets sometimes being of great size. Periglacial weathering is responsible for the dramatic and fantastic shapes and outlines of many of the granite boulders capping the highest points below which there are characteristically extensive areas of tumbled blocks of stone, known locally as 'clitter'.

Although occupying a rather small total area, the most dramatic and memorable landscape features of Bodmin Moor are the bold grey-coloured craggy granite hill and ridge summits with their fantastically weathered Tors and surrounding boulder or clitter spreads. Locally visually dominant summits with rocks stacks or Tors are found all over the Moor. Some of these, such as St Bellarmin's Tor and Colvannick Tor in the south-west, only have a local significance as landmarks. Others such as the two highest peaks in the north-west of the Moor, Brown Willy and Rough Tor and Trewortha, Kilmar and Sharp Tor in the south-east, form distinctive silhouettes on the skyline visible from far away. Some of the most impressive and unusually weathered individual rock outcrops occur in the north-west and south-east. These include the weirdly-formed altar-like stones of Showery Tor (see Fig 15), the summit of Rough Tor itself (see Fig 16) possessing long linear cleavage runnels and cave-like formations around its base, and the most famous of all the Bodmin Tors, the Cheesewring (Fig 2). Moving through the landscape all these rock outcrops, of course, look somewhat different according to the place and direction from which they are seen. Nonetheless the highest and most significant hills and ridges with Tors, such as the stepped spinal ridge of Brown Willy (Fig 11), the pyramidal outcrop of Sharp Tor or the linear tapering outcrops of Kilmar or Bearah Tor, have a relative 'constancy of form' with rock shapes on the skyline that are utterly disintinctive and instantly recognizable to a person who knows the Moor. The spatial relationships between the rock outcrops on the Rough Tor ridge, by contrast, differ far more dramatically according to one's perspectival relationship in the landscape to them. From the south Rough Tor appears as a single craggy eminence (Fig 8), from the west the summit is peculiarly indented and notched, from the east and north it appears as a series of rock stacks broken up by flat planes. Today these Tors, especially the Cheesewring and those in the Rough Tor area, are a constant source of fascination. Visitors assiduously climb up to them and on them, walk between them, gaze at them, photograph them and enjoy (the frequent damp mists permitting) the panoramic vistas. The human fascination, a sense of awe and wonder for these places, notwithstanding a modern rational geological explanation for their formation, continues.

In this mosaic of marsh and granite, streams, ridges and plateau areas, long coarse grassland dominates. Bracken, gorse and heather cover only limited areas on the steeper hillslopes and amongst the clitter. The Moor today is still much as Malim described it sixty years ago (Malim 1936). There is virtually no natural tree cover. Recent conifer plantations now cover extensive areas of some parts of the Moor. The extreme exposure of the Moor to blustery winds has always limited woodland development. Environmental evidence (Brown 1977; Caseldine 1980; Walker and Austin 1985) indicates that throughout the prehistoric past, trees were substantially

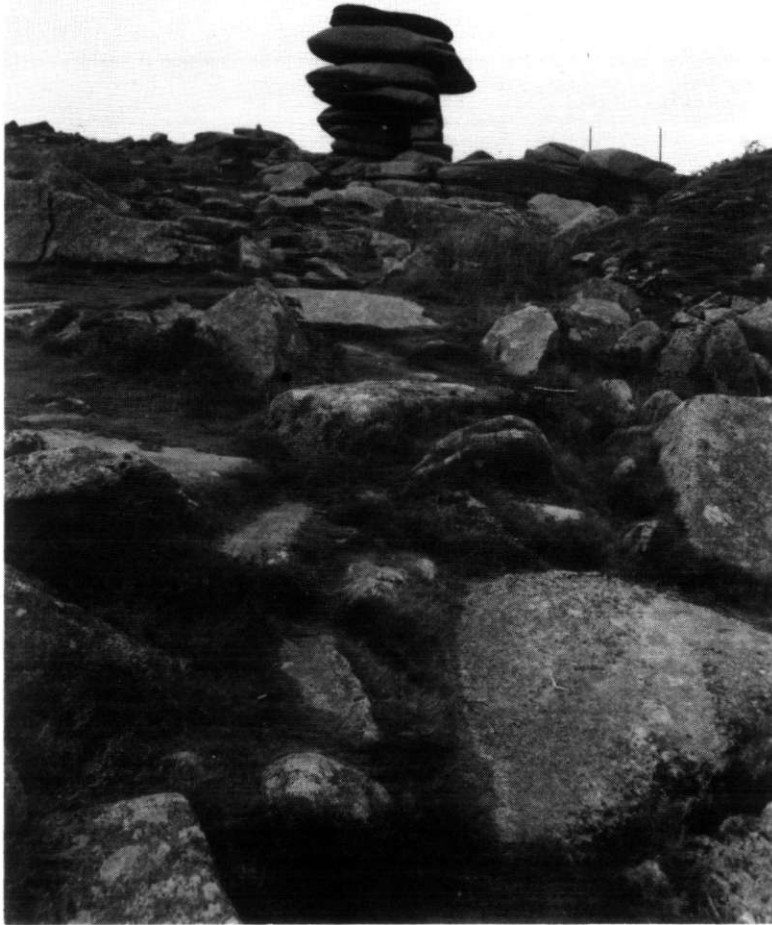


Fig 2 The Cheesewring Tor at Stowe's Pound, south-east Bodmin Moor

confined to the more sheltered valleys with the rest of the landscape being dominated by grassland and heath as today.

The earliest radiocarbon date for post-glacial sediments on Bodmin Moor is from Hawks Tor (7,700 bc). The pollen record indicates the presence of juniper scrub and crowberry heath with no woodland development at a time (see below) when Early Mesolithic communities had already begun to exploit the area (Brown 1977; Caseldine 1980; Jacobi 1979). At about the same time birch woodland may have colonised more low-lying areas but was never very extensive. As the climate warmed up around 7,000 bc hazel and oak became the dominant woodland species. During the Late Mesolithic this woodland expanded to its maximum extent but never covered the more exposed and higher parts of the Moor, which were still dominated by grassland (those areas above c200-250m). Tree and shrub pollen never amount to more than c50-70% of total regional pollen counts throughout the entire post-glacial sequence

(Caseldine 1980, 10). Caseldine notes that variations in plant community structure would be closely linked to topography and 'one distinctive characteristic of the woodland communities, especially at higher altitudes, would have been their openness, and, possibly, their low species diversity' (*ibid.*, 10). Even given what could be expected to have been a limited woodland cover over the Moor as a whole there appears to have been a decline in tree cover after c3,000 bc (Brown 1977) caused by widespread woodland removal which must have taken place in more low-lying locations.

Excavations under Bronze Age cairns at Colliford in the centre of the Moor provide evidence for only very restricted woodland cover after c1,500 bc along the lower sides of valleys (Caseldine 1980, 13). Caseldine suggests that 'following the construction of the barrows at Colliford the valley probably remained as open moorland similar to that found today . . . Under the moorland cover of *Molina*, *Calluna*, *Erica* and *Ulex* the organic horizons of the soils developed into thicker peat layers' (*ibid.*, 13). Similarly, on East Moor cairn construction was preceded by woodland clearance (Brisbane and Clews 1979, 49) without subsequent regeneration.

The climate of Bodmin Moor has altered significantly from the Earlier Mesolithic to the present-day. The ameliorating post-glacial climate reached a maximum during the Late Mesolithic when mean annual temperatures were a few degrees centigrade higher than today. Summers were both significantly drier and warmer with marsh and bog areas being less extensive than today. Lower water levels at Dozmary Pool, a focus of Earlier Mesolithic activity (Jacobi 1979), may indicate this as well as the presence of carbonized material in the peat deposits probably resulting from natural fires (Caseldine 1980, 10). Deteriorating environmental conditions with a change to cooler and wetter summers seem to have occurred, as elsewhere in Britain, towards the end of the Bronze Age when many settlements appear to have been abandoned.

The Mesolithic: developing a sense of place c8,000-3,500 bc

During the Mesolithic Bodmin Moor was probably sporadically inhabited by perhaps no more than three or four bands of hunter-fisher-gatherers on a seasonal basis. Jacobi has proposed that Mesolithic populations in the south-west of England concentrated on the exploitation of the rich marine resources of the coast during the bulk of the year. These may have included estuarine areas in the late spring and early summer (shellfish, salmon, seal, fish and sea birds) and rocky coastline areas during the autumn and early winter (fish and seals). He proposed that the 'pull' of upland inland areas such as Bodmin Moor would be greatest during the summer when the red and roe deer would move up into their summer pasture lands (Jacobi 1979, 84). Although distances between the coast and Bodmin Moor are short, c8 km to the nearest coastline from the northern fringes of the Moor and roughly twice this distance to the south, this remains a plausible economic model.

The Mesolithic evidence from Bodmin Moor consists of flint scatters and our knowledge of the distribution of sites is limited because systematic survey by fieldwalking is not possible in an area of substantially unploughed rough-grazing land. The *Gazetteer of Mesolithic Sites* for England and Wales (Wymer 1977) records only five findspots from the whole of Bodmin Moor. Only one of these places, Dozmary Pool, in the heart of the Moor, consists of a substantial flint assemblage with a predominance of earlier microlith forms (Jacobi 1979, 51-4; Berridge and Roberts 1986, 28-9 with earlier references). Large numbers of Mesolithic flint scatters have recently been documented from along the eroding shorelines of the Colliford, Crowdy Marsh and Siblyback reservoirs (Trudgian 1977a, 1977b; Berridge and Roberts 1986). Herring records two flint scatters of indisputable Mesolithic date at Brown Willy East and Carkees Tor in the north-west of Bodmin Moor found during field walking between 1981 and 1984 (Herring and Lewis 1992, 12). Jacobi notes that the predominantly late 19th century flint collections from Dozmary Pool contain material mixed with other possible sites on higher ground to the west and east of the main lake and lakeshore collection. Herring and Lewis (1992) have recently documented 36 flint scatters, all 5 m or less across, most of which appear

to be of Mesolithic date. These come from an area of only $c5$ ha on Butterstor, a small rounded hill in the middle of the Moor, $c5$ km to the north-west of Dozmary Pool. This is the only area of disturbed soil to have been systematically surveyed, after ploughing in advance of afforestation. Single microliths and other flint material are also documented from the old land surface underlying barrows excavated in advance of the construction of the Colliford reservoir (Griffith 1984, 78-9) and a microlith was found in trenches dug to examine later prehistoric field boundaries at Stannon (Herring and Lewis 1992, 10). This represents the sum of our published knowledge of Mesolithic findspots on Bodmin Moor (Fig 3).

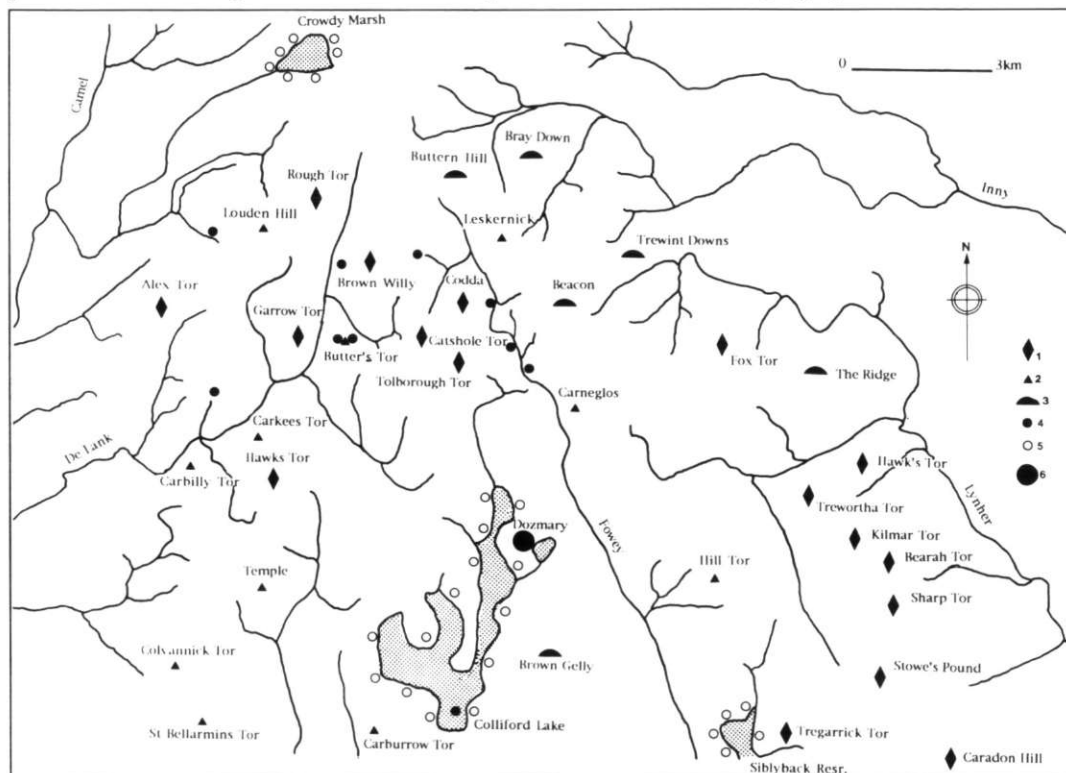


Fig 3 Major places mentioned in the text and the distribution of Mesolithic finds. 1: Major Tor or rocky outcrop; 2: Minor Tor; 3: Important hill or ridge without visually significant rock outcrops; 4: Mesolithic flint find or scatter; 5: Mesolithic flint scatters on eroding edges of modern reservoirs: locations generalized; 6: Major finds of Mesolithic flints around Dozmary Pool

What is to be made of the distribution of these finds and what indications might they provide about the symbolic geography of the Mesolithic? If the only small area to have been systematically surveyed—Butterstor—is at all representative of the overall density of Mesolithic sites across the Moor one might expect figures approaching an astonishing 140,000 flint scatters, most no doubt representing brief single-episode use for perhaps a few minutes or hours (Herring and Lewis 1992, 9). Dozmary Pool must, by contrast, represent one of a much smaller number of larger more regularly occupied locales, perhaps intermittently forming a focus for hunting activities throughout the summer months. Here microlithic forms indicate a date of initial occupation and use as early as the first half of the eighth millennium bc. The findspots documented around the Crowdy, Siblyback and Colliford reservoirs show extensive evidence of both Earlier and Later Mesolithic activity (Berridge and Roberts 1986, 29).

The Mesolithic populations left no deliberate permanent and tangible trace of their activities

and occupation of the Moor. The majority of Mesolithic flint scatters appear to mark paths of movement through the landscape. The Butterstor scatters appear to mark a mix of regularly used tracks and less structured wanderings away from them. Others have been discovered in disturbed ground on contemporary animal and vehicle trackways, fords and gateways, and along river valley edges. Those places in the landscape that would appear to have had a particular symbolic and sacred importance are the inland lake of Dozmary Pool, springheads, marsh areas and the more prominent craggy Tors.

It seems reasonable to propose that all areas of Bodmin Moor were exploited during the Mesolithic on a seasonal basis with bands moving inland from the coast in the summer and criss-crossing the Moor with ungulates, principally red and roe deer, providing the main exploited animal resource. Movement up to and into the Moor would almost certainly have taken place by following the routes provided by the main river courses and their tributaries such as the Fowey, De Lank, Camel and Lynher (Fig 3). It is interesting, in this respect, to note that the Mesolithic flint scatters found on the eroding edges of the present-day Colliford and Siblyback reservoirs represent relatively high locations on the open moorland edges of (now-flooded) river valleys which would have had fairly substantial forest and scrub cover along their edges providing browse and protection for game in contrast with higher surrounding areas of the Moor with substantial areas of open heath and grassland. The river valley edges provided obvious paths of movement for hunter-gatherers following and exploiting game and fish and plant foods. The flint scatters found around the Crowdy Marsh reservoir are all on the margins of a former bog (Trudgian 1977a, 21) and a significant number are concentrated near to where three ancient trackways converged on a ford crossing a tributary of the Camel draining the marsh (Trudgian 1977b, 17). Dozmary Pool is situated 700m to the east of the river Fowey whose remarkably straight-sided valley effectively cuts Bodmin Moor into two halves. Both the St Neot river draining the Colliford reservoir and that flowing from the Siblyback lake, are tributaries of the Fowey while the Crowdy Marsh reservoir is just 2.5km to the north-west of its source. Mesolithic findspots at Codda and Palmer's Bridge seem to occur at fords (given grid references to findspots are only general and inexact) across the river while three others occur near to stream heads feeding the Fowey or St Neot's rivers. This strongly suggests, as might well be expected, that the Fowey and its tributaries acted as a major axis of movement from the south coast to the heart of Bodmin Moor.

Up to this point I have largely been considering an 'economic' geography of the chase and the catch, but the occurrence of Mesolithic findspots at stream heads, fords, around marshy areas and along the upper edges of river valleys seems to have been important in the symbolic geography of place. In the light of this, the large concentration of finds in and around Dozmary Pool takes on an added significance. This inland lake was the only substantial body of open water on Bodmin Moor. It was clearly an important seasonally occupied site and was one of the earliest to be occupied. The blue-black high quality flint found here, as elsewhere on Bodmin Moor, consists of transported material from local beach deposits, almost certainly derived from the south Cornish coast. Longer distance transportation of the material from farther away, as has sometimes been suggested, seems unlikely as the cortical surfaces display 'the characteristic clattering associated with beach pebbles' (Berridge and Roberts 1986, 15). Discussions of Dozmary Pool have concentrated on typological analyses of the flint assemblages. Jacobi records a total of 60 microliths as being present and 115 scrapers and argues for the importance of hide processing (Jacobi 1979, 54). Whatever the economic activities, Dozmary Pool, an isolated body of water lying in a flat hollow amongst the hills, must have been a place of considerable sacred and symbolic significance to Mesolithic populations. The many Arthurian and earlier legends associated with the place indicate this significance: a giant chieftain who bade his daughters slay their husbands on their marriage night had his hunting grounds nearby. This was where Bedivere threw the sword Excalibur, siezed by a hand that withdrew it to the bottomless depths. It was an *inland* lake, or sea, around which artefacts made from

beach pebbles were deposited. At least some of these may have been votive offerings rather than simply just lost or discarded artefacts. People were 'drawing out' the hidden meaning of the pool as a manifestation of a sea in the land.

Once in the centre of the Moor the rock outcrops, ridges, hilltops and Tors would have provided natural vantage points to hide and wait for game and survey the land below. They would be important focal points. Together with the river valleys they provided an indispensable means for human orientation in the landscape. In the past, as today, the Tors would be named and significant places invested with meaning, between which people moved. Ethnographic studies have shown that over and over again sacred places are intimately connected with striking 'natural' landscape features. A recent publication (Carmichael *et al* 1994) gives an outline of the significance of natural landscape features as sacred places with examples taken from all over the world. While the myths, meanings, cosmic and symbolic associations of these places differ from example to example what remains constant are the kinds of topographic features that become invested with a sacred significance: mountain peaks, unusual rocks, caves, springs, lakes, waterfalls, rivers, bogs, large trees. Many of these places are not marked by any human constructions or activities that would be visibly recognizable to an archaeologist in the field, although at most offerings are made.

It is not hard to imagine that the fabulously weathered Tors would be great sources of symbolic potency and power, signifying a wide range of enduring relationships between people, the land, time and space. We might expect, should excavation take place, substantial evidence of Mesolithic activity in and around them, perhaps much greater than those already documented on the rounded hilltop of Butterstor, lacking any impressive craggy eminences. The Tors were, in effect, non-domesticated 'megaliths' or stone monuments, sculptured by the elements and imbued with cultural significance in the Mesolithic cultural imaginary in the forms of stories, myths and events of cosmological import. Lacking any tangible material evidence at present it is, of course, impossible to recognize exactly which of the Tors and rock outcrops had an especial significance to Mesolithic populations, but it seems likely that particularly striking topographical features and high craggy eminences would have been of great importance. With the advent of monument construction during the Neolithic and Bronze Age it becomes feasible to retrodict (*see sections below*) where at least some of these places were.

The Early and Middle Neolithic c3,500 bc-c2,300 bc

Evidence for the Earlier Neolithic occupation of Bodmin Moor is almost as slight as for the Mesolithic. There are no traces of 'domestic' settlement apart from flint scatters as at Dozmary Pool where Neolithic flintwork was recovered together with Mesolithic and Bronze Age material. Axes from Cornish Neolithic stone axe factory sites are virtually absent from Bodmin Moor (Mercer 1986a, Fig 2), contrasting with a scattered and sometimes quite dense distribution in other areas of Cornwall, although this may be partially attributable to lack of excavation and ploughed areas amenable to field survey. If anything the beginnings of woodland clearance, associated with possible traces of cultivation, start in the Late Neolithic. At Stannon Down in north-west Bodmin Moor parts of a field-wall system, a greenstone axe and hoe provide physical evidence of land clearance at such a date (Mercer 1970; 1986a,38). Ashbee (1982, 12) and Mercer (1986a, 40) have pointed out that distribution maps of Mesolithic and Neolithic sites and findspots in Cornwall are virtually identical. It appears as if economic activities throughout the bulk of the period continued the pattern of seasonal summer exploitation of the moorland established in the Mesolithic. Consequently it is not surprising to find that exactly the same locales have a consistent representation of both Mesolithic and Neolithic flintwork. The major change occurring during the Earlier and Middle Neolithic on Bodmin Moor was not of an economic character but ideological—the beginnings of monument construction in the landscape. There are two distinct classes of ritual and ceremonial monuments attributable to this period: long cairns and hill-top enclosures (Fig 4).

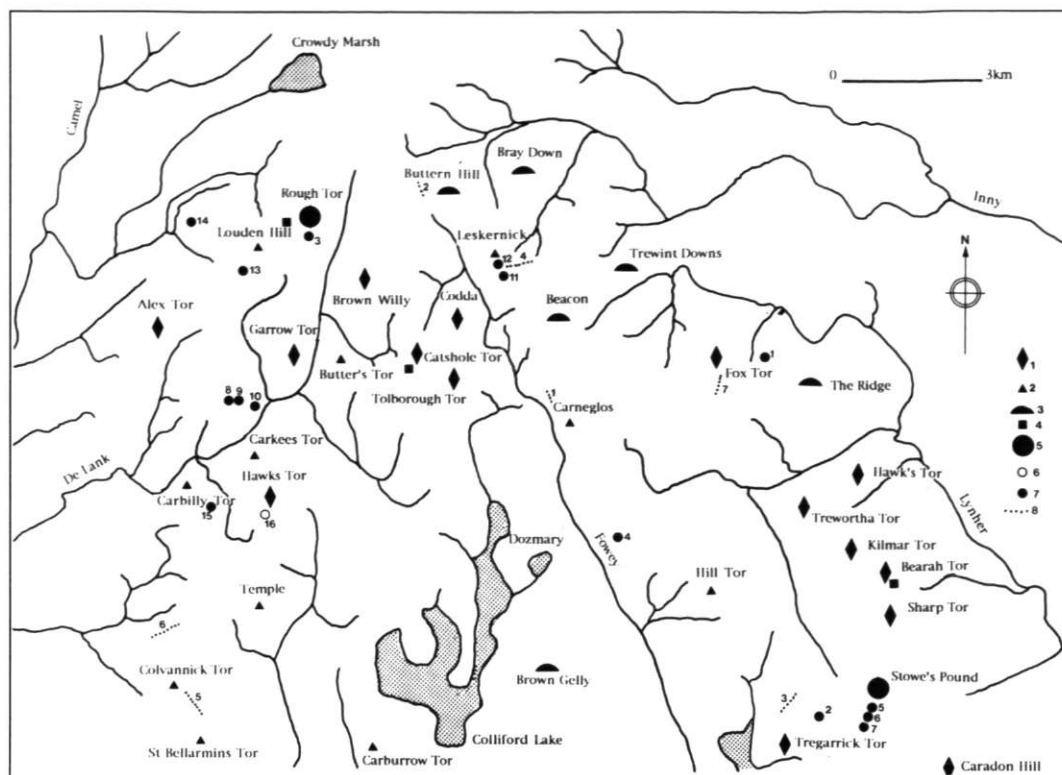


Fig 4 The distribution of earlier and later Neolithic monuments on Bodmin Moor in relation to Tors and hills. 1: Major Tor or rocky outcrop; 2: Minor Tor; 3: Significant hills or ridges without visually significant rock outcrops; 4: Long cairn; 5: Ceremonial hill top enclosure; 6: Henge with stone circle; 7: Stone circle; 8: Stone row

Stone Circles 1: Nine Stones, Alternun; 2: Craddock Moor; 3: Fernacre; 4: Goodaver; 5-7: The Hurlers; 8-9: King Arthur's Downs; 10: Leaze; 11-12: Leskernick; 13: Louden Hill; 14: Stannon; 15: Trippet Stones; 16: Stripple Stones (Circle Henge)

Stone Rows 1: Carneglos; 2: Buttern Hill; 3: Craddock Moor; 4: Leskernick; 5: Cardinham Moor; 6: Trehudreth Downs

Long cairns

Three long cairns have been recently documented from Bodmin Moor, Louden in the north-west, Catshole in the central part of the Moor, and Bearah in the south-east (Herring 1983; Johnson and Rose 1994, 24-6). Others are probably still to be found. In addition an impressive chambered tomb of 'portal dolmen' type, Trethevy Quoit, is situated just beyond the south-eastern edge of Bodmin Moor, 3.7km to the south of the Cheesewring and Stowe's Pound enclosure (see below).

The Louden cairn is orientated N-S along a contour on the lower eastern slopes of Louden Hill, with the land rising up to the north and west on the edge of a marshy area to the east. The long axis of the cairn is not orientated in relation to any visually important Tors or other landmarks. The visually dominant feature of the surrounding landscape are the towering heights of Rough Tor lowering over the cairn to the north-east.

The Catshole long cairn, orientated NNE-SSW, is of trapezoidal shape with the wider ending facing north. It is again situated along a contour, towards the bottom of a slope, with a rock-strewn area of moorland, Catshole Tor, rising above it to the north and west. The broader

northern end, with the fallen remains of facade stones, points towards an impressive weathered Tor that itself uncannily resembles a dolmen chamber (Fig 5).



Fig 5 View along the long axis of the Catshole Tor long cairn up to Catshole Tor on the skyline above. A Bronze Age Tor cairn surrounds the Tor itself

The Bearah long cairn is enclosed within a valley with the land rising up beyond it on all sides, except to the east. Like the Louden and Catshole cairns it is situated on a slope, but is orientated W-E, with the broader end incorporating the remains of a chamber situated down-slope towards the east. Looking to the east along the cairn axis there are extensive views. By contrast the western and higher end of the cairn is aligned towards a series of dramatic weathered Tors at the top of the slope. Views to the north are restricted by the W-E ridge of Bearah Tor with its series of linearly arranged rock outcrops leading up to the terminal rock stacks towards which the western end of the long cairn points.

The lineal alignment in the landscape of the Catshole and Bearah long cairns is such that at both sites one end points towards the impressive Tors, while at the other end there are much more extensive and open views across the landscape. Although there is no such precise alignment in relation to a localised Tor at Louden it is situated just below Rough Tor, one of the most visually impressive landmarks on Bodmin Moor surmounted by a ceremonial enclosure which is probably of Neolithic origin. Its topographic location on a slope is similar to that of the Catshole and Bearah cairns, with extensive views across the landscape along only one cairn long axis, to the south. These three long cairns are, then, all situated *below* impressive Tors to which the *higher* end of the axis of two of them points, thus serving to highlight a specific symbolic relationship between cultural monument and natural rock outcrop, and to emphasize the cultural significance of the latter which had, almost certainly, already been established, or encultured, during the Mesolithic. The construction of the long cairns served to formalise, objectify and make explicitly *visible*, for the first time, a relationship between social Being

and the physical form of the landscape which had already existed in human *thought* for thousands of years. The building of these long cairns thus served to establish in a material and enduring form a relationship between ritual practices and the landscape. It indicates a new ideological concern—to stabilize a cultural relationship with significant features of the topography by freezing them in time.

Hill-top enclosures

There are at least two hill-top enclosures on Bodmin Moor, Rough Tor in the north-west and Stowe's Pound in the south-east, which may have their origins in the Neolithic, although both were probably extensively remodelled during the Bronze Age. Excavation has taken place at neither site. Mercer (1981, 1986a, 52; 1986b), Johnson and Rose (1994,48) and others have all stressed similarities in position and constructional form (the siting in the landscape, use of orthostats, presence of entrance gaps), between the Rough Tor and Stowe's Pound enclosures and excavated Cornish examples of proven Neolithic date at Carn Brea and Helman Tor. Both Carn Brea and Helman Tor were hilltop "settlements" surrounded by massive stone walls enclosing a series of platforms upon which traces of structures were found. At Carn Brea a large assemblage of pottery, flint (including 750 leaf-shaped arrowheads) and stonework was recovered. The site clearly operated as an important regional centre with a great many imported artefacts (principally pottery and axes) found on site. More limited excavations at Helman Tor revealed an enclosure of remarkable similarity to that at Carn Brea, together with house platforms, flintwork, chert and pottery.

The Rough Tor hilltop is made up of two extensive areas of dramatic rock outcrops and clutter, Rough Tor itself and Little Rough Tor, separated by a flattish area approaching 350m in length, now almost devoid of loose small surface stone but with many grounders or earth-fast boulders, some of considerable size. The hill crest is orientated NW-SE, with moderately steep sides sloping away to the north and south. A series of stone walls encircles the crest of the hill joining Rough Tor to Little Rough Tor enclosing an area of c6.5ha with a maximum width of c210m. On the northern side there are up to four stone walls and two entrances (Fig 6). The entrance at the south-western end is particularly elaborate with a deep hollow passing through four lines of flanking and curved stone walls. The southern walls are comprised of two main lines, incomplete where they meet dense areas of clutter at the north-east end of the enclosure. They are most elaborate in the one sector with a clear entrance at the south-western end near to Rough Tor. Inside the enclosure two concentrations of oval house platforms occur, 3-7m in diameter, on sloping ground immediately beyond the western entrances, between the northern and southern wall. Otherwise the interior appears devoid of any structures.

At Stowe's Pound a massive stone bank, up to 12m wide and 5m high externally, encloses an area of about 1ha, the highest part of Stowe's Hill, with course stonework and external facing orthostats still upright and visible in places. The stone walls link up and incorporate a number of dramatic Tors with the Cheesewring Tor itself at the southern end, just outside the enclosure, in a kidney-shaped ring with the ground sloping steeply away in all directions. Today there are no obvious entrances, but there may have been one in the south, an area now lost to the Cheesewring granite quarry. To the north another series of walls encloses a 5ha area, the rest of the hilltop. There appear to be two main entrances to the large compound, flanked by outworks of stone on the western and eastern sides, funnelling movement into it. Other small gaps along the compound walls may represent simpler entrances of lesser significance. Inside the larger compound there are around 80 cleared platform areas, one stone-faced hut circle, and two Bronze Age cairns in the northern sector.

The Rough Tor and Stowe's Pound enclosures share a number of features in common. In terms of altitude, lack of water, and extreme exposure to wind, few worse positions for a permanent settlement could be imagined. This, together with the lack of normal domestic hut circles, common elsewhere on Bodmin Moor, the incorporation of the Cheesewring and other prominent Tors in the Stowe's Pound enclosure banks, and the summits of Rough Tor and

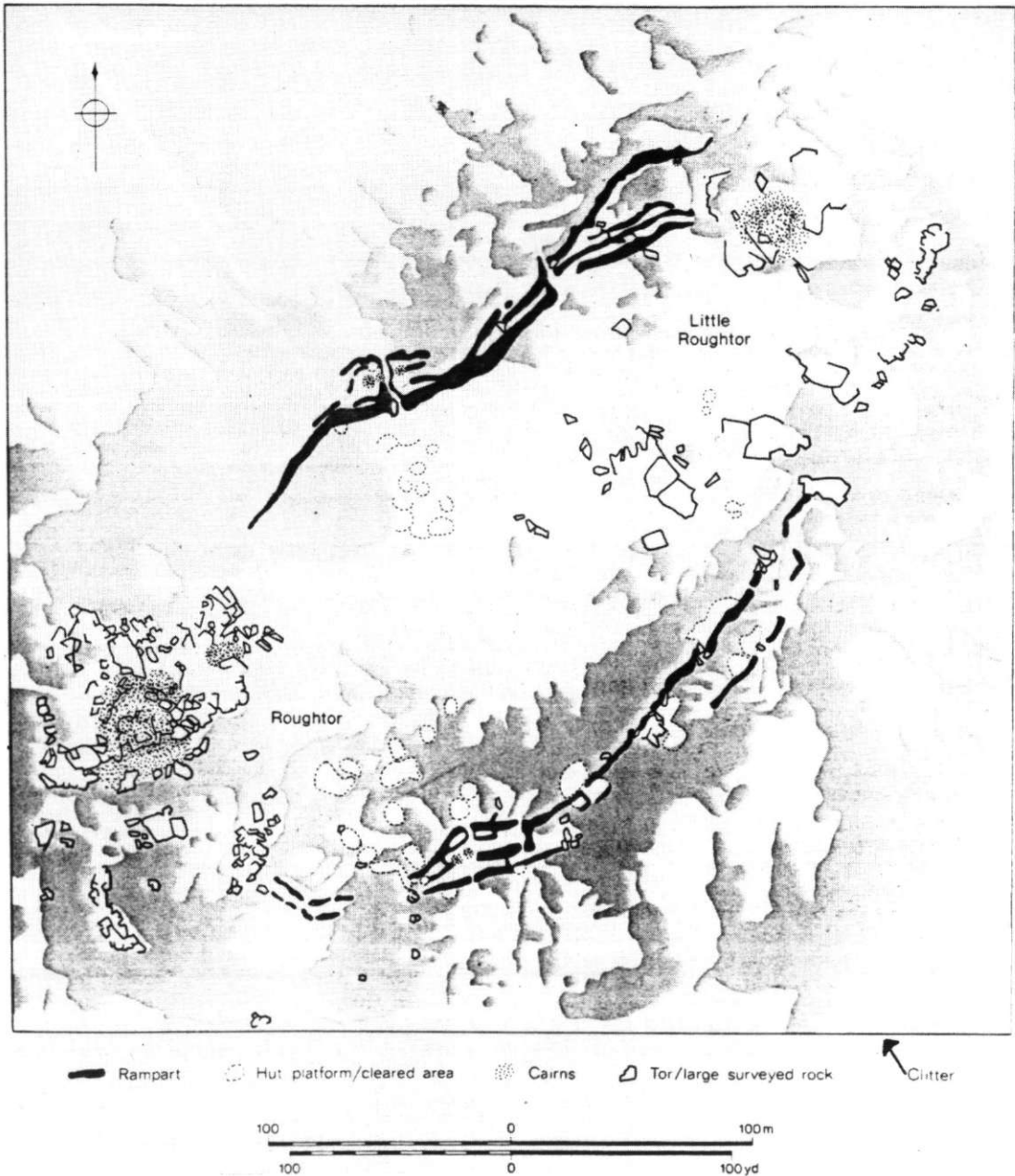


Fig 6 The Rough Tor enclosure. Source: Johnson and Rose 1994, Fig 31 © RCHME, Crown Copyright 1994, and Cornwall Archaeological Unit 1994

Little Rough Tor at the Rough Tor enclosure, all strongly suggest that both of these places were not normal domestic settlement sites. Both are particularly prominent locales dominating the landscape for miles around. They were meant to be seen, climbed up to, visited for ceremonial events, and then left. At Stowe's Pound a feature of particular interest is the contrast between the 'permeable' larger and lower enclosure with its circular platforms and cairns and the smaller and higher 'impermeable' orthostatic faced walls of the smaller enclosure incorporating the Tors, an area where activities would effectively be hidden from the larger enclosure and the

rest of the landscape beyond. Both Rough Tor and Stowe's Pound would appear to be multi-period sites. At the latter, the smaller enclosure may have been built first during the Neolithic, and the larger one, lacking any evidence for an orthostatic construction, added later during the Bronze Age.

Rough Tor and Stowe's Pound may be two of the very oldest ceremonial complexes on Bodmin Moor. There are a number of other possible hilltop enclosures, which may have Neolithic origins, Berry Down, De Lank, Tregarrick Tor and Notter Tor (Herring pers comm). The last two are, respectively, a short distance to the south-west and north-east of Stowe's Pound. The association of the Rough Tor and the Stowe's Pound enclosures with the most visually impressive individual Tors on Bodmin Moor, the former with Showery Tor and the Rough Tor summits, and the latter with the Cheesewring, is of more than passing interest, and makes them of particular significance. All three Neolithic long cairns are situated within a few kilometres of these enclosures, Louden Hill, the largest, just below the Rough Tor summit.

During the Earlier and Middle Neolithic, then, the first stone monuments were built on Bodmin Moor. The positioning and orientation of the long cairns made symbolic reference to the Tors but were located at a reserved distance. The hilltop enclosures incorporated Tors in their stone walls. The long cairns provided a fixed spatial context for the playing out of local rites connected with the ancestors and ancestral powers. The hilltop enclosures, requiring much greater effort for their construction, may have acted as communal ritual centres. Both types of monument, I want to suggest, drew part of their power and significance through appropriating and making reference to landmarks that already had an embedded cultural significance going back to the Mesolithic. The past sacred powers of topographic space became incorporated in the present of monument construction and use which served to 'draw out' ancestral powers from the landscape, make them visible, and provide symbolic potentiality for their ritual control. The hilltop enclosures marked out the two most important hills at opposite ends of Bodmin Moor, joining and enclosing their rocky Tors. The long cairns acted to focus attention to other Tors along their axes. In the social context of an area of moorland that was only seasonally occupied by small numbers of people the use of these monuments would be integrated with movement-patterns involving the dispersal and coming together of populations. The locations of these sites both harmonized and intervened in the topographical structure of the landscape altering and transforming it, albeit to a limited extent, for good. For the first time for an individual to possess personal knowledge of important symbolic and sacred topographic elements of the Moor was no longer sufficient in social discourse. Knowledge of these things was now both formalized and to be gained *through* the mediation of monuments. But the potential for social control remained slight and only became more fully realized during the Late Neolithic and Bronze Age.

The Late Neolithic and Bronze Age c2,400-500 bc

This period was one in which there occurred a quite massive cultural transformation of the landscape. While the material traces of earlier Mesolithic and Neolithic activity on the Moor are few, and found in restricted areas, monuments and settlements dating to the Bronze Age are almost everywhere and still make an indelible impact on the landscape today. There are four main developments:

- 1: For the first time there is widespread evidence of permanent and substantial domestic settlement areas associated with enclosures, fields, the cultivation of the land, and localised woodland destruction.
- 2: Major ceremonial monuments are built, stone circles and stone rows.
- 3: Cairns and cairn cemeteries were constructed in a wide variety of locations.
- 4: Towards the end of the Bronze Age major land divisions were constructed in some areas restructuring access to, and experience of, both monuments and the land.

The account below considers each of these in turn.

Settlements and landscape

Recent survey work on Bodmin Moor has identified 1,601 hut circles, 2123 clearance cairns and 978ha of prehistoric enclosures and fields (Johnson and Rose 1994, 7). Most of these are of presumed Bronze Age date, although some may date to the Late Neolithic and others may be later. Together with Bronze Age cairn building this represents a massive cultural incursion on the landscape compared with the earlier Mesolithic and Neolithic and probably marks the first permanent settling of the Moor. The huts are mostly circular or oval in form, stone-built at the base with double or single-faced walling. The hut roofs were probably conical resting on top of the ring walls and relying for support on central post holes (Mercer 1970). One entrance, usually facing in a southerly direction is normal. Doorways are sometimes elaborated with the provision of external side-entrance porches, orthostatic door jambs and a thickening of the surrounding walls. Johnson and Rose document great variety in hut dimensions from small examples less than 4m in diameter to massive ones exceeding 8m with floor areas extending up to 120m². Most huts are between 5 and 7m in internal diameter, providing space for perhaps 4-5 persons. Excavations at Stannon Down have provided evidence for timber radial subdivisions within the huts and shelf-like arrangements around the walls as well as internal wall recesses (Mercer 1970). It is likely that many of the smaller huts were used only seasonally, for storage, workshops, animal shelters etc rather than as dwellings. Although there are isolated hut circles, the vast majority are grouped together in settlements that vary significantly in size and morphology. Smaller settlements may have as few as five or six huts probably representing a single homestead with one main and a number of ancillary structures as at Catshole Tor. Larger ones, as at Rough Tor North, may have as many as 100 or more. Some settlements contain huts of similar dimensions closely clustered together as at Black Tor where 96 huts (4-7m internal diameter) occur in an area of only three hectares. Others are spread over a much larger area of land with considerable variation in hut dimensions with spatial arrangements suggesting a grouping of huts around compounds with one very large hut being associated with a number of smaller ones. Some hut circles are not linked with land boundaries and enclosures but the majority appear to be. Walls frequently link huts together which are strung out like beads along them.

There is a very clear relationship between settlement areas and the local topography. The settlements and farmsteads are generally scattered along valley slopes and ridge edges, generally to the west, south and east of prominent hills, with one or a number of settlements and farmsteads being associated with a particular area of higher ground. In the north of Bodmin Moor, in an area of only 60sq km at least 22 settlement areas occur. Based on hut numbers eleven of these (50%) appear to be major settlements with 25 or more huts, and the remainder smaller farms or homesteads. Since it is unlikely that all the huts were in use at the same time, and some show evidence of having been robbed, differences in settlement size may be more apparent than real, i.e. the largest settlements were probably in use for much longer periods. By far the greatest concentration of settlement occurs in the area around Rough Tor and Garrow Tor, where in less than 10% of the total land area of the Moor, about one third of all hut circles and cairns are located. Substantial settlements also occur to the south of Leskernick Hill, to the west and east of Louden Hill, on Brockabarrow Common, and on the western and eastern slopes of Brown Willy. The hills and Tors are divided from each other by streams and bogs forming natural boundaries between settlement areas in the landscape. It would seem that there are strong symbolic associations between settlement areas and particular hills and Tors. For example Garrow Tor, surrounded by streams and bogs, is effectively a settlement island in the middle of the north-west of Bodmin Moor, as is Rough Tor.

Generalizing, three landscape zones exist, each with different uses and associations:

1. Ridge and hilltops with rock outcrops and Tors. Here large cairns occur and the hill-top enclosures of Rough Tor and Stowe's Pound.
2. Sloping ground, often with clitter spreads, beneath the hill-tops with settlement areas, enclosures and small cairns.
3. Flatter plateau areas with major ceremonial monuments: circles and stone rows.

The organization of the landscape around Leskernick Hill in the north of Bodmin Moor exemplifies this well. The hill and settlement area is bounded off by the River Fowey to the west and bog and stream areas to the south and east. On the top of the hill is a large kerbed cairn. This is set well away from the settlement area and is not visible from it. The settlement is situated on the lower southern and western slopes of the hill in a stony area with substantial clutter spreads. There are two clusters of hut structures, each associated with small enclosures. The western part of the settlement has around 30 huts, that in the south 20. Four very small cairns and one cist are strung along the southern edge of the settlement area, and one occurs to the north. South of the settlement on a flattish plateau area is a major ceremonial complex consisting of two stone circles with a large cairn roughly equidistant to them up to which a stone row runs from the east (Fig 7). Most of the huts on the southern slopes of the hill have

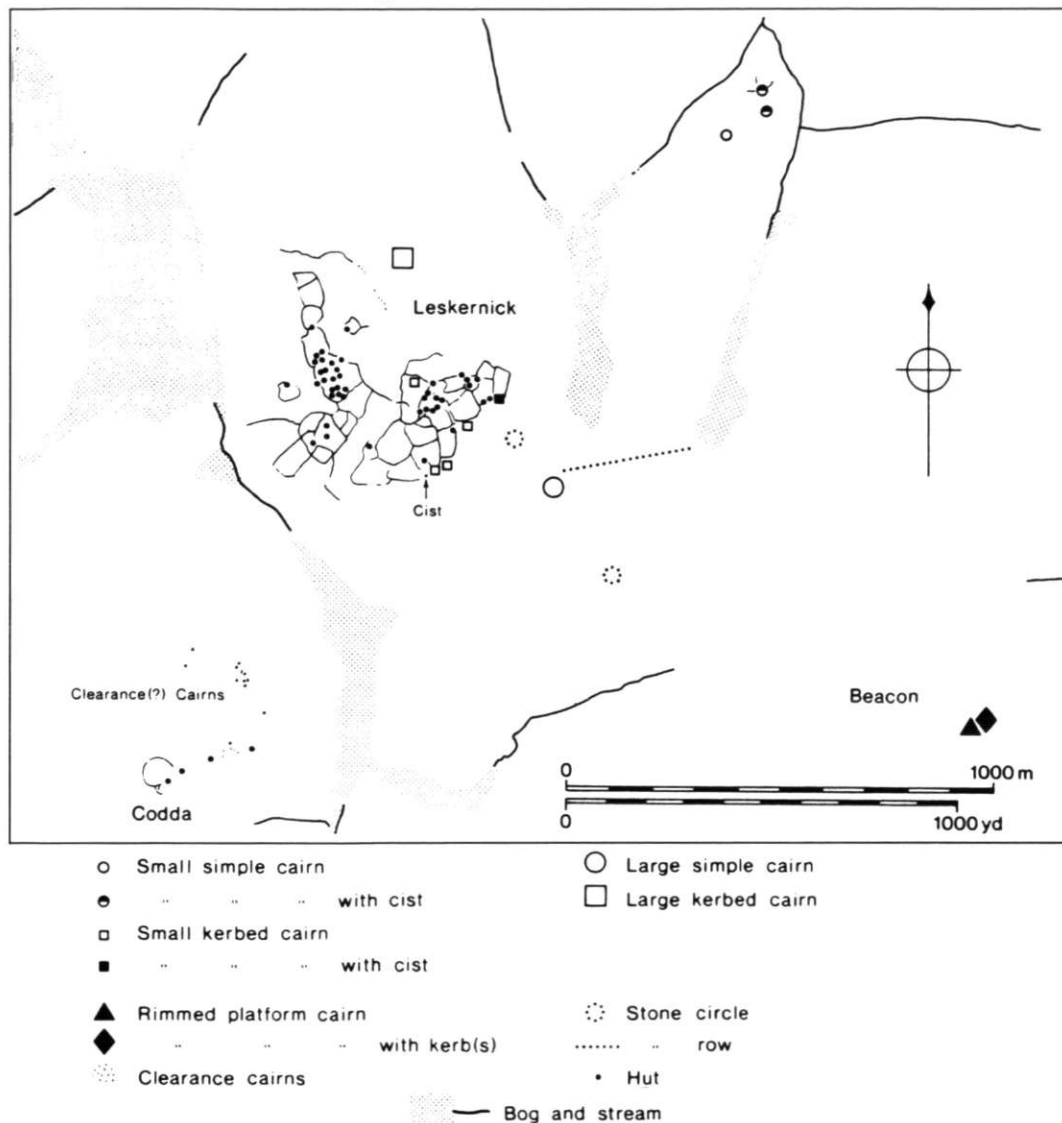


Fig 7 Cairns, ceremonial monuments, huts and field enclosures around Leskernick Hill. Source: Johnson and Rose 1994, Fig 28 © RCHME, Crown Copyright 1994, and Cornwall Archaeological Unit 1994

Circle Name	Map	Max D	St No	St Int	Shape	CS	Mean St Ht	Ht range	Highest Stone(s)
Nine Stones, Altarnun	1	15.2	12	4.9-3.0	Regular	?	1.10	1.0-1.30	-
Craddock Moor	2	39.3	27	4.9-4.2	Regular	-	1.10	0.8-1.50	-
Fernacre	3	46.0	77-95	2.5-1.2	Irregular	-	0.55	0.3-1.35	-
Goodaver	4	32.7	30	5.6-4.6	Regular	-	1.05	0.8-1.35	-
Hurlers North-East	5	34.7	29	4.1-3.5	Regular	-	1.25	0.9-1.55	SSE
Hurlers Central	6	43.5	29	5.1-4.3	Regular	+	1.40	0.95-1.70	S
Hurlers South-West	7	32.8	29	3.8-3.2	Regular	-	1.40	1.05-1.65	SE
King Arthur's Downs W	8	23.5	16-23	?	Irregular	-	?	0.70-1.50	SSE
King Arthur's Downs E	9	23.2	16-22	?	Irregular	-	?	0.50-2.15	SSE
Leaze	10	24.8	22	3.9-3.1	Regular	-	1.10	1.0-1.15	-
Leskernick Hill South	11	30.6	31	3.5-2.7	Regular	-	1.05	0.70-1.20	-
Leskernick Hill North	12	?	?	?	Regular?	?	0.45	0.30-0.80	-
Louden Hill	13	45.5	33-39	5.1-3.21	Regular	-	0.90	0.45-1.45	S
Stannon	14	42.7	71-82	2.5-1.2	Irregular	-	0.70	0.30-1.15	-
Trippet Stones	15	33.0	26-27	4.1-3.6	Regular	-	1.30	1.05-1.45	-
Stripple Stones (Henge)	16	46.3	28-29	5.6-4.6	Irregular	+	1.60	1.05-2.75	SE

Table 1 Morphological characteristics of the stone circles on Bodmin Moor. Map numbers refer to Fig 4. Max D = Maximum diameter of circle. St No = Estimated original numbers of stones. St Int = Estimated distance between stones. CS = central stone present. Mean St Ht = Mean Stone Height. Ht range = Variation in heights of stones. Highest stones = Sector of circle in which highest stone or stone present. Data from Barnatt 1980; 1989; Burl 1976

their entrances facing in a southerly direction looking down-slope and across to the ritual complex. Day-to-day life at Leskernick must have involved emerging through the doorway of a hut, seeing the ritual complex below: the place of ceremonial processions and dancing grounds, and then moving in the landscape between settlements and fields, ritual monuments and cairns, all constantly serving to structure an individual's experience of the significance of place (*see below*).

Ceremonial monuments: stone circles and stone rows

The circle and the line are two basic forms which could not be more contrasting in terms of their basic geometry. The former encloses and delimits a space for activity and event, the latter cuts a line across space, in a similar manner to the axis of the long cairn. Circles imply motion within and around, lines motion along. Both types of monument demarcated spaces to cross, to go beyond, spaces to move into and out of, move between, look at and look beyond. I want to argue that these were stones by which to learn, stones by which to remember, stones by which to orient, and stones by which to think. Learning, remembering, orientation and thinking are all processes requiring education and instruction. And such knowledge was both empowering to the individual, and offered the potential for structures of ritual authority to be effective. Controlling access to the ritual secrets of the stones enabled social inequalities to be established and then reproduced. I want to argue that one vitally important part of the ritual knowledge embodied in the stones, to be both conveyed and selectively 'released' by ritual specialists, was knowledge of the landscape and the spirit powers embedded in it. During the Earlier and Middle Neolithic specific features of the topography became referenced for the first time through monument building. This relationship, involving the alignment of a cairn on a Tor, or the building of a hilltop enclosure, was not particularly complex. During the Late Neolithic and Bronze Age this same process was both extended and transformed through the process of round cairn construction and use. It also took on a variety of different forms and achieved its most subtle expression at the major ceremonial and processional sites: the stone circles and stone rows.

Stone circles

Sixteen stone circles are now known on Bodmin Moor (Tregelles 1906; Burl 1976, 115-22; Barnatt 1980, 1989; Johnson and Rose 1994, 31-3). Only two have been partially excavated and there are no radiocarbon dates. They are all probably fairly early in date, being constructed towards the end of the Late Neolithic and in the Earlier Bronze Age, but it is likely they were in use throughout the period. Most were probably built in tandem with the earliest phase of permanent settlement on Bodmin Moor. They are distributed throughout the area, except in the south-west, and vary quite considerably in terms of diameter and form, stone dimensions, numbers of stones and the sizes of gaps between them (Table 1, Fig 4). At least two of the circles have internal central stones and nearby groups of menhirs are almost certainly associated with the triple Hurlers rings and the Stannon circle. The Stripple Stones is unique: a circle henge with a ring of stones and central stone being surrounded by a ditch with an external bank cut through by a single entrance to the WSW. Most of the stone circles have an average stone height of around 1m, although those at the three Hurlers circles, the Trippet Stones and the Stripple Stones are considerably higher. Apart from Leaze and the Trippet Stones, where stone height is exceptionally even, the other circles display considerable variation. Higher stones are usually in the southern sectors of the circles. Barnatt suggests that some of the variation in stone height might be the result of systematically grading large stones opposite smaller ones (Barnatt 1980, 28). Only the central circle of the Hurlers complex is constructed from dressed stones.

Taking into account numbers of stones, circle diameters, stone heights and intervals, provision of central stones and circle shapes it is fairly obvious that all the circles have unique individual characteristics and attempts to divide them on typological grounds into clearly defined

standardized groups is not possible. However, a basic division may be drawn between circles which are irregular in form and those which are regular, with a much greater concern for symmetry and careful site planning (see Table 1). Barnatt (1982, 1989) suggests that the irregular circles may simply have been laid out by eye to appear circular while the construction of the latter probably involved the use of a central peg and rope. Two circles in particular, Fernacre and Stannon, stand out from all the others in terms of three characteristics—their large diameters, large numbers of generally small closely spaced stones, and flattened shape in the northern sector that may, in these two cases at least, have been a deliberate design element because of the importance of a N-S symbolic axis in circle placement and use (*see below*). All the irregular circles occur in the north-west of Bodmin Moor. Burl (1976) and Barnatt (1982) both suggest that they may be somewhat earlier in date, and if this is so, an increasing concern, through time, with symmetry would appear to be a significant development.

Most occur together in closely associated groups. At King Arthur's Downs two circles are adjacent to each other, with a third circle, Leaze, only 300m away to the south-west. In the south-east of Bodmin Moor three circles, the Hurlers, occur along a rough N-E to S-W axis. Two circles at Leskernick Hill occur only 300m apart and are associated with a stone row. Of the eight other circles, all except two occur at relatively short distances from their nearest neighbours (<1.5km). Circles situated next to each other seem to have been deliberately constructed so as to incorporate important aesthetic contrasts. For example the Hurlers circles, while having the same number of stones of roughly the same height, differ in size with the central circle being considerably more spacious. The centre circle is also the only one of the three constructed from dressed stones and possibly possessed a central monolith. In addition it is slightly irregular in comparison with the rigidly regular and symmetrical forms of the northern and southern circles. Excavations revealed that the central circle was covered with a floor of quartz crystals and a possible paved way led between it and the circle to the north (Radford 1935, 1938).

Five geographical groups may be defined (see Fig 4), and processional ways, socially proscribed paths of movement through the landscape, must have formally connected them:

1. Stannon, Fernacre and Louden Hill in the north-west.
2. King Arthur's Downs East and West, and Leaze in the west.
3. The Trippet Stones and the Stripple Stones, also in the west.
4. The two Leskernick Hill circles in the north.
5. Craddock Moor and the Hurlers in the south-east.

There are only two isolated circles, Nine Stones, Altarnun and Goodaver.

Patterns of visibility between the circles are interesting to examine. From Louden Hill both the nearby circles of Fernacre and Stannon can be seen (the latter only from the northern part of the circle). The two circles on Leskernick Hill are intervisible (see Fig 7) while the circle pair at King Arthur's Downs is not intervisible with Leaze situated down-slope. Craddock Moor and the Hurlers situated only 1 km apart are not intervisible (see Fig 12) while the Trippet Stones and the Stripple Stones, 1.2km apart, are. The entrance of the Stripple Stones henge is precisely orientated so that an observer can look out to the west from the central stone through the gap in the ditch and bank down to the Trippet Stones.

The topographic locations of these circles are summarised in Table 2. These fall into four main groups:

1. Circles in exposed positions on or just below the tops of ridges or hills (3 circles)
2. Circles on south-facing slopes immediately below impressive Tors and hills to the north (6 circles at four locations)
3. Circles on gentle slopes (3 circles at two locations)
4. Circles on flat moorland plateau (3 circles)

Comparing these locations with the five geographically defined groups of circles noted above it is interesting to observe that each group of circles (except for Leaze and the pair on King Arthur's Downs) have locations that contrast greatly with each other. The variety found in

Name	Map No	Height	Location
Nine Stones, Altarnun	1	292	Exposed position in centre of flat plain enclosed by hills
Craddock Moor	2	328	Near top of hill on gentle west facing slope, land rising to east
Fernacre	3	283	On southern slope of Rough Tor, land rising to north and east
Goodaver	4	305	Exposed high point on north end of ridge
The Hurlers	5-7	315	In dip on gentle north-south slope rising up to Cheesewring Tor to north. Land rises up to south of circles
King Arthur's Downs	8-9	260	Gentle slope, land rising up to north and west
Leaze	10	252	Gentle slope, land rising up to north and west
Leskernick Hill South	11	293	Flat plateau, land rising slightly to east
Leskernick Hill North	12	297	Gentle slope rising up to Leskernick Hill to north-west
Louden Hill	13	284	Exposed position on top of east-west ridge. Land rises slightly to north
Stannon	14	250	Flat moorland plateau
Trippet Stones	15	242	Flat moorland plateau
Stripple Stones	16	275	Southern slope of Hawk's Tor. Land rising to north-west

Table 2 The topographic locations of the stone circles on Bodmin Moor. Circle numbers refer to Fig 4

stone heights, circle sizes etc is mirrored by their topographic locations. For example the regular circle of Trippet Stones, with a virtually even stone height, is located on a flat moorland plateau whereas its intervisible neighbour, the Stripple Stones circle henge, is irregular in form with an uneven stone height, and situated on a slope just below the rocky Hawk's Tor summit. Fernacre is on a gentle slope below Rough Tor (Fig 8), Louden Hill on an exposed ridge and Stannon on a flat plateau. The differences in the placement of these circles seems to further emphasize their often considerable morphological differences. This indicates a desire to build on, draw out, and emphasize natural physical distinctions in the landscape, thus emphasizing their ritual connotations and cosmic significance.

The spaces in which the stone circles are located, are for the most part, conspicuously distant from other monuments, cairns or settlement areas. The nearest prehistoric settlement areas (of any period or date) to the circles are located at distances varying between 250m and more than 1 km. In no case do these settlement areas impinge on the immediate area in which the circles are located and in some cases settlement areas and circles are separated by streams or marshy areas. The major exception is at Leskernick, where the northern circle is less than 100m from field boundaries (Fig 7). Here, and elsewhere, the fields seem to be deliberately laid out to respect a non-domestic zone around the circle. At Leskernick there is a definite association between a stone row and two circles. The row is not aligned on either of these circles but runs up a slope to end in a space roughly equidistant between them ending a short distance to the north east of a large cairn.

Despite this case, few cairns are located in the immediate vicinity of the circles. Only 16 cairns out of a total of 354 known for Bodmin Moor are found within a 250m radius of the circles (Table 3). The frequency of cairns within a 500m radius is similarly low. Considerably larger numbers occur within 1 km but frequencies vary considerably from site to site and very few are large or conspicuous. The area around the Hurlers circles is an important exception (Figs 9 and 12). Here, of a relatively low total number of cairns within a 1 km radius, seven out of the eight are large and/or complex in form. The exceptionally large Rillaton barrow is visible from the Hurlers on the skyline and is directly in line with the orientation of the three circles. As Barnatt (1982, 69) suggests, the circles would appear to be the centres of reserved sacred spaces, but the size of such areas differs considerably: up to 1 km or more

Name	Map	250m	L/C	Dir	H/L	N Vis	500m	L/C	Dir	H/L	N Vis	1km	L/C
Nine Stones, Altarnun	1	0	—	—	—	—	2	1	ENE;SW	H	1	3	2
Craddock Moor	2	2	1	NE;SW	H+L	1	9	3	NE;SSW;SW	H+L	2	23	9
Fernacre	3	0	—	—	—	—	1	0	NNW	H	0	38	6
Goodaver	4	1	0	SE	H	1	1	0	SE	H	1	2	1
Hurlers	5-7	2	2	S;SW	H+L	1	2	2	S;SW	H+L	1	8	7
King Arthur's Downs	8-9	0	—	—	—	—	1	0	SE	L	0	3	2
Leaze	10	1	0	NE	H	1	2	0	SW;NE	H	1	2	1
Leskernick Hill South	11	1	1	NE	H	1	5	1	NE	H	1	9	4
Leskernick Hill North	12	5	1	W;NW;SW;SE	H+L	1	6	1	W;NW;SE;SW	H+L	1	10	2
Louden Hill	13	1	1	NE	H	1	16	3	N;NE;S	H+L	1	26	4
Stannon	14	2	0	SW	H	0	5	2	S;SW;SE	H	2	18	6
Trippet Stones	15	0	—	—	—	—	1	1	N	H	1	3	3
Stripple Stones	16	1	0	W	H	D	1	1	W	H	D	1	0
Total		16	6				43*	15				103*	47
Total %		4					12					29	

Table 3 The frequency of cairns within a 250m, 500m, and 1km radius of the circles. L/C = Large (>10m diameter) or complex (platform cairns, rimmed platform cairns, rimmed platform cairns with kerbs, large cairns with kerbs, Tor cairns). Dir = Direction from circle; H/L = Cairn located on higher (H) or lower (L) land than circle. N Vis = Numbers of cairns visible from the circle. Data from Johnson and Rose 1994 and personal field observations. Total numbers of barrows within each circle radius given revised downwards (*) when the same barrows fall within the radius of more than one circle. Total % = Percent of all known barrows on Bodmin Moor

Circle Name	Map	NT	Dir	Dist	2nd NT	Dir	Dist	VDT	Dir	Dist	Dir	
Nine Stones, Altarnun	1	Fox Tor	NE	1.0	Trewortha	NE	2.5	Fox	SW	1.0	NW	
Craddock Moor	2	Tregarrick	SW	0.9	Cheesewring	SW	1.0	Cheesewring	NE	1.0	NW	
Fernacre	3	Rough Tor	N	0.7	Louden: Logan Rock	N	0.8	Rough	NW	0.7	N	
Goodaver	4	Hill Tor	SW	1.0	Trewortha	SW	3.1	?	ENE	—	—	
Hurlers	5-7	Cheesewring	N	1.0	Tregarrick	N	1.7	?	W	—	—	
King Arthur's Downs	8-9	Garrow	NW	1.0	Carkees	NW	1.2	Cheesewring	ESE	1.0	N	
Leaze	10	Carkees	S	0.9	Garrow	S	1.2	Rough Tor	ESE	3.2	NNE	
Leskernick Hill South	11	Leskernick	NNW	0.7	Codda	NNW	1.1	Rough Tor	NW	3.6	NNE	
Leskernick Hill North	12	Leskernick	NNW	0.4	Codda	NNW	1.1	Rough Tor	SW	4.4	WNW	
Louden Hill	13	Garrow	SE	1.6	Rough Tor	SE	1.9	Brown Willy	SW	2.6	W	
Stannon	14	Alex Tor	SW	1.4	Rough Tor	SW	1.9	Rough Tor	NE	1.7	NE	
Trippet Stones	15	Carbilly	NW	0.6	Hawk's	NW	1.1	Rough Tor	NE	2.0	NE	
Stripple Stones	16	Hawk's	N	0.3	Carkees	N	1.2	Rough Tor	NE	5.8	NNE	
									NNW	5.5	N	

Table 4 Prominent Tors in relation to the Bodmin Moor stone circles. Map numbers refer to Fig 4. NT = Nearest Tor area with impressive rock outcrops to circle. 2nd NT = Second Tor. VDT = Visually dominant Tor viewed from circle. Straight line distances to the Tors and directional orientation of Tors in relation to circles are given

around the Trippet Stones and Stripple Stones, but much more confined spaces around others such as Craddock Moor and Louden Hill.

All the circles are located only a short distance away from streams and substantial bog areas. Walking from one circle to another invariably requires crossing, or going round, these streams and bogs. It appears as if the natural boundaries formed by these wet areas may have played an important role in marking out the areas of sacred space in the landscape occupied by the circles (Barnatt 1982, 109). For example, the Stannon circle is surrounded by substantial marsh areas to the south, west and east with streams flowing a short distance to the south and north. Large Bronze Age cairns to the south of the circle are located on the other side of the marsh (see Fig 17). Fernacre has bogs and streams to the north and west across which one must pass to reach areas with settlements and cairns and the nearby Louden Hill circle. The substantial Redmoor Marsh is just to the west of the Nine Stones and another bog area occurs to its south. The circles at King Arthur's Downs and Leaze occupy a large and featureless undulating moorland area bounded by streams separating them from both cairns and settlement areas.

A special relationship exists between the circles and individual Tors on Bodmin Moor. Table 4 shows the relationship between the circles and the nearest prominent Tors in the surrounding landscape. All the circles are situated at a short distance, 2km or considerably less, from the nearest Tor. Some, such as the Hurlers, Fernacre, Leskernick Hill North and Stripple Stones circles are actually situated on the lower slopes of land immediately rising up to the Tor. In all except three cases the circles are situated to the *south* of these Tors (see Figs 8 and 9). The second nearest Tors are usually situated considerably farther away and their directional orientation in relation to the circles is much more variable, and probably not significant.

The majority of the circles are intimately related to a particular nearby Tor. Pairs of associated circles, and sometimes groups of circles, share this symbolic association with a Tor that is usually to the north. However, the nearest Tor to any particular circle is in only three cases (Nine Stones, Fernacre and The Hurlers) the most *visually dominant* Tor on the skyline (Tables 4 and 5). In the others it may be a Tor up to 5km or more distant. Again, the most visually dominant Tor is located, except in the case of the Leskernick circles, to the north (between NE and NW). The location of a circle is related both to a nearby Tor at a local level and also seems to make reference to a wider symbolic geography of place going beyond its immediate location.

The number of visually prominent Tors visible from the circles in any direction is shown in Table 5. There may be as many as seven. The two highest points on Bodmin Moor, Brown Willy and Rough Tor are each visible from ten of the circles (63%). The only circles from which *neither* of these peaks are visible are the three Hurlers situated in the far south-east

Circle Name	Map	Dom Tor	DLV	DSV	RT	BW	NDT
Nine Stones, Altarnun	1	Fox Tor	S;NNW	E;SE	-	+	1
Craddock Moor	2	Cheesewring	S;SW	E	-	+	4
Fernacre	3	Rough Tor	SW	N	+	+	7
Goodaver	4	?	SW	N	-	+	7
Hurlers	5-7	Cheesewring	SW;SE	N;S	-	-	1
King Arthur's Downs	8-9	Rough Tor	W	NW	+	-	5
Leaze	10	Rough Tor	SW	NE;W	+	-	4
Leskernick Hill South	11	Rough Tor	NE	NW	+	+	4
Leskernick Hill North	12	Brown Willy	NE	NW	+	+	3
Louden Hill	13	Rough Tor	SW;W	N;NE	+	+	7
Stannon	14	Rough Tor	SW;W	NE	+	+	4
Trippet Stones	15	Rough Tor	W	NW	+	+	5
Stripple Stones	16	Rough Tor	W;SW	N	+	+	6

Table 5 Landscape features from the Bodmin Moor Stone Circles. Map Numbers refer to Fig 4. Dom Tor = Visually most dominant Tor from the circle looking in any direction. DLV = Direction of longest view(s) looking out from circle. DSV = Direction of shortest view looking out from circle. RT = Rough Tor visible from circle; BW = Brown Willy visible from circle. NDT = Number of visually dominant Tors visible from circle in any direction. Some observations were impossible from Goodaver due to the presence of plantations on most sides of the circle



Fig 8 The Fernacre stone circle with the Rough Tor ridge beyond seen from the south

of Bodmin Moor. Although Brown Willy is slightly higher than Rough Tor, the latter with its particularly jagged outline is visually far more prominent, dominating the skyline for many miles beyond and, as already pointed out, altering dramatically in form according to the direction from which it is seen. It is by far the most striking topographic feature from the circles situated in the north and west of Bodmin Moor, being visually dominant at nine (56%) of the circles. Only three circles in the north, west or east of Bodmin Moor, Leskernick North and the isolated sites of Nine Stones and Goodaver have a visual field dominated by other Tors. The most impressive view from the three Hurlers circles and that on Craddock Moor, on the south-eastern fringe of Bodmin Moor, is the unusually weathered Cheesewring on Stowe's Hill. As in the Earlier and Middle Neolithic, Rough Tor and Stowe's Hill appear to have been the most important symbolic features of the landscape of Bodmin Moor, as experienced from the visual field of the stone circles.

Given the presence of Tors to the north of most of the circles it is not surprising that this is the direction of the shortest view from most of them. The longest view out across the landscape is in all but two cases to the west and south (Table 5). This is a particularly interesting point since the circles may have been entered and left on the western and southern sides of the rings, which are typically emphasized in some way. The single entrance across the bank and ditch of the Stripple Stones henge faces WSW. Two menhirs, known as the Pipers, stand a few hundred metres to the south-west of the central Hurlers circle, perhaps indicating a processional way to it. Burl has noted for Cornish stone circles in general that their tallest stones are frequently placed in the south or WSW (Burl 1976, 127). In the case of the Bodmin Moor circles an individual leaving them and walking to the west or south would experience a sweeping view across the landscape. Indeed, from the Hurlers and Craddock Moor the sea and the south coast of Cornwall are visible in the far distance. Conversely entering the circles from the south and west would be to move into an area delimited by the stones with a far more constricted



Fig 9 The Hurlers stone circles seen from cairn 6 (see Fig 12). The Rillaton barrow is visible on the skyline to the right and the Stowe's Pound ceremonial enclosure to the left

view of hills and Tors to the north and east, their jagged outlines serving as a spectacular backdrop to the events and ceremonies that took place within these rings of stone.

A desire that visually prominent Tors be visible from the circles played a major role in their precise location is evident from a consideration of a number of specific instances. Had the Leaze circle, positioned on a slope, been located no more than 30m or so to the south of its present position the outline of Rough Tor would have been invisible. Locating the Louden Hill circle south and down-slope from its present position would have had a similar effect. From Leskernick South the tip of Rough Tor is clearly visible and from the southern part of the stone ring at Leskernick North. Moving towards the centre of Leskernick North, Rough Tor becomes hidden behind a spur of Leskernick Hill. Here Rough Tor is only visible, for the first or last time, as one passes into and out of the stones in the south of the circle. Moving the stones no more than a few metres to the north of their present position would eliminate this perspectival effect.

The most interesting case concerns the Trippet Stones and the Stripple Stones (Fig 4 Nos 15 and 16). These two circles are situated 1.2km apart, the former just below Carbilly Tor to its north, the latter on the southern slopes of Hawk's Tor. From the centres of both circles the view is dominated by the outline of Rough Tor. They are intervisible, with the entrance to the Stripple Stones henge positioned so that the Trippet Stones is visible through it to the WSW. Both circles have their longest visual field towards the west and shortest one to the north-west. The tip of Carbilly Tor, below which the Trippet stones is situated is also visible from the Stripple Stones. Hawk's Tor forms a prominent landmark to the east of the Trippet Stones. Walking east towards the Stripple Stones from the Trippet Stones one starts going down a fairly steep slope to a stream. After no more than c50m Rough Tor becomes lost on the skyline. Almost immediately afterwards Brown Willy becomes invisible, at about the

same time as the Stripple Stones, a short distance before crossing a stream. After this natural landscape boundary has been passed the only visible landmark ahead is the tip of Hawk's Tor. Rising up the slope the tips of the Stripple Stones gradually come into view again, but both Rough Tor and Brown Willy remain concealed behind Hawk's Tor to the north-east. The tip of Brown Willy becomes visible on the horizon again only 30m or so before reaching the entrance to the Stripple Stones. Passing through the entrance to the Stripple Stones, across the bank, Rough Tor is still invisible. The tip becomes visible on the skyline only immediately after crossing the ditch. It gradually becomes more and more prominent as one proceeds to enter the stone ring and moves towards the centre of the circle with its large marker stone.

The entrance area of the Stripple Stones ditch marks and emphasizes an important *transition point* in relation to the visibility of Rough Tor. It seems highly likely that the Stripple Stones is a multi-period site, the circle having been erected first and later the ditch and bank added to surround it. The effect of elaborating on the monument through the provision of ditch and bank and clearly demarcated entrance area was to emphasize on the ground that which was already known in the minds of the builders—that the impact and significance of the monument was bound up with its relationship both to the Trippet Stones to the west and Rough Tor to the north. Moving between these sites, in either direction, it is only just before entering the stone rings that Rough Tor becomes visible on the skyline. The major difference is that this transition point is marked on the ground at the Stripple Stones, but not at the Trippet Stones.

In a series of publications Lewis, who undertook one of the earliest systematic surveys of the circles in the north-west of Bodmin Moor, also argued that a special relationship existed between the locations of circles and prominent Tors (Lewis 1883; 1892; 1895-8; 1896). Lewis noted that the Stripple Stones, Garrow Tor, the Fernacre circle and Rough Tor are all in a direct line almost due N-S and that the Stannon circle, the Fernacre circle and Brown Willy are located along a W-E line crossing the first at right angles. The Trippet Stones and the Leaze circle are also in line with Rough Tor just 12 degrees east of north. Noting that the circles are situated on relatively flat land with an apparent freedom of precise location, he notes that changing the positions of any of these circles by only 100m or so would put them out of these lines and concludes: 'I see no escape from the conclusion that each of these circles was placed on the exact spot that it occupies, because that spot was in a certain direction from the hills I have mentioned' (Lewis 1895-8, 111). He notes that Rough Tor is the only one of the hills visible from all of these circles and that it 'may be considered to be the sacred hill of East Cornwall' (*ibid*, 112 and see Barnatt 1982, Appendix H for results of a computer simulation study confirming the non-random nature of these alignments). These alignments between circles and prominent Tors not only reinforce the association between cultural monument and natural landscape feature but also point to a far more complex regional symbolic geography at work—that the relationship between monuments and landscape features was carefully planned and, by implication there must have been proscribed paths of movement between them. They could only be approached and entered from specific directions.

Lewis suggested that the siting of the circles might also be related to the rising and setting of the sun in relation to horizon features. This has been carefully studied by Barnatt who found evidence for 13 significant solar associations between six different circles and six prominent Tors (Barnatt 1982, 72-5). Brown Willy has the most orientations marking equinox sunrise and sunset and midsummer sunset from six circles. The Stannon circle has a dramatic solar association with Rough Tor, the sun on May day rising through a cleft on its western side and shining into the circle. In view of other well attested examples of such basic astronomical alignments (eg Stonehenge and New Grange) their absence, rather than their presence, would be rather surprising. The stone circle with the greatest number of solar orientations, Goodaver, is located high up on a ridge top rather than below a Tor. Its position, high up on a ridge, with panoramic views (before recent afforestation), with no Tors nearby, is very different from the other circles. This may suggest a different use than for the circles associated with Tors. The large number of solar alignments from it may suggest it was a regional 'calendrical' circle coordinating several festivals.

Stone rows

Seven stone rows have recently been documented on Bodmin Moor (Johnson and Rose 1994, 32-4) and are found in all areas except the north-west. They vary considerably in terms of length, alignment, stone dimensions and distances between the stones (Table 6, Fig 4). Row length varies between 59 and 560m and in all but one case, Trehudreth Downs, the row ends are intervisible. Two rows are aligned roughly W-E, the other five between NE-SW and NW-SE. Six of the seven rows have the southernmost end marked out by larger stones, terminal stone settings or the provision of transverse stones.

Name	Map	Ht	Length	Alignment	Mean Ht	St Dist	Terminal Ends
Carneglos	1	285	59	N-S	0.15	1.6	Tallest stone at S end
Buttern Hill	2	298	77	NNE-SSW	0.45	3.5	Tallest stone at S end
Craddock Moor	3	280	244	NE-SW	0.3	0.9	—
Leskernick Hill	4	290	317	ENE-WSW	0.2	4.5	Stone setting at W end
Cardinham Moor	5	250	380	NW-SE	1.3	14.0	Tallest stone at S end
Trehudreth Downs	6	260	460	ESE-WNW	0.25	4.5	Transverse stone at W end Ends not intervisible
East Moor	7	300	560	NNE-SSW	1.0	10.0	—

Table 6 Stone rows on Bodmin Moor. After Johnson and Rose 1994, Table 6 with modifications. Map numbers refer to Fig 4. Figures given for row length, alignment, mean height of stones, mean distance between stones. Features, if any, of terminal ends noted.

None of the terminal ends of these rows is directly aligned with reference to visually prominent landscape features such as the granite Tors. Fewer Tors are visible from the rows than the circles and they are usually further away (Table 7). They do not seem, then, to make immediate reference by virtue of their alignment, or specific location, to topographically dominant features of the landscape beyond themselves. Their role, rather than pointing towards, or making reference to, prominent topographic features beyond themselves across the landscape, seems to be one of making *connections* between less visually dominant areas of the terrain, but of no less importance. A second role seems to be that of demarcating either the centres, or the boundary areas, of sacred spaces. In addition some incorporate striking perspectival visual effects as one walks from one end to another. I shall examine each of these features in turn.

Linking spaces

The row on Cardinham Moor, running a few hundred metres to the east of Colvannick and St Bellarmin's Tor, links two areas of higher ground, with the land rising up gently beyond the southernmost and tallest stone. The row is not aligned with reference to either of these two nearby Tors, but rather seems to connect together the lower slopes of the land rising up to them. A similar situation occurs on East Moor with the stone row (the longest on Bodmin Moor), running roughly along the 300m contour, crossing a saddle, and connecting together the upper slopes of Fox Tor to the north with a well defined area of higher ground, roughly circular in shape, to the south. In the middle of this higher ground are sited two large platform cairns, on the north side of one there is a (now recumbent) menhir. The much shorter row at the foot of Buttern Hill is situated deep down in a valley watershed enclosed by ridges of higher ground to the west and east. It connects together not areas of higher and drier ground, as in the previous two cases, but two very extensive bog areas immediately to the south and north. The row is located just to the north of the source of the River Fowey whose straight-sided N-S valley effectively divides Bodmin Moor into two halves. The row extends the natural landscape boundary of the Fowey across its northern watershed to another area of bogs and streams to the north. The row at Leskernick starts at a bog area to the east, crosses another area of marshy land, and terminates with a stone setting on an area of higher land to the west on which two stone circles and a large barrow are situated. The three remaining rows, Carneglos, Craddock Moor and Trehudreth Downs parallel contours in the first case, and run down slopes in the other two, without any apparent purpose in terms of connecting together locally important features of the topography.

