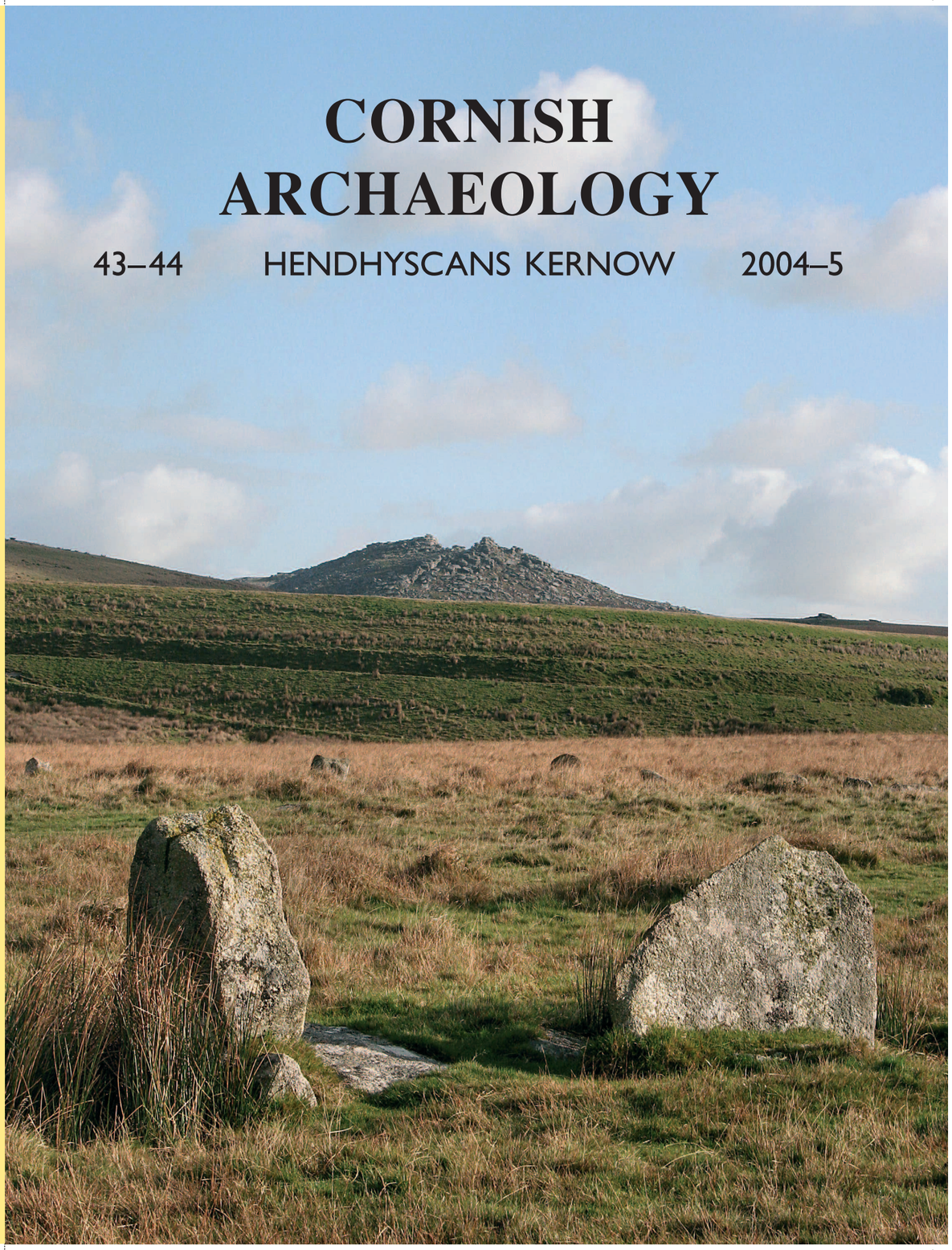
Cornish Archaeology 43–44

2004–5

CORNISH ARCHAEOLOGY

43–44 HENDHYSCANS KERNOW 2004–5



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Front cover: The view from Stannon stone circle to Rough Tor, partly obscured by the spoil heaps of Stannon china-clay works. The Stannon circle is one of the largest in Cornwall and formed part of a wider earlier prehistoric ceremonial landscape, other elements of which were investigated in a major project undertaken in 1998-9; see A M Jones, Settlement and ceremony: archaeological investigations at Stannon Down, St Breward, Cornwall, this volume. Photograph: Graeme Kirkham.

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EDITORS

GRAEME KIRKHAM AND PETER HERRING

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Contents

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Cornish Archaeology 43–44, 2004–5, 1–140

Settlement and ceremony: archaeological investigations at Stannon Down, St Breward, Cornwall

ANDY M JONES

with contributions from GIANNA AYALA, ROWENA GALE, FRASER HUNTER, JULIE JONES, ANNA LAWSON-JONES, HENRIETTA QUINNELL, PETER ROSE, ALISON SHERIDAN, ROGER TAYLOR, CARL THORPE and HEATHER TINSLEY

Between 1998 and 2000 three seasons of archaeological recording were carried out by Cornwall Archaeological Unit within Imerys' Stannon China Clay Works. The first two seasons focused on excavation of an Early Bronze Age cairn group and Middle Bronze Age and Middle Iron Age settlement activity. The third season was designed to confirm the existence of a number of cairns and a field system and to sample palaeo-environmental sites.

The cairn group comprised three ring cairns and two 'tailed' cairns. One ring cairn, site 9, was reused as a ceremonial monument in the Middle Bronze Age and again in the Iron Age as a house site. An artefactual assemblage including Bronze and Iron Age pottery and stonework was recovered. Three beads, one of faience, one of amber and another of glass, were also found.

Twelve radiocarbon determinations spanning the Early to Middle Bronze Age and two Iron Age determinations were obtained from three of the excavated cairns. Two pollen columns from an adjacent area were also dated, one of which provided environmental information from the Mesolithic to the early medieval period. The dating revealed that significant impact on the vegetation of the Down commenced during the Neolithic, with more extensive clearance during the Bronze Age. Widespread open grassland was in evidence by the Middle Bronze Age. Analyses of charred environmental material produced only limited evidence for cereal cultivation and the palynological evidence suggests that the economy in the Middle Bronze Age was based on pastoralism.

It is suggested that the cairns formed a coherent group of monuments which were part of a wider landscape cosmology which involved the grouping of particular monument types and the referencing of prominent rocks and tors.

The investigations on Stannon Down provided a rare and highly significant opportunity to examine an Early Bronze Age ceremonial landscape and consider how subsequent Middle Bronze Age and Iron Age inhabitants might have engaged with and made sense of earlier prehistoric monuments.

In 1998 Cornwall Archaeological Unit (CAU), now Cornwall County Council Historic Environment Service, was commissioned by Imerys Ltd to undertake archaeological fieldwork at Stannon Down, St Breward (SX 132 803), in advance of the expansion of the Stannon china clay works (Fig 2). During the course of the project six sites were fully excavated, ten were sectioned or partially excavated and another 16 evaluated. Importantly, for the first time in 25 years, an Early Bronze Age ceremonial complex in Cornwall was revealed and completely investigated. A nearby area, termed for convenience the 'Northern Downs', was also the subject of a programme of environmental sampling. Following the fieldwork a programme of assessment, analysis and publication was agreed with and jointly funded by Imerys and English Heritage.

Initial objectives for the fieldwork element of the project were based on an understanding of the study area derived from previous excavation and survey (see below). They included:

- Identification of features dating to the Neolithic period.
- Excavation of five roundhouses (sites 3, 6, 9, 10 and 11), assumed to be of the Middle Bronze Age.
- Excavation of a possible clearance or burial cairn (site 2).
- Recording the character of prehistoric boundaries and recovering buried soils from beneath them.
- Clarifying the archaeological potential of a number of upstanding remains on the area termed the Northern Downs in order to better understand the impact of proposed development on the archaeological resource.

In the event, the investigation revealed a greater complexity to the landscape than had been identified previously. Only site 3 proved to be a roundhouse and, where a Middle Bronze Age settlement had been expected, an Early Bronze Age ceremonial landscape was uncovered. A previously unrecognised Iron Age occupation was also revealed. This alternative interpretation was aided by comparisons with other ring cairn and ceremonial sites; in particular, sites 2, 6, 9, 10 and 11 did not display characteristics comparable with those of the houses on Stannon Down previously excavated by Roger Mercer (1970). Evidence for Middle Bronze Age activity was less substantive than expected and no Neolithic features were uncovered, although some flint artefacts were found. In the light of these findings the research objectives became less focused upon Middle Bronze Age settlement and more targeted upon answering questions relating to Early Bronze Age ceremonial activity, its influence on subsequent settlement activity, and issues relating to long term re-occupation, including the role of the 'past in the past'.

Location and setting

Stannon Down is situated within an area that contains many important archaeological remains, including prehistoric settlements, field systems and burial cairns (Figs 1, 2 and colour plates 1–3). Excavations have taken place within the china clay works on two previous occasions. In the late 1960s Roger Mercer excavated part of a Middle Bronze Age (1500–1000 cal BC) settlement at Stannon, which consisted of a number of substantial round-houses, surrounded by a field system (Mercer 1970). Artefacts from the excavations suggested that there had been an earlier Neolithic phase of activity in the vicinity. During the 1970s, Daphne Harris, Sandra Hooper and Peter Trudgian excavated three small prehistoric burial cairns on the downs to the north of the Bronze Age settlement (Harris *et al* 1984). Field survey by CAU in 1985 revealed additional features in the immediate area of the 1968 excavations. These included roundhouses, field walls and prehistoric burial cairns (Rose below). In the later 1990s, Peter Herring (1998) undertook a review of the area and more sites were identified.

All of the sites investigated during 1998–2000 were located within the china clay works. The landscape to the north of the five excavated sites was dominated by a waste tip and to the south by a large mica dam. However, extensive views remained over the moorland to the south and east and the massive rocky form of Rough Tor, one of Bodmin Moor's most distinctive hills, was visible to the north east.

The excavated sites survived on small level terraces (Areas A to D) of rough upland situated at roughly 275m OD, which gently sloped to the south towards the mica dam (Fig 3). The overall area investigated measured approximately 200m by 150m. Two of the sites (sites 2 and 6) were located on the upper terrace, as was the roundhouse

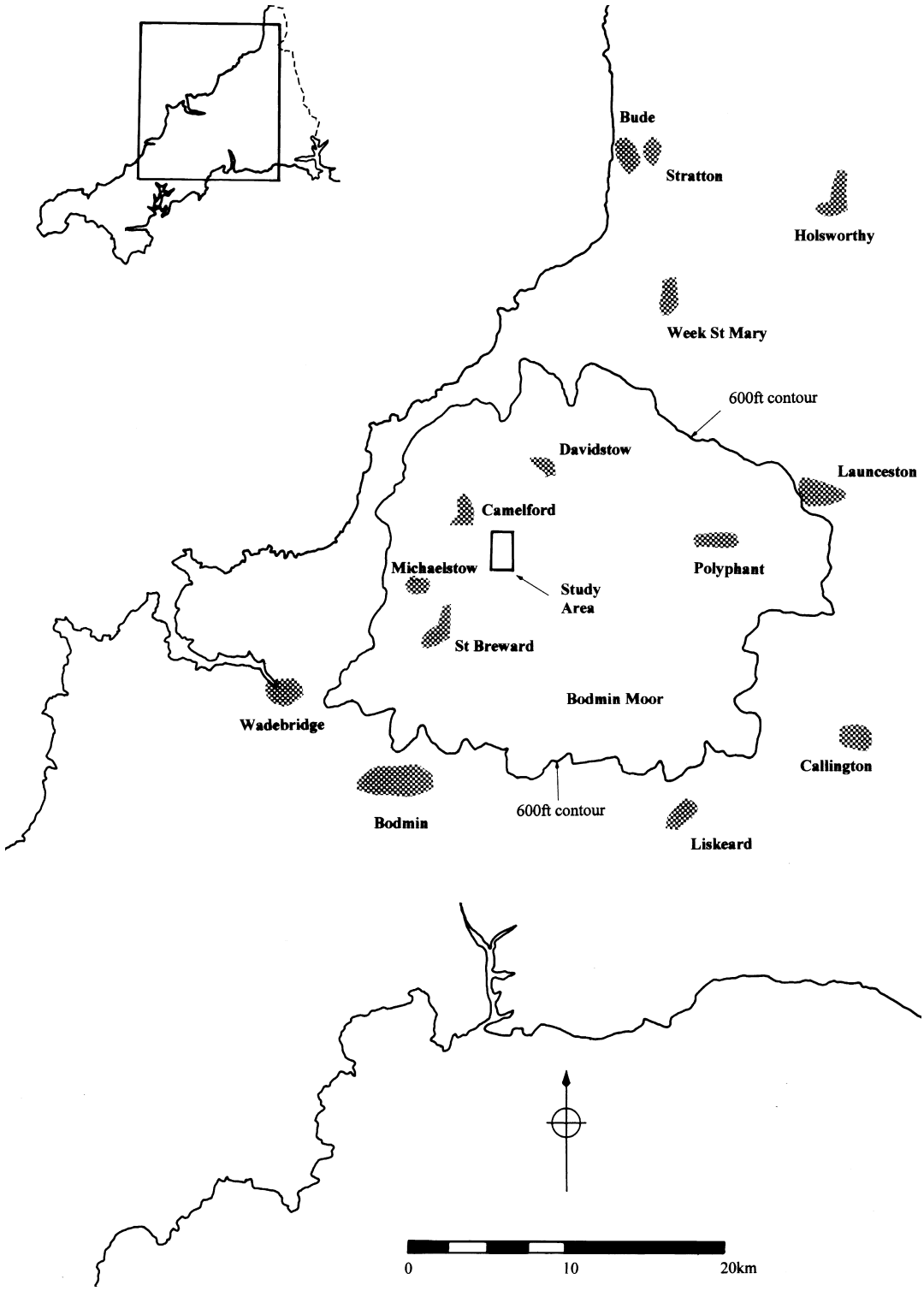

Fig 1 Location of the study area

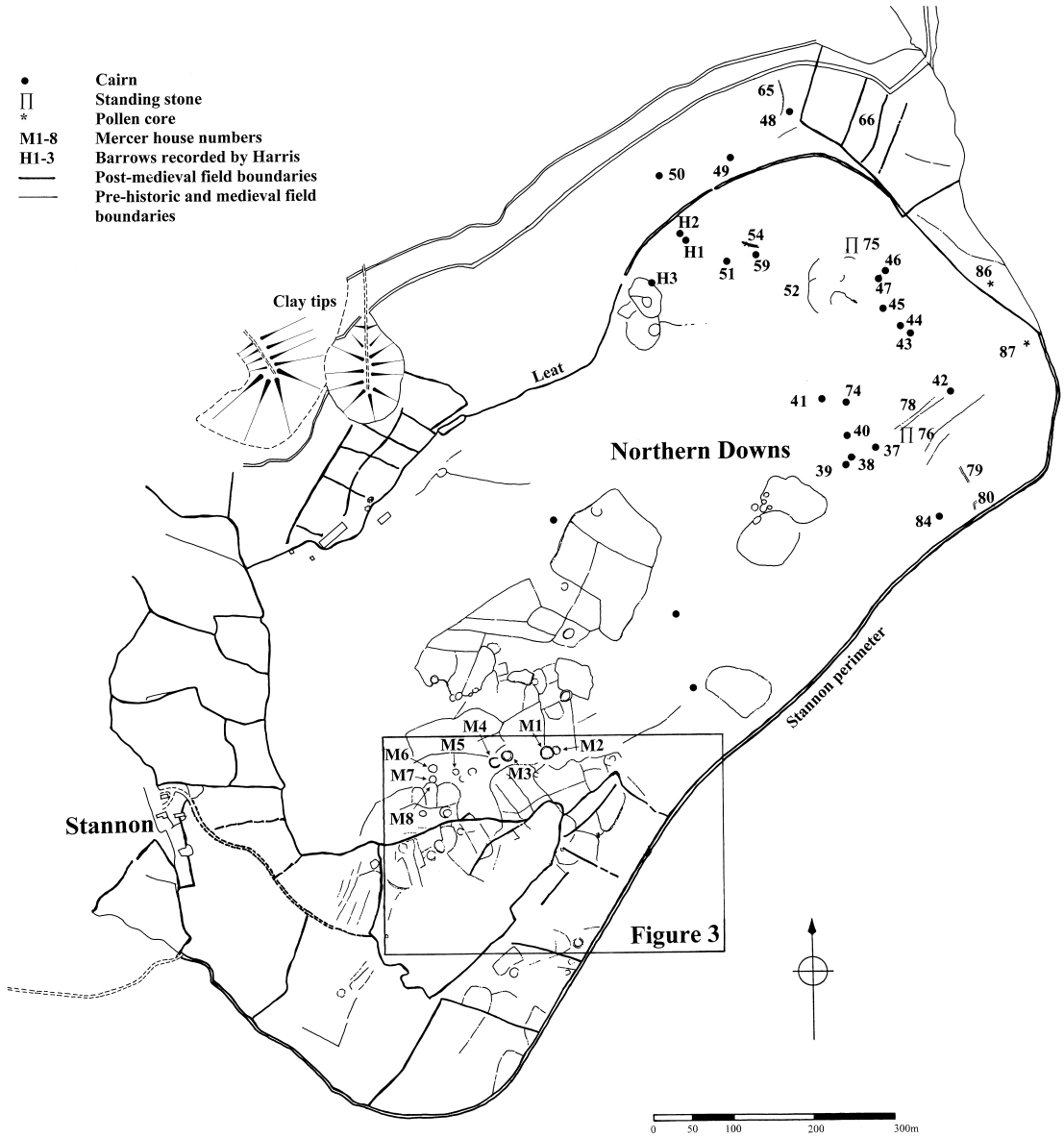

Fig 2 Archaeological sites identified within the Stannon clay works, based on 1999 1:25,000 air photographic survey plot (using 1946 air photo coverage) and 1999 evaluation survey

settlement partly excavated by Mercer. Five sites and the remnants of a Middle Bronze Age field system were located on the lower terrace (sites 3, 5, 9, 10 and 11). The excavation area was further subdivided by a number of large leats and a haul road.

The study area is located on granite covered by a periglacial head deposit. In some areas a fairly thin covering of turf overlay the archaeology, in others there were more substantial deposits of peat. The underlying subsoil varied in colour across the site from bright yellow to a rusty orange. Within the area of the archaeological excavation drainage was poor. The predominant vegetation cover was grass, although in boggier areas this was replaced by rushes.

Evaluation work in 2000 on the Northern Downs was centred upon sites which lay in open moorland

on the far side of the clayworks spoil dumps to the north east of the excavation areas. (It should be noted that 'Northern Downs' is a descriptive term coined for a survey area during fieldwork in 1985 and is not an established place-name.) The Downs slope down towards the east and have views towards Rough Tor, which lies approximately 700m distant. Sixteen sites, including cairns, standing stones and prehistoric field boundaries, were evaluated in this area and pollen samples were taken from an exposed peat deposit (Fig 2). The cessation of work in Stannon china-clay works meant that sites on the Northern Downs did not in the event require further investigation beyond this initial evaluation.

Stannon Downs: previous investigations

Peter Rose

Like many parts of the granite upland of Bodmin Moor, Stannon Downs was remarkable for the extensive survival of visible archaeological remains. Several episodes of excavation and survey over the past 25 years have identified a rich archaeological resource reflecting the use of the downs for over 4000 years. This includes an Early Bronze Age cairn group of 17 cairns scattered over the Northern Downs, more than 30 roundhouses and small enclosures and fields, predominantly in the southern part of the downs, and medieval and later fields associated with the settlement of Stannon.

The 1968 excavations

In 1968 Roger Mercer undertook excavations at Stannon Down in advance of china clay tipping (Mercer 1970). Eight Middle Bronze Age roundhouses were partially excavated and found to have substantial stone walls and internal features such as stone-lined drains, paving and stake-settings. No radiocarbon determinations were obtained but a small assemblage of Bronze Age Trevisker pottery was recovered.

The 1976–77 excavations

In the 1970s Daphne Harris, Sandra Hooper and Peter Trudgian excavated three small prehistoric cairns on the Northern Downs as part of rescue work by Cornwall Archaeological Society (Harris *et al* 1984). The excavations revealed that the cairns had been carefully constructed and covered evidence of a range of ceremonial and funerary activity. Cairn 1 covered a pit containing a charcoal-rich deposit, cairn 2 a possible inhumation burial and cairn 3 two cremation deposits (representing at least three individuals) within an inverted Trevisker vessel. A radiocarbon determination obtained from a pit beneath cairn 2 calibrates to 1930–1520 cal BC, 3440 ±70 BP (HAR-5130).

The 1985 survey

In the 1980s Bodmin Moor was the subject of detailed survey consisting of 1:2500 air photo plotting and field checking by Ann Carter, Norman Quinnell and Martin Fletcher of the Royal Commission on the Historical Monuments of England (RCHME). As part of this project – the Bodmin Moor Survey – CAU undertook field checking and additional survey of the north-west part of Bodmin Moor at 1:1000; this included Stannon Downs as well as the surrounding areas of Louden, Garrow and Rough Tor, providing a mass of contextual data for the current project (Johnson and Rose 1994).

By 1985 expansion of the china clay workings had effectively split Stannon Downs into two survey areas: a south-western area (surveyed by Nicholas Johnson and Roger Radcliffe), including what survived of the settlement excavated in 1968 by Roger Mercer, and the Northern Downs, surveyed by Ann Preston-Jones and Peter Rose. The surveys were based on the RCHME aerial plot enlarged to 1:1000 as a base. Newly-discovered material was plotted by plane table and microptic alidade and detailed notes including descriptions and dimensions were recorded on context cards. Most of the cairns on the Northern Downs were planned at 1:100 using plane table and alidade.

The 1998 review

Following the recommencement of china-clay working in archaeologically sensitive areas and in advance of further major expansion over the remaining downland, Imerys commissioned a review of current survival and condition and a consideration of the requirements for further archaeological recording. This was undertaken by Peter Herring in May 1998. The extents of recent disturbances to the south-western settlement area were surveyed onto the 1985 plan, and the Northern Downs were

carefully walked, with previously unrecorded features added by sketching. The results of the survey were reported in Herring 1998.

The 1999 review of air photographic coverage

The Bodmin Moor Survey had used 1977 vertical photo coverage and later oblique photographs; it did not therefore record sites that had been destroyed by earlier china-clay workings. In 1999, earlier air photo coverage (RAF, 13 May 1946) was plotted at 1:2500 by Andrew Young of CAU. In spite of some difficulty in establishing good controls, a reasonable degree of accuracy was attained. The plot distinguished between well-preserved features and those which appeared more denuded or less certain. This survey had a dramatic impact on understanding of the area, providing a more complete picture of the settlement which formerly extended across the southern part of the downs.

The 2000 evaluation of the Northern Downs

As part of a programme of evaluation to guide proposals for further recording (Jones and Nowakowski 2000), sites in the Northern Downs evaluation area were located by EDM (Electronic Distance Measurement) survey.

Descriptive summary of the survey results

The site numbers in the following section follow those of the CAU survey of 1985.

Cairns and related sites

A group of 17 or 18 cairns, including the three excavated in 1976 and 1977 (Harris *et al* 1984), has been recorded within an area of 500m by 300m across the Northern Downs (Table 1). Most (13) had been located at 1:2500 by the Ordnance Survey in 1976. Their aspect is generally towards the north west, north and north east, hinting that they could relate to Rough Tor as much as to activity elsewhere on Stannon Downs. The cairns are predominantly small: 13 are 5m or less in diameter, typically 0.2m-0.3m high; a further three are in the range 5m to 10m and only one is over 10m (CAU 48). This larger cairn, measuring 14.2m by 16.2m and 0.8m high, is a platform cairn with a rim and internal kerbing. It is placed well down the slope compared to the other cairns, perhaps to be particularly visible from the slopes of Rough Tor. Eleven of the cairns have some structural evidence in the form of a kerb or a cist: nine have kerbs (including two uncertain examples) and five have cists (two uncertain). In one case ('cairn 3', excavated in 1977: Harris *et al* 1984), a cairn was incorporated into the boundary of a small enclosure; the rest were isolated from other visible features. Two of the sites, CAU 42 and 43, were possibly a roundhouse and an oval house rather than cairns. At least half of the cairns show evidence of disturbance or robbing.

Two small stones on edge, 0.65m and 0.35m high (CAU 75 and 76), may have been deliberately set, also part of the ceremonial landscape (Table 2). A larger slab on edge (CAU 59), 2.3m long and 0.7m high, could be the remains of a cist or other setting or structure.

A few possible additional cairns were identified by survey outside this main group. Six possible cairns were recorded from the 1946 air photographs across the centre of the area but had been destroyed by 1968 and have not been confirmed on the ground. Another cairn, 3.5m in diameter, was identified in the southern survey area in 1985 and excavated in 1998 (site 2).

Roundhouses, enclosures and fields

The various surveys have identified at least 36 roundhouses with associated enclosures and fields; these mostly lie within an area of 750m by 350m but there are other scattered enclosures further north (Fig 2). Beyond the perimeter wall of the Stannon medieval settlement, prehistoric settlements and field systems continue to the south east over Louden Hill for another 800m; there the remains can be seen to belong to at least three phases (Johnson and Rose 1994, 65). A group of four houses on the extreme southern edge of Stannon should probably be regarded as part of the immediately adjoining Louden settlement.

Interpretation of the survey results at Stannon is affected in the southernmost area by the impact of post-medieval enclosures and improvement, and by episodes of medieval cultivation and modification of the prehistoric layout; and to the north of this by a reliance on air survey alone for much of the picture.

At the time of Mercer's excavations in 1968 there may have been as many as 25 extant or possible roundhouses, eight of which he excavated. By 1985, 19 of these remained, including five of the excavated houses, but by 1998 only 11 and part of another were

thought to have survived (still including four of the excavated houses). In general the settlement is characterised by large houses, 5.5–10m in internal diameter, although some smaller or slighter structures (for example, CAU 5 and 6) have been considered as evidence for a possible early phase (Johnson and Rose 1994, 66). The houses are associated with curvilinear and irregular rectilinear enclosures which show no signs of overall organised layout but instead are the result of accretions and agglomeration as additional enclosures have been created. In some cases, particularly to the east and north, the enclosures remain scattered, individually or in pairs, and not necessarily with certain evidence for associated houses. For example, possible roundhouses were recorded from air photographs in the small enclosure which incorporates cairn 3 in its boundary and the adjoining enclosure (Harris *et al* 1984), but this was not confirmed on the ground.

On the Northern Downs there is another system of irregular curvilinear fields of unknown extent (CAU 52, centred SX 1365 8094), with other scattered stretches of stony bank around it. The system appears fragmentary, probably because of peat cover, and although there are cairns in this area (two of which might instead be houses) there is no obvious relationship with the fields.

Medieval and post-medieval fields

Stannon is first recorded as a place-name in AD 1401 and was presumably part of the expansion of settlement onto Bodmin Moor in the twelfth to fourteenth centuries (Johnson and Rose 1994, 114). A substantial perimeter wall with external ditch, presumably of medieval origin, defines the extent of Stannon, more or less. Most of the area within this large enclosure remained as downland rough grazing, but enclosed fields were established over limited areas in the west and south. There has been no archaeological investigation of Stannon itself, which continued in use as a farm well into the twentieth century, and only limited recording of its fields in two areas. These are described below.

Outfields on the Northern Downs

An enclosure on the fairly steep north-eastern slope of the Northern Downs (CAU 66) is interpreted as an area of medieval (possibly post-medieval) outfield cultivation, farmed from Stannon. An area of 1.5 ha is enclosed by a bank 1.5–1.8m wide and 0.5m high, with an outer stone face and outer ditch. It is subdivided into four fields by three slighter banks and appears to be ridged throughout (ridges 2m to 3m wide), with clearance heaps piled onto grounders (*in situ,* earthfast natural boulders) in the stonier western part of the enclosure.

Southern fields

The southernmost part of the survey area included a few fields which are shown on nineteenth and twentieth-century maps. Prehistoric structures and field boundaries survived within them to varying degrees, suggesting that they were not used intensively across their full extent. In recent decades the mapped boundaries have largely been slighted and mostly survived as low banks and lynchets; better preserved stretches survive as stone-faced earth-and-stone walls (Cornish hedges) up to 1.4m high and up to 1.25m wide. Evidence of medieval use has been identified in the form of cultivation strips in one of the fields (SX 1302 8020, 1946 air photos), and may also be reflected in numerous stone clearance heaps found among some of the prehistoric enclosures where later use and improvement has been less intensive. Some of the prehistoric enclosures may also have been adapted and altered into a strip-like form. In addition, Mercer's survey (1970, fig 6) showed many strips in this area which were not identified in subsequent surveys; these are likely to be the result of medieval cultivation. The survey evidence suggests:

1. Fairly limited medieval cultivation, among and incorporating the prehistoric enclosures as well as creating strip fields and subdividing prehistoric enclosures into strip-like fields. Many of the strip boundaries interpreted by Mercer as prehistoric are likely to date to this period.
2. More intensively used post-medieval hedged fields.

Other sites

Other sites recorded on the Northern Downs in the 1985 and 1998 surveys included a prospecting pit, leats associated with the china clay works, areas of turf (peat) cutting, and three World War II slit trenches. Of particular significance was the identification of areas where exposed peat suggested potential for the survival of palaeo-environmental evidence.

Table 1 Northern Downs: cairns and related sites identified by survey (asterisked sites no longer extant). (HER PRN = Historic Environment Record Primary Record Number)

CAU no	*HER PRN*	*NGR*	*Site type*	*Dimensions*	*Comments*
37	3359.3	SX 1368 8075	Kerbed cairn with cist	4m, 0.2m high	
38	3359.2	SX 1365 8073	Cairn	3–3.8m, 0.4m high	Confirmed in evaluation
39	3359.1	SX 1364 8073	Cairn	3.0–3.7m, 0.35m high	Confirmed in evaluation
40	3359.4	SX 1364 8076	Kerbed cairn with probable central cist	3.5m, 0.2m high	Confirmed in evaluation
41	3359.2	SX 1364 8080	(Mound)	1.9m, 0.15m high	Evaluation: natural feature
42	3359.6	SX 1377 8082	Cairn with possible cist; or roundhouse	4.8–5m, 0.25 high	
43	3359.7	SX 1372 8089	Cairn or oval house	11.9m × 7.3m 0.45m high	
44	3359.8	SX 1371 8090	Kerbed cairn	7.6 m overall, 6.5m to kerb, 0.4m high	
45	3359.9	SX 1369 8092	Kerbed cairn with cist	4.4m, 0.35m high	Kerb and cist are uncertain
46	3359.10	SX 1369 8097	Kerbed cairn with cist	4.5m, 0.25m high	
47	3359.11	SX 1368 8096	Kerbed cairn	2.2m, 0.3m high	Confirmed in evaluation
48	3359.12	SX 1357 8117	Platform cairn with rim and inner kerb	14.2m × 16.2m, 0.8m high	
49	3359.13	SX 1350 8111	Cairn	4.4m × 4.6m, 0.3m high	
50	3359.14	SX 1340 8109	Cairn with cist	5m, 0.1m high	Very slight mound, prominent cist
51	3359.15	SX 1349 8099	Kerbed cairn with possible cist	4m	Confirmed in evaluation
59	141251	SX1352 8099	Stone setting – possible cist	2.3m long and 0.70m high.	Slab set on edge
74	141255	SX 1368 8079	(Mound)	1.6–2.9m, 0.15m high	Evaluation: natural feature
75	141256	SX1365 8099	Standing stone	1m wide, 0.65m high	Confirmed in evaluation
76	141257	SX 1372 8077	Standing stone	0.55m wide, 0.35m high	Confirmed in evaluation
77	141258	SX 1354 8096	(Possible 'clitter structure')	–	Evaluation: natural feature
84	141263	SX 1380 8089	Possible kerbed cairn	3.8m	Evaluation inconclusive
-	3359.19	SX 1344 8101	Cairn *	4m	Excavated 1976, cairn 1
-	3359.18	SX 1344 8102	Cairn *	5m	Excavated 1976, site 2
-	3359.20	SX 1340 8095	Cairn *	6m	Excavated 1977, cairn 3; enclosure attached

Table 2 Other areas: cairns and related sites identified by survey (asterisked sites no longer extant). (HER PRN = Historic Environment Record Primary Record Number)

CAU no	*HER PRN*	*NGR*	*Site type*	*Dimensions*	*Comments*
2	-	SX 1329 8034	Cairn *	3.5m, 0.4m high	1985 survey; excavated 1998
-	-	SX 1305 8068	Possible cairn *	Approx 6m	1999 AP plot
-	-	SX 1305 8069	Possible cairn *	Approx 6m	1999 AP plot
-	-	SX 1328 8066	Possible cairn *	Approx 7.5m	1999 AP plot
-	-	SX 1343 8054	Possible cairn *	Approx 7.5m	1999 AP plot
-	3392.1	SX 1345 8045	Possible cairn *	Approx 13m	1999 AP plot
-	3392.2	SX1349 8043	Possible cairn *	Approx 4m	Incorporated in enclosure wall; AP plot, OS Index card SX 18 SW 68

The investigations

The excavations at Stannon Down were carried out in 1998 and 1999 over two five-week periods. The CAU team was aided by a large number of volunteers, including university students from Bristol, Exeter, the Institute of Archaeology in London and Lampeter, Truro College HND and 'A' Level students, the Young Archaeologists Club, and members of Cornwall Archaeological Society and Devon Archaeological Society.

Most of the sites were buried beneath thin layers of peat and were de-turfed by hand. Site 2, however, had a substantial overburden of waste which was removed by a mechanical excavator. After de-turfing the excavation areas were cleaned and planned at a scale of 1:20. Subsequent plans were produced at scales of 1:20 and sections were drawn at scales of 1:10. A full photographic record was made. Five of the sites (2, 6, 9, 10 and 15) were excavated by quadrant and site 11 by a series of nine boxes. All of the standing baulks were removed at a late stage of the excavations and the sites totally investigated. Site 3 had been partially removed by a haul road and the remainder was entirely excavated. Soil samples were taken from features and layers that were considered to have potential for palaeo-environmental analysis. Pollen samples were taken from site 2 and the ditches which encircled site 9. Soils were also examined for their potential to provide geoarchaeological data.

The eight best-preserved boundaries were recorded by trenches 1m wide by 5m long, cut across them by a mechanical excavator. The walls of two of the roundhouses excavated by Roger Mercer (M3 and M4 following Mercer's numeration) were also sectioned by hand with trenches 0.5m wide.

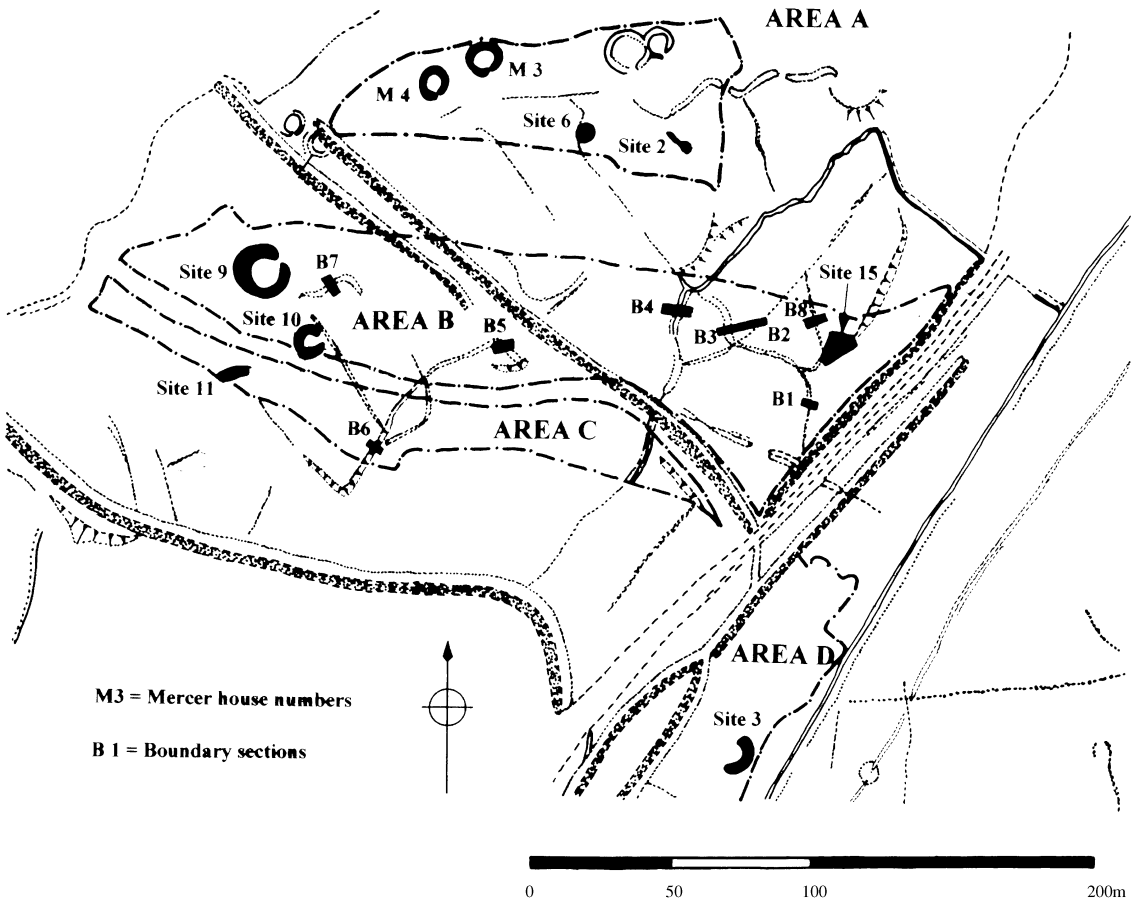

Fig 3 Location of the excavated sites, based on the 1985 survey (Areas A, B, C and D were surviving islands in 1998; stippled shading indicates haul roads)

On the Northern Downs hand-dug trenches were excavated down to the top of the archaeology; buried archaeological remains were not disturbed. Environmental recording was carried out, including the sampling of peat deposits at two locations (sites 86 and 87) and augering for buried soils.

The results of the investigations are presented below by period, bringing together evidence from the excavations, survey, environmental analyses and artefactual studies.

The Neolithic landscape (c 4000–2500 cal BC)

Although the excavations on Stannon Down did not identify any features which could be ascribed to the Neolithic, the environmental analyses provide significant new information on activity in the area during this period. In particular, the pollen analysis of site 86 (see Tinsley below) revealed some clearance in the Neolithic, although woodland remained a major component in the landscape until the Middle Bronze Age. There had also been clearance around site 2 prior to construction of the Early Bronze Age ceremonial complex. Pre-cairn activity at site 2 is also indicated by the soil micromorphology analyses (Ayala below) and by the recovery of diagnostic Neolithic flints from the area. Two greenstone axes were found during Mercer's excavations (Mercer 1970) and many of the excavated areas, including sites 6, 9 and 11 produced Earlier and Later Neolithic flints (Lawson-Jones below). Additionally, the soils beneath sites 2, 6 and 9 all produced a small background ceramic scatter which may indicate activity stretching back into the third millennium BC (Quinnell below) and a small number of sherds from Mercer's excavations may possibly be Later Neolithic Grooved Ware (Quinnell below).

Discussion

The evidence from the environmental analyses suggests that woodland formed a major component of the environment throughout the Neolithic period. In common with much of southern Britain, none of the environmental samples revealed any evidence for pre-Bronze Age cultivation, suggesting that wild resources continued to be of importance (Austin 2000; Robinson 2000; Campbell and Straker 2003) and grain processing stone tools were absent. A similar paucity of evidence for early cultivation has come from other recent archaeological investigations on Neolithic sites in Cornwall (Cole and Jones 2002–3; Jones and Taylor 2004).

The dearth of evidence for sedentary settlement activity dating to the Neolithic at Stannon does not mean that the area was unoccupied during the period. Indeed, the environmental evidence and presence of diagnostic flint artefacts and sherds of possible Grooved Ware all indicate that there were cleared areas in the woodland which were occupied or visited prior to the development of the ceremonial complex from the Early Bronze Age. The proximity of the Rough Tor tor enclosure and bank cairn, which lie approximately 1km to the north east of the excavated sites on Stannon Down (Johnson and Rose 1994; Oswald *et al* 2001; Herring and Kirkham, forthcoming), suggests extensive Neolithic activity in the wider area. Significant Early Neolithic activity around Rough Tor is also indicated by an unpublished flint assemblage (H. Quinnell, pers comm). By analogy with excavated tor enclosures such as Carn Brea and Helman Tor (Mercer 1981; 1997), we might expect Rough Tor to have been visited by communities during the earlier part of the fourth millennium BC. The newly-identified bank cairn is unexcavated but, if related to the wider class of bank barrows which are found in southern England, the Midlands and Scotland, is likely to date to the middle to later part of the fourth millennium BC (Brophy 1998, 103; Sharples 1991, 103). The reason for drawing these two sites into this discussion is two-fold. Firstly, as Tilley (1996) has argued, large, distinctive rocky outcrops appear to have been important focal places in the landscape of Bodmin Moor from early in the Neolithic period. Secondly, the location of the bank cairn suggests an established tradition of the tor being referenced as an important place by monuments during the Neolithic. This is significant because it will subsequently be argued that Rough Tor itself was of central importance to the Stannon Down ceremonial complex during the Early Bronze Age.

In summary, using the evidence recovered during the excavations and from wider environmental and survey work on the Moor (Johnson and Rose 1994; Gearey *et al* 2000b), we can picture for the Neolithic a landscape covered by woodland and punctuated by clearings of varying size that were perhaps interlinked by trackways. People and their animals may have moved across the Moor as part of a seasonal round, stopping at places such as the cleared area at site 2 or visiting larger centres like the

enclosure at Rough Tor where perhaps bigger gatherings involving communal ritualized activities took place. During the course of the Neolithic it is likely that clearings in the woodland became more numerous and larger and that particular cleared areas began to be marked by monuments which referenced significant places in the landscape. Small-scale ritualized depositions of special objects may have occurred in some clearings. The context for the greenstone axes and possible Grooved Ware recovered in Mercer's excavations has been lost, but it is possible that they represent formal deposits to mark the occupation of a special place in the landscape. What is certain is that site 2 was one of a growing number of ceremonial monuments found within cleared areas of Bodmin Moor during the early part of the Early Bronze Age.

The Early Bronze Age and pre-settlement landscape (*c* 2500–1500 cal BC)

The majority of the excavated sites were found to belong to the Early Bronze Age. These included three ring cairns, (sites 6, 9 and 10) and two 'tailed' cairns (sites 2 and 11). Six of the eight sites evaluated on the Northern Downs were confirmed as small cairns (cairns 38, 39, 40, 47, 51 and 84) and are also of probable Early Bronze Age date.

Site 2

Phase 1

Site 2 was located at the eastern end of the investigated area (Fig 3) where the ground was wetter and possessed a deeper coverage of peat than the surrounding area. The cairn was partially constructed upon the natural granite-derived gritty clay or 'rab' ([8] on Fig 6) and partly upon layer [10], a deposit of grey silty clay loam which may have been an old land surface. Environmental and micromorphological analyses of this layer indicate that the cairn was constructed within open acid grassland and that soil deterioration had already occurred (Ayala and Tinsley below).

Construction of the cairn commenced with the creation of a circular space measuring approximately 2.3m in diameter defined by a ring composed of a single course of large, irregularly-shaped granite stones [29] set around a slightly raised area of natural subsoil (Fig 4). The external diameter of the kerb was 3.5m. A portion of the south-eastern part of the kerb had been removed prior to the excavations, when the site was buried beneath china clay waste. The remaining *in situ* larger stones forming the kerb were of coarse granite with high quartzite content. Many were positioned so that their upper surfaces sloped inward towards the centre of the cairn (Fig 7) and in places there were voids between the stones. A few artefacts were recovered from the kerb, including a flint (SF44), a semicircular slate object, a sandstone plaque (SF40) and a quartz pebble (SF43) (Quinnell below). None were found inside the area enclosed by the kerb.

Following construction of the kerb, layer [27] a 0.24m thick charcoal-rich deposit of dark brown silty clay loam was placed within the centre of site 2. Most of this material was sealed beneath an east-west line of four large granite slabs [28] which bisected the centre of the cairn, but some of it extended beyond and infilled spaces between the stones of the kerb. These slabs were up to 0.8m wide and approximately 0.3m thick. A very early Early Bronze Age radiocarbon determination, 3919±31 BP, 2490–2290 cal BC (OxA-13387) was obtained on hazel (*Corylus*) charcoal from layer [27].

The stony 'tail' [9] which extended from the north-west side of the cairn was contemporary with this phase, as it was also constructed upon layer [10] and the stones within it interlocked with those of the kerb. Initially the 'tail' was identified as a natural run of granite clitter. However, excavation revealed that it was an artificial construction consisting of two parallel lines of large stones which sloped in towards the axis of the alignment. The spaces between these lines had then been partly infilled with smaller stones. The 'tail' measured approximately 5.3m long and 2.4m wide and was up to 1m high. A triangular stone placed transversely across the alignment and butted up against a large grounder – marked its north-western end. The 'tail' thus gave the otherwise circular monument an orientation but also linked it with a natural feature.

After the completion of the kerb and 'tail', and following the deposition of layer [27] and the slabs [28], further stones were placed over the centre and the top of the kerb (Fig 5). Three context numbers were given to the stony material which formed the mound, although the distinctions between these layers are somewhat arbitrary and reflect the development of silt, soils and peat which built up around and over it after its construction. The lowest

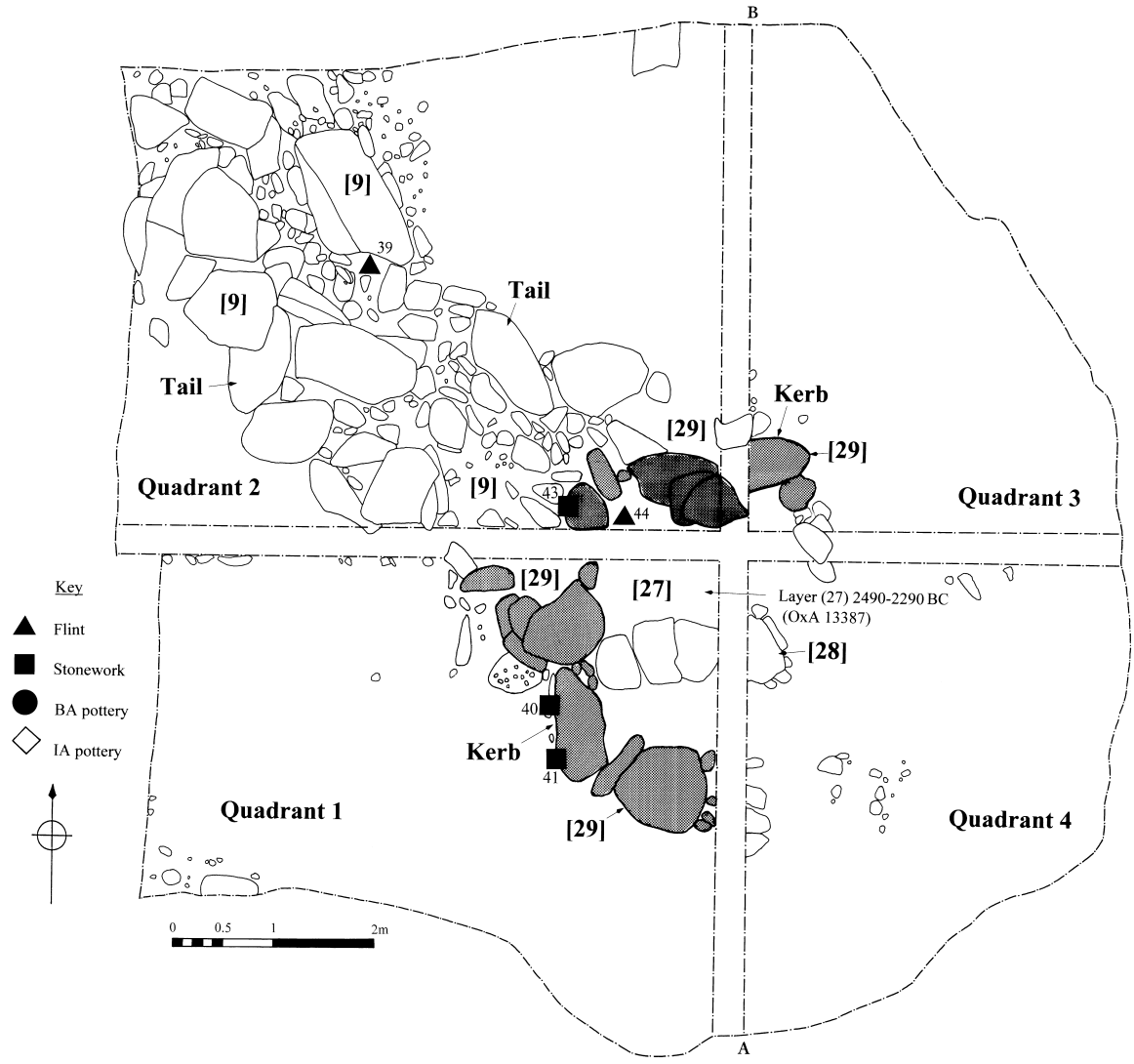

Fig 4 Plan of site 2 phase 1

layer of stones within the cairn was layer [24], consisting of stones which ranged from fist size to up to 0.5m across. A gritty silty clay matrix had formed between many of the stones. Layer [4] constituted the next layer of stones, which was roughly circular and measured 3.5m long by 3m wide and 0.25m deep. The top layer of stones, [2], comprised a jumble of stones in a matrix of peat. Most of the stones in this layer were displaced. After the last deposit of stones had been put in place site 2 probably stood to a height of approximately 0.5m (Fig 6) and covered an area approximately 3.5–4m in diameter. There were no traces of burial activity beneath, within or around the site. Finally a loamy peaty layer [3] developed over the site.

Phase 2

Phase 2 consisted of a group of two pits and eight postholes on the north-east side of the cairn (Fig 5). The spatial relationship between these features and the cairn suggests that they postdate it and this is confirmed by the radiocarbon dating. The pits and postholes were all sealed beneath layer [3], a peaty

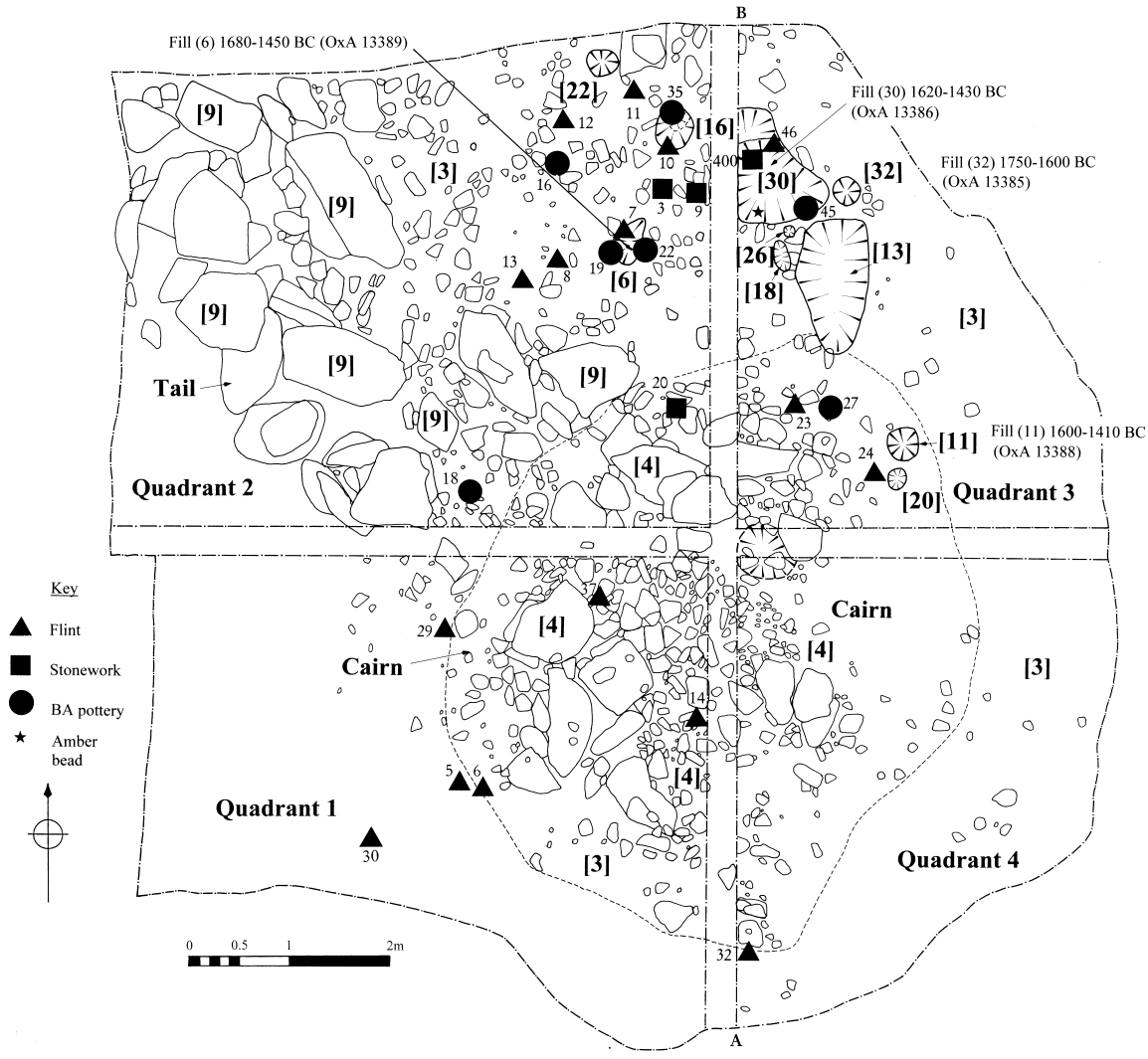

Fig 5 Plan of site 2 phase 2

loamy soil which postdated the cairn, and were cut into either the natural rab or layer [10].

The two pits were situated near to each other and were both filled by distinctive deposits. Pit [13] was steep-sided, flat-bottomed and sub-rectangular, filled by a charcoal-rich deposit; the sides and bottom of the pit had been burnt red. The pit was devoid of artefacts and did not contain any cremated bone. To the north, pit [30] had large stones lining the sides of the cut and a large flat stone on top, forming a cist-like structure. Initially it was thought that the pit may contain a burial but when the covering stone was lifted it was found to conceal a large piece of quartz. The remainder of the pit was filled by a deposit containing charcoal and quartz stones. Pit [30] held a number of artefacts, including Bronze Age pottery (SF45), several pieces of a snapped discoidal flint knife (SF46) and an amber bead. A radiocarbon determination of 3254±31 BP, 1620–1430 cal BC (OxA-13386) was obtained on hazel (Corylus) charcoal from pit [30].