Name	Map	NT	Dist	Dir	VDT	Dist	Dir	RT	BW	PE	Topography
Carneglos	1	Carneglos	0.4	SW	Brown Willy	4.5	NW	-	+	-	Parallels contours along ridge. Land falls to west, rises to east to top of slope. N end slightly higher.
Buttern Hill	2	Brown Willy	2.0	SW	Brown Willy	2.0	SW	-	+	+	Flat area on watershed linking two extensive bogs.
Craddock Moor	3	Tregarrick	0.9	S	Tregarrick	0.9	S	-	-	-	Runs down slope, N end higher.
Leskernick Hill	4	Codda	1.2	SW	Rough Tor	4.0	NW	+	+	+	Runs down slope from bog area at E end, crossing wet land. W end stops at midpoint on slope with land rising beyond it.
Cardinham Moor	5	Colvannick	0.3	W	Rough Tor	8.5	N	+	+	+	Crosses flat area linking slightly higher ground to N and S.
Trehudreth Downs	6	Colvannick	1.2	S	Rough Tor	7.5	N	+	+	-	Runs down side of slope below plateau top to south. Lowest end at west. Land rises to S.
East Moor	7	Fox	0.3	S	Fox	0.3	S	-	+	-	Crosses saddle linking areas of higher ground to N and S. Highest end to N.

Table 7 Landscape features in relation to the Bodmin Moor stone rows. NT = Nearest Tor. Straight line distances and directions are given. VDT = Visually dominant Tor from the row with distance and direction. RT = Rough Tor visible. BW = Brown Willy visible. PE = Perspectival effect occurs as one walks along the row (see text). Main features of topographic location noted. Map numbers refer to Figure 4.

Marking the centres or margins of sacred spaces

The second feature is shared, to a greater or lesser extent, by all the stone rows. Like the stone circles, they occur in relative isolation in wide 'empty' tracts of land usually devoid of other contemporary or later monuments or settlement areas. The rows are relatively isolated both from each other, distances varying between 1.1 and 5.9km, and other types of monuments (Table 8). Distances between the rows and the nearest circles fall within the same range varying

Name	Map	250m	L/C	Dir	H/L	N Vis	500m	L/C	Dir	H/L	N Vis
Carneglos	1	0	—	—	—	—	1	1	SE	H	0
Buttern Hill	2	0	—	—	—	—	5	3	E	H	0
Craddock Moor	3	0	—	—	—	—	10	0	NW	H	0
Leskernick Hill	4	1	1	SW	H	1	6	1	SW;NW	H	1
Cardinham Moor	5	0	—	—	—	—	1	1	S	H	0
Trehudreth Downs	6	10	3	S	H	3	10	3	S	H	3
East Moor	7	2	2	SE	H	1	2	2	SE	H	1

Table 8 The frequency of cairns within a 250m and 500m radius of the Bodmin Moor stone rows. Map Numbers refer to Fig 4. L/C = Large (>10m diameter) or complex cairns. Direction from stone row given. H/L = Cairns higher or lower than stone row. N Vis = Number of cairns visible from any part of the stone row

between 0.9 and 4.7km. The only exception is the row at Leskernick which is located only a few hundred metres from two stone circles to the north and south and terminates near to a cairn. In other cases in which cairns or cairn cemeteries occur within 500m of the rows few are visible and in all cases the cairns are situated on higher ground than the rows. Given that 354 cairns have been documented from Bodmin Moor it is of interest to note that only thirteen are located anywhere within 250m of the rows, a meagre 35 within 500m (9%).

Just as none of the row ends are aligned on visually dominant features of the natural topography, none of them are directly aligned with reference to long cairns, stone circles, standing stones or Bronze Age round cairns. Drawing straight lines out from all the row ends across Bodmin Moor no monuments occur along them in eleven cases (78%) and in the remaining three cases single cairns occur, all almost certainly fortuitously, at distances varying between 0.8 and 1.9km, none of which are visible. Imaginary lines drawn out from the row terminals thus cross areas which might be described as cultural and topographic deserts, tracts of land which remain undefined either by other monuments or visually striking and memorable topographic features.

The nearest areas of known prehistoric settlement to the stone rows in any direction vary between 200m and over 2km. Five of the seven are well away, 3km or more. The only exception is Craddock Moor where a settlement area, of perhaps later date, seems to have impinged on the northern end of the row at a time when the monument had probably become redundant (Johnson and Rose 1994, 34).

On Trehudreth Downs a complex of cairns and standing stones occurs to the south of a stone row, while in the area immediately to the north none are known. These monuments are all situated on the top and western and eastern edges of a plateau with the stone row running diagonally up its side. The complex consists of two standing stones, one of which is surrounded by smaller stones at the base, a group of 3 or 4 stones in a row, and ten cairns. Three of these are large and probably originally possessed platform type mounds. The other seven cairns are small and inconspicuous. Patterns of intervisibility between these monuments and the stone row are shown in Fig 10. The groups of standing stones are all intervisible and with the two largest cairns which are situated on high points with panoramic vistas. One of these large cairns at the western end of the plateau, just before the land starts to dip down to the west is associated with a group of standing stones. The smaller cairns are situated on sloping terrain and are only locally visible clustering near to, but down-slope from the larger ones. The stone row is not visible from any of these cairns. Only some of the monuments on the plateau are visible from the row itself: a standing stone at the SW end, three barrows at the NW end,

another standing stone and the largest and most prominent barrow of all as one moves up or down its course. The stone row is not aligned in relation to any of the monuments, nor does it in any obvious way lead up to them. It may be marking the northern boundary of the high sacred space which the barrows and standing stones occupy.

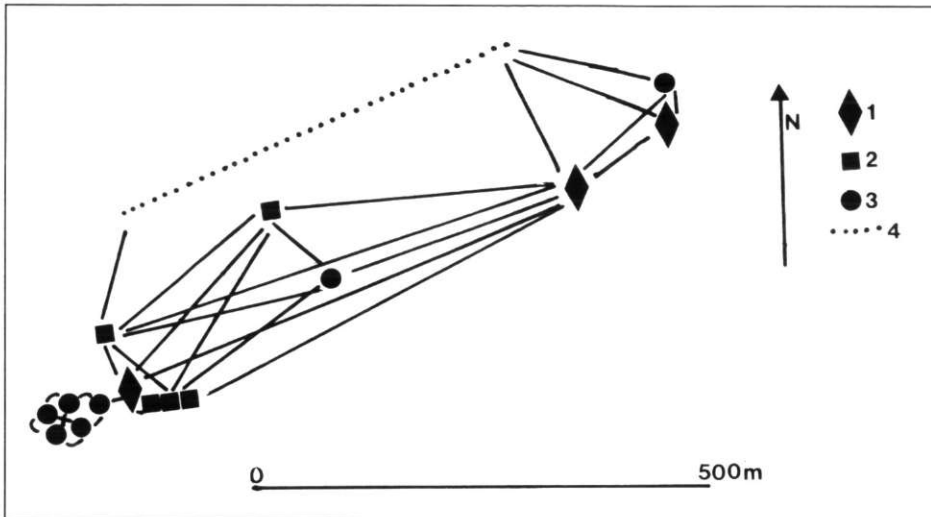


Fig 10 Intervisibility patterns between cairns and monuments on Trehudreth Downs, west Bodmin Moor (for location of stone row see Fig 4). 1: Large platform cairn; 2: Standing stone; 3: Small cairn (<10m diameter); 4: Stone row

Analogous situations occur elsewhere. The short stone row at Carneglos is similarly inconspicuously sited, running along a contour on a west facing slope of a N-S ridge. On the very top of the ridge, 400m to the south-west of the row, a large cairn and a standing stone (both are now destroyed) occurred next to each other. The stone row and the barrow and standing stone would not have been intervisible. This barrow was originally large, of platform type with a central cist and surrounded by a ditch. The stone row here would again seem to mark a transition point to higher and sacred ground marked out by the cairn and standing stone. The Craddock Moor stone row is situated just over 200m from an 'embanked avenue' and cairn cemetery to the east. No monuments occur for some considerable distance on its western side. The stone row is not visible from the cairns or the avenue and the latter can only be seen from the southern end of the row. The land gently rises up away from the row towards the avenue and cairns. Similarly, no cairns are visible from the Buttern Hill stone row. To its west there are no monuments for a considerable distance. To its east the land rises up steeply to the summit of Buttern Hill on top of which a linear group of five cairns is situated, three of which are substantial in size.

Perspectival effects

In three cases the rows have impressive perspectival effects in relation to the wider topography of Bodmin Moor, or beyond, as one walks along them from one terminal to the other. The Buttern Hill stone row, running between two bog areas in an enclosed upland valley of the Moor is not itself set below or aligned in relation to any particularly visually impressive landmarks. Yet as one walks towards the southern end of the row the top of Brown Willy gradually slips away beyond the horizon, becoming invisible at the tallest stone at the southern end, the point at which the outline of Codda Tor, 3km to the south, becomes clearly visible for the first time. At Leskernick there is a clear association between a stone row, two stone circles, settlement area and cairns (see Fig 7). Moving west down the Leskernick stone row the tip of Rough Tor becomes visible for the first time shortly before approaching the row

end, immediately after crossing over a marshy area and then becomes increasingly visually dominant as one approaches the terminal setting of three standing stones on the midpoint of a gentle slope by a cairn (Fig 11). The tip of Rough Tor is also clearly visible from the southern circle, but disappears from sight as one walks from it and beyond the stone row and cairn



Fig 11 View to Rough Tor (on the skyline to the right) at the terminal of the Leskernick stone row. The ridge of Brown Willy is to the left

and enters the northern circle being invisible from the settlement area beyond. Walking up Leskernick Hill towards the large cairn at first the tip of Rough Tor and then the entire Rough Tor ridge with its ceremonial enclosure and Showery Tor beyond, come into view. This perspectival effect culminates by the large cairn marking the hilltop. Walking along the stone row on Cardinham Moor, St Bellarmin's Tor can be seen along the entire length of the row and Colvannick Tor can also be seen except as one approaches closest to it at the northern end of the row. But there is a more interesting visual perspective than this. At the northern end of the row part of the south coast of Cornwall and the sea is visible. Conversely at the southern end of the row part of the north coast of Cornwall and the sea is visible. The south coast is not visible from the southern row end and vice versa—an intriguing type of 'twisted' perspective duplicating the effect of not being able to see Colvannick Tor, when one is closest to it, at the northern end of the row.

Trying to take into account variations in the morphological characteristics of the stone rows, their topographic locations, relationships to prominent Tors and other landscape features on Bodmin Moor, it seems clear that the purposes for which they were constructed differed. It seems possible to suggest that in three cases (Carneglos, Trehudreth Downs and Craddock Moor) they defined the margins of higher sacred space occupied by cairns and standing stones. These stone rows all run along and beneath higher ground to the east or south on which the cairns and standing stones are situated and from which the stone rows themselves are invisible. They would mark transition points one would have to cross in order to climb up to the monuments beyond them.

In another four cases (Leskernick, Cardinham Moor, East Moor and Buttern Hill) the stone rows may themselves have been at the centres of sacred spaces. The Leskernick row seems a clear-cut case running up toward two circles and a cairn from the east. The row on Cardinham Moor linking areas of higher ground with Tors to the west stands in splendid isolation from other monuments, while the East Moor row links Fox Tor with an area of higher ground occupied by two large cairns. The stone row at the foot of Buttern Hill linking two bog areas seems far removed from the invisible cairns set on the top of Buttern Hill to the east. It is of great interest to note that it is only in those cases where the rows may have formed centres of a ritual space that what I have termed above 'perspectival effects' occur in relation to the wider landscape. In three cases (Cardinham, East Moor and Buttern Hill) the stones are higher and more massive with, in the first two cases significantly longer gaps between them (10m or more) than is the case for the other stone rows with large numbers of smaller stones with shorter distances between them (see Table 7). In other words, the stones of which these rows are composed more closely resemble those used to construct stone circles. These stone rows, whether looking out from their terminal ends, or from anywhere along them, and whether with reference to contemporary or later monuments or settled areas appear to be rather isolated monuments, central lines across sacred spaces, and in some cases as already discussed above, serving to link together topographically defined spaces such as bogs and areas of higher ground. They would appear to be the linear centres of these sacred spaces rather than at their boundaries, focal lines within ritual areas that both linked them together, and by virtue of their linearity, divided.

However, the builders of Carnac would not be impressed! By only a very broad stretch of the imagination could any of them be termed monumental. Only three of them have stones exceeding knee height, and even with good maps they are difficult to find today. They would not have been highly visible markers in the landscape, even when freshly erected. Today, with most stones fallen or only visible as turf covered stumps, their impact on the landscape is negligible. None are located on the highest points in the immediate surroundings. When they run up slopes they never terminate at the top, but some way down. If they were never intended to be impressive monuments, visible for long distances, their main purpose would seem to have been mnemonic, to confirm where one was, the margins or centre of a sacred area, and that this area of ritualized geographic space (bog, stream, Tor or area of higher land) was linked to another, providing a tangible cognitive map of Bodmin Moor.

Cairns and the landscape

Over 350 cairns are now known on Bodmin Moor (Johnson and Rose 1994, 34), substantially increasing the numbers documented from an earlier study (Trahair 1978). A wide variety of structural features have been noted. The cairn mounds may be bow-shaped, slightly domed or flat topped in the centre or occur on platforms. Orthostatic or boulder kerbs may delimit the mound or be set inside it, be contiguous or open in plan. In some cases several kerb rings may be set inside the mound. Internal cists may be centrally placed or offset, above the mound material or sunk into the ground, may originally have been visible or concealed by the cairn material. Some cairns have Tors, 'grounders' (large earthfast boulders) or, occasionally, standing stones as central foci (Johnson and Rose 1994, 34).

The majority of the larger cairns over 10m in diameter lie on major watersheds, plateaus, hillslopes and hillcrests (*ibid*, 41) and, as already noted, some distance away from settlement areas and the ritual spaces defined by the presence of stone circles and stone rows. Two or more structurally different cairn forms eg kerbed, Tor and platform cairns, may be found in the same group and there appears to be no major difference between cairn form in different parts of Bodmin Moor.

Trahair in his survey of 225 (generally larger) cairns found that 60% were on hilltops or ridges. Twelve per cent were sited in false crest situations so that the cairn appears prominent on the skyline when looked at from a distance but is not itself sited on the hilltop. The remaining

28% were inconspicuously located on lower or gently sloping ground (Trahair 1978, 4). Barnatt (1982, 85-6) similarly found a strong relationship between cairn size and topography with 79% of the large cairns being found in prominent positions and 90% of the smaller ones in low-lying locations.

It is, however, impossible to provide any more meaningful generalizations as regards cairn location for Bodmin Moor as a whole since their specific siting is intimately related to the character of the local topography, the presence of other classes of monuments and the history of settlement and landscape use. I will consider two areas in detail.

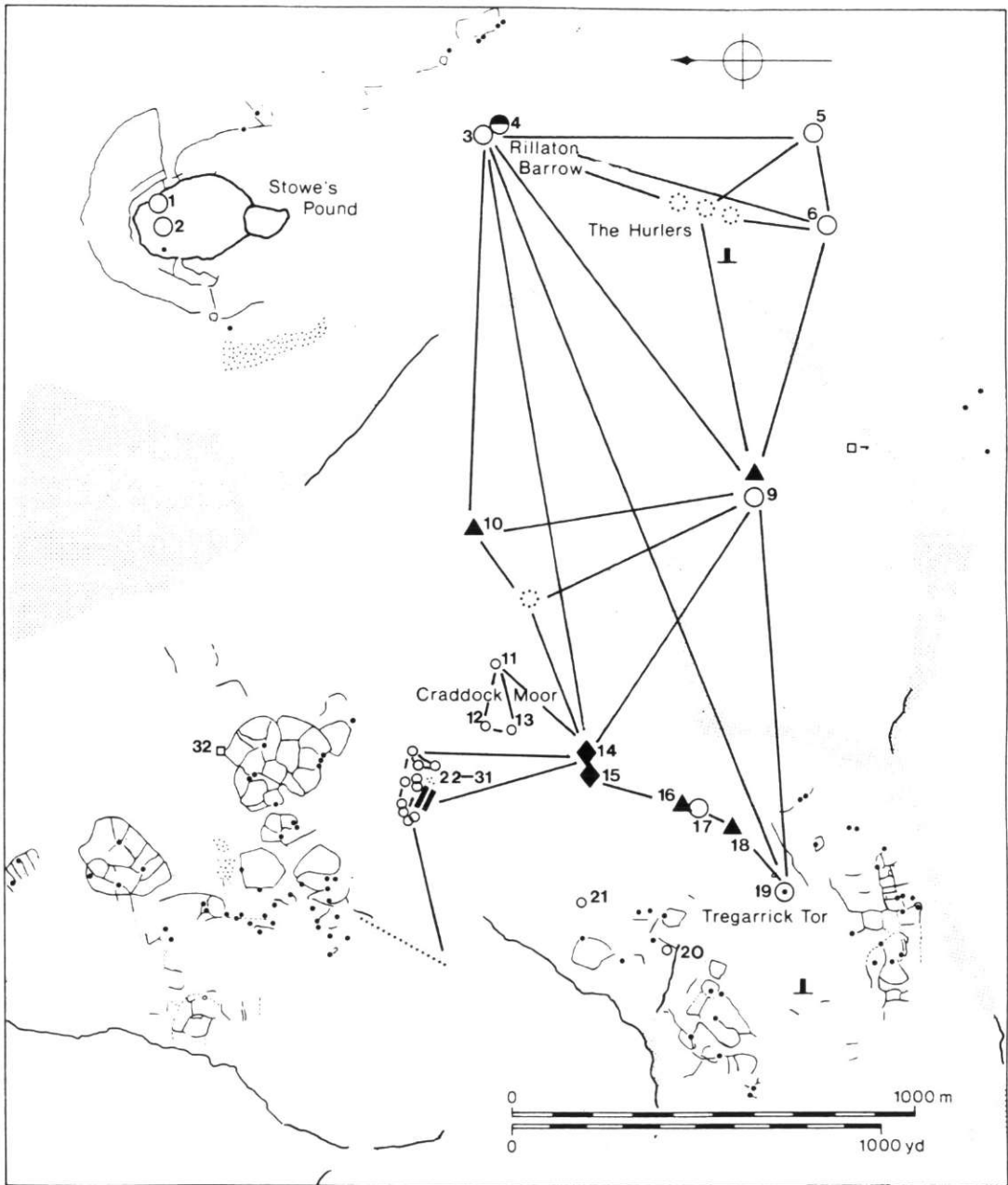
The Craddock Moor area

On Craddock Moor 32 cairns have been documented along with one stone row, an 'embanked avenue' (possibly a double stone row), four stone circles, three menhirs and the Stowe's Pound ceremonial enclosure (Fig 12). The cairns, as elsewhere on Bodmin Moor, fall into two fairly clearly defined groups: 17 small circular structures 1m or so high and no more than a few metres in diameter, and 15 larger and much more monumental sites ranging in diameter from 11m to 34m. The larger and smaller cairns differ significantly in terms of their locations in the landscape, degree of visibility and relationship with other monuments and prominent landscape features.

The locations of the small cairns are all inconspicuous. They are found in low points in the landscape, on sloping ground with the land rising up beyond them in two or more directions. The majority are clustered around an embanked avenue. With the exception of a few of them (see Fig 12), none of the large cairns are visible and they are all out of sight of the stone circles. From none of them can the visually most impressive Tor in the area, the Cheesewring, be seen and at most it is possible to see three other Tors. They are hidden away both from views over the wider landscape and from the larger cairns and monuments.

The locations of the large cairns on Craddock Moor were carefully chosen both in relation to each other and other types of monuments. They are placed either individually, or in pairs, in prominent high positions on flat or only slightly sloping land, with panoramic views. In most cases they have a high degree of intervisibility with up to nine other cairns visible from any particular site, some at a considerably distance—up to 2km away. They fall into two groups, one being intervisible with the Craddock Moor, and the other, the Hurlers stone circles (Fig 12). From one strategically sited pair of cairns (Fig 12, Nos 8 and 9) both sets of circles are visible—the only point marked by a monument on Craddock Moor where this is possible. The only large cairns from which a stone circle is not visible are those two actually within the Stowe's Pound enclosure. It is only possible to see some of the smaller cairns from *one* location with large cairns (Fig 12, Nos 14 and 15). Up to six visually prominent Tors in the landscape can be seen from the larger cairns with Stowe's Pound and the Cheesewring dominating views from nine (Fig 9), Tregarrick Tor from four and Sharp Tor from two. As is usual on Bodmin Moor they are located at a reserved distance from the stone circles, 200m, or further, and are usually sited at higher points in the landscape so that from the cairn site one looks across the Moor and down onto the circles.

Two large cairns at the western and eastern peripheries of the overall distribution are of particular interest. The outcrop of Tregarrick Tor is about 35m long, 20m wide and 2-4m high. The highest part is the south-east end where small stones are piled up against the vertical rock stacks to form a semi-circular Tor cairn around 7m wide and 1m high. Here there may also be a hilltop enclosure, as noted previously. The Rillaton barrow at the eastern end of the distribution is situated just below the Cheesewring and Stowe's Pound enclosure. In contrast to the Tregarrick Tor cairn it is a huge artificial cairn—in effect a humanly produced Tor. Visible for miles around, and commanding panoramic views in all directions, as far as to the south coast of Cornwall and east to Dartmoor, it is the second largest cairn on Bodmin Moor. Although much mutilated it still stands up to 2.7m high, with a diameter of 34m. The contrast between these two monuments could not be greater—one a Tor encultured with a cairn and the other a huge cairn resembling, in some respects, a Tor.



- | | | |
|-------------------------|---------------------|----------------------|
| ○ Small simple cairn | ● Long cairn | ○ Large simple cairn |
| ◐ " " " with cist | ◉ Tor cairn | ◑ " " " with cist |
| ◑ Small kerbed cairn | ◐ Clearance cairns | ◒ Large kerbed cairn |
| ◒ " " " with cist | — Bog and stream | ◓ " " " with cist |
| △ Platform cairn | ⋯ Stone circle | ⊥ Standing stone |
| ▲ Rimmed platform cairn | ⋯⋯ Stone circle row | ▬ Embanked avenue |
| ◆ " " " with kerb(s) | ⋯⋯⋯ " " setting | • Hut |

Fig 12 Intervisibility between the cairns and ceremonial monuments in the Craddock Moor area of south-east Bodmin Moor. Map based on Johnson and Rose 1994. © RCHME, Crown Copyright 1994, and Cornwall Archaeological Unit 1994

The Rillaton barrow is a short distance to the north-east of the Hurlers circles, and is in line with their axis. It is difficult to believe its siting on a ridge directly above these circles and just below the most impressive Tor on Bodmin Moor, the Cheesewring, is a mere chance association. The presence of a possible fourth Hurlers circle, sited roughly a quarter of the way between the northern Hurlers circle and the Rillaton barrow makes this even more likely (Herring pers comm). The massive Rillaton barrow just to the south and the three Hurlers circles, clearly visible below from the top of the smaller Stowe's Pound enclosure, reinforces the ritual connotations of the site, a series of spaces set apart from the routines of everyday life. An axis of importance, a line of movement through the landscape, from the circles to the Rillaton barrow to Stowe's Pound seems highly likely as Barnatt (1982, 187) suggests.

If a SW-NE line between the Hurlers and the Rillaton barrow marks an axis through which people moved through this landscape, then at least three others also seem to be indicated: between the Tregarrick Tor cairn and the other large cairns to its NE and the Craddock Moor circle; between Tregarrick Tor, cairns 8 and 9, the Pipers menhirs and the Hurlers circles. A final possible axis of movement links monuments rather than cairns, but none of these are intervisible—the Craddock Moor stone row, embanked enclosure, stone circle and the Hurlers. It is difficult to imagine how such a striking alignment could occur purely by chance.

During the Bronze Age, in this area, the landscape became increasingly ritualized and marked by monuments. Ways between them were formalized. This was no longer a landscape through which one could move without being constantly reminded of its symbolic potency and significance.

North-West Bodmin Moor

North-west Bodmin Moor has the highest concentration of the smaller cairns on Bodmin Moor but with numerous larger cairns also present. The smaller cairns tend to cluster in cemeteries, sometimes associated with one or two larger ones. The large cairns do not usually occur in pairs, as on Craddock Moor, and are typically situated at some distance apart from each other (see Fig 13). Based on a sample of 30 of these cairns in the vicinity of the Stannon, Louden and Fernacre circles, the locations of the smaller and larger cairns in the landscape do not differ so dramatically as on Craddock Moor. Views from all the cairns are dominated by Rough Tor. There are no significant differences between the larger and smaller cairns according to degrees of visibility across the landscape. Larger cairns may be located on high points with panoramic views, on slopes, or areas of flat moorland plateau at the base of slopes. The smaller cairns are found in the latter two locations, but not the first. In other words a few (two out of seven) of the larger cairns are deliberately sited so as to possess commanding views over the landscape but the majority of them are located no differently from the smaller ones. One of the Stannon, Louden and Fernacre stone circles is visible from every cairn with only one exception. In five cases two of these circles are visible from the same cairn, but from only one particularly large and prominently sited cairn can all three of them be seen (Fig 13).

From all the cairns between one and eleven other cairn sites are visible. From the smaller cairn sites one or two larger cairns can be seen, for longer distances, and up to seven smaller ones more locally. All but one of the larger cairns are intervisible with another large cairn up to 1 km or more distant, and usually with a number of smaller ones. Smaller numbers of cairns are visible from the circles than the circles are from the cairns because the cairns are generally positioned at higher points in the landscape so that an observer looks down to the circles from them. The cairns are set at a reserved distance from the circles, especially in the case of Fernacre where only one possible small cist occurs within a 500m radius. At the Louden circle all but one particularly prominent cairn (the only one visible from the circle itself) within 500m are situated to the north of a major Late Bronze Age field boundary. At Stannon the two large cairns within 500m of the circle are situated well up a slope and separated from the circle itself by a substantial bog area. The larger cairns here do not seem to obviously

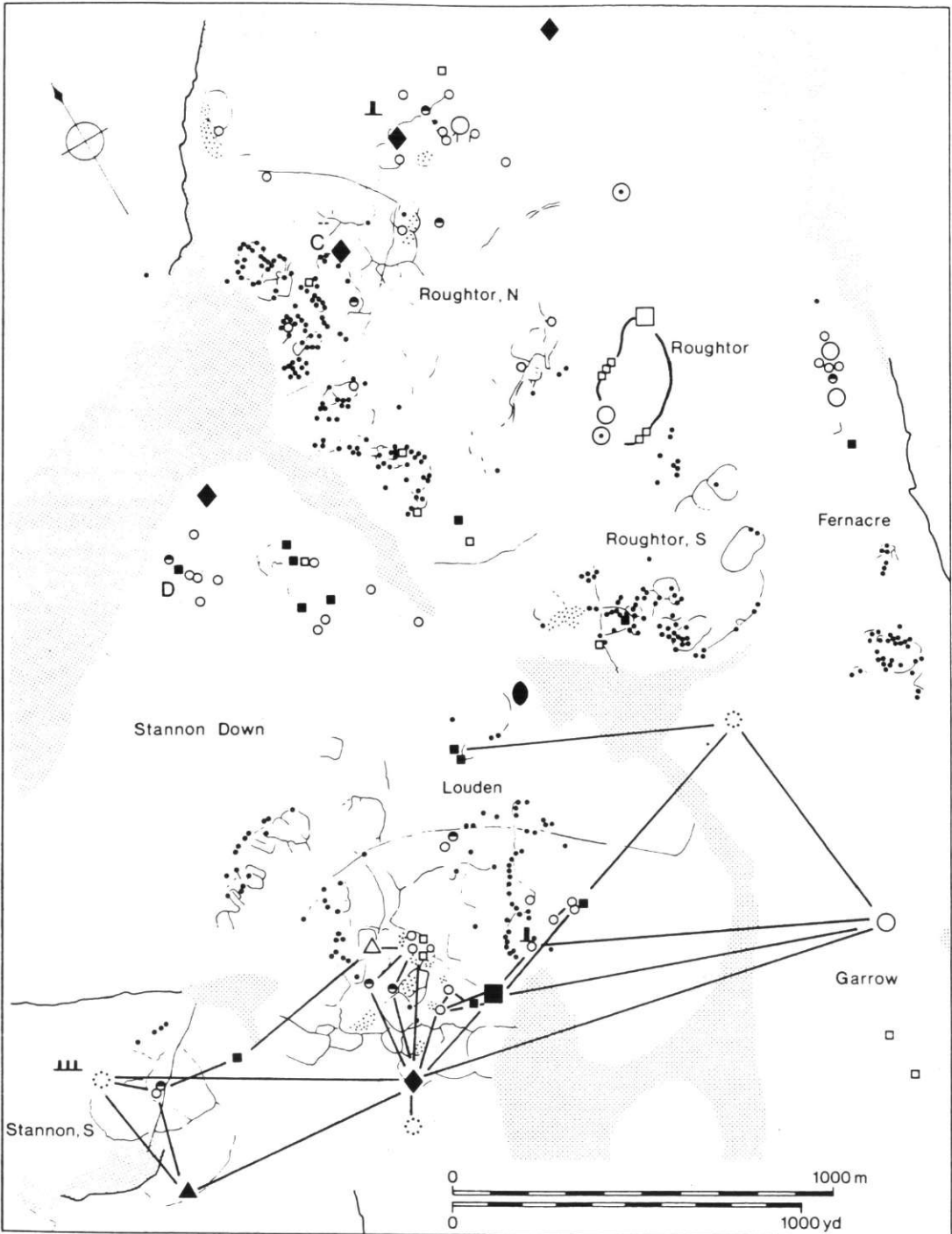


Fig 13 Intervisibility patterns between the cairns and ceremonial monuments in the area south of Rough Tor, north-west Bodmin Moor. For key see Fig 12. Map based on Johnson and Rose 1994. © RCHME, Crown Copyright 1994, and Cornwall Archaeological Unit 1994

mark paths of movement across the landscape, as in the Craddock Moor area, and are much more closely associated with settlement areas and field boundaries (see the discussion below). In both areas the cairns mark important transition points situated on the margins of the sacred spaces connected with the stone circles. While in the Craddock Moor area they may mark ways of movement through the landscape in the Rough Tor area this is less obvious. This reinforces the impression that the cairns were systematically placed in relation to the circles.

Tor cairns and 'grounder' cairns

There are at least fifteen cairns on Bodmin Moor where natural rock outcrops and stacks form the focus of the cairn, or directly on top of which the cairn is built. Four of these are located in the south-east part of the Moor, the remaining eleven in the north-west of the Moor (Fig 14).

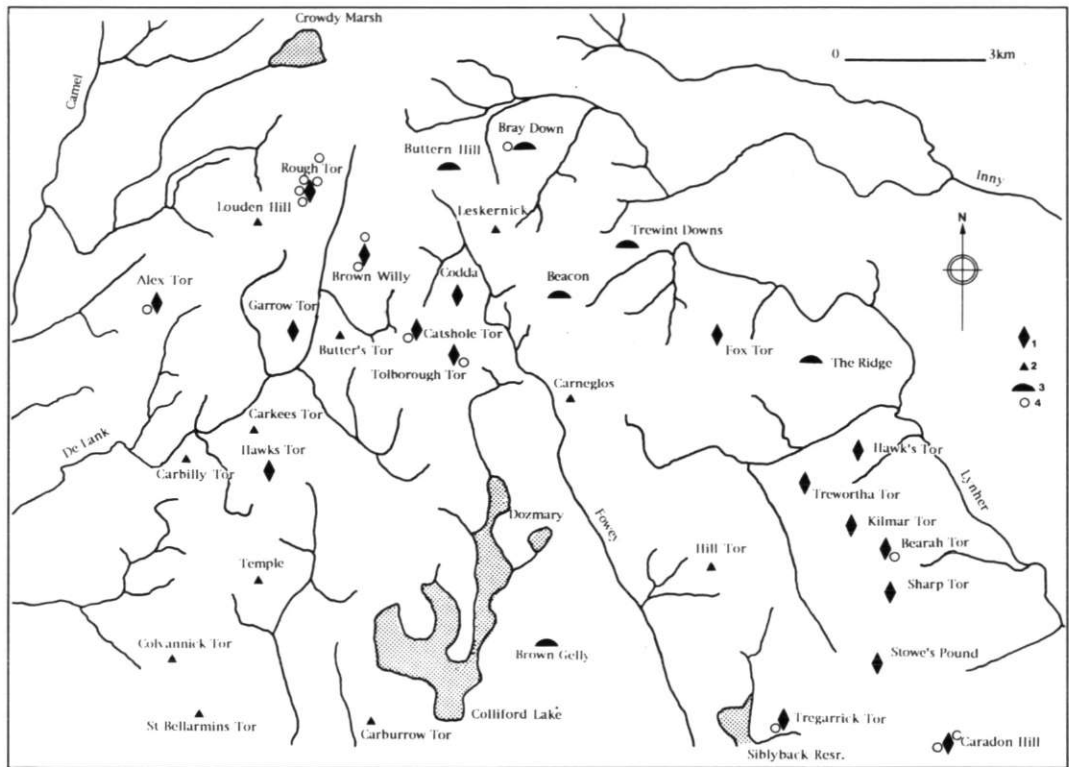


Fig 14 The distribution of Tor cairns on Bodmin Moor. 1: Major Tor or rocky outcrop; 2: Minor Tor; 3: Significant hill without prominent outcrops; 4: Tor cairns built on or around rock outcrops

Various forms of these cairns can be distinguished:

- (i) They completely encircle a rock stack as the central focal point. Showery Tor is the most dramatic example (Fig 15).
- (ii) Some are semi-circular in form enclosing part of the rock stacks as at Tregarrick Tor, discussed above.
- (iii) Others may be placed on top of a prominent rocky eminence as at Rough Tor and at Brown Willy where a cairn marks the highest point on Bodmin Moor.
- (iv) A few may almost completely hide and envelop a series of rock stacks as at Tolborough Tor. Given the high locations of these sites and the presence of jagged rocks they are all visually prominent landscape markers.

In addition to these Tor cairns there are a number of well-documented examples of ‘grounder’ cairns in which large earthfast boulders form the central focus of the cairn or are incorporated within it. Grounder cairns are found both high up on ridges and hill summits and in lower lying locations. How many of these actually exist is impossible to determine since the boulders are usually partly or completely concealed and are only visible in cases where the covering cairn material has been mutilated or removed at a later date.

Excavation of a number of cairns on Bodmin Moor have shown them to be constructed over grounders, or a large stone in the case of cairn IVB at Colliford which had been especially moved to the centre of the area where the cairn was constructed, as if to resemble a grounder (Griffith 1984, 72). But the most dramatic example comes from the excavation of cairn I at Caerloggas on the nearby St Austell granite uplands 20km to the west of Bodmin Moor. This was a ring cairn, 25m in diameter, with a flat internal area focussed on a remnant Tor. The initial phase of construction involved the definition of the area around the Tor by a shallow ditch to the south and west with a causeway across it. Four small grounders were used to create a small 0.9m wide entrance gap into the central area. Later a bank was constructed within the ditch consisting of turves laid over a ring of granite blocks. This ran across the first entrance and a new one was created to the south, 3m wide and flanked by enlarged terminals. A ring of posts was erected on top of this bank. Another post was erected in the middle of the entrance, and a line of seven in the interior of the enclosure probably formed part of a screen obscuring the Tor from view from anyone standing at the entrance. In a third phase of construction the bank was heightened with a 0.3m high band of yellow clay and another row of posts erected on top. In a fourth phase this bank was heightened yet again, this time with black gritty soil and was capped with a cairn ring two stones high. These may have been built up around the base of the earlier posts since the stones did not overlie the post holes (Miles 1975, 24-8).

In connection with the earlier phases of activity at the enclosure, a grave-shaped pit had been dug to the north-east of the Tor and in it offerings had been deposited: 17 flints, 14 white pebbles, a quartz crystal, an incised slate, a burnt and broken killas (clay slate) pebble, two unused killas pebbles, a tourmaline pebble and two fragments of burnt long bones (*ibid*, 26). Other finds from the interior, also clustering around the central Tor, include parts of a decorated bronze dagger, seven pieces of glassy tin slag, an amber fragment, a serpentine stone bead, 88 white waterworn quartz pebbles, some with a highly polished surface produced by handling, 4 quartz crystals, stone tools and unused pebbles. These were deposited on the site and were not incorporated as part of the project of heightening the cairn ring (*ibid*, 32).

Clearly this Tor cairn was a ceremonial enclosure with the Tor as the central focus below which a dedicatory burial of artefacts and bones had taken place. Access to the enclosure was both restricted and remodelled. The narrow entrances, internal screen, successive heightening of the surrounding cairn ring surmounted with posts, probably supporting a fence, all betray a concern for secrecy, to hide the activities taking place inside the ritual arena from observation from the outside, the implication being that only certain individuals or groups were allowed to enter. This enclosure may have been in use for sixty years or more. Each new construction phase bounded it off more and more from the outside.

The deposits are of a highly symbolically charged nature. A grave beneath the central Tor contained white quartz, incised and clay slate, beach flints, a tourmaline pebble but only two burnt long bones. Other finds from the interior show the symbolic association of slag and metal (fire) and waterworn pebbles. Some of the objects, such as the dagger, amber (probably from the Baltic) and stone bead (from the Lizard) are of an exotic nature from far-flung locations. Finally there is an obvious concern with colour—the yellow ring of clay capping the enclosure, the whiteness of the quartz, the red amber and the tourmaline pebble.

The cairns with rock stacks or large boulders forming their central foci were clearly of great significance on Bodmin Moor during the Bronze Age. The most prominent visual landmarks of all, the granite Tors, are being encultured through the stacking up of stones around or on

The cairns with rock stacks or large boulders forming their central foci were clearly of great significance on Bodmin Moor during the Bronze Age. The most prominent visual landmarks of all, the granite Tors, are being encultured through the stacking up of stones around or on them, while boulders acting only locally as landscape markers and orientational foci are being built into and concealed by cairns. In the case of the Tors a natural outcrop is being enhanced, controlled, domesticated, as part of a whole series of ritual activities. In both cases cairn location, quite literally, builds on natural features marking the landscape.

Yet a choice of which boulders to conceal, and which Tors to mark out, was always involved. A large number of prominent rock outcrops do not have surrounding or enclosing cairns and there are many many thousands of prominent boulders present on the Moor not covered by cairns. The most symbolically significant points in the landscape must have been emphasized and the reasons for this can be explained in terms of historical precedent. Those areas of the landscape already marked out with monuments and enclosures during the Neolithic receive special emphasis through the later construction of Tor cairns, while prominent Tors on ridges and hills (eg Trewortha Tor and Kilmar Tor in the south-east, St Bellarmin's Tor and Colvannick Tor in the south-west, Fox Tor in the north-east) without such ancestral associations do not. The concentration of Tor cairns in or near to the two early hill top ceremonial enclosures, Rough Tor and Stowe's Pound enclosures can be explained in this manner. They also occur in the two areas of the Moor where the majority of the stone circles are clustered. There also appears to be an association with the presence of Earlier Neolithic long cairns. The Louden Hill long cairn is sited just below Rough Tor, the Catshole Tor long cairn is sited between the Tor cairns on Catshole and Tolborough Tors and its long axis is directly orientated towards the rock stacks encircled by the Catshole Tor cairn (Fig 5). The Bearah long cairn is situated a few hundred metres to the south of a Tor cairn on the eastern end of the rocky ridge of Bearah Tor.

The Rough Tor enclosure (Fig 6) seems to have been substantially altered and remodelled during the Bronze Age, transforming its significance. Part of this remodelling involved the construction of the Tor cairns. Small cairns also occur on either side of the main entrances which may themselves have been elaborated. Passing into the Rough Tor enclosure one has to move between structures associated with death before entering the interior space.

Apart from five marker cairns around the two main entrances three large cairns surmount, and partially surround, the top of Rough Tor itself, another crowns Little Rough Tor and a fifth Showery Tor, down-slope and across a shelf of land, 300m to the north-east of Little Rough Tor at the end of the Rough Tor ridge. This concentration of cairns built around and on Tors is unique on Bodmin Moor indicating the great ritual significance of this area. Showery Tor (Fig 15) is the largest and most impressive cairn on Bodmin Moor. The cairn, up to 37m in diameter, consists of a ring of stones, a maximum of 10m wide in the best preserved section and originally at least 3m high on the outside, encircling a most unusually weathered rock outcrop, reminiscent of the Cheesewring at Stowe's Pound, forming a huge sculpted 'altar' at the cairn centre. The little Rough Tor cairn, up to 20m in diameter and 5m high, is piled up on and around a natural rock stack crowning the summit of Little Rough Tor. On the summit of Rough Tor itself there are a further three cairns built on and around the rock stacks (Fig 16). The largest and highest is still up to 18m in diameter and over 1m high today. Immediately below it, to the south, more cairn material encircles the base of the rock stacks 7m above which the summit cairn was built. About 20m downslope to the north-east another smaller ring of cairn material is built up on a small terrace above a series of lower rock stacks forming part of the summit of Rough Tor.

The Rough Tor summit itself has particularly unusual weathered rocks. On the eastern and southern sides there are cave-like structures penetrating into the rocks running in effect beneath the pair of summit cairns. These are only visible as one moves up to the base of the summit itself. Climbing up to the two summit cairns from the north-east, the easiest and most obvious means of approach, one passes two natural tunnel-like structures up to 20m or so in length



Fig 15 Showery Tor cairn at the end of the Rough Tor ridge, north-west Bodmin Moor

through which the landscape to the north is visible below. These two summit cairns are thus sited and built amongst rock stacks, above 'caves' and 'tunnels' in the rock further emphasizing their significance.

Looking out from the highest summit cairn on Rough Tor the entirety of the enclosure is visible together with all the other cairns on the hilltop summit, the only point at which this is possible. Below, to the south, the Fernacre circle is clearly visible. The only other cairns from which this circle can be seen are the two small 'marker' cairns at the southern entrance. On a clear day, and there were probably many more during the Bronze Age, the Stannon and Loudon circles are also visible from this *single* point.

The experience of landscape thus culminates on the summit of Rough Tor from which the three stone circles and some of the larger cairns surrounding them could be seen. The process of learning to see the landscape and to understand it was clearly different according to whether one entered the Rough Tor enclosure from the north or the south or approached it from Showery Tor. Moving was a process of revelation with more and different cairns coming into view with a final ascent to the summit involving passing fantastic looking caves and fissures until the three circles become revealed in the distance below.

Clearly the construction of Tor cairns represents a very different type of symbolic relationship to the rock outcrops than that during the Neolithic. While the Neolithic long cairns make reference to them at a reserved distance, they become enclosed, built over, and bounded off during the Bronze Age. The emphasis on the relationship between rocks and monuments is further and deliberately emphasized, and in a manner which can hardly be described as discrete. In contrast to the Neolithic there is a much stronger will to *visibility* with cairns found in all the very highest locations in the landscape. There is a concern with *hiding* some of the smaller Tors as at Caerloggas. Other larger and more prominent Tors are surrounded by stones around the base thus serving to emphasize the living rock as a ceremonial focus, or the Tors may



Fig 16 The Rough Tor summit. Tor cairns surmount the rocks to the right of the picture and cairn material is visible below the rocks

be built upon or the outcropping rock be incorporated within the cairn and only visible in outer parts of the cairn ring as at Tolborough and Alex Tor. The emphasis seems to be to capture, appropriate and control the powers of the rocks which first become materially marked out through monument construction in the Neolithic. The cairn ring surrounding Showery Tor is unbroken and there is no sign of any possible entrance. To reach the central rock would require clambering over it, a practice which it is highly unlikely would be possible for everyone. While in the Neolithic the Tors constituted a series of symbolic resources whose use and veneration were available to all, during the Bronze Age access to, and use of them, became far more restricted. Appropriating the Tors and controlling access to their embedded spirit powers and ancestral associations became part and parcel of the exercise of power and social control.

Cairns on ridges

Encircling a Tor, or enclosing a boulder, was one way to emphasize and utilize features of the landscape. A second was to use the stone circles and stone rows with their particular symbolic relationship to topographic boundaries, Tors and the perspectival effects engendered by moving between or along them. Another was the location of cairns in prominent positions on ridge spines running across and breaking up the landscape. These, like the Tor cairns, are visible for miles around when viewed from either side of the ridge. Some of the cairns in these locations if not built so as to enclose rock outcrops utilize or 'refer' to them in a different way by either (i) being constructed in line with a spine of outcropping rocks or (ii) where no such rocks occur themselves by reproducing a similar effect through the imposition of the cairn form breaking up a hill or ridge with otherwise smooth contours.

The locations of cairns on the ridges of Caradon Hill, Bearah Tor and Trewortha Tor fall

into the first class. Here cairns are aligned along the spinal ridges of the hills, their orientation in relation to each other follows the ridge and points to the rocky outcrops. The nineteen cairns on Caradon Hill run in a staggered SW-NE row up and along the spine of this very prominent hill to the extreme south-east of Bodmin Moor. In this group two cairns at the south-west end of the group also incorporate low Tors. On the Bearah Tor ridge two cairns are aligned at the western and eastern ends of a rocky spine including six major stacks of outcropping rocks. As already noted the eastern cairn is built up and surrounds one of these rock stacks.

The five cairns running along the ridge of Brown Gelly are the best example of the second situation in which there are no prominent stacks or rock outcrops breaking up the skyline. The cairns are arranged in a semicircular arc along the top of a ridge. The southernmost and northernmost cairns are sited on the edges of the ridge at a point where the land begins to fall steeply away. Approached from the north or south only these cairns are visible, the three intermediate cairns sited on the flat ridge top only coming into view when they are reached. However all five cairns are prominent, when seen from a distance, from either the west or east across the whole of Bodmin Moor. They must have been intended to have been seen as a group from these cardinal directions. These five cairns break up the smoothed contours of the Brown Gelly ridge to, in effect, themselves *resemble or simulate* Tors. There is another relationship of interest here. Down-slope, about 100m to the south of the southernmost cairn, a rock outcrop, inconspicuous from a distance but locally significant, the only one on Brown Gelly, occurs. Both cairn and Tor are intervisible and the specific siting of rock outcrop and cultural monument are clearly related. From the Tor only the southern cairn is visible. Walking from Tor to cairn it is only at the point where that cairn is reached that the others and two of the most prominent landmarks in the north-west of Bodmin Moor, Rough Tor and Brown Willy, come into view. The passage from rock outcrop to cairn incorporates precisely the same perspectival effects in relationship to prominent landscape features as encountered in movement along some of the stone rows or between the stone circles.

These cairns, aligned along ridges and in relation to rock stacks, performed two purposes in relation to the landscape. They represent paths of movement through which the landscape was encountered and became known. The rows of cairns set out in lines across the landscape resemble the stone rows in their educative purpose, while their circular form resembles that of the stone circles. They also served, at a distance, as important orientational foci, like the Tors, artificially breaking up and enculturing the land. They, then, both acted immediately upon people moving between them and at a distance over wider tracts of the Moor.

Cairns, ritual and landscape

While a great many cairns from Bodmin Moor have been dug into and plundered in the past, there are only four 19th century excavation reports, which are not that informative, and the majority of the find material is now lost (Trahair 1978, 12-3). Funerary urns were recovered from two of these excavations. A third, that of the Rillaton barrow, the second largest on the Moor and situated just below the Cheesewring and north-east of the three Hurlers circles, revealed one of the richest Bronze Age gravegood assemblages from southern England. A large N-S orientated cist was discovered in 1837 with the remains of an extended skeleton with a clay pot by the breast covered by a stone slab leaning diagonally against the cist wall. Inside the pot was a small biconical cup of beaten gold. The other contents of the cist included a bronze dagger, a metal rivet, pieces of ivory or bone and faience beads. The off-centre location of the cist in the outer edge of the east side of the cairn and its construction above the old land surface, 1m below the top of the c.2.7m high cairn suggests that it was not a primary feature but inserted later. The grave goods indicate an Early Bronze Age date (Borlase 1872, 37; Hencken 1932, 69-70). This is the only *inhumation* grave known from Bodmin Moor. This point of contrast is replicated in the richness of the grave goods, few or absent in connection with the cremation graves, discussed below.

Since 1939 a further 25 cairns or barrows on, or in the immediate vicinity of Bodmin Moor

have been partially or completely excavated (Table 9). Of those completely excavated there was certain or possible evidence for burial at only eleven sites (48%) indicating a funerary purpose was not the reason for building many of them. Even in cases where barrows possess burials these rarely appear to be their primary significance. Cremation, with bones of a single individual being deposited in an urn or grave pit was the dominant rite. Excavations of two barrow cemeteries at Davidstow Moor (wartime excavations by Croft Andrew published by Christie 1988) and Colliford (Griffith 1984) have demonstrated considerable variation in the internal structure of the mounds and the nature of the deposits from localised groups of sites.

At Davidstow each of the ten certain barrows had a distinctive construction and at least two had been successively modified over long time periods. The site of cairn XXVI was first utilized during the Late Neolithic in the last centuries of the third millennium bc and its use continued until the mid second millennium bc. Use is first attested with sherds of grooved ware pottery and flintwork found on the old land surface and a charcoal filled pit or posthole underlying the south-east part of the barrow site. A second phase of activity involved the erection of a free standing stone or timber circle, about 9m in diameter, with access through an entrance on the south-west. A central pit was dug at approximately the same time, possibly containing a cist with a cremation and covered with stones, including a 38kg quartz lump. Associated with the timber or stone circle was a series of 40 notched or perforated stones, one resembling a human face. Christie argues that 'the association in Phase 2 of a circle with the holed and notched stones strongly suggests the concept of a burial or burials within a house-like structure, symbolic in that the thatch roof-weights, if that is what they were, may have been re-used and did not weight down an actual roof' (Christie 1988, 129). In Phase 3 another burial pit was dug in the centre of the circle and in it was deposited a late beaker burial containing cremated bone and charcoal. Sometime during phases 2 and 3 a number of other pits, 'troughs', hollows or stakeholes appear to have been dug some containing charcoal and grey clay filling. The timber or stone circle was removed, a small inner cairn raised up over the burial pits and surrounded by a cairn ring, 1.8m wide, and a continuous ditch dug around it. Finally the central area of the cairn was mounded over.

Barrow I at Davidstow was carefully laid out from a central point from which a shallow marking out trench, 26m in diameter, was constructed. Within this a stake circle of c21m diameter was constructed with a possible entrance on the south-east side. Within the area of this circle six heaps of charcoal were deposited on the west side and associated with them were broken pots, worked lithic material and burnt wooden (agricultural?) implements. One of the charcoal deposits contained tiny fragments of calcined bone, probably human. A second phase of activity involved the construction of a small central mound of turf sealing these deposits. This was covered over and surrounded by a second mound around which a double stake circle was set forming a palisade around the monument.

While barrows XXVI and I in the Davidstow cemetery were clearly multiphase sites starting out as, initially, open sites with well-defined entrances, evidence from seven other barrows in the same cemetery suggests either a single or much shorter phase of ritual use and construction. Two examples will be discussed here. Barrow III contained a central cairn about 1m in diameter, constructed mainly of quartz stones set on the old land surface. In the upper level of the cairn a small cremation deposit of calcined bones from one individual, possibly once contained in a leather bag, had been deposited. These bones consisted of teeth but no skull fragments, a femur and metatarsal head together with nine non-human bone fragments one of which was identifiable as a pig scapula. Two stones of highly micaceous fine grained granite, especially chosen for their glitter and a piece of quern stone were associated with this cremation. A turf mound, 4m in diameter, was constructed over the quartz cairn and a bank with external ditch a further c2.5m beyond the mound periphery. The ditch was continuous but the bank was interrupted to form an entrance on the eastern side.

Barrow V was 18m in diameter consisting of a platform mound of turf and yellow clay construction with an external kerb. There was no burial deposit but seven features were recorded

Barrow Name	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	Reference
Davidstow Moor I	+	T	-	-	-	-	?	-	+	+2 C4	+	P	+	+	PL	Christie 1988
Davidstow Moor II	+	T	-	+	+	QC	-	-	-	-	-	-	-	+	L	Christie 1988
Davidstow Moor III	+	T	-	+	+	+*SE	+	-	-	-	-	-	-	+	L	Christie 1988
Davidstow Moor IV	+	T	-	+	+	-	+	-	-	-	+	-	-	+	-	Christie 1988
Davidstow Moor V	+	T	+	-	-	QCT	-	-	-	C CP1	?	-	+	+	PL	Christie 1988
Davidstow Moor VII	-	-	-	+	+	C?	-	+	-	-	-	-	-	+	L	Christie 1988
Davidstow Moor XIX	+	T	-	-	-	C?	Pit	-	+B	-	-	-	-	+	L	Christie 1988
Davidstow Moor XXIV	+	TS	-	-	-	QL	Pot	-	+B	+1 Q1	-	-	+	+	PLH	Christie 1988
Davidstow Moor XXV	-	T	-	-	-	-	-	+	+	+1	-	-	-	+	L	Christie 1988
Davidstow Moor XXVI	+	?	+	+	-	IC?	Pot+Pit	+	+B	+3 C1	+	S	+	+	PLH	Christie 1988
Stannon 1	-	S	-	-	-	SS	-	+	+	-	-	-	-	-	L	Harris <i>et al</i> 1984
Stannon 2*	-	S	-	-	-	-	-	+	+	-	-	-	-	-	-	Harris <i>et al</i> 1984
Stannon 3	-	S	+	-	-	ISR	Pot(3)	+	+B	-	-	-	-	-	PL	Harris <i>et al</i> 1984
Colliford II	-	TS	+	-	-	ISR	-	+	+	C1 CWP2	-	-	-	+	L	Griffith 1984
Colliford IVA	+	T	+	-	-	-	-	-	-	-	-	-	-	-	L	Griffith 1984
Colliford IVB	-	T	+	-	-	-	-	-	-	-	-	-	-	-	L	Griffith 1984
Colliford IVC	-	T	+	-	-	-	Pit	-	+B	-	-	-	+	-	PL	Griffith 1984
Tiechbarrow**	+	TS	+	-	-	-	-	-	-	-	-	-	-	-	H	Trudgian 1976
Otterham	+	TS	-	+	-	-	Pit?	?	+B?	-	+	P	-	-	-	Dudley 1961
Tregullund	+	TS	+	+	-	ISR	Pit?Pit-S	+	+B?	C1 CQ1	+	P	+	+	PL	Ashbee 1958
Fore Down	-	TS?	-	-	-	-	Pot	+	-	-	-	-	-	-	PLM	Christie 1988
St Neot	+	S	+	-	-	ISR	-	-	-	-	+	-	-	-	-	Wainwright 1965
Cocksbarrow	+	T	+	+	+	ISR	Pit	+	+B	+2 Q1	+	P	-	+	PL	Miles 1971; 1975
Crowdy Marsh	+	TS	-	-	-	-	-	-	-	-	-	-	-	-	-	Trudgian 1977a
Clitters Cairn**	+	S	+	-	-	-	-	-	-	-	-	-	-	-	-	Brisbane and Clews 1979

Table 9 Major features of barrow or cairn construction and deposition recorded from excavations undertaken on or in the vicinity of Bodmin Moor since 1939

Barrow name* = mound destroyed** = partial excavation only + = category present - = not present Blank: no information

A: Barrows or cairns with a diameter greater than 10m. B: Mound construction T=turf S=stone TS=stone ring or kerb*=With entrance Direction given. D: Ditch around mound E: Clay or earth bank*=With entrance Direction given. F: Internal structures under barrow or cairn QC=small quartz cairn T=timber frame structure C: stone-lined cist Q1=quartz layer on barrow floor IC=internal cairn SS=stone spiral ring ISR=internal stone ring. G: Cremation burials. Deposition of bones in pit or pot noted. Davidstow Moor III—bones on small internal quartz cairn Tregullund—possible central burial and secondary burial. All burials are remains of single individuals except for Stannon 3—three individuals. H: Gravegoods associated with cremation burial. I: Central pit present. B=contains burial in pot or without pot. J: Other pits present under cairn or barrow. Frequencies given + =present but with no deposits C: charcoal deposits CP: charcoal and pot Q=quartz deposits CWP=charcoal and white pebbles CQ=charcoal and quartz deposits. K: Multiphase construction. L: Post circle (P) or stone circle (S) present. M: Fires or charcoal spreads present. N: Quartz used on site. O: Major categories of artefacts present. P: pottery. L: lithics. M: metal. H: holed stones

sealed underneath the barrow representing initial ritual activity: a cairn on the eastern side consisting of 12 pieces of quartz overlying a shallow depression containing charcoal and white clay, a low cairn on the south-east side consisting of slate and some quartz covering charcoal and carbonized timbers of an upright post, a charcoal filled pit, a large post-hole immediately to the south-east of the cairn, a miniature collared urn in a pit also from the south-east of the cairn area containing fat and resin, a fallen orthostat and socket on the western side of the cairn and a holed stone by the kerb in the south-east.

The Colliford cemetery consisted of three barrows, A, B and C, set in a N-S line along a low spur a short distance apart in a rather inconspicuous setting west of the St Neot river. The excavator notes that they were only readily visible in the landscape when viewed from a distance of c50m to their west or from near a fourth barrow situated 300m to the north-east and on the other side of the river (Griffith 1984, 84). The two southern cairns (B and C) were less than 10m in diameter and the largest and northernmost, 17m in diameter was set at the tip of the spur. The largest and most striking barrow did not cover a burial while there was possible evidence for a cist in the middle barrow B and a central cremation was recovered from the southernmost of the three.

The largest cairn was constructed as an inner stone cairn with turfstack and outer walling. Before construction of the cairn charcoal, entirely from mature oak, had been scattered on the old land surface in several substantial concentrations. There were no traces of burning *in situ* and this material must have been derived from elsewhere. The old turf surface was also scattered with streaks of red material varying in colour from brown to scarlet and unlikely to be of natural origin.

Barrow B was built over a large granite stone which had been moved to the barrow site before the cairn was constructed thus constituting an artificial 'grounder' or central 'Tor'. Just to the east of this central stone remains of a possible cist were recovered. The old ground surface as at barrow A was streaked with red material.

The old land surface under Barrow C was also streaked with red material. At the centre was a small stakehole probably used for marking out the cairn periphery and to the east a pit cut into the old land surface filled with charcoal and cremated bone. The sides of the pit showed traces of scorching indicating the bone and charcoal had been deposited hot. Around this pit were several charcoal scatters. Within a turf stack constructed over the pit an inverted small decorated pot was recovered. Above the turves a stone capping had been provided.

The fourth excavation cairn at Colliford was more structurally complex. The old land surface had been completely stripped and was covered with flecks of charcoal and some flintwork. Four pits had been dug into the subsoil beneath the cairn. Three were sealed with stones and had a fill of oak charcoal and wood fragments. This ritual area was then partially sealed with a layer of greyish clay and two cairn rings constructed. The area within the inner cairn ring was infilled with five discrete layers of charcoal, loam and stones. Covering all these features a stone cairn was heaped up.

The excavations at the Davidstow and Colliford cemeteries give a good indication of the structural variability of the cairns and the types of deposits found in them. Of the ten Davidstow cemetery cairns, five contained cremations, three were multiphase sites, seven covered pits, eight quartz deposits and shiny granite stones, five charcoal and/or fire deposits. Most covered small scatters of worked lithics. These are all recurrent features recorded from other excavated cairns. Apart from the Rillaton Barrow find metal has been recorded from only one of these excavations, that at Fore Down, St Cleer which contained a riveted dagger. Taking into account other excavations of barrows on or around Bodmin Moor (Table 9) the following general observations can be made:

1. Only some of the barrows were specifically intended for burial. These are most usually the smaller cairns. While burial may take place in the larger cairns this does not appear to be their primary function, but an element in a much more extensive series of ceremonial rites. Both the largest barrows in the Davidstow and Colliford cemeteries had non-sepulchral functions.

The bulk of the population did not receive burial in a cairn, but there is little indication that those who did constituted an elite group.

2. Burial of a single individual either in a pit or a pot within a pit is the normal practice. All except one are the cremated remains of mature adults of reproductive age. Biological sex is not possible to determine and young children do not appear to be represented. The major exception is Stannon cairn 3 in which the cremated remains of three individuals were deposited in two distinct layers in a funerary urn. Secondary use of the cairns for further burials is only documented at one site, Tregullund. The bones recovered from the cremations do not represent all body parts, but only a selection, most usually skulls and long bones, a continuation of earlier Neolithic traditions of the formal deposition of selected body parts. Grave goods associated with these cremations are few and highly variable and appear to be token depositions.

3. Most cairn sites seem to have started as open sites in which a variety of activities took place including fires, pit digging, the deposition of large quantities of charcoal, wood, lithics and quartz piles. In a number of cases these ceremonial areas are enclosed and defined with stake circles and/or stone settings. The later construction of cairns and turf mounds was used to seal the ceremonial area and create a noticeable marker in the landscape serving as a visible memory of the activities which had taken place. Many burials, where they do occur, are connected with this stage of the life-cycle of the site rather than the initial one.

4. The central ritual focus at a number of sites appears to have been not a burial but stones (either occurring at the site or taken to it) along with charcoal filled pits, quartz piles, and in some cases wooden posts, stakes or stone orthostats. Mature oak almost exclusively makes up the charcoal deposits found underneath the cairns indicating the symbolic significance of this tree. Both quartz and charcoal from mature oak timbers are being deliberately buried in a manner analogous to the human remains. A chain of landscape signifiers would seem to link oak, quartz and human bone with fire acting as an agent of mediation and transformation. At the cremation pyres fire acted to transform the green of oak into black charcoal, human flesh into white calcined bones. There were deposited with white quartz, perhaps symbolizing the 'bones' of the land itself, to which living substance was being returned in a transformed state. In the process the individuality of both the trees and the human body was being reduced to ancestral substance with regenerative powers.

5. Within any particular barrow group there was probably always one barrow site in use for ceremonial activity. Barrows were perhaps being used cyclically with each site changing its function along with its structure. Once the mound had been built sealing off the ceremonial area a neighbouring site would begin to be utilized (Barnatt 1982, 81). Cairns and barrows began to be constructed from the Earlier Bronze Age and were used for over a millennium. Some cemeteries, such as the one at Davidstow with Late Neolithic grooved ware sealed beneath barrow XXVI appear to have been in use for as long as a millennium. Others such as those in the smaller Colliford cemetery appear to have been used much more briefly.

6. The form of the cairns and the activities taking place at them appear to link together all the most important features of the contemporary natural and cultural environment of Bodmin Moor and beyond: the rocks, sea and sky, thus emphasizing a continuum between them. They incorporated boulders and were built on or around Tors, they ran lineally on ridges and between prominent landmarks, the pits beneath them perhaps represented the fissures, clefts and 'caves' in these rocks. The layering of the mounds with different types of materials and the inclusion of shiny granite and white iridescent quartz, black loams and yellow and grey clay indicated a concern with both the tactile qualities of raw materials in the landscape and colour symbolism. The widespread constructional use of granite, quartz, clay and loam brought together at the barrow site highly significant elements of the surrounding natural landscape. The most significant (ancestral: a metaphor of the lineage?) tree, the oak, was incorporated in charcoal and wooden deposits. Worked and modified stone tools and objects were made from the slates, granites and greenstones of the Moor and beach flint and pebbles were incorporated from the coast (Healy 1988, 142-6). The domestic world of life in the settlements is represented by the thatch weights, agricultural tools, the cleared trees and pottery.

Dividing the land

Johnson and Rose describe field systems on the Moor as 'typically curvilinear and accreted, having developed organically from one or more foci' (1994,59), although in some areas such as East Moor the layout is much more regular and planned (Brisbane and Clews 1979; Johnson and Rose 1994, 63-4). Two main phases of land division may be distinguished:

1: The development of settlements, farms, huts and accreted curvilinear fields with large-scale cultivation, and possibly with a substantial pastoral component during the Earlier Bronze Age.

2: The construction of large-scale boundaries that divided the area into blocks during the Later Bronze Age. Within each block there are a series of huts and enclosures showing evidence of cultivation but the pastoral component of the economy may have substantially increased. These large-scale land boundaries sometimes overlie the earlier curvilinear field boundaries. They only appear to be well-developed in the north-west and north-east of Bodmin Moor (East Moor). There are few in the south-west of the Moor and only one (running up to Bearah Tor) in the south-east. Even in the north-west of Bodmin Moor they are absent from substantial areas (Fig 17). In some cases they cross-cut and partly incorporate the earlier, smaller, shorter, more sinuous and less regular field boundaries and enclosures. Unlike the earlier boundaries they are not intimately related to the characteristics of the land—the type of slope and nature of the terrain at a very localised level—but cut across the topography dividing it up into clearly defined areas. They typically join together natural boundaries in the landscape running up and across slopes between bogs and streams or running between bog and stream margins and areas of higher ground with exposed clitter and rocks. They thus both utilize and join up with natural boundaries in the terrain so as to clearly define landscape blocks or areas. It is interesting to note that they occur in the most densely settled, and arguably, the most symbolically significant areas of the Moor in the Later Bronze Age. Natural boundaries in the landscape—streams, ridges, bogs, Tor and rock outcrops—embedded in social memory, would appear to have sufficed elsewhere.

Although probably constructed at the same time as the Dartmoor reave systems discussed by Fleming (1978, 1983) they do not appear to be comparable, being much shorter (1 km or less) and defining much smaller areas of land. It would be difficult to make out a case that they defined social territories. Johnson (1980, 163-4; Johnson and Rose 1994, 73-6) discusses a number of possible economic functions of these land boundaries, to act as inter-farm boundaries or to define and control cattle movements and access to grazing land in a situation of increasing pastoralism. Rather than being used to define land rights, or to control animals, I want to argue that their primary purpose was to control and mark out access to crucial symbolic and ritual resources in the landscape: large cairns and stone circles. Fig 17 shows the boundaries and major monuments (stone circles and large cairns over 10m in diameter) in the north-west of Bodmin Moor. Looking at these land boundaries it is interesting to note each serves to incorporate a single monument (cairn or stone circle) or a number of monuments (a few cairns or cairn and stone circle) of major importance. To give some examples: Alex Tor with its massive surmounting Tor cairn is enclosed by two boundaries which run up and cross the slope on either side of the Tor. Small areas with huts and fields occur a short distance away down the slope to the west. Land boundaries to the south and north of Alex Tor define areas with a cairn or number of cairns. The Stannon stone circle is already effectively enclosed by bogs and streams on three sides. A land boundary to the south-west of the circle runs along a break of slope cutting off the flat plateau area, in the middle of which the circle is located, from higher ground with cairns and the Loudon Hill stone circle. Part of this boundary was excavated in 1991. It was a substantial stone-faced wall, probably stock proof, on the line of an earlier timber fence (Herring pers comm). The settlement areas to the south and west of Rough Tor are bounded-off from each other by a number of substantial boundaries that run from the clitter on the lower slopes of the Rough Tor summit to lower-lying bog areas. The boundaries here would seem not only to divide settlement areas, but also served to mark

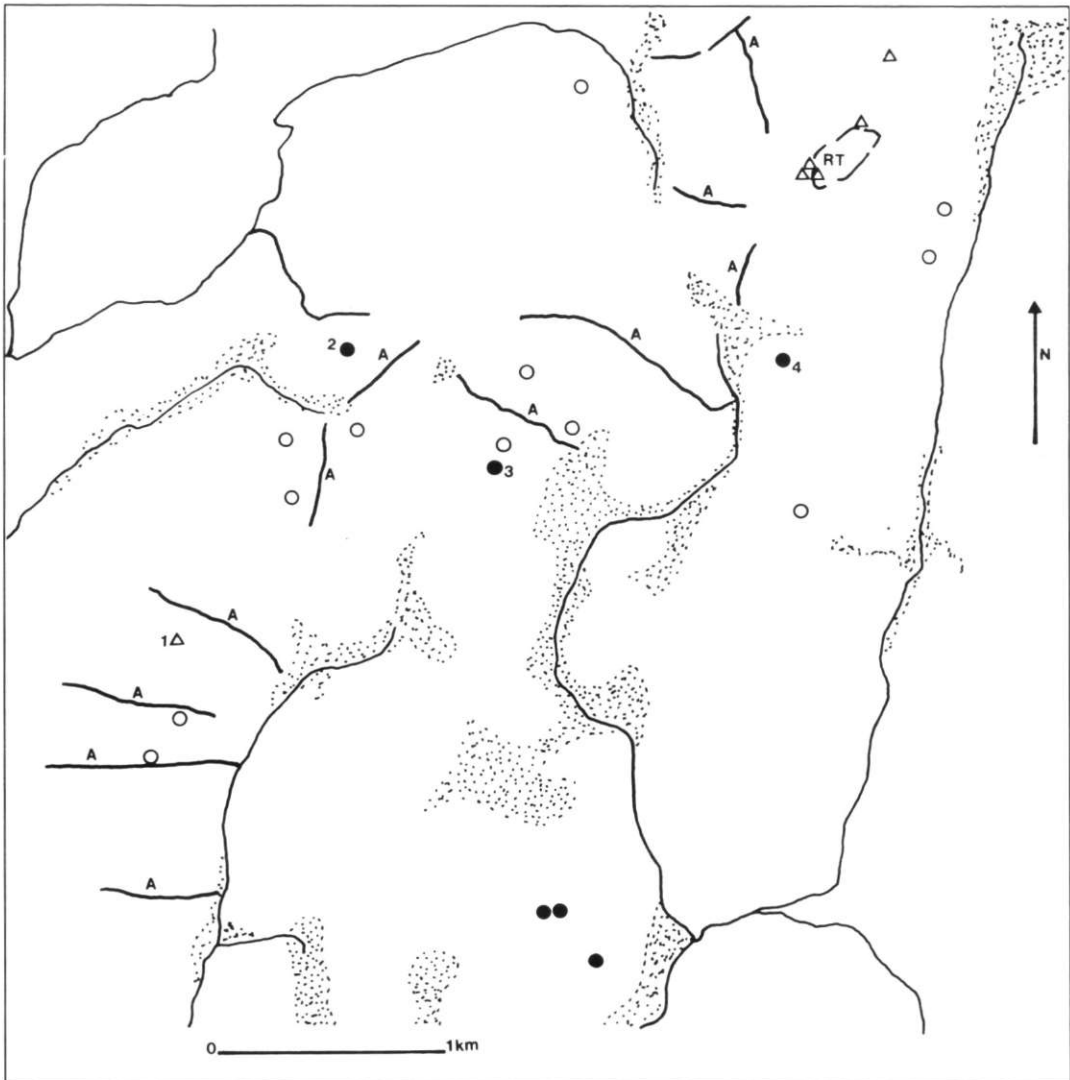


Fig 17 The distribution of large cairns (>10m diameter), ceremonial monuments and land boundaries (A) in the north-west of Bodmin Moor. Stippled areas: bogs; RT: Rough Tor ceremonial enclosure; Triangles: Tor cairns; Filled circles: stone circles; Open circles: cairns. 1: Alex Tor; 2: Stannon stone circle; 3: Louden stone circle; 4: Fernacre circle. The land boundaries around Rough Tor run up from boggy areas to the lower, rock strewn slopes of the ridge. Elsewhere they connect marshy areas or run up to them

out and lay claim to access to the Rough Tor summit itself with its massive Tor cairns and important ceremonial enclosure. Two successive processes would seem to be at work here: first the marking out of the Tors and hilltops through the construction of the cairns as ritual foci; second the subsequent enclosure of these sites in landscape blocks. On Rough Tor the cairns had probably already been built with reference to the incorporating walls of an enclosure dating back to the Neolithic. In the Later Bronze Age other cairns and the stone circles subsequently become incorporated within enclosure systems running up to natural boundaries and landscape markers. Access to monuments as a result becomes increasingly controlled and formalized.

In other areas of Bodmin Moor a rather different process occurs in which cairns themselves become incorporated within, rather than surrounded by boundary systems. Bearah Tor consists of a chain of six main rock outcrops. The most easterly of these is marked by a Tor cairn. Beneath the westernmost outcrop another cairn, now badly disturbed probably by modern quarrying, was built up, away from which the field boundary runs cutting across the moorland towards the bottom of a slope. One gap through it is positioned next to another cairn 5m to its south. Here three cairns are linked by a boundary system, running up and continuing the W-E line formed by the Bearah Tor chain of rock outcrops.

On East Moor two major phases of the development of land boundaries and enclosures can be distinguished (Brisbane and Clews 1979; Johnson and Rose 1994, 63). Here a series of settlements and fields extend along sloping land on the edge of a moorland plateau divided up by streams for 3.5km. Seven settlements lie within the 300ha area and there are two large cairns and the Nine Stones stone circle (Fig 18). The latter is set in a flat and low-lying moorland plateau area well below the ridges on which the settlements and cairns occur. Excavations (Brisbane and Clews 1979) have demonstrated the Clitters cairn is older than the field boundary that now runs up to it and incorporates it. Careful field observations have shown that the earliest large-scale field boundaries divided the area in tracts of land separating off the two cairns from each other (Fig 18). With later boundary development the land became further parcelled up and Clitters cairn became incorporated in one of the boundaries. When this process occurred on East Moor is not possible to tell; it was probably a late development in which the ritual power and importance of the cairns became used to symbolically strengthen and legitimise boundaries cutting up and redefining access to the landscape.

Conclusions

Ever since the first human encounter with Bodmin Moor in the Early Mesolithic craggy rock outcrops and their contrastive relationship to other elements (streams, bogs, plateau areas and rounded hills) played an extremely important role in the structuring of personal experience. Learning about the landscape was part and parcel of the process of understanding oneself, the social world and the entire cosmos. During the Early and Middle Neolithic sacred places began to be physically marked and referenced through the construction of cairns and hill-top enclosures but knowledges of the significance of these places remained relatively unstructured as the small groups of Neolithic hunter-fisher-gatherers moved through the landscape. During the Later Neolithic, and throughout the Bronze Age, in tandem with the first permanent settling of the Moor, there was a dramatic increase in both the numbers and forms of monuments that were constructed. The day-to-day rhythms of social life altered significantly in that they now became bound up with permanent place-bound dwellings rather than seasonal movements across wide tracts of land.

During the Bronze Age two main competing centres of social power may have developed on Bodmin Moor: the Rough Tor area in the north-west and the Stowe's Pound area in the south-east. There are a number of reasons for suggesting this:

1. The presence of ritually important hill-top enclosures dating back to the Neolithic which became successively modified.
2. The concentration of Tor cairns in these areas and the presence of the two most impressive Tors on Bodmin Moor, the Cheesewring and Showery Tor; the former was incorporated into the Stowe's Pound enclosure and the latter encircled by a ring cairn.
3. The presence of the two largest cairns on Bodmin Moor, the Rillaton barrow with its rich graves finds and Showery Tor.
4. A concentration of stone circles: Fernacre, Stannon and Loudon Hill all within 2km of Rough Tor; the three Hurlers circles and the Craddock Moor circle near to Stowe's Pound.
5. The presence of exceptionally large numbers of barrows and barrow cemeteries. Caradon Hill with 17 barrows running in a rough N-W to S-E line, two of which incorporate Tors, is the largest lineal barrow cemetery on Bodmin Moor while 15 other large barrows including

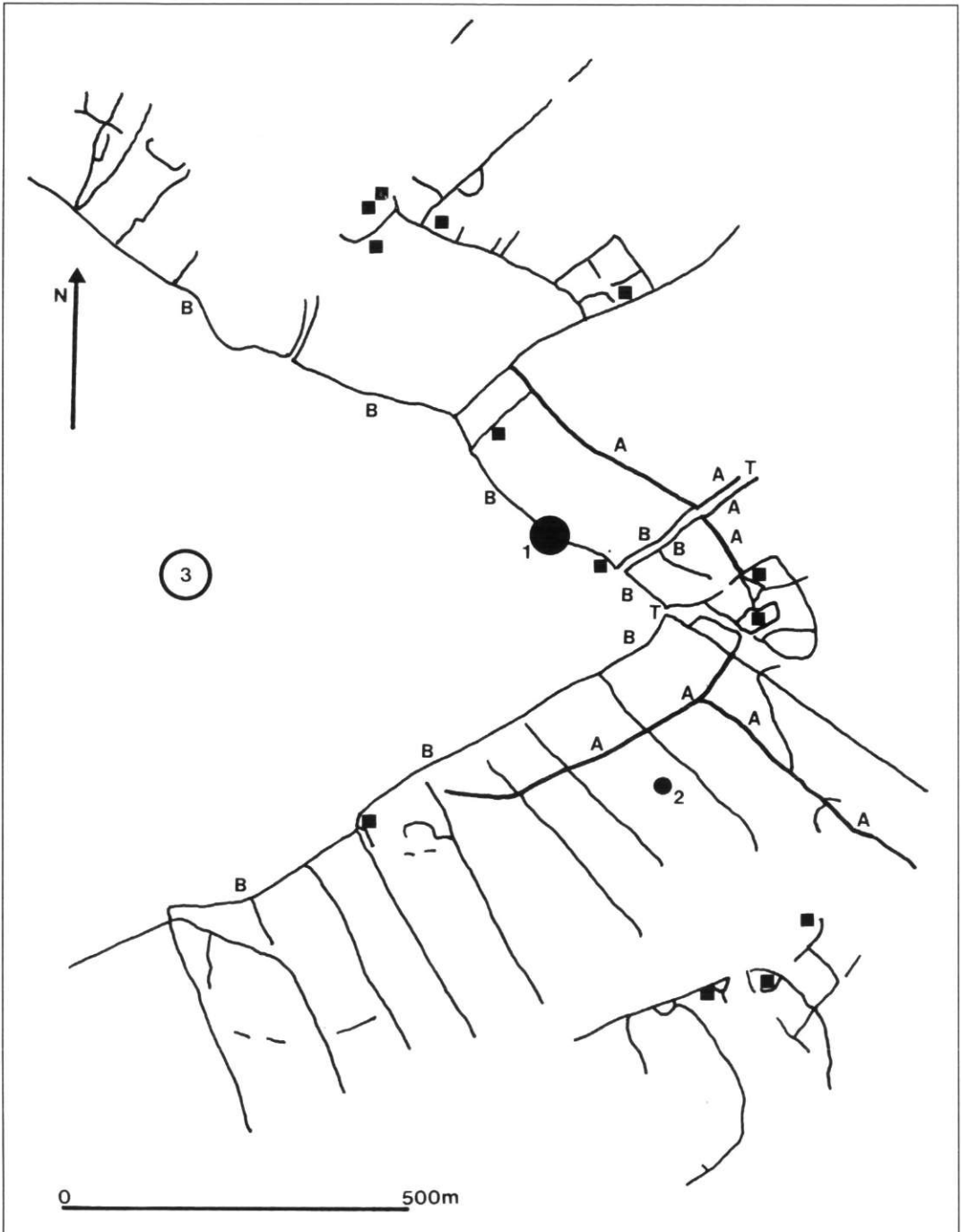


Fig 18 Land boundaries, houses, monuments and cairns in the East Moor area of Bodmin Moor. A: Early land boundaries; B: Later land boundaries; T: Trackways; 1: Clitters cairn; 2: Small cairn; 3: Nine Stones Stone circle; Squares: huts. The long land boundary B running to the west and south of Clitters cairn follows the contours of the land with the stone circle being situated below. Map based on Brisbane and Clews 1979 and Johnson and Rose 1994

the Tregarrick Tor cairn are located in the immediate area of Stowe's Pound. Rough Tor has the densest concentration of both large and small cairns around it anywhere on Bodmin Moor as well as settlement.

The presence of exceptionally rich burials such as that of the individual interred in the Rillaton barrow strongly suggests the existence of a small, but significant, social elite associated with these places. The most important resource being appropriated locally to maintain the authority of this social elite is unlikely to have been either land, crops, animals or raw materials such as quartz or tin; these were readily accessible to all and very cumbersome to control. Controlling flows of exotic exchange items also seems unlikely to have been important in an area such as Bodmin Moor that appears to have been of peripheral significance in the Bronze Age regional economy. Virtually all the prestigious items known from Cornwall in the Bronze Age are confined to coastal areas to the south and west (Christie 1986). Knowledges deemed essential to the reproduction and well-being of the social group were, by contrast, unlimited and quite easy to control and manipulate. One form this knowledge took was that embodied in the cultural significance of the landscape, mediated through monuments, and their potent structuring effects on the biographies of individuals, groups and collectivities. It provided a primary medium through which power was reproduced. The ritually and symbolically effective placing of monuments in the landscape became of vital significance in the creation, reproduction and articulation of authority, in a relationship between ritual specialists and those who were led and instructed. One of the purposes of using and visiting these monuments was to inform and sediment in the mind a sense of awe and wonder of the significance of the place, and its ancestral connotations, the events which had taken place there and the telling of myths recounting the spirit powers inhabiting it. This entailed an ever increasing emphasis on creating, maintaining, working and re-working an intimate network of relationships between monuments and the topography. It was a process in which earlier social practices and attitudes to the land became transformed and appropriated. Throughout the Bronze Age the landscape underwent a constant process of structuration in relation to both the numbers, and the architectural forms of the monuments, being imposed on it. As each new monument was constructed it became more and more socially embedded as part of an all-encompassing system of ritual knowledge. The Neolithic past was actively appropriated so as to naturalize and legitimize the present. This may have involved the remodelling of the Rough Tor and Stowe's Pound enclosures through extending and modifying their entrance ways and by means of cairn construction. Tor cairns were built on or around those rocks referenced at a distance by the Neolithic long cairns.

The stone circles and stone rows variously acted so as to mark out or link sacred areas, or their margins. Ceremonial movement along, around and between them entailed passing transition points and the revelation of perspectival effects in relation to important topographic elements of the landscape beyond. The relationship between the stone circles and the stone rows and the landscape was undoubtedly complex and there was no single set of meanings associated with all of them. The circles were set in sacred spaces devoid of settlements or cairns, bounded by streams and bogs over which one had to pass to move between them. Most were symbolically linked with a neighbouring Tor at a local level, usually to the north, but were also specifically sited so as to relate to a wider symbolic geography of the landscape, and particularly to important visually prominent Tors further away. The precise setting of many of them seems to be planned in relation both to other circles and important Tors and hills. Some incorporate basic solar alignments in relationship to these Tors. Moving between them involved important changing perspectival effects in relationship to symbolically charged places such as Rough Tor. All these features formed part and parcel of the selective structuring of the experience of the landscape for the people who were led into them, left them, and followed in processions between them. Some stone rows linked together sacred areas, others defined their centres or margins. The experience of being taken along some of them engendered striking perspectival effects in relation to the wider topography.

The topography and its significance was thus reworked by these monuments when people

were led along them, or were taken into the specific and restricted spaces they served to define. This simultaneously entailed a closing down and restriction on the visibility of the landscape and options for movement through, and knowledge of it. The single entrance to the Stripple Stones circle-henge may simply represent and formally mark on the ground what happened in the other circles: there was a single way to approach this monument and to leave it. A possible change through time from the construction of irregular to regular circles suggests an increasing concern for symmetry and control. While the irregular circles, with their flattened arcs to the north emphasized the importance of this cardinal direction, with the Tors beyond acting as a focus and backdrop for ceremonies, the regular circles no longer physically mark this on the ground. Such knowledge only existed in thought and had to be transmitted by some, and learnt by others.

Natural boundaries in the landscape, particularly marsh areas and watercourses, always seem to have been important in defining the margins of sacred spaces. In the Late Bronze Age, as well as particular *places* (cairns, Tors, stone circles etc) being of especial significance, marked out by monuments, and surrounded by sacred areas delimited by marsh, stream and Tor, it also became important to formally delineate and bound off other spaces in the landscape lacking such topographic reference points. Linear boundaries were strung out between rocks and streams or along ridges, and in some cases derived further symbolic potency and power by incorporating cairns.

From available radiocarbon dates many of the cairns appear to have been constructed between c2,200 bc to 1700 bc (Christie 1988, 164). Lacking any radiocarbon dates for the stone circles and rows their temporal relationship to the cairns is uncertain. It is tempting to suggest that circle and stone row construction was earlier than that of most of the cairns. What does seem to be more readily apparent is that the cairns embody in their positioning, construction and use similar structuring principles. Both being aligned in rows, along which processions would take place, and covering circular arenas used for display and deposition, the cairns make obvious metaphorical reference to the stone circles and the stone rows.

The cairns display an almost obsessive concern with circularity, enclosure and boundedness, effected by various means—the construction of kerb stones, inner and outer rings of stones, stake and post circles, ditches and banks. Burial is all about containment—bones in pots in pits surrounded by fences or cairn rings finally heaped over with stones or turves. This emphasis on circularity and enclosure with entrances, where they occur, in the southern sector of the cairns links the cairns with the stone circles, as does the use of quartz in both (deposited in piles under the cairns and used to cover the area enclosed by the central Hurlers stone circle). Excavation of the Stripple Stones circle henge revealed four pits near to the centre stone and quantities of charcoal and oak timbers from the ditch (Gray 1908), structures and types of deposits also featuring so prominently at the cairn sites.

The stone circles and stone rows indicate a concern with processions and specific paths of movement through the landscape, of serially ordering and arranging activities and events. The frequent linear arrangement of the cairns in the landscape and the fact that many, such as those at Colliford, would only be prominent from specific positions in the landscape, especially other barrow sites, betrays a similar concern, as do the arrangements of stake and post circles, ditches and banks with proscribed entrance ways. The Cocksbarrow cairn (Miles and Miles 1971; Miles 1975, 58-60) provides a particularly striking example. Here an initial phase of construction consisted of a double circle of at least 87 posts with an entrance on the south-east side marked by a yellow clay floor. Inside three (perhaps four) posts were set up to mark the cardinal positions. Later the site was remodelled, the rings of posts were removed and a wide bank constructed of turves with stone facing on both sides. An outer gap enabled entry onto the turf bank but movement along it was only possible in a clockwise direction because of a blocking wall. Only when opposite the outer entrance did a second gap allow entry to the small central area of the cairn.

In the Mesolithic and Neolithic the primary symbolic connections were between the sea,

the inland lake of Dozmary Pool, and the Tors. During the Bronze Age the landscape of Bodmin Moor becomes, quite literally, filled with cairns. Some were very conspicuous and meant to be seen from certain cardinal directions for miles around, thus emphasizing links between the land and the sky. The eternities of the land, oak and stone, were integrated by the cairns, in intervisible constellations. Some cairns were less prominent and had a more localised significance. Broadly, and as excavations have demonstrated, a division can be drawn between those monuments (generally those in less conspicuous positions) that had burials as their primary focus and those whose importance was to act as cultural and social markers and centres for ritual activity in the landscape in which burials were not made, or were only of secondary significance. The larger and more important cairns incorporated, or perhaps substituted for, many of the ceremonial activities which took place at the stone circles but the major distinction may simply have been between a monument commonly used in a series of ceremonies linking different social groups (the stone circles), and one more intimately related to rites relating to individuals within a single community: the cairn and cairn cemetery.

Unlike the stone circles and stone rows the cairns were built in their hundreds. They crowned the ridge and hilltops, resembled, encircled, incorporated and hid the Tors. Knowledge of the landscape became bound into them. Through time they became the most significant permanent sacred reference points in the landscape of Bodmin Moor, usurping the social role that the Tors had previously played, a cultural triumph over the sleeping powers of the rocks.

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Leskernick: the biography of an excavation

BABARA BENDER, SUE HAMILTON and CHRISTOPHER TILLEY

The Leskernick Project

This paper is a preliminary report on some of the results of the first season of work at Leskernick Hill, Bodmin Moor. This is envisaged as part of a long-term project investigating the relationship between prehistoric settlements, ceremonial monuments and their landscape settings, combining surface field survey and excavation. The results of the field survey are reported elsewhere (Bender *et al* 1997). Here we provide a background of the Leskernick project, and then discuss the results of the excavation of the terminal setting of a stone row.

Between 1978 and 1985 an intensive archaeological survey of Bodmin Moor took place using both air photographs and field survey. It was undertaken by the Cornwall Archaeological Unit and the Royal Commission on the Historical Monuments of England (RCHME). The publication (Johnson and Rose 1994), was a meticulous documentation of the archaeological landscape. The results were spectacular both in terms of the numbers of monuments and sites that were identified for the first time, and the fact that it was possible, from the maps, plans and documents provided, to obtain a coherent impression of the prehistoric and medieval landscapes. It was possible to assess relationships between houses and field boundaries, settlements and cairns and monuments such as stone circles and stone rows in detail. In part, this was because large areas of Bodmin Moor have been relatively little disturbed by modern agriculture. Some areas, such as that around Leskernick Hill, have not been permanently settled since the end of the Bronze Age, although there was later intermittent peat digging and tin streaming. The combination of a uniquely valuable high-quality archaeological survey in an area that is as close as we are likely to find to a 'fossil' prehistoric landscape made working on Bodmin Moor an exciting prospect. And, as important, the landscape: the rocks, hills, tors and grassy plateau areas invites, at least for us, a deep emotional and personal attraction and response.

Leskernick Hill (Fig 1) is located in the heart of the northern part of Bodmin Moor. According to Padel, the name is a compound of *lys* and the adjectival *carn*. *Lys* means either 'court' or 'ruin' and *carn* is 'rockpile' or 'tor'. This name is likely to be old, *lys* as a prefix being usually pre-Norman (Padel 1985, 38-40, 150-151). A hill with lots of rock piles and ruins: the name fits very well. From even a short distance away to the south it seems to be entirely covered in a great grey clutter of stone. The hill, rising to a maximum height of 329m is relatively low, oval in form and flat-topped, with a long axis running roughly north-south. Walking up and around the hill it becomes clear that the boulder and stone areas, known locally as clutter, are not uniform. There is none on top of the hill, rather little on the northern and eastern sides, a fair amount on the southern slopes, and a dense mass on the western side. The land dips away, gently or more steeply, from the hill summit to an undulating moorland plain broken up by the line of the Fowey and its tributaries to the west, and smaller streams to the north and east.

There are, on this hill, about fifty round Early Bronze Age house circles. They form two discrete settlements, separated by a long corridor leading up to the top of the hill. One is on the southern side of the hill, set among a fair amount of clutter. The other is on the western side in among a dense mass of stones. Both settlements have associated enclosures and compounds marked by low sinuous stone walls, which are somewhat different in shape, size and form. The enclosures are also on the hillside, in among the clutter.

On the edge of the southern enclosures are four small cairns and a cist. A fifth cairn is found further up the hill, beyond the houses but still within an enclosure. On the top of the hill, is a large flat-topped stone, propped up on the top of an earth-fast boulder, resembling

a neolithic 'quoit' or dolmen. The dying rays of the sun, on the Summer solstice, shine through the hole in this 'quoit' just before they slip below the skyline. Also on top of the hill, but deliberately located out of sight of both settlements is a very large cairn probably covering, on the basis of analogies with other excavated examples elsewhere on Bodmin Moor and beyond (see Tilley, this volume), timber and/or stone-post settings, acting as a focal point for ceremonies and offerings.

Below the hill, to the south, is an undulating plateau area. In among the springy turf, and the remains of the old peat drying stacks and disturbances created by medieval and later tin-panning, at a short distance from the hill are the remains of a modest Late Neolithic or Early Bronze Age stone row. The stones are less than 0.5m high except at the western end where there are three large recumbent stones. Associated with the western end of the stone row are two stone circles and a much disturbed large cairn (Fig 1).

From the southern settlement at Leskernick an observer looks down on a stoneless, almost level, plateau area, in which two stone circles, a large cairn, and a stone row are just discernible. The close association between the stone row, stone circles, cairn and settlement complex is exceptional on Bodmin Moor making Leskernick particularly interesting to investigate. Elsewhere stone rows and stone circles are spatially separated, often by considerable distances.

All the monuments are very ruined today and would have been fairly modest constructions even when first built. The distance, a few hundred metres, and the walking time, between the settlement area and the stone monuments is small. The obvious source of the stones used to construct the monuments was the clitter accumulations on the southern slopes of Leskernick Hill. In the absence of excavation, the architectural morphology of the settlement and its topographic location indicate an Early Bronze Age date (Johnson and Rose 1994, 55, 76; Mercer 1970). This, and the substantive evidence for a Late Neolithic/Early Bronze Age dating and use of stone settings, stone circles and stone rows (Miles 1975, 10-12; Burl 1976; 1993; Barnatt 1980; 1982; 1989) in south-west England indicate possible concurrent use of the settlement and the ceremonial monuments.

Our initial interpretation is that the stone row and circles out on the plain began to be constructed towards the end of the Neolithic, ie the early third millennium bc, and were used by populations who visited and used the area on a seasonal basis, probably during the summer months. The houses, enclosures, and small cairns on the southern slopes of Leskernick were then built at a somewhat later date. This represents the first permanent settling of this area of Bodmin Moor. The houses were set at a reserved distance above the earlier stone monuments which remained in use. The first inhabitants of the settlement on Leskernick Hill thus created and maintained links with the past. We think that the settlement on the western side of the hill, situated away from the Late Neolithic monuments, may be later in date.

The practice of archaeology

As part of our work at Leskernick we want to move beyond conventional aims: the reconstruction and reinterpretation of relationships between settlement areas, ceremonial monuments and landscape features, to also think about the *process* of doing archaeology—the conduct of research at both the level of the excavation trench and that of field survey. We want to try and investigate the relationship between archaeology as a discourse on the past and archaeology as a practice in the present. Archaeology is a *contemporary* practice. It is not just about what went on in the past, but the experience we have of the traces of the past today, and the contemporary social shaping of our accounts.

There have been a growing number of criticisms of the accounts of the past archaeologists provide in general (eg Bapty and Yates 1990; Hodder 1986, 1992; Shanks and Tilley 1987, 1992; Tilley 1990), and of the process of writing-up the results of field surveys and excavations in particular (Hodder 1989; Tilley 1989). The boundaries between archaeology as text, and literature as text, have been challenged. The standard type of distanced third-person 'authoritative' narrative in which archaeologists 'cover the traces' of what they actually do,

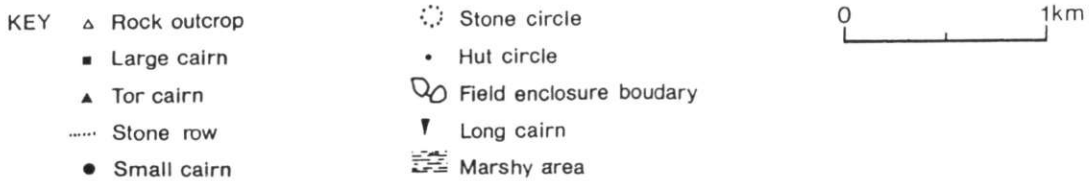
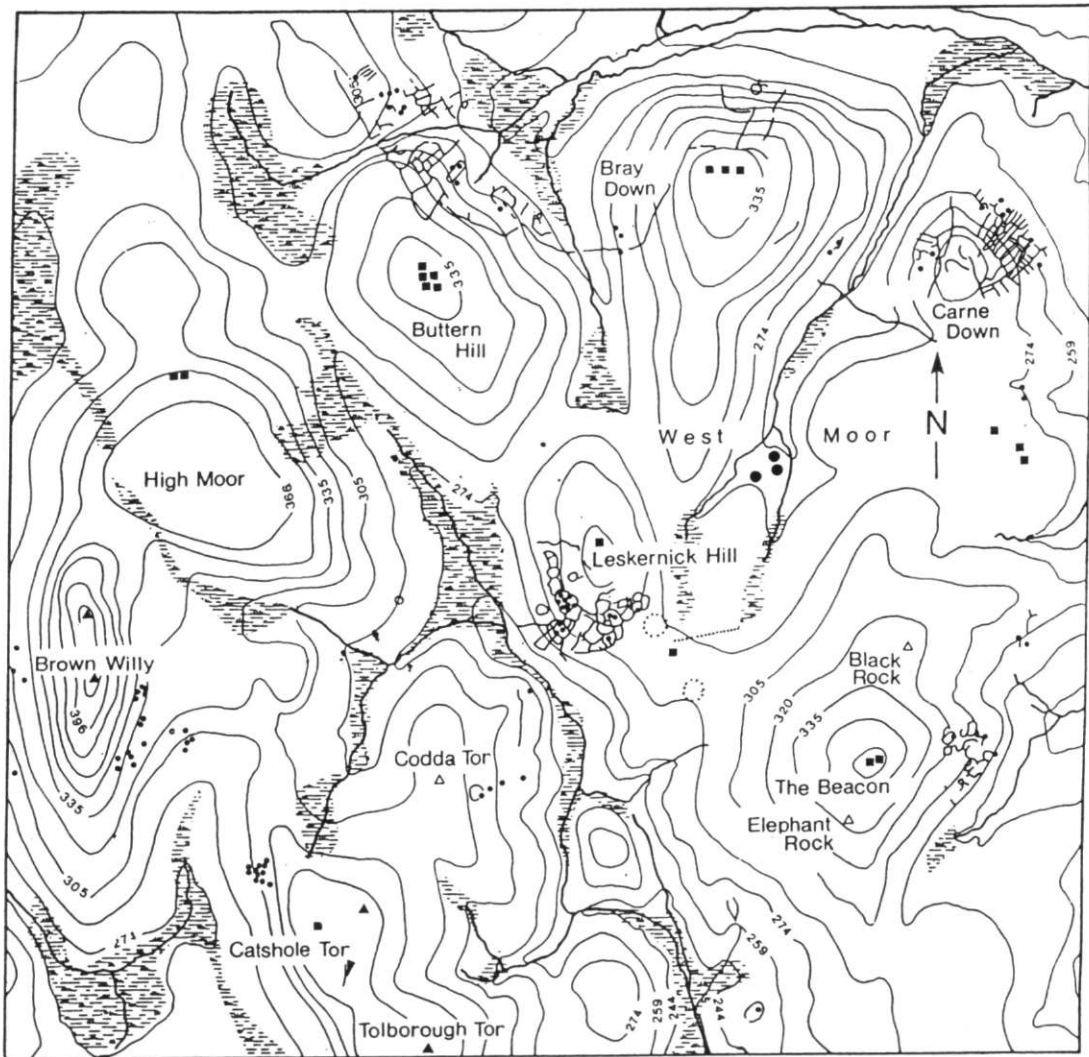


Fig 1 The location of the study area (based on Johnson and Rose 1994: Map 1 with additions)

to produce a 'polished' version of the past for professional consumption has been called into question. Nonetheless, whilst there have been criticisms, there has been little attempt to develop alternatives.

The excavation that we undertook was small in area, short in duration, produced no portable finds, and only a small number of features. The standard approach would be to produce a brief, formulaic, interim (to use the standard jargon), report on our work. The daily process of excavation, however, generates alternative site histories which are subsequently abandoned, forgotten, perpetuated or transformed. The usual excavation account eliminates this process

of reconstruction and interpretation, and in so doing jettisons much that is of value to an understanding of both the site itself and the manner in which some conclusions and interpretations, rather than the others, become the final report. It needs to be recognised that the intensely detailed procedures of excavation have the potential to be time-consuming to the detriment of interpretative thinking. If excavation is not interpretation, and presented as such, it is nothing. All excavation, from the identification of a feature, to the manner in which this feature is recorded, and meaning assigned, involves different levels and types of interpretative debate. We need to find a means to highlight this in order to provide a counterpoint to the spurious fixedness of both excavation reports and archives with their context sheets allowing minimal space for the interpretative process to be recorded. How do we 'free-up' excavation while providing an acceptable empirical record? Who and what is the guardian of acceptability?

In this paper, we attempt to present the excavation at Leskernick in terms of a *process* in the conviction that the act of 'getting there' is as important as whatever temporary conclusions we might arrive at through that process. We want, during the Leskernick project, to try and create methodologies and ways of writing that more truthfully reflect the process of discovery, uncovering, intuition and interpretation.

The Leskernick stone row and circles

The stone row is just over 300m in length, orientated ENE-WSW and terminates at a 'U'-shaped formation of three substantial, part turf-covered, recumbent stones just short of the cairn. The rest of the row consists of 47 small, low and square-topped stones, mostly less than knee-height. The eastern part of the stone row is irregular with gaps, and clusters of stones lying out of axis of the alignment. Approximately two thirds along the length of the stone row, walking towards the terminal, the row crosses a boggy area which has been modified by tin streaming. The land surface then gently rises up to the terminal at the south-west end and the stones have a more regular alignment. Two questions which arise are whether this disalignment was original or something which the row had subsequently suffered? Was the topographic point at which the disalignment took place significant? It is only immediately after crossing the boggy area, moving west towards the terminal setting, that the tip of Rough Tor first comes into view in the far distance, becoming more and more visually dominant as one approaches the terminal. It seems therefore that both the disalignment of the row at this point, and the place at which it crosses water, are of great symbolic significance. This tor, with its spiky, fugitive silhouette, its encumbrance of tor cairns and ritual enclosures, must, we think, have been of special importance to the people of Leskernick (for further discussion of Rough Tor and landscape signifiers on Bodmin Moor see Tilley, this volume).

The row is not directly aligned on either of the two stone circles or the cairns, but all are intervisible. The two circles and the cairn are more or less directly in alignment with each other and the (invisible) large cairn on the top of Leskernick Hill. Since the stone circles are probably earlier than the cairn on the top of the hill the position of this cairn must have been fixed in relation to that of the circles. This might, in turn, suggest that the hilltop cairn and that built down below near to stone row terminal were both contemporary with each other and that at some stage the stone row, stone circles and cairns all formed components of an interconnected group of monuments.

The two stone circles are approximately 350m apart. The shapes of the stones appear similar to those used to construct the stone row. The southern circle, the larger of the two and slightly better preserved, has a diameter of 30m and consists of 20-22 stones, with possibly originally as many as 30. One is a low stump, the rest have fallen (Barnatt 1980,17).

The biography of an excavation (see Appendix for detailed context descriptions)

'For me, the femaleness of the group was striking: Henry surrounded by Barbara, Gill, Cath, Helen, Mary and Pippa'.

'I'm glad there are so few men. We can avoid the macho types who are so often attracted'.

We decided to excavate part of the terminal area of the Leskernick stone row because: (i) it was a small entity; (ii) an interesting number of ritual and landscape features were visible from it; (iii) it was situated approximately half-way between the stone circle and might be considered as a focal point in the overall zonation of the ritual monuments in the landscape. We chose to investigate an area between one of the terminal stones and the first stone of the stone row because the final stages of the approach to the terminal may have been a zone of special significance, in the passage along the row and access to the terminal. The trench boundaries incorporated one of the three recumbent stones of the terminal setting, and was orientated ENE along the axis of the stone row (Fig 2).

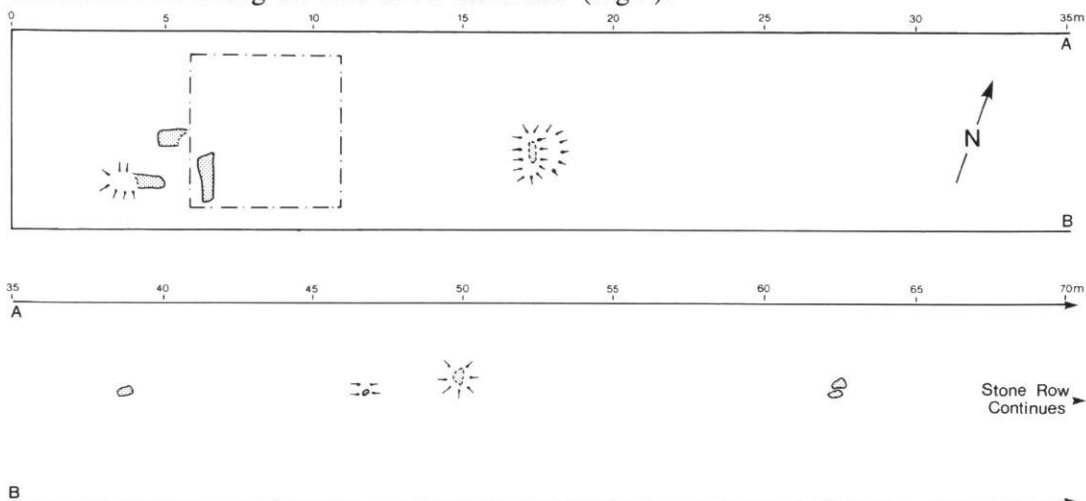


Fig 2 Leskernick stone row terminal: location map of the excavation trench

'Sue has brought four of her own fairly massive 2" grid pegs that form the initial basis of the grid. These seem ridiculously thick and cumbersome, but I'm told they won't be easily knocked over, or dislodged, unlike my own'.

An area excavation, rather than test pits was chosen to maximise the possibility of revealing the type of features and activities which we thought would be probable in the vicinity of a stone row terminal. These possible features included post settings, the stone-holes of the now recumbent stones, evidence of human or animal burials or cremations, and artefact deposits or scatters.

'Ian and I set up the site grid, with Chris occasionally holding the end of a tape with a lost look in his eyes. Having got this underway Chris started setting up the fence around the trench area. It amused me that the person who least liked the 'rules' of excavation had fenced us in'.

'Back at the camp site the warm sun had brought out the midges in droves. An unpleasant hour was spent battling with them before I retired to the bar'.

Tuesday 13 June:

We deturfed the trench taking off that grass root mat layer which was c70mm thick.

'It felt as if we were disturbing (mutilating) a landscape at rest'.

At the same time, the locations of each of the stones in the row, together with the centre of each of the stones circles were marked out using white flags.

'These flags drew our eyes out of the fenced-in trench and facilitated the consideration of wider sets of relationships between the 'trench' area, the rest of the 'ritual complex', and dominant focal points in the landscape. The waving flags made the 'trench people' feel part of a wider landscape and helped us focus upon the interrelationships between the terminal setting and the other stones. The wild horses were magnetically attracted to the flags and completely ignored our trench, which we have specifically wired them out of'.

Wednesday 14 June

'I am amazed at the neatness of the turf stack outside the trench, the obvious aesthetics of the straight lines and neatly numbered grid pegs. I remark on the professionalism of it all to Ian and Sue: "It looks just like an excavation should look". Eyebrows are raised. There is a green baize door through the fence into this interiorised little world. Highly incongruous in the middle of nowhere, little figures huddling behind it, peering down at stone and soil. The creation of another reality, dark and secret. Inside the door there is discipline: you cannot smoke in there, there are places one must not walk, lines, pegs, tapes, objects which should not be disturbed'.

Under the grass mat layer there was a dark brownish-black soft, silty horizon (Context 1), which stained the hands. Mixed in with this were coarse elements of occasional granite pieces and, in the SE corner of the trench, some slate fragments. This silty layer (c0.10m in depth) was removed down to the top of a bleached soil horizon (Context 2), which comprised a friable mid greyish black coarse sand.

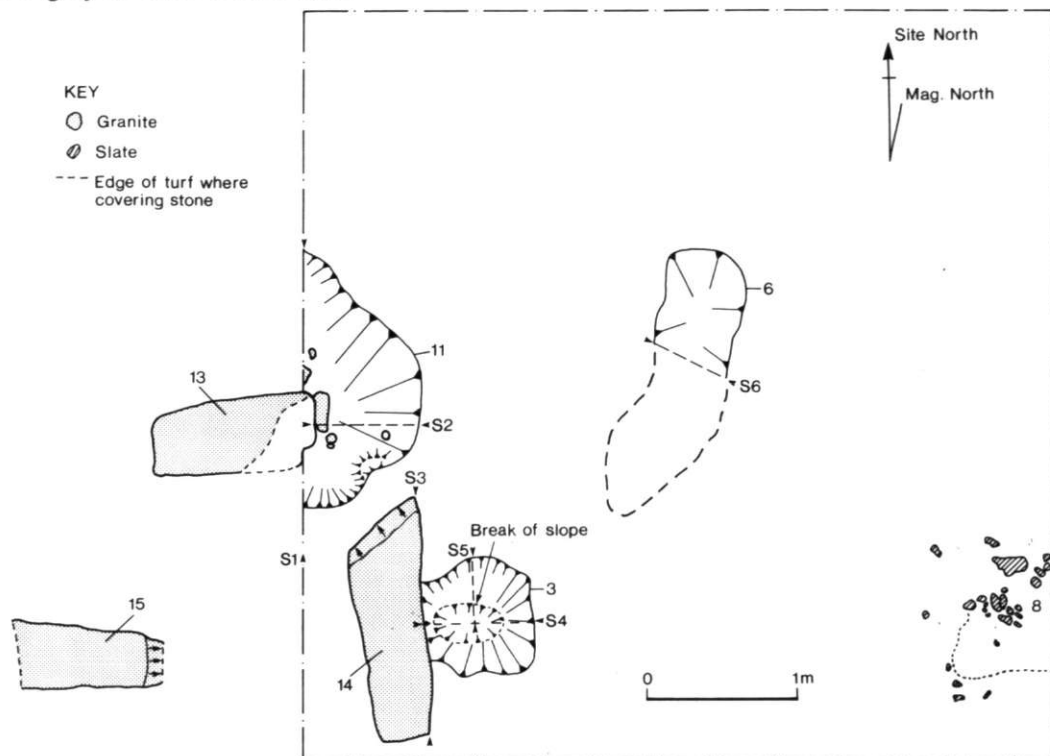


Fig 3 Leskernick stone row terminal: plan of excavated archaeological features and locations of sections

Two features quickly became apparent (Figs 3, 4: S4, S5 and 6). One was the top of an 'incomplete' circular arrangement (c0.30m internal diameter), of five granite pieces (Context 4) with a 'missing' stone on the north part of its circuit. This 'circle' was just 0.20m east of one of the recumbent terminal setting stones (Context 14). The other feature was a sub-circular concentration (c0.60m across) of thin pieces of slate (Context 8). This concentration disappeared into the east edge of the trench and corresponded to where we had noted the presence of slate on deturfing. The slate fragments included tile-sized pieces and, due to their proximity to the surface, were interpreted to be a relatively modern dump of building material (see Appendix). Slate is not local to the site but slate stone occurs north of Bodmin and is widely used for roofing.

'Spent the afternoon helping at the excavation. Henry matted, I shovelled and barrowed. Tiring and fairly

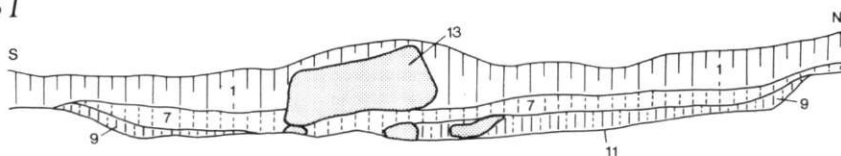
tedious. Not much for the imagination to work on, though Pippa discovered that one of the recumbent stones was 6ft plus’.

The pre-excitation plan (Fig 2) of the trench was commenced by planning the three recumbent stones of the terminal setting. The dimensions of two of these stones are evident since the stones lie wholly on, or very near, the present day land surface. The third stone lay about one metre outside the west edge of the excavation trench, aligned along the axis of the stone row, with its western end deeply buried. Probing established its length to be at least 1.95 m. This is 0.50m higher than the other stones and it would have been the most spectacular of the stones in the terminal setting.

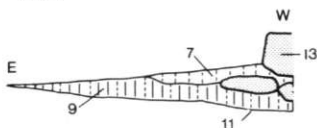
Thursday 15 June

[on the settlement] ‘The houses were being identified on the ground. This activity involved constant movement across the landscape, which created a sense of freedom which was difficult to achieve on the excavation. Indeed, by contrast, the excavation was creating a sense of unnatural fixedness’.

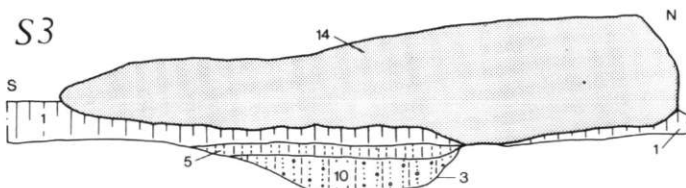
S1



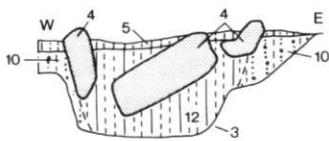
S2



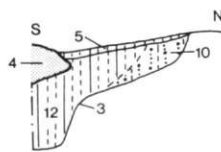
S3



S4



S5



KEY

	Silty clay
	Clayey silt
	Silt
	Sand and silt
	Silty sand

S6

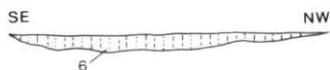


Fig 4 Leskernick stone row terminal: sections. See Fig 3 for locations of sections

With further trowelling, two more features became evident. The first was a large ‘sausage shaped’ area of dark brownish black sandy silt (Context 6) situated in the middle of the trench, NW of the slate concentration and orientated NNE-SSW (Fig 3). The second was a semi-circular area of mid-brown friable silt (Context 7; Fig 4: S1, S2), which continued into the west edge of the excavation trench at the point that it cut across the end of one of the recumbent stones (Context 13; Fig 3). We thought that the sausage shaped area might be either a natural depression which retained moisture or a footing trench for a semi circular structure such as a wind break, but more recent in date than the stone row. The two areas (Contexts 7 and 4), next to the recumbent terminal stones, remained the most interesting. The mid-brown silt (Context 7) was full of rooty material. We interpreted it as having accumulated in a waterlogged hollow (Context 11; Fig 3). The circle of granite pieces (Context 4) was clearly deliberately

placed, and in alignment with the stone row. Perhaps we had a stone-lined hearth? Or a cremation pit? But the stones were not affected by heat. Alternatively it might be a specially lined pit for the deposition of offerings: pieces of white quartz and charcoal from non-local oak timbers—materials known to be deposited under cairns in the area. The uppermost fill (Context 5) within (and possibly encircling: we were not sure yet) the circle of granite pieces (Context 4), was all that was revealed (Fig 4: S4, S5). This fill was dark and of soft consistency. A new possibility emerged: we might have the post-pipe of a substantial rotted post, c0.30m wide, which could be part of a post alignment preceding the stone row. Perhaps the terminal area had incorporated timbers as well as standing stones?

'Some of the rust that had been gradually accumulating on my new trowel was now worn away. I noticed how large it was compared with other trowels in use and was duly informed that all their trowels had started out this way. The more diminutive the size of your trowel the greater your status as an archaeologist since years of scraping were required to reduce the blade to an area little larger than a postage stamp. The trowel was a prized personal possession and a lengthy discussion ensued about the best place to carve one's initials, or name, on the wooden handle. This also would show signs of longevity—a sleek oiled surface produced by being pressed into the palm of a sweaty hand for months on end. Another quaint archaeological fetish. This ageing of objects, through appearance, and the clear relationship between use, time and status reminded me very much of Kula valuables but while these are given away it would be horrific for an archaeologist to give up a trowel as it was so obviously entangled with personal identity. I should have spent several days gradually filing down the blade of my trowel before the excavation commenced. But even if I had done that the handle would have given the game away. Taken to its logical extreme, the greatest status symbol of all would be to have no trowel at all. How foolish to purchase one!'

Friday 16 June

The southern half of the fill of Context 11 was emptied to produce a W-E section (Fig 4: S2). Under the root-filled layer (Context 7), there was a dark brown silty clay (Context 9) abutting the sides and base of the hollow. We interpreted Context 9 as a primary inwash into a cut or depression (Context 11) in the bleached soil horizon (Context 2), which had subsequently become waterlogged (the interpretation of the previous day), causing the build up of the rooty mass of Context 7. The fill thus came about by natural processes, but how the hollow had been formed in the first place remained unresolved.

'It was good to walk across the settlement and feel the freedom of moving through a landscape. The lack of ambulation in an excavation trench closes down some of the senses, and also concentrates others, slight changes in texture, compaction, sound etc. as the trowel blade scrapes along and slices through fills. The excavation trench seemed part of a secret world which could not be seen from the western settlement'.

The edge of the cut (Context 3) in which the granite pieces had been placed was finally located. The cut was now seen to be wide of the outer edge of the packing by c0.20m. This suggested a pit with an internal circle of stone pieces and not, as we had thought, a posthole with stone-packing. We now believed that we had located the original stone-packed hole of one of the fallen terminal stones.

Sunday 18 June

'Here one worked with a structured, overtly hierarchical environment. While the fencing off of the pit is, of course, necessary it gave the whole process of the excavation a certain alien character. The fence around the pit was like a metaphor for the divisions in attitude towards archaeology among the team'.

The 'sausage shaped' feature was half emptied to create a W-E cross section (Fig 4: S6). It was surprisingly shallow (40mm max depth) with rounded irregular sides, concave profile and no perceptible break of slope (Fig 3). It contained a single fill (Context 6). We think that it is a relatively modern scuff-hollow created by animals.

'The smallness of people in the landscape. Looking up from the prehistoric stone row, people on the settlement seem tiny. Skylarks, yellow flowers, fluffy cloud'.

Excavation of the exposed part of Context 11 was completed to reveal a N-S section (Fig 4: S1) in the edge of the trench. This feature had to be earlier than the fall or removal of

the recumbent stone (flat-topped at both ends), which projected over the point that the feature continued into the edge of the trench. Parts of this stone (Context 13) had broken away to rest at the interface between the two fills (Contexts 7 and 9), while the stone itself was resting at the interface between the 'topsoil' (Context 1) and the uppermost fill (Context 7). Our interpretation was that while it was still standing, a hollow had been created around the standing stone, perhaps by animals, and this had become waterlogged and silted up. There was no evidence of an original stone-hole, suggesting that we possibly had the uppermost end of the standing stone exposed in the N-S section. The hollow was oval-shaped indicating that the stone originally stood on a N-S axis (Fig 3). The recumbent position of the stone reflects this supposed original alignment.

Monday 19 June

'The ignorant, including myself, are kept well away to minimise damage to certain areas'.

A W-E section (Fig 4: S4) was created across Context 3 by removing the southern half of the fill. The edge of the feature was still extremely difficult to define. The bluish fill of Context 5 (first thought to be a post-pipe fill) now seemed to be a shallow silting across the feature. Underneath this it gradually became clear that the fill (Context 12) within the granite circular arrangement of stones also continued for c0.10m on the outside of its southern circuit, where it adjoined the compacted edge of a different fill (Context 10). On the SW side of the circuit the compacted edge was seen to mirror the projected imprint of three of the granite stones, if their uppermost ends were sloped further backwards to meet it. This indicated that the granite stones had shifted. As the sectioning continued, the 'missing' stone from the granite circular arrangement appeared in the middle of the fill (Figs 5 and 6). Neither the movement

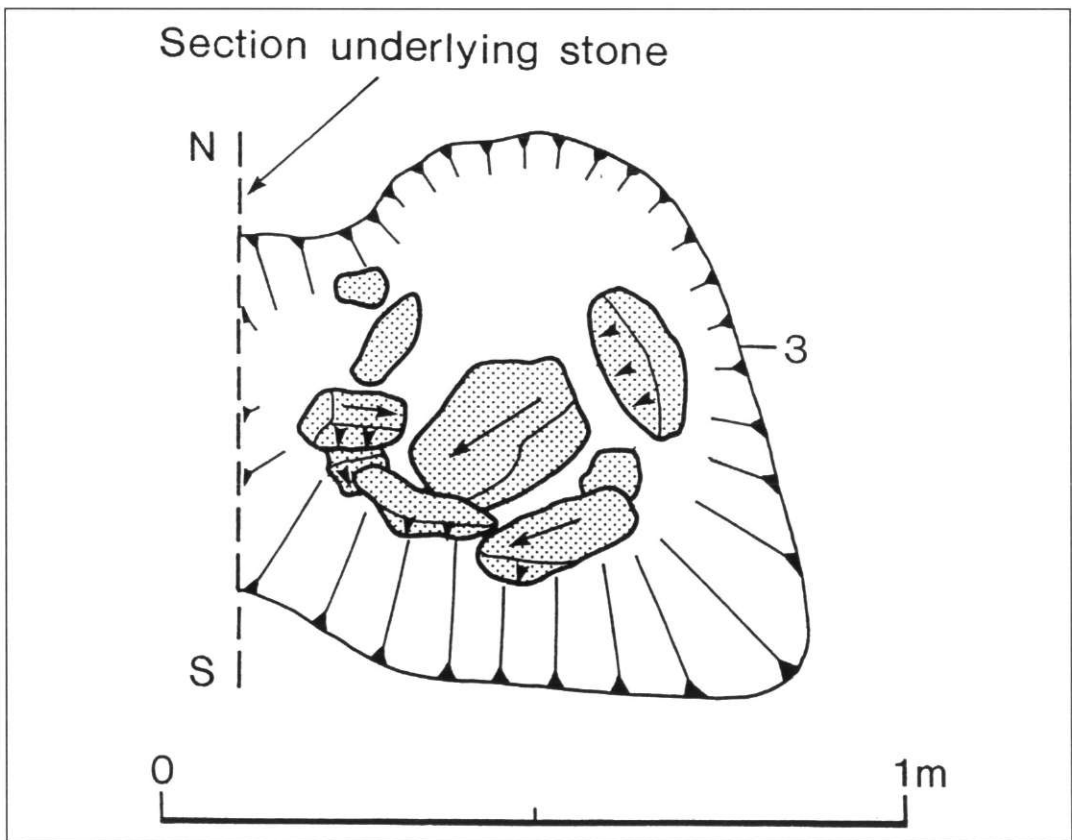


Fig 5 Leskernick stone row terminal: plan of the stone-hole packing-stones



Fig 6 Leskernick stone row terminal: stone-hole, half sectioned. The scale is 0.50m

of the stones, nor the position of the ‘missing’ stone, suggested that they had been caused by a fallen standing stone. The stone must have been carefully removed with the packing stones shifting marginally and the one stone loosened from the circuit being placed (deliberately?) in the void left by the removed terminal stone. A new, and exciting interpretative possibility now emerged: a deliberate, but careful, dismantling of the terminal setting in the Bronze Age.

This decommissioning of the site had been done in such a way as to preserve the essential character of the monument by: (i) only destroying its distant visibility, by taking down the conspicuous stones of the terminal setting; and (ii) by selective disalignment of parts of the stone row only beyond a specific point—the boggy area marked by the leat created by later, post-medieval, tin-streaming.

Tuesday 20 June

‘This is the first day I have spent most of the time on the excavation and it does provide some relief from [visibility studies on the settlement, looking out of hut entrances and] shouting out “Fowey valley and hut 20 straight out, Brown Willy and hut 24 to left”.’

The difficulties in understanding the relationships between the fills in the stone-hole (Context 3) were further resolved by quarter-sectioning (Fig 4: S5) the remaining fill. Context 10 was a grey-brown silty sand, c0.10m in depth and wholly rested on a ledge. The abutting Context 12, a mid greyish black clayey silt, partly lay on this edge, but towards the centre of the fill of the granite setting the edge of the ledge was reached, and the fill deepened considerably. Context 10 was interpreted as the silting or backfill around the granite packing which kept a stone upright in place. Context 12 was understood as the backfill after the stone had been removed. It became clear that the stone-hole was surrounded by a ramp (Figs 3, 4: S4 and 7), probably to help set up the stone, but the orientation of the stone-hole and its dimensions remained unclear.

‘There is a distinction between the excavation and the settlement work. The excavation, because it is destructive, has to be more detailed, more obsessional. There are other differences. About *looking down* in an excavation, as

opposed to *looking out*. About the *specificity* of the small area under excavation. The 'box' that one has created, and that, if one is not very careful, is divorced from the multiplicity of nested scales of action, movement, thought, sight, understanding'.

We began taking off the bleached soil horizon (Context 12). Because of little remaining time, we decided to concentrate on the western 3m of the trench (an area of 3×5m). This means that the slate concentration (Context 8) is unexcavated.

Wednesday 21 June

'The excavation was proceeding at a snail's pace and I am longing to see what is at the base of the stone'.

Mattocking of the western part of the trench was continued down to a mottled dark orange, sandy, iron-rich soil horizon (Context 16), known locally as 'rabb'. No other features were discovered.



Fig 7 Leskernick stone row terminal: stone-hole, post-excitation. The scale is 0.50m

The excavation of the stone-hole was completed (Fig 7). Underneath the displaced stone from the granite packing circle there was a thin (c3mm thick) layer of bright orange iron pan. Once the hole was entirely excavated it was possible to establish the original orientation of the long axis, W-E (Fig 3). The stone which it held would, therefore, have been aligned along the axis of the stone row. This stone-hole cut through the Context 2 horizon and penetrated the 'rabb' (Context 16) horizon to a depth of 0.17m. The weight of the stone had compacted the 'rabb' and gave some indication of the shape of the base of the stone that had originally stood in it. This corresponded with the square-edged southern end of the adjacent (Context 14) recumbent stone. So, the pointed end of the stone would have been the uppermost end. It was now also evident that the west side of the stone-hole ledge went under this recumbent stone (Fig 4: S3 and 7). The section created at the point this stone crossed the ledge or ramp showed that a final silting (Context 5) and a turfline (Context 1) had formed over the ledge/ramp before the stone came to be in its present position (Fig 4: S3). At the thickest part of the stone its weight had pushed it through the turf to rest on top of the final silting. Three interpretations remain possible:

1. The stone seals a Bronze Age turfline which had already formed around it while standing
2. During the Bronze Age the stone was dismantled and placed in some unknown location, and at some time after a turfline formed over the pit, the stone was moved to its present position
3. The stone was dismantled in more recent times and the stone seals a 'modern' turfline.

Pollen analysis might tell us whether the turfline is prehistoric or more recent, and sampling will be undertaken next year.

'I went down and looked at the trench where the turfing had been finished in my absence. The excavation hole was hardly visible. It, and I, felt lost in the landscape . . . The different axis of each terminal stone is interesting. It became too dark to think it through. It was a wrench to leave the place . . .'

Conclusion: August 1995

It seems very unlikely that the stone fell itself because of both the lack of disruption to the setting such a fall would cause and its present position which could only have been achieved by lifting and placing the stone. It is now possible to reconstruct the original configuration of the terminal setting. A point-top stone stood at the end of the stone row with its axis orientated directly along the stone row alignment. The shortest terminal stone, which was flat-topped, would have stood just to the north of it on a N-S axis. If we presume that the tall stone, with one end still deeply buried, fell, or was dismantled, along its axis of gravity, as has happened with the other two terminal stones, it would have been transverse to the axis of the stone row, ie N-S. This arrangement of the three stones would have created a 'cove', or a triangular space approximately $2.6 \times 2.6 \times 4$ m, with a terminal stone at each corner. The positioning of two of the stones on axes at right angles to the stone row alignment would have created a space in which the stone could act as 'backdrops', both partially concealing, and focusing attention on the activities performed within the setting. This configuration of stones would have allowed unobstructed access from the SE side and the southern stone circle, with a visual focal point being created by the flat-topped stone being aligned along this path of movement. There would also have been unobstructed access from a north-westerly direction, from a spur of land with three small cairns (invisible from the stone row terminal), c 1 km away. Approach from the northern stone circle, and the southern settlement area at Leskernick, would have been visually disrupted by the transverse orientations of two of the stones. An approach along the stone row would not only have been blocked by the terminal stone on the axis of the row, but additionally, beyond it, by a terminal stone placed transverse to the axis of the stone row. What the stone row, in fact, appears to be doing is dividing two zones of access to the terminal setting.

At some point, probably towards the end of the Bronze Age, the people who lived at Leskernick abandoned their hill. As part of this process they may have deliberately decommissioned the stone row. It was not to be used by others and not to be returned to. The act of removing and toppling the stones was the symbolic closure of their world, the final act before departing from it.

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APPENDIX: LESKERNICK STONE ROW TERMINAL: DETAILS OF THE SITE AND EXCAVATED CONTEXTS

1.0 LESKERNICK STONE ROW: SITE DETAILS

1.1 The terminal setting

Parish: Altarnum, NW Bodmin Moor

NGR: SX 18707986

Height OD: 290m

Topography: slightly sloping ground descending to the NE

Geology: granitic upland

Ownership: commonland

Landuse: rough grazing

Present day configuration: three recumbent stones (lengths 1.50m, 1.60m and 1.95m, forming a 'U' (Figs 2 and 3)

Archive site code: LSR95

Location of archive: the records will be deposited at County Museum, Truro

1.2 The stone row

NGR: SX 18707986-SX 19017991

Length of row: 317m

Alignment of row: ENE-WSW

Average height of stones: 0.2m

Average distance between stones: 4.5m

2. LESKERNICK STONE ROW TERMINAL: EXCAVATION CONTEXTS

2.1 Index of excavated contexts

<i>Context</i>	<i>Description</i>	<i>Context</i>	<i>Description</i>
1	2.2	9	2.5
2	2.2	10	2.4
3	2.4	11	2.5
4	2.4	12	2.4
5	2.4	13	2.3
6	2.6	14	2.3
7	2.5	15	2.3
8	2.7	16	2.2

2.2 The soil horizons (Contexts 1, 2 and 16)

Grass root mat
Thickness: *c*70m

Context 1

Very smooth amorphous deposit underlying the grass root mat and comprising soft, very dark brownish black, slightly stony silt with abundant fine fibrous roots, fine subrounded quartz pebbles (5%), occasional angular fragments of granite (average 30mm) and occasional fragments of slate (maximum 200mm, average 25mm). Thickness: 70-110mm. Boundary with Context 2: sharp.

Context 2

Bleached horizon underlying Context 1 comprising friable, mid greyish black coarse sand with fine (2-4mm) angular pebbles (40%) of weathered granite. Thickness: 120-130mm. Boundary with Context 16: sharp.

Context 16

Friable, slightly brittle, mid yellowish brown coarse sand (with occasional fine, rusty mottles) underlying Context 2 and containing 15-20% angular coarse sand (*c*2mm) granite inclusions. Thickness: >180mm (base not reached).

2.3 The terminal stones (Contexts 13, 14 and 15)

Context 13 (Figs 2, 3, and 4)

Recumbent granite monolith lying on an W-E axis with its partially buried eastern end protruding from the west baulk of the excavation trench. The base of the eastern end of the monolith partly overlies the uppermost fill (Context 7) of the stone-hollow (Context 11). Both ends of the stone are flat-topped. Monolith dimensions: 1.07 m (length) × 0.30-0.48 m (width) × 0.64 m (thickness—rounded end).

Context 14 (Figs 2, 3, and 4)

Recumbent granite monolith lying on a N-S axis just south of the stone-hole (Context 3) with its eastern side sealing the turfline (Context 1) where it passes over the edge of the uppermost fill (Context 5) of the stone-hole. One end of the monolith is rounded, the other pointed. Monolith dimensions: 1.30-1.58 m (length) × 0.40 m (width) × 60 mm (thickness—pointed end) and 0.64 m (thickness—rounded end).

Context 15 (Figs 2, 3, and 4)

Recumbent granite monolith lying on a N-S axis with its eastern end 1.32m west of Context 14 (recumbent monolith). Its western end is deeply buried. Its partly exposed eastern end is square-ended. Monolith dimensions: 1.90m (length)×0.42m (width); thickness not ascertained.

2.4 The stone-hole (Contexts 3, 4, 5, 10 and 12)

Context 3 (Figs 3, 4, 6 and 7)

The feature cut through Context 2 and partly into Context 16. It contained a circular arrangement of granite stones (Context 5) and three fills (Contexts 5, 10 and 12). The cut comprises an oval hole (with its long axis orientated W-E) with sharply sloping sides and a gradual break of slope at its base. The hole has a depth of 0.17m and its base measures 0.3m×0.12m. The upper edge of the hole is surrounded by a ramp (0.12m deep) which is vertical-sided and flat-based on its northern edge and sharply sloping with a gradual break of slope on its other sides. *Interpretation*: ramped stone-hole for a monolith (Context 14).

Context 4 (Fig 4: S3, S4, S5; Fig 5)

Six flat-faced granite stones averaging 0.25m in length. Each stone lay at a vertical to oblique angle. The stones formed a circuit (external diameter 0.44m, internal diameter 0.30m) within the upper part of the stone-hole fill. The circuit was incomplete on its northern side, with the 'missing stone' resting within the centre (Context 12) of the circuit. *Interpretation*: stone-hole packing-stones.

Context 5 (Fig 4: S3, S4, S5)

Uppermost fill of Context 3 (stone-hole) extending across the whole feature of over-lying Contexts 10 and 12 (fills). The deposit comprises a soft, dark bluish brown clayey silt of 20mm depth. *Interpretation*: Inwash deposit post the dismantling/fall of the monolith (Context 14).

Context 10 (Fig 4: S3, S4, S5)

Fill of Context 3 underlying Context 5 (fill) and encircling Context 4 (packing stones). The deposit comprises a soft dark grey brown silty sand with occasional granite fragments (c20mm) and 2% medium sand size (c0.20mm) quartz and mica inclusions. The deposit has a depth of 0.12m where it abuts Context 4 and thins out to 2-3mm where it meets the edge of the cut (Context 3). *Interpretation*: sedimentation around stone-packing (Context 4).

Context 12 (Fig 4: S3, S4, S5)

Fill of Context 3 under Context 5 (fill) and within the stone packing (Context 4). The deposit comprises a firm, mid greyish black clayey silt of 0.22m depth. *Interpretation*: infill deposit after dismantling/fall of stone monolith (Context 14).

2.5 The stone-hollow (Contexts 7, 9 and 11)

Context 7 (Fig 4: S1, S2)

Fill of Context 11 (stone-hollow) under Context 1, and partly overlaying Context 13 (recumbent monolith) and comprising a moist, friable mid brown silt full of root matter. The fill extends across the whole stone hollow feature and has a maximum depth of 60mm, thinning out to virtually nothing at the edge of the hollow. *Interpretation*: deposit formed in waterlogged hollow created by animal trampling around a standing stone (Context 13 prior to dismantling/fall).

Context 9 (Fig 4: S1, S2)

Fill of Context 11 below Context 7 (fill). Context 11 comprises a friable brown silty clay with some root penetration. The deposit abuts the sides and much of the base of the hollow (Context 11) and has a maximum depth of 60mm, thinning out to <4mm at the edge of the

hollow. *Interpretation*: initial inwash deposit into a depression caused by animal trampling around a standing stone (Context 13 prior to dismantling/fall).

Context 11 (Fig 3)

Irregular oval hollow which continued into the west baulk of the excavation trench. The hollow is cut into Context 2, and lies below Context 1, and partially under Context 13 (recumbent monolith). The hollow has its long axis orientated N-S with a maximal length of 1.90m. The maximum exposed width is 1.00m and the maximum depth 80mm. Break of slope—top: sharp at the north and south ends of the feature and a gradual break of slope on the eastern side;—sides: steep, concave slopes occur on the north and south sides and a smooth gradual slope on the east side;—base: sharp on the north and south sides, gradual on the east side.

Interpretation: depression created (by animal trampling?) around an originally standing stone (Context 13), and subsequently infilled with an inwash layer (Context 9) and then a waterlogged deposit (Context 7).

2.6 The animal scuff-hollow (Context 6)

Context 6 (Fig 3 and 4: S6)

Shallow, sausage-shaped hollow under Context 1 and cut into Context 2. The feature measures c 1.94m (length) × 0.50m (width) × 40mm (depth) and orientated NNE-SSW. The feature has a single fill comprising a friable, dark brownish black sandy silt with 5% angular, medium quartz sand (c0.10-0.20mm). *Interpretation*: an animal scuff-hollow.

2.7 The slate concentration (Context 8)

Context 8 (Fig 3)

Not excavated. Irregular, circular area of roots and flat slate fragments (0.90m × 0.46m) directly under Context 1 in the south-west corner of the excavation trench and disappearing into the eastern baulk of the excavation trench. The slate pieces are c 4mm thick with the largest pieces measuring c 0.22m × 0.08m, and the smallest c 60mm × 60mm. There is possible evidence of a cut delimiting the rooty area on the south edge of the feature. *Interpretation*: 'modern' (ie 19th or 20th century) dump of roofing slates (eg relating to local 19th century farm buildings).

Vegetation change in lowland Cornwall: preliminary results from Crift Down, near Lanlivery and Hoggs Moor near Lostwithiel

PHILIP F BURTON and DANIEL J CHARMAN

Summary

Vegetation changes over the last 10,000 years are known from only a few upland areas in Cornwall and there are no long sequences available from the lowlands. Preliminary results of attempts to locate suitable deposits to rectify this are presented. An apparently ideal site (Hoggs Moor) is shown to possess no useful deposits while an unremarkable pasture (Crift Down) overlies 1.8m of peat. Pollen and charcoal analysis at Crift Down shows a transition from alder carr surrounded by mixed deciduous woodland to open pasture with patchy hazel woodland thought to be related to late Neolithic/early Bronze Age activity. A hiatus in the record is followed by intensive human activity and a mixed agricultural system, presumed to be medieval in date. Since that time cereal cultivation is not evident and recolonisation by willow and alder has taken place, although it has subsequently been reduced in extent. It is argued that a network of such sites needs to be identified with a view to reconstructing in greater detail the environment experienced by prehistoric and early historic people in the county.

Introduction

The vegetation history of Cornwall over the past 10,000 years (the Holocene) is still rather poorly known. A summary account of the subject (Caseldine 1980) depends heavily on the work of Brown (1977) yet this is entirely based on rather fragmentary profiles from Bodmin Moor, a rather atypical area of the county due to its altitude. In addition, much of the detailed work from Bodmin Moor refers to the Devensian Lateglacial (14,000 to 10,000 years before present (BP)) or the early Holocene (10-8,000 BP) and is therefore of little relevance to the majority of the prehistoric and historic periods when most human settlement and landscape change occurred. Spatial and temporal detail in landscape change on Bodmin Moor is currently the subject of research (Gearey *et al* 1994) and is beginning to suggest major changes to established ideas on vegetation sequences in some parts of the moor. In particular, greater heterogeneity of vegetation cover is thought to be related to the diverse and complex archaeological sequences represented (Johnson and Rose 1994) and some phases of intensive land use may be rather poorly represented in the archaeological record. In the light of these discoveries it seems even more important that further attempts are made to discover and analyse further sequences of vegetation change from upland areas of the county.

However, it must also be stressed that, as today, the upland zone would have provided a very different environment for prehistoric peoples to that found at the coast and in the many sheltered valleys and lowland areas in the rest of the county. While this is inherently logical, there is almost no empirical data to support such a contention and we simply do not know what the vegetational composition of the lowland landscape was before, during and after phases of human activity in the prehistoric landscape. With this in mind, some attempts are being made to locate and research locations where long sequences of deposits suitable for pollen analysis are present. Initial efforts (Burton 1995) have concentrated on south-east Cornwall and two sites have been investigated in some detail (Fig 1). This paper presents the results of this work and suggests where further efforts might be concentrated as well as calling for information on potential sites around the county.

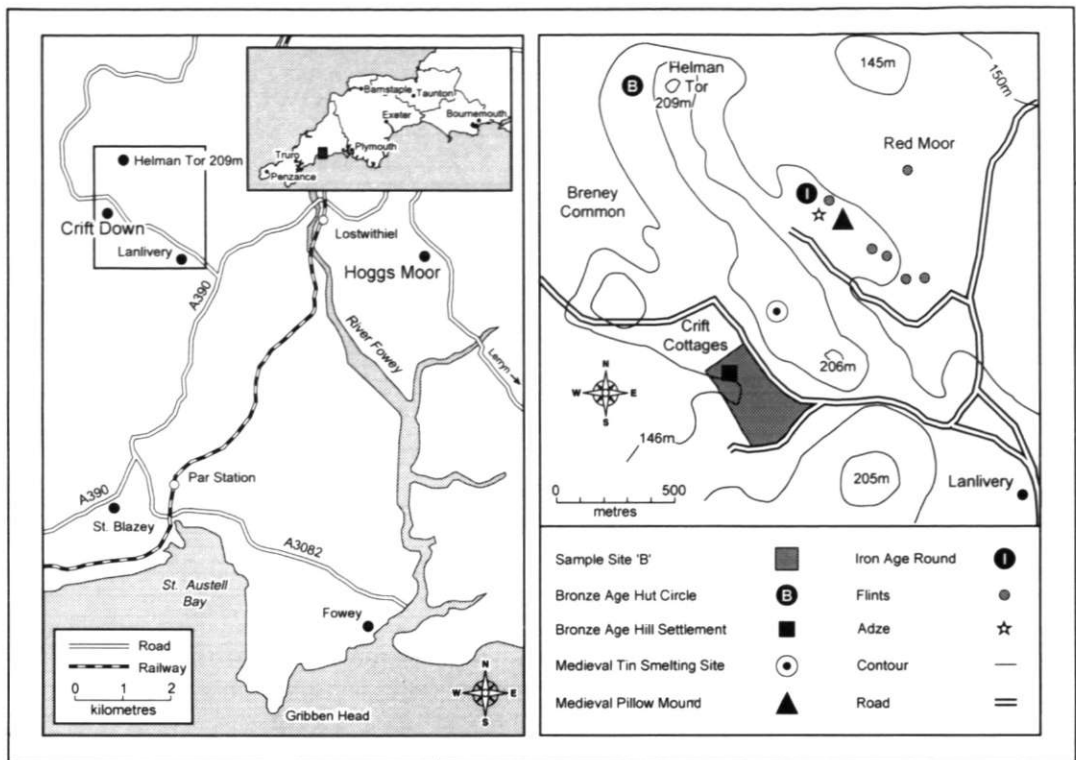


Fig 1 Location of Crift Down and Hoggs Moor. Major archaeological features at Crift Down are also shown

Hoggs Moor and Crift Down

Hoggs Moor (SX125595, 90m above OD) is a spring fed mire lying on a watershed with streams draining south and east and is bisected by the Lerryn-Lostwithiel road (Fig 1). Only the south-western half of the site was investigated here. The surface vegetation is typical of oligotrophic mires with ericaceous shrubs, purple moor grass (*Molinia caerulea*) and cotton grasses (*Eriophorum* spp). It was therefore thought to be likely to have a thick organic layer, ideal for palaeoenvironmental investigations. However, extensive survey work over the whole site showed that this was not the case and that the soil profile consisted of a weathered granite overlain by a variable depth of clay (10-70cm) and only a very shallow layer (5-10cm) of decayed vegetation. Since the clay was of unknown origin and was unlikely to contain significant pollen content, the site was abandoned as the subject of further work.

Crift Down (SX065598, 140m above OD) lies in a small valley immediately to the south of Helman Tor (Fig 1). It has been extensively drained for pasture since 1986 and would now be difficult to locate from the surface vegetation which is predominantly pasture grasses. A peat depth survey (Fig 2) showed that organic deposits exist across the whole area to a maximum depth of about 1.8m. The northern edge where the deepest peat was found was also known to be the least disturbed by drainage operations and was sampled with a Russian pattern corer down to a depth of 1.7m. The stratigraphy is described in Table 1 and shows an abrupt change at 70cm depth from a highly humified peat below to a fibrous orange-brown grass-*Sphagnum* peat above. This is thought to represent a hiatus in peat deposition and is discussed further below.

The pollen record from Crift Down

1 cm³ subsamples for pollen analysis were removed at 10cm intervals down to 130cm and at 5 cm intervals from 130cm to the base. Samples were prepared by standard techniques (Moore

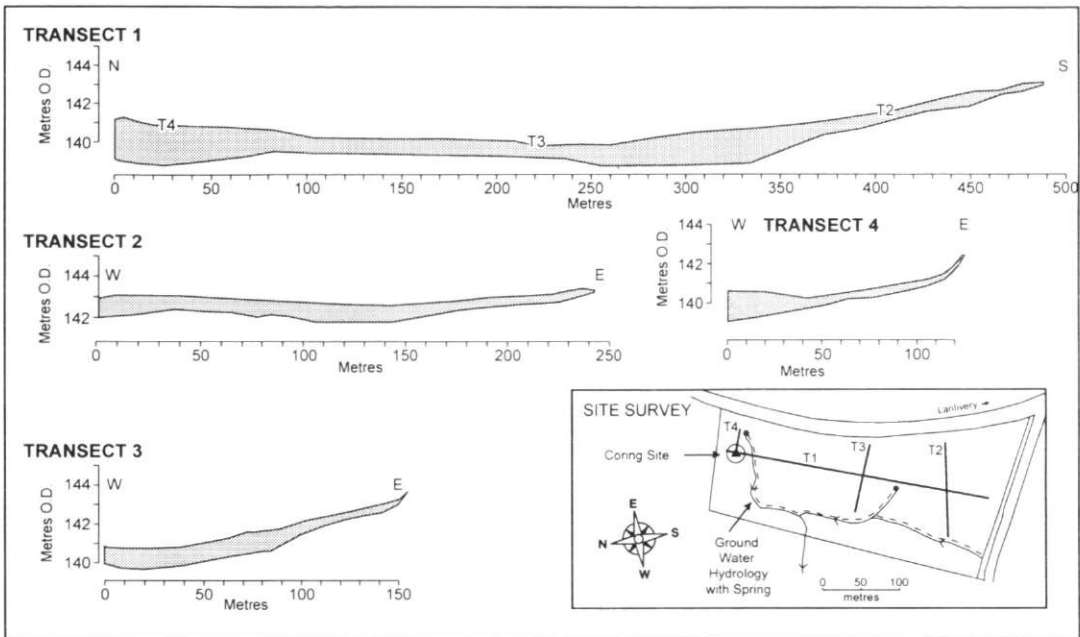


Fig 2 Peat depth sampling strategy and profiles from Crift Down

et al 1991) and counted at $\times 400$ to a pollen sum of a minimum of 200 land pollen. The concentration of charcoal fragments smaller than $180 \mu\text{m}$ was also estimated microscopically on the pollen slides. The percentage pollen diagram and charcoal counts are shown in Fig 3. The diagram is divided into four assemblage zones CRD1 to CRD4.

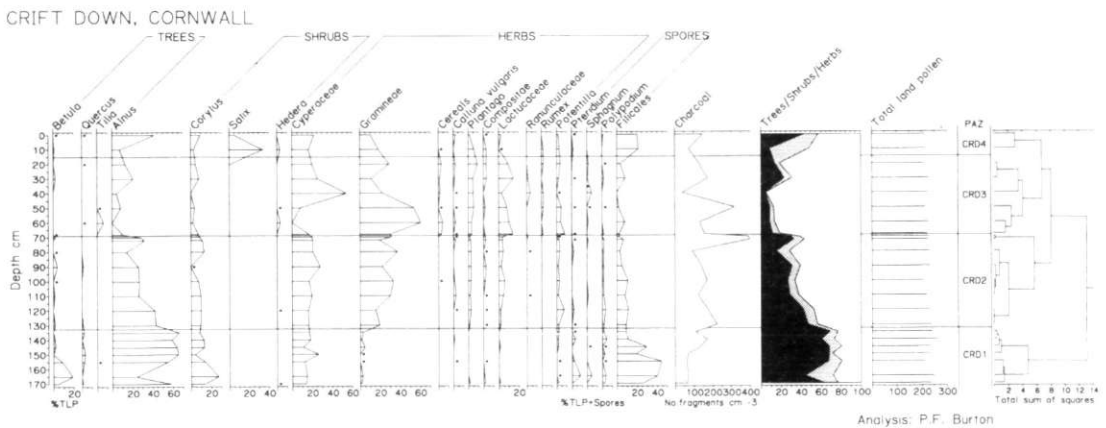


Fig 3 Percentage pollen diagram for Crift Down. The pollen sum is total land pollen excluding pteridophytes. A • symbol indicates values of $< 2\%$. The charcoal curve shows fragments cm^{-1} . The dendrogram indicates the degree of similarity between adjacent samples and is used as a basis for dividing the diagram into zones CRD1-4

CRD1 is dominated by tree and shrub pollen (*Alnus* (alder), *Corylus* (hazel) and *Betula* (birch)). *Quercus* (oak) is also present in small amounts. This probably represents an alder carr on the mire itself with a mixed deciduous woodland on the surrounding slopes. There may have been limited areas of open ground but the *Cyperaceae* (sedge) pollen is more likely to be from the mire vegetation. An increase in *Pteridium* (bracken) at 165 cm suggests some intermittent

disturbance of the woodland, possibly associated with human activity. While charcoal counts are generally low, they increase in the top of the zone suggesting increasing fire frequency. Combined with the slight increase in grasses and lower values of *Corylus* and *Betula*, this indicates disturbance of the woodland on the drier slopes.

CRD2 shows a marked change with a reduction in all tree taxa and an expansion in open ground dominated by grasses and herbaceous plants including *Plantago lanceolata* (ribwort plantain), *Potentilla* spp (Tormentil and related spp), and Compositae (Daisy family). This represents an opening of the alder carr vegetation with some limited further clearance of surrounding slopes. *Corylus* does not show a significant decline which suggests that this species maintained a significant presence on the dry land around the mire. The herb types suggest predominantly pastoral land use of the cleared areas but the cereal grain at 100cm indicates limited cultivation and occasional *Calluna vulgaris* (Ling heather) suggests that there was some heath developing, perhaps on the upper slopes of Helman Tor. The increased charcoal concentrations may be derived from use of fire in the management of land, or more likely from domestic fires.

CRD3 coincides with the abrupt change in stratigraphy noted earlier and shows a further decline in tree and *Corylus* cover and an expansion in the open ground species already present together with *Rumex* (Dock family) and the first significant presence of cereals. This shows almost complete eradication of woodland cover on the mire and surrounding areas by 60cm, although there is some subsequent recovery. There was clearly extensive cultivation for cereal growing but also an expansion in the area of land under grazing. Some expansion in the extent of heathland is suggested by the rise in *Calluna*, although this must have been limited to upper slopes some distance from the coring site. The later decline in Poaceae (grasses) with a rise in Cyperaceae is likely to be a local change in the mire vegetation itself.

CRD4 shows some recovery in *Alnus* and a large increase in *Salix* (willow) with some decline in grasses and sedges. The mire was clearly recolonised by alder and *Salix* but there may have been little change on the surrounding slopes, although there is no evidence for continued cereal cultivation. Contraction in percentage values of other open ground taxa is a result of suppression by the abundance of *Salix* and *Alnus* as concentrations remain stable.

Discussion: Possible age and relationship with archaeology

In the absence of an independent chronology based on radiocarbon dates, any attempt to correlate vegetation change with the archaeology of the area is tentative. However, some ideas are represented here but firm conclusions must await future radiocarbon dated sequences. Since *Alnus* is well established in the earliest phases of the pollen diagram, the basal date must be later than c7000 BP. It seems likely that the continuous but at first light disturbance relates to the earliest recorded activity in the area in the late Neolithic (Harris 1977), when Mercer (1986, 50-5) believes this site to represent a settlement on one of the principle east to west routes through Cornwall. The following more intensive land use represented in CRD3 is presumably then related to Bronze Age activity but since the latest date before the hiatus (70cm) occurs is difficult to estimate, little can be inferred about changes in prehistoric land use during the later Bronze Age and Iron Age. The hiatus may be a result of cessation of peat growth or, more likely, is due to later peat cutting. However, 70cm of predominantly organic sediment overlies this transition and even at relatively high accumulation rates (say 1 mmyr^{-1}), this represents 700 years. It seems likely that peat cutting took place during medieval times and that the deposit has accumulated since that time. CRD3 would then represent the medieval period with the more intensive cultivation of these marginal farming areas. This is also the period in which the tin smelting activity at Crift was at its height (McDonnell 1995) and the peak in charcoal may be related to this. Zone CRD4 is then post-medieval and the decrease in arable activity perhaps reflects the decline in population and intensive farming following the Black Death and the climatic downturn of the Little Ice Age. The recolonisation of the mire by *Salix* may have been encouraged by its use as a source of withies, although there is no documentary evidence of this for this area.

The potential for lowland palaeoenvironmental records

This small scale study has shown that suitable sites for the reconstruction of long sequences of vegetation change in lowland Cornwall do exist and that useful records for landscape change can be established. Such sites may not necessarily be obvious from superficial vegetation cover and more detailed survey is required to establish the nature and depth of any underlying organic deposits. The vegetation history of Cornwall has been largely based on a single study (Brown 1977) covering an atypical area of the county. Even within this restricted area, there is scope for further work in relation to archaeological sites (Gearey *et al* 1994, Gearey 1996) but extreme caution should be used in attempting to extrapolate to other areas. The priority should now be to identify other potential sites in the county, particularly from coastal and lowland areas with a view to establishing a network of sites for future work. It is only by such means that the environment experienced by people in the prehistoric and early historic periods can be adequately reconstructed in its full and complex detail.

Acknowledgements

Thanks to Mr R Rawlings, Mr D Chapman and the Boconnoc Estate for access to private land, Dr J D McDonnell for discussions and information on Crift Down and Dr Keith Ray for pointing out Hogs Moor. Figures were drawn by Cartographic Resource Unit, University of Plymouth.

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Table 1 Sediment stratigraphy at Crift Down. All depths in cm

0-10	Weakly humified crumbly peat with sand/small pebbles
10-25	Moderately humified fibrous grass/sedge roots with some sand/silt
25-32	Dark grey humified peat with sand/silt
32-50	Banded with alternating orange-brown <i>Sphagnum</i> -Gramineae peat and darker grey-brown poorly humified fibrous grass-sedge peat
50-70	Dark orange-brown fibrous <i>Sphagnum</i> -grass peat. Dark band with charcoal at 53cm
70-76	Sharp boundary with above. Humified dark brown peat
76-84	Humified peat with abundant fibrous grass-sedge roots
84-100	Humified peat with some fibrous grass-sedge roots and sand/silt
100-122	Humified dark brown peat with occasional sand/silt
122-127	Highly humified with wood fragments and sand/silt
127-140	Humified dark brown peat
140-165	Highly humified black peat with sand/silt and wood fragments and grass-sedge roots
165-170	Banded light brown and black layers with sand/silt and wood fragments

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Fig 1 Aerial view of Duckpool and Coombe Valley, looking east. (CAU photograph)

Duckpool, Morwenstow: A Romano-British and early medieval industrial site and harbour

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1.0 Summary

From its discovery in 1983 by Cornwall Archaeological Society member, Richard Heard, Duckpool appeared an unusual and intriguing site. Its valley-bottom, beach-top location and predominantly industrial character set it apart from the typical Romano-British settlements (rounds) with which it was apparently contemporary. The threat to the site posed by coastal erosion and use of the area as a car park led in 1992 to a small-scale evaluation excavation by Cornwall Archaeological Unit (Cornwall County Council), funded jointly by English Heritage and land owners, The National Trust. This excavation and earlier recording work carried out by Heard revealed that the archaeological remains consisted of a series of hearths and layers containing industrial and domestic debris. Radiocarbon dates and artefactual evidence indicated that Duckpool was also occupied in early medieval times. During the Romano-British period (Phases 1 and 2—3rd to mid-4th centuries AD) the site appears to have been a specialist settlement involved in secondary metal working, including the casting of lead, pewter, and possibly also copper alloy, objects. In addition, the much more unusual activity of extracting dye from dog wheelks apparently also took place. The discovery of a human jawbone suggests that graves contemporary with the settlement may have existed in the vicinity. An important aspect of the artefactual evidence is the predominance of South Devon ware pottery, which shows for the first time that this was a major fabric in North Cornwall (and by inference, North Devon) during the late Roman period. During Phases 3 and 4 (7th-12th centuries AD) Duckpool continued to be primarily an industrial site, though metal working had ceased and the nature of the activities taking place is unknown. The site may have functioned as a harbour and place of manufacture for the prosperous early medieval manor of Kilkhampton. The excavation has posed as many questions as it has answered and, as coastal erosion continues to erode the archaeological remains, there is a need for further work to enhance our understanding of this important site, for which there is as yet no parallel in Cornwall or Devon.

2.0 BACKGROUND

2.1 Location and setting

Duckpool is located in the extreme north-east of Cornwall (NGR SS20101164), close to the border with Devon (Fig 2B). It lies amongst the Upper Culm Measures where the geology comprises massive grey and brown/yellow sandstones, with thin interbedded grey or black shales (Barton 1969), and the soils are typically heavy. The coast is characterised by high vertical or steeply sloping cliffs. These form the seaward edge of a plateau, approximately 140m above OD, which rises gently inland to a ridge at approximately 200m above OD along which runs the A39 (Fig 2A; Countryside Commission 1996, 99-101). The plateau is dissected by numerous streams which form steeply incised valleys that cut their way to the coast running at right angles to it (*ibid*). The landscape is exposed, windswept and largely treeless except in the valleys which, especially in their more sheltered upper reaches, support mixed woodland (sycamore, oak and conifers) and willow scrub. The cliff tops are covered in unimproved and partially improved grassland, with some bracken, heather and gorse. A few areas of rough ground also survive inland. However, pasture fields of improved grassland predominate, with some arable farming (barley and other crops). This very rural landscape is populated with small farms and occasional hamlets and small villages, centred on the former medieval market town of Kilkhampton (now a large village). The settlements are interconnected by roads which are narrow, sinuous and usually single-track. More modern land use features include a number of caravan and holiday parks and the prominent Early Warning Station on the former World War II Anti-Aircraft Practice Site.