The remaining features comprised a group of eight postholes aligned roughly south east to north west (Table 3). Most of the posthole fills were charcoal-

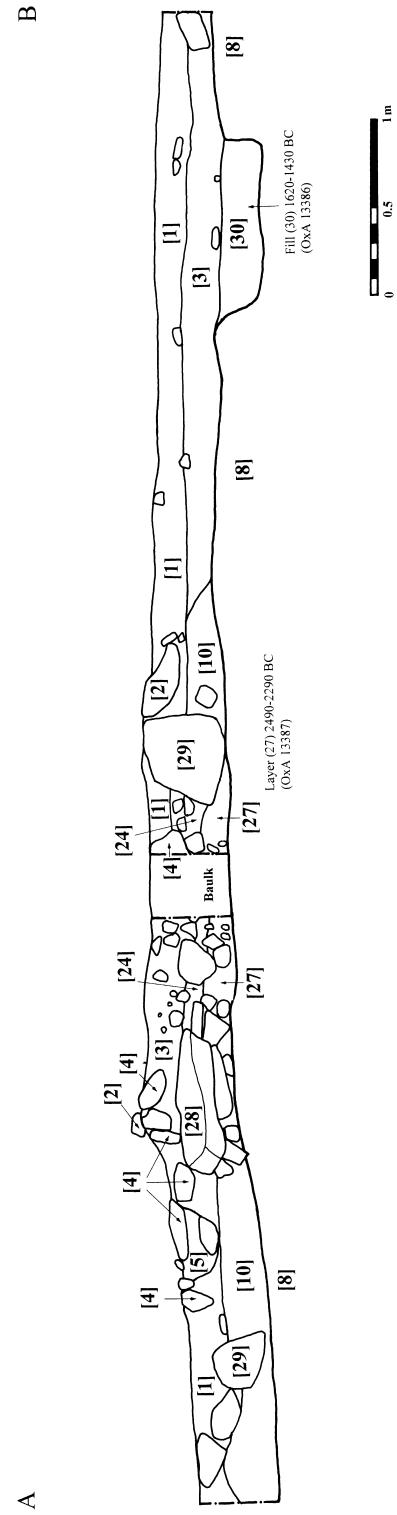

Fig 6 Section across site 2

Fig 7 Site 2 from the south-east showing kerb [29] and central stone alignment [28]

rich but only two contained artefacts (Quinnell below). Three radiocarbon dates were obtained: posthole [32], 3385±30 BP, 1750–1600 cal BC (OxA-13385), followed by posthole [6], 3274±31 BP, 1680–1450 cal BC (OxA-13389), and posthole [11], 3223±30 BP, 1600–1410 cal BC (OxA-13388). These dates are not statistically consistent (T'=15.7; T' (5%)=6.0; v=2, Ward and Wilson 1978) and therefore represent material of different ages; the postholes could represent a sequence of upright posts marking the position of the cairn, or, more probably, a linear timber structure, perhaps periodically remewed. The cairn certainly formed the focal point for subsequent activity, which may have lasted for centuries after it was constructed. This point is reinforced by the number of quartz stones, Trevisker-ware pottery and other artefacts which were recovered from the space between the cairn and the pits and postholes, more than anywhere else on the site. Some of these objects were of an unusual character, including a small green cushion-shaped grinding stone (SF20) lying on top of layer [10] and a triangular object of Devon sandstone (SF3) which may have been an amulet (Quinnell below).

Phase 3

The third phase of site 2 is represented by the development of layer [3] and the subsequent peat formation, layer [1]. Layer [3] was a thick deposit of peaty loam up to 0.3m thick which covered much of the cairn and all of the external pits and postholes. The layer contained a number of artefacts, including stone objects, flint and pottery, although most of them were located at the bottom of this horizon at the junction with the old land surface. The layer also

Table 3 Site 2 pits and postholes

Context	*Width*	*Length*	*Depth*	*Diameter*	*Comments*
[6]	0.3m	0.5m	0.31m	*	Steep-sided, oval posthole, with post-packing lining its sides. Animal disturbance on its northern side. Contained pottery. Radiocarbon date of 3274±31 BP, 1680–1450 cal BC (OxA-13389) from fill [7], a silty clay loam.
[11]	0.3m	0.4m	0.15m	*	Oval posthole with steep sides; truncated. Radiocarbon date of, 3254±31 BP, 1620–1430 cal BC (OxA-13386) from fill [12], a silty clay loam.
[13]	0.76m	1.3m	0.32m	*	Sub-rectangular pit with steep sides. The fills, [14], [15] and [25], were charcoal-rich and the sides scorched from burning.
[16]	*	*	0.23m	0.4m	Circular posthole with sheer sides and an undulating base. The clay loam fill [17] contained pottery and flint.
[18]	0.16m	0.3m	0.15m	*	Oval posthole with tapering sides. The clay loam fill [19] was charcoal-rich.
[20]	*	*	0.1m	0.16m	Shallow, circular posthole with steep sides. The clay loam fill [21] was charcoal-rich.
[22]	0.28m	0.34m	0.1m	*	Shallow, oval posthole with steep sides. The clay loam fill [23] was rich in charcoal.
[26]	*	*	0.08m	0.1m	Shallow, circular posthole with steep sides. The gritty clay loam fill was charcoal-rich.
[30]	0.9m	1.1m	0.36m	*	Wedge-shaped pit with steep sides. The clay loam fill [31] was charcoal-rich and contained flint, quartz, pottery and an amber bead. Radiocarbon date from fill of 3223±30 BP, 1600–1410 cal BC (OxA-13387).
[32]	*	*	0.2m	0.26m	Circular posthole with steep sides. The clay loam fill [33] was charcoal-rich. Radiocarbon date from fill of 3385±30 BP, 1750–1600 cal BC (OxA-13385).

included stones which had become displaced from the cairn. Layer [3] was itself sealed beneath two deposits of peaty soil. These deposits covered the entire area of the excavations and were up to 0.36m deep, with the result that initially only the upper stones of the cairn and 'tail' protruded through them.

Site 6

Phase 1

Site 6 was a small ring cairn located towards the eastern end of the investigated area, 25m west of site 2 in a fairly level, if stony location (Fig 3). The first phase of the site commenced with the digging of a roughly circular hollow [69]. The cut was approximately 5.5m in diameter and up to 0.35m deep (Fig 8), with the outside edge encircled by a low wall [89] of large blocks of granite. This was over 2m thick in places and stood to a maximum height of 0.45m. The walling increased the external diameter of the site to around 9m. There were no breaks in the circuit, although some large stones in the south-east quadrant were initially thought to be fallen jamb-stones. The 1985 survey recorded upright slabs in the wall but these were not evident in 1998. The wall of the ring cairn overlay a large natural grounder in the north-west quadrant, part of which protruded into the area enclosed as a triangular projection (Fig 10). Incorporation of large grounders within the circuits of cairn-rings has been noted on other excavated moorland cairns (for example, Griffith 1984a) but also within later Middle Bronze Age roundhouses (Bender *et al* 1997), where they have been interpreted as shrines. The 'special' nature of this grounder was indicated during excavation when a small triangular shaped piece of quartz **SF51** was found in front of it.

Apart from four shallow pits, there were no other identifiable features associated with this phase of the site. The four pits (Table 4) were all located in the north-east quadrant. They were all neatly cut and approximately the same depth. It seems likely that all four features were contemporary but their function is uncertain.

Phase 2

The second phase involved the infilling of the central hollow with layer [52] (Fig 9). This was a very mixed

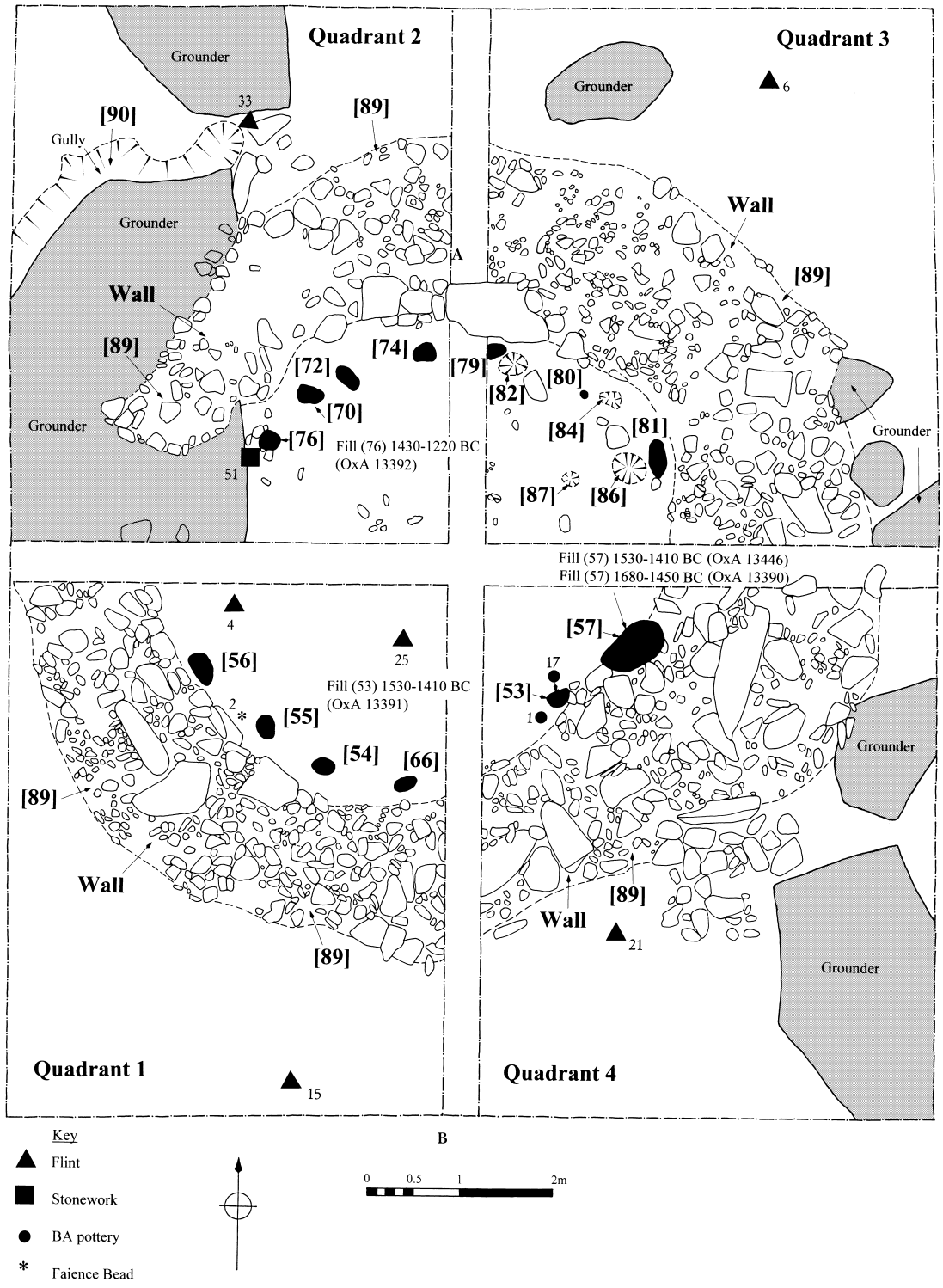

Fig 8 Plan of site 6

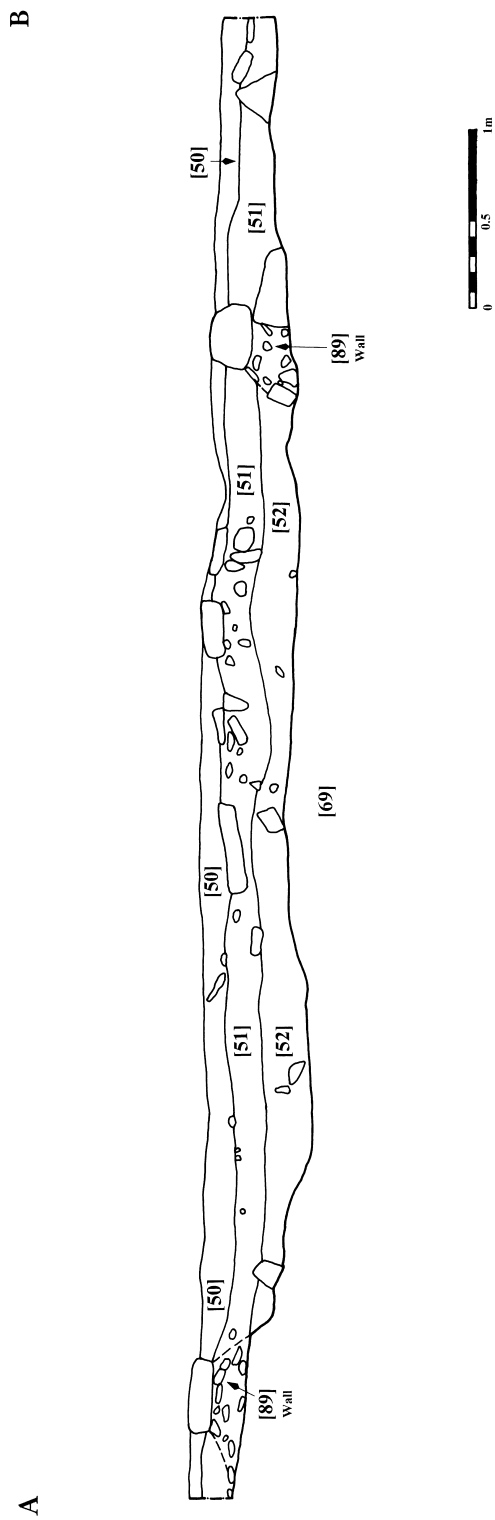

Fig 9 Section across site 6

Fig 10 Site 6 from the north showing wall [89] and central infilling deposit in baulk

Table 4 Site 6 Phase 1 pits

Context	*Width*	*Length*	*Depth*	*Diameter*	*Comments*
[82]	0.22m	0.32m	0.1m	*	Steep-sided oval pit filled by a clay loam deposit [82].
[84]	0.12m	0.14m	0.13m	*	Square pit filled by a clay loam deposit [85].
[86]	*	*	0.12m	0.34m	Straight-sided circular pit filled by a dark clay loam deposit.
[87]	*	*	0.1m	0.15m	Small circular straight-sided pit filled by a clay loam deposit [88].

loamy clay deposit which had been extensively disturbed by animal burrowing and root activity. However, it was one of the few contexts within the interior of site 6 to produce any artefacts. These included a few sherds of pottery, a flint blade (SF25) and a perforated five-pointed star faience bead (SF2).

Phase 3

The third phase consisted of the insertion of a post-ring, set just inside the circuit of wall [89]. There were no obvious signs of a break within this post-ring. Posthole [53] was the only one to contain any artefacts, a few sherds of Bronze Age pottery (Table 5 and Quinnell below).

It is probable that the postholes in the ring are contemporary: all were cut through infill layer [52] and sealed beneath layers [50] and [51], peaty loamy soils that postdated the site. The postholes were evenly spaced forming a roughly circlular arrangement of posts of irregular shape and size, probably part of a unitary construction. Four radiocarbon determinations have been obtained from the post-ring (see below and Table 5 above), indicating that it was erected between 1600 and 1400 cal BC.

There were no identifiable features outside site 6 except for a possible gully [90] of indeterminate date, and layer [64], a patchy, thin deposit of grey clay loam which may have been a remnant old land

Table 5 Site 6 Phase 3 postholes

Context	*Width*	*Length*	*Depth*	*Diameter*	*Comments*
[53]	*	*	0.35m	0.3m	Steep-sided circular posthole, with post-packing in its sides. It contained Bronze Age pottery. Radiocarbon date of, 3215±30 BP, 1530–1410 cal BC (OxA-13391) from fill [65], a silty clay loam.
[54]	0.2m	0.3m	0.24m	*	Steep-sided oval posthole with steep sides filled by clay loam deposits [62] and [63].
[55]	0.19m	0.4m	0.32m	*	Oval posthole filled by a silty clay loam deposit.
[56]	0.26m	0.45m	0.3m	*	Steep-sided oval posthole with steep sides filled by clay loam deposits [60] and [61].
[57]	0.4m	0.7m	0.2m	*	Large oval posthole with sloping southern side and steep northern side. Two radiocarbon dates from clay loam fill [58]: 3267±31 BP, 1680–1450 cal BC (OxA-13390) and 3200±28 BP, 1530–1410 cal BC (OxA-13346).
[66]	0.2m	0.24m	0.26m	*	Square posthole with steep sides, filled by clay loam deposits [67] and [68].
[70]	0.15m	0.3m	0.29m	*	Steep-sided posthole, roughly oval in plan filled by clay loam deposits [71] and [78].
[72]	0.18m	0.44m	0.15m	*	Steep-sided posthole filled by a clay loam deposit [73].
[74]	0.2m	0.3m	0.16m	*	Square posthole with steep sides, filled by a silty clay loam deposit [75].
[76]	0.18m	0.38m	0.16m	*	Steep-sided posthole. Radiocarbon date from clay loam fill [77]: 3076±32 BP, 1430–1220 cal BC (OxA-13392).
[79]	*	*	0.2m	0.12m	Steep-sided, oval posthole filled by a dark clay loam deposit.
[80]	0.25m	0.3m	0.15m	*	Roughly oval posthole filled by a dark clay loam deposit.
[81]	0.3m	0.4m	0.12m	*	Oval posthole filled by a dark clay loam deposit.

surface. A finely worked plano-convex knife (SF33) was found beyond the northern edge of the site in layer [51].

Site 9

Site 9 was located towards the western end of Area B (Fig 3). Four clearly-defined phases of activity were identified, three of them relating to the Bronze Age. A fourth relating to an Iron Age occupation is discussed separately below.

Phase 1

Site 9 commenced with the construction of a cairn-ring [213] which enclosed a circular area measuring up to 7m in diameter. The ring was made from granite blocks and was up to 0.5m high and 1.1m wide. It comprised two arcs of walling which were laid out not quite concentrically to one another, the northern segment having a larger internal diameter than the southern (Fig 11). The largest stones were concentrated in the northern half of the site. The southern part of the cairn-ring was made from smaller stones and was not as well constructed. A low, flat, natural grounder was included in the centre of the southern part of the cairn-ring. The gap in the north-eastern side probably represented an entrance since it was much wider (2m) than the break on the western side and was flanked by large stones. Its position also corresponded with the terminals of banks and ditches in the later phases of the monument. A deliberately placed deposit of charcoal was recovered from below the cairn-ring; a single piece of oak (*Quercus*) roundwood was dated to 3326±31 BP, 1690–1510 cal BC (OxA-13384). No internal features or surfaces belonging to this phase were identified, although it is quite likely that subsequent Iron Age activity would have removed earlier features. This means that the interior may have been similar to site 6.

Two features were uncovered just outside the perimeter of the cairn-ring. The first was a long stone-lined cist [243] aligned roughly north-south. It measured 1.8m long by 0.34m wide internally and 0.34m deep, and was filled by two deposits of dark silty loamy clay, [244] and [245]. The southern end of the cist had been removed by a ditch, [206]. The second feature [247] was aligned approximately east-west. It was a cut measuring 1.1m long, 0.4m wide and 0.26m deep, the sides of which were lined by small granite stones [249] and was interpreted as a stone-lined grave. Both [243] and [247] were assigned to the same phase as the cairn-ring because

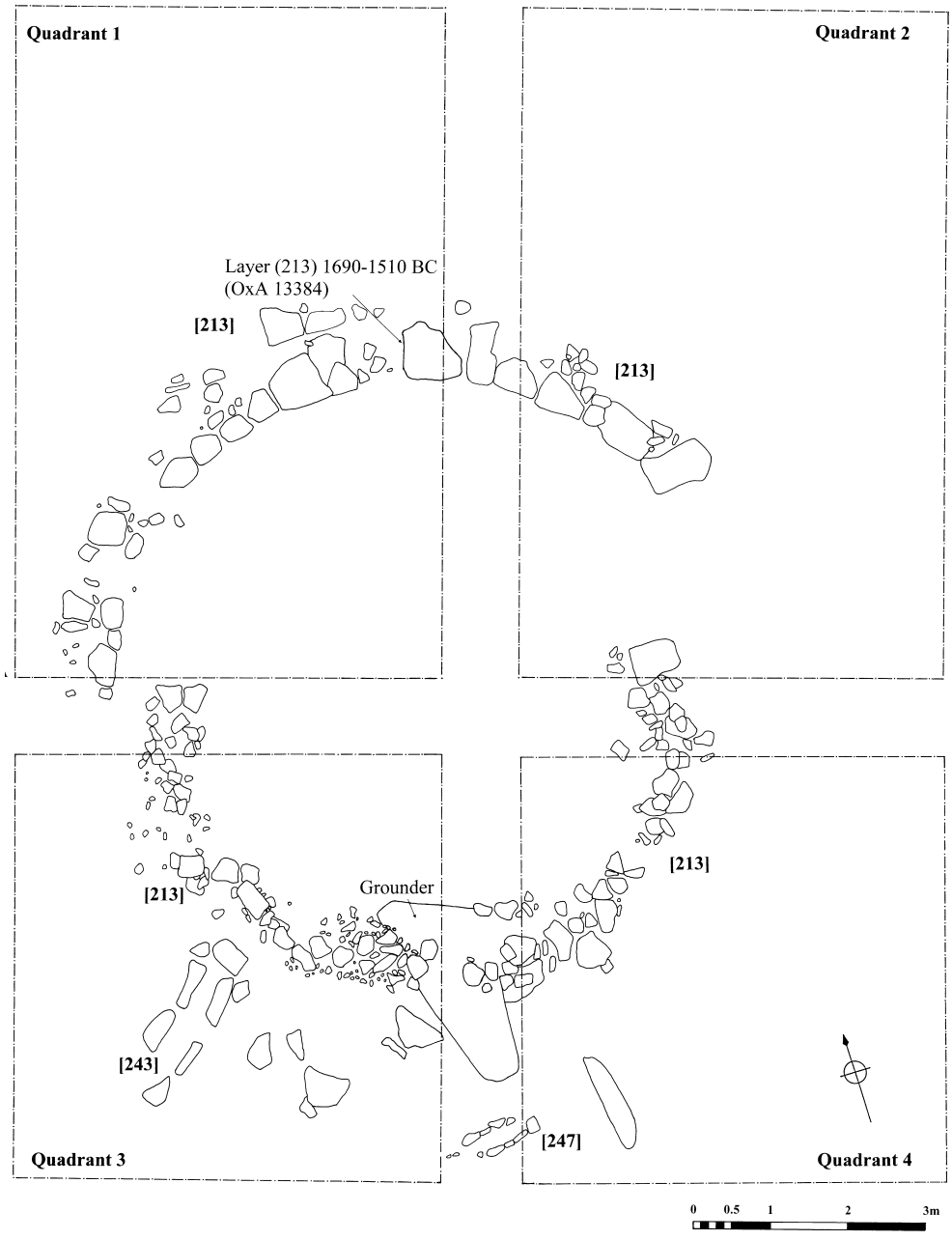

Fig 11 Plan of site 9 phase 1

they were sealed beneath the banks and ditches of a later phase.

The majority of the ceramic finds from the first phase were Trevisker ware, although some sherds of Iron Age pottery were also found (Quinnell below). The majority of the ceramics from phase 1 and phases 2 and 3 were recovered from quadrant 3. The intermixing of Bronze Age and Iron Age ceramics is hardly surprising given the shallow stratigraphy across the site, the ephemeral nature of many of the Iron Age features and the general level of disturbance caused by animal burrowing and root

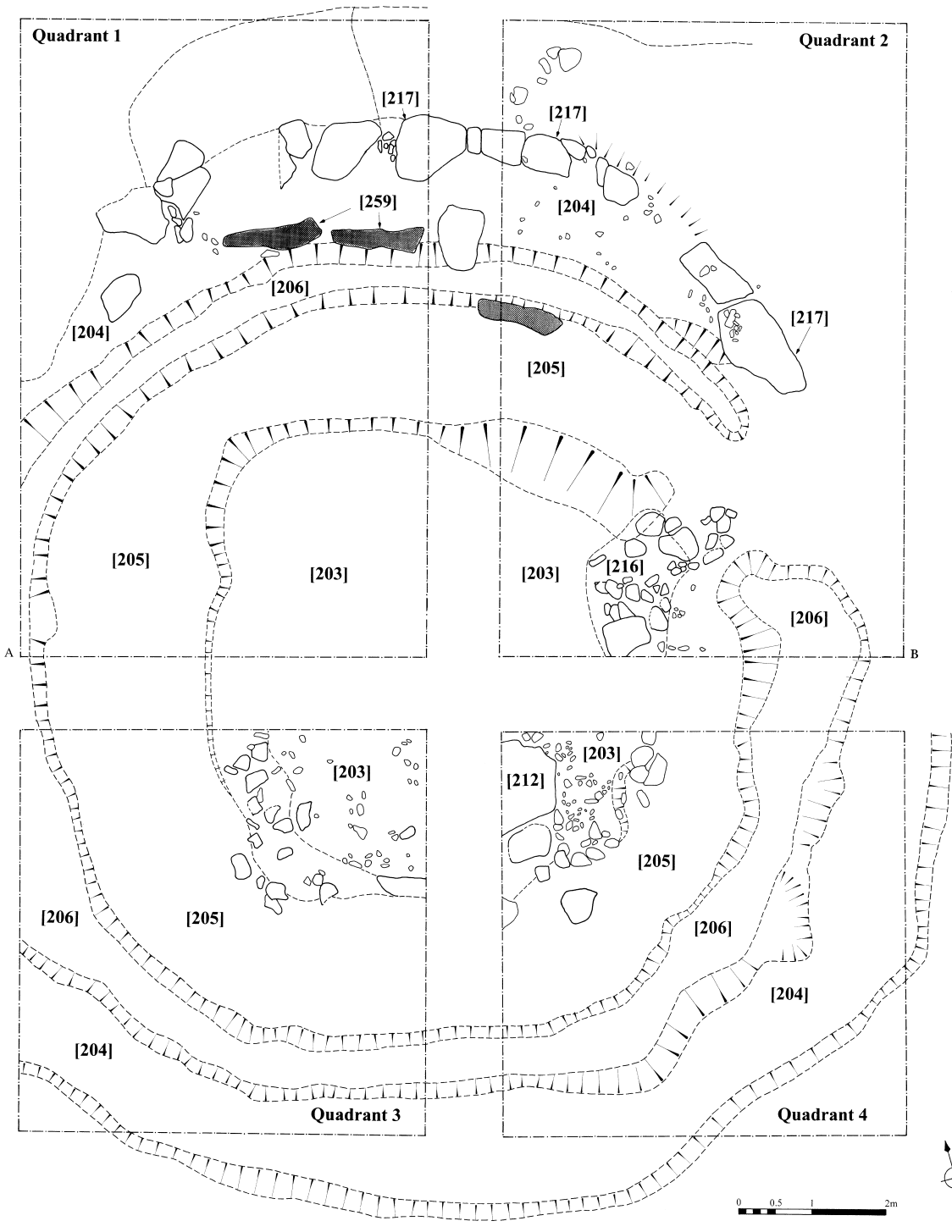

Fig 12 Plan of site 9 phases 2 and 3

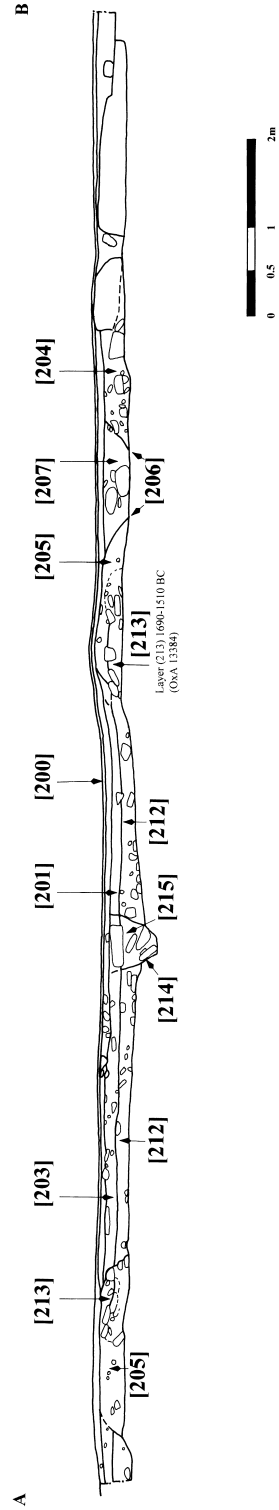

Fig 13 Section across site 9

Fig 14 Site 9 from the north showing phase 2 and 3 features and outer ditch [208]

activity. The Iron Age pottery is therefore seen as intrusive.

Pottery found within the cists is also likely to be intrusive (Quinnell below). Construction of the site is likely to have taken place towards the end of the Early Bronze Age; the radiocarbon date of 1690–1510 cal BC for charcoal from below the cairn-ring provides a *terminus post quem* for its initial structural phase. However, the fresh nature of the deposit means that it is unlikely to have been exposed to the elements for any length of time after deposition. This is consistent with the Trevisker Ware which was recovered from this phase.

Phase 2

The second phase involved the remodelling of the site (Figs 12 and 13). The cairn-ring was buried beneath an inner bank [205] approximately 10m in diameter across its outer edges. This bank was quite spread and measured up to 2.6m wide and 0.35m high. It was encircled by an irregular, shallow (0.4m deep) penannular ditch [206], which varied between 1m and 1.8m wide. This was mostly filled by a dark layer [207] but in places a lighter silty loam [242] was found along the bottom of the cut. The outer edge of the ditch was surrounded by a second substantial bank [204], 1.6m to 2m wide with a maximum height of 0.35m. The outer edge of the bank encircled an area approximately 14m in diameter although it had become quite spread in places. The northern part of the bank was faced on its outer edge with large granite kerbstones [217] which stood up to two courses high. The stones retained the bank and gave it a vertical outer profile. Given the large number of tumbled stones in the outer ditch, this kerb must originally have been much higher. Both banks had been burrowed by animals

and disturbed by roots and later Iron Age activity. No cut features belonging to this phase were identified within the interior of the site, although it is likely that layer [212] was deposited during this phase. This consisted of large granite stones, which had been laid flat on top of the natural, and where undisturbed, had the appearance of paving. Unfortunately, much of this deposit had been disturbed by insertion of a ring of postholes dating to the Iron Age reuse of the site. All of the features belonging to the second phase respected the original entrance; both banks and the inner ditch had terminals, which ended in the area of the original entrance. The entrance was also emphasised by a spread of localised paving [216] in the area between the ends of the bank [205] and ditch [206]. The entrance was aligned to open towards Rough Tor.

Again, the artefacts recovered from the second phase consisted of a mixture of Bronze Age and residual Iron Age artefacts. Bronze Age and Iron Age sherds were recovered from the banks and several sherds of Iron Age pottery from the inner ditch. The presence of Iron Age ceramics is not problematic given the level of disturbance to the banks and the possibility that the ditch infilled slowly. The datable ceramic assemblage within layer [212] was dominated by Iron Age pottery, although Trevisker Ware was also recovered (Quinnell below). Again, this is unsurprising, since the layer appeared to have formed the floor level during both periods. It had also been cut through by the ring of Iron Age postholes.

Phase 3

The third phase of the site was marked by the erection of three granite slabs [259], which were set into the outer bank (Fig 14). The stones were large, measuring up to 0.8m high. No artefacts were recovered from this phase of activity. However, their location within a part of the site which had been an earlier focus for the placing of large stones, suggests a Bronze Age date for this phase of activity.

The radiocarbon dating and artefact analyses suggest an additional Bronze Age phase, phase 3a. One of the postholes, [256], produced only pottery of Bronze Age date and two others, [258] and [224], (Fig 23) produced Middle Bronze Age determinations: 3127±31 BP, 1490–1310 cal BC (OxA-13381) and 2987±30 BP, 1380–1120 cal BC (OxA-13380). These are not statistically consistent (T'=10.5; T'(5%)=3.8; v=1, Ward and Wilson 1978), suggesting that the material is of different ages. These results raise the possibility that, as with sites 2 and 6, site 9 had a timber phase, although there was no evidence of a complete post-ring. However, it must be stressed that given the shallow stratigraphy and the later disturbance to the site, it is possible that the radiocarbon determinations were the result of residual material entering these postholes. The pottery analysis also provides evidence for continuing use of the site during the Middle Bronze Age, as sherds of Trevisker ware with similarities to ceramics from Middle Bronze Age sites elsewhere were recovered. This material is considered under phase 4 by Quinnell, below.

Site 10

Phase 1

Site 10 was a ring cairn located near to the southern edge of the excavated area. The southern side of the site had been clipped by a leat and much of the ground surrounding it was disturbed (Fig 3).

The excavation revealed that the perimeter walling of the cairn enclosed a roughly circular area measuring 5.4m by 6m (Fig 15). Wall [303] had been built directly on top of the natural and consisted of granite stones set within a matrix of silty clay loam and redeposited natural. It measured from 0.8m to 1.4m across and stood up 0.4m high. In some places the stones had been laid flat (for example, in the south-east quadrant), whereas in others they appeared to have been more casually placed. Two large stones measuring up to 1m high were built into the northern section of the wall. The stone content of the wall was quite variable and in places it was more of an earth and stone bank. A 1.4m wide entrance in the north-east quadrant pierced the wall.

Much of the ring cairn was covered by two turf horizons [300] and [302]. Between these deposits and covering most of the interior of the site was a 0.2m thick deposit of clay waste [301] which had collected within the site since its identification in 1985 (Fig 16). Beneath [302] were two 0.3m thick layers of silty material [304] and [305], which contained sherds of medieval pottery and were post-prehistoric. Only one feature was identified beneath the infilling deposit, an oval pit [307] cut into the natural rab and filled with layer [308] which had a charcoal-rich and quartz stone content. It had shallow sides and a flat base, measured 1.8m long, 1.5m wide and was 0.17m deep. This paucity of

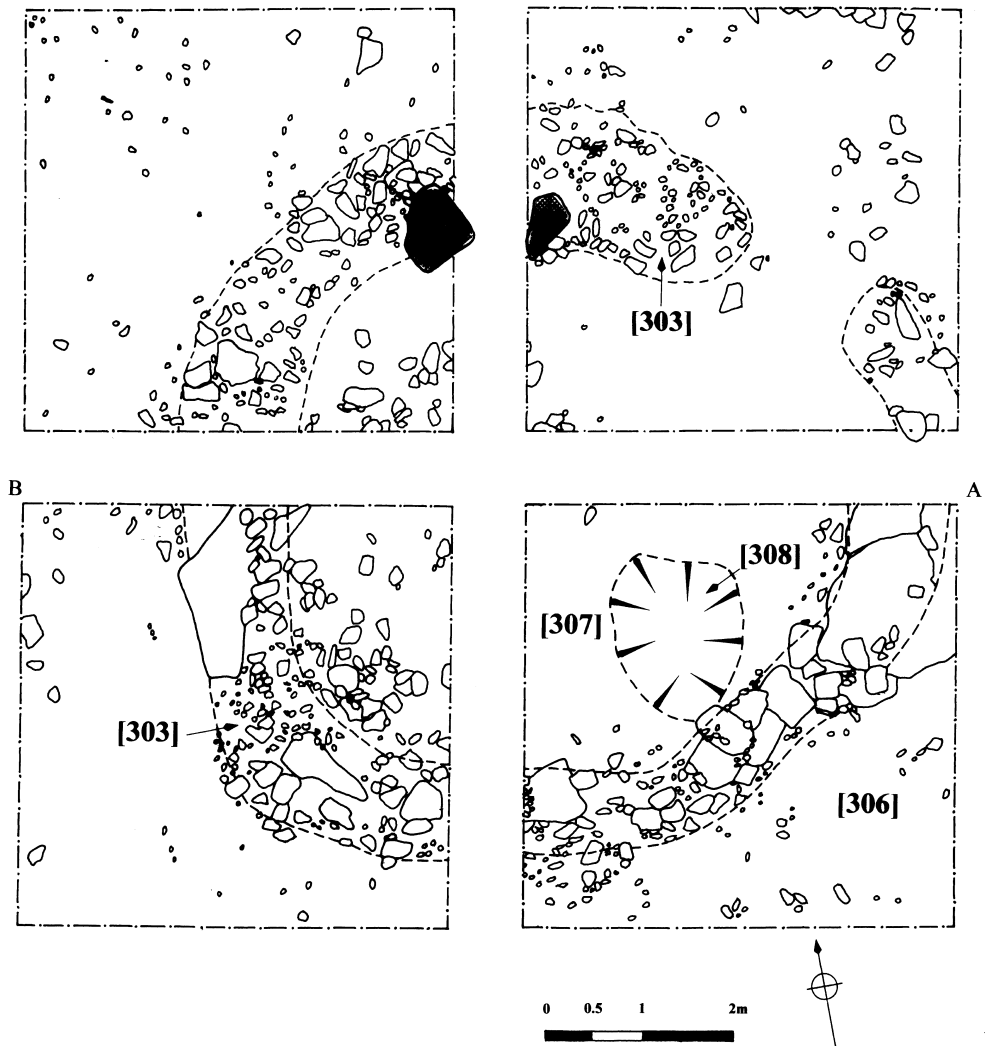

Fig 15 Plan of site 10

apparent activity is not unusual within ring cairn sites (for example, Quinnell 1997).

A ditch [309] ran around the eastern perimeter of site 10 and it was felt initially that it was possibly contemporary with it. However, when excavated it was apparent that it cut the ring cairn wall; modern artefacts, including a milk bottle, were recovered from within it. The ditch was therefore interpreted as an infilled leat.

Site 10 produced few artefacts. A handful of flints, beach-derived pebbles and medieval potsherds were recorded from the interior of the site, but these came from the infill deposits and were therefore not associated with the use of the site. A small number of flints were found in the wall material but none of them were diagnostic (Lawson-Jones below).

Site 11

Phase 1

Site 11 was a 'tailed' cairn located on the southern edge of the investigated area. It had suffered some disturbance: enlargement of the mica dam had removed part of its south-west end and part of the natural rock upon which it was constructed showed evidence of stone splitting.

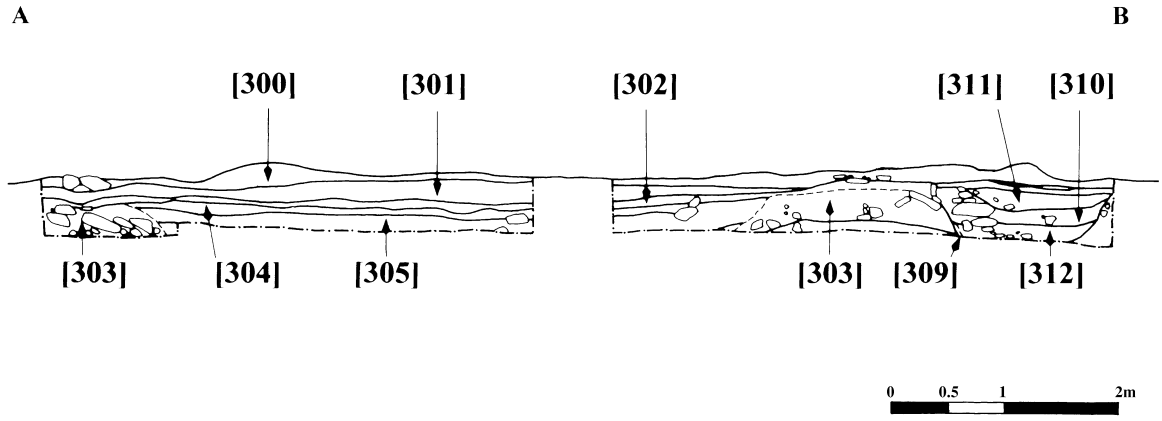

Fig 16 Section across site 10

The cairn was constructed around a natural granite outcrop (Figs 17 and 18). The primary phase began with the erection of two granite orthostats [125] up to 0.7m high, standing 1.6m apart at either end of a large flat slab of natural granite at the eastern end of the site (not shown on Figs 17 and 18). The orthostats were not set within cut sockets but were instead wedged into fissures in the granite. The impression created to modern eyes by these settings was of a large stone bed (Fig 19). The orthostats sealed silty deposits [126], [128] and [129], up to 0.2m deep. The stones were sealed beneath a small circular cairn of stones [102] and [116] 4m in diameter and 0.8m high. The larger stones [116] were situated towards the base of the cairn, whereas generally smaller fist-sized stones [102] made up the upper half. The cairn covered the orthostats and sealed most of the granite outcrop. Beyond the sorting of stones by size there was no formal structure to the circular part of the cairn. The second component to site 11 was a 'tail' of stones [124] that extended from the south-west side of the cairn and gave the site an orientation north east towards Rough Tor.

The 'tail' was 9m long by 0.5m wide, with the tallest stones standing up to 1m high. None of the stones were set into sockets; all rather rested on the natural rab and most of the larger stones in the 'tail' had fallen. The bulk of the stones making up the 'tail' were fairly small. Two localised silty clay deposits [113] and [123] were sealed beneath the 'tail' and were probably of natural origin. The relationship between the two elements of the cairn was unclear since the 'tail' ran up to the edge of the circular part of the cairn, but did not overlie it. After the cairn had been constructed, deposits of silty clay ([106], [115] and [119]) started to form around both it and and the 'tail'. A few localised stony deposits were recorded around the site but they consisted of tumbled material which had fallen from the cairn; these deposits may have formed over time as a result of disturbance by grazing animals and the elements.

The major deposits which sealed the site, [103] and [112], appeared to have formed relatively quickly. These were essentially homogenous layers of dark brown silty clay, up to 0.4m thick, which engulfed the site. They were identified as possible hill-wash layers, perhaps formed when the Middle Bronze Age settlement and fields were constructed upslope from the site. Layer [103], in particular, contained tiny abraded sherds of pottery and a handful of other artefacts which may have been moved downhill by settlement-related activity. The effect of this soil build-up was to mask the original cairn and transform its appearance into a crescent-shaped bank. A number of localised deposits developed after the formation of [103], including peat growth [101] in the wetter parts of the site. Finally, the site was covered by the development of two successive turf horizons [100] and [104].

The excavation of site 11 produced a number of artefacts, including flints and worked stones, but most of them were recovered from hill-wash deposits and could therefore have entered the site at any time. Some of the flints and one or two of the worked stones may have been *in situ* but none were diagnostic (Lawson-Jones and Quinnell below). A blue glass bead of post-Roman date (Hunter below)

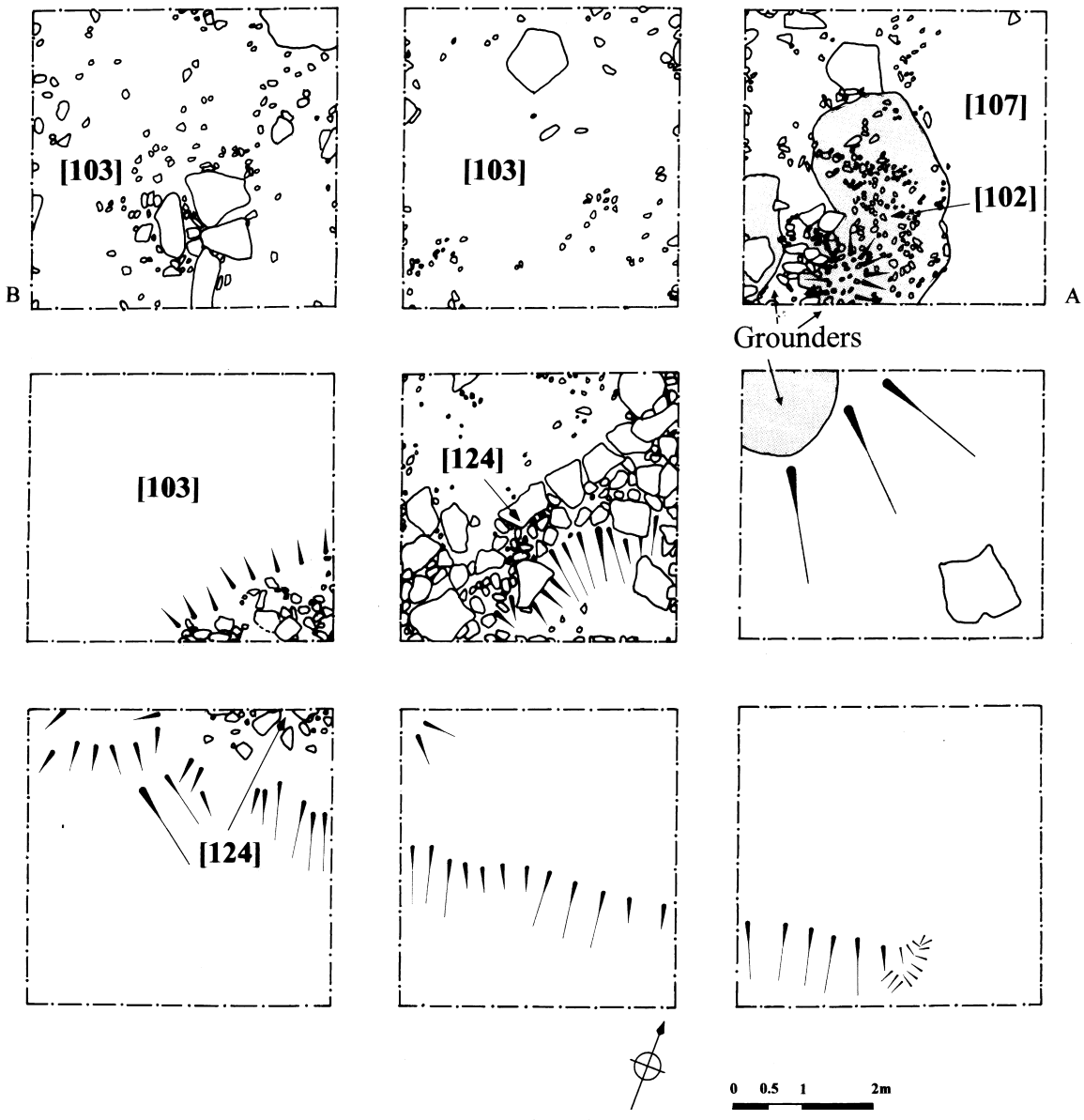

Fig 17 Plan of site 11

was also recovered from the site in a residual context.

Northern Downs cairns

Eight cairns on the Northern Downs were evaluated by hand-dug trenches (Jones and Nowakowski 2000), some of the large number of cairns found in isolation or small clusters across this area. Six of these (cairns 38, 39, 40, 47, 51 and 84) were confirmed as sites of probable Early Bronze Age origin (Fig 3). Although they were only evaluated by non-invasive trenches, the results indicated that they were of a different character to the sites excavated on Stannon Down but similar to cairns in the small cairn groups which are found in other parts of

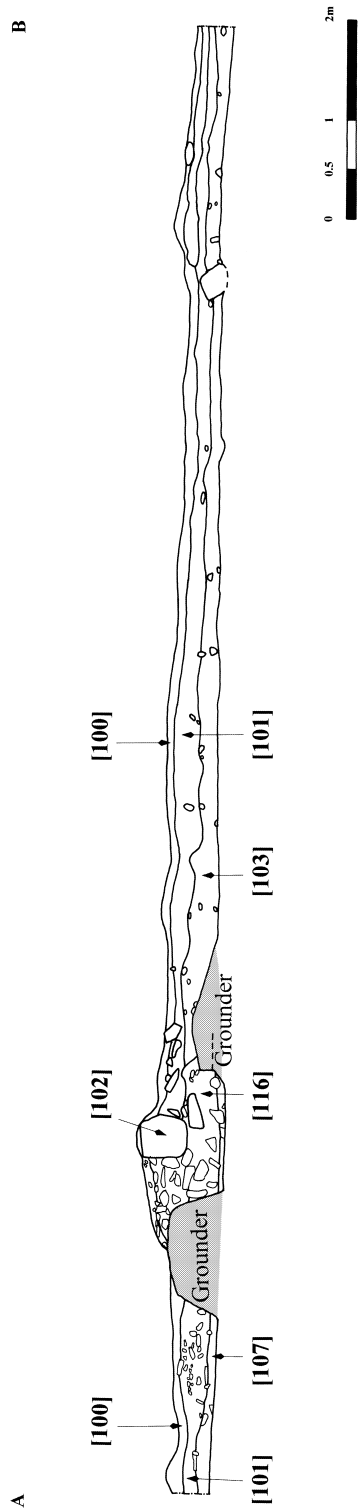

Fig 18 Section across site 11

Fig 19 Site 11 from the north showing orthostats [125]; mica dam in the background

Bodmin Moor and on Dartmoor (for example, Fleming 1980). Overall, the Northern Down cairns appeared to be small, carefully constructed monuments.

In addition to the cairns, two small standing stones (CAU 75 and 76) and a clitter feature (CAU 54) were also recorded on the Northern Downs. Both of the standing stones were under 1m high and neither formed prominent features within the landscape. It is possible that they were associated with the cairns, as standing stone 75 was located beyond the north-western end of one group of cairns and standing stone 76 beyond the north-eastern end of another (Fig 2).

Clitter feature 54 consisted of a linear band of stones approximately 22m long and aligned west-north-west to east-south-east towards Rough Tor. The north-western end of the site consisted of a large natural earthfast grounder but other stones in the alignment appeared to have been placed in position. The trenching indicated that, although partly made up of natural earthfast stones, the site had been enhanced by human activity. No artefacts were recovered. However, the techniques used in its construction bore a resemblance to the 'tails' on cairn sites 2 and 11 (although lacking the circular cairn at one end). The orientation on Rough Tor also paralleled that of sites 9, 10 and 11 and of the bank

cairn on the slopes of Rough Tor. These features suggest that clitter feature 54 may be of Neolithic or Early Bronze Age date.

Discussion

Site 2, probably the earliest of the five monuments which comprised the Stannon Down ceremonial complex, was constructed around 2500 cal BC. The complex consisted of three ring cairns and two 'tailed' cairns, which were loosely grouped east-west along a natural terrace. Radiocarbon dating evidence suggests that site 2 was the primary site, but each of the sites had several phases and their use probably overlapped. The primary phase of site 6 was undated although the radiocarbon determinations suggest activity around the middle of the second millennium cal BC, the Early to Middle Bronze Age transition period. However, the pottery, flintwork and faience bead (SF2) recovered suggest that it lies within the Early Bronze Age and predates the nearby settlement. Construction of site 9 occurred after about 1600 cal BC and the last Bronze Age activity, in the form of ceramic deposition and possible timber features, occurred around 1300 cal BC, during the Middle Bronze Age.

The Stannon Downs ceremonial complex is therefore likely to have been in use for more than a millennium, stretching from the end of the Neolithic into the later Middle Bronze Age when the nearby settlement is likely to have been built. The dating also means that activities within the ceremonial complex are likely to have overlapped with the construction of the cairns and other monuments on the Northern Downs, as well as with other ceremonial monuments in the wider landscape, including Stannon stone circle 800m to the south.

Few artefacts were recovered from the primary phases of any of the excavated sites, and two sites (sites 10 and 11) produced very few finds which can be strictly associated with their Bronze Age use. Three of the sites (sites 2, 6 and 9), however, were considered appropriate places for the deposition of ceramics and worked stones, which included objects and clays which had been obtained far from the limits of Bodmin Moor (see below). Sites 2 and 6 were also embellished with post-settings while site 9 was made ever more complex with the addition of banks, ditches, paved areas and orthostatic settings.

The artefacts which were recovered from the excavations add important information to this picture. Deliberately placed objects were recovered from sites 2 and 6 and it is likely that artefacts had also been placed into site 9. The stone objects in the kerb at site 2 and quartz object (SF51) within site 6 are the only ones likely to have been associated with the primary phases of these sites.

Deposition of objects seems to have become more important during later phases. At site 6 this was limited to the deposition of a few pieces of well-worked flint, a faience bead (SF2) and few sherds of pottery. All of these finds were recovered from within the southern part of the site; a similar preference has been identified at other Bronze Age burial and domestic sites in southern Britain (Bradley 1998a). The recovery of a faience bead is significant because they are rare in Cornish ceremonial monuments and are usually associated with cremations (Ashbee 1974; Borlase 1885; Jones and Nowakowski 1997; Sheridan below). At site 2 large numbers of artefacts, including worked stone from Devon, an amber bead, flintwork and a large number of sherds of Trevisker pottery were placed into pits beside the cairn or onto the land surface. The vessels represented were all small and the freshness of their condition suggests that they had all been covered by soil, whether in pits or on the cairn (Quinnell below). This phase of activity is likely to have taken place in the centuries before 1500 cal BC. Similar activities may have occurred at site 9 a century or two later, although there the vessels were larger.

The Northern Downs cairns were of a different character. Broadly, they could be described as variant forms of the small kerbed cairns found in other upland parts of Britain (for example, Ritchie *et al* 1974; Lynch 1993). This impression is reinforced by the results from excavation of three sites in this group in the 1970s (Harris *et al* 1984); this revealed evidence for purposefully built arrangements of stones within the body of the cairns, two of which also possessed substantial kerbs. Unlike some other small cairns across Britain, they do not appear to have been associated with field systems or clearance (for example, Yates 1984). Indeed, there is the possibility that the cairns on the Northern Downs were more closely associated with funerary activity, as one of the cairns excavated by Harris contained a cremation while another sealed a pit that was large enough to hold an inhumation burial. Only one artefact was recovered from the evaluation trenches, a worked flint from the top of cairn 38. This was not

diagnostic and is likely to be residual (Lawson-Jones below).

The environmental analyses indicate that woodland still formed a significant component of the landscape during the Early Bronze Age and it is possible that the cairn complexes on this part of the Moor were separated by stands of trees. The pollen analysis from site 86 and analysis of charcoal from the excavated sites suggests that throughout this period there were mature trees in the area (Tinsley and Gale below). However, the environmental evidence does suggest that clearances are likely to have been more extensive in this part of the Moor and that peat was developing in the wetter areas (see Tinsley below). Indeed, site 2 was constructed in an area already suffering from soil deterioration. The creation of numbers of barrows in the area must of itself have meant that clearings expanded throughout the period.

Once again, however, there is little evidence for cereal production, although a few grains were recovered from sites 2, 6 and 9 (J Jones below). It is possible that the cereal grains were brought to the sites as part of ceremonial feasting within the ceremonial complex. Hazelnut fragments were also recovered from several of the Stannon Down sites and the sherds from the vessels recovered from site 2 may also have been associated with eating and drinking (Quinnell below). The movement of people and material culture onto the Moor from other places is indicated by presence of stone objects and faience and amber beads at sites 2 and 6. These were obtained from beyond the Moor (and Cornwall) and indicate networks extending far beyond Stannon.

The settled landscape of the Middle Bronze Age (*c* 1500–1000 cal BC)

In addition to the evidence for continued use of site 6 and particularly site 9 into the Middle Bronze Age, a number of sites relating to settlement of this period were investigated, including three roundhouses (site 3, M3 and M4), a substantial field wall (site 15), eight rather less substantial boundaries on Stannon Down (boundaries 1–8) and three boundaries on the Northern Downs (boundaries 78, 79 and 80).