Duckpool is the name of a small cove at the mouth of Coombe Valley (Figs 1 and 3). The latter is steep-sided, aligned east-west and has a good sized stream meandering along its narrow flat bottom, running through the shingle bank that forms the top of Duckpool beach and flowing across the sand to the sea. The upper part of the valley has wooded sides, in contrast to the Duckpool end where the valley sides and bottom are covered in unimproved or partially improved

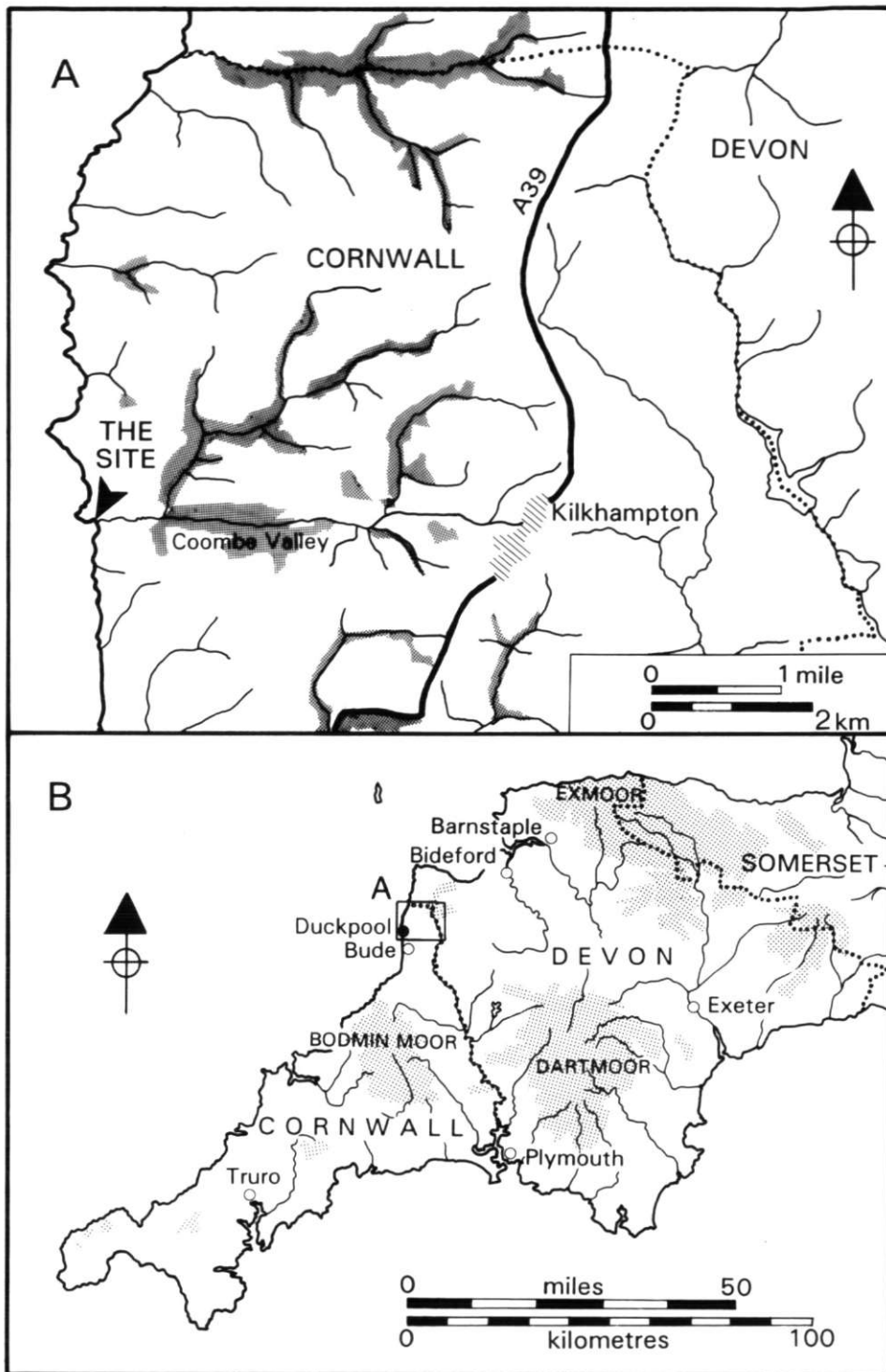


Fig 2 The location and setting of Duckpool—shading on A represents woodland and on B land above 200 metres ordnance datum. (Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Cornwall County Council LA 076538/97/05)

grassland, bracken and scrub. Duckpool is not a sheltered location, being exposed to the prevailing westerly winds which drive any bad weather in over the beach and up the valley (Fig 13). The northern side of the lower part of Coombe Valley is owned by the National Trust who maintain a car park at the top of the beach for the use of visitors to the cove and adjacent cliffs. This car park is metalled with gravel and small stones. The only buildings presently standing at Duckpool are Duckpool Cottage and the National Trust toilet block (both at the eastern end of the car park) and a disused emergency telephone booth halfway along it.

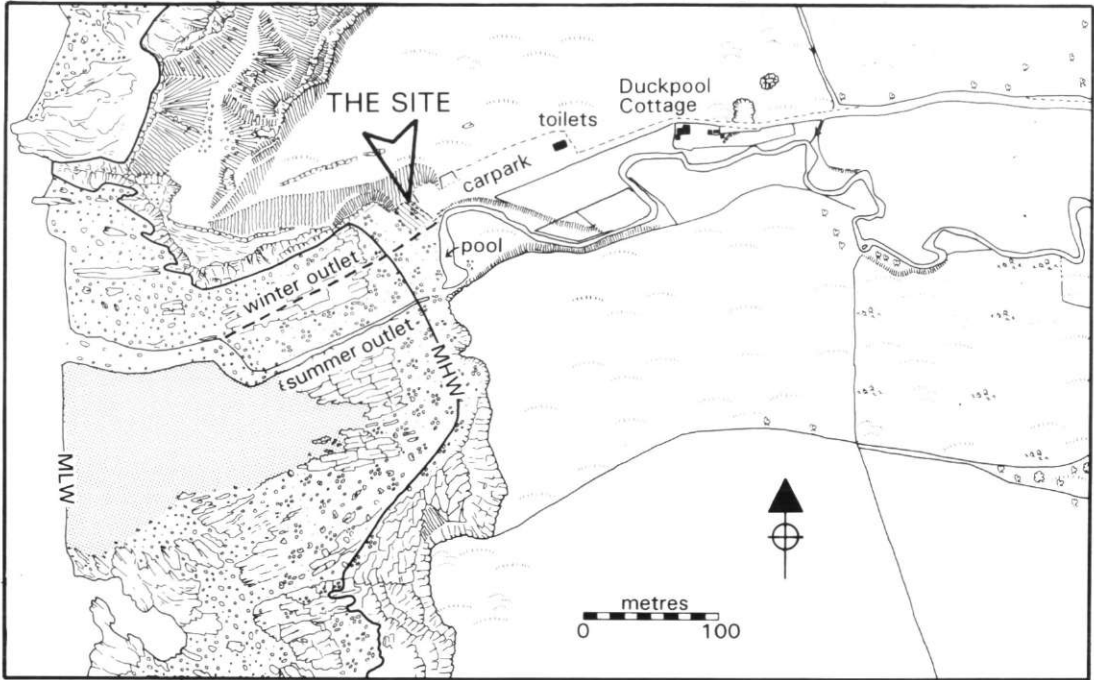


Fig 3 Duckpool, showing the location of the archaeological site. (Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Cornwall County Council LA 076538/97/05)

2.2 Archaeology and history of the area

The following outline is based on information in the Cornwall and Devon Sites and Monuments Records. Mesolithic, Neolithic and Bronze Age flints and other artefacts testify to early prehistoric activity in the general area. The earliest surviving monuments are Bronze Age ceremonial sites, such as the two barrows surviving in a field south-west of Kilkhampton, a major concentration of which lies around Welsford Manor, Hartland. The nearest Iron Age hillforts lie approximately 16km (10 miles) south of Duckpool and 8km (5 miles) to the north. However, in much closer proximity are a number of univallate enclosures interpreted as Iron Age and/or Romano-British defended settlements (rounds), including a good example located only 2km (1 ¼ miles) to the east in Stowe Woods (Fig 26). Located on a spur of land overlooking a tributary of the Coombe Valley stream, it faces another enclosure recently revealed by air photography on an opposing spur.

Most present day settlements in the area have names first recorded in the early or later medieval period, some being Domesday or later manors. Associated with these are early churches, chapels, holy wells, crosses and lazar houses. The small roads and lanes that connect these sites and the surrounding field pattern, comprised of small enclosed strips and more irregular fields formed by sinuous boundaries, are also of medieval origin, and a good proportion of the

woodland is ancient. Four kilometres (2½ miles) inland from Duckpool are the remains of a castle, probably 12th century in date. These lie just west of the only town in the immediate area—Kilkhampton, a well-preserved medieval market town with a 16th century church which is located on one of the main access roads into Cornwall (the A39). A number of post-medieval (16th-18th century) manor houses are documented—a few continue to be occupied, while others survive as earthworks or have left no trace. There are small areas of farmland where the field pattern is post-medieval and consists of larger, straight-side fields enclosing former upland and coastal rough ground or, in a few cases, resulting from the reorganisation of medieval fields. As well as surviving settlements of post-medieval origin, there are a significant number of deserted farmsteads of this date. Post-medieval industrial or semi-industrial sites include numerous small building stone quarries and several water mills and bridges (including King William's Bridge just west of Duckpool), and there is cartographic or documentary evidence for malhousers, blacksmiths, a windmill, a beacon, a brick kiln (or clay source) and a copper mine.

2.3 More recent history of the site

The placename *Duckpool* was first recorded in the late 16th Century as *Duck Poole* (Norden 1966, opp 55), and is an English coastal name whose meaning is presumably self-explanatory given that wild ducks are still seen in the pool behind the shingle bank at the top of the beach. Nothing is shown at or adjacent to the excavation site on the 1840 Tithe Apportionment map, the closest features being a couple of small enclosures about 60m back from the top of the beach. However, on the 1880 OS 25" map a series of (walled?) bays and a small square enclosure are shown in the area that is now occupied by the western half of the National Trust car park (Fig 4). These probably relate to the stone quarries still visible in the cliffs on the south side

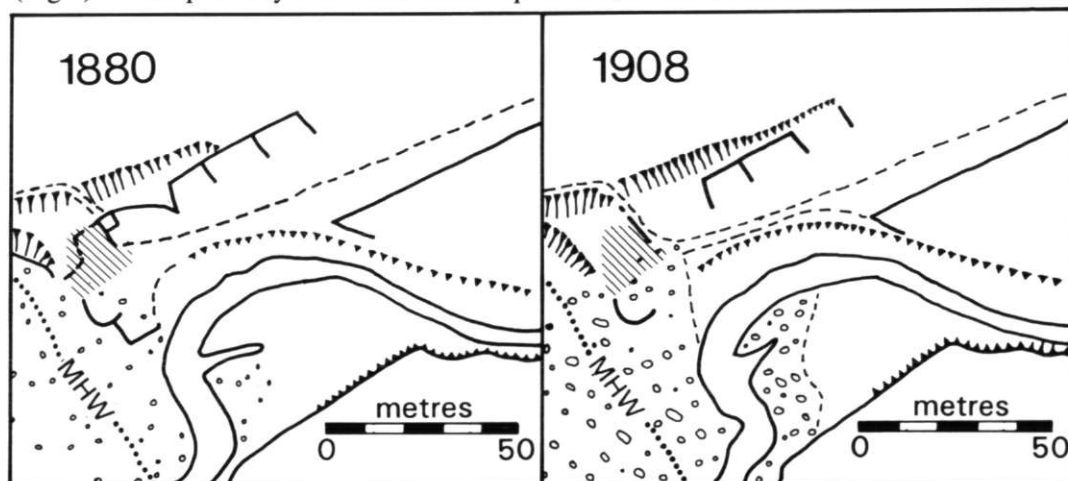


Fig 4 The archaeological site shown in relation to features depicted on the 1880 and 1908 OS 25" map sheets

of the cove and to the use of Duckpool as a source of sand for dressing fields (pers comm Richard Heard). Sand and stone may have been stored in the bays before being transported inland by horse and cart. Interestingly, a right-angled and a semi-circular piece of wall are shown close to where the archaeological remains were first discovered. Could this walling have been part of the earlier site rather than the 19th century one? The detail shown on the 1908 OS 25" map is essentially the same, though there is slightly less walling at the top of the beach, perhaps as a result of it having become hidden beneath beach shingle or redeposited sand, or maybe because some walls had been destroyed or removed by this date. During this century, owing to its beach, cliffs and dramatic seascape, Duckpool has become increasingly popular amongst local people and holidaymakers. During the summer months, in particular, it attracts a considerable number of visitors.

2.4 Description of the archaeological remains found prior to 1992

The archaeological site was first discovered in 1983 by amateur archaeologist and Cornwall Archaeological Society member, Richard Heard, who lives in nearby Kilkhampton and has been visiting Duckpool since boyhood (a period of over forty years). From 1983 to 1990 various features were recorded by Heard. Though all clearly part of the same site, these features divide into two groups according to their location in relation to the shingle bank which forms the top of the beach, just above mean high water (Figs 5 and 6). Area A became visible when

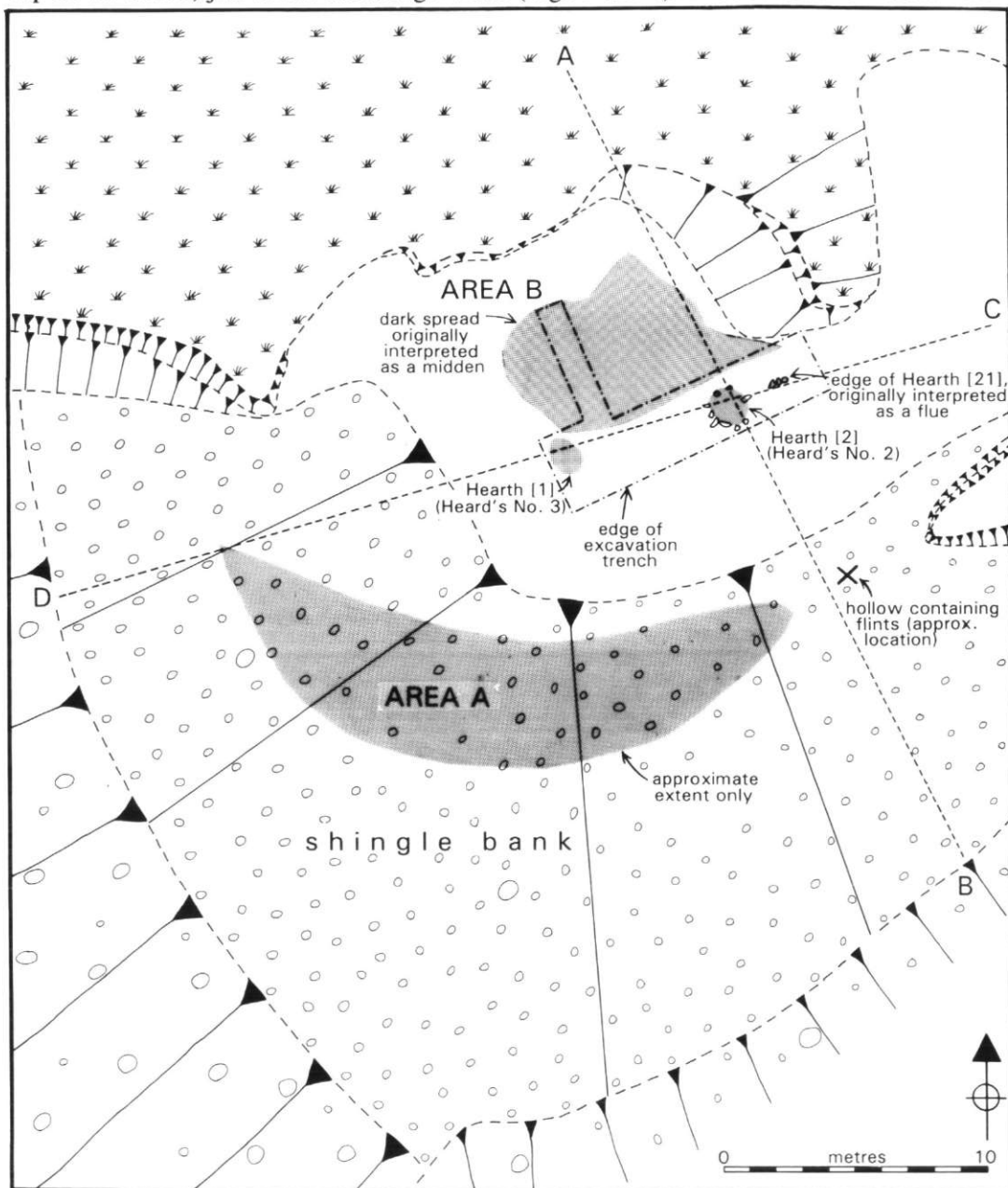


Fig 5 Plan of the site showing the location of the archaeological remains (Areas A and B) and the 1992 excavation trench. The line of profiles drawn across the site (A-B, C-D) are also shown



Fig 6 Area A photographed by Richard Heard in 1984 (Area B lies to the right of the cars)

storm seas scoured away this shingle bank to expose a ridge of yellow brown clayey subsoil overlain and cut into by a series of deposits and features which subsequent erosion gradually revealed. Area B lay just inland of the shingle bank, 5 m northeast of Area A and on slightly higher ground. The remains in this area were visible in the surface of the western-most bay of the car park. They were being eroded by the sea and the winter outlet of the stream (on their west and south sides) and also by vehicles parking and manoeuvring over the top of them. The turf and topsoil that must have originally overlain the archaeology had previously been removed, either during the creation of the present car park or during the earlier (19th century) use of the area as a sand and stone store. Prior to 1983 the Area A remains appear to have been protected by the shingle bank, though their shelving nature was clearly the result of previous cutting back by the sea and stream. The remains in Area B may have been only partially exposed, and so less easily recognisable, before 1983. By 1992 all recorded features in Area A, apart from part of the paving and possible walling appeared to have been removed by a combination of excavation (by Heard and another) and wave action, and the shingle bank had reinstated itself. The remains in Area B were not excavated by Heard and, though they were slightly more eroded, their condition in 1992 was largely similar to when they were first discovered.

Area A

The main features in this group are shown in Fig 8. They consisted of a square hearth with a stone surround and a stone-lined flue, a longitudinal stone-lined pit showing signs of intense burning, a large pot apparently re-used as an oven, probable stone paving and a possible wall.

The hearth (Heard's Hearth No 1) was approximately 1.3m square, defined by a perimeter of stones set in orange/pink burnt clay and with a deposit of charcoal in its interior (Fig 9). It was surrounded by a worn surface of (natural?) clay and a spread of charcoal. A narrow trench, lined with stones set in a V-shape and covered by small slabs, extended from the south side of the hearth. It ran downhill in a curving course, first roughly north to south and then roughly east to west for a distance of approximately 4m, and has been interpreted as a flue.

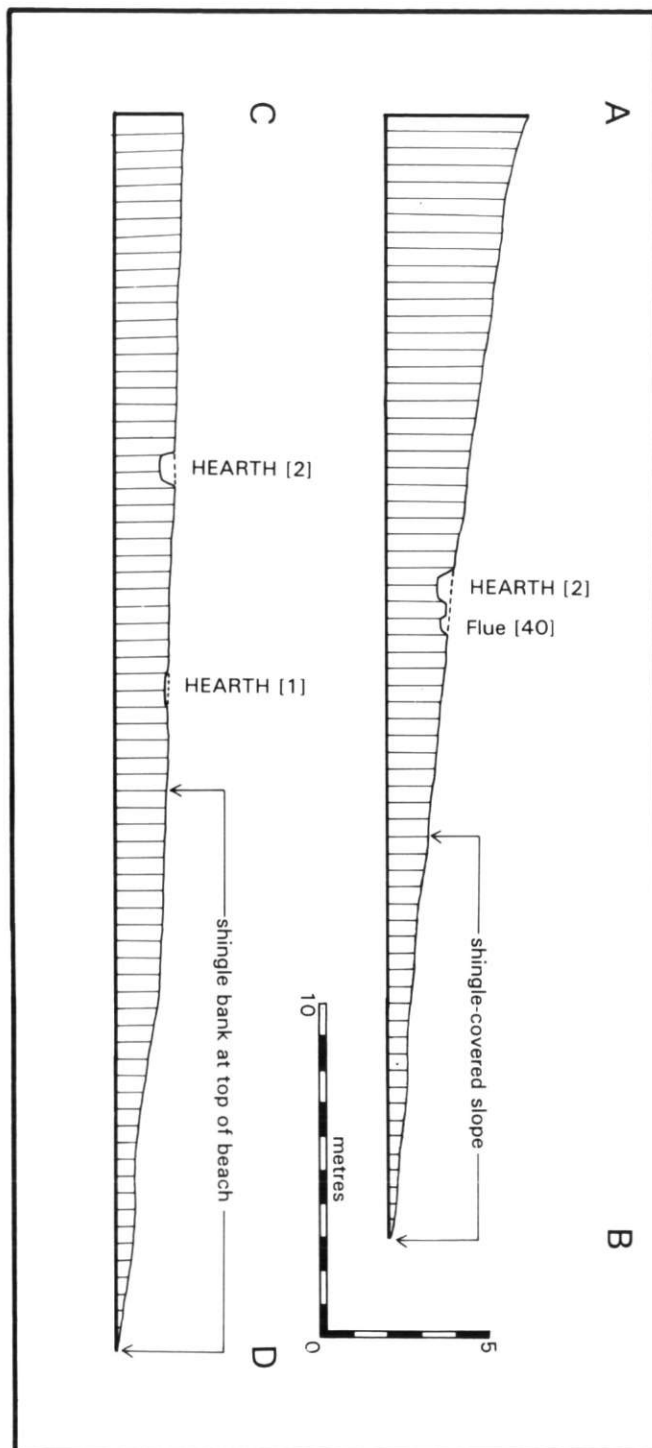


Fig 7 Profiles across the site

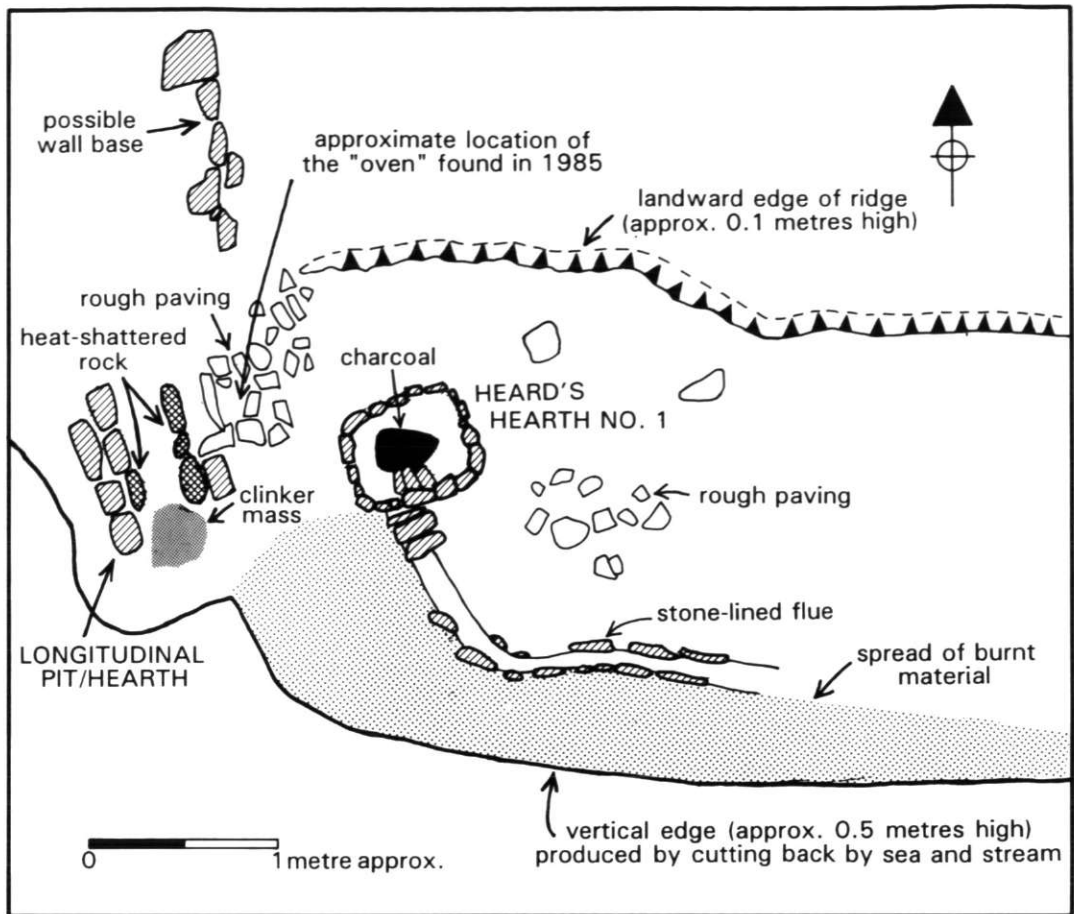


Fig 8 Remains in Area A (based on a sketch plan drawn by Richard Heard in 1984)

At its north end where it joined the hearth it appears (from Heard's photographs) to have extended into the interior beneath the charcoal fill.

The longitudinal pit appeared to be rectangular in plan, approximately 1 m long and lined on at least two sides with clay-mortared walling 2-3 courses high (Fig 10). In its interior, heat had changed the clay mortar from yellow to orange/red and fractured some of the wall stones. A 'clinker' mass was found at the south end of the feature. The evidence suggests that this could have been the remains of a second hearth.

The large pot was found between the square hearth and the rectangular pit/hearth. It was a half-metre tall cordoned ware storage jar (Fig 12) which had been set on its side. When found, a quantity of sherds and soil overlay the interior of its lower side. When exposed (Fig 11), the surface of this was seen to be partly blackened and have traces of a pale buff deposit, while the fabric of the pot as a whole had been reddened as a result of being subjected to heat. The impression gained by Heard was that the pot had been re-used as an oven which functioned in a similar way to the cloam oven his grandmother had once used. The pot's rim did not survive and had apparently been deliberately knocked out in antiquity, perhaps to provide a wider opening for the oven. On one side the oven mouth appeared to have been completed or repaired by the insertion of a rim sherd from another cordoned ware vessel. A flat stone placed just in front of the knocked-out rim was thought also to have formed part of the oven—perhaps as a sill or paved area (see Fig 11). A possible late Roman parallel may exist at Holcombe



Fig 9 The hearth exposed in Area A (Heard's Hearth No 1) after partial destruction by the sea and excavation—photographed by Richard Heard in 1985

Villa in south-east Devon (storage jar 139, oven 40) and a description of the use of such an oven is given in the excavation report for this site (Pollard 1974, 104, 135, fig 21, plates XLII-XLIV). As a result of subsequent close examination of the storage jar (see Quinnell's pottery report below), it is suggested that it was subsequently reused as a water trough associated with the nearby hearths. The upper side of the pot did not survive, suggesting that it may have been removed in antiquity to form a more bowl-like container. Though the friability and colour of the fabric and the deposit on its interior are due to heat, the comparative absence of charcoal or soot makes it likely that its present condition is the result of it having contained hot water. As a water-containing trough it may have been used to cool metal-working tools.

The probable stone paving consisted of two small areas of irregularly set, medium sized stones to the north-west and south-east of the square hearth. To the north of the north-western paving, a line of stone blocks protruding above the land surface was interpreted as a possible base of a wall.

Around the southern edge of the exposed shelf containing the Area A remains was a spread of burnt material. This was recorded as a shell and ash midden by Heard. In his photographs it appears as a dark, charcoal-rich spread containing blackened stones and flecked with red fragments of burnt clay and white pieces of shell and bone. This spread appears identical to that visible in the car park surface (see Area B remains below). As the deposit eroded it yielded most of the lattice-decorated pottery collected by Heard.

Area B

Three features were found in this area—two hearths and an irregular dark spread (Fig 5). The most prominent feature was Heard's Hearth No 2, located on the north-eastern side of



*Fig 10 The longitudinal pit or hearth in Area A after partial destruction by coastal erosion—
photographed by Richard Heard in 1985*

the exposure. It was visible as a sub-circular area enclosed by a ring of flat stones set in reddened clay, and measured 1.7m in overall diameter. All of the stones were local sandstone except one which was granite. A detached line of four closely set stones extended from a point 1m to the north-east and was identified as a possible stone-capped flue associated with Hearth No 2. Heard's Hearth No 3 lay on the south-western edge of the Area B remains and consisted simply of a roughly circular area of reddened clay, approximately 1.5m in diameter, with two or three stones embedded but not obviously part of its structure. The dark spread covered an area approximately 9m by 6m north-west of an imaginary line connecting the two hearths. It appeared as dark soil containing small stones, charcoal, fragments of shell and some animal bone, and was at this stage identified as a domestic midden.

Artefacts collected by Richard Heard

Heard collected quantities of pottery, flint, animal bone, shell, lead, copper alloy, iron, stone, burnt clay, vitreous lumps and slag. These were collected over several years and came from around features in both areas of the site, though most finds are not closely located and quite a few are unprovenanced. It seems likely that the bulk of the assemblage eroded out of the two spreads of dark soil, particularly that in Area A. Three quarters of the 386 pot sherds came from the reused storage vessel, and most of the remainder came from around or 'under' Hearth No 1 (which presumably means they came from the layer it was cut into). All but 3 of the 45 pieces of flint were found east of Hearth No 1, most in a small hollow (see Fig 5). The animal bone came from the site as a whole. Most of the shell was unprovenanced, but an interesting collection of clipped dog whelk shells was restricted to the vicinity of the Area A remains. Heard only collected a small sample of these but estimated there were enough exposed 'to fill a two gallon bucket'. The lead, copper alloy and iron was retrieved from near

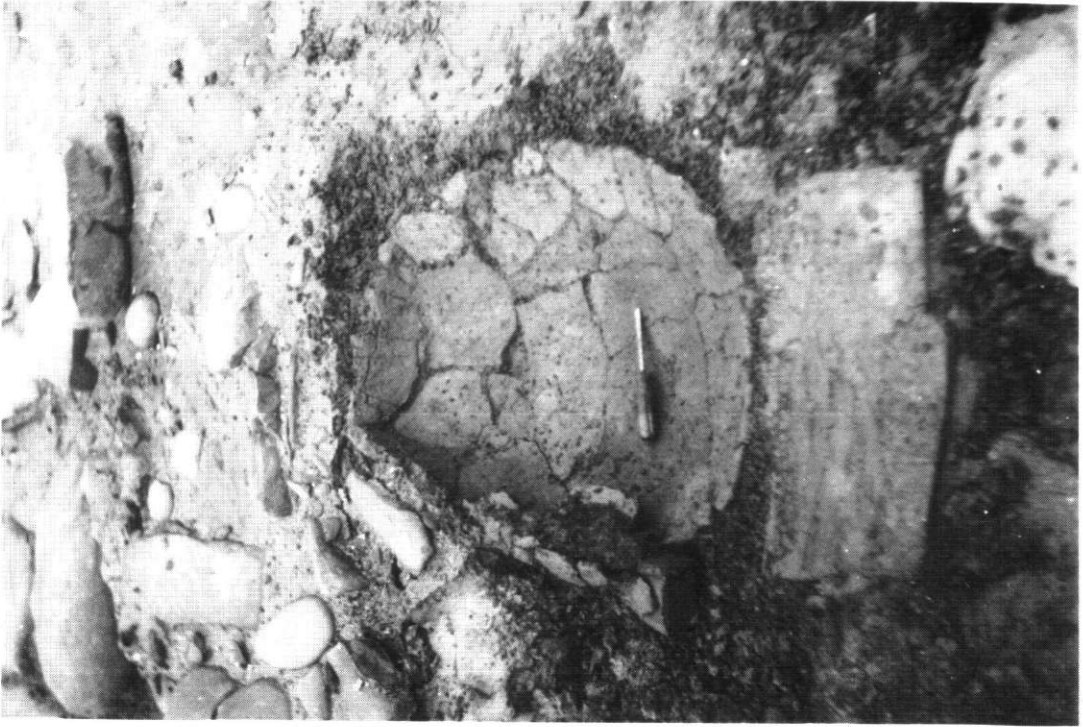


Fig 11 The re-used storage jar in Area A, after removal of collapsed pottery and soil from its interior—photographed by Richard Heard in 1985



Fig 12 Richard Heard with the cordoned-ware storage jar after excavation—photographed 1992

all three hearths, but the lumps of burnt clay, vitreous material and slag came largely from around Hearth No 1 and the rectangular pit/hearth.

Initial interpretation of the site

The nature of the remains discovered by Richard Heard suggested that they were the result of small-scale industrial activity (probably metal working) during the Roman period—the dating evidence being provided by diagnostically Romano-British pottery (though a few medieval sherds were also found). Although most excavated Romano-British settlements in Cornwall have produced evidence of metal working, the lack of any obvious domestic structures, the strong industrial character and the unusual valley-bottom and coastal location of the Duckpool site made it untypical of rural settlement of this period. It appeared to be a specialised industrial site, perhaps, because of its exposed location, used only on a seasonal basis during spring and summer.

2.5 Circumstances of the 1992 excavation

Over the years, as continued erosion progressively exposed and (in some cases) destroyed various features, reports were made to CAU and notes on the site were published in successive issues of the Cornwall Archaeological Society newsletter (No 44, Feb 1984, 4; No 46, Oct 1984, 3-4; No 54, June 1987, 5; No 63, June 1990, 4). A site visit was made by CAU in 1984 when the burnt spread adjacent to Hearth No 1 was sampled and finds collected, and again in 1990 when the main features then exposed were surveyed at 1:100. Following the last visit a report on the character, potential and management requirements of the site was compiled at the request of David Thackray, National Trust Chief Archaeological Advisor (Rose 1990). This concluded that a small-scale evaluation excavation should take place to record the remains preserved in the car park surface in advance of their gradual erosion, to help interpret the site as a whole, and to provide a basis for future management recommendations. A project



Fig 13 Duckpool during bad weather—the 1992 site accommodation taking a battering!



Fig 14 The 1992 excavation trench viewed from above—after the removal of the car park surface

design (Rose 1992) was drawn up according to English Heritage guidelines (Management of Archaeological Projects, 1991) and joint funding was generously provided by English Heritage and the National Trust.

The excavation took place over twelve days during August 1992 (Fig 15). Work was carried out by a team of three professional archaeologists comprised of the author (as Excavation Director) and two experienced excavators (Anna and Andrew Jones), together with three archaeological volunteers (Richard Heard, Pearl Myers and Colin Rose). Following the excavation an assessment was made of the potential of the structural and stratigraphic data and the artefactual and environmental material for detailed analysis, and the project design was updated (Ratcliffe 1994). Detailed analysis, production and circulation of a draft report, and compilation of this article took place during 1994 and 1995. The site archive (details of which are given in the appendix) will be deposited at the Royal Cornwall Museum in Truro.

2.6 Excavation strategy and methodology

A trench measuring 11 m long by 3 m wide (maximum) was set out NE-SW to incorporate the two hearths, and a trench (5 m long by 1 m wide) was laid out at right angles to the north side of the main one to sample the burnt spread (Figs 5 and 14). The intention was to totally excavate these adjoining trenches, but as it transpired, the depth, survival and complexity of the remains made this impossible in the short time available. Only the western part of the smaller trench was excavated and the most eastern 2 m of the main trench were only very partially investigated.

All artefacts found during the excavation were retained. Many finds were individually plotted in 3-D, but most of those from layers [12] and [30] were located to the nearest metre square (Fig 25). Artefacts were also extracted from the residues of sieved bulk soil samples (see below).



Fig 15 The 1992 excavation in progress

Conservation of artefacts was carried out by Margaret Brooks, English Heritage contract conservator for the south and west of England (Brooks 1994).

Bulk soil samples were taken of virtually all the fills and layers uncovered by the excavation—a total of 31 samples from 24 contexts. The total weight of soil sampled from each context varied quite considerably, and while for most contexts it was 9-17 kg, for a few it was much more (44 kg for [10], 82 kg for [12] and 124 kg for [11]) or less (0.5-5 kg for Contexts [9], [16], [30], [41] and [61]). The samples were processed by Andrew Young under the guidance of Vanessa Straker (English Heritage environmental archaeologist for the South West). They were sieved through 500 micron mesh and floated onto 250 micron mesh sieves. Residues from the samples were divided further by sieving through a 1 mm mesh to provide residues A (coarse) and B (fine). Environmental material was extracted from the floats (by Vanessa Straker) and artefacts, environmental and technological material from the residues (by Forbes and Marian Johnson).

As well as the bulk soil samples, a column consisting of three micromorphology samples was collected from the layers making up the dark spread cut through by the northern arm of the excavation trench (Fig 23). This sampling was carried out by Matthew Canti (English Heritage AM Lab).

A site visit was made by Don Tarling of Plymouth University with the intention of taking hearth samples for archaeomagnetic dating, but unfortunately heavy rain made sampling impossible.

3.0 EXCAVATION RESULTS

3.1 Structural, stratigraphic and dating evidence

Structural evidence uncovered during the excavation consisted of three hearths, an ash-lined pit, an enigmatic stone feature and seven shallow post-holes. With the fills and associated

layers, a total of sixty-two contexts were recorded during the excavation. There was no topsoil in the excavation area, it having been removed either by coastal erosion, the use of the site as a car park or its previous use as a temporary storage area for stone and beach sand. The depth of underlying stratigraphy varied considerably. On the south-western edge of the main trench erosion by the sea had removed all archaeological layers to expose the natural subsoil—a yellow sandy clay, Contexts [14] and [56] (Fig 16). This was also the case along much of the southern side of the main trench. However, on the northern, most inland side of the excavation the stratigraphy was up to 0.7m deep (Fig 23). The main features and layers recorded during the excavation are described below. Site context numbers, enclosed in square brackets [], are used to distinguish the individual features and layers. It should be noted that the numbering of the hearths is not the same as that used by Heard. If a hearth was previously numbered by him, his number is mentioned for cross-reference.

Hearth [1] (Heard's Hearth No 3)

Located at the south-western, seaward end of the main trench, this hearth was sub-circular in plan and survived only as a shallow, 0.08m deep, scoop (Figs 17 and 21). It is unclear whether this was its original form or whether it was once a more substantial structure. From the bottom upwards it was filled by thin layers of charcoal [49], ash [48], burnt clay [47] and gritty silt [9]. The lowest two layers ([48] and [49]) represent the last firing of the hearth. Layer [47] may represent the remains of a clay roof or superstructure that collapsed inwards, covering the hearth interior. Fragments of burnt clay were also found in [48] and [49] and may have derived from the same source or some kind of clay lining. The upper fill, [9], probably accumulated once the hearth had gone out of use. It contained occasional small pieces of charcoal, burnt and semi-burnt clay and animal bone. The top part of Fill [9] was synonymous with the car park surface and it had been partially compacted by cars manoeuvring and also scoured by the sea. Apart from burnt clay and charcoal the only other finds from the lower fills of Hearth [1] were the shell fragments recorded in the ash fill [48]. Once its interior had been excavated Hearth [1] appeared as two concentric rings of red and orange—the result of the yellow subsoil into which it had been dug having become differentially burnt during use. Animal bone was found embedded into the surface of the orange outer ring [53].

Hearth [2] (Heard's Hearth No 2)

In contrast to [1], Hearth [2] consisted of a 0.3-0.4m deep square pit, with steep sides, a flat bottom and a surround of flat stones set in clay—Context [46] (Figs 17, 18 and 21). It was served by a flue which entered the hearth pit towards its top on its south-eastern side. The sides and bottom of the hearth were heavily burnt as was much of the stone and clay surround. The stones comprising the latter were sandstone, except for a large piece of granite (part of an unfinished rotary quern) reused and set on the north-west side of the flue opening. On the northern edge of the surround were two stakeholes, approximately 0.15m deep. The flue, [40], ran west to east and then turned a right angle to enter the hearth, and was clearly designed to take advantage of the prevailing westerly winds coming in from the sea. It had vertical or concave sides and a level flattish bottom. This stepped down at its eastern (hearth) end, and at its west end there was a deeper circular depression. As a result the depth of the flue varied from 0.05m along most of its length to 0.09m at its west end and 0.18m at its east. It may originally have been deeper, especially towards its west end which extended into that part of the trench most affected by coastal erosion.

Hearth [2] was filled with generally similar layers to those found in Hearth [1]. From the bottom upwards these were : charcoal [44]; ash [43]; lumps of burnt, partially burnt and unburnt clay [38] intermixed with silty sand [39]; and an upper fill of almost pure silty sand [11]. As with Hearth [1], the charcoal and ash layers represent the last firing of the hearth, the clay which also contained a few large burnt stones appears to be collapsed hearth roof or superstructure, and the silty sand is post-use accumulation. A large, flat, 0.02-0.03m thick

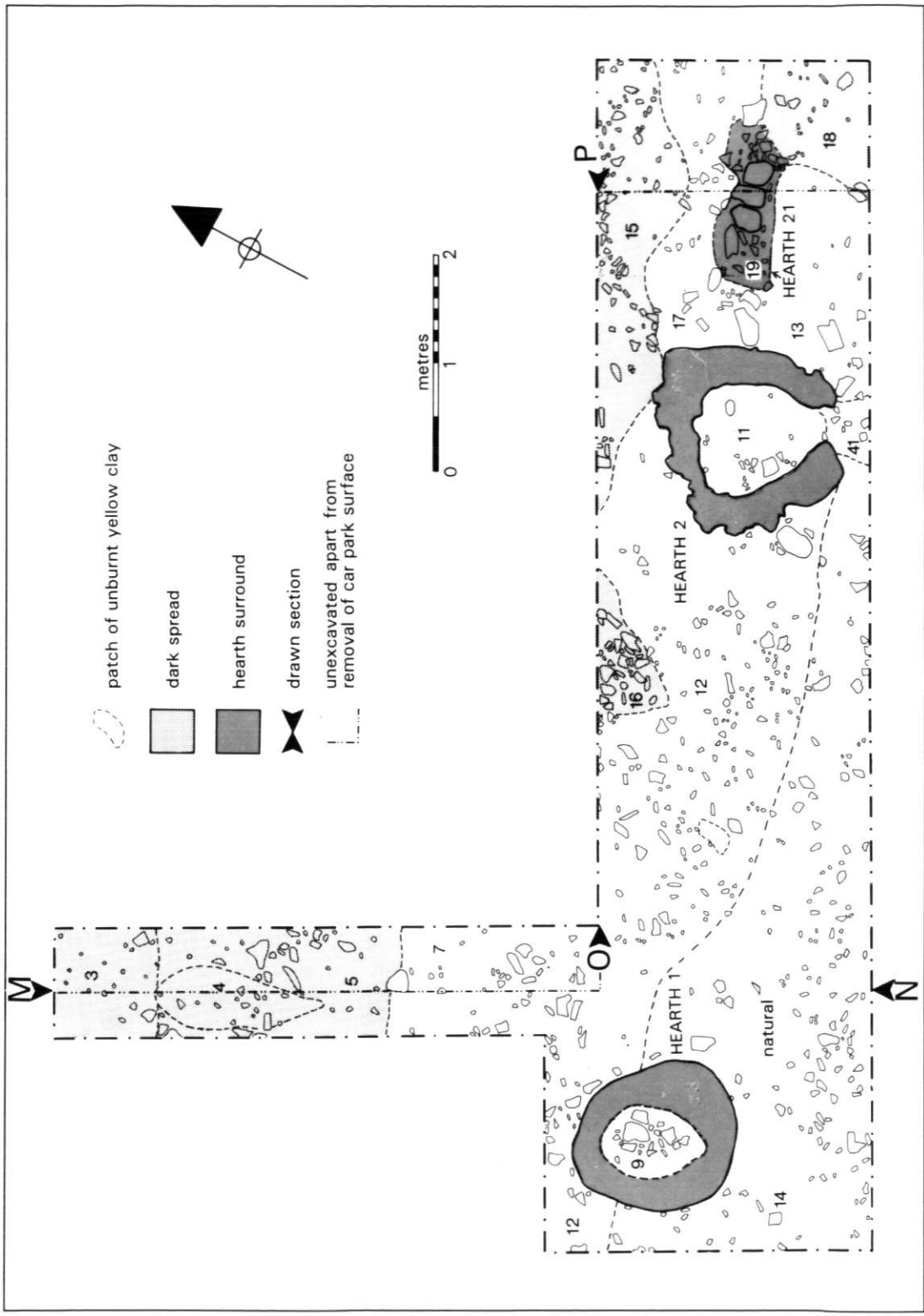


Fig 16 Plan of the excavation trench after removal of the car park surface—showing Phase 2 layers and spreads (Contexts [3]-[5], [7], [12], [15]-[18]); part of the surround of Phase 1 hearth [21] (Context [19]); and Hearths [1] and [2] (Phase 3), showing their surrounds (in outline only) and upper fills (Contexts [9] and [11]), with the upper fill [41] of Flue [40] also shown

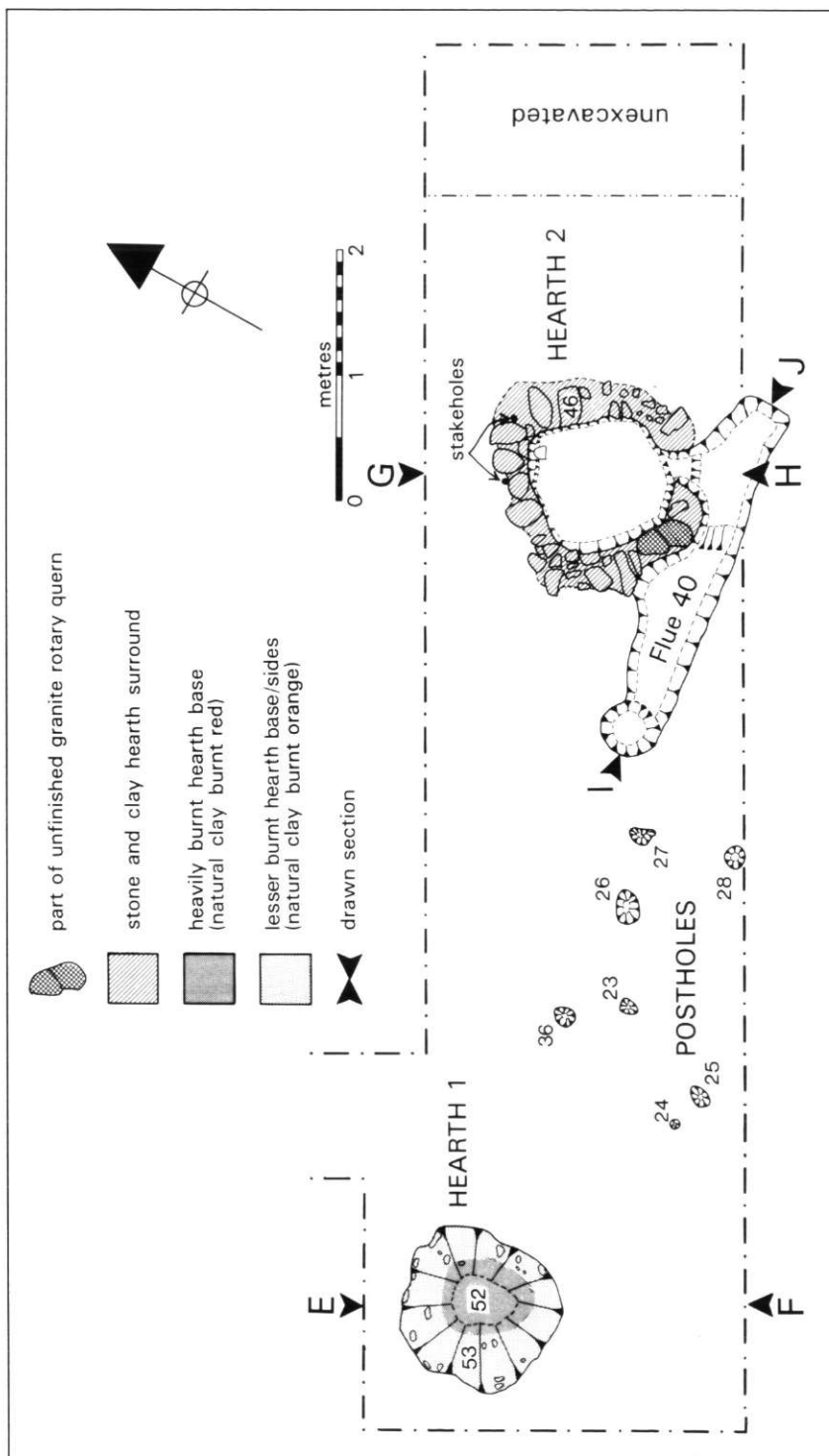


Fig 17 Plan of the main part of the excavation trench showing the early medieval, Phases 3 and 4, features—Hearths [1] and [2] (with Flue [40]) and the seven postholes



Fig 18 *Hearth [2] (Phase 4) and Flue [40] after excavation of their interiors*

piece of slate was found resting on top of Fill [39] and this may also be a collapsed part of the hearth structure. Apart from vitreous and clay lumps the only finds from Hearth [2] were animal bone and shell from Fills [11] and [43], and shell from Fill [39] and embedded in the burnt base of the hearth (Context [45]).

Flue [40] was filled with silty clay [42] containing charcoal, burnt clay and sand and occasional pieces of animal bone and shell, and single pieces of pottery and lead. Outside the opening of the hearth there was a markedly darker upper fill of sandy loam [41] containing similar finds to [42] except for the absence of pottery and lead.

Hearth [21]

Located at the landward, south-eastern end of the main trench (Figs 19, 20, 21 and 24), this feature was only very partially excavated, but on its south-east side it appeared to have a similar stone and clay surround to Hearth [2] (Context [19]). Two large stones set in clayey sand [61], visible in the trench section to the north-west, may also be part of this hearth surround. The Hearth was at least 0.5m deep and seemed to have roughly similar types of fills to the other two hearths. Towards its unexcavated bottom was a dark yellowish brown ash overlain by a powdery red clayey ash. These layers were apparently below a compacted hard layer of burnt and unburnt clay [55] which could be collapsed hearth structure. This in turn was overlain by a very sand clay [22] containing occasional charcoal flecks, burnt stone and clay,

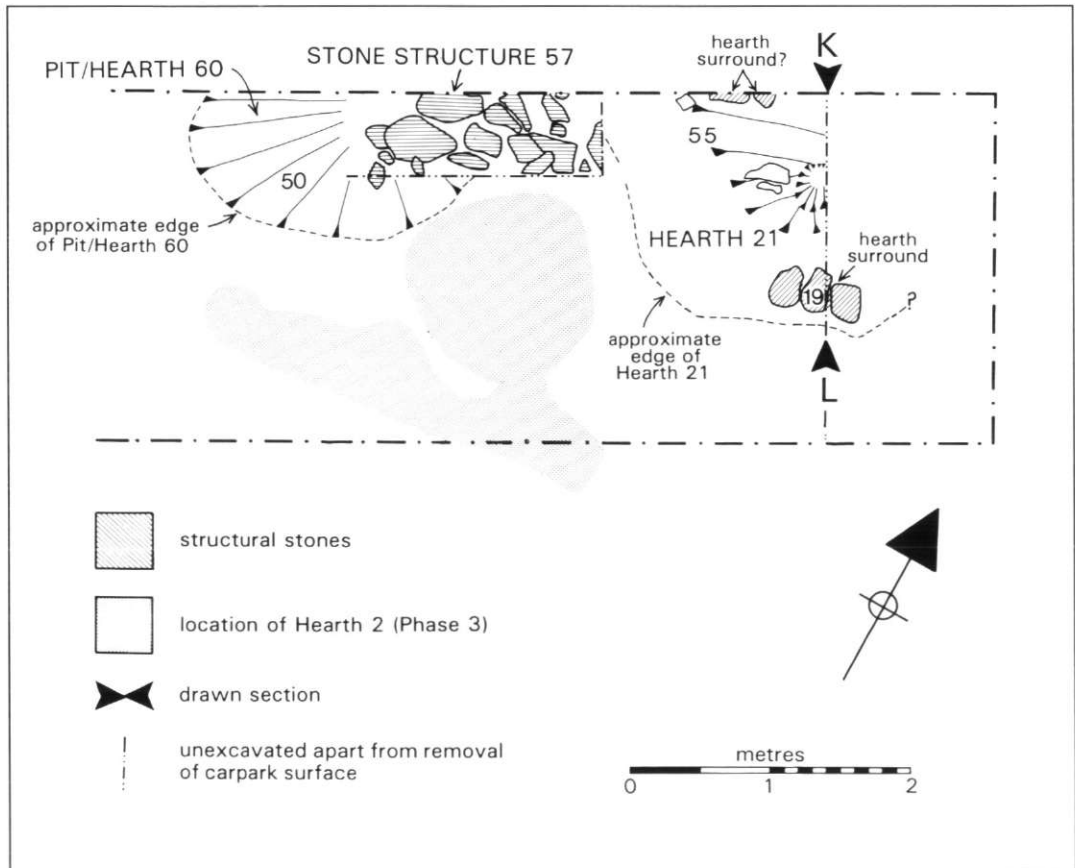


Fig 19 Plan of south-eastern half of the excavation trench showing partially excavated Phase 1, 3rd or early 4th century, features—Hearth [21], Stone Structure [57] and Pit/Hearth [60]



Fig 20 Partially excavated Pit/Hearth [60] and Stone Structure [57], looking towards Hearth [21]—photographed during the last hour of the excavation

pockets of ash, animal bone, shell and a copper alloy object which has been identified as a fingernail or toenail cleaner. Fill [22], like Fills [9] and [11] of Hearths [1] and [2] almost certainly accumulated after Hearth [21] went out of use. It is of different character to [9] and [11] but this is probably because it accumulated while there was still intensive activity in the immediate vicinity, while Fills [9] and [11] appear to represent a more gradual silting up process, perhaps after this part of the site had gone out of use (see below for dating evidence). Context [17] appears in section as the uppermost fill of [21] but extends beyond this hearth and is very similar to Layer [12], of which it is probably a south-eastern extension.

Pit/Hearth [60]

This feature was apparently oval in plan but since its north-west side lay outside the excavation trench (Figs 19 and 20) this could not be confirmed. Within the trench, the upper fill of the pit (Context [54]) was totally excavated but two lower fills ([50] and [62]) were only very partially excavated and the sides and bottom of the pit were not fully exposed (Fig 24). This meant that its form was not fully determined, which made interpretation of its function very difficult. From what was revealed it appeared to have gently sloping sides on its south-east and south-west and was at least 0.3m deep. Its upper fill, [54], consisted of a sandy clay containing numerous vitreous lumps and pieces of burnt clay, with lesser amounts of stone, pottery, animal bone, shell and copper alloy. It does not appear to relate to the use of the pit but rather represents infilling after it went out of use. In contrast, the character of the lower fills which line the sides and bottom of the cut suggest these are primary deposits—[50] was a layer of compacted ash and [62] a looser ash deposit apparently overlying [50], but possibly instead representing the lower extension of it. Since the deepest part of the pit was not excavated it is unknown whether other underlying fills existed—perhaps a basal layer of charcoal which would indicate that the pit had in fact been a hearth.

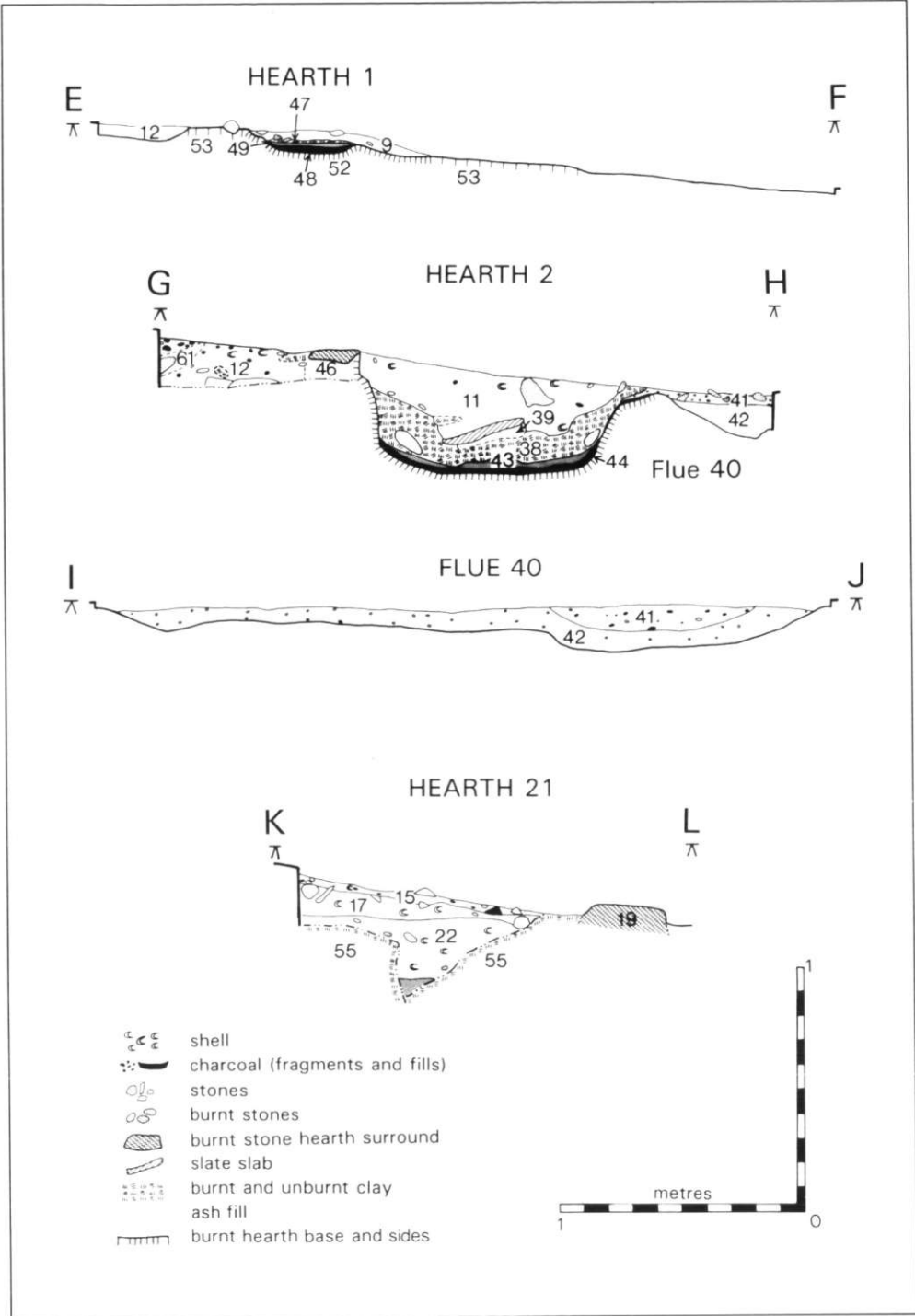


Fig 21 Sections across the hearths

Stone structure [57]

Within Pit [60], on its north-east side, was an enigmatic structure formed by overlapping slab-like stones in at least two roughly laid courses (Figs 19, 20 and 24). This feature was found on the last day of the excavation when only an hour of daylight remained, and as a consequence was only very partially exposed and not excavated. On the north-west side it could be seen to extend into the trench section. On the north-east it was continuing towards Hearth [21] and the strong impression gained was that it probably provided the connection between this hearth and Pit/Hearth [60] and that the three features may have formed part of a single complex.

The post-holes

These seven small holes of sub-circular or sub-oval plan were only 0.03-0.04m deep (Figs 17 and 22). However, they were located in the part of the trench where most of the archaeological deposits had been eroded away to reveal the underlying subsoil and it is likely that the post-holes were dug from a higher level and had originally been deeper. Five of the holes enclose a roughly rectangular area but it is impossible to determine what sort of structure (or structures) their posts supported—possibly one relating in some way to the use of Hearths [1] or [2] with which they may be broadly contemporary.

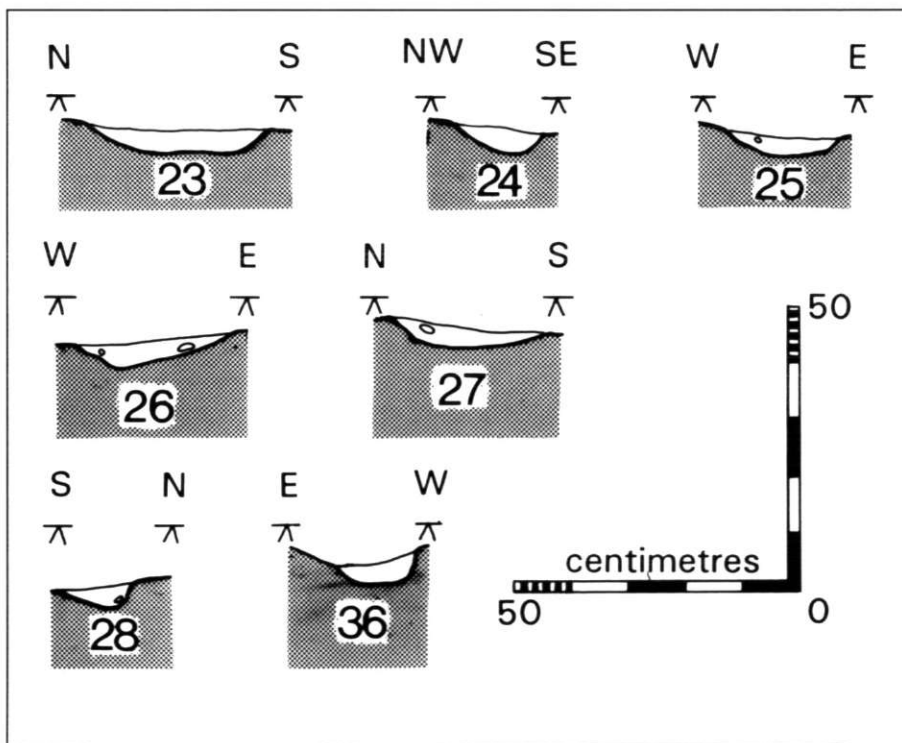


Fig 22 Posthole sections

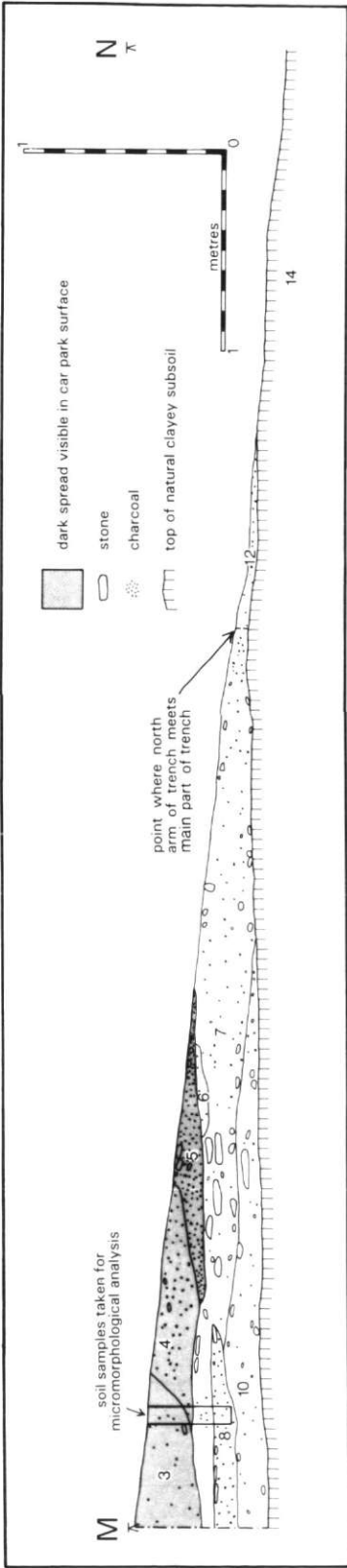


Fig 23 Section through the rubbish dump/burnt spread in the northern arm of the excavation trench (Phase 2, mid-4th century layers)

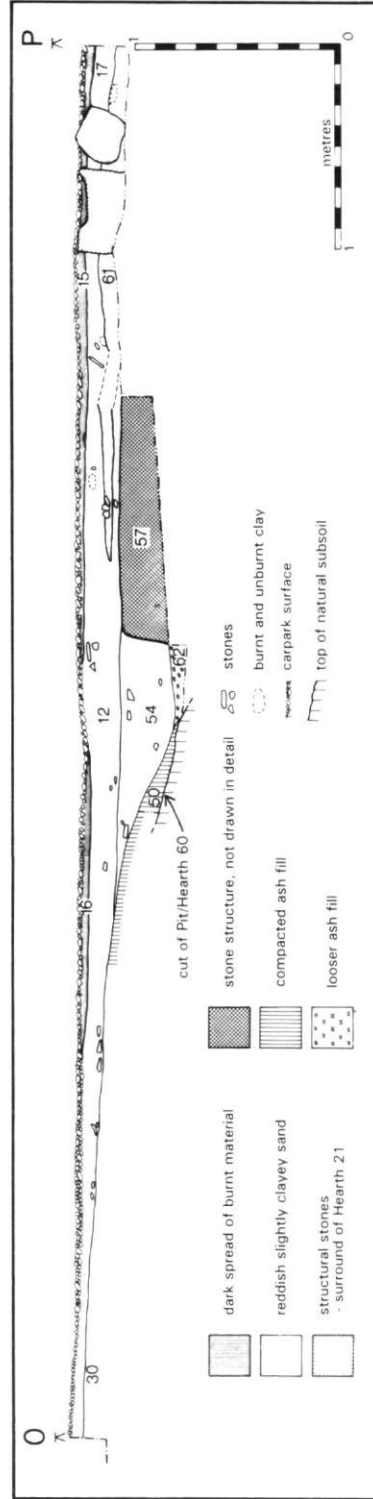


Fig 24 Section showing the partially excavated Phase 1 features (Hearth 121), Stone Structure [57] and Pit/Hearth [60]) and overlying layers

The main excavated layers

As Fig 16 shows, the most extensive of the layers excavated was [12] (also number [7] and [17] and probably also the same as [30] which seemed to represent the more compacted lower part of [12]). This sandy clay loam extended over all of the northern arm of the trench and over half of the main part of the trench, but not much along its southern side where it had either been completely removed or eroded very thin by the sea (Figs 16 and 23). Layer [12] yielded much of the artefactual, environmental and technological material collection during the excavation. Of generally similar character and also rich in finds were the layers which underlay and overlay [12] in the northern arm of the trench—Layers [3]-[6], [8] and [10] (Fig 23). These sandy loams and sandy clay loams appeared to form (together with [12]) a rubbish dump of both domestic and industrial waste—pottery, coins, bone, shell, copper alloy and iron objects, lead waste, burnt clay, charcoal and vitreous lumps. When first seen as a dark spread in the carpark surface, this dump was interpreted as a midden, but excavation revealed that the density of food and artefactual remains was not as great as would normally be expected in a midden and the presence of industrial debris also mitigates against such an interpretation. An additional, surprising, find in [12] was part of a human mandible from an adult female. Spreads containing charcoal and burnt clay also overlay [12] along the north side of the main trench (Layers [15] and [16]) and are an extension of the waste dump. Other layers recorded during the excavation were either natural ([56] and [14]) or unexcavated ([13] and [18]).

Dating of the excavated remains

Despite the small-scale nature of the excavation it has proved possible to phase and attach broad dates to the various excavated features and layers. From the stratigraphic evidence it was clear that four main phases of activity were represented and this was confirmed by the artefactual evidence and radiocarbon dates (Table 14).

Phase 1: The earliest activity was represented by Hearth [21], Stone Structure [57] and Pit/Hearth [60] which seemed to be interrelated. Two radiocarbon dates were obtained for [50], one of the primary ash fills of [60]. When calibrated to 95% level of confidence these dates provided ranges of cal AD 110-420 (0xA-5069; 1760 ± 60 BP) and cal AD 120-430 (0xA-5070; 1740 ± 60 BP). Statistical analysis of the dates suggests that the probability of the last event in [60] being later than AD 200 is 95% and, given the coin dates in Phase 2, a 3rd or early 4th century date seems likely for Phase 1.

Phase 1a: Contexts [22] and [54], which are the upper, post-use fills of Hearth [21] and Pit/Hearth [60], may belong to a separate phase (1a), but are more likely to be part of Phase 2, given that the only dateable evidence consists of a copper alloy toilet implement of probably mid to late 4th century date (from [22]) and two sherds of South Devon ware (from [54]) indistinguishable from those from Phase 2 contexts.

Phase 2: This phase was represented by Layer [12] and other layers making up the spread of domestic and industrial material which overlay the Phase 1 features (Fig 24). No radiocarbon date was obtained for this phase, but six bronze Roman coins found in Layers [12] and [30] form a tight chronological group dating to the 340's-360's AD. The pottery from Phase 2 layers is also considered generally to be of mid-4th century date. Contexts apart from [12] and [30] which belong to Phase 2 are [3]-[8], [10], [15]-[18], [20]/[15].

Phases 3 and 4: Hearth [1] and [2], which were cut into Layer [12], belong to these phases. Surprisingly, given that virtually all the artefactual evidence that has come from the site over the years has been of Romano-British date, the charcoal fills of these two hearths produced early medieval radiocarbon dates. When calibrated to 95% level of confidence the two dates obtained for Hearth [1] produced ranges of cal AD 780-1020 (0xA-5067; 1120 ± 50 BP)

and cal AD 670-960 (0xA-5068; 1210 ± 50 BP), and those for Hearth [2] produced ranges of cal AD 970-1170 (0xA-5065; 975 ± 50 BP) and cal AD 960-1160 (0xA-5066; 1005 ± 45 BP). The age ranges overlap but by statistically modelling Hearths [1] and [2] as separate phases, and comparing the probability distributions of the last events in Hearths [1] and [2], it has been calculated that the probability of Hearth [2] being later than Hearth [1] is over 95% (see Section 6.15). This suggests that it may be appropriate to see Hearth [1] as representing Phase 3 and Hearth [2] a later, fourth phase. The seven post-holes (Contexts [23]-[28] and [36]) located between Hearth [1] and [2] may be contemporary with either or both of these hearths, or are of earlier date. Apart from the odd find of burnt clay, undiagnostic vitreous material, shell and animal bone in the primary hearth fills, no stratified domestic or industrial debris relating to Phases 3 or 4 was found during the excavation. This is presumably at least partly due to coastal erosion having removed part of the site to the south and west of [1] and [2]. It is also probably the result of overlying layers having been scraped off either during the 19th century use of the site as a sand and stone depot or during the creation of the present car park. However, it is possible that early medieval remains survive a bit further inland in the adjacent unexcavated part of the site. Five unstratified sherds of 11th or 12th century pottery were found on the car park surface.

Phases 3a and 4a: The upper, post-use fills of Hearths [1] and [2] presumably represent phases subsequent to those during which these two hearths were in use (though Phase 3a, when Hearth [1] was out of use, may equate with Phase 4, when Hearth [2] was still in use). If the post-holes are contemporary with Hearths [1] or [2], their fills (Contexts [29], [31]-[37]) must also have accumulated during Phase 3a or 4a. In the absence of radiocarbon determinations it is difficult to precisely date Phases 3a and 4a. No dateable artefacts were retrieved from the Phase 3a contexts (Hearth [1], Fills [9] and [47]) or Fills [11], [38] and [39] of Hearth [2] (Phase 4a). A single sherd of pottery came from the main fill, [42], of Flue [40] which is part of Hearth [2]. However, this sherd is indistinguishable from the South Devon ware of Phase 2, which indicates that the find is residual.

In addition to the above phases, there is artefactual evidence, in the form of mesolithic flints, for much earlier activity on the site unrelated to the excavated features and layers.

3.2 Summary of the artefactual evidence (including pre-excavation material)

The aim of this section is to provide an easily accessible summary of the artefactual evidence retrieved. Detailed reports on all but one of the different artefact types are contained in Section 6. The exception is the very brief report on the glass which is only presented in the section below (though a catalogue of the glass is housed with the site archive).

The pottery

Pottery was collected from Contexts [7], [10], [12] and [30], with a single sherd each from [16], [42], [46] and [54]. In addition, there were a few unstratified finds. Sherds total 145 and comprise a single group, with no distinctive features differentiating the pottery from the various contexts. With the exception of six BBI sherds from Context [10] and two sherds of a fabric of unknown origin from [12], all the excavated pottery was made from granitic clay from South Devon. It appears all to have been deposited during a single short period in the mid-4th century AD. However, this observation may be revised in the future, given the limited nature of the excavation and the fact that the pottery assemblage was small and much fragmented. The latter is indicative of some activity on the site. Breaks were fresh and sherds were often burnt after breakage.

A greater quantity of pottery was found before the 1992 excavations. The 386 sherds recovered by Heard were also virtually all South Devon ware. Most came from the reused cordoned-ware storage jar. This large vessel, measuring 300mm across its base and 530mm high (without

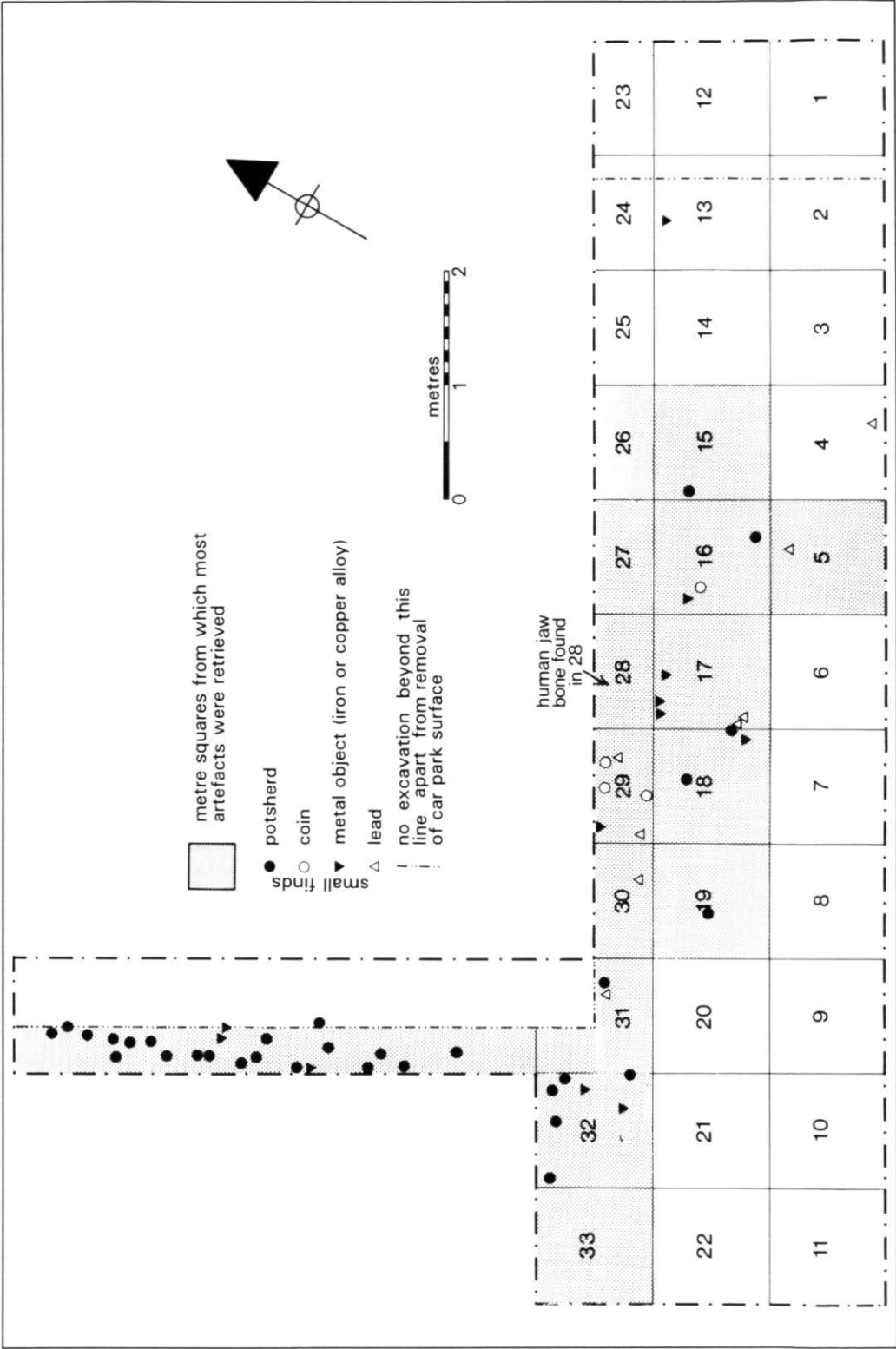


Fig 25 Plan showing the horizontal distribution of finds within the excavation trench. Virtually all are from Romano-British contexts

its rim), is not closely dateable but could be of the same 4th century date as the excavated material. The pot's very friable fabric and reddish interior with traces of blackening and a pale buff deposit indicate subjection to heat. The latter may be interpreted as the result of its reuse as an oven. However, the comparative absence of charcoal or soot has led Quinnell to suggest that during its final phase of use it contained heated water (see her pottery report below). Most of the other granitic sherds are plain but some have upright lattice decoration (as did a few excavated sherds), which on a couple of larger pieces can be seen as a band, bordered both top and bottom by tooled cordons (for example on the large cooking pot rim dateable to the 2nd-4th centuries found adjacent to the 'oven'). Eleven of the non-granitic sherds collected by Heard were modern tile or stoneware, but five (representing two fabrics) were Romano-British and a further five (all from one vessel) were medieval sherds of chert-tempered ware. Though petrologically examined these fabrics could not be sourced.

The Duckpool assemblage is the most northerly group of Roman pottery from Cornwall. The predominance of South Devon ware is important since it shows for the first time that this was a major fabric in North Cornwall and, by inference, North Devon during at least the late Roman period (pers comm Neil Holbrook). Previously there was no indication of what pottery, if any, was being used in these areas (*ibid*). The Duckpool pottery is also currently the most tightly dated assemblage of South Devon ware.