None of the eight Middle Bronze Age roundhouses excavated by Mercer were radiocarbon dated (Mercer 1970), making precise dating of the settlement difficult. However, a small assemblage of Trevisker pottery was recovered which may date to the latter part of the currency of this ware (1500–1000 cal BC) (Quinnell below).

Site 3

Site 3 was a roundhouse. It was located approximately 200m to the south of the ceremonial complex on lower-lying ground (Fig 3). The western half of the site had been completely removed by a haul road and the ground around the eastern part of it was very disturbed. The site was not considered part of the main settlement on Stannon but rather as an outlying element of the Louden Hill roundhouse settlement (Herring 1998), most of which lies beyond the eastern boundary of the clay works.

The excavation revealed that a wall enclosed an area measuring approximately 4.5m across, although the original diameter of the roundhouse may have been around 5.5m. The walling was so disturbed that it was not possible to establish the location of the entrance; it may have been situated within the portion of the roundhouse that had been removed. The surviving wall consisted of rough blocks of granite, from 0.4m to 1.m across, standing up to 0.4m high. Much of the wall had become turf covered. A 0.1m thick deposit of redeposited rab covered the interior of the site. This deposit was devoid of artefacts but did contain two patches of charcoal. It seems probable that the redeposited rab was a floor surface as it overlay the natural subsoil. Only one possible feature was identified within the structure. This appeared to be a posthole or a stone hole cut through the redeposited rab floor; it measured 0.3m in diameter and was 0.25m deep with steep tapering sides and a rounded base.

Roundhouse M3

M3 was located at the northern edge of the investigated area (Fig 3). A slot 0.5m wide was cut across the western wall of the house. The section revealed that the wall was essentially an earth bank with stone facing on both sides. Construction had started with the dumping of layers of dark coloured clay loams and redeposited rab to form a bank approximately 0.74m high and up to 1.45m wide. The stone facing was then built onto the sides of the bank. The facing stones were of granite and measured up to 0.68m high and 0.4m wide. The layers within the wall were quite mixed and the horizons between each were not well defined. An

undiagnostic flint flake was the only find recovered from the section.

Roundhouse M4

Situated at the northern edge of the investigated area (Fig 3), M4 was the best preserved of the previously excavated houses. A slot 0.5m wide was cut across the eastern wall of the house. Here the section revealed that the wall consisted of an earth bank approximately 0.8m high and up to 1.7m wide with facing stones on either side. These were of granite and measured up to 1.18m high and 0.14m wide. No artefacts were found within the section.

Stannon Down boundaries

The moorland to the north and south of the excavated cairns was enclosed by a Bronze Age field system consisting of curvilinear and rectilinear fields (Fig 2). This field system was probably contemporary with the 25 or so Middle Bronze Age roundhouses found within the fields (see Rose above), eight of which were excavated by Mercer (1970). However, there were also some boundaries within the system which were stone-faced and likely to be of medieval or post-medieval origin (Herring 1998, 5). Targeted recording of the best-preserved examples of the early boundaries was undertaken to identify construction techniques and recover palaeo-environmental information. Boundaries 1–8 were investigated in section and site 15 in plan and section.

Unfortunately, most of the boundaries had been robbed or become very spread so that there was little structural integrity. None sealed a buried soil and there were no direct physical and therefore chronological relationships with any of the other Bronze Age features; none had any artefactual associations. Most of the boundaries were probably simple stone banks, although as at site 15 (see below) there was a tendency for smaller stones to be used as a core upon which larger stones had been placed (Fig 20). This contrasts with the sectioned medieval boundary 4, which had an earth and stone core faced with stones. All the sectioned boundaries were much slighter than site 15.

One of the most significant pieces of information to be recovered from the boundary recording was that a later boundary (boundary 4) appeared to overlie a probable Middle Bronze Age boundary. This indicates that some of the earlier, probably prehistoric, boundaries were re-used and continued to influence the division of the landscape in later periods.

Site 15

The boundary was located at the eastern end of the ceremonial complex (Fig 3). It was oriented east-west for most of its length, but turned towards the north in the western end of the trench. The site had been identified as a boundary with a small cairn attached to its western side. A wedge-shaped area measuring 9m by 15m was de-turfed. After a covering of up to 0.2m of turf [401] and topsoil [402] had been removed it was evident that the boundary [404] was far more substantial than had previously been apparent, up to 3.5m wide and up to 0.6m high (Figs 21 and 22). It consisted of granite stones from 0.05 to 0.8m across but the line of the boundary also included a number of earthfast natural grounders. At first it appeared that the wall had been put together in a rather haphazard fashion, but it became apparent that an identifiable technique had been used in its construction. Smaller stones formed the core of the wall, upon which the large stones appeared to have been placed or set. However, it is probable that the larger stones were originally set upright within the core of the wall. A rebuilt section of walling [403], containing slates, was identified, suggesting that the wall had been maintained over time. Recent disturbance to the boundary was also evident in the form of stone robbing and a sheep burial which had been inserted into it. The small 'cairn' was found, in fact, to be tumble from the boundary. A small patch of a possible remnant peaty soil [407] was found beneath one of the stones, but the majority of the wall appeared to have been constructed directly on top of the rab. A number of flint artefacts were recovered from within and around the boundary (Lawson-Jones below) but given the lack of stratigraphy none of them can be said to be associated with it. Site 15 was far more substantial than any of the other boundaries examined, possibly because it was one of the boundaries that demarcated the eastern edge of the Stannon Down settlement.

Northern Downs boundaries

Three boundaries (78, 79 and 80) were evaluated on the Northern Downs (Fig 2), with the object of determining the character of any remains and assessing the potential for buried soils. Two trenches were excavated across each of the boundaries. All of

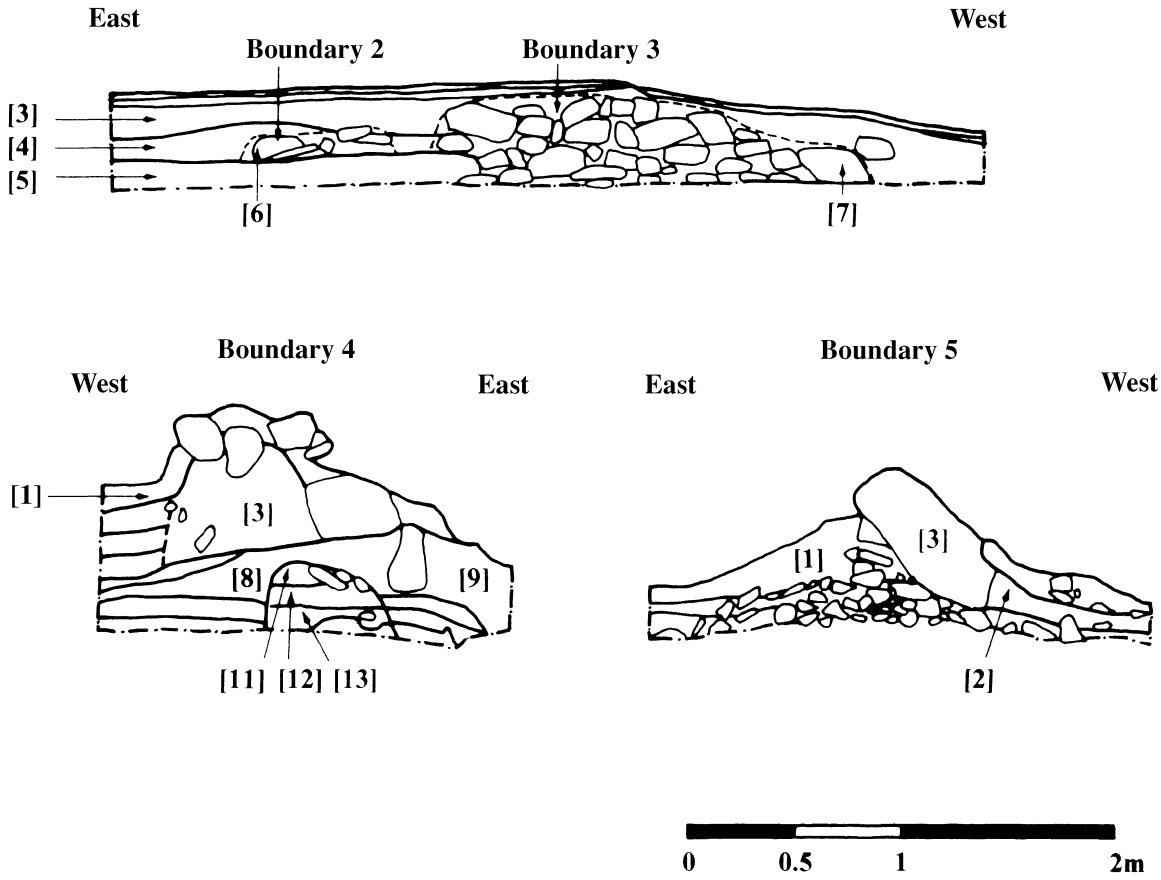

Fig 20 Sections across boundaries 3, 4 and 5

the investigated sites were sealed beneath peaty soils but none of them sealed any buried soils and the stones appeared to sit on the natural rab. No artefacts were found in association. Boundary 78 was very robbed out and difficult to record. Boundaries 79 and 80 were spread, measuring up to 1.5m wide by 0.15m high, and made up of medium-sized stones. Morphologically the boundaries were comparable to those on Stannon Down and they may have been contemporary, associated with the expansion of field systems and settlements during the Middle Bronze Age, although there are no certain roundhouses on the Northern Downs (see Rose above). The full extent of the system of boundaries on the Northern Downs was not ascertained due to the fact that much of the area was poorly preserved or buried beneath the peat.

Discussion

In common with many other upland areas in Britain, the primary evidence for activity in the Middle Bronze Age on Stannon Down consists of roundhouses and field systems. As with other investigated settlements of this period in upland Cornwall, artefactual evidence was extremely limited. No suitable material for radiocarbon dating was obtained from any of the investigated roundhouses or boundaries. The available evidence is therefore confined to structural details of the boundaries and houses and information from environmental and landscape survey.

Beyond confirming the well-built character of their walls, the investigation of the previously excavated roundhouses M3 and M4 added little to our knowledge of the Stannon Down settlement. The

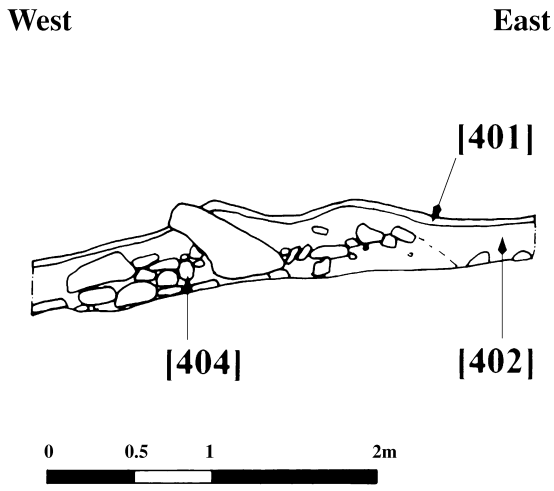

Fig 21 Section across site 15

excavation of the site 3 roundhouse revealed a much simpler structure than any of the investigated houses in the Stannon Down settlement. The houses investigated there by Roger Mercer in the 1960s possessed well-built walls with clearly defined entrances, paved internal floors, drains and post-settings (Mercer 1970). Site 3 lacked the internal features, although the small internal diameter (around 4.5m) means that it would not have needed a post-ring to support the roof (T Blackman, pers comm). Although rab floor surfaces were not recorded in any of the roundhouses excavated by Mercer (1970, 22), the use of rab as a deliberately laid surface is paralleled in Bronze Age houses investigated at Porth Killier on the Isles of Scilly (Ratcliffe and Young 1997, 12) and on Dartmoor (Wainwright and Smith 1980). The lack of a hearth within site 3 is consistent with other excavated house sites on Bodmin Moor and Dartmoor (for example, Mercer 1970; Wainwright and Smith 1980), which might imply that houses were occupied on a seasonal basis or that cooking was undertaken outside. The variations in architecture and construction techniques may reflect functional, status or chronological differences between the Stannon Down and Louden Hill settlements, or variations in the ways that individual communities chose to construct their buildings. Architecture as well as boundaries may have been used to define distinctions between communities.

Fig 22 Site 15 from the south

Eleven boundaries were investigated on Stannon Downs and the Northern Downs. For the most part, these were simple, spread, stony banks which had been robbed. Site 15 was interesting in that, although sharing a number of constructional characteristics with some of the sectioned field boundaries, it was built on a much more massive scale. However, despite its width, it was not particularly high and in its present condition would not have been stock-proof. Since there was not an enormous amount of tumble, it must be assumed that either the wall has been extensively robbed or, as Andrew Fleming (1988, 71) suggests for Dartmoor boundaries, it had once been covered by turves or hedges. The size of the wall may relate to the fact that it was one of the boundaries on the edge of the Stannon Down settlement field system. The Louden settlement lay approximately 200m to the south east and the wall may have been intended to make a clear statement about ownership and division of land and access to it. It may also have been important to ensure that animals from one community did not cause inter-group tensions by intermixing with those of another.

The number of field boundaries and the large area enclosed by them in this part of Bodmin Moor (see Johnson and Rose 1994; Rose above) implies that the area was intensively used by the Middle Bronze Age. In addition to the surveyed boundaries, the evidence from the evaluation trenches on the Northern Downs implies that additional field systems exist beneath the peat to the north west of the Stannon Down settlement and that the area of enclosure was even greater than the mapped evidence suggests. In general, the layout of the fields and settlements in the area has an irregular appearance, suggesting that the process of enclosure was accretive, rather than extensive and ordered.

The expansion of settlement activity at this period would have had a marked impact on woodland coverage. The pollen analysis of site 86 (Tinsley below) indicates that significant areas of the landscape became transformed into the herb-rich grassland which continues to characterise the present day landscape, although trees still appear to have been present in the valleys. Work on pollen from the Rough Tor area to the north also suggests that some areas of woodland persisted into the Iron Age (Gearey *et al* 2000b). Significantly, there was little environmental evidence for cereal cultivation during this period, although small amounts of charred grain were recovered (J Jones below). However, these grains may have been bought up to the site from the fringes of the Moor, where recent analysis has produced some evidence for small-scale cultivation (Jones and Tinsley 1999–2000). The limited pollen sampling at the Stannon settlement undertaken by Mercer indicated that some woodland had existed up to the construction of the settlement and that pastoral, rather than arable agriculture had been practised (Mercer and Dimbleby 1978, 26–28).

No buried soils were found beneath any of the investigated boundaries or the roundhouse site 3. Indeed, site 2 was the only excavated feature to seal a buried soil horizon. One explanation for the absence of artefacts and buried soils is that woodland clearance and construction of the roundhouse settlement upslope of the investigated sites may have resulted in soil erosion. The large accumulation of hill-wash around and over the lower lying site 11 may have been the result of this process (H Tinsley, pers comm). A similar process of soil loss during this period was also indicated on the Northern Downs, where augering revealed that there were no buried soils except for accumulation at the bottom of the slope (Heathcote 2003). Although undated, it is possible that this erosion occurred during the Middle Bronze Age.

In summary, the analyses indicate that by the Middle Bronze Age the landscape had largely been cleared of trees and was dominated by grassland subdivided by stone boundaries. However, there is little evidence for cultivation and people and their animals may still have moved across the Moor as part of a pattern of seasonal transhumance (Herring forthcoming a).

The Middle Iron Age landscape (*c* 300–200 cal BC)

The evidence for Iron Age activity on Stannon Down is restricted to a small number of features within site 9. Nonetheless, this represents one of the few identified Iron Age sites on Bodmin Moor (Johnson and Rose 1994) and is the only one to have been excavated under modern conditions and have provided radiocarbon dates. It is therefore highly significant to our understanding of the character of activity during this period.

Site 9

The fourth and final phase of activity on site 9 represents reuse of the site during the Iron Age (Fig 23). Seventeen postholes (Table 6) and a drain were

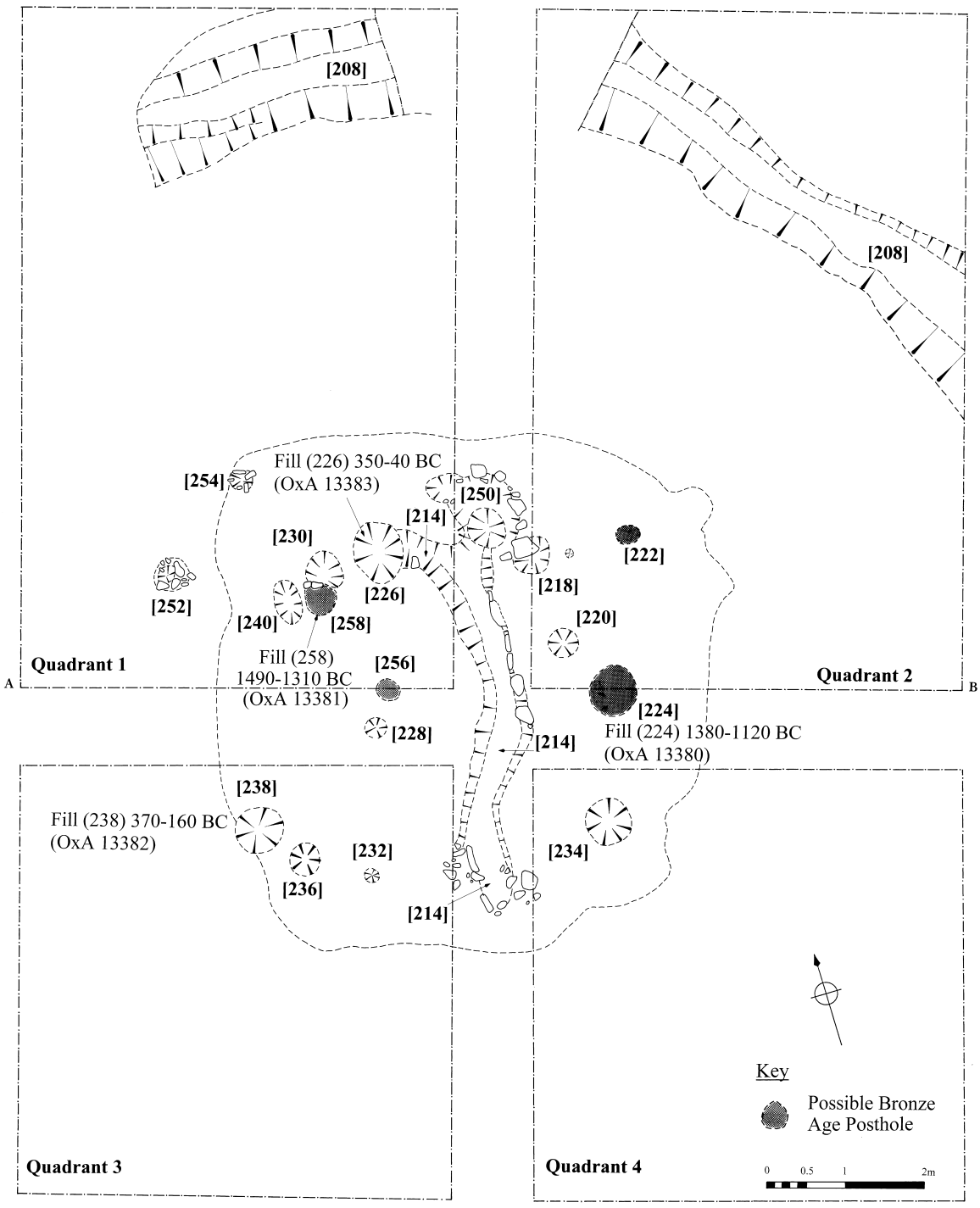

Fig 23 Plan of site 9 phase 4

identified as belonging to a roughly circular structure; however, four of these postholes could have been associated with an earlier Bronze Age timber setting (see above). The tops of many of the postholes were not recognised early on in the excavation and were therefore truncated. The post-ring and the central drain were cut through the Bronze Age paving, layer [212]. An assemblage of Iron Age pottery was recovered from several of the postholes and the drain (Quinnell below). All of this is South Western Decorated Ware which dates to the Middle Iron Age. The calibrated radiocarbon dates from Stannon span the fourth to first centuries BC (see below).

The post-ring enclosed an area measuring approximately 6m in diameter and was situated within the earlier Bronze Age cairn. The interior of the post-ring was bisected by a long drain [214] oriented north-south and U-shaped in profile. It measured 5.5m long, 0.6m wide and 0.4m deep, and was filled by a silty loam deposit [215]. Two of the postholes [228] and [256] were situated towards the middle of the structure; their position suggests that they could have supported the roof, although a building of this size would not have required a central post. However, posthole [256] contained Bronze Age pottery; this may have been residual but could have been associated with an earlier Bronze Age timber-setting (see above). Two inter-cutting postholes and the fact that the northern end of the drain cut posthole [250] indicate a degree of renewal within the later structure. The irregular distribution of the postholes may also indicate rebuilding. After the structure had fallen out of use the site was covered by gritty, stony sub-soils [202] and [201] before becoming covered by a thin layer of peaty soil [200] (Fig 13).

A second outer ditch [208] 1.6m wide and up to 0.5m deep was uncovered on the northern side of the site, which was initially assigned to a Bronze Age phase. However, subsequent analyses revealed that the ditch not only contained Iron Age pottery but more significantly had a pollen sequence which was different from the Bronze Age sequences, and is therefore likely to be associated with an Iron Age environment (Tinsley below). For most of its length the ditch had steep sides with a narrow flat base. It was filled by three silty clay loam deposits [209], [210] and [211]. This ditch was only traced for a length of 12m: the western end had been removed by china clay working and the eastern end petered out in the vicinity of the entrance to the site; it was not found around the southern side of the site.

The two Iron Age radiocarbon determinations from site 9 were obtained from postholes [238] and [226]: 2183±29 BP, 370–160 cal BC (OxA-13382) and 2118±28 BP, 350–40 cal BC (OxA-13383) (see below). These are statistically consistent (T'=2.6; T'(5%)=3.8; v=1, Ward and Wilson 1978) and these two postholes could therefore be contemporary.

Discussion

The Iron Age activity at site 9 is not easy to parallel, since clearly identified sites dating to this period are almost entirely absent from Bodmin Moor (Johnson and Rose 1994) and scarce on Dartmoor (Quinnell 1994). Several prehistoric settlements on the Moor appear to be multi-phased or reused, including the nearby settlement on Louden (Johnson and Rose 1994, 65), and some might prove to be associated with Iron Age activity. However, these sites are unexcavated. The only other excavated Iron Age settlement on Bodmin Moor is at Garrow Tor, where Iron Age pottery and a blue glass bead were recorded (Silvester 1979, 179). This site has not been published so it is difficult to make any direct comparisons, although Quinnell (below) suggests an Early Iron Age date for the pottery.

The apparent scarcity of Iron Age activity on Bodmin Moor has been attributed to environmental deterioration: blanket peat may have formed on some of the south-west uplands at around 900 cal BC. However, it is unlikely that it would have been found across all of the region's uplands and evidence from higher upland areas in other parts of Britain, including northern England (Bevan 1997; Ferrell 1997; Tipping 2002) and Wales (Kelly 1988; RCAHMW 1997), indicates that climatic deterioration did not lead to total abandonment. The evidence from Bodmin Moor suggests localised variations in vegetation patterns (Tinsley below) which would have allowed some form of exploitation and occupation to continue.

The apparent absence of evidence may lie in the nature of the archaeology and the kinds of occupation which occurred in the Iron Age in the south-west uplands, and the likelihood that early excavators may not have retrieved small sherds of Iron Age pottery (H. Quinnell, pers comm.). The nearest comparable excavated sites of the period are at Gold Park (Gibson 1992), Kestor (Fox 1954a; 1954b) and Shaugh Moor (Wainwright and Smith 1980), all on Dartmoor. Two hut circles at Kestor were excavated in the 1950s. The larger one, inside

Table 6 Site 9, Bronze Age and Iron Age postholes

Context	*Width*	*Length*	*Depth*	*Diameter*	*Comments*
[218]	*	*	0.25m	0.4m	Steep-sided, circular posthole filled by a dark silty clay loam deposit [219]. Contained Iron Age pottery.
[220]	*	*	0.1m	0.4m	Steep-sided, oval posthole filled by a dark silty clay loam deposit [221].
[222]	*	*	0.12m	0.3m	Shallow, steep-sided, circular posthole filled by a dark silty clay loam deposit [223]. Contained Bronze Age pottery.
[224]	*	*	0.7m	0.65m	Steep-sided, oval posthole filled by a dark silty clay loam deposit [225]. Contained 1 worked stone. A Bronze Age radiocarbon date was obtained from its fill, 2987±30 BP, 1380–1120 cal BC (OxA-13380).
[226]	0.6m	0.8m	0.6m	*	Steep-sided, sub-rectangular posthole filled by a dark silty clay loam deposit [227]. Contained Iron Age pottery. An Iron Age radiocarbon date was obtained from its fill, 2118±28 BP, 350–40 cal BC (OxA-13383).
[228]	*	*	0.05m	0.3m	Steep-sided, shallow posthole filled by a dark silty clay loam deposit [229]. Contained Bronze Age and Iron Age pottery.
[230]	0.38m	0.5m	0.2m	*	Steep-sided, oval posthole filled by a dark silty clay loam deposit [231]. Contained Iron Age pottery.
[232]	*	*	0.14m	0.18m	Shallow, steep-sided, circular posthole filled by a dark silty clay loam deposit [233].
[234]	*	*	0.36m	0.6m	Steep-sided, circular posthole filled by a dark silty clay loam deposit [235]. Contained Iron Age pottery.
[236]	0.36m	0.4m	0.2m	*	Steep-sided, oval posthole filled by a dark silty clay loam deposit [237]. Contained sherds of Iron Age pottery and a flint.
[238]	*	*	0.28m	0.6m	Steep-sided, circular posthole filled by a dark silty clay loam deposit [239]. Contained sherds of Bronze Age pottery and a worked stone. An Iron Age radiocarbon date was obtained from its fill, 2183±29 BP, 370–160 cal BC (OxA-13382).
[240]	0.3m	0.5m	0.2m	*	Steep-sided, oval shaped posthole filled by a dark silty clay loam deposit [241].
[250]	*	*	0.2m	0.4m	Steep-sided, circular posthole filled by a dark silty clay loam deposit [251]. Stone packing around the sides.
[252]	0.4m	0.45m	0.44m	*	Steep-sided, oval shaped posthole filled by a dark silty clay loam deposit [253]. Contained Iron Age pottery.
[254]	0.3m	0.35m	0.13m	*	Shallow, square posthole filled by a dark silty clay loam deposit [255]. Stone packing around the sides.
[256]	0.2m	0.3m	0.28m	*	Steep-sided posthole filled by a dark silty clay loam deposit [257]. Contained 1 sherd of Bronze Age pottery.
[258]	0.26m	0.4m	0.35m	*	Steep-sided, oval posthole filled by a dark silty clay loam deposit. A Bronze Age radiocarbon date was obtained, 3127±31 BP, 1490–1310 cal BC (OxA-13381).

a pound, contained ironworking debris and a small amount of Iron Age pottery (Fox 1954a, 95– 96), together with an irregular setting of postholes and a central drain. The excavator interpreted these features as contemporary with the construction of the roundhouse but recent studies of the pottery indicate that the ceramic assemblage includes Trevisker Ware (H Quinnell, pers comm), indicating that the postholes and drain represent Iron Age reuse of an earlier Bronze Age building. Structurally, the Kestor structure has some interesting parallels with Stannon site 9 and it is possible that it too was associated with seasonal occupation. However, it is also possible that the metalworking activity dates to the medieval period and that this phase of reuse of the Kestor structure was much later than that of site 9 (H. Quinnell, pers comm).

Iron Age activity was also found within the Bronze Age settlement and enclosure on Shaugh Moor. Charcoal from the drain fill of house 19 gave a Late Bronze or Early Iron Age radiocarbon determination of 2640±70 BP, 960–540 cal BC (HAR-2978); Middle Iron Age pottery, a rotary quern and spindle whorls were also recovered from a reused Bronze Age roundhouse (Wainwright and Smith 1980, 87–89). At Gold Park a circular wooden

structure dated to the Middle Iron Age was found beneath a later stone built building. The earlier building had similar dimensions to the wooden structure at site 9 and consisted of a simple post-ring. Three radiocarbon determinations indicated that the wooden phase of the structure dated between 350–10 cal BC. The excavator suggested that the inhabitants were probably exploiting seasonal grazing on the moors (Gibson 1992, 43).

On Dartmoor, therefore, there is some limited evidence for the construction of wooden structures and reuse of Bronze Age roundhouses during the Iron Age. It has been argued that these occupations were associated with seasonal exploitation of the moor by lowland communities (for example, Quinnell 1994). The structure within Stannon site 9 was not built within a Bronze Age roundhouse but instead within a ring cairn. However, given the similarities between the site 9 structure and those on Dartmoor it seems probable that this too was used on a seasonal or occasional basis.

The medieval landscape (AD 410–1600)

The medieval settlement of Stannon, first recorded in 1401, was located to the south of the investigated area on the present southern fringe of the china clay works (Fig 2). A substantial perimeter boundary is also likely to be of medieval origin and to have defined the associated landholding (Rose above). One of the boundaries (boundary 4) was sectioned as part of the excavations (Fig 20). This was found to be a stone-faced earth and stone wall, which had two identifiable phases of construction. The primary phase consisted of a low earthen bank 0.3m high and 0.6m wide ([11], [12] and [13]), capped with small stones. This boundary was sealed beneath a substantial deposit of peaty soil [8] and is likely to have been prehistoric in origin. The second phase ([3]) occurred after the original boundary had become buried by peat. It seems to have been marked by the dumping of a clay loam core layer on top of the earlier boundary, to which stone facing was added on both sides. In places this facing formed a herringbone pattern; this style of facing, sometimes referred to as 'Jack-over-Jill' or 'kersey-way', is relatively widespread on post-medieval Cornish hedges. This evidence for renewal of the boundary is significant because it indicates that earlier, probably prehistoric boundaries continued to influence the division of the landscape in later periods.

A medieval cropping unit divided into strips by low banks is found on the Northern Downs and there are further strips to the south of the Bronze Age settlement. The later field system was initially interpreted as a Bronze Age field system (Mercer 1970, fig 6), but has been reinterpreted in the light of detailed survey (Johnson and Rose 1994; Rose above). These features are likely to have been associated with occasional episodes of cultivation rather than prolonged arable use.

Much of the evidence for activity in the medieval period came in the form of artefacts. The earliest of these was a small post-Roman blue glass bead from a deposit postdating the cairn on site 11 (Hunter below). The find was not associated with the use of the cairn but interestingly hints that the area continued to be used into the post-Roman period. The paucity of settlement or artefactual evidence might suggest that this use was of a similar seasonal or occasional nature to that of the Iron Age. Most of the artefacts recovered were medieval ceramics. These were not associated with particular structures or features (Thorpe below) and were located to the south of sites 6 and 2; the majority are likely to have been deposited as manuring material during intermittent attempts to cultivate the area during the thirteenth to fourteenth centuries. This suggests that intensive post-prehistoric cultivation was confined to a relatively narrow period of time and post-medieval agriculture did not have a major impact upon the prehistoric archaeology.

Discussion

Understanding of the medieval archaeology was not greatly enhanced by the excavations. The glass bead constitutes the only evidence from the earlier part of the period and is likely to be a chance loss during the post-Roman period. This lack of information may be a consequence of the relatively small areas excavated but could equally be due to the nature of activity on the Moor at this period, perhaps continuing the predominantly seasonal and pastoral occupation of the Iron Age and leaving little trace in the archaeological record.

Stannon was first recorded in the early fifteenth century but is likely to be earlier and was probably part of the medieval expansion of settlements onto the Moor in the twelfth to fourteenth centuries (Johnson and Rose 1994). The field boundaries and strip

divisions which have been recorded almost certainly date to this period. The ceramic evidence supports this picture, with the bulk of the medieval pottery dating to between the mid thirteenth and fifteenth centuries (Thorpe below). The later medieval settlement is likely to have been fairly marginal in character for, as has been noted, much of the enclosed area was only suitable for rough grazing; cultivation is likely to have been intermittent and small-scale. The relatively minor impact of medieval occupation on the landscape in the study area is demonstrated by the well-preserved upstanding prehistoric remains which survived within the perimeter of the medieval settlement boundary.

Charred plant remains

Julie Jones

The environmental sampling strategy employed at Stannon Down involved the collection of bulk samples from well-sealed deposits for the recovery of charred plant remains and charcoal. For the 1998 excavation this involved sampling contexts associated with sites 6 and 2 and in 1999 the recovery of samples from layers associated with sites 3, 9, 10, 11 and 15. The aim of the sampling strategy was to obtain environmental evidence concerned with economic activities at the site as well as providing suitable material for radiocarbon dating.

The samples were flotation sieved with a 250 micron mesh used to retain the float and 500 micron mesh for the residues. As the assemblages recovered were all charred the flots and residues were dried before examination. The bulk of many of the flots was composed of matted roots which were carefully teased apart to remove any charred material present. The flots were assessed by the author by means of a binocular microscope under low-powered magnification. In view of the low abundance of charred plant macrofossils preserved in the sampled deposits no further analysis was recommended. However, plant remains were recorded during the assessment in samples from sites 2, 6 and 9 and these are shown in Table 7.

Results

Site 2

Posthole fills [7], [12], [17], [19] and [21] included occasional barley (*Hordeum*), indeterminate cereal grain and charred hazel (*Corylus avellana*) nut fragments, with only occasional hazel nut fragments in fill [33]. Two layers were also sampled from the cairn: layer [24] contained three hazelnut fragments and one barley grain, with two barley grains from layer [10]. From pit [13] the fill [14] contained occasional hazelnut fragments and context [15] three poorly preserved barley grains. There were also occasional hazelnut fragments in the fill [31] of pit [30]. Hazel charcoal was also common in all sampled deposits.

Site 6

One of the layers sampled from the ring cairn [64] had a single poorly preserved barley grain. Context [89] in the cairn wall included occasional hazel fragments. One of the postholes [53] within the cairn also included hazel charcoal.

Site 9

Samples were taken associated with various phases of activity. Phase 1 was associated with the laying out of the ring cairn and the presence of hazel and oak charcoal from this phase may have been associated with the early clearance of the site. One layer [213] included four hazelnut fragments. During phase 2, the banks and ditches of the cairn were laid out, with layer [204] from this phase containing one fragmented heath-grass (*Danthonia decumbens*) and three sedges (*Carex*); these may have been the charred remains of local heathland vegetation. The site appears to have been reused during the Iron Age. Predominantly oak and hazel charcoal were recovered from layers of this phase, although these were not associated with hearths. The only macrofossils recovered were one wheat (*Triticum*) grain and three grass (Poaceae) caryopses from context [237] and one lesser spearwort (*Ranunculus flammula*) and one cinquefoil (*Potentilla*) from [215]. These samples also included gorse (*Ulex*) or broom (*Cytisus*) charcoal and may indicate burning of local moorland vegetation.

Conclusion

Assessment of the bulk environmental samples from the 1998 and 1999 excavations at Stannon showed variable preservation of charred plant remains. Of the 45 samples taken during 1998, 22% of the flots were discarded; 53% of the 109 samples from 1999

were discarded as no charred material was present. Overall only 17 samples included charred plant macrofossils (Table 7).

The quantities of charred plant macrofossils recorded from the bulk samples were also very low. Most of the samples associated with the Early Bronze Age ring cairns (cairns 2 and 6) included occasional charred hazel nut fragments with rare barley grains. The few barley grains recorded were in poor condition due to fragmentation; in the few better-preserved examples, the small size of the grain was noted, being <0.5cm and reminiscent of tail grain.

Charred hazelnut fragments were also associated with the earliest phase of activity at site 9. The only wheat grain recorded from the project was from the later Iron Age re-use of the site (context [237]). Charred examples of grass, sedge and cinquefoil and in particular heath-grass could all represent burning of local moorland vegetation. Heath-grass is a densely tufted perennial of sandy or peaty, often damp soils, usually in acid conditions such as on moors and heaths. Damp conditions would also have been ideal for the lesser spearwort found in [215]. It seems likely that local heath vegetation was used as fuel and the presence of broom/gorse charcoal would tend to confirm this. The pollen study (Tinsley below) suggests an increase of grass and heathland species from the Middle Bronze Age, likely to be from clearance of the earlier climax oak and hazel woodland, and this ties in well with the limited evidence for heathland species provided by the charred plant remains.

Interpretation of the cereal remains associated with the cairns is difficult due to their sparsity in the samples. Those few cereal grains present are likely to

Table 7 Charred plant remains

Sample	*Context*	*Feature*	*Sample size (kg/litres)*	*Size of float (ml)*	*Charred plant remains*
Site 2					
1011	7	Posthole 6	19/19	140	Occasional *Corylus avellana* (hazel) nut fragments 1 cereal indet (grain)
1014	12	Posthole 11	11.2/9.7	85	1 cereal indet – small fragment only 1 *Hordeum* sp (grain) 2 fragments *Hordeum* sp Small grain size (cf tail grain)
1017	17	Posthole 16	8.6/6.6	320	1 cf *Hordeum* sp (grain) – barley 1 *Corylus avellana* (hazel) nut fragment
1019	19	Posthole 18	0.9/1	5	1 *Corylus avellana* (hazel) nut fragment
1024	21	Posthole 20	0.6/0.5	25	1 *Corylus avellana* (hazel) nut fragment
1035	33	Posthole 32	4.7/5	28	Occasional *Corylus avellana* (hazel) nut fragments
1026	24	layer	60.2/57	140	3 *Corylus avellana* (hazel) nut fragments 1 *Hordeum* sp (grain) – barley
1043	10	layer	63.4/	180	2 *Hordeum* sp (grain) – barley
1016	14	Pit 13	131/95.7	1730	Occasional *Corylus avellana* (hazel) nut fragments
1018	15	Pit 13	5.6/4.8	220	3 cf *Hordeum* sp (grain) – barley.
1033	31	Pit 30	24/24	3300	Occasional *Corylus avellana* (hazel) nut fragments
Site 6					
1012	64	layer	5.9/6.7	175	cf *Hordeum* sp (grain) – barley – poor condition
1036	89	wall	1.9/1.9	30	Occasional *Corylus avellana* (hazel) nut fragments

Sample	*Context*	*Feature*	*Size of float (ml)*	*Charred plant remains*
Site 9				
Phase 1				
1106	213	layer	130	4 *Corylus avellana* (hazel)
Phase 2				
1067	204	layer	600	1 fragmented *Danthonia decumbens* (heath-grass) 3 *Carex* (sedge)
Phase 4				
1081	237	layer	240	1 *Triticum* (grain) wheat 3 Poaceae (grass)
1088	215	layer	370	1 *Ranunculus flammula* (lesser spearwort) 1 *Potentilla* (cinquefoil)

represent chance burning on fires, but evidence for food preparation cannot be confirmed. However, the upland location of the site makes it likely that the cereals were cultivated elsewhere, with perhaps processed cereals or indeed food offerings brought to these sites as part of their ceremonial or religious function. Similarly the charred hazelnuts could have been food remains but their association with hazel charcoal make it seem more likely that they originated from branches of hazel with nuts still attached. Much of the charred debris from the samples was charcoal which Rowena Gale suggests originated from the ceremonial use of fire or debris from hearths for heating.

The charcoal

Rowena Gale

During the 1998 and 1999 excavations environmental samples were collected from cairns 2, 6, 9, 10, 11 and 15 and a house on site 3. Charcoal was recovered from a good proportion of the samples, although often the quantity was insufficient or too comminuted to warrant identification, particularly from sites 3, 10, 11 and 15. Twelve samples were selected for full analysis from securely phased contexts from sites 2, 6 and 9, and a single unphased sample from site 11 for dating purposes.

This report includes the analysis of charcoal from contexts associated with sites 2, 6, 9 and 11. Although the charcoal was poorly preserved, its analysis was potentially important to provide suitable material for radiocarbon dating and to obtain environmental evidence for a period when the character of the landscape was undergoing considerable change. The origin of the charcoal from the early use of the cairns is unknown, although the evidence suggests either ceremonial use of fire or charcoal, or debris from hearths providing heating; the paucity of charred cereal remains implies that food preparation is unlikely. The charcoal analysis also provided the opportunity to compare the range of wood species selected for fuel with their availability in the environment, as indicated by pollen analysis. Woodland management and the procurement of fuel are discussed.

Twelve samples of charcoal were selected for inclusion in this analysis on the basis of secure phasing and adequate quantity:

Site 2: Phase 1, 1 sample; Phase 2, 2 samples
Site 6: Phase 1, 1 sample; Phase 3, 1 sample
Site 9: Phase 1, 2 samples; Phase 2, 1 sample; Phase 4, 4 samples
Site 11: Single unphased sample

Methods

Bulk soil samples were processed by flotation and sieving using 250 micron and 500 micron meshes (J Jones 2003). The resulting flots and residues were scanned under low magnification and the charcoal separated from plant macrofossils. Charcoal fragments measuring >2mm in radial cross-section were considered for species identification. Sub-samples were examined from samples 1016 (25%) and 1095 (25%).

Although the samples examined were relatively large, the condition of the charcoal was generally poor. Intact radial segments of roundwood were relatively infrequent. Standard methods were used to prepare the samples for examination (Gale and Cutler 2000). The anatomical structures were examined using incident light on a Nikon Labophot-2 microscope at magnifications up to x400. The taxa identified were matched to prepared reference slides of modern wood. Where possible, the maturity of the wood was assessed – that is, whether heartwood or sapwood – and stem diameters were recorded. It should be noted that, when carbonized, stems may be reduced in volume by up to 40%.

Results

The taxa identified are discussed below. Classification follows Stace (1991). Group names are given when anatomical differences between related genera are too slight to allow secure identification to genus level. These include members of the Pomoideae (*Crataegus, Malus, Pyrus* and *Sorbus*) and Fabiaceae (*Ulex* and *Cytisus*). When a genus is represented by a single species in the British flora this is named as the most likely origin of the wood, given the provenance and period, but it should be noted that it is rarely possible to name individual species from wood features, and exotic species of trees and shrubs were introduced to Britain from an early period (Godwin 1956; Mitchell 1974). The anatomical structure of the charcoal was consistent with the following taxa or groups of taxa:

Betulaceae. *Alnus glutinosa* (L.) Gaertner, European alder; *Corylus avellana* L., hazel
cf Caprifoliaceae. *Sambucus* sp., elder

Fabaceae. *Cytisus scoparius* (L.) Link, broom and/or *Ulex* sp., gorse

Fagaceae. *Quercus* sp., oak

Rosaceae. Subfamilies:

Pomoideae, which includes *Crataegus* sp., hawthorn; *Malus* sp., apple;

Pyrus sp., pear; *Sorbus* spp., rowan, service tree and whitebeam. One or more taxa may be represented in the charcoal.

Prunoideae: *Prunus spinosa* L., blackthorn.

Site 2

Charcoal was examined from layer [4] of the phase 1 activity and posthole [6], fill [7], and pit [13], fill [14], from phase 2. Charcoal from fill [14] was extremely abundant (1730g). Oak (*Quercus* sp.) (mostly heartwood) predominated in all contexts. Hazel (*Corylus avellana*) was also common to each sample and, in both the posthole and pit, narrow roundwood up to 10mm in diameter was recorded. Member/s of the hawthorn/*Sorbus* group (Pomoideae) were sparsely present in contexts [4] and [14], and blackthorn (*Prunus spinosa*) in posthole [7].

Site 6

Charcoal was examined from wall context [89] associated with phase 1, and posthole [53], fill [65], from the ring of postholes inside the wall dated to phase 3. Charcoal from the wall [89] consisted entirely of oak (*Quercus* sp.) heartwood. In addition to oak heartwood and roundwood, posthole [53] also included hazel (*Corylus avellana*) (including roundwood).

Site 9

Charcoal was examined from layers associated with phases 1 [213] and [244], phase 2 [207] and phase 4 [215], [235] and [237].

The earliest phase involved the laying out of the ring cairn and it is feasible that clearance of scrub or woodland may have been necessary before work could begin. If this was achieved by burning, the event may have been recorded on the soil surface by a layer of charcoal, although there was no evidence to indicate localised scorching of the soil. Alternative origins worth considering could include ritual bonfires to 'cleanse' the site, initiation ceremonies prior to the construction of the cairn or, perhaps, a hearth for more profane purposes. Oak (*Quercus* sp.) and hazel (*Corylus avellana*) were recorded from context [213] in this early phase, with a broader range of taxa from a subsequent layer, [244], which included: hazel (*Corylus avellana*), oak (*Quercus* sp.), the hawthorn/*Sorbus* group (Pomoideae), blackthorn (*Prunus spinosa*), gorse (*Ulex* sp.) or broom (*Cytisus* sp.) and *cf* alder (*Alnus glutinosa*).

Banks and ditches were constructed during phase 2. Associated charcoal from layer [207] consisted of hazel (*Corylus avellana*) roundwood, oak (*Quercus* sp.) heartwood and gorse (*Ulex* sp.) and/or broom (*Cytisus* sp.).

Phase 4 relates to re-use of the site during the Iron Age. This appears to have occurred at a time when settlements had moved to more hospitable areas around the fringes of the Moor, leaving upland areas for sheep grazing (Quinnell 1994). It has been suggested that site 9 may have served as a seasonal shelter. Although hearth features were not recorded within the structure, substantial quantities of charcoal were collected from several layers. The charcoal from layers [215], [235] and [237] consisted predominantly of oak (*Quercus* sp.), both roundwood and heartwood, but also included hazel (*Corylus avellana*), alder (*Alnus glutinosa*), the hawthorn/*Sorbus* group (Pomoideae), blackthorn (*Prunus spinosa*), gorse (*Ulex* sp.) and/or broom (*Cytisus* sp.) and *cf* elder (*Sambucus* sp.).

Site 11

Charcoal was very sparse and mostly occurred in contexts of uncertain phasing. Charcoal from context [106], an unphased layer, was examined to provide material for dating. The taxa identified included oak (*Quercus* sp.) heartwood and roundwood, and twiggy material from blackthorn (*Prunus spinosa*), the hawthorn/*Sorbus* group (Pomoideae) and gorse (*Ulex* sp.) or broom (*Cytisus* sp.).

Discussion

The charcoal from the Early Bronze Age contexts appears to have derived from activities in or around

the excavated cairns. Charred cereals were absent or sparse and there was no obvious surviving evidence of food preparation. Although occasional hazelnut shells were recorded from cairns 2, 6 and 9 (J Jones above), which could represent food remains, these could equally well have originated from the use of hazel branches as fuel, with leaves and nuts attached. If the latter, this would be indicative of 'burning events' in the late summer or early autumn.

The charcoal appears to have originated either with the use of fire for ceremonial purposes or as a heat source, although deposits from phase 1 at site 9 may have involved burning off scrub or tree stumps. The lack of evidence for *in situ* burning on the cairn structures could suggest that wood was burnt off site and the charcoal redeposited at the cairn, that fires burnt on the cairns were too short-lived to cause scorching, or that evidence of *in situ* burning was subsequently lost through weathering or stone robbing. It is also possible that the charcoal itself had some ritualistic application and was scattered at propitious places.

Knowledge of tree veneration in Europe in the prehistoric period is scanty; while some early literature refers to ritual uses for certain trees (for example, Tacitus' *Germania* 2–7; Piggot 1968), this mainly refers to the Iron Age. Recent discoveries, however, of well preserved wood-henges, notably the Bronze Age wood circle at Holne Sands, Norfolk (Brennand and Taylor 2003), are contributing to the growing corpus of evidence of tree worship in earlier periods. While it is possible that species selection based on sacred trees or species may be relevant at the cairn structures at Stannon Down, the evidence available is insufficient to substantiate this suggestion and the general use of multiple species tends to suggest otherwise.

The taxa identified from cairns 2, 6 and the earliest phase of site 9 indicate the predominant use of oak (*Quercus* sp.) and hazel (*Corylus avellana*), with occasional use of shrubby species such as blackthorn (*Prunus spinosa*) and the hawthorn/*Sorbus* group (Pomoideae). In site 6, charcoal from the wall context [89] was identified as exclusively oak. The significance of the latter (if any) is difficult to determine, especially as charred hazelnut shell was recorded from the same sample. In contrast, a greater use of shrubby species, including gorse (*Ulex* sp.) and/or broom (*Cytisus* sp.) and *cf* alder (*Alnus glutinosa*), was recorded from phases 1 and 2 at site 9. The similarity of these deposits to those of the Iron Age occupation of site 9, which also included *cf* elder *(Sambucus sp.),* may be attributable to material redeposited during the considerable disturbance to the structure in the Iron Age. Also, since it is probable that these species reflect the character of the contemporary woodland environment (see below) rather than the preferential selection of species, a later use for this cairn may be inferred.

Environmental evidence

The cairn complex was located on a small terrace on elevated ground. Pollen analysis indicates that prior to the onset of peat formation in the Neolithic, climax woodland consisted of oak and hazel (Tinsley below). Wetter conditions on the lower ground encouraged the growth of alder carr, although oak and hazel probably persisted into the Bronze Age on higher terrain. By the Middle Bronze Age the environment was more open and supported predominantly grassland and moorland species, including heather.

Evidence from the charcoal supports the palynological evidence and it is probable that oak-hazel woodland existed on the elevated ground on which the Early Bronze Age cairns were built. The frequency of hazelnut shells in the deposits suggests that at least some of the hazel grew in open or sunlit situations to enable fruiting. It is not known whether the cairns were constructed in clearings or if the surrounding land was cleared of woodland. In view of the ready availability of both oak and hazel, it could be argued that the former seems the most likely, although the monuments and associated activities would not have been so visible if enclosed by trees. For such a large complex of ceremonial structures to have been built here, it is possible that the site and its environment were of particular significance and individual trees or groves may have been sacred. Despite the abundance of alder in the region, it was not recorded in the charcoal deposits. Oak and hazel were probably more easily obtained and were plentiful enough to sustain the needs of the cairn users.

The increased use of shrubby species, particularly gorse (*Ulex* sp.) or broom (*Cytisus* sp.), in the Iron Age conforms to the development of heathland suggested by the pollen record, although oak (*Quercus* sp.) and hazel (*Corylus avellana*) still appear to have formed the dominant woodland cover.

The oak charcoal included a mixture of both narrow roundwood and wider roundwood or

largewood. A high proportion of the hazel derived from relatively narrow roundwood, measuring up to 15mm in (charred) diameter. Growth rates were mostly moderate, although occasional pieces of oak were indicative of stressed conditions. There was no evidence to suggest the use of coppiced wood and thus woodland may not have been managed during the Early Bronze Age. Narrow stems and branches would have been easier to cut and carry and would also have ignited more readily than largewood.

Conclusion

Charcoal associated with activities at the Early Bronze Age ceremonial cairns (2, 6 and 9) indicated the predominant use of oak (*Quercus* sp.) and hazel (*Corylus avellana*). The origin of the charcoal is unknown and there was no evidence of hearths or *in situ* burning and scarcely any food debris (for example charred cereals or animal bones). A ritual origin for the charcoal seems the most plausible explanation, perhaps from beacons or other ceremonial events, although bonfires for land clearance or merely for keeping the attendant communicants warm are also possible. On site 9, charcoal from deposits associated with the re-use of the structure during the Iron Age is more likely to relate to domestic or heating activities. Although oak (*Quercus* sp.) and hazel (*Corylus avellana*) still formed the main components of the fuel, greater use was made of shrubby species, especially gorse (*Ulex* sp.) or broom (*Cytisus* sp.).

The results of the charcoal analysis correlate closely with those of the pollen study, which demonstrate that during the Early Bronze Age oak and hazel formed the climax woodland on higher, drier ground, whereas the damper soils in low lying areas supported dense alder carr. By the Middle Bronze Age, the widespread increase of grasses and heathland species indicates major land clearance. The greater frequency of shrubby species, including gorse, in the Iron Age charcoal supports this evidence and suggests that the species selection was related to availability. Although the charcoal included a large proportion of roundwood, there was no evidence to suggest woodland management.

Soil micromorphological analysis

Gianna Ayala

This report presents the micromorphological analysis of the buried soil sequence from beneath site 2, exposed during excavation and sampled during geoarchaeological assessment by Dr J Heathcote in 1998. The profile was interpreted in the field as a humus-iron pan stagnopodzol (horizons I-VIII) (Avery 1990). During assessment there were

Table 8 The buried soil sequence beneath site 2

Layer no.	*Depth (cm)*	*Description*	*Interpretation*
		cairn construction stones	
	0	sharp boundary	
I		black, well humified peat; frequent fine roots	OH
	10	graded boundary	
II		very dark brown (10 YR 2/2), organic coarse sandy loam, frequent fine roots	Ah
	18	graded boundary	
III		dark greyish brown (7.5 YR 4/2), coarse sandy loam	E
	28	graded boundary	
IV		dark brown (10 YR 3/3), coarse sandy loam	Bh
	34	graded boundary	
V		coarse sandy silt loam, heterogenous mixture of dark brown (7.5 YR 3/4), very dark brown and yellow (sandy clay loam)	Bfe
	44	graded boundary	
VI		black, coarse sandy loam with fibrous organic material, stone-free with 0.5 cm thick, pinkish grey lens (7.5 YR 6/2) at 47cm	Bh_2
	50	sharp boundary	
VII		greyish brown (7.5 YR 6/2), hard, brittle iron pan (up to 1cm thick)	Bf
	51+	sharp boundary	
VIII		'rab'; reddish yellow (7.5 YR 6/6) coarse sandy clay with abundant weathered granite fragments	C

Table 9 Summary of the major micromorphological features of the Stannon Down soil sequence

Sample	*Fabric type (Horizon)*	*Micro-structure & porosity*	*C/F ratio & related distribution*	*Coarse fraction description*	*Micromass description (CPL)*	*Major pedofeatures*
1	OH	spongy, vughs & channels	1/4; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase and rare biotite	dark brown silt with organic staining; very slight stiple speckled	few typic iron nodules, abundant excrement with associated organic material
2	Ah	spongy, vughs & channels	1/2; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase and rare biotite	dark brown silty clay with organic staining; slightly stiple speckled	few typic iron nodules, abundant excrement with associated organic material
3	E	crumb to moderately blocky structure; vughs & channels	1/2; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase	brown silty clay with some organic staining; slightly stiple speckled	predominantly typic and aggregate iron nodules, abundant excrement
4	Bh	crumb to fairly blocky; vughs & channels	1/2; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase	dark brown silty clay with organic staining; slightly stiple speckled	predominantly typic and aggregate iron nodules, some geotite nodules, iron hypocoatings of pores, abundant excrement
5	Bfe	crumb; vughs & channels	1/2; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase	yellow silty clay; stiple speckled	predominantly typic and aggregate iron nodules, some geotite nodules, iron hypocoatings of pores and few silty clay coatings, abundant excrement
6	Bh2	spongy; vughs & channels	1/2; single spaced porphyric	predominantly quartz and mica, with frequent plagioclase	dark brown silty clay with organic staining; stiple speckled	predominantly typic and aggregate iron nodules, some geotite nodules, iron hypocoatings of pores, abundant excrement

certain characteristics which were not immediately explicable. These features were in the lower horizons and led to the sampling of the profile for further analysis.