The coins

Six Roman coins (two fused together) were recovered during the excavation. These were all found in Layer [12]/[30], within a discrete, 3m by 2m, area between Hearths [1] and [2] (see Fig 25). Of bronze issue, they are all types commonly found on Romano-British sites and form a tight chronological group, all having been manufactured during the mid-4th century (340's to early 360's). Three were struck at the mint of Trier and the other three are 'irregular' coins produced in Britain to supply a dwindling currency.

The iron

Thirty pieces of iron were found during the excavation, but only seven identifiable objects came from secure contexts—a knife, part of two small hooks, five hobnails and three nails from Layers [7], [10], [12] and [16], which are all Phase 2 (mid-4th century contexts). The long-bladed, whittle tang knife and the hooks could have been used for gathering fuel, and the condition of the nails is consistent with them having been derived from timber broken up for firewood. The incorporation of wood and plant matter in the surface corrosion of the knife and hooks may indicate the presence of potential fuel in various stages of use in the deposits from which these items came. The excavation did not produce any direct evidence for iron smithing.

Though thirteen nails and two bolts were collected prior to the excavation, only one of the bolts (found close to Hearth [1], Heard's Hearth No 3) can be tentatively dated to the Roman period.

The copper alloy

Of the four copper alloy pieces recovered by excavation, only two were from secure contexts ([12] and [22]) and only one of these (from the post-use fill, [22], of Hearth [21]-Phase 1a or 2) could be identified as a definite object. This was a small decorated cast object interpreted as a toenail or fingernail cleaner, an attached unit in a group of toilet implements, which is an unusual find from a Roman period rural site in the South West.

Of the ten pieces of copper alloy found prior to excavation, the majority are probably modern, the exceptions being a couple of nails and what appears to be a triangular clasp, decorated with dot and ring motifs and probably of Late Saxon (8th to 11th century) date. This is apparently the first time such a motif has been found on an object from Cornwall. In Devon it occurs occasionally on objects, such as bone combs, of Post-Roman and Saxon date. The Duckpool

clasp came from the car park surface in the general area of Hearth [1], and if it is of 8th-11th century date it would fit in well with the dates for the final use of either Hearth [1] or [2].

The stone

Four stones collected during the excavation proved to be significant. The largest (now in four pieces) is a chunk of granite, which was built into the surround of Hearth [2] and appears to be part of an unfinished upper stone of a rotary quern. Another small piece of unworked granite probably originated from the same block/object. This piece came from Layer [12] which has a 4th century AD date, suggesting the incorporation of Romano-British worked stone into an early medieval structure (Hearth [2]). The granite is weathered material from a granite surface. It may have been transported from an inland source (perhaps as a partly finished object) or arrived as ballast from a coastal source such as the Land's End Granite. To some extent this also applies to the piece of stone found in Fill [54] of Pit/Hearth [60]—relatively soft altered elvan material, used for the manufacture of bowls and dishes (and some moulds—pers comm Neil Beagrie, Brown 1970) found at several Romano-British sites in the South West. The fourth stone is a probable whetstone consisting of an elongated piece of local sandstone, which is undated since it came from the surface of the burnt spread in the northern arm of the excavation trench.

A small piece of unworked elvan was found previously by Heard, together with a well-rounded granite pebble used either as a quern rubber or as ballast. Another interesting find was a few fragments of tuffaceous slate from the Tintagel Volcanic Formation, which outcrops on the coast between Boscastle and Tintagel. These could have arrived at Duckpool as chippings from ballast, but the date of their arrival is unknown.

The flint

Only one piece of residual flint was found during the excavation—a blade from Lye [10]. Together with the forty-five flints found previously by Heard, this is probably of mesolithic date and part of the general spread of such material around the north coast of Devon and Cornwall.

The glass (by Denise Allen)

Six unstratified fragments of glass were found by Heard prior to the 1992 excavation. Though all are probably modern, three pieces could possibly be Roman—two tiny green fragments (one unprovenanced, the other from the car park surface) and a brown fragment much distorted by fire which appears to have come from the area north of Heard's Hearth No 1.

3.3 Summary of the environmental evidence (including pre-excavation material)

Environmental evidence was hand collected (both during and prior to the 1992 excavation) and retrieved from the floats and residues of sieved soil samples. It includes animal bone, marine and land molluscs, plant macrofossils and charcoal. The environmental evidence is summarised below and reported on in detail in Section 6.

Animal bone

Though over half of the excavated fills and layers produced animal bone, by far the largest quantity came from Layer [12]. The vast majority of the excavated bone was of 2nd-4th century date. Most of the bone found previously by Heard appears to have come from two spreads of dark soil which also yielded Romano-British pottery. The assemblage is highly fragmented and as a result only a small fraction could be identified to species—203 (11.5%) of the 1758 pieces. The main animals present, in order of abundance, were cattle, sheep (possibly including some goat) and pig. Horse, red deer, dog, cat, hare and domestic fowl were also present in small numbers. The domestic species are typical of Romano-British sites in England. It was anticipated that as Duckpool was a coastal site the animal remains would include fish bones,

but, despite good preservation and recovery, none were found. Though eggshell was identified in the micromorphological soil samples, the only bird bones were the few from domestic fowl. The discovery of up to three wild species is relatively high for a site with a comparatively small sample. The results from the excavation and the earlier collection made by Heard are similar, with the possible exception of the lower proportion of pig in the latter. On the whole, the assemblage is consistent with what would be expected of domestic refuse, though the high fragmentation and proportion of burnt bone could be the result of an industrial process.

Nearly all of the small number of bones from early medieval contexts are tiny unidentifiable fragments and half of these were burnt. Only five could be identified to species (pig, cattle, sheep/goat).

Marine molluscs

By and large the contexts yielding shell were similar to those for the bone, with significant amounts from [12] and the other Romano-British layers making up the burnt spread, but the greatest quantity of shell came from a medieval context (Fill [11]), owing to the fact that much larger bulk samples were taken from this context than from any other. Mussels and limpets dominated the excavated assemblage, followed by flat periwinkle, dog whelk, purple top shell and smaller amounts of other species. On the whole there is little difference between Romano-British and early medieval excavated samples in terms of the shell species they contain, with the notable exception that dog whelks are virtually absent from samples from early medieval contexts. In contrast to the excavated material, Richard Heard's small (probably Romano-British) assemblage was dominated by dog whelks and contained very few other shells. However, rather than revealing any true difference, this is probably the result of highly selective collecting.

Like the animal bones, the marine molluscs appear, in general, to have been collected for food. However, there are a few species which must have arrived on the site as a result of wind blow, and the flat periwinkles were probably transported as a bycatch, the fucoïd seaweeds they live on being the thing that was being collected. The dog whelk is also not a food species and, interestingly, over half of the shells of this species had had their spires cut off, suggesting extraction of the purple dye from the gland of the animal inside (see Janice Light's report in Section 6.9 for a description of extraction and dyeing process). An enigmatic find was a fossil bivalve (*Venericardia*) from a 4th century layer ([7]), which may be evidence for early fossil-collecting.

Land molluscs

Large numbers of land snails were observed in the floats of the sieved bulk samples and burnt examples of four of the most common taxa from [44], the charcoal fill of Hearth [2], confirmed that these are directly associated with the archaeological remains. The assemblages from the different contexts (both Romano-British and early medieval) are all very similar and in general suggest a dry open environment similar to the short-turfed grassland in the immediate vicinity of the site today.

Plant macrofossils

Unsurprisingly, the plant macrofossils were largely confined to the layers making up the burnt spread and the primary (charcoal and ash) fills of Hearth [2]. Cereals, seeds and chaff were present but not abundant and only a small range of species was identified. The dominant component was oats, but it is not known whether wild or domestic varieties are represented. If they are domestic varieties, their discovery in Romano-British as well as medieval contexts is very interesting as oats are rare in southern Britain during these periods. Wheat and barley, also not closely identifiable to species, was present, as well as wild plants representing several habitats (arable, open waste ground and heathland) and providing additional information on the vegetation in the general vicinity of the site. The plant macrofossils suggest that plants

charred as a result of different activities have become mixed together as general domestic rubbish—the heath flora, for example, being used as tinder to start fires and the charred grain and weed seeds resulting from small-scale crop processing. There were no apparent differences between the types of crops exploited in the Roman and early medieval periods. Evidence for exploitation of heathland is only recorded in Phase 4, early medieval, deposits but on the basis of evidence elsewhere in Cornwall heathland was probably established in the area by the Bronze Age.

Charcoal

Charcoal, in the form of small fragments, was abundant in the sieved samples. Most of the wood was oak, but other taxa were also amongst samples identified for radiocarbon dating. The largest range came from early medieval contexts (oak, gorse or broom, alder, hazel and birch), while only oak and willow or poplar were identified in the Romano-British sample. All are native taxa collected from the local area for fuel or construction purposes.

Soil micromorphology

Micromorphology samples collected from Phase 2 Layers [3], [4], [7] and [8] in the northern arm of the excavation trench showed these layers were essentially similar in character and the latter was consistent with the dumped nature of these deposits.

3.4 Summary of the technological evidence (including pre-excavation material)

The technological material examined included lead and lead-tin metal blobs and dribbles, fired or burnt clay fragments, slags and other vitrified material, a single crucible fragment and a few pot sherds with white residues. Apart from the burnt clay, which was found in most layers and fills, and the, probably residual, single piece of lead from Fill [42] of Flue [40], all the stratified material came from Romano-British contexts, with no finds from the primary or post-use fills of Hearths [1] and [2]. Layers [12] and [30], and Fills [50] and [54] of Pit/Hearth [60] yielded most of the excavated technological data. Unstratified material was also collected by Heard (from both Areas A and B) prior to the excavation, including the crucible fragment. Owing to its similarity to the excavated material and the fact that it appears to have eroded out of similar, if not the same layers as the latter, it is probably safe to assume Heard's material is also Romano-British. The crucible fragment could possibly be of later date, given that no comparable remains were found in securely dated Romano-British deposits, but is probably contemporary with the rest of the metal-working debris.

Despite the substantial structural evidence, the quality of technological debris was relatively small when compared with other contemporary sites, and unfortunately much of it is ambiguous and not diagnostic of any particular 'high-temperature' process. However, some specific activities were identified. The lead and lead-tin dribbles suggest lead and pewter-working (or the use of solders—pers comm Neil Beagrie and Beagrie 1989, 183), and the potsherd residues tested lead-rich indicating that these sherds were probably from vessels used for melting lead and possibly lead-tin alloys. Ten of the lead dribbles were found in [50], one of the primary fills of Pit/Hearth [60], which suggests that this feature (and perhaps also stone structure [57] and Hearth [21], with which it was apparently associated) was used for lead and pewter working. The corrosion on the crucible fragment indicates melting and casting of a zinc-containing metal alloy (probably a copper alloy).

There is no evidence for cupellation, this having been suggested as a possible activity in the interim excavation report (Ratcliffe 1992). Cupellation is the extraction of silver from a lead-rich compound. The silver-containing lead is melted in a ceramic hearth or clay container, lined with crushed bone ash. The lead forms litharge (lead oxide blocks) and the silver is left behind as a metal button. No litharge cakes were found at Duckpool.

4.0 DISCUSSION

4.1 The character, date and function of Duckpool

Essentially, the structural remains at Duckpool consisted of a series of hearths, perhaps as many as six if Heard's longitudinal pit and Pit/Hearth [60] are included. These varied in character, being oval, square or rectangular in plan, shallow scoops or up to 0.40m deep, with vertical or sloping sides and with or without a stone surround, flue or evidence for a clay roof or superstructure.

Chronologically and stratigraphically the excavated hearths fall into two groups—those dating to the 3rd or early 4th century AD (Phase 1), which were overlain by Layer [12], and those dating to the 7th to 12th centuries AD (Phases 3 and 4) which were cut into this Layer. Hearth [21] and Pit/Hearth [60] belong to Phase 1, while Phases 3 and 4 are represented by Hearths [1] and [2] respectively. An intermediate phase of activity (Phase 2) is represented by a series of layers (including Layer [12]) forming a burnt spread dating to the mid 4th century AD. The dating evidence suggests continuity between the two Romano-British phases (1 and 2) and probably also between the two early medieval ones (3 and 4), but it appears that there was a break in activity at the site of at least two hundred and fifty years between the two chronological periods. However, given the limited extent of the 1992 excavation it is possible that remains relating to the intervening centuries survive unexcavated in another part of the car park. Equally such remains may have already been eroded away by the sea. The third possibility is that they were amongst those investigated by Heard in Area A. The spread of burnt material in this area yielded South Devon ware similar to that from the Phase 2 (mid-4th century) layers in the excavation trench, but a later date can presumably be ascribed to the features which were apparently cut into this spread—Heard's Hearth No 1, his longitudinal pit/hearth and his oven may be early medieval features broadly contemporary with Hearths [1] and [2]. Of equally uncertain date are the seven post-holes located between Hearths [1] and [2], although they appear to be associated with the later phases of activity on the site.

Romano-British Duckpool

Though all the Romano-British structural remains relate to Phase 1, most of the diagnostic evidence for this period came from the Phase 2 layers making up the burnt spread which extended over much of the excavation trench. These layers (and those forming the apparently contemporary burnt spreads identified by Heard in Area A) contained domestic debris (pottery, metal tools, animal bone and shells of edible marine molluscs), but this did not form a distinct midden. Also present was material clearly derived from specialist industrial activity (lead, potsherds with lead-rich residues and a crucible fragment). The hearth(s) this material related to were not found during the excavation. They either survive unexcavated inland or have already been eroded by the sea.

The mixture of domestic and industrial material within the layers is puzzling and the circumstances under which they were formed are unclear. However, the following scenario is suggested: the domestic debris initially accumulated around a contemporary hearth(s) and was subsequently scraped up, together with industrial waste generated by the use of the hearth(s), and redeposited in the part of the site excavated in 1992. It is unclear whether each of the layers making up the burnt spread signifies a single 'scraping up' event or whether they represent separate phases of hearth use during which the hearth(s) were cleaned out more than once. Either way the homogenous character of the artefact assemblage indicates that all this material was probably redeposited over a relatively short period of time (during the mid 4th century AD).

The pottery assemblage was much fragmented, but breaks were fresh suggesting that when initially deposited the sherds were not lying around long enough to become worn or trampled. However, many sherds had been burnt after breakage and, some had lead-rich residues on their interior surface indicating that they had been used or reused as part of the industrial process. The fact that the iron knife from Layers [7] and [10] had broken into small pieces is another unusual feature of the domestic assemblage. The marine molluscs appear to have been primarily

collected for food, and the animal bone assemblage is consistent in many respects with what would be expected of domestic refuse. However, the bone was highly fragmented and burnt and appeared to have been affected by the industrial activity and processes of redeposition taking place at the site. Some of the shells were also charred. The presence of part of a human mandible in Layer [12] adds to the general impression of material having been disturbed subsequent to its initial deposition. It also suggests that there was a contemporary (or earlier) cemetery in the vicinity, which may still survive inland or have already been eroded.

Whatever the explanation for the mixture of industrial and domestic debris, the latter provides evidence for people living and subsisting on or close to the site as well as being involved in industrial activity. Domestic species common on Romano-British sites were identified amongst the Duckpool animal bones and the presence of bones of a very young calf is possible evidence for the rearing of stock at the site. Wild mammals were being hunted, shellfish and seaweed collected from the foreshore, but apparently no fishing took place since no fish bones were recovered, despite the good preservation of bone on this site. Barley, wheat and possibly oats were eaten by Duckpool's inhabitants. They were not grown in the immediate vicinity of the site, since there is no evidence that the coastal rough ground in which it is located was ever cultivated, but probably within the anciently enclosed farmland just inland of this. There was no positive evidence for the occupation of Duckpool having only been on a seasonal basis, which was one of the suggestions made prior to the excavation, but equally the evidence does not discount this possibility. Duckpool's exposed location provides an argument against occupation during the winter months, though, of course, during Roman times the site may have been more sheltered by virtue of the fact that it was located further inland, sea level rise and coastal erosion having resulted in its present beach-top situation. Despite the Phase 2 domestic debris, no Romano-British dwellings or other domestic buildings were recorded, either before or during the excavation. However, the lack of such structures must be viewed in the light of coastal erosion and the fact that only a small area of the surviving part of the site was excavated in 1992. The possible reuse of the cordoned ware storage vessel as an oven suggests domestic activity. The exact date of this reuse is uncertain, but it could have been within the 4th century AD.

Most of the technological debris is only indicative of non-specific high temperature processes. Material of this kind (charcoal, fired clay, vitrified hearth or furnace lining, compacted ash and fuel ash slag) has been found at other Cornish sites where there is evidence for metal working (for example, Castle Gotha and Reawla—Bayley 1982, 1992a). Though it need not have a metallurgical origin, its occurrence with diagnostic metal working debris suggests that this may be the case.

From the small amount of diagnostic technological material found at Duckpool it is clear that melting and casting of lead, pewter (and cobby alloy?) was taking place here. Most of the diagnostic material was found in Phase 2 (and 1a) layers and fills and, therefore, unrelated to the excavated Romano-British industrial structures. However, lead dribbles were also found in one of the primary ash fills of Pit/Hearth [60], indicating that this feature (and perhaps associated Stone Structure [57] and Hearth [21] was used in the production of lead and pewter objects. There are no moulds or wasters to indicate the form of the finished products of the Duckpool metal working. Presumably pewter table ware, so popular during Roman times, could have been made here, but there is no definite evidence for this. Though the residue on the crucible fragment indicates that copper alloy objects were being cast, it is very unlikely that the highly exotic finger or toe-nail cleaner was made at Duckpool. It is more likely to reflect the wider external contacts made by Duckpool's inhabitants and, since it had broken away from the group of toilet implements to which it was originally attached, this object was probably brought to the site as part of a load of scrap for recycling.

Metal working is not the only industrial activity identified at Duckpool. There is also evidence for the extraction of dye from dog whelks. Known as Tyrian Purple, this dye is extracted by careful removal of the spire of the shell to allow access to the dye-containing gland within.

Enormous numbers of dog whelks are needed to produce dye in a large enough quantity to be workable, but although the Duckpool sample was very small, over half of the shells had been cut in the distinctive way associated with dye-extraction and it appears likely, therefore, that they were collected for this purpose. Evidence of this kind is very unusual and, as far as the author is aware, is not known from any other Romano-British site in Cornwall or Devon.

On present evidence, Romano-British Duckpool can be interpreted as a settlement site whose inhabitants were involved to some degree in subsistence farming, hunting, gathering and dye-extraction, but at which secondary metal working was perhaps the main economic activity. Semi-finished metal products, in the form of lead, tin and copper ingots and scrap would have been imported to the site for casting into lead, pewter and cobby alloy objects, which were then presumably transported to local markets. These industrial processes are not unusual—small-scale metal working is fairly common and lead, tin and bronze working is recorded at other excavated Romano-British rural sites in Cornwall (Reawla—Appleton-Fox 1992; Carvossa—Carlyon 1987; Goldherring—Guthrie 1969; Castle Gotha—Saunders and Harris 1982). In addition, a Roman pewter-bowl mould was found in St Just in Penwith (Brown 1970) and pewter vessels have come from other sites in the county (Beagrie 1989). The absence at Duckpool of any definite evidence for iron working may be taken as unusual since it was a relatively common activity at other Romano-British sites (Reawla—Appleton-Fox 1992; Carvossa—Douch and Beard 1970; Carlyon 1987; Carlidnack—Harris and Johnson 1976; Trevisker—ApSimon and Greenfield 1972; Castle Gotha—Saunders and Harris 1982; Goldherring—Guthrie 1969).

However, what really sets Duckpool apart from the typical Romano-Cornish rural settlement is a combination of its unusual location and the apparent emphasis given to industrial activity. Instead of being located on gently sloping land within a contemporary field system, the site was on a valley bottom near to the coast, and unlike other sites where metal working has been recorded this activity does not appear to have taken place within an enclosed settlement or adjacent to any recognisable house structures. These two factors suggest that Duckpool was a specialist site, similar to the broadly contemporary saltmaking sites of the Lizard peninsula (Peacock 1969, McAvoy 1980), and that its location was determined by its specialist function. The valley-bottom situation adjacent to a good-sized stream would have provided an ample supply of fresh water for use in the metal working processes, as well as easy access to woodland for the fuel needed to fire the hearths. Proximity to the sea would have allowed the Duckpool metal workers to use coastal trade as a means of importing the necessary raw materials (and perhaps exporting at least some of their finished products). The cost of transportation was an important factor in the location of Romano-British industries (Cleere 1982, 125), for heavy goods in particular, sea transport would have been considerably less expensive than that over land or even that by inland water-ways (Duncan-Jones 1974, 366; Peacock 1978, 49). It should also be considered that Duckpool may have had a more general function as a small harbour serving its immediate hinterland and that associated with this role may have been other industries or processes in addition to the metal working and dye extraction already detected.

Early medieval Duckpool

Both hearths that were fully excavated in 1992 (Hearths [1] and [2]) relate to this period. However, none of the diagnostic technological debris retrieved during the excavation came from either the primary or post-use fills of these hearths. A single piece of lead was found in the main fill of Flue [40] which is part of Hearth [2], but a residual sherd of granitic pottery indistinguishable from the mid-4th century South Devon ware from Phase 2 was also found in this fill, making an early medieval date for the lead unlikely. However, it is difficult not to see Hearth [2] as having had some sort of industrial function given that it is almost half a metre deep and has vertical sides, a flue, a stone surround and a clay superstructure. Similarly, Heard's Hearth No 1 and longitudinal pit/hearth (which may also be of early medieval date) do not have the appearance of domestic features. In addition, no early medieval house remains

were identified at Duckpool. Nor was there definite evidence for any other sort of building, though the seven post-holes revealed by the excavation must represent the remains of some sort of wooden structure, and remnants of stone paving and possible stone walling were discovered in Area A. However, the date of all these features is uncertain.

Understanding of the character and function of early medieval Duckpool is made difficult by the fact that no occupation layers of this date were found during the 1992 excavation. These and any overlying layers appear to have been removed either during the 19th century use of the site as a sand and stone depot or by the creation of the present car park. Since its discovery, only six artefacts of early medieval date have been recovered from the site, all from the car park surface in the vicinity of Hearths [1] and [2]. These consist of five sherds of 11th-12th century chert-tempered pottery and an 8th-10th century copper alloy clasp decorated with a dot and ring motif. The latter is the first object with such a decoration to be found in Cornwall, and the presence of such an unusual artefact is probably a reflection of the wider external contacts afforded Duckpool by virtue of its coastal location.

Whatever the nature of the industrial activity being carried out at Duckpool during early medieval times, it is clear that, as in the Romano-British period, its primary function was not agricultural but related to the site's coastal location and access to the resources of sea and coast.

4.2 Duckpool in its local setting

Romano-British

Settlements in the general vicinity of Duckpool which may be broadly contemporary with its Romano-British phases are located in Fig 26. These consist of a series of enclosures identifiable as earthworks or cropmarks, which are potentially of Iron Age or Romano-British date. The nearest two are a spur enclosure and a round in close proximity to each other about 2 km (1 mile) up the valley from Duckpool, in Stowe Woods. The Romano-British settlement pattern was probably much denser than the distribution of the recorded enclosures suggests—it is likely that many of the medieval settlements shown in Figure 26 are on the site of Romano-British ones and further sites may await discovery by air photography or other methods.

Since there has been no excavation of any other Romano-British site in the area (and no parallel to Duckpool is known elsewhere in Cornwall or Devon), it is difficult to discuss in any detail how Duckpool may have functioned within the local social and economic structure of that period. The apparently small-scale nature of the metal working being carried out at the site suggests that the finished products were for local consumption rather than any wider market. Duckpool may have been no more important in terms of status than other settlements in the area, but its inhabitants were probably more involved in specialised industrial activities.

Early medieval

By the late medieval period the countryside inland of Duckpool was populated by an even scatter of farms and hamlets located mainly on the upper slopes of valleys or heads of streams amongst contemporary fields systems (Fig 26). It is probably safe to assume that a similar settlement pattern existed during the early medieval period when Duckpool was still in use as a small harbour settlement. Despite its contrasting location and function, like the surrounding farming settlements, at the time of the Norman Conquest and before, Duckpool must have worked within the manorial system. It may have been connected with the Manor of Lee, centred on the present farm of this name which lies less than 3 km to the east-north-east. However, it is more likely that it was under the control of Kilkhampton, a royal manor and one of the most valuable in Cornwall (Thorn and Thorn 1979, 1.5).

There is an earlier reference to Kilkhampton than the Domesday Survey—a 12 hide estate at Kilkhampton was granted by King Egbert of Wessex to Sherborne Abbey some time between 815 and 839—and though this is only a grant of land, there would presumably have been a manorial/estate centre (Hooke 1994, 16). Duckpool's role may have been to supply this centre

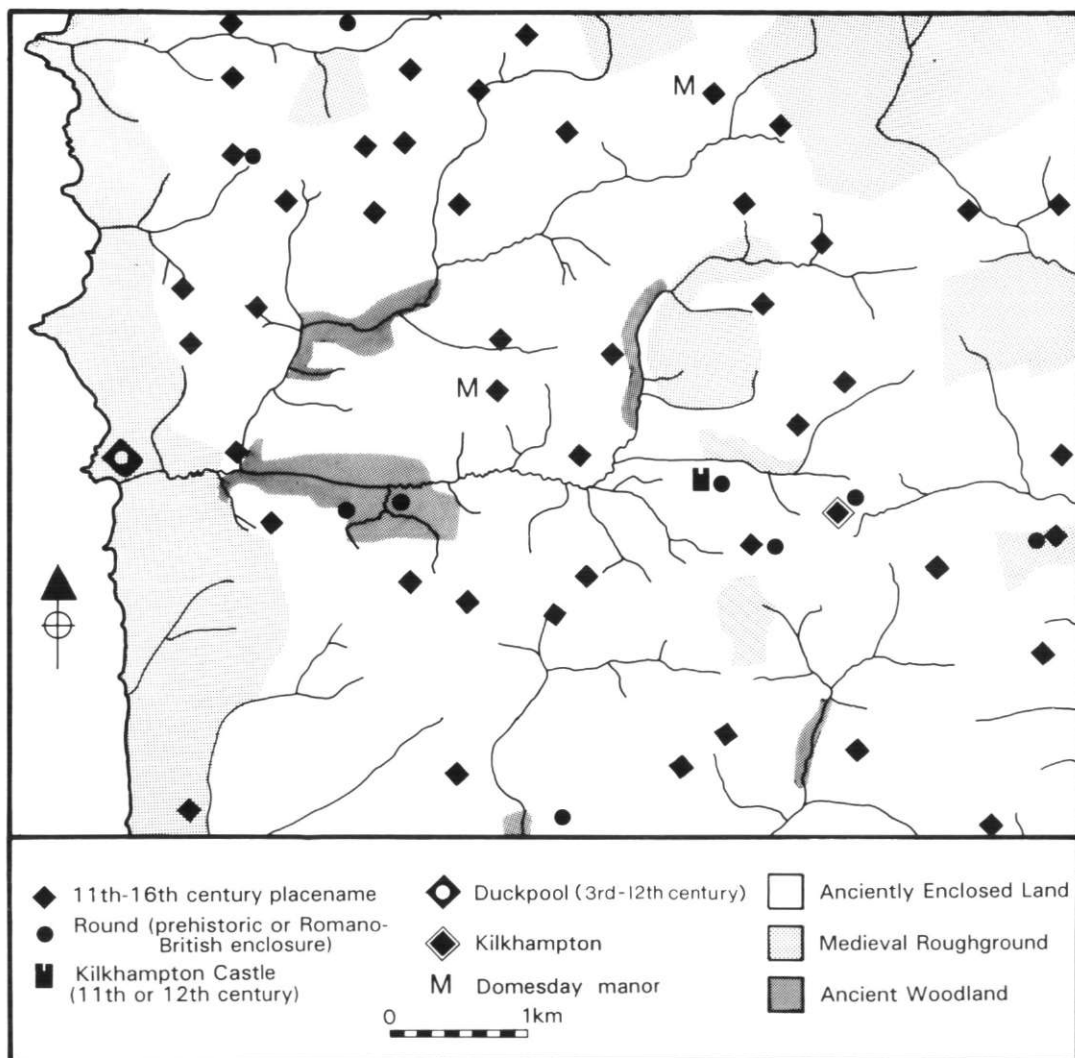


Fig 26 Duckpool in its contemporary local setting; compiled using archaeological evidence, the Institute of Cornish Studies Placename Index and the historic landscape types and zones maps produced as part of the recent Cornwall Landscape Assessment (Countryside Commission 1996). (Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Cornwall County Council LA 076538/97/05)

with manufactured and/or imported goods, but it is difficult to predict the commodities that were being supplied or the exact nature of the relationship between the two sites. There is no documentary record for the early development of Kilkhampton as a market and town; all that is known is that at the beginning of the 14th century it was claimed that it had long been an important market with three annual fairs (Sheppard 1980, 73). Duckpool appears not to continue beyond the 12th century. It could be very tentatively suggested that the demise of Duckpool is related to the development of Kilkhampton as a market town. What may also be suggested is that the medieval development of Kilkhampton occurred by virtue of its ridge top location on a major east-west land route, rather than as a result of coastal trade. This would

explain why the increasing prosperity of Kilkhampton did not stimulate any further development of Duckpool, especially if some of its specialist activities had been taken over by Kilkhampton.

4.3 External trade and contacts

Romano-British

During the Roman period Duckpool's external contacts would presumably have at least partly been associated with the need to import semi-raw materials for the metal working being carried out at the site—lead, tin (and copper?) in the form of ingots or scrap. The nearest major source of mined lead was the Mendips, but a closer source may have been Coombe Martin, near Ilfracombe on the North Devon coast (pers comm Adam Sharpe). Tin ingots could have come from either Bodmin Moor or Dartmoor (Duckpool is roughly equidistant from the northern edge of both moors), or from other mineral rich areas in Cornwall and Devon. A local source of tin is unlikely since although in more recent centuries small mineral outcrops have been exploited in the vicinity Northcott Mouth Mine and Wheal Morwenna were located 2.5 km (1.5 miles) to the north and south of Duckpool respectively—this was never an important mining area. Copper ingots could have come from a South Western source, but since no such source has yet been identified for the Roman period, they may have been derived from further afield, for example from south west Ireland. Sources of scrap metal may presumably have ranged from being very local to much more distant.

In addition to trade directly associated with metal working, other materials were also brought to Duckpool. All the pottery found is imported, the majority from the Dart Valley in South Devon and a few black-burnished ware sherds from the Poole harbour area of south-east Dorset. Granite and elvan were also imported (as semi-finished objects or unworked pieces of stone) probably from where these rocks outcrop along the north Cornish coast. The Roman coins found at Duckpool suggest it had wider external links than many other rural sites in Devon and Cornwall, at which such finds are extremely rare (Neil Holbrook pers comm). The iron objects found may have been manufactured close to mine sites on Exmoor or in the Brendon Hills, but, on the basis of excavated evidence from elsewhere in Cornwall, were probably made at contemporary nearby settlements.

Coastal trade is likely to have been the most common form of long distance external contact, particularly when heavy materials such as metal and stone were being imported. Thomas has used the distribution of imported Mediterranean pottery to suggest a post-Roman seaborne trade route along the north coast of Cornwall from North Africa to the Severn Estuary (Fig 27, route 1; Thomas 1993, fig 77, route 1), and given the demand for Cornish tin, this route probably also existed in the late Roman period. Duckpool could have tapped into this trade route or, more probably, into more local trade that must have occurred along the north coasts of Cornwall, Devon and Somerset. Duckpool's involvement could have been direct or, perhaps more likely, indirect via sites such as a possible Roman period harbour at the mouth of the River Camel (Padstow?) or Tintagel, located only 32 km (17 miles) down the coast and thought by Thomas to have possibly functioned as an official trading centre during the 3rd and 4th centuries and a royal citadel (a centre of power, tribute and exchange) during the post-Roman period (Thomas 1993, 82-99). The presence at Duckpool of fragments of tuffaceous slate from the coast around Tintagel and the recent identification of South Devon ware amongst the Romano-British pottery from Tintagel (see Quinell in this report) may be tentative evidence for a connection between the two sites.

Long or short distance overland contacts west into Cornwall or east into Devon may have been provided by a Roman road(s) passing relatively close to Duckpool. The presence of two Roman milestones at Tintagel has led Thomas to argue the existence of a Roman road running along the north coast from a port at Padstow to Stratton and then inland to Exeter (Fig 27, route 2; Thomas 1993, fig 66). Todd favours a route running from Exeter up the Creedy valley, due west to the northern flank of Dartmoor and up the valley of the River Okement to follow the line of the present A30 into Cornwall (Fig 27, route 3; Todd 1987, 218). Excavation and

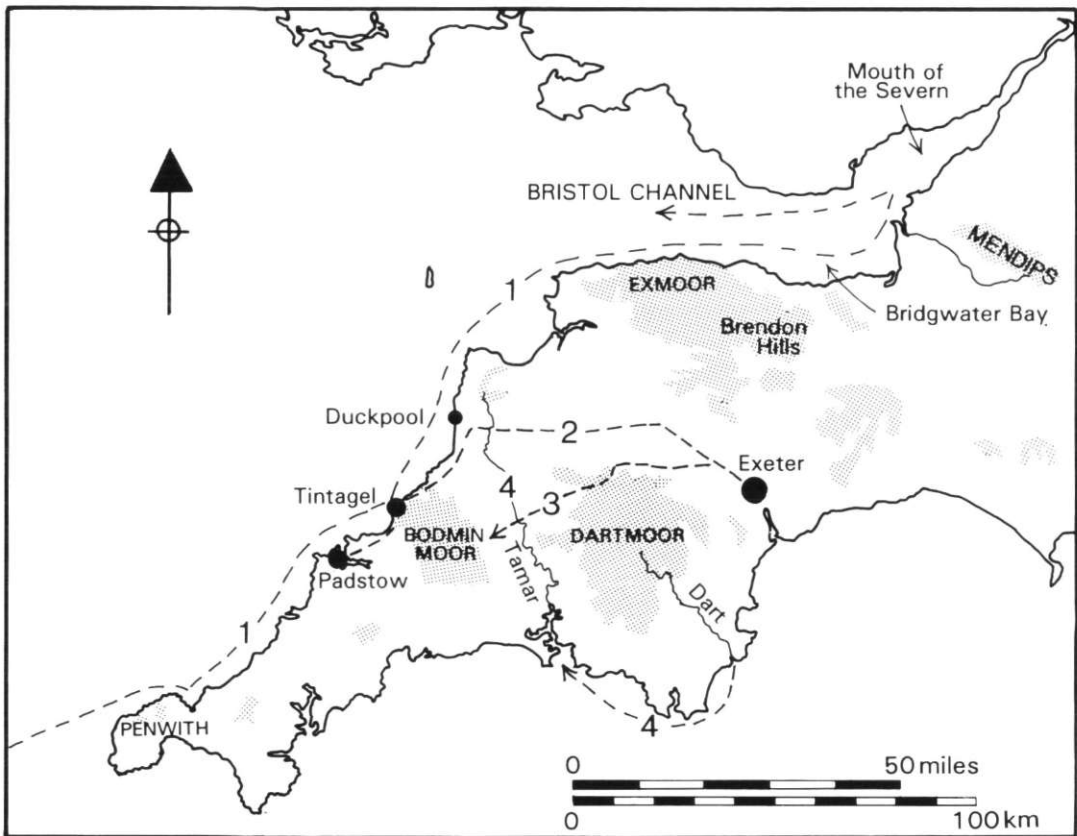


Fig 27 External trade and contacts: 1. Thomas' post-Roman north coast trading route; 2. Thomas' postulated Roman road; 3. Roman road route favoured by Todd; 4. Possible transportation route for South Devon ware. (Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown Copyright. Unauthorised reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings. Cornwall County Council LA 076538/97/05)

air photography have confirmed the existence of the latter road as far as Okehampton (pers comm Neil Holbrook). Thomas' route if it existed, is unlikely to have been a formal metalled road, except for its eastern end where it utilises the line of the present Exeter-Barnstaple road (*ibid*).

Duckpool lies only a short distance (8km, 5 miles) from the upper reaches of the River Tamar which would have provided a direct link with the south coasts of Cornwall and Devon, and also the Roman road proposed by Todd which would have crossed the Tamar near Launceston. The most efficient way for South Devon ware to have been transported to Duckpool would have been by sea from Dartmouth to Plymouth Sound (where South Devon ware is well represented at Mount Batten—pers comm Neil Holbrook), up the Tamar and then overland to the site. However, this presupposes that the pottery was being supplied direct to the site or at least the area and does not take account of more general networks for the supply of ceramics and other commodities which may have existed in rural Devon and Cornwall at this time. Special arrangement for the provision of South Devon ware may have been made, for example if its granitic fabric was found to be particularly suited to the metal working or other processes being carried out at Duckpool. However, its presence at the site is more likely to be the result of relatively low level, down-the-line trade as opposed to a commercial trading venture (*ibid*).

If South Devon ware is identified at other sites in North Devon or Cornwall (as it has tentatively already been at Tintagel and Widemouth Bay), a supply route involving transport by sea right around the peninsular or overland through Devon may seem more likely.

Early medieval

Owing to the dearth of artefactual evidence for the early medieval occupation at Duckpool, it is difficult to say much about the site's external contacts during this period. The five sherds of pottery found were of a chert-tempered fabric found in East Devon and South Somerset from the 9th century, in Exeter until the 13th or 14th centuries and in East Cornwall and North Devon during the 11th and 12th centuries. The source of this pottery is unknown but it seems likely that it arrived at Duckpool as a result of coastal contacts with North Devon or Somerset. The only other early medieval artefact, the copper alloy clasp with a dot and ring motif paralleled on various objects found in Devon (but not in Cornwall), probably also arrived via this route.

4.4 A topic for future research

The Cornish coast is indented by numerous coves and harbours (*porth* in Cornish: Padel 1985, 190-2), most of which are more or less suitable for the landing of boats. Some have become the sites of fishing villages and harbours, others have remained undeveloped. Duckpool is very important in raising questions about the archaeology of porths and the origin of Cornwall's coastal settlements.

It is interesting to speculate how common sites such as Duckpool were in Romano-British and early medieval Cornwall (and Devon). Would every porth close to an important inland centre have had such a site and, if so, does Duckpool give an indication of the earlier character and function of many modern coastal settlements (for example, Bude, which could have functioned as the harbour for the borough of Stratton)? This represents a valuable area for future research and a useful first task would be to draw up a check list of both developed and undeveloped porths which may have performed a similar role to Duckpool.

5.0 POTENTIAL FOR FUTURE WORK AT DUCKPOOL

There is considerable potential for further work at Duckpool. Owing to lack of time several major features identified in the 1992 excavation trench were only very partially excavated and as a result are little understood. These include Pit/Hearth [60], Stone Structure [57] and probable Hearth [21]. All three could be seen to extend beyond the northern side of the trench, beneath the burnt spread which covered most of the western bay of the car park, and it seems likely that further structures lie beneath the unexcavated northern extent of this spread. The 1992 excavation only partially achieved its aim of determining the function of the remains. The nature of the high-temperature process which generated most of the waste material remains a mystery and the specific function of most of the hearths and associated structures is still uncertain. Further excavation may reveal clearer evidence of the range and nature of activities being carried out at Duckpool during the different phases of occupation.

The whole of the western end of the car park is threatened in the medium term by coastal erosion and the archaeology here will inevitably be gradually eroded away by the sea (initially those lower remains to the south by overtopping during extreme high tides and winter storms, but eventually those on higher ground to the north which will become exposed in section). There is also the added threat posed by continued use of the area for car parking, and though the laying of some sort of protective surface may mitigate against this, damage could still be caused to the underlying remains as a result of compaction.

In terms of the effective management of the archaeological site at Duckpool, it would be useful to determine the extent to which remains survive inland of that part of the car park in which they have so far been identified. Establishing the full surviving extent of the site would not only provide a better understanding of its character but would also make it easier to assess the importance of the beach top remains and the priority that should be given to

further recording of these. Test trenching (and geophysical survey if appropriate) along the full length of the car park, and perhaps beyond, would help to establish how far the archaeological remains extend inland. Further excavation in the western bay of the car park would allow for the recording of remains here prior to their gradual erosion.

The as yet unpublished results of more recent (November 1995) recording work carried out in association with British Telecom trenching at Duckpool provide an illustration of the continuing high archaeological potential of the site. A previously unrecorded hearth was found newly exposed in the car park surface adjacent to the 1992 excavation, and another hearth-like feature was seen in the section of a trench dug near the opposite, inland end of the car park (in the field south of the National Trust toilet block—see Fig 3). The location of this last feature suggests that the extent and scale of the site may be much greater than indicated by the remains described in this report.

6.0 SPECIALIST REPORTS

By and large the specialist reports are included in full below, but in a few cases the information has been presented in a slightly abbreviated form. Where this has occurred, this is made clear below the relevant heading and full versions of these reports have been deposited with the excavation archive (see appendix). All the artefact drawings in this section are the work of Carl Thorpe.

6.1 *The Pottery by Henrietta Quinnell*

The pottery studied includes both the 1992 excavated material and that recovered by R M Heard (abbreviated RMH) and totals 531 sherds weighing 10,256g; sherd and weight totals are difficult to define precisely because the friable nature of much of the material. 145 sherds came from the 1992 excavations. 386 sherds derived from previous work; these divide into 238 from the 'oven' excavated by RMH, 90 from its vicinity, 20 sherds retrieved by RMH from the area of the 1992 excavation, and 37 without contexts (both 1992 unstratified and RMH's material).

Computation of vessel numbers is difficult because most sherds are small (c 12sq cm), rims have broken off at the rim angle and in no case is it possible to reconstruct either a complete profile or a definite diameter from the excavated material. These comments on the size of sherds apply in particular to the excavated material, where in addition breaks all appeared to be fresh. The size of the sherds from the excavated contexts appear to be in general smaller than would be expected in normally broken domestic refuse, and it is possible that the material had been broken up deliberately. Because of the small size of the sherds a relatively large number have been illustrated to give some idea of the variation in shapes represented.

By fabric 505 sherds (10,116g) are granitic, representing a minimum of fifteen vessels; six (32g) are black-burnished ware (BB1), probably from the same vessel; four (21g) come from three fabrics examined petrologically but not sourced; five (21g) are medieval, from one vessel; two (45g) are modern stoneware and nine (21g) modern tile. The last two categories, all unstratified, will not be discussed further.

The granitic fabric appears to be South Devon ware. The fabric contains a full suite of minerals deriving from weathered granite, and is considered most likely to have its origin in the Dart Valley, South Devon. Vessels are normally wheelmade, except for large storage jars (Bidwell and Silvester 1988, 43). A further description is given in the petrological report; any special features are commented upon under individual sherd descriptions. As the petrological report confirms that all the granitic sherds studied are likely to be South Devon ware, the terms are therefore used interchangeably hereafter.

The BB1 sherds conform to standard descriptions of South-East Dorset Black-Burnished ware (eg Holbrook & Bidwell 1991, 100) deriving from the Poole Harbour area of Dorset. The fabric typically is reduced, generally almost black in colour; it contains a large quantity of fine quartz grit and its surface is usually finished by high-quality burnishing.

Small sherds of three unsourced fabrics, which appear to be of Roman date, are commented upon in the petrological report; their presence highlights the way in which small sherds of distinctive fabrics can potentially distort minimum vessel numbers; a minimum of 16 vessels are represented in South Devon and BB1 wares, but these three sherds of different fabrics push the minimum vessel count up to 19.

The excavated material

Context [10]

[10] produced 39 granitic sherds (219 g) and 6 of BB1 (32 g), the only context on the site to produce the latter.

P1, Fig 28 (DKP92.49/2): rim sherd from small BB1 cooking pot, diameter perhaps 130mm. The modern degree of out-turn fits better with the general range from late 3rd to 4th centuries than with those from earlier periods (cf 20.1a, 20.1e from Exeter, Holbrook & Bidwell 1991, Fig 28; discussion in Gillam 1976, 63).

P2, Fig 28 (DKP92.38): body sherd from BB1 cooking pot. The slight carination at the base of the decoration is unusual as is the absence of a horizontal line defining the bottom of the decorated zone. Surviving decoration consists only of lines roughly parallel to each other, not the usual lattice. The almost horizontal angle of these lines is consistent with the obtuse lattice which occurs on BB1 cooking pots from the late 3rd century onwards (Gillam 1976, 63). Diagonal and herringbone design does occur as opposed to the more normal lattice (cf Exeter types 20.2, 21.1 and Ilchester fig 76, 369-70). It is always late (ie late 3rd-4th century). It is quite possible that P1 and P2 come from the same vessel as may the other smaller BB1 sherds DKP92.48/2, DKP92.43, DKP92.410/1 & 2.

P3, Fig 28 (DKP92.37): rim with moderate degree of out-turn from granitic cooking pot, diameter about 226mm, two slight grooves on exterior; traces of black coating. May be compared to Nos 8.1, 9.1 fig 71 from late 3rd/4th centuries in Exeter (Holbrook & Bidwell 1991). Holbrook and Bidwell (*ibid*, 178) comment that, at Exeter, South Devon ware cooking pots do not generally follow the extremes of BB1 shapes and that contexts with granitic material elsewhere in South West Britain are usually without much evidence for date.

P4, Fig 28 (DKP92.45): rim from granitic cooking pot, diameter about 168mm; neck more upright than P3 and with no trace of external grooves.

P5, Fig 28 (DKP92.44/1): shoulder and neck from granitic cooking pot, maximum surviving diameter 215mm; parts of exterior reduced black, apparently after breakage. Possibly from a vessel with a similar neck to P4.

P6, Fig 28 (DKP92.39): body sherd from granitic cooking pot with moderately upright incised lattice; trace of horizontal groove at base of lattice. The lattice decoration has been applied, as on all vessels on the site on which it survives, with the lines slanting down from the right applied before those slanting down from the left. Studies from Exeter show that this upright lattice persists, even with out-turned rims, into the 4th century (Holbrook & Bidwell 1991, 178). The larger collections of South Devon ware from Devon, although not closely dated, confirm the absence of obtuse lattice which is found on BB1 vessels in late 3rd/4th century contexts (Clanacombe (Greene & Greene 1970), Stoke Gabriel (Masson Phillips 1966), Mount Batten (Bidwell & Silvester 1988)). P6 could quite easily belong to either P3 or P4).

Context [30]

[30] produced only granitic sherds, 16 weighing 93 g.

P7, Fig 28 (DKP92.73): rim from small granitic cooking pot bent outward from an upright neck, diameter about 180mm (compare No 9.1, fig 71 from Exeter, Holbrook & Bidwell 1991), which was found in a context dated AD 275-340/50); some of the black colouring caused by reduction appears to post-date breakage. A second small rim sherd (DKP92.84, not illus) is more similar to P4 from Context [10] than to P7.

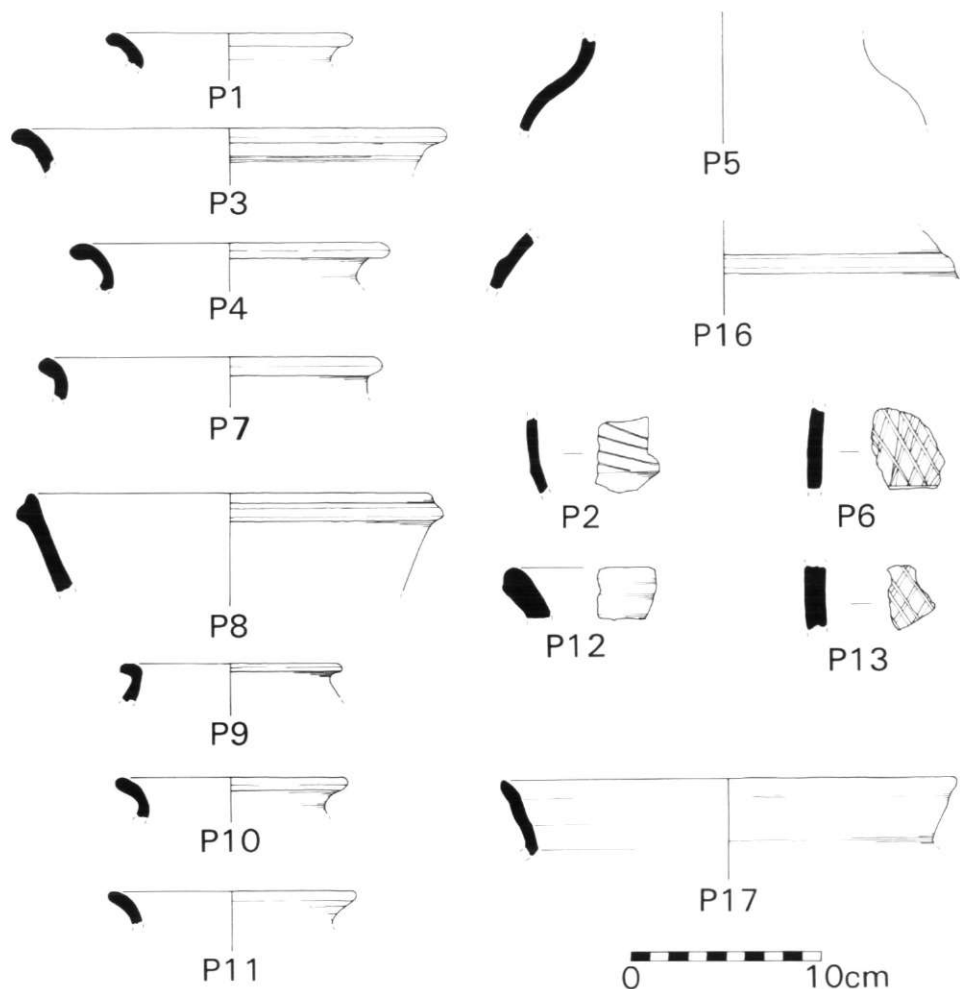


Fig 28 Pottery from Area B, includes sherds found during the 1992 excavation (P1-13) and previous surface finds (P16-17). ¼ actual size. (Drawn by Carl Thorpe)

P8, Fig 28: sherds of flanged bowl (DKP92.78, DKP92.83 from [30], DKP92.71 joining from [12]), diameter including flange about 225 mm. Granitic fabric; exterior reduced black, burnished with coating in places. While this bowl does not have a pronounced flange, it fits best with the bowl group in granitic fabric which adapts the flanged rim form from BB1 types; such BB1 flanged bowls date to the late 3rd or 4th century, while the evidence for the type in granitic fabric at Exeter suggests introduction during the 4th century (Holbrook & Bidwell 1991, 180).

Samples of seven sherds with white interior residue, DKP92.151/3, /4, /6, /7 & DKP92.122/2, /3, /4, were tested and proved to be lead-rich by XRF analysis (Mortimer 1994 and in this report); these sherds appeared to be of the regular granitic fabric but had been oxidised red by re-heating. One small sherd with residue (DKP92.122/3) appeared to be from a base angle, but, as far as can be seen, is more likely to come from a re-used cooking pot than from a specially designed crucible. Sherds with similar residues were found in [12]; (for numbers see below). There are therefore three links between [30] and [12]—residues on pottery, the joining sherds of P8, and the retrieval of 4th century coins from both, which enhance the probability of the two contexts being part of the same stratigraphic deposit.

Context [54]

[54], upper fill of pit [60], produced two granitic body sherds (5g).

Context [7]

Context [7], which may be regarded as the spread of [12] into the north arm of the excavation, produced ten granitic sherds (90g). These were base sherds c8mm thick from two separate vessels, one vessel represented by DKP92.24, the other by DKP92.35/1 & /2 and DKP92.30/1. One rim sherd, joining pieces DKP92.30/2 & /3, was similar to, but not the same vessel as P4 from context [10]. Including P9 the sherds may represent no more than two vessels.

P9, Fig 28 (DKP92.101): rim of small granitic cooking pot, diameter about 115mm; the rim is definitely of lesser diameter than the girth and has no direct comparanda among the material published from Exeter. Comparable forms may be noted at Clanacombe (Greene & Greene 1970, No 12, fig 2) and at Mount Batten (Bidwell & Silvester 1988, No 9, fig 28).

Context [12]

[12] produced 69 granitic sherds (395g). There was also a small (11g) bead-rimmed sherd (DKP92.75 not illus) of fine buff (YR 6/6) micaceous fabric, with traces of red colour under the rim. This was not sourced by petrological analysis (see below) but may be from the same vessel as DKP92.255/1 found prior to the excavation north of RMH's Hearth 1.

The granitic sherds represent five cooking pots, in addition to DKP92.71 which joins to flanged bowl P8 from [30]. These comprise P10-12 as well as two rimsherds (DKP92.141/1 & /2, DKP92.411) too small to be illustrated. Sherds with incised lattice, P13, DKP92.419/1 and DKP92.146 may come from the same vessels as any of the illustrated rims. As with layer [30], white interior residue on some sherds, (DKP92.136 five unmarked sherds and DKP92.109/1-/4) have been demonstrated to contain lead (Mortimer 1994); DKP92.117/2 has a similar coating. Also some 14 small sherds, DKP92.136/16-29, show signs of the kind of oxidation due to extreme heat.

P10, Fig 28 (DKP92.25): rim sherd with moderate out-turn, diameter about 122mm, from granitic cooking pot.

P11, Fig 28 (DKP92.105): as P10 but slighter.

P12, Fig 28 (DKP92.139/1): rim with moderate out-turn from thick-walled (13mm) vessel; groove on outer facet of rim; diameter about 130mm. May be compared to 5.1 (fig 71, Holbrook & Bidwell 1991) from a context dated cAD 275 at Exeter. Generally grooves in various positions on the rims of larger vessels, which might be termed storage jars rather than cooking pots, are reasonably frequent in granitic fabric; cf collections from Exeter and Clanacombe.

P13, Fig 28 (DKP92.145/2): body sherd with incised lattice, slightly longer on the vertical than on the horizontal axis. Representative of several similar sherds from this context.

Context [42]

A single granitic sherd came from this context.

Context [46]

Two granitic body sherds (5g) came from [46] (the edge of [12], subsequently cut and burnt red by Hearth [2]).

(NB: A single granitic rim sherd was found amongst an animal bone sample from Context [16] subsequent to the completion of the pottery and is not, therefore, reported on here).

Oven excavated by R M Heard

P14a, Fig 29 (DKP92.390): the side, representing a third to a quarter of a large squat cordoned vessel in granitic fabric, which was found lining a pit; it was cracked into many sherds, about 229 weighing 8,381g, and thus accounted for most of the pottery found, by weight, on the site. Most of the larger sherds joined but the smaller sherds were too crumbly for fits to be

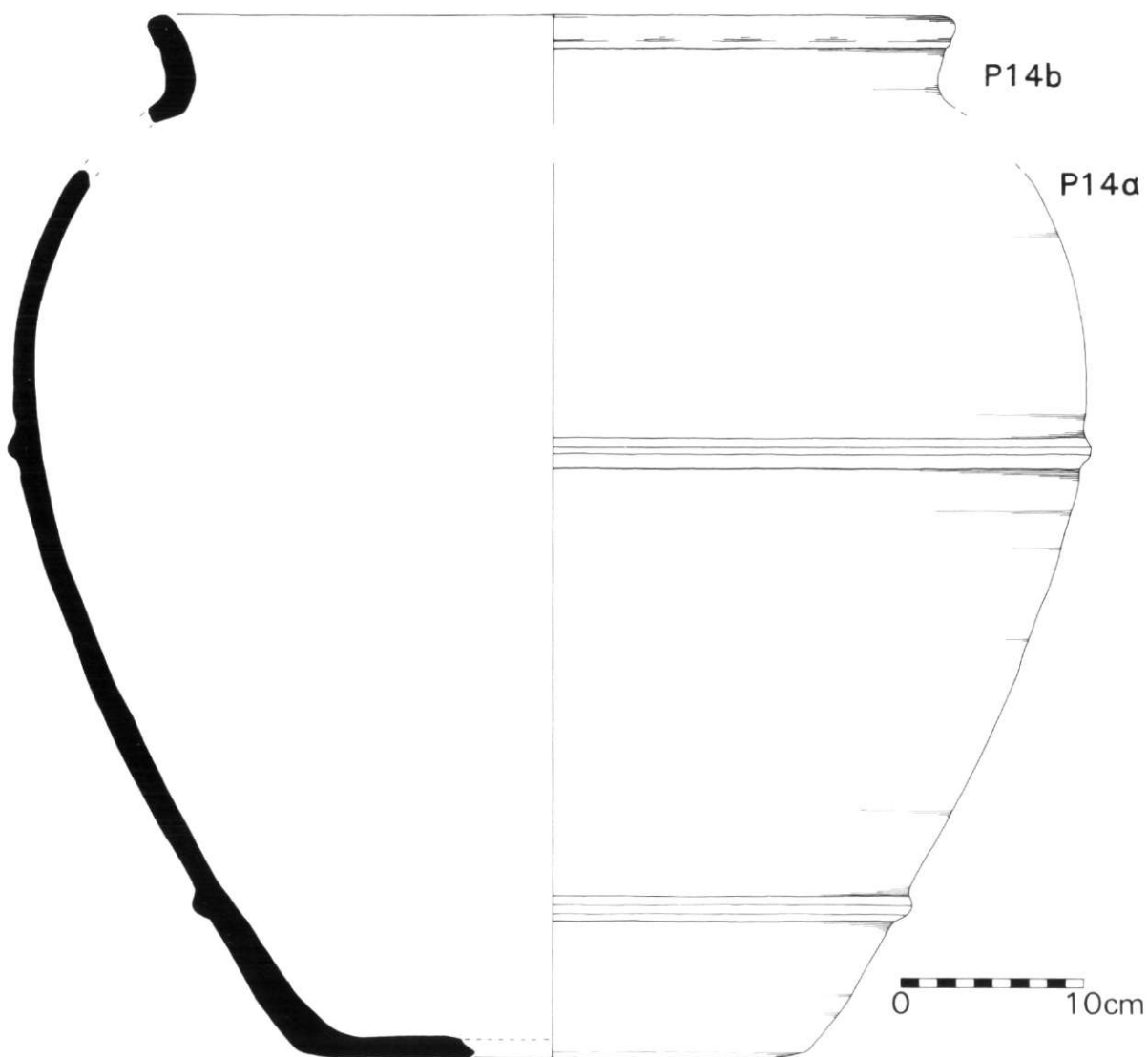


Fig 29 P14, granitic South Devon ware, from Heard's 'oven'. $\frac{1}{4}$ actual size. (Drawn by Carl Thorpe)

attempted. The sherds recovered suggest much less than half the original vessel, perhaps trimmed to shape, was present in the excavated context. The fabric is accepted in the petrological report as a coarse version of granitic South Devon ware. The drawing of P14 is composite; the sections which could be permanently joined during restoration work were initially drawn separately and the resultant drawings subsequently fitted together. The base is about 300mm across, the height (without rim) about 490mm. The rim has broken away but two joining sherds DKP92.191/1 & DKP92.197/3, illustrated as P14b, rounded and out-turned, may come from it. The vessel as a whole is about 15mm thick; both surfaces have been roughly smoothed; colour ranges from 7.5 YR 5/6 reddish, generally on the interior, to 7.5 YR 6/4 buff on the exterior. The interior has traces of a pale buff deposit 7.5 YR 7/2 which does not appear to be metallic. The exterior has two cordons about 15mm wide and about 235mm apart, with the upper cordon placed around the girth of the vessel giving it a maximum diameter of 590mm.

The maximum height with reconstructed rim, is 570mm. It is impossible to determine from surviving surface trace marks whether the jar was wheel made or not.

The pit with its pottery lining was consistently described as an oven during the pre-1992 operations, but there were no traces of charcoal or soot when the sherds were examined. There appears little doubt however that the colour and friability of the vessel are due to heat; if the cracks between the sherds had been caulked it may have held hot water and the interior residue have been caused by the leaching of minerals from the body of the pot by heated water. Perhaps in its final phase it functioned as a quenching trough associated with adjacent hearths. Fig 31 is a reconstruction of the re-used pot as it was found lining a shallow pit. P15 (see below) appears to have wedged the opposite end to the base.

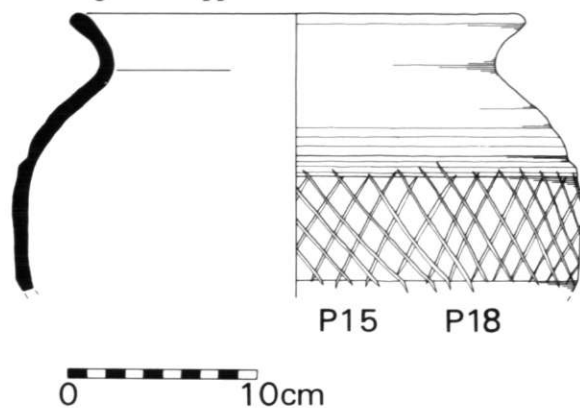


Fig 30 P15, granitic South Devon ware, from Heard's 'oven'. ¼ actual size. (Drawn by Carl Thorpe)

Storage jars are a common type in granitic South Devon ware, and generally have cordons, although not one has survived with a profile as complete as this or of as large as size. In general its shape appears squat and rounded compared to large cordoned jars in gabbroic ware. Calculations, which must necessarily be imprecise, suggest that the vessel may have weighed around 25 kilogrammes and have held about 3000cc or about 30 litres. A general range of storage jar sherds with cordons is illustrated from Clanacombe (Greene & Greene 1970, 21); at Exeter sherds of such jars occur from the late 2nd century through to the end of the Roman occupation (Holbrook & Bidwell 1991, 180). The type originates with the Cornish Late Iron Age cordoned ware of gabbroic fabric, best typified by Types J (with out-turned rim) and H (with rolled rim) at St Mawgan-in-Pydar (Threipland 1956). It has now been shown that basic cordoned ware forms in gabbroic ware continued to be made throughout the Roman period (Quinnell forthcoming; 1986, 120). Gabbroic fabrics are found in Devon during the 1st and 2nd centuries so examples would have been available to be copied by potteries working further up the peninsula. It must be emphasised that the form of a storage jar such as P14 is not closely dateable. The evidence from Trethurgy, and the unpublished collection from Carwarthen, (Quinnell forthcoming) makes it quite clear that large simple storage jars with cordons could be made during the 4th century AD.

P15, Fig 30 (DPK92.390) joining to DKP92.389/1 & /2): large cooking pot, sherds weighing 226g, in thin-walled (c6mm) granitic fabric; out-turned rim but diameter of girth (about 300mm) larger than that of the rim; modelling around the girth gives the appearance of two cordons, one broad, one narrow, separated by a groove; these cordons top a zone of upright lattice bordered also along its bottom by a tooled cordon. Very generally comparable to 10.1 (fig 71, Holbrook & Bidwell 1991) from Exeter, from a late 4th century context and to No 40 (Greene & Greene 1970, 21) from Clanacombe, not closely dated. Incised lattice decoration is not a feature of gabbroic Iron Age cordoned ware; it appears to have been copied, both

on gabbroic and granitic fabrics, from cooking pots during the 2nd century. Given the fact that the more oblique forms of lattice decoration were not copied from BB1 wares onto granitic forms, P15 may have a date range anywhere from the 2nd to the 4th centuries.



Fig 31 P14, as it was found lining a shallow pit. $\frac{1}{4}$ actual size. (Drawn by Carl Thorpe)

R M H's finds from area of his Hearth No 1

The 90 sherds consisted mainly of granitic fabric, 85 (523g). These were generally featureless but some had surviving lattice decoration generally similar to that found elsewhere on the site. Some pieces could have come from P14; in particular a distinctive sherd with a cordon was found 'under the Hearth'. One small (2g) bead-rim sherd (DKP92.255/1) of fine buff micaceous fabric with traces of red colour under the rim may have come from the same vessel as DKP92.75 from context [12] (see petrological report). The remaining four sherds (7g) were modern tile.

Finds collected by RMH in area of 1992 excavations

These, although strictly unstratified, may have originated from layers now removed/eroded which either had overlain Context [12] or had been in its general vicinity. There were nine granitic sherds (51g), four small joining sherds of sandy red ware (18g), DKP92.189/1-/4 (see petrological report), five medieval sherds (21g), two of modern stoneware (45g) and three of modern tile (5g).

P16 Cordoned body sherd from shoulder of jar, about 245mm in diameter, granitic ware; surface very dark grey 7.5 YR 3/2. The cordon had been formed by tooling and not added on. Cordons are very much a feature of granitic cooking pots (cf P15 above), as evidenced by the collection published from Stoke Gabriel (Masson Phillips 1966). They have a very long production range through the Roman period, similar to that of the cordoned storage jars (cf P14).

P17 Medieval cooking pot rim, diameter about 240mm, of chert-tempered ware (see petrological report). This fabric is widespread in East Devon and South Somerset from the 9th century AD and continues in the Exeter area until the 13th/14th centuries. During the 11th and 12th centuries it occurs in East Cornwall (eg Launceston) and North Devon (eg Barnstaple Castle & Braunton Burrows) where it was superseded c 1200 by the development of local North Devon wares (Allan 1983, 78). It appears likely therefore that the occurrence of this sherd, and several other small pieces of the same fabric at Duckpool, probably belongs to the 11th or 12th centuries, and could relate to activity connected with Hearth [2] as indicated by radiocarbon dating (see Table 14).

Unstratified material, including the unlocated sherds collected by RMH

These comprised 32 granitic sherds (131g), and one sherd (3g), DKP92.381, of sandy red ware (see petrological report). There were also two pieces of modern tile (9g).

Discussion

The pottery from the 1992 excavation may be treated as a single group. The lower layers, [10] and [30] and the upper layer, [12] may be regarded as part of a continuous deposit, with

a number of distinctive features detailed above linking the pottery found especially in [30] and [12]. The only distinction in the pottery from these contexts is the presence of six BB1 sherds, including P1 and P2, probably all from the same vessel, in [10], but too much weight should not be put on material from a small sample of a site. Although it is unclear from stratigraphic evidence how long the various deposits took to form, the South Devon sherds can, on their typological characteristics, be considered as 'a tight chronological group, all having been manufactured during the mid-fourth century'; these would provide the tightest dating yet available for any group of South Devon ware. This dating is broadly supported by the radiocarbon samples from context [50], relating to Pit [60] which predates the main build-up of layers such as [30] and [12]. OxA-5069 calibrates to cal AD 110-420 and OxA-5070 to cal AD 120-430 (both 95% confidence). Taken together they indicate that context [50] has a 95% probability of occurring after AD 200, and the general distribution of probability suggests a period later rather than earlier within the Roman period. It may be suggested that the mid-4th century date for the coins be taken as the date of the deposition of the pottery as an assemblage, and in view of the lack of firm sealed contexts for South Devon ware, this comparatively well-dated assemblage may be taken for the time being as benchmark to assist in further study of this material.

It was initially suggested that the pottery was of 2nd century date. The sherds are all small; the upright style of lattice decoration, which on BB1 is indicative of a 2nd or 3rd century date, was the most obvious characteristic. Close review of all known collections of granitic material indicates that this style of decoration continues into the 4th century. Rim sherds had in all cases broken off at the neck angle and only detailed study demonstrated that they represented a degree of out-turn appropriate in this fabric to the 4th century rather than to an earlier period. The only diagnostic two sherds of BB1, from [10], were a little ambiguous. The body sherd P2 has some untypical features and the rim P1 again lacks a substantial degree of out-turn; studies from Exeter however (Holbrook & Bidwell 1991, 95) show that the gradual development of the more exaggerated forms through the 4th century as outlined by Gillam (1976) does not apply. While the writer is now confident of the 4th century date supported by the coins, the initial misleading identifications may be taken as a warning against producing definite dating on collection of small sherds in a fabric which has not been well studied.

It should be stressed that the collection is small and much fragmented (the latter feature perhaps relating to some, possibly later, activity on the site). The comparatively small trial trench made it unlikely that many joining fragments would be found, as none of the spread dump deposits were excavated in full. Further work carried out on the site might be expected to increase our understanding of the assemblage. In particular, the retrieval of more sherds of non-granitic fabric may be useful in illuminating the length of time the deposits took to form.

The material from Duckpool represents the most northerly group of Roman pottery from Cornwall; there are no assemblages located so far in north or west Devon. The nearest collection comes from a coastal situation 10km south at Widemouth Bay, Cornwall. This consists of a series of groups collected over a period of time during the 1960s. One, published by P M Carlyon (1981), contained gabbroic coarse wares, as well as samian and other material suggesting a 2nd century date. Other groups contain gabbroic sherds probably dating to the 2nd century, a possible granitic South Devon sherd, and some fine quality (La Tène) South-Western Decorated ware (Glastonbury ware). Widemouth Bay appears to be a site on which occupation ranged from the Later Iron Age until the 2nd century AD. It represents the most northerly group of gabbroic material in the county. The situation at Tintagel, a further 20km south down the coast from Widemouth Bay, is complex, and detailed comment in advance of the excavations currently being undertaken by Professor C Morris would be premature. It has long been recognised that pottery of Roman date exists at Tintagel (see Thomas 1993, 84). A preliminary examination of Tintagel Box 06 in Truro Museum, containing 'native' (presumed locally made) wares from Dr C A R Radford's excavations, showed three main fabric groups. There were

37 sherds of granitic fabric; these appeared identical to South Devon ware and included jar and plain dish rims which would be entirely acceptable in the 4th century. There were 16 gabbroic sherds; these included jar rims, and parts of flanged bowls, generally poorly made. There were also 20 sherds in what may be termed 'local' fabric, with a variety of inclusions including shale fragments; the forms include both jar rims and flanged bowls, and in general are poorly made. It seems reasonable to assume some 4th century occupation at Tintagel, taking into account the Oxford ware recognized by C Young (Thomas 1993, 84). Gabbroic wares definitely continued into the 5th century (Quinnell forthcoming). At present there is no indication when production of South Devon ware ceased. If the Tintagel South Devon ware is taken for the present as being of 4th century date, it may be reflecting a situation in which the expansion of South Devon wares in the 4th century provided an overlap with provision of gabbroic pottery from the Lizard. In this general area of North Cornwall, well away from known pottery production centres, small scale local production may either have continued through from the Iron Age or have been resumed as more distant sources provided less regular supplies in the late 4th and 5th centuries.

The distribution of gabbroic wares may have varied with date. At Exeter BB1 South-East Dorset material was the predominant fabric in the late 3rd and 4th centuries (Holbrook & Bidwell 1991, 94). South Devon granitic ware becomes important at Exeter in the late 2nd and 3rd centuries and increased in importance during the 4th (*ibid*, 178). This increase in the frequency of the two types at Exeter is generally reflected in increased quantities on Cornish sites, although only evidenced so far on sites west of Bodmin Moor where gabbroic ware was still the common fabric (Quinnell 1986, 128). It should be noted that almost all work on the Roman period in Cornwall has taken place on sites west of Bodmin, and it may be that ceramic distribution in the later Roman period was affected by sea traffic along the south coast linking with the gabbroic production centres on the Lizard.

While the position of Duckpool on the north coast was ideally suited to supply by sea, its lines of contact may have differed from sites on the south coast or in the narrow western part of the peninsula. As suggested above in connection with Tintagel, the North Cornwall area may have been at the end of supply routes and therefore vulnerable to shifting patterns of transport and exchange. If the production site of South Devon ware is eventually confirmed as being in the Dart Valley, pottery may have reached Duckpool either by an overland route east of Dartmoor, or by water along the south coast and partway up the Tamar and then overland. Such a route for provision of ceramics, although involving less or more overland transport, may have been easier than coastal transport right around the peninsula. It may be, of course, that there were special properties in the granitic fabric of South Devon ware which made it especially useful for the activities being carried out at Duckpool, in which case special arrangements would have been made for its provision. Otherwise understanding of the route by which pottery reached the site will not be achieved until further work is done on the supply networks for ceramic and other materials in rural Devon in the 4th century. As far as Duckpool is concerned such networks must have been capable of accommodating the transport of the large cordoned vessel P14, which appears to have had a South Devon origin. Understanding of these supply networks will eventually be essential to the understanding of the place of South Devon wares in the economy of the South West as a whole in the late Roman period.

Petrological examination by D F Williams, PhD, FSA (English Heritage Ceramic & Lithic Petrology Project) Department of Archaeology, University of Southampton.

Roman

Large cordoned vessel—sherd from P14

Large, thick plain bodysherd in a rough darkish grey fabric with red core, containing inclusions of quartz, feldspar and plates of mica. Thin sectioning shows a similar, if coarser, range of inclusions to the South Devon ware described below.

South Devon ware

Six sherds from [12] were examined: DKP92.136/28, DKP92.104, DKP92.109/2, DKP92.117/5, DKP92.34, DKP92.105/1. All of these small plain bodysherds are in a rough sandy fabric, normally dark grey in colour. In the hand-specimens frequent discrete grains of quartz, feldspar and plates of biotite mica can readily be seen. Thin sectioning and study under the petrological microscope shows a range of granitic inclusions, including large distinctive grains of tourmaline, which is characteristic of South Devon ware and which is similar to examples of this pottery seen by the writer from other sites in the region (Masson Phillips 1966, 23; Bidwell & Silvester 1988). An origin south of Dartmoor has been postulated (*ibid*).

Unknown origins

DKP92.75 (Context [12]) and DKP92.255/1 (unstratified). Light red bead-rimmed bowl or dish. Both sherds share the same micaceous fabric and therefore may well be from the same vessel.

DKP92.189/2 (unstratified). Part of a lid? in a light red slightly sandy fabric.

DKP92.381 (unstratified). Small plain-rimmed sherd in a light red slightly sandy fabric.

Medieval

DKP92.181/2, P17, (RMH in area of 1992 excavations). Small sherd in a dark reddish-brown sandy fabric. Thin sectioning shows a clean clay matrix which contains a scatter of quartz grains, some of them quite large and polycrystalline, together with a few small pieces of chert. Difficult to predict a likely source on this information.

(NB a slightly fuller version of this petrological report is filed with the archive).

6.2 Coins by John Davies

Six Roman coins were discovered during the excavation. They are all bronze issues. Although they were in poor condition when recovered, with two actually fused together (DKP92.144), subsequent cleaning has revealed important diagnostic detail which has enabled the precise identifications of all six to be made.

The coins form a tight chronological group, all having been manufactured during the mid-4th century. All were found in the area to the west of Hearth [2]. Five came from Layer [12] and one (SF 81) from Layer [30]. All six are types commonly found on Romano-British sites. Three were struck under the emperor Constans. These are all examples of the VICTORIAE DD AVGG Q NN 'two victories' type. Although from different issues, they were all struck at the mint of Trier. The other three are all irregular coins.

The companion CONSTANTINOPOLIS and VRBDS ROMA issues were associated with the inauguration of Constantinople as a new capital in May of AD 330. These were very common coins during the 330s in Britain. Imitations of these issues were produced in quantity during the early 340s, at irregular mints, in order to supplement a dwindling currency. Duckpool has produced imitation, or 'irregular' examples of each of these two types. The third 'irregular' issue present is a copy of the FEL TEMP REPARATIO, 'falling horseman' coinage of the 350s. Again, copies, or counterfeits, of these issues appear to have been produced in quantity at a time when inadequate supplies of bronze coin were reaching Britain, between the mid 350s and the mid 360s. This example is a very small copy, of just 11 mm diameter. However, such imitations were commonly smaller, occasionally reaching just 4mm in diameter.

This small coin assemblage from Duckpool is a very restricted chronological group. It comprises the most common coin types in circulation towards the end of the Constantinian period. There is a complete absence of the highly prolific mid-Constantinian types, such as the GLORIA EXERCITVS, which were so common during the 330s. The Duckpool coins appear to reflect activity at the site during a short period at some time between the 340s, 350s and early 360s.

Catalogue

1 DKP92.57 SF 57 Layer [12]

Constans Follis AD 347-8

O CONSTAN [S PF AVG]

R VICTORIAE DD [AVGG Q NN]

Trier mint RIC VIII: 182

2 DKP92.64 SF 64 Layer [12]

Constans Follis AD 347-8

O CONSTANS PF AVG

R VICTORIAE DD AVGG Q NN

Trier mint RIC VIII: 195

3 DKP92.63 Layer [12]

Constans Follis AD 347-8

O CONSTANS PF AVG

R VICTORIAE DD AVGG Q NN

Trier mint RIC VIII: 199

4 DKP92.81 SF 81 Layer [30]

Constantine I Irregular follis AD 341-6

O [CONSTA]NT[INOPOLIS]

R Victory on prow

13mm diameter

5 DKP91.144 (one of two coins fused together) Layer [12]

Constantine I Irregular follis AD 341-6

O [VRBS ROMA]

R Wolf and twins

13mm diameter

6 DKP92.144 (one of two coins fused together) Layer [12]

House of Constantine Irregular minim AD 354-64

O Illegible

R [FEL TEMP REPARATIO]; falling horseman

11mm diameter

NB: RIC VIII=Kent, J P C, 1981, *The Roman Imperial Coinage, Vol VIII: The Family of Constantine I, AD 337-364*, C H V Sutherland and R A G Carson (eds)

6.3 Iron objects by Henrietta Quinnell

Specific iron artefacts have only recently begun to be identified from sites in the South West; extensive use of X-rays combined with skilled cleaning has shown (eg Quinnell forthcoming) that too many corroded iron lumps from unfriendly soils were dismissed as unstudyable in the past (cf the '86' from Carvossa which were X-rayed at a time at which skilled cleaning had not been sufficiently developed (Carlyon 1987, 128)). The local comparative data are therefore too few to be representative of those iron artefacts that may have been in use in the Roman period. Brooks (1994) points out that three of the few identifiable objects, knife SF 6a and small hooks SF 6d and SF 58 could be connected with gathering fuel; with this the condition of the nails, suggested as surviving from timber broken up for fuel (see below), is consistent. The incorporation of wood and plant matter in the corrosion products on a number of items may indicate the presence of potential fuel in various stages of use in the deposits

from which the items came. It may be significant, in defining the function of the site at Duckpool, that none of the metallurgical debris definitely suggests on-site smithing in the area of the site examined (Mortimer 1994), although many domestic sites in Cornwall have produced such evidence (Quinnell forthcoming). A list of all iron objects, most of which are too amorphous or too obviously recent to be published, was compiled for the Post-Excavation Assessment (Brooks 1994).