The principal research question was whether the soil sequence documented under site 2 was representative of one soil or two that had developed sequentially. This would have an impact on reconstructing the environmental development of the area.

Methods

A column of five overlapping, oriented monolith samples was taken through horizons I-VIII in metal Kubiena tins for soil micromorphological analysis. The samples were then air-dried, impregnated with resin and thin sectioned to provide a continuous sequence.

The thin sections were analysed with a polarising microscope at magnifications from ×4 to ×100 and described (Table 8).

Results

The soil sequence in thin section confirmed the characteristics observed in the field interpretation. The five thin sections covered horizons I-VI, from the overlying peat layer to above the iron pan (Table 8). In thin section the soil horizons appeared to confirm the development of a single humus-iron pan stagnopodzol soil sequence (Avery 1990) rather than two.

The possibility of there being two soils which had developed one on top of the other was addressed in the analysis of the profile as a whole and specifically the characteristics of horizon VI. In the field, it was

unclear if this horizon was the Bh horizon or a buried Ah horizon of an earlier soil. In thin section it was discernible that it was a Bh horizon in two ways. One was the graded boundary between the two horizons, which would suggest a development of one out of the other, and the other was the coating of sand grains with amorphous humified material in this horizon. This would indicate that the horizon was dark in colour and rich in organic material due to the downward movement of this material from the upper layers of the profile. If instead it had been a buried Ah horizon, it would mean that the organic material had accumulated upon an older land surface that had with time been truncated and sealed by the later soil. In thin section this is obviously not the case, since an Ah horizon would not have this tendency to coat the individual grains in the way that they appear in thin section.

It is important to note that the present soil type distribution for this area (Staines 1976) is therefore similar to that of the later prehistoric period. This, together with the presence of ferruginous pedofeatures infilling the current pores rather than the matrix of the soil acting as a clast, suggests that the present climate is similar to that of later prehistory.

Roots and excrement were visible throughout the sequence, which would indicate that the sequence has been moderately to highly bioturbated. This may have implications for the environmental samples taken for pollen analysis.

Discussion

The development of a humus-iron pan stagnogley indicates a very humid environment that would encourage the leaching of fine humus and ferruginous material down profile. The characteristic formation of an iron pan at depth in this type of soil profile suggests periods of water table fluctuation and limited waterlogging; this would have caused the segregation of leached iron creating a cemented layer or iron pan (Avery 1990).

The formation of this type of acidic soil on the underlying granite substrate could be seen as an indication of soil deterioration prior to the formation of the overlying peat (Gearey *et al* 2000b, 505). However, it is important to note that the lack of gley characteristics in both macro and microscopic analysis of all horizons of the soil profile indicates that the formation of the iron pan or rise in water table was not the cause of the formation of the overlying peat. Instead, it would seem more probable that the formation of the peat which occurred prior to the construction of the Bronze Age cairn was in some way related to climatic deterioration and/or human deforestation of the area. The pollen analysis at Stannon Down confirms the trend of increased wetness with an expansion of alder woodland through the Mesolithic and Early Neolithic periods (Tinsley below). Elsewhere on Bodmin Moor, slight clearance has been noted as early as the Neolithic (Gearey 2000b, 502), while on Stannon Down clear indication of clearance of the area occurs in the Middle Bronze Age (Tinsley 2000). Further palaeo-environmental investigation and the dating of the peat sequence would be necessary to verify either hypothesis.

Conclusions

The analysis of the micromorphology samples has confirmed the field interpretation of the type of soil and pedogenic environment of the pre-Bronze Age Stannon Down. We can infer with the formation of a humus-iron pan stagnopodzol that the climatic environment was similar to the present day with an increase of soil moisture and acidity taking place with deforestation. This encouraged the formation of a peat layer that maintained the open vegetation that was present during the Bronze Age. The initial cause of deforestation, whether through human or climatic agency, needs to be further investigated.

Pollen analysis

Heather Tinsley

Pollen analysis was carried out at a number of locations on Stannon Down, in association with the programme of excavation. Two of the locations were directly linked to excavations of ceremonial cairns. At site 2, two separate sample sequences were collected for pollen analysis; one was from within the area of the cairn and came from a buried soil below the monument, the second was from an undisturbed peat developed on a podsolised sub-peat soil immediately adjacent to the cairn. Initial assessment established that pollen was well preserved in both sequences. At site 9 two circular ditches containing loamy sedimentary fills were sealed by a peat soil. Assessment established that pollen was generally less well preserved in these fills than in the site 2

sequences, but it was considered that full analysis from the outer ditch, which was better sealed than the inner, was worthwhile. Both sites 2 and 9 have been interpreted as dating from the Early Bronze Age, with reuse of site 9 during the Iron Age.

In contrast to these on-site locations associated directly with monuments, assessment of the potential for pollen analysis was also undertaken at two off-site locations on the north-eastern edge of the Northern Downs evaluation area, down-slope from the group of cairns and standing stones. Both sites lie in a shallow valley between Stannon Down and Roughtor Moors where topogenous peat has accumulated. The deepest deposits were found at site 87 (SX 1386 8089), where 1.73m of wet and moderately-humified peat was recorded, overlying gravelly rab. This site was sampled using a 25mm diameter peat borer. Some 80m away at site 86 (SX 1382 8092), 0.95m of predominantly well-humified peat was exposed in a stream cut; the peat had accumulated on top of a gritty soil with *in situ* tree roots; 500mm steel monolith tins were used to sample this section.

Assessment from both sites established that pollen was well preserved, but it appeared that the longer pollen record occurred in the shallower peat at site 86 (Tinsley 2000). This was confirmed by radiocarbon dating: the initiation of peat development at site 86 is dated to 5610–5370 cal BC, 6529 ± 40 BP (SUERC-3623), whereas at site 87 the earliest peat dated to 4358–4047 cal BC, 5420±60 BP (Wk-8499) (Table 24). The peat at site 86 continued to form, apparently undisturbed, until the early medieval period (see below). In view of the longer pollen record and the availability of more substantial samples for further radiocarbon dating, site 86 was selected as suitable for an off-site pollen diagram spanning the period of Bronze Age monument building and settlement at Stannon Down, potentially allowing that activity to be placed in its environmental context.

The pattern of Holocene vegetation change on Bodmin Moor, and its relationship to the activities of different prehistoric groups, has previously been investigated by Gearey (1996), Gearey and Charman (1996) and Gearey *et al* (2000a; 2000b). These authors present dated pollen diagrams from a number of sites in the Rough Tor area, as well as from sites on the east side of Bodmin Moor. Their work provides an invaluable palaeoecological framework in which to view the data discussed in this report.

Sampling and stratigraphy

Field descriptions were taken at all sites. Samples were collected in tins (plastic gutters in the case of the cores from site 87) and taken to the Environmental Archaeology Laboratory at Bristol University where the detailed stratigraphy was described. Sub-samples for pollen analysis consisting of 5ml of sediment were extracted; the majority of sub-samples were 10mm deep.

Site 86 Topogenous peat section

On the north-eastern edge of Stannon Down, a small stream flows through the shallow valley which separates this area from Roughtor Moors, draining the intervening saddle. The stream, which is currently little more than a drainage ditch, has been straightened and deepened and flows into an artificially cut leat. At site 86 the stream had cut a peat face some 950mm deep and at the base of the face a gritty, organic, sub-peat soil was exposed with *in situ* tree roots. Two metres from the pollen sampling site the end of a piece of timber protruded from the peat face at around 500mm below the modern ground surface. Two 500mm steel monolith tins were used to sample the section and a third tin was used to take a horizontal sample from the junction between the peat and the underlying soil in order to obtain sufficient material to get a radiocarbon date from the soil surface. Sub-samples for pollen analysis were taken at the depths indicated in Table 10. The sampling strategy was governed initially by stratigraphic considerations; seven samples were assessed (samples marked * in Table 10) and subsequently four critical horizons were radiocarbon dated (Tinsley 2000). Following receipt of these dates, full pollen analysis was undertaken, 14 further samples were inserted, concentrating particularly on the horizons likely to date from the Bronze Age, and a further four radiocarbon dates were obtained.

Site 2

The excavations at this site revealed that immediately outside the area of the cairn stones, beneath the modern ground surface, 330mm of peat had developed on top of a podsolised sandy-loam; there was an iron pan at around 520mm with granite rab below. This was exposed on the east-facing section of the excavated trench. The peat appeared

Table 10 Stratigraphy and sub-sampling at site 86 (* denotes samples assessed). Details of laboratory codes, radiocarbon ages (BP) and the material dated in each sample are shown in Table 24.

Depth mm	*Stratigraphy and soil horizon*	*Sub-samples mm*	*Radiocarbon date*
0–20	Brown, poorly-humified herbaceous peat		
20–195	Very dark brown, well-humified herbaceous peat, with modern roots, cracked and disturbed		
195–355	Black, homogenous well-humified herbaceous peat	230–240*	cal AD 650–980
		305–315	
		345–355	
355–440	Very dark brown, moderately-humified herbaceous peat	380–390*	
		400–410	520–380 cal BC
		410–420	
440–615	Black, homogenous very well-humified herbaceous peat	440–450	
		460–470*	1520–1210 cal BC
		480–490	
		500–510	
		520–530	
		540–550	1260–1000 cal BC
		560–570	
		600–610	
		625–635	
			2010–1750 cal BC
615–700	Very dark brown, well-humified herbaceous peat with wood fragments	640–650	
		670–680*	
700–725	Very dark brown, very well-humified herbaceous peat	710–720	
725–745	Very dark brown, very well-humified herbaceous peat with fine sand and some gravel		
745–800	Black, very well-humified herbaceous peat with wood remains		
		780–790*	4320–3970 cal BC
800–885	Black, very well-humified herbaceous peat		
885–915	Black, moderately-humified fibrous peat	895–905*	
		910–920	5610–5370 cal BC
915–950	Very dark grey, organic, coarse sandy-loam with roots	920–930*	6160–5800 cal BC

undisturbed; it could be traced laterally up to the cairn and had grown up around some of the structural stones. A 500mm steel monolith tin was used to sample the sequence. Pollen sub-samples were taken at the depths indicated in Table 11.

From field observations of the excavated section beneath site 2 (south-facing section of the excavation trench), it was apparent that the structural stones of the cairn lay on top of a well-sealed soil profile with the characteristics of a humus-iron pan stagnopodzol (Heathcote 2003). This was sampled for soil micromorphology and for pollen using two separate sequences of tins taken side-by-side. Two 200mm monolith tins and one Kubiena tin were used for the pollen sampling. The pollen sequence could therefore be directly related to the results of the micromorphological analysis of the buried soil described by Ayala above. The stratigraphy of this sequence is shown below using the terminology and the horizon interpretations of Ayala. Pollen sub-samples were taken at the depths indicated in Table 12.

Site 9

The fills of both the inner and outer ditches of this cairn were examined in the excavated sections in the field; both fills were overlaid by a layer of peaty topsoil which covered the site. Monoliths were removed from each of the ditch sections. However, the inner section was not as well sealed as the outer one, so pollen sampling was concentrated in the outer ditch at Cut [208]. Here 560mm of sediments were exposed from the modern ground surface to the base of the ditch. The fill and the base of the overlying peaty soil was sampled with a 500mm steel monolith tin overlapped with a 200mm tin. Pollen sub-samples were taken at the depths indicated in Table 13.

Laboratory methods

Samples were prepared using standard techniques (Moore *et al* 1991). Initial digestion in dilute potassium hydroxide was followed by sieving.

Table 11 Stratigraphy and sub-sampling from peat outside site 2

Depth mm	*Stratigraphy and soil horizon*	*Sub-samples mm*
0–40	Surface vegetation litter. L	
40–80	Mid-brown, poorly-humified herbaceous peat with modern roots. OH	70–80
80–220	Reddish-brown, moderately-humified herbaceous peat with modern roots. OH	130–140
220–330	Black, well-humified amorphous peat with modern roots.OH	230–240
		280–290
330–410	Very dark brown, organic, coarse sandy-loam. Ah	320–330
		390–400
410–480	Dark brown, organic, coarse sandy-loam. E	450–460
480–500	Black, coarse sandy-loam with fibrous organic material. Bh	490–500
500–520	Iron pan. Bfe	

Table 12 Stratigraphy and sub-sampling of the buried soil beneath site 2

Depth mm	*Stratigraphy and soil horizon*	*Sub-samples mm*
0–100	Black, well-humified peat; frequent fine roots. OH	70–80
100–180	Very dark brown, organic, coarse sandy-loam; frequent fine roots. Ah.	130–140
		150–160
180–280	Dark greyish-brown, coarse sandy-loam. E	190–200
		240–250
280–340	Dark brown, coarse sandy-loam. Bh	300–310
340–440	Coarse sandy-silt-loam, mottled dark brown, very dark brown and yellow. Bfe.	340–350
		400–410
440–500	Black, coarse sandy-loam. Bh_2	
500–510	Hard brittle iron pan. Bf	

Table 13 Stratigraphy and sub-sampling from the outer ditch, cut [208], site 9

Depth mm	*Stratigraphy and context*	*Sub-samples mm*
0–180	Black, very highly-humified amorphous peat. Contains frequent quartz grains.	
	Some modern roots.	120–130
180–420	Dark brown, uniform, coarse sandy-loam. Some modern roots.	180–190
		230–240
		280–290
		330–340
		380–390
420–560	Dark brown, coarse sandy-clay-loam with larger stones from 480mm.	430–440
		480–490
		530–540

Sandy samples were treated with cold hydrofluoric acid for a week and then washed with hot 10% hydrochloric acid. All samples were acetolysed, stained with safranin and mounted in glycerol. Two tablets of *Lycopodium* spores were added to each sample at the start of the preparation to allow pollen concentration to be assessed (Stockmarr 1971). Samples were counted at a magnification of x400 with x1000 magnification used for critical determinations. The pollen sum was at least 500 land pollen grains per sample, in almost all cases. In the basal samples of the buried soil beneath site 2 this total could not be reached as pollen was scarce, and these samples were assessed only. Individual pollen sums are shown on the pollen diagrams. In addition to pollen, fern spores and occasional algal spores of the family Zygnemataceae (includes the filamentous green algae *Spirogyra* and *Mougeotia*) were counted. The abundance of microscopic charcoal particles greater than 30μm in length was estimated only; particles were counted on two traverses of each slide and the relative abundance per 5ml of sediment calculated with reference to recovered *Lycopodium* spores.

Plant nomenclature follows Stace (1991) and pollen types generally follow Bennett (1994). Zygnemataceae were identified according to illustrations in Van Geel and Grenfell (1996). Pollen

was identified using keys from Moore *et al* (1991) and Faegri and Iversen (1989), together with descriptions from Andrew (1984) and type collections.

Results

The results are presented in pollen diagrams drawn up using *Tilia* and *Tilia*-graph software (Grimm 1990). Pollen data are expressed as percentages of total land pollen (TLP). All taxa included in the pollen sum are shown as solid bars. Obligate aquatic taxa are expressed as percentages of total pollen plus aquatics (TPA). Fern and moss spores are expressed as percentages of total pollen plus spores (TPS). All taxa excluded from the pollen sum are shown on the diagrams as hollow bars. The pollen taxa are organised into ecological groups to aid in interpretation – trees, shrubs and climbers, anthropogenic herbs, herbs of acid grassland and heath plants, wetland herbs, etc. These groups are not exclusive; some pollen taxa include plants inhabiting a variety of ecological niches. The diagrams from each site have been zoned into a series of local pollen assemblage zones (LPAZs), specific to the individual site, on the basis of changes in the dominant taxa. The main characteristics of the individual LPAZs are described below and the possible relationships between them are discussed below.

Site 86 Topogenous peat section (Figs 24a, 24b)

The sediments at this site have accumulated slowly, with 930mm of peat forming over some 7000–8000 years. The resolution of the sampling was low in the basal section of the diagram as the aim was to concentrate effort on the period associated with Bronze Age activity. Even in the upper part of the diagram the resolution of sampling was not very high, given the time span which the sediments represent. The very top of the peat section, above 240mm, was not sampled for pollen analysis as it appeared extensively desiccated and disturbed. Pollen preservation was good throughout the sequence and pollen concentration was high, rising very markedly between 600 and 700mm, where peat accumulation appears to have been particularly slow.

ST86–1 Corylus-Quercus *LPAZ*

The earliest assemblage is found in the sub-peat soil and the basal samples from the overlying peat. It is dominated by tree pollen (83–94% TLP) principally *Corylus*-type (hazel), which falls from 65% TLP at the start of the zone to 33% TLP at the zone end, and *Quercus* (oak) (14–19% TLP). *Alnus* (alder) rises from 2–19% TLP and *Betula* (birch) forms around 10% TLP. *Pinus* (pine), *Ulmus* (elm), *Salix* (willow) and *Sorbus*-type (rowan) are present at <0.8% TLP. Values for herbaceous pollen are low, Poaceae (grasses) form <6% TLP, *Calluna vulgaris* (ling), *Succisa pratensis* (devil's-bit scabious), Lactuceae (dandelion and related Asteraceae) and *Plantago lanceolata* (ribwort plantain) are all present at <2% TLP. Pteropsida (undifferentiated) form 20–30% TPS; spores of *Pteridium* (bracken), Polypodiaceae (polypody fern), *Osmunda* (royal fern) and *Sphagnum* (bog moss) are present at low frequencies. Microscopic charcoal occurs at low frequency in all samples. The base of the zone is dated to 7100 ± 70 BP, 6160–5800 cal BC (Wk-8500), from the sub-peat soil; the peat immediately above is dated to 6529 ± 40 BP, 5610–5370 cal BC (SUERC-3623).

ST86–2 Alnus-Betula-Quercus *LPAZ*

Tree pollen forms 77–88% TLP in this assemblage, principally *Alnus,* which initially rises dramatically to 69% TLP and then falls to 25% TLP by the end of the zone. *Quercus* forms 10–16% TLP, and *Betula* rises to form 30% TLP at the end of the zone. *Corylus* fluctuates between 6–20% TLP. Values for Poaceae vary between 3% and 14% TLP, with the peak value at 715mm where there are also occasional pollen grains of herbs associated with anthropogenic activity and a small peak in microscopic charcoal. Fern spores are represented throughout, values for Pteropsida (undifferentiated) decline from 20% TPS at the start of the zone to 6% TPS at the end. *Pteridium, Osmunda* and Polypodiaceae continue to be present at low frequencies. A radiocarbon date from just below the Poaceae peak calibrates to 4320–3970 cal BC (5290 ± 55 BP; Wk-8501).

ST86–3 Alnus-Poaceae *LPAZ*

At the start of the zone there is a fall in tree pollen which forms 68%-73% TLP in this assemblage. *Alnus* rises from 25% TLP to 58% TLP by the end of the zone. *Betula* declines from 21% TLP at the start of the zone to <2% TLP at the end, and there are slight falls in *Quercus* and *Corylus*. Poaceae rise to 20% TLP at the start of the zone and this value is sustained. The range and frequency of herbs

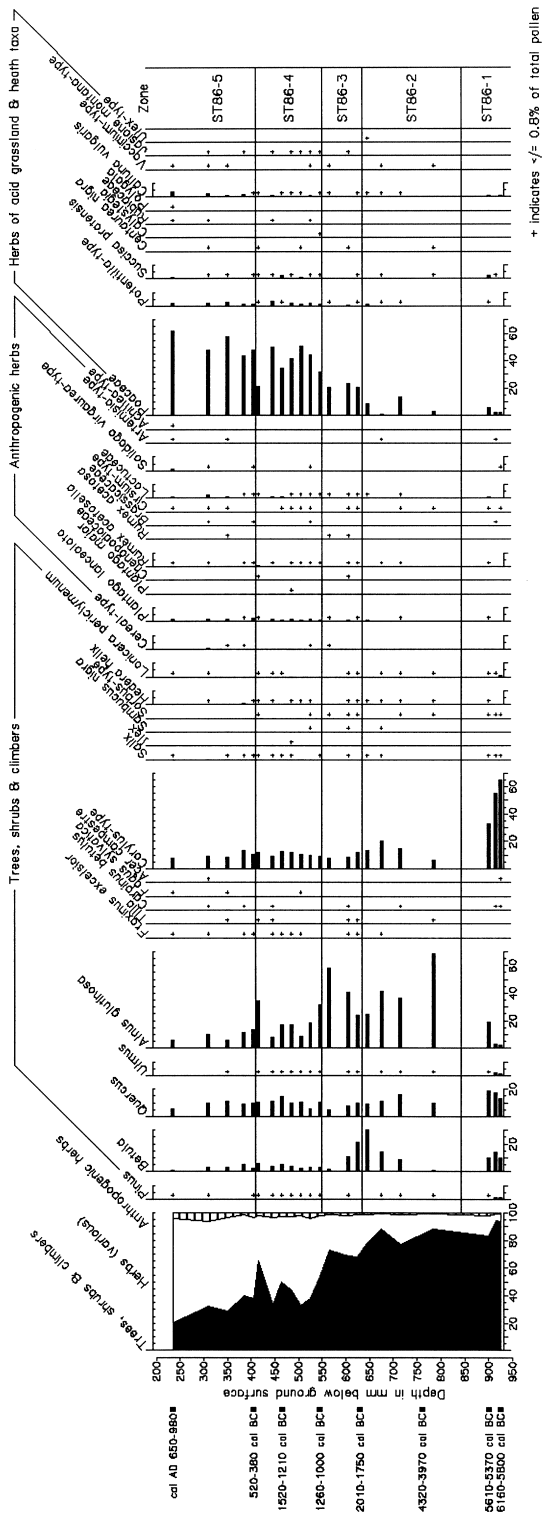

Fig 24a Stannon peat site 86, pollen diagram (percentages of total land pollen)

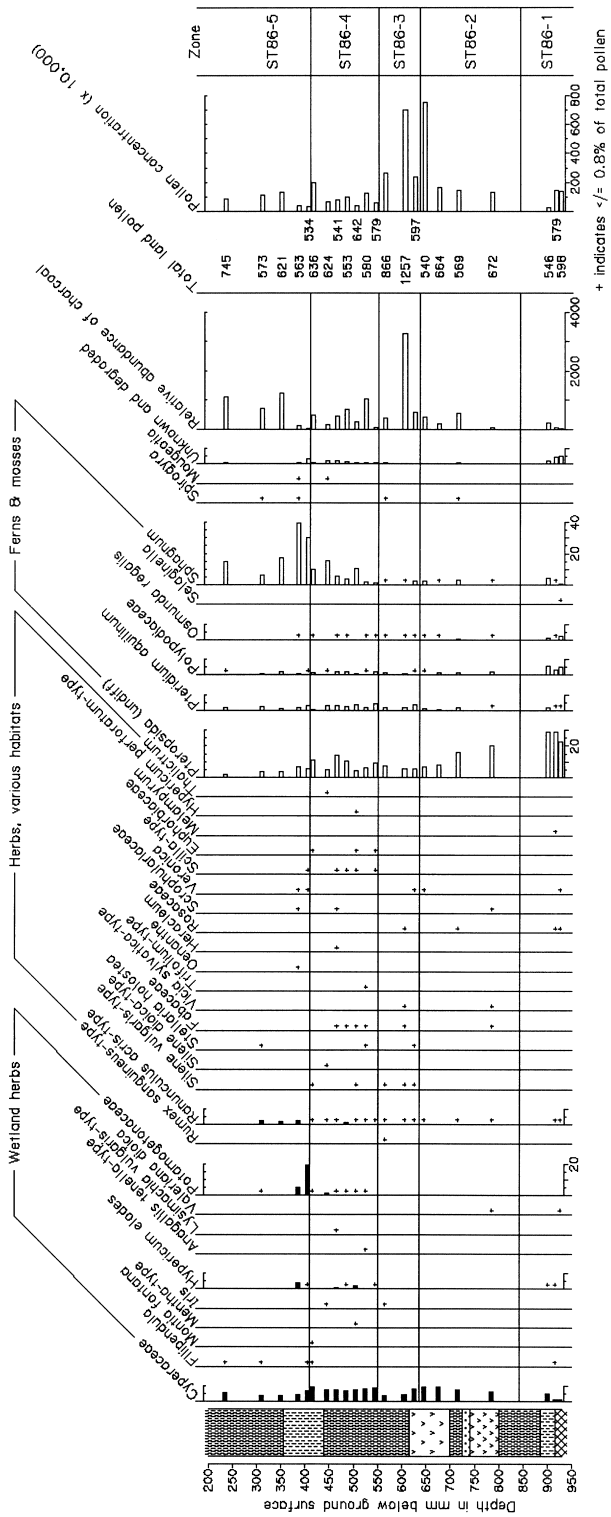

Fig 24b Stannon peat site 86, pollen diagram (percentages of total land pollen)

associated with anthropogenic activity increases to include *Plantago lanceolata*, Chenopodiaceae (goosefoot family), *Rumex* (sorrels and docks), *Cirsium*-type (thistles) and Lactuceae. The first record for cereal-type pollen at this site occurs with a single grain in this zone. Fern spores are present at low frequencies. Representation of microscopic charcoal increases somewhat compared with the previous zone, however, the very marked peak for charcoal at 785mm is associated with very slowly accumulating peat. The start of the zone is dated to 3550 ± 35 BP, 2010–1750 cal BC (SUERC-3624).

ST86–4 Alnus-Quercus-Poaceae-Plantago *LPAZ*

The start of this zone is marked by a significant fall in tree pollen to <50% TLP; *Alnus* values fluctuate between 10% and 34% TLP. *Quercus* increases slightly at the start of the zone and after a small fluctuation is sustained around 14% TLP; values for *Corylus* fluctuate from 9–13% TLP, *Betula* forms <5% TLP. *Pinus, Ulmus, Fraxinus* (ash), *Tilia* (lime), *Salix* and *Carpinus* (hornbeam) are represented by occasional grains. Poaceae form 40–50% TLP through most of the zone, declining to 35% TLP in the uppermost sample. The anthropogenic herbs increase, particularly *Plantago lanceolata* (1–2% TLP) and the Lactuceae, although both these taxa decline slightly at the end of the zone. There is an increase in pollen of herbs of acid grassland, in particular *Potentilla*-type (tormentil) and *Succisa pratensis*. Fern spores continue to be represented as in ST86–3. Spores of *Sphagnum* (bog moss) increase markedly at the top of the zone and there is a small associated rise in pollen of herbs of wetland including *Lysimachia vulgaris*-type (yellow loosestrife, creeping jenny), *Hypericum elodes* (marsh St John's wort) *Iris, Montia Fontana* (blinks) and *Potamogeton* (pond weed). Charcoal frequencies fluctuate, declining towards the top of the zone. The start of the zone is dated to 2915 ± 35 BP, 1260–1000 cal BC (SUERC-3625) and the middle (460mm) to 3110 ± 60 BP, 1520–1210 cal BC (Wk-8502). The inversion of these dates is discussed below (see Jones, Marshall and Hamilton below).

ST86–5 Poaceae-Plantago *LPAZ*

There is a further fall in tree pollen at the start of this zone to <40% TLP and values continue to fall further to around 20% TLP at the zone end. The decline is most marked for *Alnus,* which has a maximum value of only 11% TLP. During the zone *Quercus f*alls from 11% TLP to 5% TLP*, Betula* falls from 5% TLP to 1% TLP and *Corylus* from 13% TLP to 9% TLP. *Pinus, Fraxinus, Tilia*, *Carpinus, Fagus* (beech), *Salix* and *Acer campestre* (field maple) are represented by occasional grains. Following the decline in Poaceae and anthropogenic herbs at the end of ST86–4, Poaceae increase again to reach up to 60% TLP in this zone and anthropogenic herbs together form up to 6% TLP with *Plantago lanceolata* represented at 1–2% TLP throughout. *Potentilla*-type continues to be present at around 2% TLP and there is a slight increase in the pollen of heathland taxa, particularly *Calluna*. There are peaks in pollen of *Potamogeton* and *Hypericum elodes* near the start of the zone, associated with high values for *Sphagnum* spores; these all then decline. Fern spores decline to <8% TPS. Charcoal frequencies increase markedly above 370mm. The start of the zone is dated to 2370 ± 35 BP, 520–380 cal BC (SUERC-3626), and the end to 1240 ± 70 BP, cal AD 650–980 (Wk-8503), at 240mm below the ground surface.