SF 6a, Fig 32 (DKP92.6a, 6b, 6c, DKP92.7e, 7f): knife now in five fragments, three, 6a-c, from context [7] and two, 7e & 7f, from [10]. Both description and illustration are based on conservation work and comments by Brooks (1994, 3) and Carl Thorpe. Knife SF 6a has a considerable quantity of plant and woody matter incorporated into its surface corrosion (Brooks 1994). The blade is about 135 mm long and of distinctive triangular cross-section, the maximum 25 mm width being reduced by corrosion. The tang is placed centrally between shoulder and choil, making the form similar to those of Manning's (1985, 115 & fig 28) Type 16 which is described as being very long lived. Knives have otherwise been identified on Cornish sites; at Trethurgy (Quinnell forthcoming) M14 was probably also of Manning's Type 16 and of Period 5, 4th century date, and M13 unclassifiable; at St Mawgan-in-Pydar (Threipland 1956, fig 36) a small knife of uncertain type and of early Roman date; at Goldherring (Guthrie 1969) for which neither type nor location are given. No knives appear to be published either from Exeter or from Roman rural sites west of the Exe.

The breaking of an iron knife into small pieces is unusual. The breakage may relate to that suggested for the pottery, although no reasons can be suggested here. An iron knife would break more easily when old and partly corroded. It is possible that the breakage relates to Post-Roman episodes of use on the site. If so, as parts were found in two adjacent contexts, there may have been some disturbance of these in the Post-Roman period.

SF 58, Fig 32 (DKP92.58): part of small hook from [12], with plant detritus on the corroded surface similar to that on knife SF6a (Brooks 1994, 3). Surviving length of blade 55 mm, maximum width 22 mm; handle end broken prohibiting identification of either tang or socket. Close examination shows that the tip has been twisted several degrees round from the blade; this twist, and the resulting indent on the inner curve, would have made the tool more efficient and can be observed in a wide range of modern examples (Carl Thorpe pers comm). Manning (1985, 53-58) has drawn attention to the difficulties in assigning function to the wide but merging range, both in shape and size, of hooks which survive from the Roman period. The closest comparison to SF 58 in Manning's catalogue is F50 (Pl 24); Manning points out that, though hooks of this small size are usually referred to as pruning hooks, pruning is a comparatively restricted activity and that these small hooks could also have functioned as reaping hooks, for leaf cutting or for gathering kindling and firewood; for most of these activities the angle of use for the hook would have been more horizontal than vertical. These hooks have a very long date range, originating in the Iron Age and continuing without dateable typological change throughout the Roman period. Hooks in this 'small' size range have been found unstratified at St Mawgan-in-Pydar (Threipland 1956, 74, fig 36) and from Carn Euny, precise location unascertainable (S Rees in Christie 1978, 383-5 & fig 52). Again no parallels appear to have been published from Devon west of the Exe.

SF 6d, Fig 32 (DKP92.6d): tip of small hook from context [7]. Maximum width 15 mm; well-preserved wood adhering to one face.

SF 36 from [7] and SF 40 from [10], (DKP92.36 & DKP92.40 not illus), are individual hobnails, surviving heads 9 mm and 14 mm across respectively. Hobnails (cf Manning 1985, 136) are being increasingly recognised from Cornish sites as ironwork is more carefully studied; 115 were found at Trethurgy (Quinnell forthcoming), and others have been noted at Grambla (Saunders 1972, 52), and at Nornour (Dudley 1967, 25 & fig 10). NB: three additional hobnails have subsequently been found amongst an animal bone sample from Context [10] and have not been studied as part of this report.

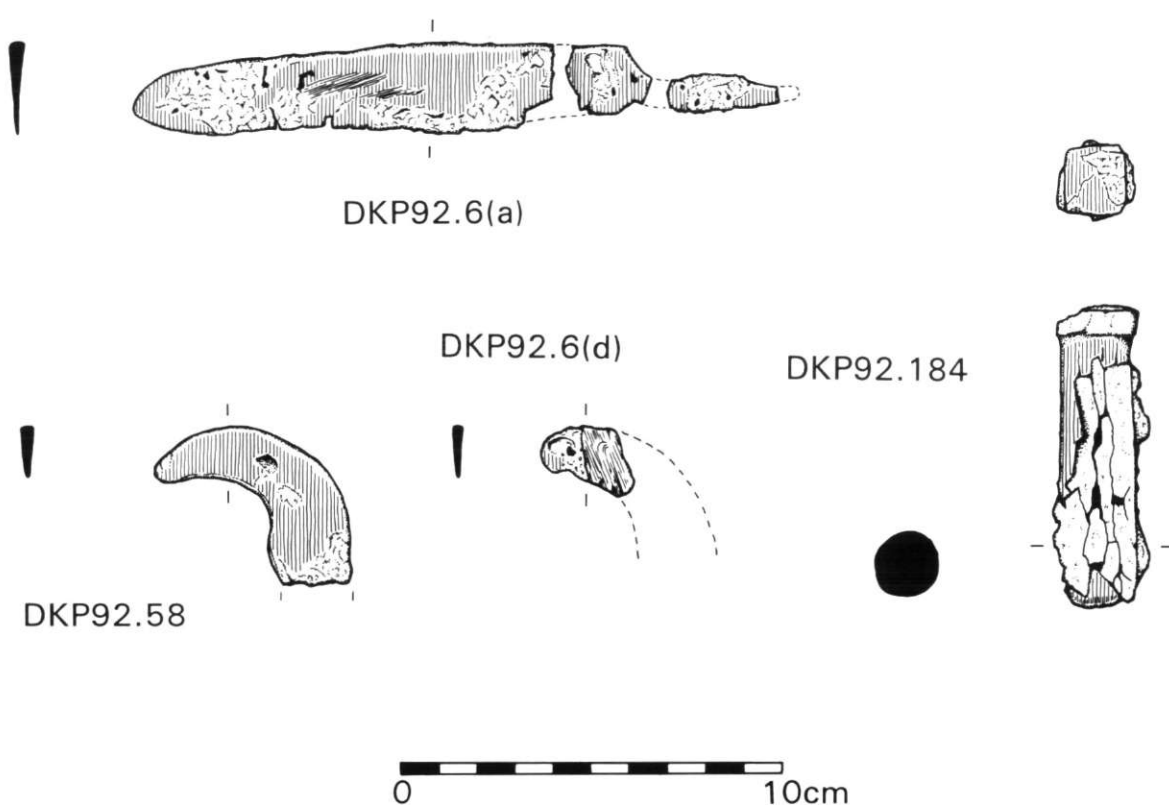


Fig 32 Iron objects. ½ actual size. (Drawn by Carl Thorpe)

SF 184, Fig 32 (DKP92.184): a bolt found north of RMH's Hearth No 3 (ie Hearth [1] excavated in 1992) and therefore possibly deriving from [12] or an equivalent context, is tentatively regarded as of Roman date. 75mm long, round-sectioned and 15mm across with a square head 22mm across, with a possible non-joining section DKP92.208 (not illus) 30mm long found in shingle in the vicinity, it conforms to Roman period types published by Manning (1985), eg R6, P1 58). The term 'bolt' is used by Manning to describe a specially crafted artefact used to fix items together, rather than a large nail.

SF 52, 53, 70, all from [12] and SF 32 from [16] are nails of various sizes and degrees of preservation. SF 52 is the most complete, 40mm in length with a squarish head 15mm across.

Prior to the excavation 13 nails (whole or fragmentary), one obviously a modern bolt, and seven other pieces of iron were found (Brooks 1994 and X-rays filed with archive); there is no way of determining whether any of these pieces are of Roman date. Almost all the nails are unbent, suggesting they derived from broken-up pieces of timber; they show no signs of wrenching for removal as would have been expected had they been used as material to be reprocessed in smithing.

6.4 Copper alloy objects by Henrietta Quinnell

Fifteen artefacts were recorded, but with the exception of those commented upon below, the combination of surface find and good preservation suggested a recent date. For these a comprehensive listing is provided in the Post-excavation Assessment (Brooks 1994). The small quantity is typical of South West rural sites, but the find of a personal artefact of distinctive Roman type, SF 55, is unusual.

SF 55, Fig 33 (DKP92.55) from Fill [22] of Hearth [21]. Narrow ring 11mm across

apparently swivel-set in bar (broken) now 35 mm long; this bar widens from 4 mm to 8 mm. The bar is decorated with grooves, badly corroded; there are additionally two small raised rings on one face. This object is almost certainly a nail cleaner (cf Cunliffe 1971, fig 42, 67-71). The ring head would have enabled attachment to a group of toilet implements on a chatelaine. Roman chatelaines seem to have been used solely for toilet implements and several have been found in Exeter; the only stratified example is mid to late 4th century in date and holds implements grooved in the style of SF 55 but less elaborately (L Allason-Jones in Holbrook & Bidwell 1991, fig 117, No 117 & p 260).

SF 359, Fig 33 (DKP92.359) from near RMH's Hearth No 3 and so from surface of general area of Hearth [1] in the 1992 trench. Triangular object, ? clasp, 25 mm long, 11 mm wide and 6 mm thick, formed by folding a piece of copper alloy sheet around iron which has now corroded except for that in the angle of the fold. The clasp appears to have been made by first casting a 20 mm square of copper alloy, which had slight projections along two adjoining edges. The sheet was then decorated with dot and ring motifs about 3 mm across. Next the sheet was bent around the edge of an iron object, possibly while the iron was still soft, so that the projections clamped into the iron. The hammering necessary to bend the sheet obscured the dot and ring motifs on the edge of the clasp; possible traces can be seen here under a strong light but have not been drawn. (I am indebted to Carl Thorpe for these comments on the sequence of manufacture). It is not known what form of iron object this clasp formed a part of.

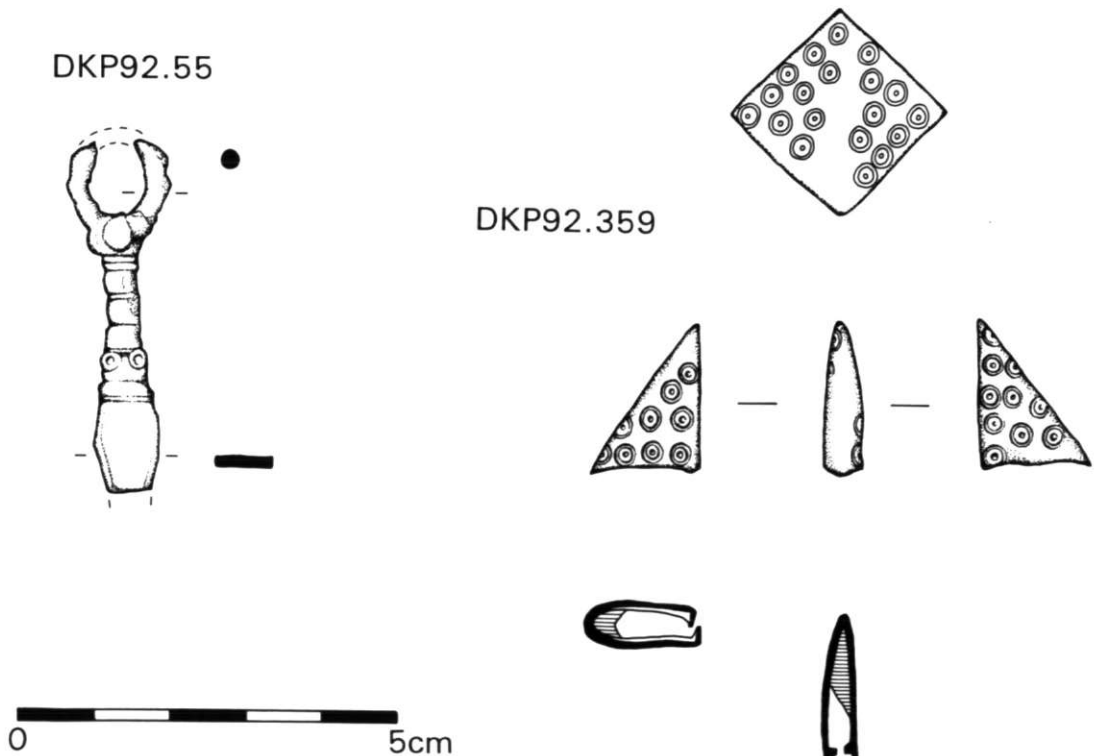


Fig 33 Copper alloy objects. Actual size. (Drawn by Carl Thorpe)

Dot and ring motifs are generally considered Post-Roman in date but occasional items occur in the Roman period, for example the 3rd century clasp from the shrine at Nettleton (Wedlake 1982, fig 87, No 24). Drawings of the clasp have been examined by M Corney and N Griffiths, who comment that they know of no similar item but that the general style of manufacture

and decoration suggests a Late Saxon date, from the 8th to the 11th centuries. SF 359 appears to be the first object with the dot and ring decorative motif found in Cornwall. The motif occurs occasionally in Devon on objects of various dates through the Post-Roman and Saxon periods, for example on bone combs from Bantham (Silvester 1981, fig 8).

SF 188 (DKP92.188 not illus), same find location as SF 359. This is a nail, 27 mm long, squarish head 8 mm across, and squarish shank 3 mm across. SF 194 (unprovenanced) is the head of a similar nail. Such small copper alloy nails were frequently used in upholstered furniture (Boon 1957, 163).

6.5 Stone by Henrietta Quinnell and Roger Taylor

Eight pieces of stone are described, either because they may be artefacts or because they represent non-local material. Dr R T Taylor is responsible for the geological comments but he has also contributed ideas for the identification of the possible artefacts; none of these could be usefully illustrated either by line drawing or photograph. Fuller geological descriptions are filed with the archive.

Pebbles showing a wide variety of wear, which can not yet be linked to function except in the case of whetstones, are common on Roman period settlement sites in the South West eg at Reawla (Quinnell 1992, 106-113). As the site was so near a beach it is surprising that more used pebbles were not found in excavated contexts, a scarcity that may point to a specialised, non-domestic, origin for the accumulated layers recorded in 1992. The presence of a possible 'false start' at an elvan mortar (DKP92.391) is compatible with finds of artefacts made of this rock on a wide variety of Cornish Roman period sites (Quinnell 1993). All the specimens, except the two local pieces, DKP92.103 and 105, indicate coastal traffic, which may have extended along the whole of the north coast of the peninsula with a number of ports of call.

SF 87: chunk of granite, now in four pieces, set in surround of Hearth [2]; part of a roughly circular block 220 mm in radius and 80 mm thick. Appears heavily burnt, but the pinkish grey colour and weathered appearance are due to natural alteration of the source granite. May have been trimmed around the edge in an attempt to manufacture a rotary quern, but the smoothed top is due to weathering in situ of the source granite. However the poor quality of the granite indicates that the manufacture of a durable object would never have been viable. It is possible that a partly finished piece was broken in transit. The granite is of too poor a quality to have survived on the beach for more than a very short length of time. Whether brought in as an object to be finished or as ballast, it must have been incorporated in a structure or covered over very soon. Geological description: coarse-grained granite with scattered euhedral potassium feldspar crystals up to 10 mm long. Muscovite and pale bronze-lustred 'biotite' mica occur as plates up to 4 mm across. Source could be anywhere within the South West, but if brought as ballast the coastal granite of Land's End would seem most appropriate.

SF 138 From [12]. Small piece of unworked granite, so similar in geological composition to SF 87 that it must have broken off from it.

SF 391 From [54] associated with pit [60]. Chunk of soft elvan, with a few external marks which could indicate an attempt at manufacture. Soft, altered elvan was commonly used for production of mortars in Cornwall during the Roman period (Quinnell 1993, 31) and suitable lumps were removed to occupation sites for manufacture as at Castle Gotha (M M Irwin in Saunders and Harris 1982, 132). Geological description: porphyritic microgranite/elvan. Soft, friable and appears to be partly kaolinised. The soft, altered state of the rock indicates that it would not have survived on a beach, and is therefore unlikely to have been ballast (see remarks on SF 90). Intrusions of elvan are more common in Cornwall than in Devon; the main group with outcrops on the north Cornish coast lies between the centre of Watergate Bay, Newquay and St Agnes Head.

SF 165 Location not recorded. Small piece of unworked elvan. Comments, both general and geological, for SF 391 apply.

SF 105 From [12]. Fragment of slate, 80mm by 50mm by 10mm thick. Natural shoreline (pebble) smoothing with split along bedding plane and not obviously an artefact. Geological description: local carboniferous micaceous, silty mud-stone.

SF 123 From surface area of 1992 excavation. Chunk of sandstone 120mm by 35mm by 30mm thick, split along bedding planes and slightly naturally worn. One surface slightly glossy from the type of wear likely to have been caused by use as a whetstone, for which the elongated shape is appropriate. Geological description: local carboniferous fine-grained micaceous sandstone.

SF 179 From RMH's finds, no context. A pebble of fine-grained granite, 100mm by 80mm by 70mm, shaped like a rounded tetrahedron. One flat surface worn very smooth, with four other facets less worn of which three are slightly concave. The size and shape are suitable for a hand-held rubbing stone, which would have produced the flat smooth surface. However the several surfaces with different wear may indicate that the pebble had been used as ballast. Moderate sized pebbles would give a compact ballast load. Smoothed surfaces would result from the abrasion of adjacent pebbles as the craft moved. The three concave surfaces suggested rounded surfaces of different hardness rubbing together. Geological description: hard, uniform, even-grained granite. Parts of the Land's End Granite or possibly the Cligga Head Granite, also coastal, could be the source.

SF 269 & 281 (281 in association with RMH's Oven). Fragments of tuffaceous slate, possibly chippings from ballast. Geological description: the two pieces are from the same source, corresponding to descriptions of agglomeratic and tuffaceous slates from the Tintagel Volcanic Formation. These rocks outcrop on the coast between Boscastle and Tintagel.

6.6 *Flint by Henrietta Quinnell*

A small collection was recovered, most of it unstratified and scattered over the area to the east of RMH's Hearth No 1. The raw material is local pebble flint, of variable quality. The standard of workmanship, with some blades and small blade cores, suggests a Mesolithic date. The only stratified piece, DKP92.407 from [10], is a blade 35mm long, 10mm wide, with careful preparation of the striking platform evidenced on the dorsal surface next to the butt. DKP92.162, from the area of the 1992 excavation, is a flake 40mm long and 25mm wide, with pebble flint cortex; 14mm thick, it has been removed from the side of a core and shows traces of four narrow parallel scars, and almost parallel ridges, on its dorsal surface; again there are traces of careful preparation of the edge of the striking platform adjacent to the butt. DKP92.241, unstratified, is a broken flake, slightly rolled; there is some evidence of retouch on both edges but it is unclear what the initial form of the piece was. The remaining unstratified material consists of: 13 unworked pebbles (DKP92.156/2, /3, /5, /7-14, /21 & /22); one pebble split in two (DKP92.192/1 & /2); 20 pieces from attempts to produce cores from poor material (DKP92.156/1, /6, /15-19, /24-28, /30, /35-37, /39-41); one single platform core of poor quality flint (DKP92.156/4); four flakes (DKP92.156/20, /29, /31, /33); four broken flakes (DKP92.156/23, /32, /34, /38). Only one of the flakes (DKP92.156/20, 21mm long by 22mm wide) is of proportions which might suggest a post-Mesolithic date.

The Duckpool lithics, if accepted as Mesolithic, appear to be part of the general spread, mostly of Late Mesolithic date, around the coast of North Devon and North Cornwall. This is well presented by Jacobi (1979, fig 17); the nearest site to the north, about 10km away, is Elmscott (approx SS 225215); the nearest to the south, about 3km, are the sites at Northcott Mouth (approx SS 204086). About 1km further south, Crooklets (SS 202074) has produced a collection of about 80 pieces (Bonsall & Selby, 1975), and there is further material from Bude. All the sites mentioned have microliths of Late Mesolithic date. It is generally accepted that the present distribution of this material is, at least in part, due to the comparative ease of identifying lithics in the erosion deposits along the coastal footpath. At least one inland site has produced Late Mesolithic material including microliths; these (unpublished) lithics have been collected from Lophorne Farm, Morwenstow (approx SS 241157) by the farmer

Mr K Boundy. Lophorne is 4 km inland and is most unlikely to be the only non-coastal site in the area. (I am grateful to Alison Roberts for comments on the North Cornwall material; her paper with P Berridge (1986) forms a useful review of the period).

6.7 Human bone by Steven Strongman

Two conjoining pieces of human mandible were found in a mid-4th century, Phase 2, context (Layer [12]). The mandible is of an adult and its relatively small size and roundness of the chin region suggest the sex is probably female. All the teeth, except the two first molars, were lost postmortem. The remodelling of the bone at the site of the sockets which housed the two first molars indicates that both teeth were lost antemortem. The blackened appearance and brittle quality of the bone show that it has been subjected to some burning.

6.8 Animal bone by Adrienne Powell and Dale Serjeantson

Introduction

The animal remains from Duckpool are mainly from the 2nd-4th century AD but some bone material was also recovered from the hearths dated to the 7th-12th century AD.

Bone was well preserved on this site. The acid soils of Cornwall do not usually provide favourable conditions for the preservation of bone, so the aims of the excavation included recovering bone with great care, and taking a large series of samples for sieving. The site is located by the sea, so it was also important to investigate whether fish and other marine animal resources were exploited by the occupants, a further reason for the careful retrieval. Because bone rarely survives in Cornwall, the material has been analysed in detail, though the quantity of identified bone is small in absolute terms.

It is discussed here in two groups: Roman and early medieval. Since Duckpool is thought to have been an industrial site, one of the main questions posed was the potential use of bone as an industrial material. Therefore one of the aims of this analysis (Smith 1994) was to examine the fragmentation and burning patterns in the bone to attempt to answer this question.

Method

Bulk samples were taken from all fills and layers; these were sieved through 1 mm mesh sieves. The bones were recorded at the Faunal Remains Unit, Southampton, and listed on a database. A copy of the archive listings is held with the site records and another with the Faunal Remains Unit archives at the University of Southampton. All the fragments were counted. In order to examine bone fragmentation, the assemblage was recorded using a zone system, in which each element (with the exception of the patella, sesamoids, carpals and smaller tarsals) was divided nominally into eight sections such that for any fragment the presence/absence of each zone could be recorded (Serjeantson 1991). Of the unidentifiable fragments, some were identified to body part (skull, rib, vertebra and long bone splinters) and size category (horse/cow/red deer and sheep/pig). Sexing was based on pelves for caprines and canines for pigs. Distinction between sheep and goats, where possible, was based on the criteria of Boessneck (1969) and Payne (1985). Tooth wear was recorded using Grant (1982) and measurements were taken after von den Driesch (1976). The assemblage contained very few measurable bones; these are not discussed here, but are available in the archive.

Roman

The bones from the Romano-British period include material recovered by hand from the 1992 excavations by the Cornwall Archaeological Unit, from the sieved samples, and from the series of earlier investigations of the site by Heard. The three groups are shown separately (Tables 1, 2 and 3). Just over 200 fragments of bone were identified.

Only a very small fraction was identified to species, 7% of the fragments recovered by hand (Table 4). A higher proportion of Heard's material was identifiable: 21% of the 429 fragments kept. (The tiny proportion of identified material in the sieved samples is not exceptional.)

Table 1 Romano-British: identified bones from 1992 excavations, hand retrieved

	Horse	Cattle	Red deer	Sheep/ goat	Sheep	Pig	Cat	Total
antler			1					1
premax		1						1
mandible		1		1		1		3
lower tth		1	1	1		4		6
upper tth						3		3
tth frag		3		1				4
axis scapula				2				2
humerus		4	1	2		1		8
radius		1		5		1		7
ulna	1							1
pelvis		3			1	2		6
femur		3		1		1		5
tibia		1		1		1		3
fibula						1		1
patella		1						1
astrag		4						4
calc		2	1			1		4
nav cub		1						1
carpal		5						5
metacarpal		2		2				1 5
metatarsal		3		1	1	1		6
med m'pod				1				1
ph1		5				2		7
ph2	1	1				2		4
ph3		1				2		3
subtotal mammal	2	43	3	18	2	23	1	92
bird								3
TOTAL	2	43	3	18	2	23	1	95

This great difference resulted from the careful retrieval of the 1992 material which enhanced the proportion of small, unidentifiable fragments. As well as the eight species listed in Tables 1-3, some bird bones, including domestic fowl, were recovered. One bone of a toad, probably the common toad *Bufo bufo* was recovered from a sieved sample.

The two collections show similar results in some respects: both are dominated by domestic mammals, and, although the sample is small, the representation of the various anatomical elements would suggest that entire animals were present. Fragments of cattle are most common, at 47% of the identified mammals. Caprines are next most frequent: very little of this material could be separated into sheep or goat: a few bones were identified to sheep and none to goat. Pig was the next most common species present; it was almost as common as caprines in the 1992 collection, but was less well represented in the identified material. The remainder consisted of a small amount of horse (2% and 2%) and red deer (6% and 3%), and one bone each of cat *Felis* sp and hare *Lepus* sp. In addition, the sieved fraction produced a bone from a species not found in the unsieved material, the third phalanx of canid, probably domestic dog.

Table 2 Romano-British: identified bones from Heard's excavations

	Horse	Cattle	Red deer	Sheep/goat	Sheep	Pig	Hare	Total
zygomatic		1						1
mandible		1		1		2		4
lower tth	1	8		8	2	3		22
upper tth		6		8		2		16
tth frag						2		2
atlas						1		1
axis		1						1
scapula		1						1
humerus				1		1		2
radius		3		1				4
ulna	1			1				2
pelvis		1						1
femur		2		1				3
tibia			1					1
calc		1						1
nav cub		1	1					2
carpal		1	1			1		3
sesamoid		1						1
metacarpal		4	2	1				7
metatarsal		3						3
ph1		1						1
ph2		2				2	1	5
ph3		2						2
subtotal mammal	2	40	5	22	2	14	1	86
bird								3
TOTAL	2	40	5	22	2	14	1	89

Bird remains were scarce, five fragments in total, three of which could be identified as domestic fowl *Gallus gallus*. This species is a rare occurrence at early Cornish sites: one bone from the Late Bronze Age at Brean Down is a possible intrusion as a result of rabbit burrowing (Levitan 1990), and one bone from Bronze Age Trethellan Farm is unstratified and probably recent (Payne 1989). Turk (1984) recorded one bone from Nornour, 2nd century BC, which would be unusually early. More plausible are several bones from the 2nd century AD level at St Martins and one bone from the second (not later than 7th century AD) layer (Turk 1984). An unidentified ulna of bird from Duckpool was in better condition than the rest of the material and may be intrusive. Despite the coastal location no bird bones were associated with the occupation.

The cat bone is also interesting: the earliest occurrence of domestic cat in Cornwall is from the 10th-12th century site of Hockin's pit, Gwithian (Turk 1969). Cat remains were present at Brean Down, but were presumably from wild animals (Levitan 1990). According to Turk (1969), although the domestic cat occurred in Britain in the Roman period, it was as a rich person's pet, and it possibly only reached Cornwall with early Christian missionaries and settlers from Ireland. If this was so, then the metacarpal from Duckpool should be from a wild cat. Turk (1969) stated that the bones and teeth of wild and domestic cats are difficult to differentiate since there is a great deal of overlap. Comparison of the Duckpool specimen with examples

Table 3 Romano-British: identified bones from 1992 excavations, sieved samples

	Cattle	Sheep/ goat	Sheep	Pig	Dog	Total
lower tth		2		2		4
upper tth		1				1
tth frag	1	1		1		3
atlas				1		1
scapula		1		1		2
humerus	1					1
pelvis	1					1
femur		1				1
tibia	1	1				2
fibula				1		1
med m'pod				1		1
lat m'pod				2		2
ph1				1		1
ph2			1			1
ph3					1	1
subtotal mammal	4	7	1	10	1	23
bird						1
toad						1
TOTAL	4	7	1	10	1	25

Table 4 Unidentified bones

	ROMANO-BRITISH				MEDIEVAL			
	1992 Hand		1992 Sieve		Heard		1992	
	n	%	n	%	n	%	n	%
Identified	95	7.3	25	1.1	89	20.7	5	4.2
Cattle-size	311	24.1	10	0.4	169	39.4	10	8.3
Sheep-size	148	11.4	47	2.0	78	18.2	4	3.3
Unidentified	739	57.2	2272	96.5	93	21.7	101	84.2
TOTAL	1293		2354		429		120	

in the reference collection at Southampton was inconclusive:

	Duckpool	Domestic	Wild
Breadth of distal metacarpal	4.7mm	4.6mm	4.8mm

Ageing and sexing

Information on ageing of the main domesticates was very scant, since the fragmentary nature of the material meant that the state of fusion on the bones was usually indeterminate, and there were only two complete mandibles in the whole assemblage. For cattle there is evidence for the presence of very young calves from the unfused halves of metapodial shafts and an unworn deciduous fourth premolar, as well as of animals over two years old. Two cattle phalanges have hyperostosis at the ligament insertions and around the articular surfaces, which indicates mature animals (Kate Clark, pers comm). All the pig teeth are from animals below about two

years, while four of the six ageable teeth and jaws of caprines are from fully mature animals. Sexing information was equally scarce: there was one pelvic fragment from a ewe, and one canine from a male pig.

Gnawing

The combination of surface alteration and fragmentation made identification of carnivore gnawing and butchery marks difficult. Gnawmarks were clearly seen only on 8% of the 1992 collection and 4% of the Heard collection. Most of the observed gnawing was restricted to surface marking; only one fragment was heavily gnawed. The proportion originally chewed has probably been underestimated because of the bone fragmentation.

Butchery

Butchery marks were also very infrequent, and were obvious on only 2.5% of the identified material. There were no certain examples of butchery marks on the smaller animals. Elements with chopmarks are cattle scapula (1), ribs (4), vertebral spine (1) and first phalanx (1). A proximal radius has a knife cut. The location of the butchery marks would suggest that they occurred during the dismembering of the carcasses, rather than filleting the meat (Binford 1984).

Fragmentation and bone condition

The material is highly fragmented, as the proportion of unidentified material confirms (Table 4). However, it is in general robust and in moderately good condition. Some etching is present on most bone surfaces; less common is a varying degree of sedimentary concretion. Where soil conditions for bone preservation are very poor, as, for instance, at the Bronze Age site of Trethellan Farm, Newquay (Payne 1989), fragmentation and destruction in the soil mean that teeth are the main part of the skeleton to survive. At Duckpool, all parts of the skeleton are present. This confirms that the bone was already very fragmented when it was buried.

Table 5 shows the fragmentation in the elements identified to species. The number of fragments with 1, 2, 3-4, 5-6 or 7-8 zones present is shown and elements more than half complete are listed. The results are similar for the Heard and 1992 material: 40-44% of fragments had

Table 5 Romano-British: bone fragmentation

1992 (hand)	%1	%2	%4	%6	%8	n
Cat	0.0	0.0	100.0	0.0	0.0	1
Horse	50.0	0.0	0.0	0.0	50.0	2
Pig	35.7	21.4	14.3	28.6	0.0	14
Red deer	0.0	50.0	0.0	50.0	0.0	2
Cattle	53.1	21.9	3.1	3.1	18.8	32
Sheep/goat	44.4	22.2	27.8	5.6	0.0	18
Bird	0.0	0.0	66.7	0.0	33.3	3
TOTAL						72
Heard						
Horse	0.0	100.0	0.0	0.0	0.0	1
Pig	66.7	0.0	0.0	0.0	33.3	6
Red deer	25.0	50.0	0.0	0.0	25.0	4
Cattle	50.0	13.6	9.1	0.0	27.3	22
Sheep/goat	16.7	50.0	33.3	0.0	0.0	6
Bird	0.0	0.0	50.0	0.0	50.0	2
Hare	0.0	0.0	0.0	0.0	100.0	1
TOTAL						42

only one zone present, and the bones which tended to be most complete for the domestic animals were tarsals and phalanges. Cattle bones were the most fragmented: 50-55% of fragments had only one zone present.

The material identified to body part and size category (Table 4) was greater in the Heard material (58%) than the 1992 assemblage (35.5%), in which, as discussed, there is more unidentified material. The ratio of large animals to small animals in the category of material identified to size class only is approximately 70%:30% both in Heard's material and in that from the 1992 excavations. However the ratio in the identified material is approximately 55%:45% in both groups. It is therefore clear that the identifiability of bones from cow-sized animals has been more affected by fragmentation than that of bones from smaller animals.

When the fragmentation evidence is considered together with the fair preservation, it is clear that bone was already fragmented when buried; it has therefore been exposed to mechanical damage before burial: this would be a consequence of bone processing or trampling, and would fit the theory that the material was 'scraped up' or redeposited from elsewhere.

Burnt bone

The burnt bones were recorded as charred or calcined (Table 6). The proportion by number is high, though it was not especially high by volume. Part of the reason for this is that burnt

Table 6 Romano-British and medieval: burnt bone: charred and calcined fragments shown separately

	calcined	charred	total	% burned
Romano-British (hand)	480	360	1722	49%
Romano-British (sieved)	940	705	2354	70%
Medieval (hand + sieved)	27	28	120	50%

bone, especially calcined bone, tends to break up into small pieces more readily than unburnt bone, and the proportion of burnt bone here increases with decreasing identifiability of the bone. It is even higher (70%) among the fragments from the sieved samples, all of these fragments too small for identification. It has been suggested that cupellation was carried out at the site. Bone ash can be used in the process, which might explain the nature of the bone present. However, according to Bayley (1992b:750) bone ash was only used in cupellation from the late medieval period onward. Though the frequency and severity of the burning here is considerable, it is not necessarily greater than would be expected in the vicinity of domestic hearths and need not suggest large-scale burning of bone as part of an industrial process.

Discussion of Romano-British assemblage

The main animals present at Duckpool were cattle, sheep (possibly including some goat) and pig, in order of abundance. Horse, red deer, dog, cat, hare and domestic fowl were also present in small numbers. The domestic species are typical of food remains from Romano-British period sites in England, and do not contain any elements which suggest a different regional tradition in Cornwall. The age at death is typical for any rural settlement of the period in southern England, with the presence of bones of a very young calf possible evidence for the rearing of stock at Duckpool (Serjeantson *et al* in prep). The finding of three wild species is relatively high for a site with a comparatively small sample. It was expected that fish would be present on this coastal site, as fish bones have been found at Brean Down and at sites on the Isles of Scilly (Bell 1990; Ratcliffe and Straker 1996), and it was partly for this reason that extensive samples were taken. Despite the good preservation and careful recovery, no fish bones were found. Similarly, the only bird bones identified are from domestic fowl; no bones of seabirds were present. While the lack of fish would not be unexpected on an inland site of the period in Britain, it was surprising to find that there was no consumption of fish at a coastal site.

The results from the 1992 excavation and the earlier collection made by R M Heard are similar. The differences which are apparent would mostly appear to be the result of the much higher retrieval rate of small fragments in 1992. A possible exception to this is the lower proportion of pig in Heard's collection, which could be the result of different activities having taken place in the two areas.

The pattern of anatomical element representation suggests consumption, and disposal of waste, at the site. The prevalence of gnawing is also compatible with a domestic site. Though the material is excessively fragmented, this may be a consequence of trampling, rather than evidence for industrial use of the bone. The assemblage is consistent with what would be expected of domestic refuse in many respects, though the high fragmentation and proportion of burnt bone could also support an industrial origin or usage.

Early medieval

Most of the bone material from the medieval hearths (100 out of 120 bones) are from sieved samples, and nearly all are tiny unidentifiable fragments. Half of these are burned. Only five could be identified to species (Table 7). As with the earlier period, the high frequency of burnt bone is unsurprising as it was associated with hearths, and it is not possible to say from the bone itself whether it was associated with industrial processes.

Table 7 Medieval: summary of animal bones

Species	Hand	Sieved	Total
Pig		1	1
Cattle		1	1
Sheep/goat	2	1	3
Sheep size	2	2	4
Cattle size	8	2	10
Unidentified	8	93	101
TOTAL	20	100	120

NB: additional tables providing data regarding bone fusion, tooth eruption and wear, gnawed bones and butchered bones are included in the unpublished archive version of this report.

6.9 Marine molluscs by Janice Light

Shells studied for this report have been collected by three methods—surface finds made prior to the excavation, hand collection from the excavation trench, and shells retrieved by sieving bulk soil samples.

For the surface finds and those hand-collected from the trench the shells were identified and quantified (but not weighed). The shell content of the sieved samples was sorted to species. The residues of two samples (S1 and S3, from Contexts [11] and [4] respectively) were sorted and remaining shell was picked, identified, and counted, and weight data obtained. On the basis of the results obtained it was considered that the amount of time needed to sort the residues for the remaining 26 samples would be inversely proportional in terms of the information yielded in respect of assemblages in the samples.

An assessment was made of the size ranges of *Patella* (limpet) and *Mytilus* (mussel) in the sieved samples. For the latter, 37 specimens from a sample containing 50 were complete enough to be measured along the antero-posterior axis. No samples contained *Mytilus* specimens that were complete enough to measure for a similar comparison, but shells taken from several samples were compared to material in the author's collection. For *Littorina obtusata* (flat-topped winkle) 137 specimens from one of the hand-collected trench samples were measured

to obtain a value for maximum width (these shells were considered representative of those in sieved samples and had the advantage of being more numerous).

During the processing of the samples a note was made of the variation in the condition of the shells.

Sieved samples

Table 8 summarises the abundance of the mollusc species per context by number and by weight. (It should be noted that the weight of the bulk soil samples from which the sieved shells are derived varied greatly—see Section 2.6, Excavation Strategy and Methodology). In view of the fact that numerical values for three parameters are included in the table, values for numbers of individuals/fragments are italicised. For the dominant component species (*Patella vulgata*—limpet and *Mytilus edulis*—mussels) abundance is expressed by the total weight of umbones/apices and total weight of all fragments. In addition, a value for numbers of individuals of *Patella* and *Mytilus* expressed by the occurrence of apices for gastropods and umbones for bivalves is given. Note that to obtain an estimate of numbers of *Mytilus* individuals the number of umbones should be divided by 2. For other gastropod species (with the exception of *Littorina obtusata*—flat-topped winkles) number of apices and total fragment weight was sufficient because the numbers of individuals were low. *Littorina obtusata* occurred predominantly as whole shells with occasional damaged specimens; no fragments which did not represent an individual were retrieved.

The lower portion of Table 8 gives values for the percentage weight of selected species in relation to the whole sample. These form the most accurate basis for comparing the different shell-yielding contexts.

All but 3 of the sampled contexts are dominated by *Mytilus* fragments. From the total weight of shell-sample/context, it can be seen that the 18 sieved samples fall into two categories. Nine samples/contexts have a weight of more than 50g (range 51.7-612.85). The remaining 9 samples weigh between 1.7 and 39g. Most of the heavier samples have the highest number of *Patella* shells across the samples also and together with *Mytilus* these two species account for 80-100% of the shell component of most of the samples. Exceptions are the samples from Contexts [17], [22] and [41] which all have the highest counts of *Littorina obtusata* (up to 23 individuals) but low weights as samples overall (<30g) and as such have a different character from the *Mytilus/Patella* assemblages. Other species in the sieved samples occur at low density and are discussed in the Species Accounts below.

In terms of distribution of shell species, the sieved samples split into two components: the heavier samples dominated by limpets and mussels and the lighter samples many of which have high number of *Littorina obtusata*—winkles.

The tubes of additional materials from floats and two of the radiocarbon samples contain a range of small marine species which are common. Some, *Littorina neritoides*, *L. neglecta*, *Lasaea adansoni* are characteristic of upper shore/splash zone rocky shore habitats, others—*Goodallia triangularis*, *Corbula gibba*, *Heteranomia squamula* are sublittoral species, small specimens of which are a common element in beach sand. All these small shells are likely to be wind-blown adventives to the site.

Hand-collected samples

In view of the manner of collection of the shells from the trench, detailed weight information was not considered appropriate. Count data for these shells are listed in Table 9 using a coded systems to indicate whole shells or apices/umbones (w), fragments (f) and mixtures (wf).

Trench

Mytilus and *Patella* occur within most samples and in terms of distribution are again the dominant species although occurring in lower numbers overall. Four contexts have relatively high numbers of *Patella* ([7], [11], [12] and [42]). *Mytilus* fragments show concentrations

Table 8 Shell content of sieved samples showing (1) species by number of whole shells (umbones/apices), (2) weight of individual species component per context and (3) % weight of individual species as a proportion of total wt per context. Values in Roman are for weight and values in italic are for number of shell items. Note that for an estimate of *Mytilus* individuals, umbone values should be divided by 2. × = presence of species in sample

CONTEXT	[3]	[4]	[5]	[6]	[8]	[10]	[11]	[12]	[15]	[17]	[22]	[30]	[41]	[42]	[43]	[45]	[50]	[54]
<i>Mytilus</i> umbones - no.	30.0	32.0	115.0	36.0	29.0	22.0	373.0	40.0	65.0	6.0	11.0	1.0	11.0	2.0	7.0		11.0	17.0
umbones - wt gms	17.5	11.0	40.0	21.0	11.5	5.3	119.75	13.9	27.7	1.7	3.0	0.1	3.5	1.5	1.2		8.5	7.6
total fragments - wt gms	43.4	28.5	102.0	34.2	41.5	15.3	408.4	60.7	99.0	8.5	10.0	2.8	14.0	4.7	8.5	0.1	64.0	56.0
<i>Patella</i> apices - no	12.0	6.0	19.0	12.0	12.0		90.0	2.0	11.0	1.0	1.0		8.0		1.0			
apices - wt gms	6.6	6.0	25.3	18.9	13.0		37.65	0.6	8.2	1.0	0.8		8.4		0.2			
total fragments - wt gms	16.2	7.3	38.2	23.3	25.2	0.2	188.50	3.8	21.0	1.8	1.1		17.5		2.0	1.3	2.7	
<i>Littorina obtusata</i> apices - no						13.0	14.0	60.0	1.0	14.0	23.0		1.0	4.0	1.0	1.0		4.0
total - wt gms						6.1	9.7	26.2	1.0	5.3	12.0		0.3	1.7	0.1	0.3		1.1
<i>Littorina saxatilis</i> apices - no	1.0							1.0			1.0							
total - wt gms	0.2							0.1			0.3							
<i>Nucella lapillus</i> apices - no	2.0	1.0	2.0	2.0		1.0	1.0	1.0	×								1.0	
total fragments - wt gms	5.5	0.3	0.2	4.2		1.3	1.0	2.75									2.0	
<i>Monodonta lin</i> apices - no	×	1.0	×	3.0	2.0	1.0	3.0										1.0	
total fragments - wt gms		2.75		10.5	4.0	3.8	4.2										4.0	
<i>Gibbula umbilicalis</i> apices - wt gms	×					×	×	4.3	1.0									
<i>Ocenebra erinacea</i> fragment - presence						×	×											
<i>Chlamys</i> sp fragment - presence	×			×		×	×						×					
Total <i>Mytilus</i> wt %	66.0	73.4	72.6	47.4	73.4	57.3	66.6	63.1	81.6	54.4	42.7	100	44.0	73.4	80.2	5.9	88.0	98.1
Total <i>Patella</i> wt %	24.6	18.8	27.2	32.3	26.6	0.7	30.7	3.9	17.3	11.5	4.7		55.0	26.6	18.9	76.5	3.7	
Total <i>L. obtusata</i> wt %						22.9	1.6	27.2	1.0	34.0	51.3				1.0			1.9
Total <i>Nucella</i> wt %	8.4	0.8		5.8		4.9	0.2	2.9										
Total <i>Gibbula</i> wt %								4.5	0.3									
TOTAL WEIGHT OF SHELLS gms	65.8	38.85	140.4	72.2	6.4	26.7	612.85	96.15	121.3	15.6	23.4	2.8	31.8	6.4	10.6	1.7	72.7	57.7

Table 9 Shell content of trench collected samples and those collected by Richard Heard (RMH)—expressed as numbers of individuals, ie umbones or apices (w), fragments (f), total shell (wf)

CONTEXT	[3]	[5]	[7]	[10]	[11]	[12]	[15]	[16]	[17]	[30]	[39]	[41]	[42]	[54]	unstratified	RMH
<i>Patella vulgata</i>	5w	3w	72wf	14w	87wf	23wf	1w		9f		3w	2w	15wf	2w	10wf	7w
<i>Monodonta lineata</i>				1w	2w	8wf				1w			1w	1w	3wf	6w
<i>Gibbula umbilicalis</i>						21wf	2w								3wf	2w
<i>Littorina littorea</i>																3w
<i>Littorina obusata</i>			3w	1w	5w	529w	11w	2w	17w	2w		1w	8w	11w	51w	14w
<i>Nucella lapillus</i> - unclipped					4w	12w			1w		1w				2w	11w
<i>Nucella lapillus</i> - clipped					1w				4w	4w					1w	37w
<i>Mytilus edulis</i>	9wf	3wf	38wf	11wf	82wf	317wf	17wf	2w	5wf	2f	3w	6w	7wf	47wf	6w	1w
<i>Ostrea edulis</i>					1w											
<i>Chlamys</i> sp						1f										
<i>Acanthocardia tuberculata</i>																
<i>Venericardia</i> (fossil)			1f													5f

in the upper fills of Hearth [2] (Context [11]) and Pit [60] (Context [54]), Layer [12] especially in the vicinity of these two features, and Layer [7].

The most striking feature of the trench samples is the occurrence of *Littorina obtusata* in high numbers in Context [12]. A size frequency histogram drawn for 139 individuals from one of the samples of this context indicates a dominance of adults. This is discussed in more detail in the Species Accounts.

Another species occurring in higher numbers than in the sieved samples is *Nucella lapillus*—the dog whelk. In most cases these represent whole shells shown as ‘unclipped’ on Table 9. Four samples contain examples of *Nucella* showing the style of breakage which is a feature of the *Nucella* specimens in the RMH samples (for description of style of breakage see section on *Nucella* below). Context [11], the upper fill of Hearth [2], contains a single small oyster shell which has been identified as *Ostrea edulis*.

Richard Heard (RMH) collection

Species frequency is different in the RMH assemblage. It contains very few shells. *Mytilus* is absent except for one shell and limpets are occasional. *Littorina obtusata* occurs and 5 fragments of *Acanthocardia tuberculata* were also present (see Species Accounts) but the RMH assemblage is dominated by *Nucella lapillus*, the majority of which are labelled as ‘cut’ or ‘clipped’. The shells making up the RMH material give evidence of highly selective collecting. (In subsequent correspondence Heard has confirmed that his collecting was very selective, stating that he tended to collect only shells of a new species and that, although mussels were dominant in the burnt spread to the south of his Hearth No 1, these were not collected—comment by Jeanette Ratcliffe).

Shell size

Taking all the samples into consideration, very few juvenile shells occur in the assemblages. The majority of limpet shells (*Patella vulgata*) fall within the size considered to represent adult shells. However limpets commonly reach dimensions of 50-60mm shell length but no shells reaching these sizes occurred in the samples. It is also worth noting that small individuals occur in many of the samples which suggests, if they were introduced by humans to the site, they were considered to be worth collecting since they do not show evidence of abrasion seen on beach-worn dead shells.

Based on comparison with whole mussels, specimens as large as 60-80mm occur in some of the samples. Modern colonies of mussels growing in low energy conditions contain specimens of this size, however the author has noted in the recent past that *Mytilus* colonies on rocks along the exposed Atlantic coast of Cornwall do not tend to reach this size.

The winkle shells are dominantly adult. Also, this species shows sexual dimorphism with a dominance of the larger females in the population so a number of the smaller individuals are considered to be adult males.

Shell preservation and colour

Many of the shells in the samples had retained sculpture, pattern and colour. Often trench-collected samples were monospecific or nearly so but might contain specimens of that species showing a range in degree of preservation.

Although many of the limpets were well preserved occasional dark grey, altered fragments were noted in some samples (for example from Context [11]), but these samples also contained much more recent-looking material with shells having the uneven, unworn fractured edges of fresher material. This breakage pattern is not typical of beach shells. When rolled around on the shore limpets often lose their apex and a collar of shell remains. Very few (<5) shells like this were seen in the samples. Limpets occurred in the earlier deposits associated with Hearth [21] and the associated Pit/Hearth [60] and these were generally larger specimens. Charred shells were noted from samples associated with Hearth [2].

Most of the mussels still retained the blue outer layer of shell. This varied from pale purple in shells from Hearth [2] and the ash dump, sometimes with flakiness revealing much of the white nacre to dark purple-blue older shells in samples from Contexts [10], [41] and [43].

Mussels associated with hearth environments often had caked combustion products on the inner surfaces of valves. The apertures of gastropods from the same samples were blocked with similar material. The shells in ash fill [50] were particularly charred—this sample was collected from Pit/Hearth [60].

The *Littorina obtusata* shells in Context [22] from Hearth [21] were particularly bleached-looking, however they still look as if they were live-collected. Some of the shells in [11] were also whitened but in Layer [12] winkles had more colour. Winkles from Layer [10] and some from Layers [12] and [17] were faded but had patchy black staining. This did not appear to be charring—it resembled the surface staining that is often seen on shells which have been buried in anaerobic marine muds. It is the kind of staining that would occur to shells left in rotting seaweed.

The *Monodonta lineata* specimens all appeared to be in good condition. Sculpture, colour and pattern were all preserved. The two latter features are not good characters to use for ageing *Monodonta*. Colour and pattern have been preserved in neolithic shells (Preece 1993) and the genus belongs to a superfamily (Trochacea) some of whose pigments are preserved in Tertiary fossils.

Species accounts

GASTROPODS

Patella vulgata (Common Limpet)

This occurs commonly in the samples. Fragments can be identified because of their distinct ribbing and concentric sculpture. The inner surface has a characteristic pattern within the lamellae of the shell. Some specimens are in extremely good condition showing good preservation of colour, pattern and sculpture. As such they resemble shells which are collected from modern beaches in a 'fresh-dead' condition. Freshest shells occur in Contexts [3], [4], [5], [11] and [41]. In the case of sieved samples they also contain the highest numbers of *Patella*. These are the stratigraphically younger samples. *Patella* fragments are very sparse in samples associated with Hearth [21] and Pit/Hearth [60], ie samples interpreted as stratigraphically earlier than Hearth [1] and [2]. However these samples often contained some of the largest specimens.

Although this report has referred to limpets as *Patella vulgata*, occasional specimens of *P. depressa* and *P. ulyssiponensis* (syn *aspera*) were noted in some of the samples, notably from Context [5], [6] and [8]. The different species were distinguished on basis of external shell morphology including patterns of regular and irregular ribbing, the overall internal colour of the shell, and the presence and colour of the headscar (muscle scar on the inside of the apex of the shell). *Patella depressa* is a smaller species than *P. vulgata* and *P. ulyssiponensis* and would probably not be considered worth collecting for its meat. *Patella ulyssiponensis* has a similar size range to *P. vulgata* but it is a lower shore species and collectors would have to venture further down the shore and require lower (spring) tides to collect specimens.

Although generally the limpets in the samples are of an adult size, they are by no means large specimens. In many populations sizes from 50mm upwards to 60mm would not be uncommon. If limpets were being gathered for food one would expect the largest individuals to be selected and thus it might be inferred that collection was too frequent to allow limpets to grow to a large size (Townsend 1967). The material collected so far from Duckpool does not necessarily support this inference, although there is no data as to the extent of the area over which limpets are distributed and thus an estimate of the proportion of limpets so far collected.

From evidence from other sites (Hayton 1977, Hencken 1933, Hogg 1930, Rogers 1910, Turk 1971, 1978 [in Butcher 1978], 1984) limpets are a common element of kitchen middens and can occur in enormous numbers: 100,000 were contained within a midden measuring

10m by 10m associated with a cottage at Samson on Scilly (Hayton *op. cit.*). However Turk (in Butcher 1978) states that predominance of limpets at Nornour is typical of many prehistoric sites in Britain in contrast to later sites where limpets are less common or absent.

Townsend (*op. cit.*) has estimated the protein content of limpets and the contribution they might make to a diet and Ashbee (forthcoming) has quoted 31,360 as the number of limpets required to supply the calorific equivalent of a red deer carcass. If collected for food, the numbers of limpets collected at the Duckpool site suggests that they were a minor component of the diet. Turk (1984) has suggested that limpets were collected for use as bait in fish traps in which case there might be an optimum size as a limiting factor in the efficacy of limpets for fish bait.

Lovell (1884) has documented the use of limpet shells for mortar.

Monodonta lineata (Thick Top Shell)

This species is documented from a number of sites in Cornwall including Scilly. It can replace *Littorina littorea* in a diet when the latter is unavailable. It is said to resemble this species in flavour (Lovell *op. cit.*). Very few specimens were found at Duckpool; about 30 in all, and most were adults. This species is living on the shore at Duckpool today and on present evidence the numbers found do not suggest that this species was one of the main food items.

Gibbula umbilicalis (Purple Top Shell)

This species and its close relative *G. cineraria* are also documented as food items by Lovell. Again, about 30 adult specimens were identified.

Littorina littorea (Common or Edible Periwinkle)

Only 3 specimens were found in the samples which suggests that this species was unavailable to the occupants of the site.

Littorina obtusata (Flat Periwinkle)

This species is not commonly associated with kitchen middens and is considered to be an inedible species (Bell 1987). Whether the reasons for this are physiological, economic, i.e. the small size of the animal, or cultural is not clear. Turk documents its occurrence at Nornour (Butcher 1978), suggesting that it might be a species collected for decorative purposes, presumably because of its bright yellow colour. However I would not expect living animals to be collected for this purpose. The specimens occurring in the Duckpool samples have a live-collected appearance; they show no sign of surface wear that occurs soon after they are cast empty onto the shore and the apertures are undamaged with the sharp edge unworn.

Littorina obtusata lives on fucoid seaweeds, especially *Fucus vesiculosus*. At certain times of the year populations of *L. obtusata* may become quite large and shaking a large plant of *Fucus* may dislodge as many as 10-30 animals.

Possible the winkles were brought to the site as a bycatch with fucoid seaweeds collected for one of a number of purposes. Fucoid seaweeds are useful for wrapping marine animals such as crabs, lobsters, large molluscs to keep them cool and moist. They may have been used for transporting such items to the site from the shore and short-term storage. It may be that the fucoids were collected for the extraction of certain substances commonly present in seaweeds i.e. iodine. A third possibility is that the seaweed was collected for fertiliser.

Nucella lapillus (Dog Whelk)

The dog whelk is not a food species. However, there are numerous references to its use in the extraction of the substance responsible for the dye known as Tyrian purple. A comprehensive list is given by Baker (1975) who gives a concise account of the history, methods, species, use and chemistry associated with the dye.

Lovell (*op. cit.*) gives an account of the extraction process: 'the shell, which is very hard,

is broken by a smart blow taking care not to crush the body of the fish within. After picking off the broken pieces, there appears a white vein or reservoir, lying transversely in a little furrow near the head. This being carefully taken out, and characters drawn with it, or its viscid juice squeezed upon linen or silk, the part immediately acquires, on being exposed to the sun, a pale yellowish green, which quickly deepens into an emerald green, then changes to blue, and at last to a fine purplish-red’.

Saul (1974) gives a short account of the history of dye extraction from *Nucella* and mentions finds of broken dog whelk shells in Connemara and Donegal and also in Cornwall, that may have been collected for dye. ‘The spires of the shells had been broken off (the usual methods of reaching the gland containing the dye fluid), leaving the body whorl and aperture intact’.

The whelks in the samples which have variously been described as ‘cut’ or ‘clipped’ and listed as the latter in the tables show a uniformity of breakage pattern which I do not believe to have been naturally derived. Shells taken by predators such as crabs and fish tend to be broken into several pieces and specimens which become progressively broken as they are rolled around the shore when dead show breakage around the shell and eventually end up as spiral columellas lacking body wall. Photographs were taken of the two samples containing 8 specimens each and when oriented with their apertures to the viewer, there is a distinct similarity in the breakage of the shell in terms of that portion which has been removed and the oblique angle at which the breakage has occurred, (Fig 34). I suggest that these shells may have been

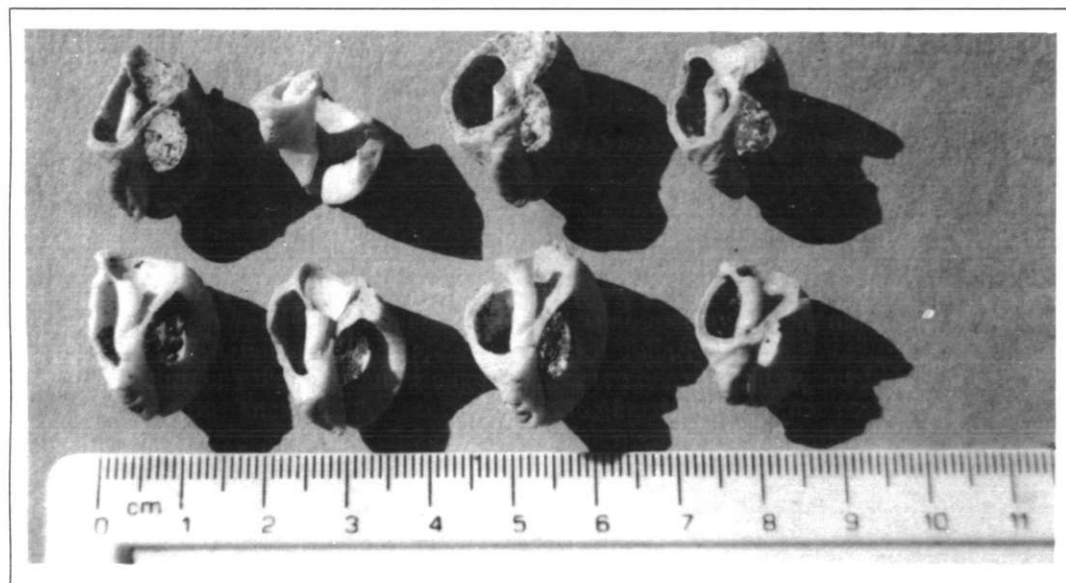


Fig 34 Dog whelks found by Richard Heard in Area A, with their spires cut off, suggesting extraction of the purple dye from the gland of the animal inside. (Photographed by Janice Light)

deliberately broken in this way, to get at the animal without damaging the soft parts. As such they are likely to be shells which were collected for dye-extraction.

Jackson (1917) documented the geographical distribution of the shell-purple industry and gave some idea of the number of animals which might be needed. Twenty ounces of salt were added to 100 pounds of juice. Five hundred pounds of the resultant dyestuffs were mixed with 100 amphorae of water. Clearly, enormous numbers of dog whelks were needed to produce dye in a large enough quantity to be workable. As a writer in the ‘Annual Register’ for 1760 states ‘I suppose a hundred fishes’ (ie specimens of *Nucella lapillus*) ‘would not produce a drop as large as a pea’.

Ocenebra erinacea

This gastropod is a native predator of the oyster, causing significant damage to oyster stocks, for example in the Solent today. In view of the habitat, one would not expect this species to occur in large numbers at Duckpool.

BIVALVES

***Mytilus edulis* (Common Mussel)**

Shell fragments of mussels were identified on the basis of shape, colour and surface texture. Fragments were either flat and relatively thin with curved concentric sculpture from the blade of the valve, or thick with the concentric sculpture running straight where the valves curve in abruptly towards the anterior margin of the mussel. When assessing number of valves for bivalve species difficulties can arise where the umbonal region breaks into more than one fragment (Bell 1987). In mussels, the umbonal angle is very acute and this problem does not arise.

Mussels are abundant around the British Isles where colonies may occur on rocks, flat gravelly shores, and in estuaries where the byssi enmesh within the fine sediments and eventually form a bed of interconnected animals. They are widely used for food in the Northern hemisphere and where they occur in middens on archaeological sites in any quantity it is assumed that they represent food remains.

Mytilus shell is distributed widely over the site at Duckpool but nowhere occurring in very large numbers. Very few (<5) whole valves were found but umbonal fragments with a substantial portion of valve allow some estimate of size. Fragments of individuals up to 70-80mm shell length are present in one of the samples from [11]) and from Context [54]. Several samples (from [15], [12] and [11] contained valves with an estimated length of 60mm. Small mussels were noted from [8], [6] and [41].

Mussel colony size fluctuates depending on the success of recruitment to the population, predation pressure, and interspecific competition for substrate with, for example, limpets and barnacles.

***Chlamys* species (Scallop)**

Occasional fragments occur in 7 of the sieved samples and one of the trench samples. Although *Chlamys* scallops may be eaten they are generally not a major component because of their small size compared to *Pecten maximus* (king scallops) and *Aequipecten opercularis* (queen scallops). Such fragments as occur are extremely eroded and may be beach deposits which have been introduced to the site accidentally by wind or human agent.

***Acanthocardia tuberculata* (Rough Cockle)**

In one of Richard Heard's samples five fragments representing part of one valve were identified. This species is localised to south west England living in muddy sand and gravel from extreme low water to a few fathoms (S M Turk in Carlyon 1982, 167). They are a highly prized food item but evidence from excavations in Jericho (Biggs 1963) suggests that pierced valves may have been used as necklaces. One valve from Kilhallon, Tywardreath has an umbonal hole similar to that illustrated by Biggs. More material from Duckpool would be needed before an attempt to explain its occurrence at the site can be made. The fragments concerned may well be modern, having been collected from the surface of the carpark.

***Ostrea edulis* (Native Oyster)**

The occurrence of one oyster valve on the site is enigmatic. The native oyster, *Ostrea edulis*, is a common component of shell middens but no deposits of the species have been excavated at Duckpool. This is not surprising because there is no immediately accessible suitable habitat. Nevertheless oysters have been found during archaeological work at inland sites at some distance from a natural source, for example at Cross Street, Wokingham (Morris & Jones 1990). The shape and growth pattern of the Duckpool shell (left valve) have given rise to distortion such

that the morphology resembles that of non-native oyster genus, *Crassostrea*, with its elongate shape from hinge to free margin and the large internal ligament pit at the umbone with crowded incremental growth. However, the shape of the muscle scar indicates that the shell is a misshapen left valve of *Ostrea*. It was found in Hearth [2] and thus does not relate to the earliest phase of occupation, but in the absence of other *Ostrea* on the site, interpretation of its occurrence is inappropriate.

***Venericardia* (Fossil Bivalve)**

This is a fossil bivalve. The genus dates from the Cretaceous to Recent but is not living in British waters today. It is a particularly common fossil in the Bracklesham Beds of the middle Eocene. Its occurrence in the Duckpool deposits in a Carboniferous geological setting is therefore interesting and may represent an early example of fossil-collecting.

Summary

Transport of the marine shells to the site

The discrete range of marine molluscan species which constitutes the bulk of the samples is one which forms one ecological group; that of a rocky shore which has an essentially exposed aspect. There is no evidence of taxa such as *Scrobicularia*, *Venerids*, *Ensis* and *Cerastoderma* which inhabit soft sediment shores, either open marine or estuarine, and are common elements of kitchen middens elsewhere (Bell 1987, Smith 1983). Thus the shells occurring in quantity at the site appear to be locally derived. Information on the nature of the shore at Duckpool has been supplied by S M Turk (pers comm) and is given by Wilson (1971). The shore is described as relatively barren with low biotic diversity. All three limpet species are described as common as are *Gibbula umbilicalis*, *Monodonta lineata*, *Nucella lapullus* and mussels. *Littorina littorea* population size appears to fluctuate markedly and neither Turk nor Wilson document *Littorina obtusata* from the site. *Fucus vesiculosus* is present but there is no heavy growth.

Some samples contain concentrations of certain species and samples from hearth environments are often richer in material. Natural strandline death assemblages would usually account for a larger proportion of juveniles than is present at the Duckpool site and occasional specimens of a wider range of species including those normally considered to be sublittoral and brought to the shore during exceptional weather and tidal conditions. On balance I believe the bulk of the excavated shells to be food remains.

Shell-gathering practices and contribution to diet

Compared to other sites in Cornwall, the amount of shell collected is not large (see comments under *Patella vulgata* account) but the site has not been extensively excavated and much more shell may still be on site. Despite initial impressions it is now agreed that a midden is not present on site. However, there is occupation debris of Romano-British date (animal bone, pottery, metal objects etc)—probably redeposited, or at least levelled out, before Hearth [1] and [2] were dug. Erosion by the encroaching sea has destroyed part of the site and not all layers excavated are stratigraphically clear.

Some discussion of shell-collection policy has also been given in the limpet section. From the assemblages in the samples it seems that the inhabitants were collecting mussels and possibly limpets from the adjacent shore as a supplement to their diet rather than a main component, although Ashbee (pers comm) has suggested that the balance of opinion is moving towards the occurrence of limpets in shell middens as a residue from bait-collection. The report on bone fragments lists mammal species likely to have been kept for food (see Powell and Serjeantson in this report) as further evidence of diet.

The Duckpool site is now situated just above the top of the shore but at its earliest phase of occupation it may have been further inland, sea level rise and coastal erosion having resulted in its present beach-top location (Ratcliffe pers comm). An alternative explanation to the small

amount of shell found on site, compared to sites such as Samson on Scilly is that larger numbers were collected and shell debris may have been returned to the shore or to an hitherto undiscovered deposit. It has also been suggested by Crawford (1921) that mussel and limpet shells were pounded for mixing with clay of which pots were made and burning of mussel shells at other sites is known to have occurred (Bullen 1902). However, there is no shell temper in the Duckpool pottery.

NB: a fuller version of this report, including additional tabulated data, is deposited with the excavation archive, together with details of a small assemblage of shells collected by Heard and sent to Stella Turk at the Cornish Biological Records Unit for her comments.

6.10 Land Molluscs by Mark Robinson

Introduction

Samples were not taken specifically for mollusc analysis owing to the lack of deposits usually though suitable such as buried land surfaces and ditches. However, bulk samples were taken from the archaeological deposits for the recovery of charred plant macrofossils and animal bones and large numbers of snails were observed in the floats. The samples were larger than normal used in standard mollusc analysis (c2kg) and large numbers of molluscs were present as a result. Small numbers of snails were present in the dried residues, but these were not examined.

The floats were separated into 2 mm, 1 mm and 500 micron fractions and each was scanned. Eleven of the 27 samples that contained snails were selected for assessment as the assemblages were very similar and in some cases duplicate samples of a single context had been processed. The samples assessed included those from most of the main layers and features. It should be emphasised that the evidence presented below is the result of the assessment. A full analysis was not carried out because it was considered that this would not add to the interpretation.

Results

Cochlicopa and *Cochlicella* were the main components in the >2mm float, but all the other taxa, as well as apices of the *Cochlicella* were recovered from the 1-2mm float. The 500 micron float only contained fragments of *Vallonia* and many other unrecognisable shell fragments. The results are presented in Table 10 and the habitat preference for each taxon is given. This information is taken from Kerney and Cameron (1979). The abundance of each taxon is scored as frequent, moderate or occasional, but a number scale for each group is not given as the snails in the residues have not been assessed.

Burnt snail shells were observed in Layer [4] and Context [44]. The latter is of particular interest as although it was not a very rich assemblage, four of the most common taxa on the site were found burnt in the hearth deposit, confirming that these are directly associated with the archaeological features. Snails thrive on alkaline soils of the sort not normally associated with the shales and sandstones of the Duckpool area. However, the inclusion of beach sand in the soils would have made conditions suitable for snails to survive in.

The *Cochlicopa* could be either *lubrica* or *lubricella*. The *Cochlicella* was compared with a range of reference material of *C. barbara* and *C. acuta* at the University Museum, Oxford, and although the overall shell shape of the Duckpool *Cochlicella* was not as elongate as *C. actua*, the apex and ribbing on the last whorl was more similar to *C. acuta* than *C. barbara*. *C. acuta* is common on the Atlantic coast, but *C. barbara* is only noted in the Torquay area of Britain.

The assemblages from the different contexts are all very similar and a strongly xerophile fauna is represented, characteristic of short-turfed grassland with some bare patches of ground. The *Cochlicella* confirms this as it is particularly characteristic of maritime grassland. The occasional shade tolerant taxa such as *Lauria*, *Discus*, *Aegopinella* and *Clausilia* probably account for less than 1% of the fauna and may represent small localised patches of shade which could be no more extensive than large grassy tussocks or rocks. In general, the land snail

Table 10 Assessment of Land Molluscs

TAXON	HABITAT	PHASE 1 Fill [22], Hearth [21]	Fill [50], Pit [60]	Fill [54] Pit [60]	PHASE 2 Layer [4]	Layer [7]	Layer [10]
<i>Cochlicopa</i> sp	catholic; <i>C. lubricella</i> in drier places than <i>C. lubrica</i>	M	M	F			M
<i>Vertigo pygmaea</i>	dry calcareous grassy places; sand dunes, occasionally in marshes	O	M	M		O(1)	O
<i>Pupilla muscorum</i>	open, exposed calcareous places: scree, dunes, short-turfed grassland	M	M	F	O(1)		M
<i>Lauria cylindracea</i>	woods, rocks, grassland, not in very wet places		O	O			O(1)
<i>Vallonia excentrica</i>	open, exposed calcareous places: scree, dunes, short-turfed grassland	F	F	M	M		M
<i>Discus rotundatus</i>	moist sheltered places of all kinds esp woodland						
<i>Aegopinella nitidula</i>	a variety of moist places: rocks, walls, woods	O(1)		O(2)	O (burnt fragment)	O(1)	
<i>Helicella itala</i>	dry exposed habitats: dunes, scree, short-turfed calcareous grassland				O(1)		
fragment large Helicid				fragment			
<i>Cochlicella acuta</i> *	martime: dunes and coastal grassland, dry exposed sites near the sea	F	M	F	F, some burnt	F	M
<i>Trichia hispida</i> gp	catholic: widespread except for very dry sites						M

Table 10 Assessment of Land Molluscs (cont)

TAXON	HABITAT	PHASE 2 Layer [12]	Layer [16]	Fill [11], Hearth [2]	PHASE 4 Fill [41], Flue [40]	Fill [42], Flue [40]	Fill [44], Hearth [2]
<i>Cochlicopa</i> sp							
<i>Vertigo pygmaea</i>	catholic; <i>C. lubricella</i> in drier places than <i>C. lubricella</i> dry calcareous grassy places; sand dunes, occasionally in marshes	F	small		O	M	O, some burnt
<i>Pupilla muscorum</i>	open, exposed calcareous places: scree, dunes, short-turfed grassland	F		F	F	M	M, some burnt
<i>Lauria cylindracea</i>	woods, rocks, grassland, not in very wet places	O(1)	fragments				
<i>Vallonia excentrica</i>	open, exposed calcareous places: scree, dunes, short-turfed grassland	F		M	M	F	M, some burnt
<i>Nesovitrea hammonis</i>	catholic: damp to moderately dry places	O(1)	only				
<i>Aegopinella nitidula</i>	a variety of moist places including woodland	O(1)				O	
<i>Clausilia bidentata</i>	moderately moist places: rocks, walls, woods	O(1 apex)					
fragment large Helicid						fragment	
<i>Cochlicella acuta</i> *	maritime: dunes and coastal grassland, dry exposed sites near the sea	M		F	F	F	F, some burnt

* *Cochlicella acuta* now includes the species formerly known as *Cochlicella barbara*

Key: F = frequent; M = moderate; O = occasional

fauna suggests that a dry open environment, similar to the short-turfed grassland in the immediate vicinity of the site today, existed when the deposits were formed in the 2nd-4th and 10th-12th centuries AD.

6.11 Plant macrofossils by Vanessa Straker

An assessment of the potential for plant macrofossil analysis of the bulk samples was carried out in 1993 (Straker 1993). Samples from thirty contexts (392.35 litres sediment from layers, hearth and pits) were processed but plant macrofossils were only recovered from 13 of them. Owing to the small size of the assemblages, only one sample warranted further analysis, but it was felt that it would be worthwhile to include in the final report the other identifications which were made during the assessment, as although the information on plant consumption and exploitation is limited, the Duckpool material is the only group of macrofossils of these dates to have been studied from north Cornwall and north Devon. Tables 11 and 12 list the plant taxa identified.

Phase 1: 3rd/early 4th century AD

The single sample (Context [50]) from this phase, from the ash fill of Pit/Hearth [60], contained a single clover or medick seed (*Trifolium/Medicago* sp). These genera include species that grow in a variety of habitats, many including cultivated ground and grassland.

Phase 2: mid 4th century AD

Plant macrofossils survived in eight contexts, all occupation/rubbish layers, though as Table 11 shows, their concentration even in Layers [7] and [12], the main "occupation" deposit, was very low.

The crops represented include six-row barley, identified by a rachis internode, and wheat, represented by a fragmentary grain, but the wheat could not be identified to species and most cereal grains are unrecognisable to genus. The dominant taxon, however, is oats (*Avena* sp). The diagnostic floret bases do not survive, and as the dimensions of wild and domesticated oat grains overlap, it is not known whether the oats were wild, growing as weed of other cereals, or the remains of a crop of domesticated oats.

(The length×breadth×thickness measurements in mm for the only measurable caryopses of *Avena* sp are as follows: 4.7×1.5×1.4; 4×1.5×1.5; 5×1.5×1.5; 4.9×1.5×1.5; 4×1.4×1.4).

The other taxa are very limited and include a possible ribwort plantain (*Plantago cf lanceolata*) seed, a grass caryopsis and a mallow seed (*Malva* sp). They could all have grown in open, disturbed ground, but mallow species are not usually found as arable weeds.

Phase 4: 10th to 12th centuries AD

Three of the samples are from Hearth [2] and the fourth from [42], the lower fill of Flue [40]. A similar range of cereals was recovered to that in Phase 2, but the barley was represented by a single poorly preserved grain which could have been from either a hulled or naked form. Again, oats were the most common taxon. The richest sample was that from the fill of Hearth [2] (Context [44]) and in addition to the crop plants, a range of other taxa typical of cultivated or disturbed ground, heathland and woods, hedges and scrub survived. The arable taxa include stinking mayweed (*Anthemis cotula*), fat hen (*Chenopodium album*), nipplewort (*Lapsana communis*) and pale persicaria (*Polygonum lapathifolium*). These are all common weeds of medieval crops on a range of soils, the mayweed being particularly characteristic of heavy soils.

Heather (*Erica* sp) is represented by charred fruits, seeds and gorse spines, the tops of which were found charred and would have had a heathland origin. The lesser stitchwort (*Stellaria graminea*) may have grown in heathland or with hazel (*Corylus avellana*) and rose or bramble in scrub, hedges or open woodland.

Table 11 Charred plant macrofossils from Phase 1 and Phase 2 contexts (Romano-British)

TAXON	COMMON NAME		PHASE 1 Fill [50] of Pit [60]	PHASE 2 Layer [4]	Layer [5]	Layer [6]	Layer [7]	Layer [8]	Layer [10]	Layer [12]	Layer [15]
Cereals											
<i>Avena</i> sp	oats	grain		1	3	2	1	15			1
Cereal sp		grain				+(1)		+(1)	1	1	+(1)
<i>Hordeum</i> sp	six - row barley	internode			1						
<i>Hordeum</i> sp	barley	grain			2						
<i>Triticum Hordeum</i> sp	wheat/barley	grain				1			1		
<i>Triticum</i> sp	wheat	grain						+(1)			
Other taxa											
Cultivated/disturbed ground											
<i>Plantago cf lanceolata</i> L.	plantain, cf ribwort	seeds								1	
<i>Trifolium/Medicago</i> sp*	clover/medick	seeds		1							
Gramineae*	grasses	caryopses					1				
<i>Malva</i> sp*	mallow	nutlets				1					
various											
<i>Trifolium/Medicago</i> sp*	clover/medick	seeds		1							
Gramineae*	grasses	caryopses					1				
<i>Malva</i> sp*	mallow	nutlets				1					
buds, indeterminate								7			
TOTAL			1	1	6	5	2	24	2	2	2
sample size (litres)			15	15	10	7	9	15	40	66	15
items/litre soil			.07	.07	.6	.7	.2	1.6	.05	.03	.13

KEY: + = fragments with number (); * = in more than one habitat, only counted once in total

Table 12 Charred plant macrofossils from Phase 4/4a contexts (early medieval)

TAXON	COMMON NAME		Fill [11], Hearth [2]	Fill [42], Flue [40]	Fill [43], Hearth [2]	Fill [44], Hearth [2]
Cereals						
<i>Avena</i> sp	oats	grain			6	25+8
Cereal sp		grain			+(15)	+(16)
<i>Hordeum</i> sp	barley	grain	1			
<i>Triticum</i> sp	wheat	grain			2	1
Other taxa						
Cultivated/disturbed ground						
<i>Anthemis cotula</i> L	stinking mayweed	achenes				2
<i>Chenopodium album</i> L	fat hen	seeds				2
<i>Lapsana cominis</i> L	nipplewort	achenes				1
<i>Trifolium/Medicago</i> sp*	clover/medick	seeds				1
Gramineae*	grasses	caryopses			1	6
<i>Polygonum lapathifolium</i> L	plate persicaria	nut		1		
Heathland						
<i>Erica</i> sp	heather	fruits				11
<i>Erica</i> sp	heather	seeds				22
<i>Stellaria graminea</i> L*	lesser stitchwort	seeds				2
<i>Ulex</i> sp	gorse	spines				18
Hedges, scrub, woodland						
<i>Corylus avellana</i> L	hazel	nutshell fragments				+(1)
<i>Rosa/Rubus</i> sp*	rose/bramble	spine				1
<i>Stellaria graminea</i> L*	lesser stitchwort	seeds				2
Various						
<i>Trifolium/Medicago</i> sp*	clover/medick	seeds				1
Gramineae*	grasses	caryopses				6
<i>Hypericum</i> sp*	St John's wort	seeds				1
<i>Rosa/Rubus</i> sp*	rose/bramble	spine				1
unidentified fruits/seeds					1	4
TOTAL			1	1	11	109
sample size (litres)			103	15	15	7
items/litre soil			<.01	.06	.7	15.6

NB: Material in Context [42] may be residual and of Romano-British rather than early medieval date

Discussion

The small size of the assemblages and poor preservation of the cereals identified at Duckpool, (wheat *Triticum* sp), six-row barley (*Hordeum* sp) and oats (*Avena* sp)) mean that there are no apparent differences between the crops exploited in the Roman and early medieval periods. In other parts of southern Britain, spelt and emmer, and occasionally free threshing wheat, but particularly spelt wheats are typically found on Roman sites, to be replaced by free threshing wheat by the medieval period. Hulled six-row barley is usually found throughout both periods. However, the nature of the present evidence for Duckpool does not allow such distinctions to be drawn.

In fact, the caryopses of oats (*Avena* sp) are more common than either the wheat or barley. As mentioned above, owing to the lack of chaff, these cannot be identified to species, and they could therefore in theory derive from crop processing waste as weeds of wheat and barley;

wild oats are common arable weeds today. But, as so little wheat and barley chaff survives and small weed seeds are also scarce, it seems more probable that the oats at Duckpool are crop remains. Domesticated oats (*Avena sativa* and *strigosa*) are not common Roman and medieval crops in southern Britain, but are characteristic of Scottish crop assemblages of these periods. Oats are the least sensitive cereal, being able to tolerate acid soils, low levels of sunshine and high rainfall, and have the ability to dry in the sheaf (Coppock 1971). Plant macrofossils have been studied from very few sites in Cornwall and Devon, but the 5th-6th century deposits at Tintagel churchyard (Straker 1992) and Tintagel Island (Straker 1997) about 20 miles to the south of Duckpool, also on the exposed Atlantic coast, are rich in oats as well. It seems likely that they were a crop in the extreme south west of England, as, like Scotland, the acid soils and wet and windy climate would have been unsuited to extensive cultivation of wheat and barley. However, until the diagnostic floret bases of domesticated oats are found in well dated Roman and post Roman contexts, such as those shortly to be studied from Penhale Round, Cornwall, this must remain a speculation.

The most likely origin of the charred cereals and weeds is as the remains of food preparation and waste disposal, and the heathland and woody taxa were probably used as fuel for industrial or domestic hearths. The exploitation of heathland is only apparent in Phase 4, the early medieval deposits, but the evidence from the land mollusc assessment (Robinson this volume) does not suggest that the immediate environment (largely dry and open) had changed between the Roman and medieval use of the site; however, the molluscs only reflect the vegetation from a very limited local area. It is not known when heathland communities developed on the shales and sandstones of the north Cornwall coast, but in other parts of the county, they were established by the Bronze Age.

Apart from Tintagel, there are few other sites from the South West from which macrofossils have been studied, with which to compare Duckpool. In Cornwall, the 2nd to early 4th century features excavated at the round at Reawla produced sparse remains of emmer (*T dicocum*), spelt (*T spelta*), hulled barley (*Hordeum sativum*), and a few oats, which were, again, not assigned to a species (Straker 1992). In Devon, plant macrofossils have been studied from the 1st century ditch of the Roman fortress in Exeter (Straker *et al* 1984) and the 2nd-3rd century ditch of the fort at Woodbury Great Close near Axminster (Straker and Jones 1993). In both cases, emmer, spelt and small amounts of indeterminate oats were present, and at Woodbury, traces of barley were also found. It is debatable whether the specialised needs of a Roman fort which could have 'imported' grain from elsewhere in Britain are comparable with the diet of the people working at the industrial site of Duckpool.

6.12 Charcoal by Rowena Gale

Prior to radiocarbon dating, charcoal was identified from three contexts as shown in the table below. The fragments were rather small and some were very friable. Where possible, the presence of stem material or sapwood was noted. The taxa identified are all native and could have been collected from the local area for fuel or construction purposes.

Table 13 Charcoal identified in radiocarbon samples

PHASE 4, Context [44], Hearth [2]	<i>Ulex</i> sp/ <i>Cytisus</i> (gorse/broom)	narrow stem
	<i>Alnus</i> sp (alder)	
	<i>Corylus</i> sp (hazel)	
	<i>Quercus</i> sp (oak)	
	cf <i>Betula</i> sp (birch)	id unconfirmed
PHASE 3, Context [49], Hearth [1]	<i>Alnus</i> sp (alder)	
PHASE 1, Context [50], Pit [60]	mainly <i>Quercus</i> sp (oak)	sapwood and probably also heartwood
	<i>Salix</i> sp/ <i>Populus</i> sp (willow/poplar)	

6.13 Soils by Matthew Canti

Sampling rationale

Two sampling procedures were carried out during the excavation:

- 1) A column consisting of three micromorphology samples was collected from the burnt layers exposed by the northern arm of the excavation trench (Fig 23). These were intended to shed light on the materials making up the layers, and examine the preservation conditions within them.
- 2) Samples of local soil were collected for chemical analysis outside the excavation area. These were intended for comparison with soil material contaminated by the industrial process carried out at the site. The sampling positions are shown in Ratcliffe 1992, fig 4. Discussions with Technology Branch staff at the Ancient Monuments Laboratory led to the conclusion that this methodology would only be appropriate at sites where no technological remains (eg slag) were recovered. Since such material was available at Duckpool, the experiment would have been an unnecessary duplication of their analyses.

Results of micromorphological analysis

One slide was cut off each of the 3 blocks taken. These were examined and found to contain the following:

- wood ash
- oak charcoal
- egg shell (bird)
- marine shell
- chert/flint
- lumps of local stone
- arionid/earthworm granules
- hazel or alder charcoal
- burnt and unburnt bone
- burnt soil

These materials are all consistent with the dumped nature of the deposit and further analysis was not recommended at the assessment stage of the project.

6.14 Technological Evidence by Catherine Mortimer

Material examined

- 1) Lead and lead-tin metal blobs and runs. Most of this is amorphous, with shapes suggesting the material ran out onto a rough surface. However SF66 could be interpreted as a deliberately-formed strip, cut or snipped at the ends. The material was found mostly in small quantities; 1052g in 17 samples, of which c500g was from SF206 (a large amorphous cake).

Some of the samples were tested using non-destructive surface X-ray fluorescence (XRF) analysis. SF61 is mostly lead, with traces of iron (probably not in the metal but from the soil) but SFs 21, 66, 132 and 206 have both lead and tin present.

- 2) Fired/burnt clay fragments. Unfired clay at the site is yellowy-brown. Most of the clays submitted for technological examination were oxidised red, but were not fired at any great temperature. Therefore they are not vitrified and easily crumble in the hand. In general, this material is found in small quantities; a total of 905g came from 26 samples. XRF analysis revealed little of significance—the usual range of clay-mineral related elements were detected, especially iron.

A few pieces were more heavily fired, in some cases such that vitrification had occurred, although not extensively. Three samples appear to be vitrified hearth/furnace lining (SFs 121, 200 and 322).

- 3) 'Burnt stone'. Some granite stones with slightly pink areas were included in the sample, but no vitrification or other evidence of very high temperature was visible on the surface.
- 4) Slags and other vitrified material. These had a range of appearances, some dense but mostly

light and porous. Most of this group is composed of compacted ashes or fuel ash slag. Again, most of the pieces are very small but SF375 weighs 415 g in total

5) Crucible. A Single tiny sherd (SF265) had evidence of high temperatures on the outside, with reddish vitrification. Inside there was greenish corrosion, presumably from copper alloy. XRF revealed very high levels of zinc on the inside. High levels of zinc are commonly found on crucibles used for copper-alloy working, because it is a volatile metal which can enter pores in the ceramic and become chemically bound.

6) Pottery with white residues. Four contexts with pot sherds which have white residues inside, which proved to be lead-rich when tested by XRF (SFs 34, 109, 122, 151); they were probably from vessels used for melting lead. The fabric and form of the pottery is similar to domestic ware at the site (ie South Devon ware).

7) Clinker/coke. A single piece (SF200, 13g) was very light and porous.

8) Iron ore. One small example (SF161, 150g).

9) White material in small lumps. Several examples, possibly a local clay mineral such as kaolinite.

Discussion

The lead/lead-tin runs and dribbles suggest lead-working and pewter-working. This could have been carried out at a relatively low temperature (*c*300°C), for example, on a domestic hearth. There are only a few ceramic fragments with evidence of lead melting; nonetheless, these may have been the vessels in which the melting of lead, and possibly of lead-tin alloys were carried out.

There is no evidence for cupellation at the site; notably there are no litharge cakes (i.e. lead oxide blocks). The other factor initially thought to be significant in this respect was the scatter of animal bone material at the site (Ratcliffe 1992, 5); however, this is not large compared with sites elsewhere in Britain (information Dale Serjeantson).

The fired clay, ?burnt, ?hearth lining, compacted ashes, fuel ash slag and clinker on this site confirm high temperature activities, but their nature is not diagnostic of any particular process. Likewise, the ash, charcoal and burnt clay dumping seen across the site is not diagnostic of any particular high-temperature process and may merely have originated from the lead/lead-tin melting and/or domestic fires.

The crucible fragment indicates melting and casting of a zinc-containing metal alloy (probably a copper alloy). Although there is only this one very small fragment from the site, this is a significant increase in terms of our current knowledge of Roman-period metalworking in Cornwall where few crucibles are known. (The fabric of the crucible has a fine sandy consistency which would not be incompatible with a local origin—comment by Henrietta Quinnell).

Catalogue

SF	Context	ID
11	[12]	Lead
12	[12]	Lead
17	[12]	Fired clay?
21	[18]	Slag/dross (Sn/Pb)
34	[12]	Pot+white deposits (Pb detected)
59	[12/60]	Lead
61	[12]	Lead
65	[12]	Slag
66	[42/40]	Lead
68	[30]	Lead
74	[30]	Lead
77	[12/46]	Slag?

SF	Context	ID
80	[30]	Lead
85	[30]	Lead
104	[12]	Fired clay (2 samples)
105	[12]	Fired clay
109	[12]	Fired clay Pot + white deposits (Pb detected)
117	[12/30]	Fired clay
121	[10]	Fired clay ?hearth lining
122	[30]	Pot + white deposits (Pb detected)
131	[29]	Slag?
132	[54]	Stone ?burnt (2 samples) Fired clay (2 samples) Metal run (Sn Pb) Slag?
136	[12]	Fired clay and white material
138	[12]	Fired clay (3 samples) Lead
139	[12]	Fired clay
140	[12]	Slag Lead
141	[12]	Fired clay
151	[30]	Fired clay Pot + white deposits (Pb detected)
161	?	Iron ore
187	RMH Hearth 3	Lead
200	RMH Hearth 2	Hearth lining
206	RMH	Lead
207	RMH Hearth 2	Lead
209	RMH Hearth 2	Lead
243	RMH Hearth 1	Pot ?white deposits (no Pb detected)
247	?	Fired clay
262	RMH Hearth 1	Lead
263	RMH Hearth 1	White material
265	RMH Hearth	Fired clay Crucible sherd
268	RMH	Fired clay
270	RMH Hearth 1	White material
278	RMH	Stone
283	RMH "oven"	White material
289	RMH	Fired clay
290	RMH	Slag and white material
298	RMH	Slag (FAS?)
309	RMH	Fired clay and white material
314	RMH	Lead
322	RMH Hearth 3	Hearth lining
316	RMH	Fired clay
333	RMH Hearth	Stone
337	RMH Hearth?	Stone
352	RMH	Fired clay
358	RMH	Fired clay
366	RMH	Fired clay
375	RMH	Smithing slag?

SF	Context	ID
385	RMH Hearth	Fired clay
386	RMH Hearth	Fired clay
387	RMH	Smithing slag?

FAS = Fuel Ash Slag

Comments in brackets signify XRF analysis was carried out, elsewhere 'lead' signifies objects which seem likely to be lead or lead-rich alloys such as pewter, in view of their weight and visual appearance.

Appendix

Subsequent to the completion of the above report on the technological evidence, further material was retrieved from the residues of sieved soil samples. Details as follows

Find No	Context (sample)	Description
392	50 (S18)	10 blobs/dribbles/concentrations of lead
398	12, box 17 (S23)	3 concretions of lead and iron
415	12, box 19 (S7)	12 blobs/concretions of lead

Though additional to the material analysed in the above report these do not in any way affect the conclusions reached in this report.

6.15 Radiocarbon Dates by Alex Bayliss

Six radiocarbon dates were obtained, two each from the charcoal fills of Hearth [1] and [2] and the ash fill of Pit/Hearth 60. Dating was carried out at the Oxford Radiocarbon Accelerator Unit. Table 14 gives the results, together with the maximum intercept calibrated date ranges (Stuiver and Reimer 1986), which have been rounded according to Mook (1986). The probability distributions (Stuiver and Reimer 1993) of these dates are shown in Fig 35. All calibrations have been calculated using data from Stuiver and Pearson (1986).

It was decided not to take a weighted mean of the results from each context, although they are not statistically different at 95% confidence (Ward and Wilson 1978). This is because it is not known whether each fragment of charcoal is of exactly the same date; they are not replicate measurements on the same piece of charcoal. However, the similarity of the results from each context does increase our confidence in their ability to provide a reliable indication of the dates of the features.

Although the calibrated dates shown in Table 14 and Fig 35 are accurate representations of the dates of the samples, more reliable estimates of the dates of the archaeological events of interest (ie the firing of the features) can be calculated by producing a mathematical model of the chronology of the site. This is done using a technique known as 'Gibbs sampling' (Gelfand and Smith 1990; Bronk Ramsey forthcoming).

In this case we have the sequence of stratigraphic relationships between the samples, and the absolute dates of the coins from Layer [12] (see *Dating of the excavated remains* in Section 3.1 and Fig 36). Layer [12] is stratigraphically later than Pit/Hearth [60], although this need not mean that Pit/Hearth [60] dates to before the coins were minted, as they could have been in circulation for some time before deposition or be residual. However this does appear unlikely here, both because the coins form a tight group, and also because the pottery from Layer [12] is of the same, mid 4th-century, date. For this reason the constraint that Pit/Hearth [60] must be before Layer [12] has been included in the model.

These results are presented in Figure 36, where the probability distributions in black are those which include the stratigraphic information and coin dates and the distributions in outline are those of the simple calibrated radiocarbon result, ignoring other information. The percentage figures are the indices of agreement (Bronk Ramsey 1994). These provide an indication of

SEQ Duckpool

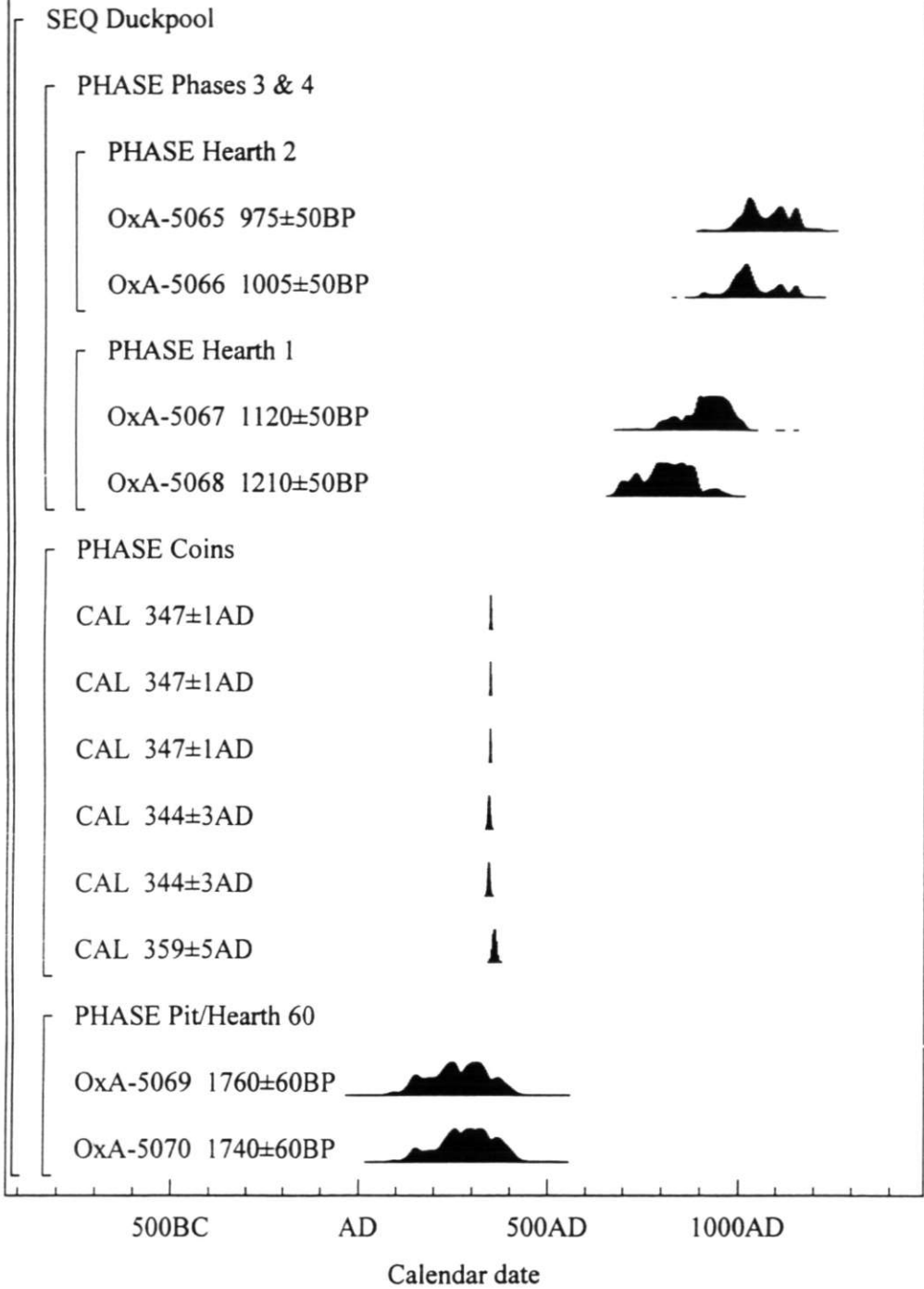


Fig 35

SEQ Duckpool

SEQ Duckpool {A=104.0%(A'c= 60.0%)}

PHASE Phases 3 & 4

PHASE Hearth 2

@OxA-5065 100.0%

@OxA-5066 100.2%

PHASE Hearth 1

@OxA-5067 99.4%

@OxA-5068 100.2%

PHASE Coins

CAL @347±1 99.9%

CAL @347±1 100.0%

CAL @347±1 99.8%

CAL @344±3 100.1%

CAL @344±3 99.9%

CAL @359±5 100.0%

PHASE Pit/Hearth 60

@OxA-5069 107.8%

@OxA-5070 106.8%

500BC

AD

500AD

1000AD

Calendar date

Fig 36

whether the model is statistically consistent. In this case it is, all the figures are well over 60%, indicating that the radiocarbon evidence is in agreement with the coin dates and stratigraphic sequence. These estimates can also be expressed as date ranges, cited in italics to distinguish them from simple calibrations. Only those for OxA-5069 and OxA-5070 are significantly different from the ranges shown in Table 14. At 95% confidence these are *130-343 cal AD* and *140-344 cal AD* respectively.

We can also compare the probability distributions of the last dated events in Hearths [1] and [2]. These are probably the best estimates of the dates of the features themselves, on the principal that a context dates to the latest material in it. However, with only two measurements for each hearth, these estimates are not robust and so are not cited here. Nevertheless comparison of the distributions does show that it is very likely that Hearth [2] is later than Hearth [1] (over 95% confidence). The probability of the last dated event in Pit/Hearth [60] being later than AD 200 is 95%;

Table 14 Duckpool radiocarbon dates

Laboratory Number	Context sampled	Material dated	Radiocarbon Age (BP)	Calibrated date range (95% confidence)
OxA-5065	Fill [44] of Hearth [2]	<i>Ulex/cytisus</i> charcoal	975 ± 50	cal AD 970-1170
OxA-5066		<i>Corylus</i> sp charcoal	1005 ± 45	cal AD 960-1160
OxA-5067	Fill [49] of Hearth [1]	<i>Alnus</i> sp charcoal	1120 ± 50	cal AD 780-1020
OxA-5068		<i>Alnus</i> sp charcoal	1210 ± 50	cal AD 670-960
OxA-5069	Fill [50] of Pit/Hearth [60]	<i>Salix/Populus</i> charcoal	1760 ± 60	cal AD 110-420
OxA-5070		<i>Quercus</i> sp sapwood charcoal	1740 ± 60	cal AD 120-430

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Appendix: Details of the site archive

The site archive consists of the following:

- 1) A ring-binder containing:
 - a) List of site plans
 - b) List of site section drawings
 - c) List of photographs
 - d) List of levels
 - e) List of context numbers
 - f) Context sheets
 - g) Site matrix
 - h) List of finds from 1992 excavation
 - i) List of finds collected by Richard Michael Heard
 - j) Lists of different types of artefacts
 - k) Table showing quantities of different types of artefact
 - l) Table showing artefact types found in each excavated context

- m) List of soil samples for chemical analysis
 - n) Initial list of bulk soil samples
 - o) Initial summary of the excavation
 - p) Specialist Assessments
- 2) Finds record forms (in 3 ring binders)
 - 3) Admin/correspondence (in Stratford file)
 - 4) Pre-excavation reports/project proposals (in Stratford file)
 - 5) Background information/articles (in Stratford file)
 - 6) Excavation site notebook (containing list of context and small find numbers and levels)
 - 7) Notebook used during sieving of bulk soil samples
 - 8) Original excavation drawings
 - 9) Inked-up archive drawings
 - 10) Publication drawings
 - 11) CAU black and white and colour slide photographs
 - 12) Detailed specialist reports on the artefactual, environmental and technological material
 - 13) Boxes containing the artefactual, environmental and technological material retrieved during the excavation and prior to it (by Richard Heard)

All of the above archive will be deposited at Truro Museum except for the CAU photographs which form part of the Unit's photo archive.

Duckpool, Morwenstow, Cornwall: the bias introduced by selective collection of the marine molluscs

JANICE LIGHT

Summary

The results obtained from different methods of collecting marine molluscs from an excavation site can give a false impression of the range of species present and their relative abundances. Shells and fragments collected by three methods during the Duckpool Excavation were available for identification, abundance estimation and interpretation. Selective collection and handpicking of specimens prior to and during excavation tended to yield complete specimens of conspicuous species. When fragments systematically collected by sieving were included, the overall composition of the assemblage and relative proportions of different species changed significantly. In considering sieved fractions it was found that sorting sieved residue below 4mm did not change the overall picture of the assemblage present.

Introduction

During August 1992 a small-scale twelve day excavation took place at Duckpool near Morwenstow, Cornwall. This beach-top site which has since suffered coastal erosion was first discovered in 1983 by an amateur archaeologist, Richard Heard. During the Romano-British period (2nd to 4th centuries AD) it appears to have been a specialist settlement involved in secondary metal working (and dye extraction) and in the early medieval period (7th to 12th centuries AD) a harbour serving the prosperous manor of Kilkhampton.

Material

After his initial discovery Heard visited the Duckpool site periodically between 1983 and 1986 and removed surface material. Some of this material was passed to the Cornish Archaeological Unit (CAU) at Truro and the marine molluscs have been examined for this study.

In addition to the Heard-collected material, CAU obtained 1.5kg of marine mollusc shell from sievings of 31 bulk soil samples and shells collected by hand from the trench during excavation. The trench-collected shells and sieved samples were considered as a separate component during analysis of the total marine shell assemblage.

The results of the analysis of the marine mollusc material are discussed elsewhere (Ratcliffe, this volume) but the mollusc species identified and quantified from the different collections from Duckpool make a useful case study on the biases introduced by different methods of collection from an archaeological site.

Marine molluscs present in the samples

The shell content of all samples examined is presented in tables contained in the Excavation Report (Ratcliffe *ibid*) and in the archived specialist marine mollusc report. Table 1 summarises distribution of occurrences of marine molluscs collected by the three methods outlined above.

Mussels (*Mytilus edulis*) dominate the assemblage, occurring in all of the 26 sieved samples, 37 of the 44 trench collected samples and in only one of the 26 Heard samples. Limpets (*Patella vulgata*) are the second most common element occurring in 22 of the sieved samples, 31 of the trench samples and 7 of the Heard samples. Other gastropods of the same ecological group (topshells and edible winkles) are infrequent in the samples. Some contexts yielded high numbers of the flat-topped winkle, *Littorina obtusata*—this is discussed below.

R M Heard collections

It is not documented how often Heard visited the Duckpool site after his initial discovery and before its excavation by CAU in 1992. In a letter to Stella Turk of Cornish Biological Records Unit, (October, 1986) he states that he gathered only what appeared on the surface exposed by rain, sea and pedestrians. The shells he collected are stored as 26 bagged samples and contain specimens all of which are whole except for five freshly-broken fragments of a large cockle species. Mussels (*Mytilus edulis*) are absent save one valve and he collected only 7 limpets (*Patella vulgata*). The Heard assemblage is dominated by the dog whelk, *Nucella lapillus*. The species is present in 21 of the samples and most appear to have been 'clipped' in a characteristic way. (The term 'clipped' is used here to imply deliberate breakage in a specific manner where the apex and part of the body whorl have been removed at an oblique angle leaving the aperture intact). In his letter to Turk, he describes a small patch of whelks about a metre from the fire as "totally whelks and not deep". He also describes whelks found as "lone deposits". In all, the shells in the Heard collection are low in species diversity and abundance.

Trench-collected shells

Shells in the trench samples were identified and quantified using number of apices as an indication of gastropod individual numbers and number of umbones divided by 2 to estimate number of bivalve specimens. *Mytilus* (mussels) and *Patella* (limpets) occur in most samples and are the dominant species.

The most striking feature of the trench samples was the occurrence of the flat-topped winkle *Littorina obtusata* in high numbers in 11 of the 44 samples. The shells were dominantly adult and in good condition, having the appearance of live-collected animals. The possible mechanisms of selection which brought them to the site include i) collection as decorative items owing to their bright yellow colour in life, and ii) accidental transport in fucoid seaweeds collected for fertiliser or as a wrapping material for marine edible items, or for the extraction of certain substances eg iodine. The species only occurred in 3 of the Heard-collected samples with a total number of 14 shells.

The dog whelk *Nucella lapillus* also occurred in higher numbers than in the sieved samples but in most cases the specimens were 'unclipped'.

Sieved samples

Analysis of the shells from sieved samples was carried out on the >8mm, and 4-8mm fractions. During analysis the same criteria for estimating numbers of individuals as was employed in trench-collected samples was used. All the samples are dominated by the mussel, *Mytilus* and the 11 heaviest samples had the highest number of *Patella* shells in the samples which, together with *Mytilus*, accounted for 80-100% of the shell component of most samples. Five samples not falling into this category had the highest counts of *Littorina obtusata*. Other species occurring in the samples were present at low density and include *Monodonta lineata*, *Gibbula umbilicalis*, *Ocenebra erinacea* and the dog whelk *Nucella lapillus*. This latter species occurred as fragments in 8 sieved samples with an estimated abundance of 1-2 individuals. It is logged as occurring in 6 other samples with a negligible weight. No 'clipped' shells were collected during sieving.

Finer fractions

The remaining fractions (2-4 mm and 1-2 mm) were sorted for two of the samples. This was a time-consuming exercise and resulted in (i) the retrieval of additional fragments of the two dominant species (*Mytilus* and *Patella*) in both sieved samples and (ii) in the addition of less than 1 g of fragments of 3 three other species in each sample. In one sample 54 g of *Mytilus* fragments were obtained but very few of the fragments were umbonal and the estimate of number of animals for that sample was not greatly increased. In this instance, therefore, it

was concluded that the additional data obtained from sorting the finer fractions of all the sieved samples was unlikely to alter significantly the overall composition and interpretation of the assemblages.

This conclusion might not be valid for other excavations where a higher proportion of the important species to be present in a more comminuted state and if small species were to be present in high numbers, these would not be reliably retrieved in <4mm fractions. It should be noted that there are many smaller species of marine mollusc which, although unlikely to be collected for food, can contribute useful environmental data. Species extracted from floats of 6 samples processed for plant macrofossils were examined and identified for this study and are summarised in table 2. They occur in very low numbers and consist of juveniles and fragments of taxa occurring in the samples, species living on the upper shore and in locally-occurring algae lower down and small specimens of sublittoral species which are a common element of beachsand. When these data are added to those obtained from analysis of all the samples, the range of species which constitutes the bulk of all the samples examined is seen as one which forms a single ecological group; that of a rocky shore which has an essentially exposed aspect.

Conclusion

Shells obtained during excavations and reported on during assessment were collected by three methods. Initially Heard visited the site and picked up surface material, some of which he retained. Although material passed to Cornish Biological Records Unit was made available to me for examination, it was only during conversations with Stella Turk on other matters that I became aware of its existence. This highlights the hazard of potential loss of material for study due to post-collection dispersal of casually collected shells, artefacts etc. Also, it is likely that the larger and more conspicuous items will be seen and picked up preferentially by this method. During the course of his visits between 1983 and 1986 Heard tended to collect a few examples of new finds. In the case of the 'clipped' dogwhelks many specimens that he observed were never collected and it is assumed they have subsequently been dispersed by beach erosion, (Ratcliffe pers comm). In view of the random method of collection that Heard employed, his assemblages may not be strictly comparable with the shells retrieved during the excavation because they may have come from a different part of the site with an intrinsic shell assemblage.

The Trench-collected material yielded more whole shells and some of the larger shell fragments. Most of the *Littorina obtusata* were retrieved by this method plus a few 'clipped' and 'unclipped' *Nucella lapillus* but considerably fewer than occur in Heard's samples, although more than in the sieved samples.

The systematic collection achieved by sieved samples has enabled retrieval of the more fragmented and inconspicuous fraction of the species making up the samples. This has not affected the picture in respect of the species which occur at low density in the samples but has yielded more information in terms of numbers of individuals of the two common molluscs in the samples ie the mussels and limpets. This has an important bearing on the interpretation of the assemblage as a whole. The Heard-collected and Trench samples contain a range of species **including** two species, *Mytilus* and *Patella*, which are recognised as edible species. However the proportion of non-gastronomic items such as *Littorina obtusata* and *Nucella lapillus* in the Heard and Trench samples is higher. When the sieved data are added the overall picture changes to give an interpretation of deposits which are *Mytilus/Patella*-dominated and thus essentially food remains with the added component of species used for other economic purposes.

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Table 1 Number of occurrences of marine mollusc species in Duckpool samples. Total number of samples shown in brackets

Species	Heard samples (26)	Trench samples (44)	Sieved samples (26)
<i>Mytilus edulis</i>	1	37	26
<i>Patella vulgata</i>	7	31	22
<i>Littorina littorea</i>	1	0	0
<i>Littorina obtusata</i>	3	33	19
<i>Littorina saxatilis</i>	0	0	3
<i>Nucella lapillus-c</i>	13	4	} 14 total
<i>Nucella lapillus-uc</i>	9	13	
<i>Monodonta lineata</i>	4	15	12
<i>Gibbula umbilicalis</i>	2	12	7
<i>Ocenebra erinacea</i>	0	0	1
<i>Chlamys</i> sp	0	1	6
<i>Acanthocardia</i> sp	1	0	0
<i>Venericardia</i> fossil	0	1	0

Note: 'c' =clipped and 'uc' =unclipped

Table 2 Marine mollusc species extracted from floats of sieved samples processed for plant macrofossils

Species	S3	S16	S18	S20	S22	S27
<i>Patella vulgata</i>	1			1		
<i>Helcion pellucidum</i>		2				
<i>Tricolia pullus</i>						1
<i>Littorina neglecta</i>	1					
<i>Melarhaphe neritoides</i>				1		
<i>Hydrobia</i> sp	1					
<i>Rissoa parva</i>	4					1
<i>Onoba semicostata</i>	1					
Neogastropod fragment	3					
<i>Brachystomia</i> sp	2					
<i>Otrea edulis</i>		1			2	
<i>Heteranomia</i> sp	1					
<i>Mytilus edulis</i>	15	10	5	7	13	1
<i>Cerastoderma edule</i>		1				
<i>Lasaea adansoni</i>		1			2	
<i>Goodallia triangularis</i>		1				
<i>Corbula gibba</i>						1

Lestowder, St Keverne: a previously unidentified stronghold

MICHAEL TANGYE

Summary

Fieldwork at Lestowder, St Keverne parish has revealed a previously unidentified fortification, now partly destroyed. Lestowder has traditionally been seen as the location of one of the strongholds of Teudar, a legendary Cornish king.

Introduction

Lestowder lies at the extreme north-east of the parish of St Keverne near its boundary with the parish of St Anthony-in-Meneage. It is today represented by a farm of 140 acres, situated 45 feet (13.7m) above sea level on the north side of a valley which descends eastwards to cliff-land and the shores of Gillan Creek (Fig 1).

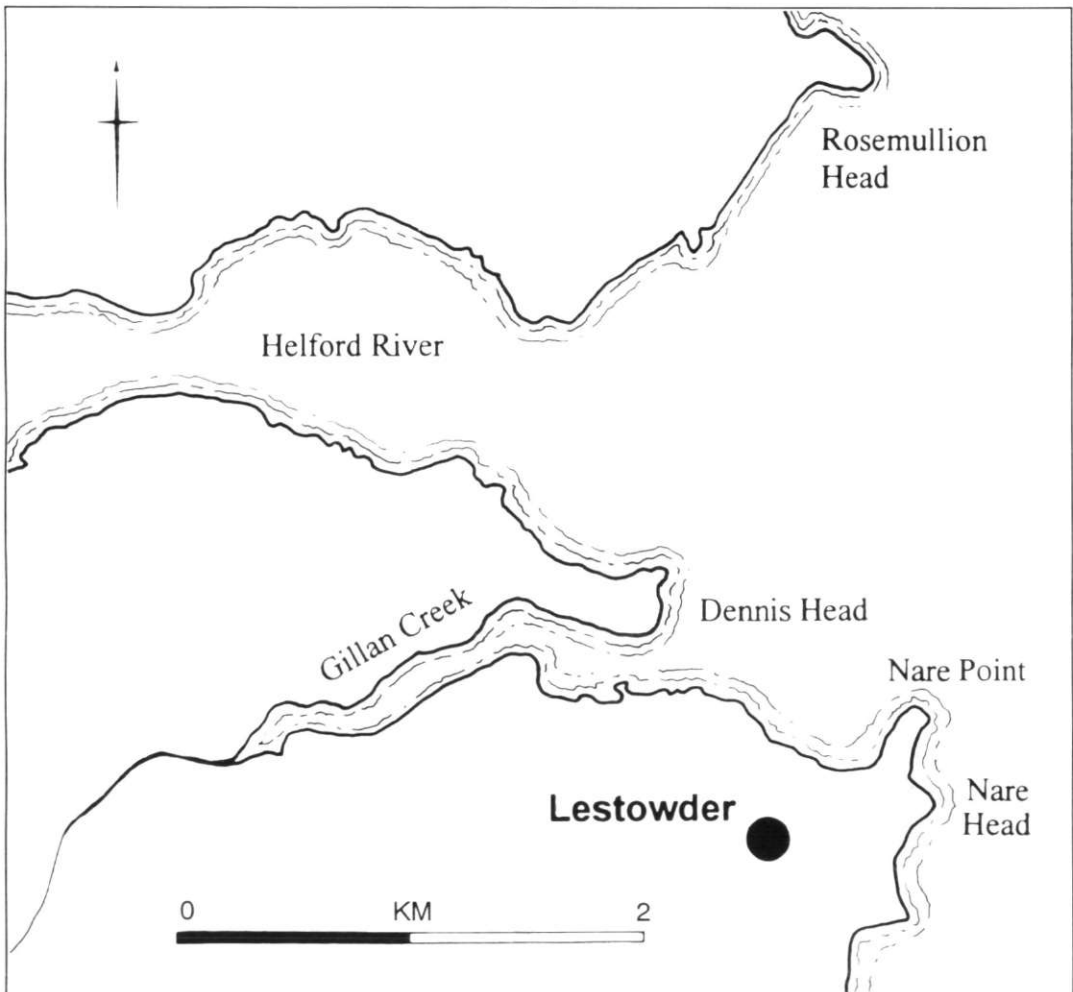


Fig 1 The location of Lestowder and its relationship to Helford River and Gillan Creek

We find numerous forms of Lestowder recorded by Charles Henderson—Lestewder 1403, Lesteudar 1504, Lestuther 1536, Lestowder 1720, (Henderson 1917, 19) and it has been well documented as the Court of Teudar, a legendary Cornish king associated with Cornish saints. Dr Oliver Padel however, informs the writer that in the earliest spelling 'Lestewder', Henderson has slightly misrepresented his source, the printed Episcopal Register of Bishop Stafford, which has 'Lesteuder' (Hingeston-Randolph 1886, 241).

In the Cornish medieval miracle play *Beunans Meriasek*, Teudar is recorded as having strongholds at Goodern, in Kea and at Lestowder in Meneage. He also, traditionally, had a fortification at Riviere in Phillack from which he is said to have attacked and slain an 'invasion' of Christian Irish landing in the Hayle estuary. Canon G H Doble records his activities in the lives of the Cornish saints (Doble 1923-1944) in connection with Saint Fingar or Gwinear, St Kea, St Petrock and St Breaca; this illustrates the extent of Teudar's kingdom in Cornwall.

Henry Jenner suggests that Teudar's attack on St Fingar, or Gwinear, and his large contingent of Irish at Hayle, took place in about AD490 and that he died around AD520, (Jenner 1928). However, there are no reliable dated records for this period, and all that one can say is that Teudar was associated with saints who were believed to have been active in about the 6th century. The area of his supposed activities would appear to have extended from near the Camel estuary to the Hayle estuary, and as far south as St Keverne; from there to the west side of Falmouth Harbour, and the Truro River, including Goodern in Kea.

It is surprising, however, that although Lestowder has for long been accepted as being a stronghold of Teudar, there has, hitherto, been no identification or description of an earthwork there which would add physical evidence as confirmation of this. Recent fieldwork, during May 1994, revealed the presence of an extensive bi-vallate fortification, with a large central enclosure, lying immediately to the south of the present farmhouse, its outline clearly defined on the 1879 inch OS map (Fig 2).

The site is situated on gently sloping ground, well below the hill summit rising to the west. To the south it is bordered by a sudden steep drop to the valley floor where a substantial stream flows to the sea to emerge at a cove named on the 1879 OS map as 'Caermenow'—Fortress of the rocks. The origin of this name is uncertain due to the lack of earlier spellings. Charles Henderson (1934, 23) recorded the pronunciation 'Gulmerrow' in the 1920's, and although 'Caermenow' has now been lost, it can still be identified locally in its abbreviated form of 'Cremow'.

Description

The outer defence work Fig 3(A)

This remains extant on the west side as a field hedge of earth, unfaced with stone, about 5 feet (1.5m) high with an angled face. It extends north to south for a distance of 102 yards (93.3m) and must represent all that is left of the original bank following its reduction and the scattering of its soil for cultivation; there are no signs of an outer ditch.

On the 1879 OS map it continues, (A1), for about 50 yards (45m) to the edge of a sudden drop into the valley which, along this southern flank, forms a natural defensive feature. However, this section has since been destroyed, and the valley area at this point has been excavated and widened by machinery in recent times to provide a watercourse and ponds, destroying section (A2), which appears to have been a continuation of the outer defensive work.

The northern section of this outer defence has also been destroyed, although section (A3) was extant in 1879. No evidence of the continuation of the bank exists in fields to the east of the site.

The inner enclosure Fig 3(B)

The area between the outer defence (bank A) and the inner defence (bank B), slopes gently downwards to the latter, and the banks are roughly 27 yards (24.6m) apart. In more recent times this area has been cleared of dense undergrowth and small trees and subsequently infilled

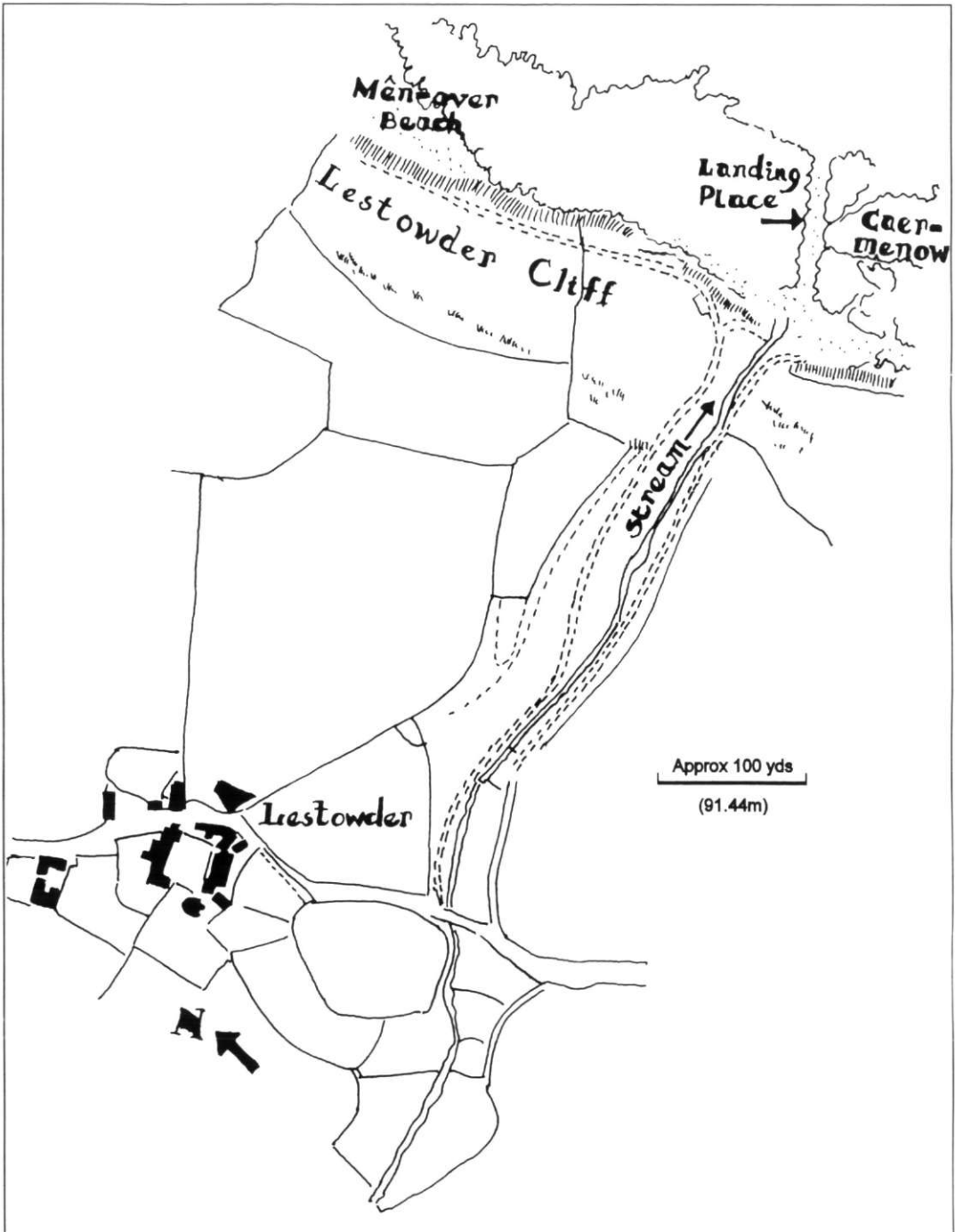


Fig 2 Lestowder and its immediate environs (based on the 1879 OS map)

by the present farmer to level it, thus obscuring traces of any bank or ditch which existed. There is now a drop of several feet, at (B), to the oval inner enclosure.

The northern section, (B1), although vastly reduced, survived until recently as a bank rising some 2 feet (0.6m) above the surrounding area, with traces of a ditch outside. This again

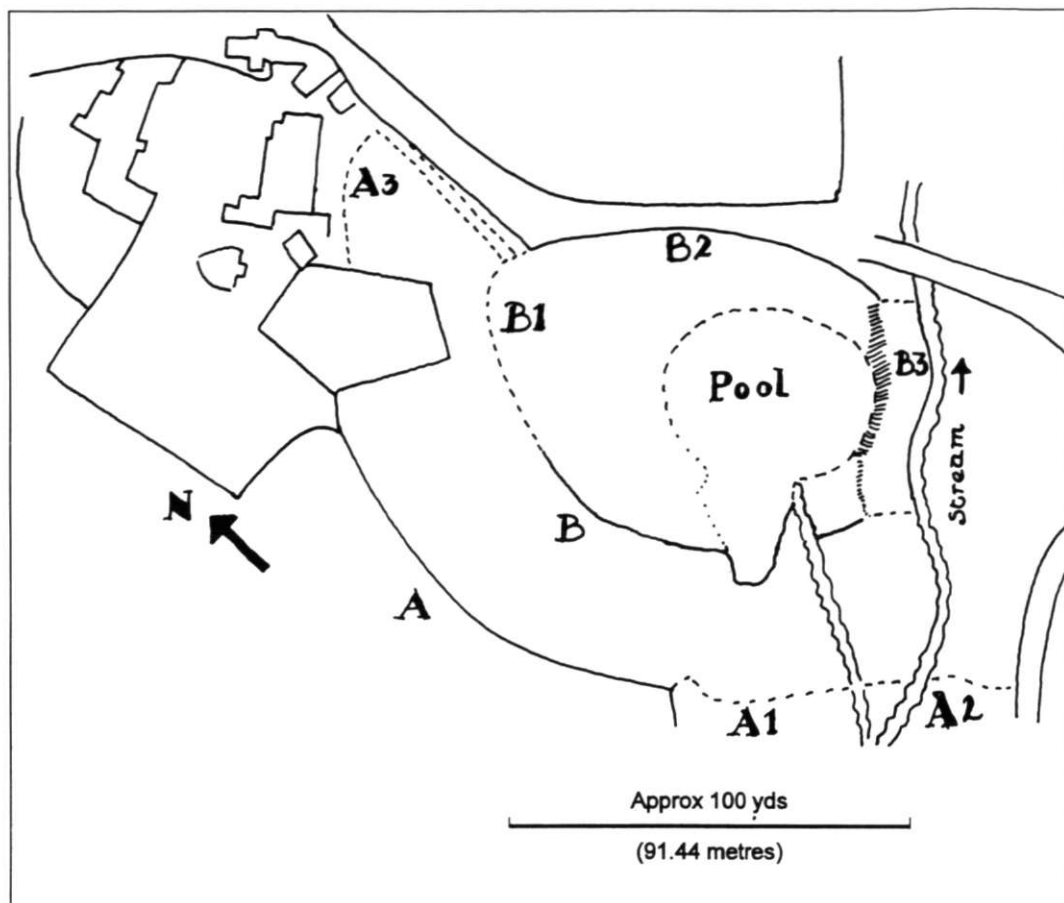


Fig 3 Plan of the stronghold at Lestowder (based on the 1879 OS map)

was also filled in recent times (D Martin pers comm). At (B2) the eastern bank survives as a hedge some 74 yards (67.6m) long flanking a road situated on its outer side, several feet lower than the inner enclosure.

At (B3) the bank has also been destroyed by piling of soil, using machinery, to form a wide earthwork some 45 yards (41.1m) long at the edge of a pool. This is 6 feet (1.8m) deep in places, and is fed by water in a channel entering on the south-west side. The latter was excavated in 1990 to form a habitat for wildlife, and in so doing, destroyed a large section of the inner enclosure which is represented by a large oval area approximately 100 yards (91.5m) long and 50 yards (47.2m) wide.

Discussion

Although not ideally situated for defence, having higher ground to the west, the extent of the earthwork at Lesdowder indicates that it was, predominantly, a fortified site, and does not therefore, come within the Cornish 'Round' classification. A stronghold would perhaps be a more apt description. It was also well situated above a convenient anchorage and landing place within the shelter of Nare Point.

The 'Caer' thus not only commanded the estuary at Gillan Creek but also the first convenient route from there to the hinterland up the valley, one section of which was incorporated as a natural defensive feature in its structure. Only Dennis Head, with its promontory fort of

the Iron Age, separates Gillan Creek from the estuary of the Helford River. Lestowder was therefore well positioned to enjoy any trade intended for settlements further inland.

The Tithe Schedule of 1845 illustrates that both the earthwork, (No 4044), and the adjoining valley section, (No 4043), were orchards. However, a small disturbed area of the inner enclosure has exposed beach material immediately beneath the turf; this would suggest that at an earlier period, the ground here was arable and manured with sand and seaweed from the cove below. The 1879 OS map shows the site was well wooded during the latter part of the 19th century.

Extensive husbandry over the centuries has reduced its large earthen banks to mere field hedges, with section (A) significantly consisting of earth and clay and not faced with stone. The site must have been heavily overgrown when Charles Henderson visited Lestowder in 1916 for he could find no trace of it. He later wrote "His (Teudar's) 'Lis' or court at Lestowder was probably a round or earthwork but not vestige of this nor any tradition of the chieftan still exist" (Henderson 1917, 19).

On the eastern side of the earthwork, the present sunken approach road to the farm appears to have developed from a section of ditch. This is a common feature of many 'lans', (such as Illogan and Lamorran), which obviously originally consisted of a single earthen bank with an external ditch.

Unfortunately much destruction of the remaining features has unknowingly taken place, in recent years. Infilling of the outer enclosure has occurred, together with the excavation of a large section of the inner enclosure (potentially the most archaeologically sensitive area), for a pond. No finds have previously been recorded at the site, but the writer has retrieved from a small disturbed area within the inner enclosure, a small worked flint resembling a microlith.

From the evidence of literary, place name and physical remains, it seems that a large fortified site, probably of Iron Age origin, was in the later Middle Ages attributed to the legendary King Teudar as his court in this area; this attribution may have arisen because of the name it bears (Lestowder, meaning 'court of Teudar'), or else it may have been the cause of that name.

Although no great dwelling is recorded at Lestowder in medieval times, it remained a place of some importance in the 15th century. Henderson records the licensing of a chapel here on the 13th May 1403, dedicated to St John the Baptist, for celebration of the Saint's nativity and decollation. "It is locally believed that a nunnery existed here, and there may be some foundation for this. A small field of two acres on the farm is still called 'Hospital', a name always suggestive of a religious house. It is very possible that a small nunnery was founded here by the Convent of Beaulieu, and it was for the sake of its occupants that the Bishop licensed the chapel in 1403. This would explain why Lestowder was so privileged without there being any resident lord to use his influence in obtaining the said licence" (Henderson 1917, 19). The abbey at Beaulieu in Hampshire owned considerable lands in the parish, along with the advowson of the church. The field name 'Hospital', (Tithe Award No 4015), still survives, while an examination of the farm buildings at Lestowder revealed several large blocks of red sandstone built into the walls of an old oxen house. These appear to be of Caen stone, possibly fragments of the chapel brought here from its site. One stone is chamfered and is now obviously of secondary use; it bears the initials 'IR' and the date 1809, probably inscribed by a yeoman of that period, perhaps a Roskruge, as 'John Roskruge Snr' (Fig 4) appears as occupier on the Tithe Schedule of 1845. Caen stone, brought by sea, and landed on both coast and river, was widely used as an easily worked building stone in medieval Cornish churches.

Since this fieldwork was undertaken, members of the Camborne and Redruth Natural History Society have made an initial and detailed report of the unusually rich flora and fauna of Lestowder. It is hoped to use the farm as a field study site for schools. The importance of the farm is enhanced with the now added knowledge of the existence of a large earthwork; this is linked by tradition to Teudar and is important to Iron Age and Dark Age studies in Cornwall.

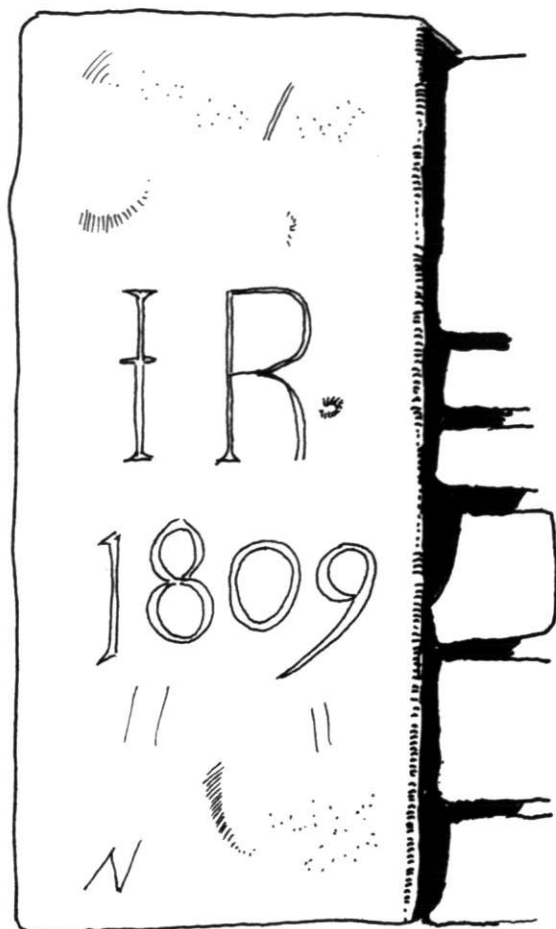


Fig 4 Inscribed stone built into the doorway of an old oxen house at Lestowder

Acknowledgements

My grateful thanks are due to Dr Oliver Padel, of the University of Cambridge, for reading this paper and for his advice and assistance in placing the research of older authorities on 5th and 6th century history within the sphere of present day informed opinion.

My thanks also to Peter Rose of the CAU for reading the paper; to Mr David Martin of Lestowder, for access to his property, and to the Courtenay Library of the Royal Institution of Cornwall, for permission to quote from the notes of Charles Henderson. Also to the Cornwall Record Office for use of the St Keverne Tithe Map and Schedule.

Redruth

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Discovery of two medieval wayside crosses

ANDREW G LANGDON

Summary

The recent discovery of two wayside crosses in Constantine and St Clether parishes is documented. The crosses are described and placed in their wider context by reference to parish topography, previously known crosses and relationship to former routes.

Introduction

There are over 600 stone crosses and fragments surviving in Cornwall, ranging from pre-Conquest churchyard crosses through to the elaborately carved Gothic lantern crosses. Included in this number are wayside crosses which were erected during the medieval period; the majority date from between the 11th and 14th centuries with a few gothic exceptions. They were normally set up as a guide post to mark ancient paths and tracks to and from parish churches or to other important ecclesiastical sites, such as ancient chapels, holy wells and baptisteries (Langdon 1992a, 2). Sometimes these routes continued from parish to parish, forming long-distance routes, in some instances skirting high moorland areas.

The wayside cross was often adopted for use as a bound stone and many mark the boundary limits of the glebe, the parish, monastic land or holy sanctuary. There are many instances where the wayside cross holds a dual function, marking both a boundary and an ancient track.

During the last decade the Cornish wayside cross has been under constant threat, due to the growing pressures on the local environment such as road widening schemes and the encroachment of housing developments in rural areas. This has caused several crosses to be shifted, some of which were formally *in situ*. Changes in agricultural policy in recent years have also given rise to many discoveries of crosses. The removal of ancient hedgerows, due to the turning of a number of small fields into one large unit, has been a classic example of the farming practise that has resulted in discoveries. Another example is the widening of field entrances to enable larger farm machinery access to fields, necessitating the removal of gateposts, which in some instances have been found to be wayside crosses buried head down in the ground (Langdon 1992b; Head 1992).

The number of recorded wayside crosses and fragments increases every year and this paper describes two recent discoveries.

Cross head discovered near High Cross, Constantine parish

Discovery

On the 24th June 1993 a report about a newly discovered wayside cross was printed in the *West Briton* and *Helston Packet* newspapers (Anon 1993a; 1993b); the cross head had been first discovered in the spring of 1992 by Mr John Kent and Mr Antron Noall. According to Mr Kent, the landowner, the granite cross head with a short portion of cross shaft was found after cattle had eroded away a section of hedge near the hamlet of High Cross in the parish of Constantine. He had noticed the piece of smooth rounded granite and, when he pulled it from the hedge, realised that it was a cross. It was stored for several months at Mr Kent's home and it was not until he offered the ancient stone to the parish council that its discovery was reported to the press.

The cross was found at SW 7505 2922, 1½ miles north-east of the hamlet of High Cross (Fig 1). On the southern side of the hedge, where the cross was discovered, is a public footpath which was formerly the old church path leading due west to Constantine churchtown. This

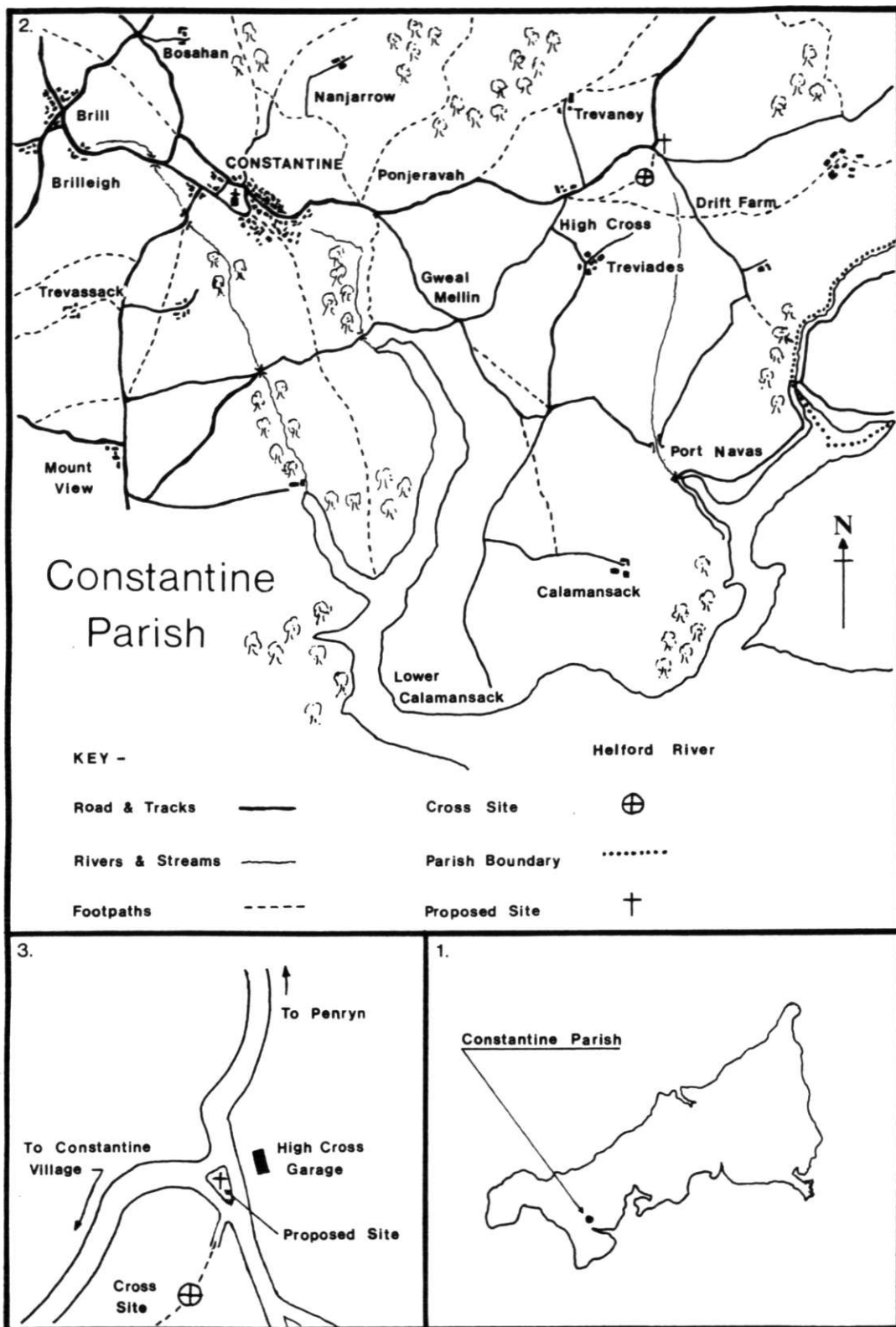


Fig 1 Constantine Parish: map showing site of cross from near High Cross hamlet

gives considerable support to the writer's theory that the monument was originally erected as a way marker for the church path.

Topography

Although today the church path is incomplete, prior to 1699 (Gascoyne 1699) the path was intact from the church to a point near High Cross garage, as no road existed between High Cross and the churchtown. By 1748 (Martyn 1748) a new road had been cut, due in part to the extensive mining activity in the area. It may have been at this time that the former church path fell into neglect and was abandoned (Henderson 1937, 18-19). The hamlet of High Cross is situated on the western slope of a hill, which gives extensive views of the churchtown and parish.

The report carried in the local newspapers suggested that the missing shaft stood on a triangular piece of grass at the road junction at High Cross at SW 7509 2934, although upon examination this turned out to be nothing more than the shaft of a 19th century direction post.

Fieldwork

In November 1993 the writer met representatives from both the parish council and local history group and Mr Kent showed the group the exact position of the discovery. Later armed with hooks and secateurs, a search was initiated to try and locate the missing portion of cross shaft and also the base stone. All large pieces of granite, including gateposts and stiles were examined in the hope of locating the monument's original site. Fieldwork extended to several fields in the vicinity of the discovery, with particular attention given to the foot of hedges where larger pieces of stone occur; unfortunately the search proved unsuccessful.

Description

The granite cross is round or wheel-headed and displays a Latin cross in relief on its front face. The limbs are expanded at their extremities, with the lower limb extending down the shaft. The cross is enclosed around the head by a narrow bead which ends at the neck of the monument.

The reverse face displays an equal-limbed incised cross, completely enclosed by a double incised ring which forms a double bead. The shaft is not decorated. In the writer's opinion the stone is a typical medieval wayside cross and probably dates from between the 12th and 14th century (Fig 2).

The style of Latin cross is similar to that on the cross in Sennen churchyard (Langdon 1896, 107), although that particular monument does not possess a bead around the head. The reverse face which displays the incised cross, is similar in design to the decoration on the Trewardreva Cross which stands on the north side of the churchtown (Langdon 1896, 281).

The writer has suggested that as the original shaft cannot be found, the cross should be restored on a modern shaft of suitable proportions and be erected close to its site of discovery marking the church path (Fig 3). The cross was removed for safe keeping to the museum room in the old chapel in Fore Street, Constantine, prior to restoration.

At present (August 1997) the cross head remains in the village museum and the writer is unsure whether the monument will be restored or not.

Dimensions

Height of existing monument 2 ft 9½ ins (0.85 m); Width (head) 1 ft 7½ ins (0.495 m) and (shaft) 1 ft 2½ ins (0.37 m); Thickness 6½ to 8 ins (0.165 to 0.205 m).

Existing monuments

Although the parish of Constantine does not boast any elaborate churchyard cross, it has several wayside crosses. There are nine free-standing crosses in the parish, one preserved in the churchyard, two at Bonallack, three at Bosvathick, and one each at Nanjarrow, Trevease

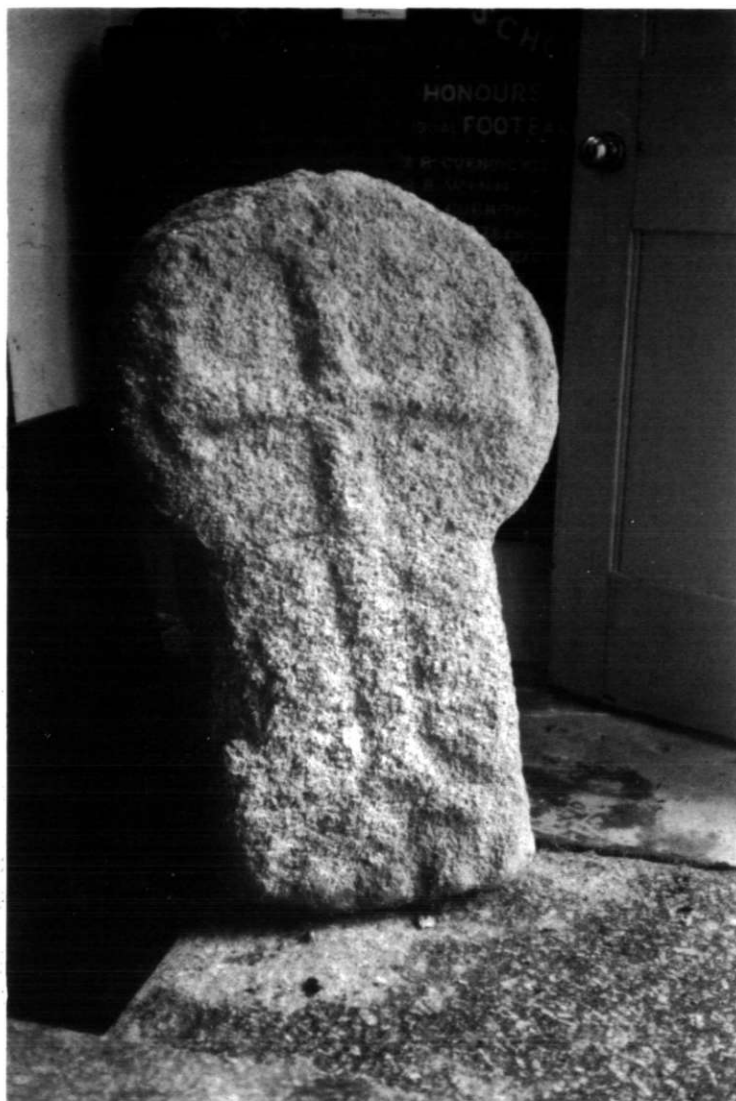


Fig 2 Cross from near High Cross hamlet: after removal to Constantine Museum for safe keeping

and Trewardreva. The two crosses at Bonallack were removed from Wendron parish and one of the crosses at Bosvathick was removed from Budock parish.

The remains of four empty socket-holed base stones occur within the parish, and there is documentary evidence to suggest that there were once several wayside crosses. A cross from Brill was removed from the parish and is now set up as a tombstone on the grave of a Mr Davey in Landewednack churchyard on the Lizard (Henderson 1958, 283).

Discussion

Given the close proximity of the hamlet of High Cross to the site of discovery, it could tentatively be suggested that this may be the original 'high cross', if such a monument existed. The place name conjures up an image of a tall monument, but in reality it may only imply that the cross was situated on high ground. The field on the western side of the site of discovery

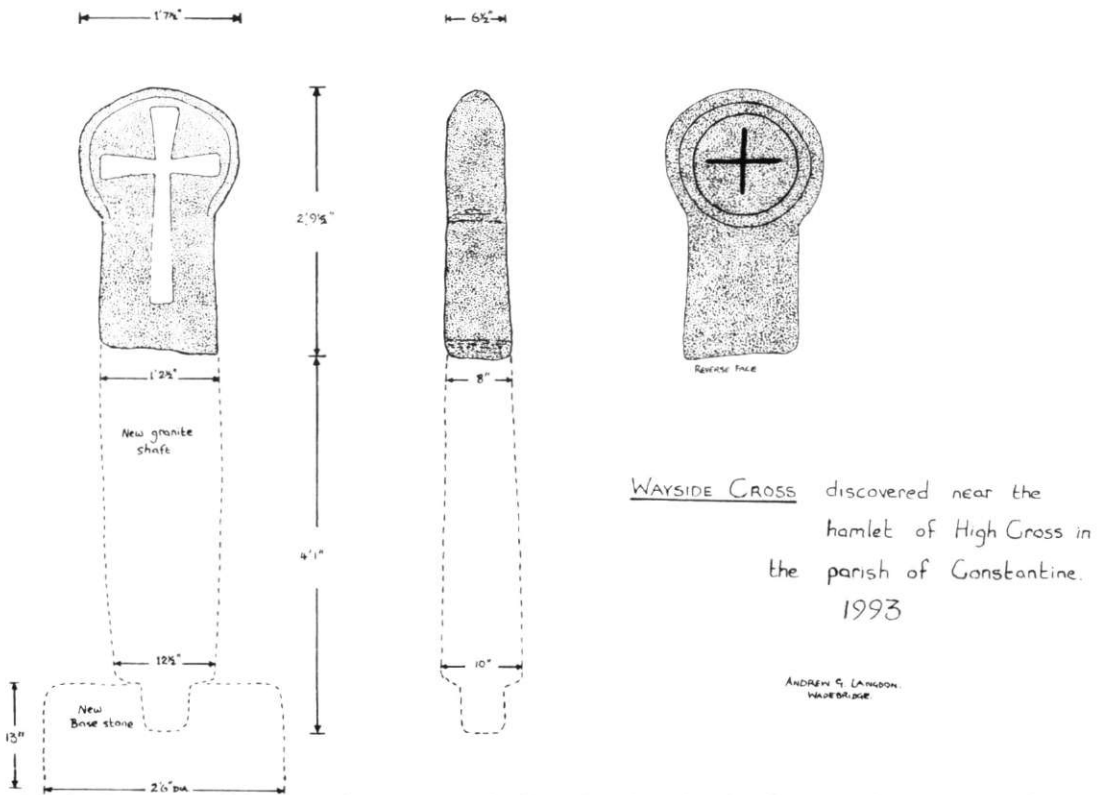


Fig 3 Drawing of the cross from near High Cross hamlet: details of proposed restoration shown

is on the summit of a hill, and commands extensive views across the parish and is close to another footpath leading from the parish of Budock, which joins the church path at High Cross.

Cross discovered at Trefranck, St Clether parish

Discovery

The writer was first notified about the discovery of this stone by Mr Harold Barriball. Mr Barriball had been in conversation with Mrs Kempthorne of Trefranck Farm, St Clether who informed him that she and her husband had recently discovered a cross on their farm. On the 14th June 1994, the writer visited Trefranck to view the stone, which was leaning against the garden hedge, close to where it was discovered. It was clearly a mutilated wayside cross and, although severely damaged, an equal-limbed cross stood out in relief on both faces.

The cross had been discovered the previous autumn while replacing a diesel tank in the back garden adjacent to the farmyard. To facilitate the installation of the new tank, part of the hedge has been removed and it was at this point that the cross was found leaning against the hedge, half buried in an upright position. According to Mrs Kempthorne the farm has been in her husband's family for many years, but no one has any recollection of the monument. The cross appeared to have been rescued at some time in the past, and brought into the garden for preservation but had become overgrown and forgotten.

The cross was re-erected on a new base stone on Sunday 15th June 1997 at SX 2037 8494. The monument has been set up on a hedge near to the entrance to Trefrank Farm, close to the minor road leading to the parish church at St Clether. The cross was erected by Mr David Atwell and Mr Andy Wray with assistance from the landowner Mr J Kempthorne and also the writer. The base stone, a piece of moorland surface granite from St Breward was prepared by stonemason Mr Ernie Hillson of St Tudy.

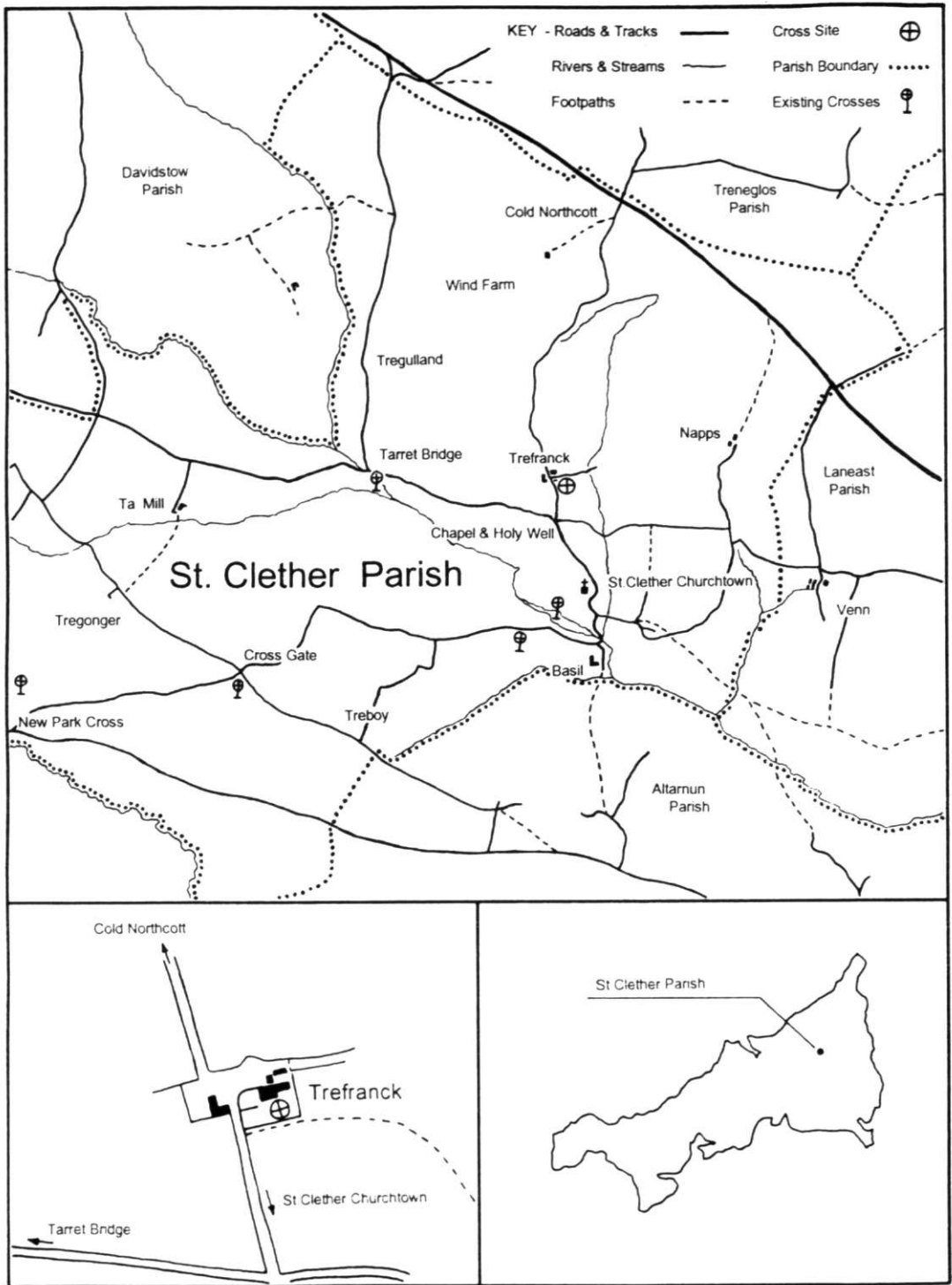


Fig 4 St Clether parish: map showing site of Trefranck cross

Topography

The parish of St Clether is situated on the northern side of Bodmin Moor and is bounded on the west by Davidstow parish, on the north by Treneglos parish, on the east by Laneast parish and in the south by Altarnun parish (Fig 4). The land north of the parish, known locally as Cold Northcott, is much higher and the southern boundary of the parish runs directly behind Basil Farm. The church nestles on the hillside above the River Inny, while the village is situated a ¼ mile away to the south-east on the Laneast road.

Description

The monument is made from fine grained moorland granite which has been severely trimmed and squared for reasons that are unclear (Fig 5). The top of the wheel head has been cut off, leaving a flat top to the stone, and the head has been cut down square with the shaft on one side, partially trimming a portion of the shaft as well as amputating one of the projections at the neck, a characteristic seen on all of the existing St Clether crosses. The remaining side of the head had been cut down square to just above the projection at the neck of the monument. The predominant face originally displayed an equal-limbed cross, with expanded ends, which was formed by the cutting of four triangular recessed segments, bringing the cross symbol into relief, and forming a narrow bead around the cross. The line of the bead is also extended around the bottom of the lower limb completely enclosing the symbol. A similar method has been employed on the reverse face, but without the line of the bead or border encircling the cross (Fig 6).

Dimensions

Height 2 ft 11½ ins (0.902m); Width of existing head 13 ins (0.33m); Width of shaft (at neck) 9½ ins (0.241m) and (at bottom) 8½ ins (0.216m); Thickness 7½ ins (0.19m).

Existing monuments

Until this recent discovery, five medieval wayside crosses had been recorded in the parish, four of which were on the ancient Barton of Basil. Three of the crosses marked the eastern route from Davidstow Moor directly to the parish church, although the first stone, a large cross head at New Park, is known to have been removed from the foot of Roughtor. The remaining three appear to be *in situ* or close to their original positions (Langdon 1896, 157-158).

Discussion

The original location of this cross is not known. However, if it was removed from the road side at Trefranck it would have marked a direct route from Treneglos to St Clether church. This route, which is a tarmac road today, was originally part of a long distance route linking Warbstow with the parish of Altarnun via St Clether. There is no evidence of any holes or leaded ironwork in the monument, which would have indicated that the stone had been utilised as a gatepost. The mutilation of the cross must, therefore, have been for some other reason. In the writer's opinion this wayside cross may have been reused as a building stone in one of the farm buildings, but was later removed to its present site.

Conclusion

Crosses still hold a prominent place in the county's vast array of antiquities and form an integral part of the Cornish countryside. Plotting the sites of these wayside crosses gives us a greater understanding of the county's medieval network of ancient tracks and trade routes, as well as establishing parish boundary changes. They help to explain why so many public footpaths today lead the walker directly through farmyards. As more crosses are found, a fuller picture of the topography of the medieval countryside, and the influence of the church on the day to day secular life of the people living in Cornwall during this period, will emerge.



Fig 5 Trefranck Cross: front face

Acknowledgements

The writer would like to thank: *Constantine* Mr John Kent of Treviades (for allowing access to his land), Mr E Morris (Chairman of Constantine Parish Council), Mr D Reynolds (Chairman of Constantine Local History Society), Mrs E Moore (Councillor) and Mr R Rashleigh (Local History Society). *St Clether* Mr and Mrs J Kempthorne of Trefranck (for allowing access to their land), Mr H Barriball (Chairman of Wadebridge Old Cornwall Society), and Mr D Attwell (North Cornwall Heritage Coast and Countryside Service).

Wadebridge

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Tintagel Island 1993: an interim report

CHRISTOPHER D MORRIS

The short excavation in September 1993, under the overall direction of the present writer was carried out on site under the supervision of Rachel Harry and Paul Johnson as a follow up to, and indeed an expansion of, work which began in 1990 (Morris 1991) and continued in 1991 (Morris 1992). The emphasis was placed upon the completion of fieldwork on the Lower Terrace (Fig 1) with the specific aim of linking up the stratigraphic sequences of the different areas originally opened up in 1990 and extended in 1991. This was accomplished by opening one overall excavation area. Additionally, further trial work was carried out on the Island following the promising results from the exploratory work undertaken in the preceding season in Trench C09 (Fig 2), outside the main building complex on the Middle Terrace. These trial trenches, C10 and C11, were located within two rooms of the building complex.

In the first season of excavation on the Lower Terrace in 1990, four 1.0m wide trial trenches were laid out and excavated, at least in part, down to bedrock. The two southernmost trenches, C01 and C02, were abandoned the following season 1991 as the archaeological return here seemed limited. However, the two northernmost trenches, C03 and C04, were extended in that year and a new area C08 opened to the south. By the end of that season the main part of the terrace was covered by one large area excavation although the central area was a later, uncompleted stage, due to adverse weather conditions. The completion of this area in 1993 would provide the necessary link to co-ordinate stratigraphic sequences across the whole of the terrace.

The excavation down to natural geology in 1993 revealed the shape of the terrace as formed by the natural slate bed-rock. This consisted of a roughly vertical face along the west side of the terrace, dropping to a flat shelf below the excavated deposits. In C03/4 the bedrock curved around to the east, so defining the limit of the terrace to the north, whilst along the east edge of the terrace the rock sloped sharply down towards the cliffs below the site.

Overlying the natural geology were scree deposits which produced five units of pottery including three imported wares and one possible local ware. Six examples of worked slate were also recovered with two quartz pebbles. The extensive burrowing of ants in these deposits demands caution in the provenance of these finds.

Several features were identified on the Lower Terrace which represented the earliest excavated evidence of a degree of occupation at the site. These included a linear slot running east-west with a row of medium-sized upright slates (including one perforated) set into it, and to the north of this a layer which yielded twelve sherds of possible native ware pottery. Between these, two hearth settings were excavated with one consisting of a flat, burnt stone in a slight basin surrounded by small, thin upright slates and the other, a bowl shaped setting roughly lined by small slates. Both hearths produced ample charcoal which was sampled for carbon dating. To the west a possible stake support was identified.

These early features were followed by a period of disuse and collapse characterised by the build-up of scree deposits. Recorded finds from this phase included a small lead weight or whorl, a whetstone and two units of imported pottery.

The later floor deposits and the structure identified in previous seasons were excavated in Area C03/4 only in 1993, as this area remained at a later stage of excavation. Recorded finds from a possible floor surface in this area included six units of imported pottery, seven slate and quartz pebbles and several stone objects, most notably a whetstone and a retouched flint flake. A second floor surface which overlay that mentioned above and remained extant below

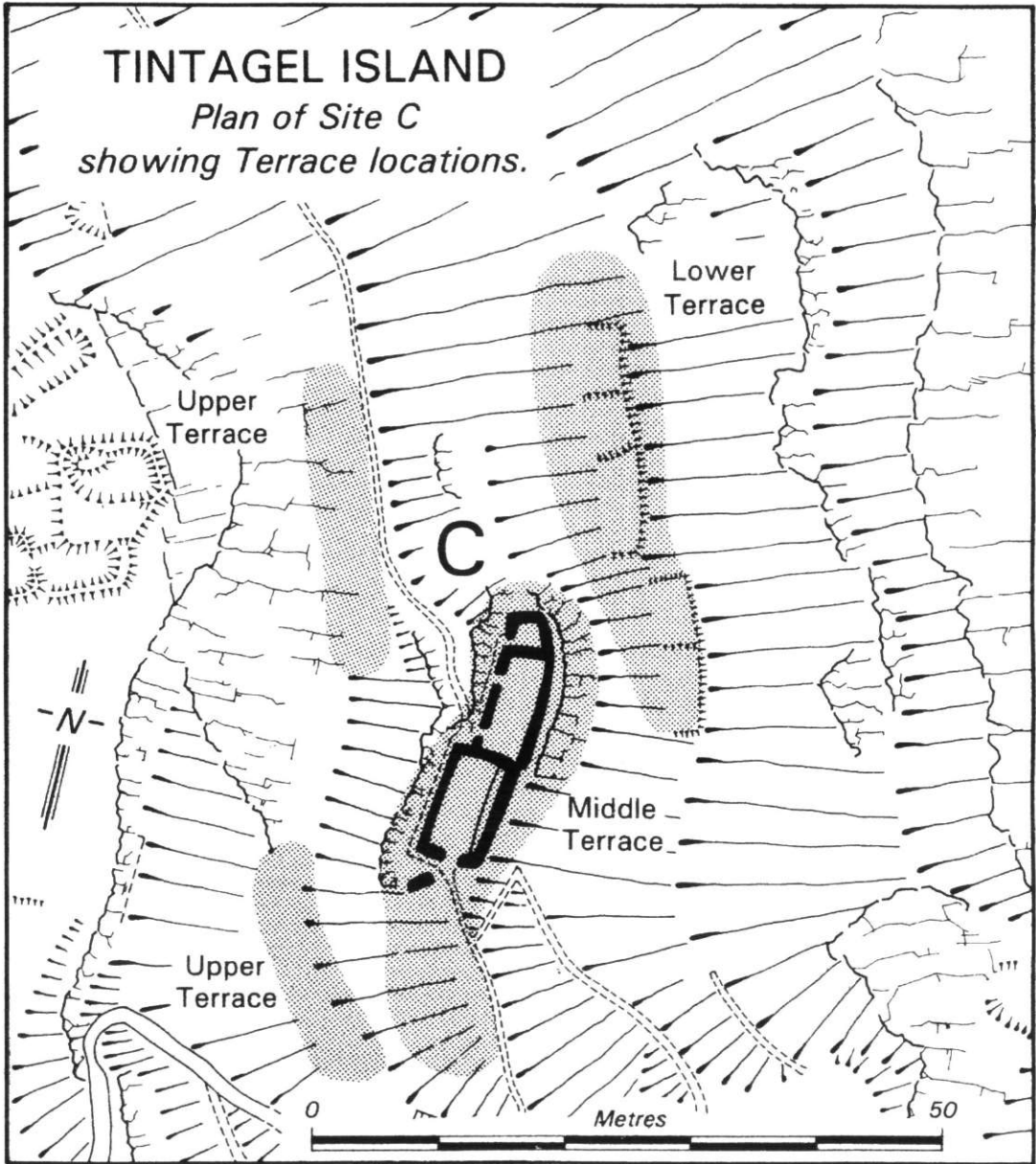


Fig 1 Tintagel Island: Plan of site C and location of Terraces

the structural remains in the area had been partially excavated in 1991 and was completed this season. This yielded nine units of imported pottery and several stone objects including a possible whetstone and a quernstone fragment.

The walling at the south of C03/4/8, noted in 1991 but left unexcavated, measured no more than 1.5m and was constructed using thin slates with some traces of earth bonding evident between each of the surviving four courses. One sherd of imported pottery was recovered between two of the courses of slates. Several disturbed contexts were identified adjacent to this walling and produced seven units of imported pottery.

In addition to the work carried out on the Lower Terrace, two small trial trenches were

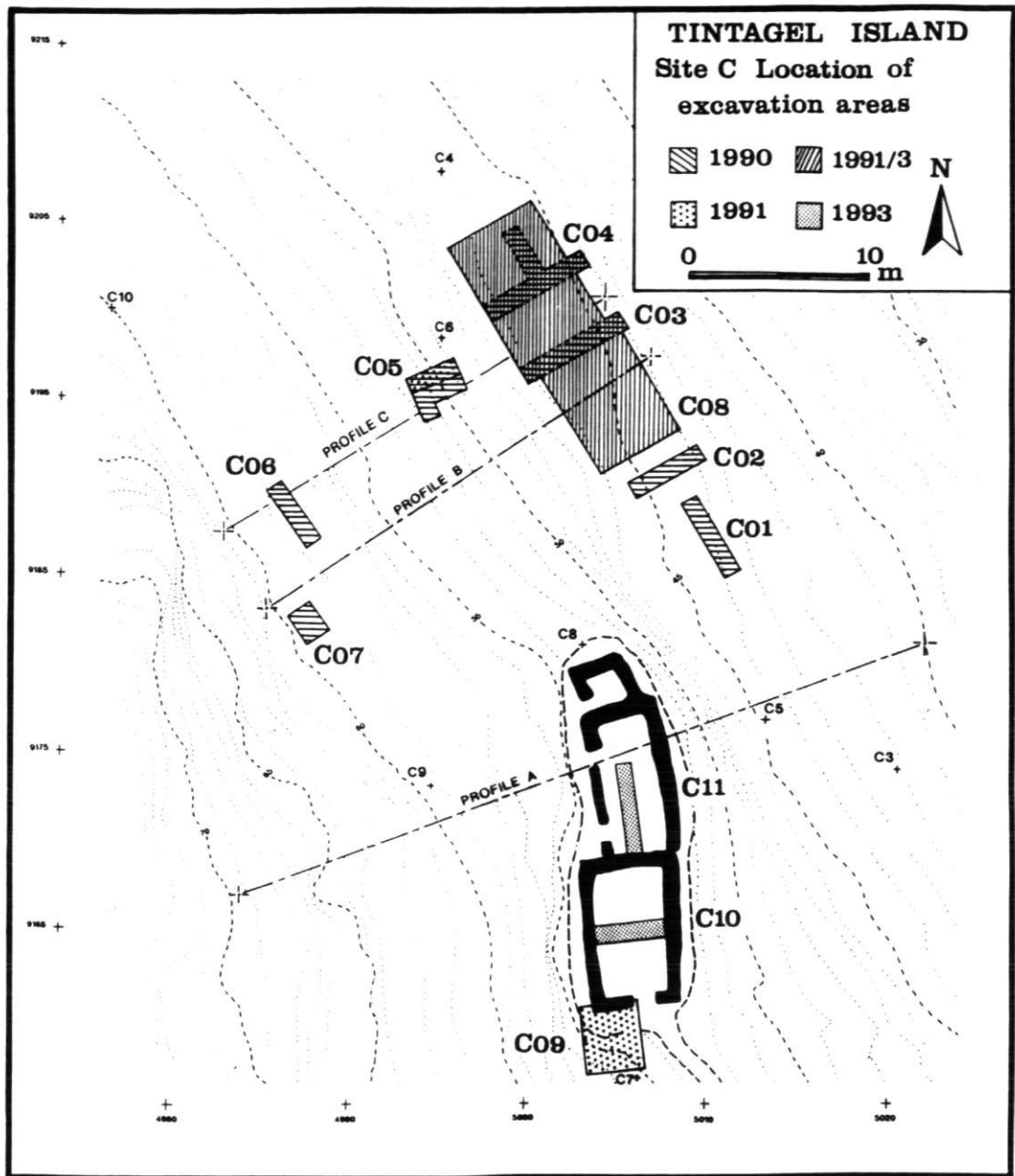


Fig 2 Tintagel Island: Trench location plan

opened on the Middle Terrace. The aim of this exercise was to assess further the archaeological potential of any surviving undisturbed deposits following excavations by Dr C A R Radford in the 1930's. Trench C10, inside the southernmost room of the building complex, was a 1.0m wide strip and Trench C11, in the adjacent room to the north, was 0.75m wide and laid out at right angles to C10.

C10 established that the west wall of the Site C building was built directly over the bedrock and abutted the east wall. At the west end of the trench, what appeared to be undisturbed scree deposits, were identified and left unexcavated for a future campaign. The disturbed modern

deposits above the scree yielded several finds including ten units of imported pottery, quartz pebbles and a lump of vitreous slag.

C11 did not, as was hoped due to a break in the stonework of the south wall, reveal any traces of a possible entrance. No features indicative of such an architectural detail were present as the undisturbed deposits were very shallow. However, the entire area examined was again covered by apparently undisturbed scree deposits suggesting fruitful opportunities for future work. The disturbed modern deposits above produced five units of imported pottery, two pieces of worked slate and several pebbles.

In addition to the two profile surveys (A and B) recorded across the Site C complex of terraces in 1991, a third (Profile C) was recorded to the north in 1993.

As in the preceding two seasons, comprehensive sampling was undertaken. Every new context identified was sampled up to 14 litres, increased only to the 28 litres of the previous years if a sample proved particularly rich on excavation or after initial on-site flotation. A total of twenty four samples were taken, three of which were sent unsieved to the laboratory on the basis of their rich ecofactual potential. Of the twenty one samples wet-sieved on-site, totalling 432.5kg, twenty produced charcoal in greatly varying degrees.

The popularity of the organised and advertised site tours of 1991 ensured their continuation throughout the 1993 season. A large map of the location was displayed with an explanatory notice which served to entice the interested to attend one of the three guided tours. These tours were conducted in the morning, at lunchtime and in the mid-afternoon and by the end of the two week season over two hundred people had taken advantage of the opportunity to have the importance of the site outlined and the aims of the excavation explained. The explanatory handouts and the welcoming of enquiries at the finds hut throughout the day were very successful in allowing visitors to participate more fully in the experience of the Island and our excavations.

Although the work carried out in 1993 was on a small-scale, the careful approach to work on this site has been amply repaid. Work in previous years had demonstrated the presence of remnants of structural elements on the Lower Terrace and the main emphasis this season was upon the elucidation of their relationships and sequences. Important additional information has been forthcoming. Three floor surfaces and two phases of structure have now been identified with the structural elements excavated in 1991 clearly representing the second (i.e. latest) phase. The two separate strips of walling uncovered in previous years appear to represent one structure built over the ephemeral earth bank and slot remains of an early structure.

The trial work on the Middle Terrace has demonstrated that the provisional sequence defined in C09 in 1991 could be replicated within the building complex. More significantly, it has demonstrated the existence of undisturbed deposits which greatly helps future plans for larger scale work.

The artefactual assemblage includes a cluster of fragments of imported Mediterranean pottery and a significant group of what are provisionally identified as native wares. Slate discs, presumed to relate to the storage vessels represented by the imported sherds, are also found in some numbers. Added to these are whetstones, part of a quern, a lead weight/whorl and a number of quartz pebbles giving a varied and rich assemblage that clearly confirms that we are dealing with a 5th-6th century settlement.

As we begin to answer the questions posed by the Lower Terrace, many more remain to be asked of the clear potential of the Middle Terrace. A larger scale, future campaign in this area would surely bear rich fruits.

As with previous years a debt of gratitude is owed to the Regional Director, P I C Inspector, Ancient Monuments Laboratory staff, Custodial and Maintenance staff of English Heritage for administrative, scientific and depot services. On site, particular thanks are owed to Rachel Harry and Paul Johnson who supervised many aspects of this season's work and to Carl Thorpe for acting as visitor guide whilst keeping on top of the daily finds recording. Both Charles

Thomas and Vanessa Straker contributed significant specialist advice on site to the supervisors, who are most grateful to them. A fuller interim report of the 1993 season has been prepared and distributed through English Heritage and the Lower Terrace final report will appear in the *Antiquaries Journal* in the near future.

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Recent Work by the Cornwall Archaeological Unit

Tregothnan Estate Survey

The landscape archaeology and standing buildings of four large blocks of the Area of Outstanding Natural Beauty in West Penwith were closely studied by Charles Johns and Peter Herring in a survey of the Tregothnan Estate's extensive western holdings, funded by English Heritage. The opportunity to compare the southern and western parts of the peninsula with the prehistoric-derived farming landscapes of Zennor and the northern valleys was welcomed. Prehistoric field patterns were indeed evident beneath medieval and modern field systems in St Buryan, St Levan and St Just parishes. Many earlier prehistoric ritual and ceremonial monuments, like the Pipers standing stones, the Merry Maidens stone circle and the Boswens menhir, now within fields and crofts, were shown to have been in open downland until relatively recently; that is until the last two or three hundred years. Many other sites, monuments and landscape features were recorded, including neolithic flint scatters in St Buryan, bronze age fields on Botallack Common, and a later prehistoric round near Crean. Other sites included medieval hamlets, wayside crosses and tin streamworks, the great mining complexes around Botallack and the Kenidjack Valley and the post-medieval miners' smallholdings and enclosures on the hills above, and huers huts and late 19th century potato and flower plots on the south-facing cliffs.

Meanwhile, historic buildings consultant Eric Berry was recording all standing buildings, noting how the inherent conservatism of a long-established and stable estate has allowed many architecturally and historically valuable vernacular buildings and associated features to survive in a part of Cornwall where they are generally very vulnerable to removal or damage.

Peter Herring

St Just-in-Penwith

In the 19th century St Just-in-Penwith changed beyond recognition from a typical Cornish 'churchtown' to a small town serving an industrialised parish, with banks, pubs, institutes and terraces of industrial housing. In 1995, Colin Buck and Eric Berry (CAU) carried out an historic audit. This followed on from the publication of CAU's "Hayle Town Survey". Initiated by Penwith District Council Planning Department, the report defines and explains the historic character of the town, catalogues surviving buildings and sites, and proposes a new Conservation Area boundary for discussion by the Town and District Councils.

Colin Buck

St Breward Holy Well

The holy well at Chaple, St Breward, has been repaired in an initiative organised by David Attwell of North Cornwall District Council's countryside service. Partly collapsed stonework in the rear wall was taken down and rebuilt by David Attwell and local builder Fred Sanders and a modern plastic water pipe re-routed out of the well and off to one side. A detailed record was made by Ann Preston-Jones and Colin Buck of CAU before work began, and a small excavation to the rear located a 19th century culvert feeding the well. The structure of the well itself is probably 17th century but extensively rebuilt in the 19th century. The project was grant-aided by English Heritage.

Ann Preston-Jones

Tintagel

In association with Rope Access Technology a record was made by Janice Grove of CAU, for English Heritage, of the exposed cliff-face section beneath the Great Hall in the Inner

Ward at Tintagel Castle. The section was then secured to prevent further erosion. The Great Hall was shown to have been built on ground raised and levelled over a post-Roman occupation terrace; sherds of 6th century AD pottery were found in the lower levels. In the valley below the castle Anna Lawson Jones of CAU carried out an evaluation and watching brief on the site of an extension to English Heritage's shop. Layers of 18th or 19th century slates were found: Tintagel Haven was used for the export of locally quarried slates.

Janice Grove and Anna Lawson Jones

Four Burrows Wind Farm

A watching brief (funded by New World Prayer) was maintained during the construction of this Wind Farm north of Truro. The stripping of some 3480 metres of access tracks and 15 turbine locations was observed. Discoveries included the ditches of a possibly prehistoric field system, a thin scatter of worked flints, and sherds of 17th and 18th century pottery from next to an abandoned farmstead. Overall, though, relatively few finds and features were recorded. This seems to be consistent with the historic character of the area, relatively marginal land much of which was heathland until two or three hundred years ago.

Anna Lawson Jones and Andrew Jones

Foundry Square, Hayle

In March 1995, CAU undertook a Site Investigation by trial trenching at Foundry Square, Hayle, in advance of a housing development by E Thomas Construction on behalf of the Guinness Trust. The area affected by the proposal was until 1903 part of Harvey's Foundry, the oldest, largest and most important engineering works in Cornwall. As a condition of consent for detailed planning approval, the Applicant was required to arrange for an Archaeological Evaluation which would investigate the impact of the development on below-ground archaeological layers.

Features revealed by the trial trenching include part of the 1850s tramway into the site, with rails still in-situ; a complex system of cast-iron pipes linking various buildings; and the cobbled coal-yard of the late 18th century. Although relatively few structures were revealed by the trenches, the Site Investigation proved to be of great value in confirming the history of this part of the foundry site. The map and documentary evidence collected prior to the excavation was shown to be correct in its essential detail, and there are no "hidden" phases or structures beneath the known and documented buildings. As a result, it is now possible to make informed recommendations to the Applicant and Local Authority.

John Smith and Colin Buck

Higher Coldvreath

Recording of part of a field system of medieval origin at Higher Coldvreath, Roche, was funded by ECCI prior to burial beneath china clay waste. An initial survey identified the low banks of removed field boundaries, probably part of a strip field system. The surviving hedge banks were sectioned by machine and recorded to study their character and history. A similar study was made in advance of tipping at Meledor Farm in St Stephen-in-Brannel. The CAU is building up a considerable corpus of information on Cornish field boundaries.

Andrew Jones and Anna Lawson Jones

East Wivelshire

In April and May 1994 Nigel Thomas and Colin Buck of CAU undertook a Rapid Identification Survey (RIS) in part of the Hundred of East Wivelshire to enhance the National Archaeological Record in the parishes bordering the River Tamar, from Lezant in the north to Botus Fleming in the south. It was funded by the Royal Commission on the Historical Monuments of England.

This survey followed the same approach and methods as the RIS carried out in Stratton Hundred in 1993 (reported last year). A search of documents and historic maps was followed by a systematic, although brief, exploration of the landscape. The fieldwork involved examination of sites highlighted in the desk-based work and also provided opportunity to search for unrecorded sites.

Like the Stratton survey, priority was given to investigation of settlements. Places with medieval documentation were visited; eighty-one sites bore evidence of being shrunken or shifted hamlets, as indicated by earthworks and sites of abandoned buildings. Four deserted hamlets were discovered. Some examples were impressive, particularly the building platforms and earthworks (which may contain evidence for a moat) at Tinnel in Landulph parish (SX 422 638, first recorded 1018). The abandoned settlement of Slipperhill in Stoke Climsland (SX 367 769, first recorded 1748), with building platforms still visible, may have been associated with mining. A deserted un-named settlement near North Wrayton (Landulph, SX 413 633) also has building platforms and a hollow-way; this site is not recorded on the earliest detailed maps of the area and therefore appears to have been abandoned before the 18th century. Halton in St Dominick parish (SX 410 655) was first recorded in the Domesday Survey in 1086. In the fields north of the settlement (historically the seat of the Rous family) there are earthworks of plots, buildings and a possible lane.

The results of the survey were somewhat surprising, given that settlements in this part of the Tamar Valley underwent considerable expansion in the 19th century due to the number of mines and other industrial complexes. Calstock parish in particular is well known for its industrial villages. It was noted, however, that the evidence for settlement shrinkage tended to be located away from the major industrial areas.

Aside from the settlements, many other features were recorded. Newly discovered prehistoric sites include barrows on the north side of Hingston Down (SX 402 718, Calstock parish) and Grove (SX 423 625, Landulph parish), and the remains of rounds, such as an example at St Dominick. Some earthworks require further investigation for their character to be understood, including a possible round or lann (an early Christian enclosure) at Landulph churchtown (SX 432 615). Medieval deer parks were recorded at Kerribullock (centred SX 375 730, Stoke Climsland parish) and West Newton Ferrers (centred SX 340 660, St Mellion parish).

Industrial sites were examined, including numerous mines, quarries, river quays and lime kilns. Many of these are already incorporated in the SMR (sometimes only recorded from documentary sources with no fieldwork carried out) and others had escaped record. Examples of rural industry were also visited, such as the tannery at Hay, Callington; Radland Mill, now an abandoned hamlet with the remains of the mill building, several houses and outbuildings (SX 3998 6844, St Dominick parish) and Ruse's Mill (SX 3062 7855, Lezant parish), where the abandoned mill building still contains machinery. A fine, relatively unaltered 19th century brewery building survives at Towell farm in St Dominick parish. Its rural location is most unusual in Cornwall; this industry probably grew up in response to the industrial expansion in the Tamar Valley.

Record sheets detailing the sites are stored with the Cornwall Sites and Monuments Register and a summary report has been produced by CAU. The records are also held at the National Monuments Record Centre, Kemble Drive, Swindon.

Nigel Thomas and Colin Buck

The National Mapping Programme, Cornwall

This is part of the Royal Commission on the Historical Monuments of England National Mapping Programme. The aim is to plot, at a scale of 1:10,000, all archaeological sites which are recorded on air photographs and input this information into the National Monuments Record. For many parts of the country the programme is being carried out by staff in the Commission's own Air Photography Unit but for some counties the work has been contracted out to the local archaeological unit; Cornwall is one such county.

In total there are around 50,000 photographs to be consulted. These are from a variety of sources and they include the collection of 5000 black and white prints resulting from Cornwall Archaeological Unit's Aerial Reconnaissance Project which has been running for the past ten years, which has also received grants from the RCHME.

Plotting of archaeological features is done using AERIAL, a computer rectification program developed by Bradford University. This enables images from oblique photographs to be transformed to a plan view and ensures a high degree of accuracy. The finished drawings are accompanied by a morphological description for each site which is input to a database specifically designed for the project. Analysis of the final database will allow detailed classification of monument types such as Romano-Cornish rounds and the final report will highlight unusual or new classes of monuments.

So far two areas have been investigated, the Tamar valley between Launceston and Saltash and the Camel estuary. Results have been exciting with more than 2000 sites recorded of which 354 are new to the Cornwall Sites and Monuments Record. Particularly interesting is the high number of new rounds appearing: 115 of these late prehistoric settlements have been recognised. Among the new rounds there is a wide variety of shape and size, ranging from subcircular to virtually square (one example at Tregaverene near Port Isaac is octagonal!) and from 35 metres across to 130 metres. Most of these sites are situated in arable land and survive only as cropmarks. To some extent their distribution pattern is influenced by appropriate land use but it is still possible to suggest aspects of their distribution which seem noteworthy. For instance the importance of Castle Killibury (a large prehistoric enclosure or hillfort in Egloshayle parish) is emphasised by the relatively high number of rounds occurring in its vicinity.

Another prehistoric site type which is turning up in some numbers is the Bronze Age barrow. Forty six new barrows have been recorded so far, occurring as low earth mounds in both the Tamar and Camel areas and as cropmarks (the mound ploughed out but with the circular outer ditch showing on the photographs as a dark ring) in the Camel area. The largest concentrations of barrows occur on the cliff tops around Padstow.

The project is proving very successful in recording new sites of later dates, in particular, features associated with tin and copper mining which are not recorded on Ordnance Survey maps. The main site types are prospecting pits, lode back pits and tin streamworks. In total thirty such sites have been mapped and added to the database. The mapping programme is contributing effectively to the Defence of Britain project, a national initiative by the Council for British Archaeology and the Fortress Study Group to identify 20th century military sites; twenty two World War Two sites have been recorded. These include army camps, hospitals, beach defences, anti-aircraft batteries, airfields and a bombing range. By the time the project is completed it will provide a comprehensive aerial view of wartime Cornwall.

Overall the National Mapping Programme is adding considerable numbers of new examples of well-known site types. In addition some more unusual sites have been recorded, such as a possible henge monument east of Wadebridge. Equally important, there are a few sites which are not fully understood at present, such as small rectangular enclosures at Treburrick and Treverrow near Padstow. It is hoped that as the project progresses more such sites will appear enabling their characteristics to become clearer and their function to be interpreted. It is anticipated that the project will run until the year 2000 by which time many hundreds of new sites will have been added to the SMR.

Andrew Young

Historic Landscape Assessment

Last year we reported on our involvement in the landscape assessment of the Bodmin Moor part of the Cornwall Area of Outstanding Natural Beauty (AONB) and noted that we would soon be working on a countywide assessment. Joint-funded by the Countryside Commission and English Heritage, this was carried out in the second half of 1994 in association with

Landscape Design Associates of Peterborough who were responsible for the overall landscape assessment. Not only do we now have extremely detailed historic landscape character maps and text for the whole of Cornwall, but the historic landscape assessment methodology devised for Bodmin Moor was refined into one capable of application to landscapes anywhere in Britain or Europe.

The method, and the mapping, is based on the premise that the whole of Cornwall, every square inch, is part of a single historic landscape. Every part has been more or less fundamentally altered by the activities of people over the last 6000 years. The most effective way of appreciating the impact of people in Cornwall is to imagine them and their works away; only the rockiest foreshore below the most vertical cliff has escaped, and even here you may happen upon a cave which produces evidence of a mine adit, or the rusty and barnacled engine of a wrecked coaster.

The earliest farmers began the clearance of the oak forests which blanketed much of Cornwall and later prehistoric farmers established the great summer grazing grounds which have transformed the vegetation of downs and cliff tops. Field patterns which have developed and been extended through the prehistoric, medieval and early modern periods continue to change as boundaries are now being removed to accommodate large machinery. Prehistoric and medieval tanners deliberately altered landforms with their streamworks, incidentally silting up previously navigable rivers; mining, quarrying and china-clay working have continued the remodelling of Cornwall's countryside, as have roads, canals, railways, and now roads again.

Cornwall is, therefore, a complex place; it is not made up of a patchwork of separate, easily distinguished historic landscapes and cannot be neatly divided up into identifiable blocks; there isn't a Redruth-Camborne mining landscape abutting a Tehidy country, abutting the towans. Instead Cornwall has a shimmering surface of small patches of differing historic landscape character. Anciently managed woods in deep valleys fringing medieval-derived field patterns; startlingly hushed parklands around Tregothnan or Boconnoc; forgotten Fowey creeks full of forgotten foreign hulks; early medieval commons fragmented by 19th century intakes from Carnmenellis to Hingston Down; 20th century airfields, reservoirs and theme parks, and 20th century housing estates encircling quiet medieval churchtowns and market towns—all form parts of Cornwall's historic landscape. In amongst the ruined and active mines and tramways that may have been called upon to define the Redruth-Camborne mining area are bits of medieval-derived field systems, even older areas of upland rough grazing, post-industrial sports complexes and retail estates and new roads which simultaneously divide and connect.

The first stage of the CAU assessment involved the mapping by Jeanette Ratcliffe, Kate Shrager and Martin Rosevear of the predominant Historical Character Type of every parcel of land in the county, from Gooseham to Porthwarra, Mount Edgcumbe to Mounts Bay. Seventeen different Types were noted in Cornwall, ranging from modern, medieval and prehistoric-derived field systems (the latter mainly in West Penwith) to extensive recreation facilities like caravan sites and golf courses, and including amongst others ancient woodland (essentially 19th century or earlier), military sites (World War Two airfields, modern training camps etc) and historic (pre-20th century) and modern urban development.

The colourful and complex map of Historic Landscape Character Types was then interpreted and to some extent simplified into Zones (or super-types) which were repeated across the county. So, for example, the Zone Recently Enclosed Land, with its straight-sided fields mainly taken in from summer grazing ground is found on downlands throughout Cornwall.

Zones will generally be more useful than Types for both landscape interpretation and management; so for each Zone a detailed commentary was prepared, identifying, among other things, the historical processes which formed it and typical historical and archaeological components found within it, as well as noting general condition, threats and protection.

Already the CAU is consulting the historic landscape character maps when assessing likely impacts of proposed developments. Historians and archaeologists will also use the mapping

and associated text and tables as a source of both raw historical geography data and also subjects for closer study. The mapping and text-writing processes have not only shone light brightly onto Zones and areas where our knowledge can usefully be extended—ornamental and military landscapes; dunes; central southern and south-eastern Cornwall—but has also identified important historical questions. Did, for example, the general lack of ancient summer grazing land in the triangle between Truro, Newlyn East and St Austell have an impact on the use, form and subsequent enclosure of medieval field systems in this area?

The countywide landscape assessment, which will include detailed Zones text and a copy of the Zones map, will be published in 1996 and the Unit is also expecting to have the opportunity to further refine its methodology.

Peter Herring

Bartinney Downs and Sancreed Beacon

At the western end of Penwith's chain of granite hills are the rolling downs of Martinney, Tredinney and Carn Grean, over one square kilometre of heathland, some of it recently turned into improved grassland, which make up The Martinney Downs Special Project Area. Supported by the Countryside Commission through the Countryside Stewardship Scheme, Penwith District Council has developed a project which gives financial support to local farmers managing this ecologically and archaeologically important block in a traditional way and establishes a model of best conservation practice for other local hill farmers to follow. Linked to this is the care of Sancreed Beacon, the beautiful tor-topped hill rising above Sancreed church, owned by the Cornwall Heritage Trust and, like Martinney, also managed under Countryside Stewardship.

CAU was commissioned by Penwith District Council to prepare an archaeological assessment of the project areas to identify, map, describe and interpret all visible remains, make management recommendations for their conservation, and prepare an historical overview which could guide future landscape management. The 1:2500 scale survey recorded prehistoric houses, fields and ritual cairns; medieval crofts, outfield strips, pasture boundaries and liddens (or cattle-watering pools); and post-medieval farming, mining, quarrying and china-clay working remains. The latter included one of Cornwall's best-preserved 19th century clayworks on Tredinney Common.

Prehistoric round houses and fields on the western slopes and tin mining on the northern and eastern dominate the archaeological record of Sancreed Beacon, but the network of pasture boundaries indicates the hill's principal land use from at least the Bronze Age to the early part of the 20th century. Summer grazing by the livestock of farms lying in more sheltered valleys nearby has created and maintained the western heath whose character is now threatened by just a few decades of agricultural neglect. High European gorse, bracken, blackthorn and brambles are becoming dominant. This historic perspective, illuminated by the archaeological remains will guide the gradual re-introduction of summer grazing to reverse the ecological impoverishment and regain the hill's essential historic character. At the same time the archaeological remains, now becoming swamped by the dense vegetation, will become visible again and available for the enjoyment of the general public whom the Cornwall Heritage Trust welcomes to the hill.

Peter Herring

Lanhydrock

The Lanhydrock estate, between Bodmin and Lostwithiel, is a popularly visited property in the National Trust's Cornwall Region. The House is justly famous as the principal seat of the Robartes family, who bought the estate in 1620. The Cornwall Archaeological Unit has carried out management surveys at many of the Trust's Cornish Properties, to identify archaeological sites and make recommendations for their preservation and interpretation. The Lanhydrock estate, covering some 4 square kilometres of parkland, farmland and woods, was investigated by Nigel Thomas during the winter of 1993-4.

The survey revealed sites of many periods and that the influence of the Robartes family—of great importance during the recent historic period—is only part of the story. The earliest sites discovered were a group of damaged Bronze Age round barrows, now located in the woods to the north of the park. In the earlier historic period, and also probably during prehistory, this area was on the edge of an area of open downland. A network of early tracks was also investigated, some perhaps used in prehistory. Remains of a possible lann (a Christian enclosure dating to before the Norman Conquest) was traced around the present church.

A medieval field system with ridge and furrow survives in the present parkland. This dates to the period before the Dissolution when Lanhydrock was owned by St Petroc's Priory at Bodmin. The field system is extremely well preserved and is a rare survival in a Cornish lowland location; this is due to the area being converted to a park from the 17th century. The tree-lined Avenue (created 1648) which leads from the House towards Respryn cut through the field system. It also replaced a narrow and winding lane which formerly connected Respryn with Lanhydrock church and Treffry crossroads.

The survey also revealed how the parkland itself was developed. In the 17th century an extensive deer park was created and its boundaries are still traceable. In the later 18th century the deer park was discontinued and an ornamental park containing ha-has and circular copses was established. In the earlier 19th century the parkland was extended eastwards into an area that had formerly been agricultural land. The lines of former field boundaries can be traced where trees, formerly on hedgerows, still survive in the park.

The woodlands surrounding the park are archaeological sites in their own right and several have charcoal burning platforms and hollow-ways within them. Brownqueen Wood and Hart Wood may well have existed in medieval times. Great Wood appears to have been a creation of the Robartes family and was documented by the end of the 17th century; field banks survive within this wood, indicating an area of former pasture or arable land. An extensive area on the northern part of the estate (on the former Lanhydrock Down) was converted to plantations during the 19th century.

A possible medieval longhouse has been discovered in the woods north of the park. This isolated building was probably situated on the edge of the former downs.

A surprising result of the survey has been the number of industrial features that have come to light. The parkland at Lanhydrock stretches down towards Respryn in the valley of the River Fowey; this area is now occupied by meadows and woods. In the past however, the character of this area was very different. There is abundant evidence of streamworking, comprising irregular banks and gullies developed during the extraction of alluvial tin. The whole of the valley floor is covered with streamworking debris, some parts disguised and ploughed over when the present meadows were created but other areas in woodland are well preserved. There is evidence to indicate that streamworking, which appears to have carried on in the vicinity as late as the 18th century, contributed to the abandonment of the deer park.

By the early 19th century the valley was already an industrial wasteland and campaigns of tree planting were undertaken, probably to tidy up the valley as an extension of the park.

In the 1850s the mainline railway was brought through the former streamworking area in the Fowey valley and the Robartes had a private halt at Respryn. Doubtless this provided a further spur to reclaim the area. Carriage drives were laid out through the woods and a route was later created to link the estate with the public railway station at Bodmin Road (now named Bodmin Parkway). This latter route involved the demolition of a hamlet at Respryn and presumably the re-settlement of its inhabitants.

Other industrial features that have been discovered are the remains of three water-powered mills, all of which were abandoned by the later 19th century. All were probably used for flour milling and/or processing animal feed but there is also a possibility that one site in the Maudlin valley was also used as a stamping mill for crushing tin ore, as a streamworks and stamping mill were recorded here in 1759.

Nigel Thomas

Whitecross

The need for repair work was drawn to our attention by Andrew Langdon, the leading authority on crosses in Cornwall, and David Attwell of North Cornwall District Council. Nineteenth century repairs to the broken shaft had rusted away, leaving the cross head vulnerable to vandalism, theft and accidental damage. In addition, build up of the surrounding verge had resulted in burial of most of the shaft. Sue and Lawrence Kelland, conservators from Somerset, were employed to re-fix the cross head to the shaft after it had been excavated from the verge. It was then re-set in a new base made by local granite mason, Noel Hill.

Ann Preston-Jones

St Teath Cross

Having been ruthlessly mutilated in 1841, the churchyard cross at St Teath was rescued and repaired in the late 19th century. One hundred years later, parts of the repair were falling apart, in particular on the head where a missing fragment had been replicated in brick and cement. Again, the Kellands were asked to undertake the delicate operation which involved stabilising the old repair and restoring sections which had fallen away completely.

Ann Preston-Jones

Trethevy Well

Paul Broadhurst has written of St Piran's Well at Trethevy, near Tintagel, that 'this unique monument is about to be lost due to utter neglect' (1988,79). Bedding mortar was missing from much of the stonework and a vehicle had run into it, knocking out some of the stone. Rather scruffy surroundings added to the appearance of neglect. Work here, which was co-ordinated by Tim Dingle of North Cornwall District Council and carried out by local builder Fred Sanders, involved repointing and rebuilding in a lime mortar and the provision of a new iron door. Tintagel parish council have now agreed to take on the management and care of the monument so that it does not again deteriorate to its former poor condition.

Ann Preston-Jones

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St Clether Holy Well

St Clether holy well is an attractive 15th century granite building with a pointed roof. Prior to the recent repair work, the roof was badly slumped and the walls cracked. *Ad hoc* repairs had been made in grey cement. Following advice from Gerald Bird of English Heritage, the roof was partly taken down, missing corework replaced, and the roofing slabs reset in a lime putty/Blue Lias lime mix. Any defective or unattractive pointing was removed and the walls repointed where necessary. Detailed drawings were made in advance. The fence around the site was replaced at the same time.

Ann Preston-Jones

Launceston Castle

English Heritage commissioned the Cornwall Archaeological Unit (CAU) to carry out recording in advance of consolidation work to the structures on the motte (the Shell Keep and the round High Tower within it). Recording comprised elevations and plans of the main wall faces and of architectural features such as entrances, windows and stairways. The drawings were intended as an archaeological record, to act as a source of information for any future interpretative work by EH and are also used by the conservation team to identify areas for repair.

Recording has been carried out in several stages since 1988, work being dependent upon the provision of scaffolding and progress of consolidation. Control points on the wall were provided by a professional surveying company; first Cathy Parkes and then Nigel Thomas and Eric Berry (for CAU) completed the survey using hand measurement. The buildings do not easily lend themselves to two dimensional recording; the wall faces are tightly curved, the masonry is severely weathered in places and both the Shell Keep and High Tower have subsided in antiquity; the Tower is out of true by approximately 1 metre from top to bottom—the leaning tower of Launceston!

Shell Keep

The Shell Keep has split in the area of the entrance (due to subsidence of the motte) and the western jamb has slumped outward. This probably caused collapse of the entrance arch some time in antiquity.

The motte structures have been extensively robbed of their dressed masonry; the entrance passage into the Shell Keep is now virtually bare of its original lining but enough dressed masonry survives in the upper walls to indicate the original form of the structure. The doorway position is marked by two drawbar slots. Framing the door was a single, probably pointed arch having two orders. In front of this there are traces of a portcullis slot, implying a winding mechanism was once sited at the present wall walk level, possibly housed in a gatehouse. All traces of structure at this height have disappeared. It has been suggested that the gateway into the keep was enlarged in line with the construction of a covered passage up the slope of the motte. The evidence in the gateway does not appear to bear this out as the drawbar slots built into the keep wall are clearly not additions and belong with the surviving door arrangements.

In the ground floor of the eroded gap in the NW part of the keep wall are the remains of a garderobe shaft, which was flushed with water from the wall walk. Above the garderobe was a small vaulted room built into the thickness of the wall and lit by an opening. This room overlooks the north gatehouse of the bailey and probably served as an additional defence. The opening, its outer part now unfortunately robbed of its dressed stone and severely weathered, may have contained a window together with arrangements for defence, such as shutters and a fixed portcullis.

There is very little surviving evidence of the way in which the interior of the keep was used prior to the construction of the High Tower. There are a few traces of render on the SW part of the interior of the keep wall but otherwise no traces of structures. The keep wall has largely been repaired at a height where roof timbers may have existed; this has also masked the relationship of the keep wall with the High Tower. Radiating joist slots in the tower wall indicate the space was roofed over but no slots survive on the interior face of the Shell Keep.

High Tower

The High Tower contains two rooms and has a defensible entrance equipped with drawbar slots. Its unheated ground floor room has a strong doorway but is otherwise featureless; this probably served as a store and possibly also a gaol. The first-floor room is lit by a two light window set within a stepped recess equipped with window seats. The window was built at sufficient height to obtain a view over the top of the surrounding Shell Keep. An elaborate and slightly curved fireplace is built against the northern wall face and this had a flue built into the wall walk and chimney stack. It is very unlikely that this room was used as permanent living quarters; it is more probable it served as a state room, used periodically when the lord visited. The first floor room was accessed by a doorway from a stairway built within the section of the wall; the base of the stairwell was lockable by means of drawbars. On the stairway opposite the entrance to the first floor room is another eroded opening. There is strong evidence

that this was another doorway (lockable from the inside of the tower by drawbars), which gave access to the wall walk of the Shell Keep.

Weathering on the exposed upper part of the tower has been very severe and the visible core masonry has been largely rebuilt. The level of the wall walk can be ascertained from the landing position of the stairs combined with the projected line of the stair vault. The battlemented parapet would have been higher still. These factors indicate that a great deal of masonry has been lost, perhaps 1.8m or more. A slit window at the head of the stairs probably served as a light source when the walk door was closed and also as a defensive position overlooking the Shell Keep entrance.

Although the tower walls are very eroded at higher levels, there are still a few traces of the form of the tower roof. A surviving double corbel set below the window arch suggests that the primary roof structure was based upon a single arch braced truss spanning the tower. It is likely that a wall plate at or just below wall walk height, perhaps carried on corbels as at Restormel Castle, supported common rafters. The roof probably had a shallow pitch with a covering of sheet lead.

The survey has highlighted the way in which all the major elements of the tower (the roof and floor heights, the positions of the doorways in relation to the winding stairs) have to work together. The information gathered appears sufficient to attempt a relatively accurate paper reconstruction of a principal part of the castle.

Nigel Thomas

Treharrock, St Kew

In 1977 seventeen graves were uncovered during the laying of a water main at St Endellion on the opposite side of the road from the present church. This cemetery may have been in use from the early Christian period until after the Norman Conquest. When a renewal of the main from St Endellion to Delabole was proposed in 1994 South West Water arranged to route it along the road to avoid further disturbance to the cemetery and at the same time commissioned CAU to undertake a watching brief along archaeologically sensitive parts of the pipeline.

A single isolated child's grave was identified just outside the village and then in April 1994 South West Water engineer Richard Cook discovered several ancient slate-lined graves in a field at Treharrock Farm just over a mile east of St Endellion. Examination of the site by CAU revealed a total of fourteen graves of the long-cist type. The oblong cists had been carefully constructed from locally quarried blue-grey slate. The sides and bases were set into almost exactly-dug holes and sealed with slate covering slabs. The overlying soil was very shallow and the tops of the cists had all been crushed and damaged by ploughing. Some had been almost completely destroyed. There were no surviving skeletons and the cists were filled with earth and small stones. The bones had long since been dissolved by the acidic soil or dispersed by ploughing. The size of the cists indicated that thirteen of the graves were probably those of new born babies. The cists were grouped together in rows, sharing an east-west alignment. Although there was no evidence for headstones, or other markers such as wooden crosses, the neat layout suggests that the graves were originally marked in some way or visible as mounds on the ground.

Some distance east of the main group were the remains of a single cist which had been very badly damaged. It was probably the last resting place of an adult who could have been at least six foot tall. All that remained was the cut of the grave with a slab of slate at the head and feet.

The graves were carefully cleaned using trowels and handbrushes and then planned and photographed by the CAU team. The cists were not completely excavated. Once the recording had been completed the graves were reburied in the hope of preserving them from further damage.

Because there were no skeletal remains or artefacts in the graves it is difficult to assign an exact date to the burials. The use of east-west oriented long cists is thought to have been

introduced in the Early Christian period (AD 400-600)—although it was influenced by an earlier Iron Age tradition and continued in use throughout the medieval period. The burial ground at Treharrock is an important discovery and a full report on the site is forthcoming.

Charles Johns

Geevor Mine

The Derelict Land Grant-funded programme begun in 1994 is now almost complete. Work in the first year primarily concentrated on finding and treating most of the small shafts and shallow workings known to pepper the landscape between the modern mine buildings and the mine entrance off the St Just road—not surprisingly, since this area was proposed for use as car-parking and visitor amenity. During the programme, the site team refined existing methods of shaft capping to ensure not only public safety and minimal damage to archaeological features, but also the retention of the potential for underground access. Other works resulted in reduced contamination levels on the old Levant arsenic works, improved the mine surface drainage, and stabilised ruinous structures near the cliffs. From an archaeological viewpoint there were many new discoveries, including a maze of late-medieval shallow mine workings—some potentially accessible to visitors.

In 1995, attention has switched to the lower part of the site—between the mill buildings and the sea. Again, there have been several strands to the programme. Works to reduce surface contamination have allowed the team to go some way towards recreating the pre-mining landscape in the badly scarred area below the mill, and Cornwall Wildlife Trust will soon begin to re-introduce heathland vegetation to this area, whilst in Trewellard Zawn, urgently-required works to secure the retaining wall should ensure the long-term stability of this spectacular part of the site. As has been hoped at the outset, the 1994/5 DLG works programme has demonstrated the high archaeological potential of the site. Over the next few years with the creation of a new museum and the development of underground tours the results of this work will become increasingly accessible to visitors to this exciting site. Once again, however, the need to locate and secure the remaining mine shafts has been the priority and work concentrated on two formerly important shafts, Thorne's and New Mexico.

Adam Sharpe

The Excavation of a Complex Barrow at Trelowthas Manor Farm, Probus 1995

As part of an archaeological assessment of the Probus bypass during the winter of 1994, the Cornwall Archaeological Unit (CAU) commissioned Geophysical Surveys of Bradford to carry out a magnetometer survey along a strip of land close to Trelowthas Manor Farm (SW 8807 4658)—to the south-west of Probus village (Report no: 94/113). The site was chosen as a test for this technique in a lowland context in an area with no above-ground archaeology. The remains of a ring-ditched barrow discovered by this survey was excavated in March and April 1995 by a team from CAU. The following is an interim summary of the results of that work.

Although modest in size by Cornish standards, at 16 metres in diameter, Trelowthas barrow was found to have had a complex history, during which the site was repeatedly remodelled to fit changing functions. A number of structural phases have been defined, as follows.

The earliest signs of activity on site were a small number of pits of various shapes and sizes which appeared to be arranged in an irregularly spaced although linear, west-east alignment. None produced any datable finds. The largest pit, which lay in the west, was 2.30m long, 0.60m wide and 0.65m deep. Its substantial size was in contrast to the other earlier features and it may have once contained a substantial marker—perhaps a menhir or wooden post—although there were no signs of packing material in its strangely uniform fill. The existence of these enigmatic pits suggests that prior to the construction of the barrow, the site was already physically marked, perhaps specially designated for ritual activities. The full extent of such

activities is unknown though it is likely that they extended beyond the narrow confines of investigation within the road corridor.

The construction of an apparently continuous, U-shaped, circular ditch marked the beginning of change in the appearance and perhaps use of the site. This ditch was an impressive feature cut deeply into the shillet bedrock—measuring at least 1.20m deep and 2.30m wide. It had a relatively flat floor and steep sides. Due to lack of time, only a number of sections were fully excavated but the exposed sections showed the ditch to be consistent in character, suggesting that it had been created in a single event. The circular space enclosed by the ditch was 16.30m in diameter. A sub-oval pit had been dug into the central area. The very ephemeral remains of a shillet bank—presumably partly created from ditch upcast—were only found on the north-eastern perimeter of the site. During this phase the site had become transformed into a defined space. How it was used and exactly when it was created, is, as yet, unclear. No finds were recovered from either the central pit or the ditch and so it is hoped that organic material extracted from the lower fills of either pit or ditch will be suitable for radiocarbon dating.

The ditch was subsequently infilled—perhaps deliberately—as there was little evidence for silting. On the western side of the site the surface of the infilled ditch was consolidated with a slate “pavement”. Contemporary with this structural alteration was a circular arrangement of posts placed along the centre of the ditch on the east and south-eastern sides of the site. The substantial postholes found here were on average 40cm in diameter, 29cm deep and contained charcoal-rich fills. The charred remains of oak posts were found in at least three of these post sockets (Jennifer Hillam, pers comm). Their regular spacing suggests that these wooden features were associated and may have once formed a wooden screen or “facade”. Fragments of cremated human bone (2g; Jackie McKinley, pers comm) were found in the fill of one of the postholes. A solitary sherd of fairly undiagnostic prehistoric pottery was recovered from one posthole—the only artefact related to this phase.

During this stage the site appears to exhibit a structural duality with the western and eastern halves of the site perhaps being used in distinctly different ways. Such an east-west dichotomy has been noted on Cornish barrows such as Crig-A-Mennis when it was excavated in the 1950s (Christie 1960). The “elaborately structured” internal space within Crig-A-Mennis led Paddy Christie to interpret the barrow as a “cenotaph” or a “ritual barrow” (*ibid*, 89)—that is a “sacred spot” for rites of remembrance rather than formal burial. It is as yet unclear whether this was the role played by Trelowthas Barrow during this phase but the absence of finds, the “token” deposit of human bone, the wooden screen or “facade” and the “pavement” provide a strong impression of ritual behaviour rather than formal burial activities. Furthermore the embellishment with upstanding architectural features such as the post facade and the “pavement” give the impression that movement around the site may have been highly mannered or prescribed. Whether this is linked to or was a prerequisite for subsequent funerary activity on the site is not yet apparent, although the transformation of a ritual barrow to a burial barrow has been recorded on other excavated sites in the south-west, such as Watch Hill in the St Austell area (Miles 1975, 23) and Tregulland in North Cornwall (Ashbee 1958). The end of this phase was marked by the dramatic destruction of the wooden posts by fire. In at least 3 postholes the burnt stumps of posts were found: either the wood was too thick to burn through completely or the fire was not hot enough to reduce the charcoal to wood ash.

Following this, the inner space was sealed with a low mound of soil and shillet. There were no clear traces of a buried soil or old land surface beneath the mound which may suggest that the space enclosed by the ditch may have been systematically prepared with the removal of old turf. Similar behaviour has been recorded on other barrow excavations in Cornwall such as Cataclews (Christie 1985, 98). The raising of the mound appears to have been closely followed by the construction of a shallow ditch cut along the alignment of the earlier one, but less regularly made. This new ditch was penannular with rounded terminals fringing a causeway to the north. A continuous stake ring-fence was set up around the circumference of the site with a gap in the north respecting the causeway (Fig 1).

Trelowthas Barrow TL95,
 Probos - Later phases 4-5

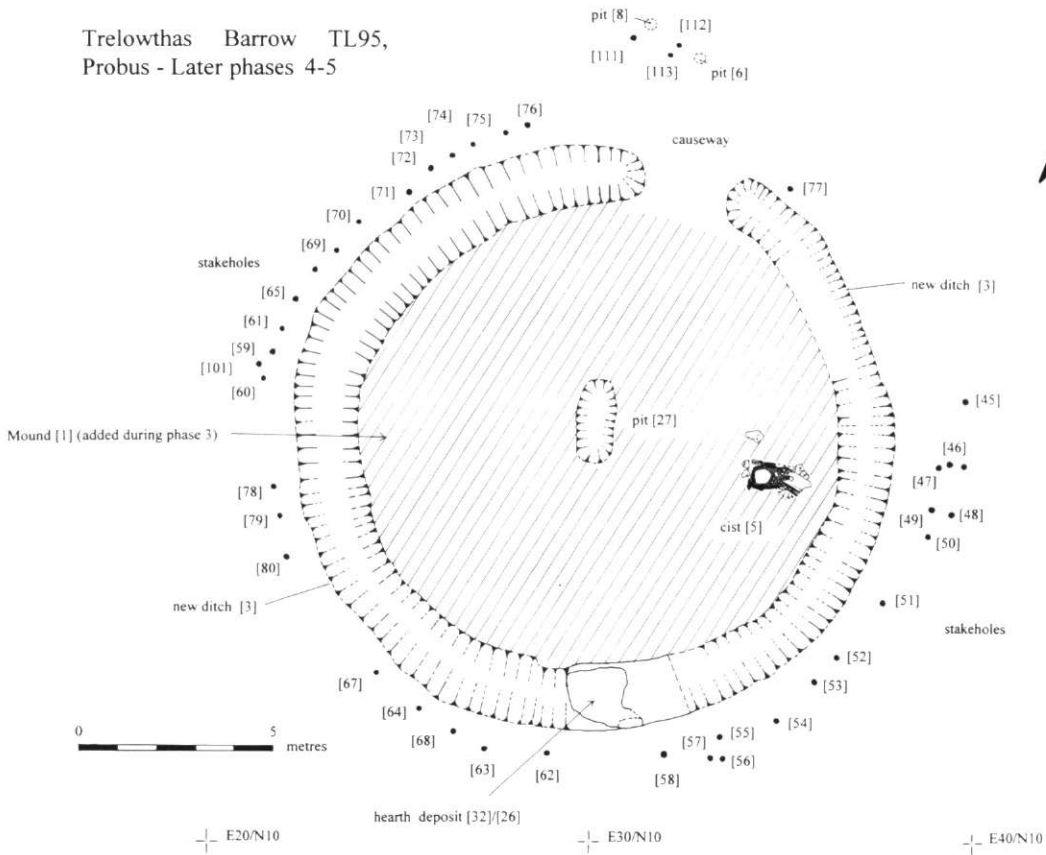


Fig 1 Plan of Trelowthas Barrow during final phase of activities at the site (*CAU Archive GRH: 197/9 J A Nowakowski*)

Over 1500 sherds of pottery were found shattered on the floor of this new ditch. Many form partially complete pots representing at least 22 vessels. Most of the pottery is decorated with cord-impressed chevron motifs (89.2%) and preliminary analysis suggests that the majority were medium-sized biconical urns (Carl Thorpe, pers comm). Ribbon handles and pimple lugs were noted on some vessels. The decorative motif is typical of south-western Trevisker ware of the Bronze Age. There were two localised spreads of pottery—in the south-eastern and eastern areas of the ditch. The layers within the ditch were well sealed protecting the pottery scatters from later ploughing disturbance. The fractures on the majority of the sherds were fresh indicating that most of the material had lain undisturbed for over 3,500 years. The stylistic character of the pots suggests that all this material was dumped into the ditch during one major chronological phase. Why there is so much pottery on site and why it was dumped here is still unclear. Large collections of pottery have been found on other south-western sites and the practice of scattering broken pottery on funerary enclosures has been documented on other excavations such as Carvinack Barrow (Dudley 1964, 438) and Cataclews (Christie 1985, 103) recalling late Neolithic traditions. A small collection of unworked and worked flints were also recovered from the ditch fill (Carl Thorpe, pers comm).

After the second ditch had been infilled open fires were later lit on its surface in the south. These may have been alight and were perhaps contemporary with the insertion of a slate-built cist into the eastern side of the central mound (Fig 2). The cist was intact and found to be entirely filled with cremated bone and soil which had been deposited within the structure in



Fig 2 Trelowthas Barrow, Probus. Slate-built cist during excavation showing slate floor with upturned cremation urn <3419> in situ. (CAU Archive GBP:501/19)

three episodes. A preliminary assessment of the cremated deposits has revealed the material (9,480g in weight) to comprise the remains of adults, juveniles and infants mixed with animal bone (Jackie McKinley, pers comm). Most of the cremated bone was dumped into the cist although

small quantities were contained in a collection of 4 upturned miniature urns which had been placed within the eastern end of the cist. Two tiny objects of faience—a six-pointed star and a quoit (both perforated like beads)—were found lying at the back of the cist. Had they been placed here as amulets or talismans? Once the infilling material had been removed, the floor of the cist was found to have been neatly made of flat slates and a “cobbled” surface of over a hundred sparkling white quartz pebbles, beneath which was a further spread of cremated human bone.

Also belonging to this later phase was a fairly large and deep rectangular pit which was found dug into the centre of the mound. This feature contained one worked flint and several “worked” stones (Carl Thorpe, pers comm). The long axis of this feature appeared to be aligned onto the causeway. Lying to the north of the causeway were two pits together with a small cluster of stakeholes. Both pits were shallow but contained the bases of two vessels. It is possible that these features represent votive or token deposits. The two pits form a short linear alignment placed 3.0 metres away and partly to one side of the causeway and their location and stratigraphic positioning is of interest. They both appear to be related to the existence of the causeway and as such are likely to have been positioned towards the end use of the barrow perhaps to form a symbolic blocking across a former point of access.

In summary, excavation revealed Trelowthas Barrow to have had a complex composition and as such is a reminder of the varied and complex richness of funerary sites in the south-west. Structural analysis has indicated the gradual transformation of a site over a period of time where the changing functions of the site—from ritual to burial activities—physically altered its outward appearance. It is anticipated that radiocarbon dates will clarify when this site was established although as far as the later history of the barrow is concerned, pottery indicated an episode of formal burial which dates to the Middle Bronze Age. Samples for pollen and environmental analysis were taken during the excavation and are currently being studied. A full excavation report on the work along the Probus bypass will appear in a future edition of *Cornish Archaeology*.

Acknowledgements

The excavation of Trelowthas barrow was supervised by Andrew Jones and Carl Thorpe who were ably assisted by Ann Reynolds, Clive Williams and a willing band of many volunteers. Their valuable help ensured the success of the project. Thanks also to Vanessa Straker of the Dept of Geography at the University of Bristol for advice and organising the processing and analysis of the environmental data and to Wendy Carruthers for carrying out the assessment. Thanks to Peter Davies of the Dept of Science at the University of Plymouth for help with archaeomagnetic dating and also to Jennifer Hillam of the Dendrochronology Laboratory at the University of Sheffield for her advice on the charred wood. Geophysical Surveys of Bradford carried out the original survey and particular thanks must go to Dan Shiels for his advice. Post excavation analysis is currently taking place and thanks are extended to Andrew Jones and Carl Thorpe (at CAU), Jackie McKinley of Wessex Archaeology and Henrietta Quinnell. The author would also like to thank Nicholas Johnson, Peter Rose, Adam Sharpe and Professor Charles Thomas for their support and encouragement and also members of Probus Parish Council for their interest. The smooth-running of the excavation was due to the co-operation and help of Bob Fraser, Neil Homerston and Mike Peters of the Highways Dept of Cornwall County Council and Tim Johns and Andy Newton of CORMAC. The work was funded by Cornwall County Council.

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St Andrew's Day 1995

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Archaeological Investigations on Viverdon Down 1995

Archaeological investigations along the route of the Viverdon Down bypass by CAU over the winter of 1995 comprised geophysical surveys, open-area excavation and the excavation of Westcott Cross. In addition an area targeted for landfill was monitored.

A northern and southern section of the bypass corridor were examined by excavation in February 1995 under the supervision of Andrew Jones following two geophysical surveys which were undertaken by Geophysical Surveys of Bradford (Report no: 94/12) at the request of CAU. On the east-facing slopes of the down (the southern section) a number of linear drainage ditches were found. These were part of attempts earlier this century to reclaim the land (Billing 1976). The absence of any earlier traces of activities here seemed to confirm the impression that the downland has always been heathland until very recently. In the north (near Westcott) further land drains and a field boundary were excavated, but also of interest was the discovery of an isolated hearth pit with contained the broken head of a neolithic axe. It is hoped that environmental samples taken from the pit will be suitable for a radiocarbon date. The lack of flint artefacts from this second area of excavation was puzzling given that so many finds have been found by local fieldworkers in this area (Geoff Walford, pers comm). However the evidence for Neolithic activity close to the barrow group on Viverdon Down is of some interest (Ray 1994).

Westcott Wayside Cross was excavated in advance of its removal to a new site. The excavation which took place in April by Carl Thorpe and Ann Reynolds, showed that this fine grained granite cross was not *in situ* as it was found to overlie a nineteenth century field boundary. The cross was re-sited at SX 3785 6797 under the archaeological supervision of Nigel Thomas in September 1995. Topsoil removal for a landfill site at Tipwell which lies just to the south of Viverdon Down was monitored by Carl Thorpe in April. No archaeological features were found. The work at Viverdon Down was funded by Cornwall County Council and has been summarised in an archive report (Jones, Nowakowski and Thorpe 1995). A further detailed note on the neolithic pit is proposed once post excavation analysis is completed.

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Winter 1995*

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Wheal Uny

A watching brief was carried out in July and August 1994 by Colin Buck for CAU during shaft capping operations administered by Kerrier District Council for English Partnerships

under a Land Reclamation scheme. An archaeological assessment was carried out in 1991 by P Herring (CAU), which identified Archaeological Constraint Areas consisting of extant building remains, Tudor or early post-medieval lode back pits and archaeologically sensitive mineshafts.

The study area contained two mines in the 19th century, Wheal Uny to the north and North Buller mine to the south. The Cornish boom of tin mining from the 1830's is reflected at this site which contained at least 6 steam engine houses, exploiting the Great Flat Lode by the turn of the century.

Out of a total of 20 shafts found on the site, only 9 were 'plugged' and Kerrier District Council were persuaded to securely fence the remainder to preserve important archaeological remains in the area of the shaft rockhead. Two geotex paragrid sheets were laid over areas of shallow mineworkings which proved to contain a series of interesting underground water tunnels. The main excavated tunnel measured 0.6m wide and 0.9m high with soffit level 2.1m below the surface, for a distance of some 28.0 metres. This complex seems to have been designed to supply water to turn 16 waterwheels powering two whims (winders) and 16 sets of ore crushing stamps, all operational by 1843. It proved possible to retain features near some capped shafts, including a granite stone-lined flat rod slot and a large balance bob box and slot.

Information from the CAU assessment report and Watching Brief report is available within Cornwall's Sites and Monuments Record.

Colin Buck

Notes on recent field work in Cornwall by the Royal Commission on the Historical Monuments of England

by M FLETCHER and P TOPPING

The RCHME undertook a comprehensive architectural survey of Godolphin House (SW 6010 3179) in Breage Parish during 1994. This work was complemented by a large scale survey of the gardens and immediate environs of the house which was undertaken in 1995 by archaeology field staff from the Commission's Exeter office.

The gardens are an outstanding survival of an early possibly 16th century plan, although part of the layout was ploughed flat during the 20th century.

In August 1994 the RCHME began a national survey of the enclosures and flint mines of the Neolithic period to provide accurate analytical plans of some of the earliest and most fragile earthwork remains in the English landscape. The aim of the project is to create a corpus of new surveys to inform both the academic debate and the management process and improve opportunities for their preservation.

To date fieldwork has taken place in most regions of England. In Cornwall surveys have been carried out on definite or probable Neolithic enclosures including Helman Tor (SX 0680 6070), Tregarrick Tor (SSX 2410 7110), and Trencrom Hill (SW 5180 3620). These new surveys have added to the corpus already recorded by the RCHME's Exeter office which includes De Lank, Rough Tor and Stowe's Pound, and emphasises the range and increasing numbers of early enclosures being discovered in the south west of England. Other hilltop sites in Cornwall which may be Neolithic in origin also investigated in 1995 were St Stephen's Beacon (SX 9597 5452), Carn Galver (SW 4273 3600) and Berry Castle (SX 1970 6890).

Reviews

CORPUS OF EARLY CHRISTIAN INSCRIBED STONES OF SOUTH-WEST BRITAIN by Elisabeth Okasha. Leicester University Press, London and New York 1993. 374 pages, 90 illustrations. ISBN 0 7185 1475 0 (hardback). £65.

This corpus is an important addition to the archaeological literature for south-west Britain, particularly Cornwall. The early Christian inscribed stones of Devon and Cornwall are much less well known than their Welsh counterparts, and for the first time we now have available one of the key sources for understanding the culture, society and religion of the inhabitants of the south-west, by one of Britain's leading medieval epigraphers.

The scholarly introduction takes up less than one sixth of the volume, but covers a wide range of topics. These include a summary of previous research on the inscribed stones, a new classification based primarily on form and function, a discussion of the language and formulae, script and layout of the texts on the stones, the sources of influence, the personal names and dating of the stones. One area not discussed is the siting of the stones, perhaps emphasising the epigrapher rather than archaeologist authorship. Certainly many of the stones were first recorded "in clearly non-original contexts" (p 5), but it would nevertheless have been of interest to know the distribution of those that were not. It might also have been useful to attempt some discussion of the overall distribution. Even if a good number of stones are now removed, they will not have moved far.

The gazetteer or "entries" forms the main part of the volume, and will be invaluable as a work reference. Considerable industry over a long period has clearly been necessary to produce such a comprehensive bibliography for the work. It would have been of interest to know the strategy behind the selection of photographs. Many different sources of photography are acknowledged, some clearly selected for providing a view no longer available, generally due to the deterioration of the stone. There are many excellent photographs, but a few of those of extant stones are not very good. However it would be wrong to underestimate the difficulties in finding the time and weather for such a large number of photographic subjects.

It will be of interest to see what use is made of this volume in changing our understanding of the south-west in the early medieval period. For anyone planning to visit the sites, this volume would make an excellent and indispensable field guide. It may also sharpen awareness of the inscribed stone, and lead to further discoveries.

Roger Leech
Romsey, Hants

CORNWALL IN THE AGE OF STEAM, by A Guthrie. Tabb House 1994. 211 pages, 46 illustrations. ISBN 873951 16 7 (soft back). £11.99.

Cornwall in the 18th and 19th centuries at first mirrored the progress of the Industrial Revolution taking place in the rest of Britain, then took the lead in the field of mining and heavy engineering. By the 1850s Cornish technology was pre-eminent in these key industries, supported by a wealth of innovative individuals and companies. The subsequent collapse of Cornish copper and tin mining made the county Britain's first post-industrial community, its population halved by mass emigration in the face of poverty and unemployment. This two-hundred year period of history is, therefore, one of momentous change in Cornwall, not only for industry and the workplace but also for towns, villages and the very fabric of society.

This is the theme which Mr Guthrie has chosen for *Cornwall in the Age of Steam*. He has gathered together a remarkable number of sources, to present a comprehensive and compact

guide to almost every significant aspect of Cornish industry and life during this heroic era. The topics covered in sixteen short chapters include farming, milling, fishing, mining, quarrying and china-clay, railways, heavy engineering, education, religion, and the arts. The author has chosen to paint with a broad brush, highlighting the essentials while covering a great deal of ground; inevitably, this has resulted in a selective and sometimes slightly superficial treatment of the subject. Mr Guthrie states in his preface that the book should be regarded as a collection of references to observations made by other writers, and it is in essence a re-assemblage of information from established sources. Criticisms such as this are, however, forgivable in a work of such scope which must fit into a slim volume of some 200 pages.

There is a fine selection of illustrations to enliven the text, and it is good to see that many of these have not been previously published. Perhaps the strongest impression imparted by the book is of the extraordinary vitality and diversity of Cornish enterprise, and its resilience in adversity. Many personalities of the 18th and 19th centuries are not yet well enough known or appreciated; although most have heard of Richard Trevithick or Sir Humphrey Davey, William Murdoch, John Opie, and Sylvanus Trevail are less well recognized. Mr Guthrie certainly attempts to redress the balance, and even gives Andrew Pears, the Mevagissey barber, his due place in history as the inventor of Pears soap.

Cornwall in the Age of Steam is a splendidly concise and accessible introduction to a vital period in Cornish history, and covers a multitude of topics in a thoroughly readable and compelling form. The bibliography is excellent and a model of its kind. Factually, there is little to fault; perhaps one could have wished for a little more critical assessment of the sources and a more penetrating analysis of cause and effect. Required reading, nonetheless.

John R Smith
Truro

Peter Hadley

Peter Hadley, who died in February 1996, had been a valued member of the Cornwall Archaeological Society for over thirty years. After an active military and business career, he settled at Poldowrian, a farmstead situated on a south-facing cliff top in the Lizard peninsula. The land lay on both sides of the dividing line between the gabbro and serpentine bedrocks, and included the Lankidden cliff castle. He soon found that his fields were producing artefacts from various prehistoric periods, notably Bronze Age flints and pottery, and this started an interest in archaeology which never left him. He published these finds in *The Lizard* (1977, 4, no 1, 14-18). He also traced and mapped a prehistoric field system whose walls linked rocky outcrops and had hitherto been invisible under gorse.

In 1978, while breaking in new ground, the plough cut into a low mound of burnt clay and small lumps of burnt gabbro stone. The Cornwall Archaeological Society was invited to carry out an excavation of the deposit, and this was done in July of the same year. Peter Hadley was a very generous land owner, having the gorse cleared beforehand, offering camping facilities, even taking the two youngest campers into his own house when they were washed out of their tent one night by rain. The mound produced the greater part of a Beaker and sherds of four others, as well as an earlier neolithic pot in a nearby pit (*Cornish Archaeol* 18, 1979, 13-32).

Peter Hadley's next discovery was a rock outcrop (only 100 metres from the Beaker site but on serpentine) where a preliminary examination by Peter himself and Peter Trudgian found that the crevices were packed with mesolithic flints and pebble tools. Our then president, Dr Geoffrey Wainwright, considered the find important enough to bring in the Central Excavation Unit, and an excavation was mounted jointly by CAS and the CEU in the spring and summer of 1980. This proved to be the Society's last full scale excavation to date. The examination of the mesolithic site was carried out by sieving with the help of a high pressure pump, for which Peter allowed a tiny stream to be dammed to provide sufficient water. With a date of 5500-5250 cal BC the site proved to be the earliest working floor in Cornwall. A nearby Bronze Age round house was excavated at the same time, and was shown to be linked to the field system (*Cornish Archaeol* 21, 1982, 23-62).

Peter Hadley kept the finds from the various excavations and from field walking in a small museum which he converted from a barn. They made a rich multi-period collection to which he welcomed friends and visitors from CAS and other bodies. In August 1991 he threw open the whole area for the Society's Young Archaeologists' Day. A new excavation was opened (near enough to the mesolithic site to guarantee some flints) where would-be diggers could learn to use a trowel and prove that eight to ten year olds have keener eyesight than some adults. They shaped (gabbroic) clay into pots and fired them in the bonfire which had already cooked a meal; they ground corn on saddle querns; they practised the elements of surveying; and of course visited the museum and the excavated sites. It was a most enjoyable and educational event, and it is difficult to think of any venue which could have matched the opportunities and archaeological riches of Poldowrian. For this event, as for others, Peter did much of the publicity, at which he had great skill. For this, as for his constant interest and generosity, the Cornwall Archaeological Society will always be grateful to him.

Daphne Harris

7 DIRECTORS

The Director or Directors of Excavations shall be appointed by the Committee and shall, subject to the general direction of the Committee, have complete executive control of the Excavations with power to appoint such excavation staff as he, she or they may think fit. Directors shall be members of the Committee ex-officio for the duration of the excavations for which they are appointed and for two years thereafter.

8 COMMITTEE MEMBERS

The Annual General Meeting shall in each year elect at least seven and a maximum of twelve members to the Committee, and the Committee may from time to time co-opt not more than two additional members for such periods as it may determine.

9 COMMITTEE MEETINGS

The Committee shall meet as and when necessary, and the Secretary shall give notice of each meeting to all members of the Committee at least 14 days in advance. Five Members shall form a quorum.

10 GENERAL MEETINGS

General Meetings of the Society shall be of two kinds:
(a) Annual General Meetings held once in every calendar year.
(b) Special General Meetings to discuss specific topics, which shall be convened either by direction of the Committee or upon the requisition of twelve members of the Society.

The Secretary shall give notice of all General Meetings to all members of the Society at least 21 days in advance.

11 NOMINATIONS

Nominations for officers and committee members shall be sent, duly seconded, to the Secretary at least seven days prior to the Annual General Meeting. In the absence of nominations the Meeting may elect any members of the Society as Officers or Committee members.

12 PUBLICATIONS

The publications of the Society shall, subject to the general direction of the committee, be managed by a sub-committee consisting of the President, the Secretary, the Treasurer, the Director or Directors, the Editor (who shall act as Secretary of the Sub-Committee) and two members elected by the Committee. The sub-committee may from time to time co-opt additional members for such periods as it may determine.

13 SUBSCRIPTIONS

The subscription shall be the sum of £8 yearly (£4 for members under 18 years of age or full-time students aged under 23). Two members living at the same address receiving between them only one copy of the Journal may pay a joint subscription of £10. Persons aged under 14 may be elected to junior membership on the recommendation of a teacher or a member of the Society, or on such conditions as the Committee may determine, at a subscription of £2 but shall not be entitled to vote at general meetings or to receive a copy of the Journal. All subscriptions shall be payable in advance on 1 January in each year. The membership of any person whose subscription has not been paid by 31 December in the year for which it is due shall be suspended until all arrears are paid, but such person may on payment of such arrears resume membership without further election.

14 HONORARY MEMBERSHIP

The Committee may elect to Honorary Membership of the Society any persons who have rendered outstanding service to the Society, to Cornish Studies, or to Archaeology generally. Honorary members shall enjoy all rights of membership but shall not be liable to pay a subscription.

15 ACCOUNTS

The Treasurer shall make up the accounts of the Society for each calendar year and circulate them to all members prior to the Annual General Meeting in the next year (unless such meeting shall be held in the first six months of the year). The Accounts shall be certified by an Auditor (who need not be a member of the Society) appointed annually by the Annual General Meeting.

If a casual vacancy shall occur in the office of Auditor the Treasurer or the Committee may appoint any person to the same until the next Annual General Meeting.

16 CHANGE OF RULES

Subject to the following provisions of this clause the constitution may be altered by a resolution passed by not less than two-thirds of the members present and voting at a general meeting. The notice of the general meeting must include notice of the resolution, setting out the terms of the alteration proposed.

No amendment may be made to clause 1, clause 2, clause 18 or this clause without the prior consent in writing of the Charity Commissioners.

No amendment may be made which would have the effect of making the Charity cease to be a charity at law.

The Committee should promptly send to the Charity Commissioners a copy of any amendment made under this clause.

17 TRUSTEES

The Committee may cause any assets of the Society to be vested in not more than four nor less than two individual trustees or in a trust corporation as sole trustee. All trustees shall be custodian trustees and shall deal with property vested in them in accordance with the directions of the Committee.

18 DISSOLUTION

If the Committee decides that it is necessary or advisable to dissolve the Society it shall call a meeting of all members of the Society, of which not less than 21 days' notice (stating the terms of the resolution to be proposed) shall be given. If the proposal is confirmed by two-thirds majority of those present and voting the Committee shall have power to realise any assets held by or on behalf of the Society. Any assets remaining after the satisfaction of any proper debts and liabilities shall be given or transferred to such other charitable institution or institutions having objects similar to the objects of the Society as the members of the Society may determine or failing that shall be applied for some other charitable purpose. A copy of the statement of accounts, or account and statement, for the final accounting period of the Society must be sent to the Charity Commissioners.



THE SOCIETY'S AREA CORRESPONDENTS 1995

PENWITH	Mrs A. Hathway, Caer Bran Cottage, Higher Grumbla, Newbridge, Penzance TR20 8QZ (01736-786124)
KERRIER	Mrs M.F. Hunt, Higher Polcoverack, Coverack, Helston (St Keverne 280434)
CARNMARTH	Mr M.E. Tangye, Penolva, Trefusis Terrace, Redruth (Redruth 214016)
POWDER	Mr H.L. Douch, 2 Enys Road, Truro TR1 3TE (Truro 272120)
PYDAR	Mr S.V. Hebdige, 14 Bay View Terrace, Newquay (Newquay 874216)
ST AUSTELL	Mrs V. Brokenshire, 5 Cannis Road, Tregonnissey, St Austell (St Austell 73110)
BODMIN	Mr F.B.J. Coombes, 5 Valley View, Bodmin (Bodmin 73036)
TRIGG MINOR	Miss D.J. Andrew, The Hazard, Widemouth Bay, Bude (Widemouth Bay 361291)
WEST	Miss M. A. Morris, Clover Cottage, St Ive, Liskeard (Liskeard 83157)
EAST	Mr G.F. Walford, 92 Sunnysbanks, Hatt, Saltash (Saltash 842730)
WEST WIVELSHIRE	Mrs M. Lovelock, Park Farm, St Neot (0579-20644)
TRIGG MAJOR	—
STRATTON	Mr R.M. Heard, 4 The Square, Kilkhampton, Bude (Kilkhampton 294)
SCILLY	Mr F.S. Ottery, 2 Porthcressa Terrace, St Mary's (Scillonia 22638)

Publications Committee 1995

<i>Ex-officio:</i>	President, Joint Secretaries, Treasurer, Editors
<i>Convenor:</i>	Editor
<i>Appointed:</i>	P.C. Herring, Miss M.Y. Morgan, Miss J. Nowakowski, Mrs H. Quinnell, H.L. Douch, N. Johnson

Executive Sub-committee 1995

<i>Ex-officio:</i>	President, Joint Secretaries, Treasurer
<i>Convenor:</i>	Any one of the above
<i>Appointed:</i>	Miss D.G. Harris, H.L. Douch, N.D. Johnson

Historic Towns and Buildings Sub-committee 1995

<i>Ex-officio:</i>	President, Joint Secretaries, Treasurer
<i>Convenor:</i>	F.J. Chesher

Projects Sub-committee 1995

<i>Ex-officio:</i>	President, Joint Secretaries, Treasurer
<i>Appointed:</i>	M. Avent, T. Blackman, Mrs V. Brokenshire, H.L. Douch, A.W. Farrell, Mrs C. Gaskell-Brown, Miss D.G. Harris, S. Hartgroves, P. Herring, A. Mercer, Miss J. Nowakowski, Mrs H. Quinnell, N.V. Quinnell, P. Rose, N. Thomas, P. Lowndes, Mrs T. Lowndes, Mrs J. Wood, Mr I. Rowe

The Publications Committee is authorised by the Society's 1961 constitution and is responsible to the General Committee and to the Annual General Meeting for all matters concerned with the Society's journal and other publications. The various sub-committees have been appointed by the General Committee to assume responsibility for different aspects of the Society's work in Cornwall and Scilly.

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