Site 2

Peat and sub-peat soil from outside the cairn (Figs 25a, 25b)

Eight pollen samples spanned the peat and sub-peat soil section from immediately outside site 2. Pollen preservation in the upper, less well-humified peat was good; preservation was moderately good in the lower, well-humified peat and only moderate in the underlying soil. This is reflected in increasing numbers of degraded pollen grains in the lower part of the pollen diagram. Pollen concentration was low to moderate throughout the most of the soil sequence, but higher in the overlying peat.

ST2.1–1 Corylus-Poaceae *LPAZ*

This assemblage, which is represented in the lowest sample of the sub-peat soil, is dominated by *Corylus*-type pollen (35% TLP) and Poaceae (47% TLP). *Quercus* and *Alnus* each form <3% TLP, no other tree pollen taxa are present. Anthropogenic herbs are represented by *Plantago lanceolata* (5% TLP) and Lactuceae (2% TLP). Spores of Polypodiaceae form 50% TPS. Microscopic charcoal is present in the assemblage at low frequency. Degraded grains form more than 25% of total pollen and pollen concentration is low.

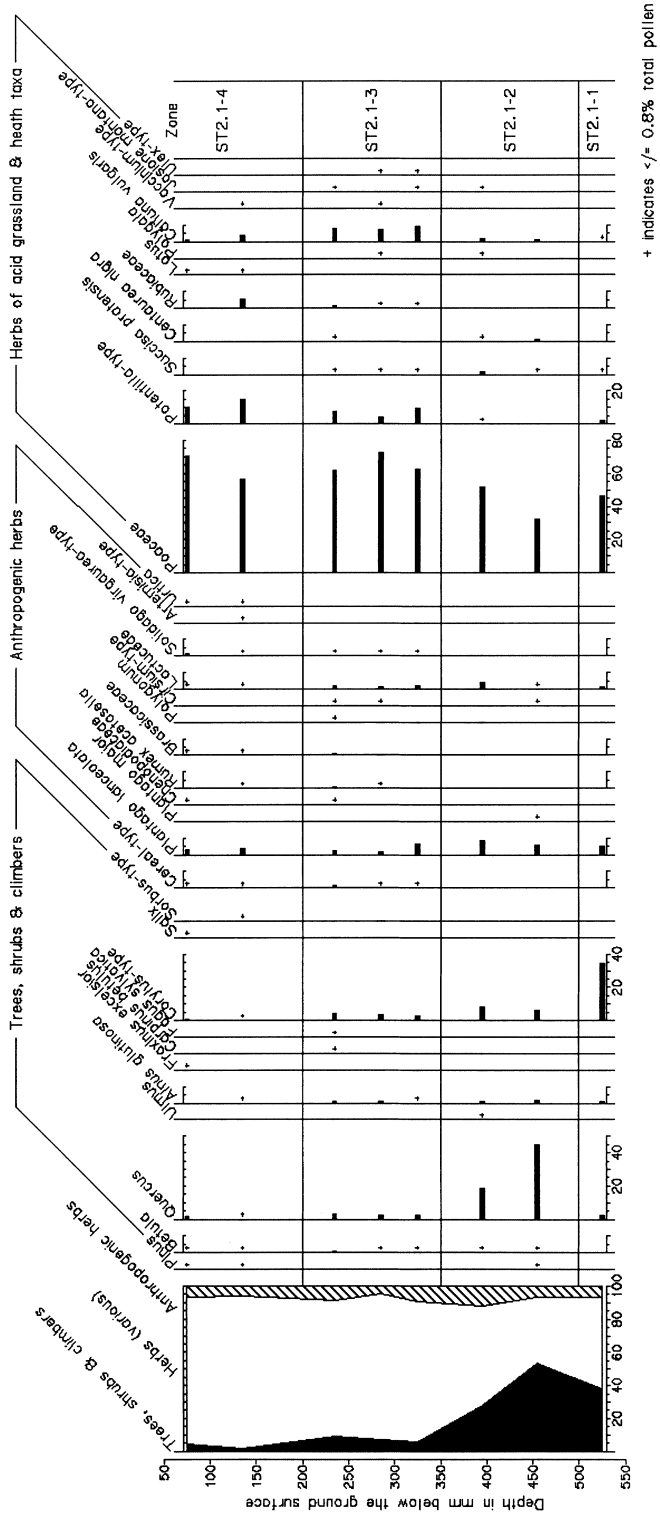

Fig 25a Site 2, pollen diagram from peat and sub-peat soil from outside the cairn (percentages of total land pollen)

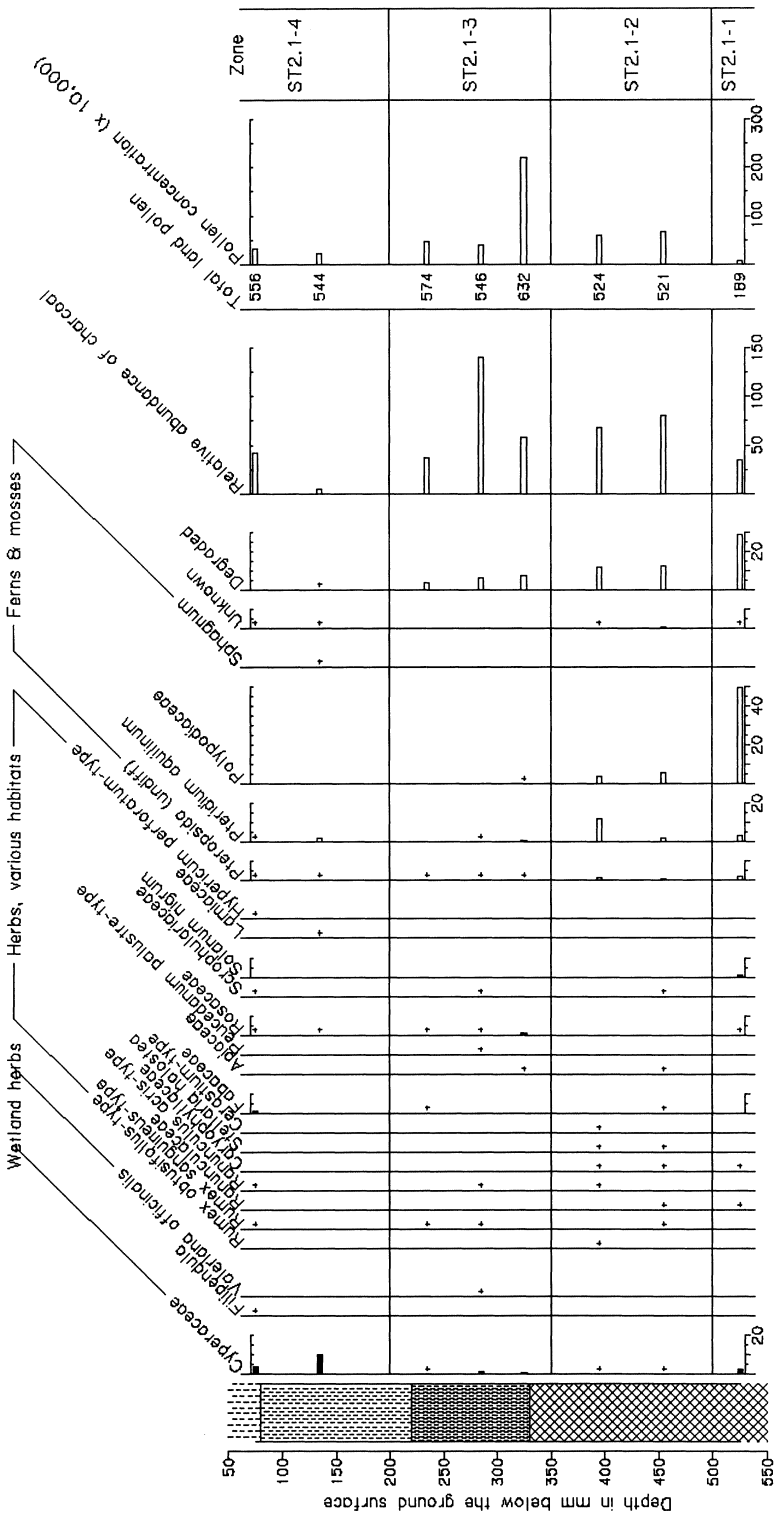

Fig 25b Site 2, pollen diagram from peat and sub-peat soil from outside the cairn (percentages of total land pollen)

ST2.1–2 Quercus-Poaceae *LPAZ*

This assemblage is represented in the E and Ah horizons of the sub-peat soil, *Quercus* forms 19–44% TLP, *Corylus*-type is < 8% TLP. *Alnus* and *Ulmus* are present at <2% TLP. Poaceae form 32–52% TLP, *Plantago lanceolata* 6–8% TLP and Lactuceae <4% TLP. There are occasional pollen grains of herbs associated with acid grassland and heath including *Potentilla*-type, *Succisa*, *Centaurea nigra* (common knapweed), *Calluna* and *Jasione montana*-type (sheep's-bit). A range of other herbs is present including *Stellaria holostea* (greater stitchwort) and *Ranunculus acris*-type (buttercups, and other species from the buttercup family). Spores of Polypodiaceae form <6% TPS and spores of bracken <12% TPS. The pollen concentration is higher than in the previous zone. Degraded grains decline to around 12% of total pollen. Microscopic charcoal is more frequent than in ST2.1–1

ST2.1–3 Poaceae-Potentilla-Calluna *LPAZ*

Tree pollen forms <5% TLP in this assemblage, which is in the well-humified lower peat, above the sub-peat soil. The pollen assemblage is dominated by herbaceous pollen with Poaceae contributing 61–72% TLP. Herbs of acid grassland and heathland taxa are well-represented, *Potentilla*-type forms 4–10% TLP and *Calluna* 7–10% TLP. *Succisa*, *Jasione montana*-type, *Ulex* (gorse) and *Rubiaceae* (bedstraw family), are all represented by occasional grains. Anthropogenic herbs remain frequent with *Plantago lanceolata* 2–6% TLP, Lactuceae 2% TLP, and *Solidago virgaurea*-type (daisy and related Asteraceae), *Cirsium*-type (thistles), *Rumex acetosella* (sheep's sorrel), and Chenopodiaceae all represented by occasional grains. Cereal-type pollen is present at <0.8% TLP. There are few fern spores. The number of degraded pollen grains is less than in previous zones. Pollen concentration is very high in the lowest sample from the peat, suggesting slow sediment accumulation at this level. Microscopic charcoal is more frequent than in the lower assemblage zones.

ST2.1–4 Poaceae-Potentilla-*type LPAZ*

The pollen assemblage in the upper, poorly-humified peat is dominated by Poaceae (57–72% TLP) with *Potentilla*-type peaking at 10–15% TLP. *Calluna* declines to <4% TLP. Tree pollen remains <5% TLP. Anthropogenic herbs decline slightly compared with the previous zone, with *Plantago lanceolata* at 3–4% TLP, and Lactuceae <0.8% TLP. Cereal-type pollen remains present at <0.8% TLP. Pollen concentration is low compared to the previous zone, but preservation is very good and there are very few degraded grains. Microscopic charcoal declines somewhat in this assemblage zone

Buried soil from beneath the cairn (Figs 26a, 26b)

Pollen was very scarce in the lower horizons of the soil beneath the cairn and preservation was generally poor, except in the lowest sample (400–410mm), where the preservation was somewhat better and a greater diversity of taxa was found. This is possibly the result of accumulation of pollen translocated down the profile with organic matter, though the sample is some 30mm above the level of the Bh2 horizon recorded by Ayala (above). As a result of the low pollen concentration and poor preservation in these samples, they were not included in the pollen diagram as the pollen sum achieved in the counts fell far short of that required for full analysis; the data are shown separately in Table 14. Above 250mm in the buried soil, pollen preservation improved and the pollen diagram (Figs 26a and 26b) includes five samples from the upper soil horizons and the lower part of the peaty topsoil. The pollen assemblages recognised in the whole sequence are described below.

ST2.2–1 Corylus-*Poaceae LPAZ*

This assemblage is represented in the lower 3 samples from the buried soil where data is at assessment level only (Table 14). The assemblage is dominated by *Corylus*-type and Poaceae, and appears similar to that recognised in the base of the sub-peat soil from outside the cairn. The lowest sample contains single occurrences of a range of herbs associated with acid grassland and disturbed ground. Spores of Polypodiaceae are very frequent. Pollen concentration is very low and pollen preservation is poor to moderate. Microscopic charcoal is present at low frequency.

ST2.2–2 Quercus-*Poaceae LPAZ*

In the assemblage from the upper part of the E horizon and the lower part of the Ah horizon of the buried soil, *Quercus* forms 20–40% TLP, *Corylus*-type forms <9% TLP and *Alnus* is present at <2% TLP. Poaceae form 40–48% TLP, *Plantago*

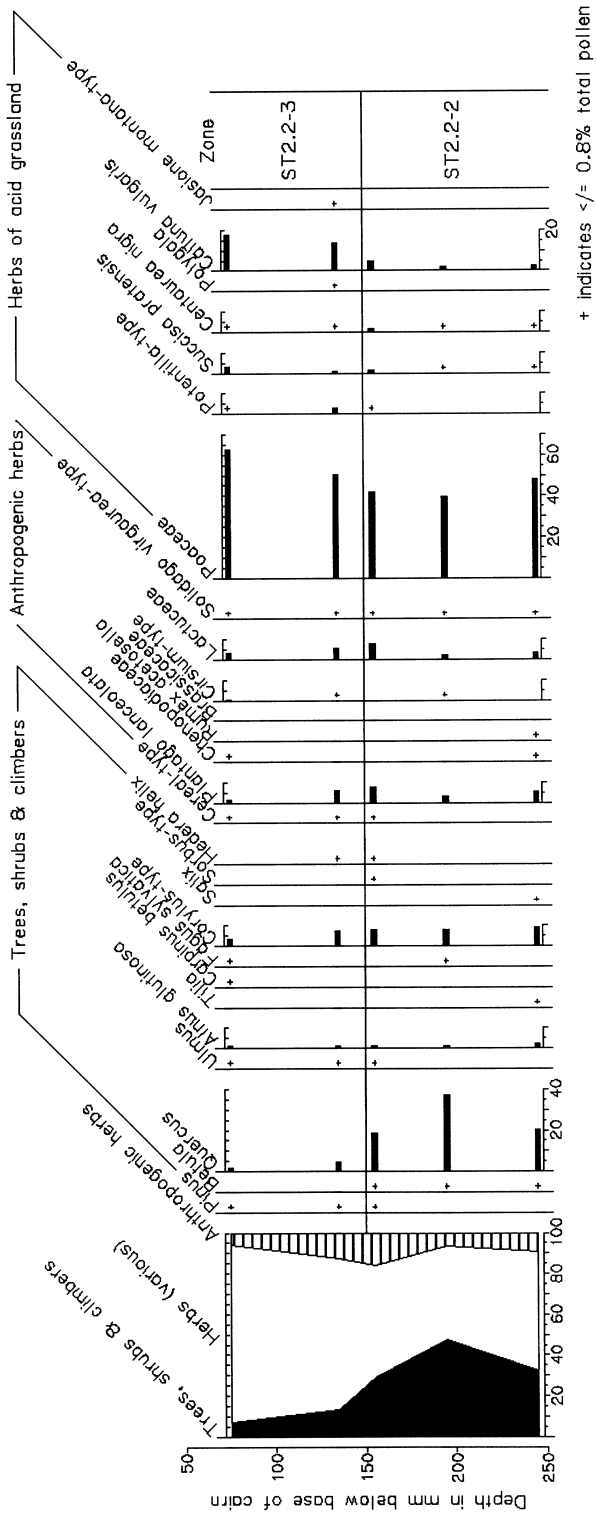

Fig 26a Site 2, pollen diagram from buried soil beneath cairn (percentages of total land pollen)

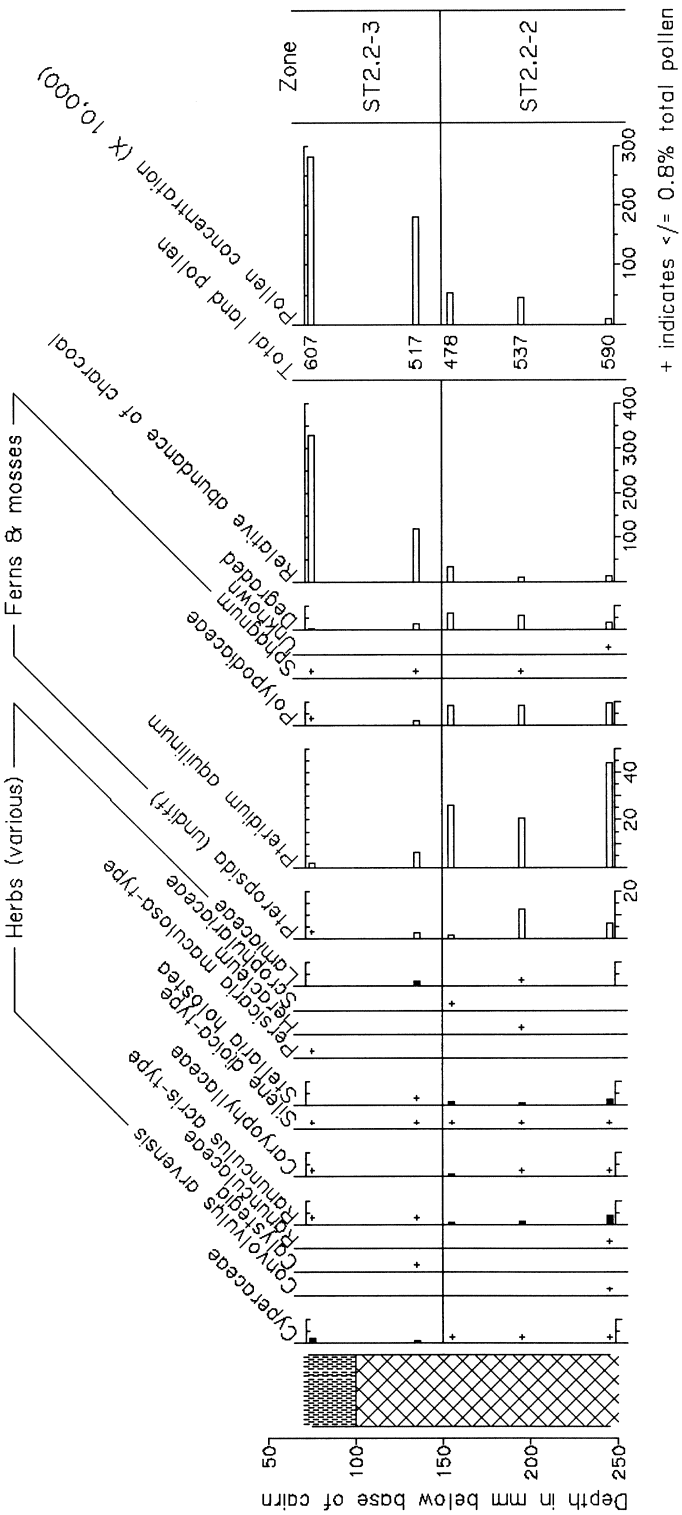

Fig 26b Site 2, pollen diagram from buried soil beneath cairn (percentages of total land pollen)

Table 14 Pollen data from three samples assessed from the base of the buried soil beneath site 2

Sample depth	*300–310mm*	*340–350mm*	*400–410mm*
Total pollen counted	**36**	**43**	**46**
Betula	1		6
Pinus	1	1	
Quercus	2	1	7
Alnus	3		3
Fraxinus		1	
Corylus-type		17	13
Poaceae	9	20	8
Cyperaceae			2
Plantago lanceolata			1
Lactuceae			1
Ranunculus acris-type			1
Succisa pratensis			1
Potentilla-type			1
Calluna vulgaris			1
Filipendula			1
Pteropsida undifferentiated	69	34	18
Pteridium	4	6	8
Polypodiaceae	55	39	10
Degraded grains	8	22	8
Microscopic charcoal	present	present	present

lanceolata 4–7% TLP and Lactuceae <7% TLP. A single grain of cereal-type pollen is present. There are occasional pollen grains of herbs associated with acid grassland and heath, including *Potentilla*-type, *Succisa*, *Centaurea nigra* and *Calluna*. Other herbs present include *Stellaria holostea* (1–2% TLP) and *Ranunculus acris*-type (1–3% TLP). Spores of Polypodiaceae form <10% TPS in this assemblage, and spores of Pteridium form 25–40% TPS. This assemblage is similar to that in the E and Ah horizons of the sub-peat soil outside the cairn. The pollen concentration is relatively low. Pollen preservation is moderate-good. Microscopic charcoal is present at low frequencies.

ST2.2–3 Poaceae-Calluna *LPAZ*

The uppermost assemblage from beneath the cairn is represented in the top of the Ah horizon of the buried soil and the base of the overlying peat. It is dominated by herbaceous pollen, with tree pollen forming <10% TLP. Poaceae contribute 50–60% TLP, with *Calluna* forming 10–18% TLP. Herbs of acid grassland such as *Potentilla*-type, *Succisa pratensis*, *Centaurea nigra, Jasione montana* and *Polygala* (milkwort) are present at values of <3% TLP. Anthropogenic herbs, principally *Plantago lanceolata* and Lactuceae, continue to be represented at 1–4% TLP. Fern spores are not as frequent as in ST2.2–2, and Pteridium in particular declines. The assemblage is similar to ST2.1–3 from outside the cairn, though values for *Potentilla*-type are lower. Pollen concentration is higher than in the underlying soil and preservation is good. The concentration of microscopic charcoal increases markedly in the uppermost sample.

Site 9 (Figs 27a, 27b)

Of the nine pollen samples assessed from the fill of the outer ditch at site 9, eight spanned the fill itself, with four taken from each of the two contexts recognised in the field; a further sample was taken from the base of the peaty topsoil which sealed the ditch. In the event, the pollen spectra were very similar in all the samples and therefore only five were fully analysed, one from the top and one from the bottom of each ditch context and one from the topsoil.

Pollen preservation in the peaty topsoil was only moderate; the high number of degraded grains recovered suggested oxidation and drying out of this horizon. However, the pollen concentration was very high. In the fill beneath, pollen concentration was also high and pollen preservation was slightly better, although not good. The best preservation occurred in the basal sample, probably due to damper conditions in the bottom of the ditch. As a result of the overall state of pollen preservation at this site, quite significant numbers of grains were degraded to the point where they could not be identified (actual frequencies are shown on the pollen diagram). The pollen assemblage may therefore show some bias towards the more robust taxa and this indeed seems to be likely, as Lactuceae pollen, which is particularly resistant to degradation, occurs frequently in all samples from the ditch fill. Bias could also have occurred as a result of differential losses of less resistant pollen taxa from the assemblage. Bunting and Tipping (2000) presented nine tests of possible post-depositional biasing in pollen spectra, with statistical failure thresholds, and they suggested that when several of these tests are failed, it may be appropriate to remove samples from interpretation. In fact, despite the relatively high numbers of degraded grains in the sediments from the site 9 outer ditch, none of the samples failed any of these tests, and it was therefore considered worthwhile to produce a pollen diagram from the fill. As all the samples exhibited rather similar pollen spectra, the pollen diagram has not been

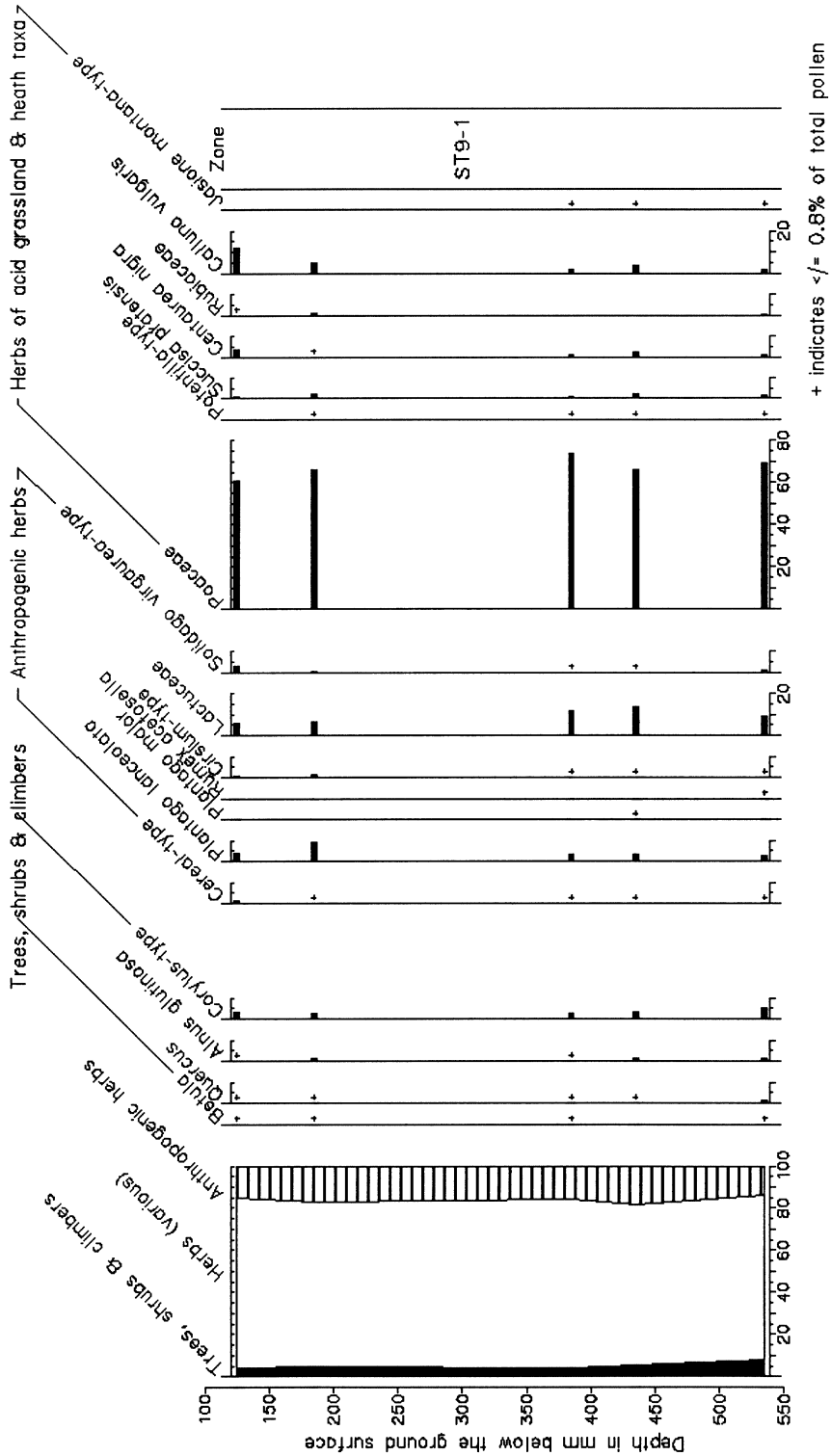

Fig 27a Site 9, pollen diagram from outer ditch fill (percentages of total land pollen)

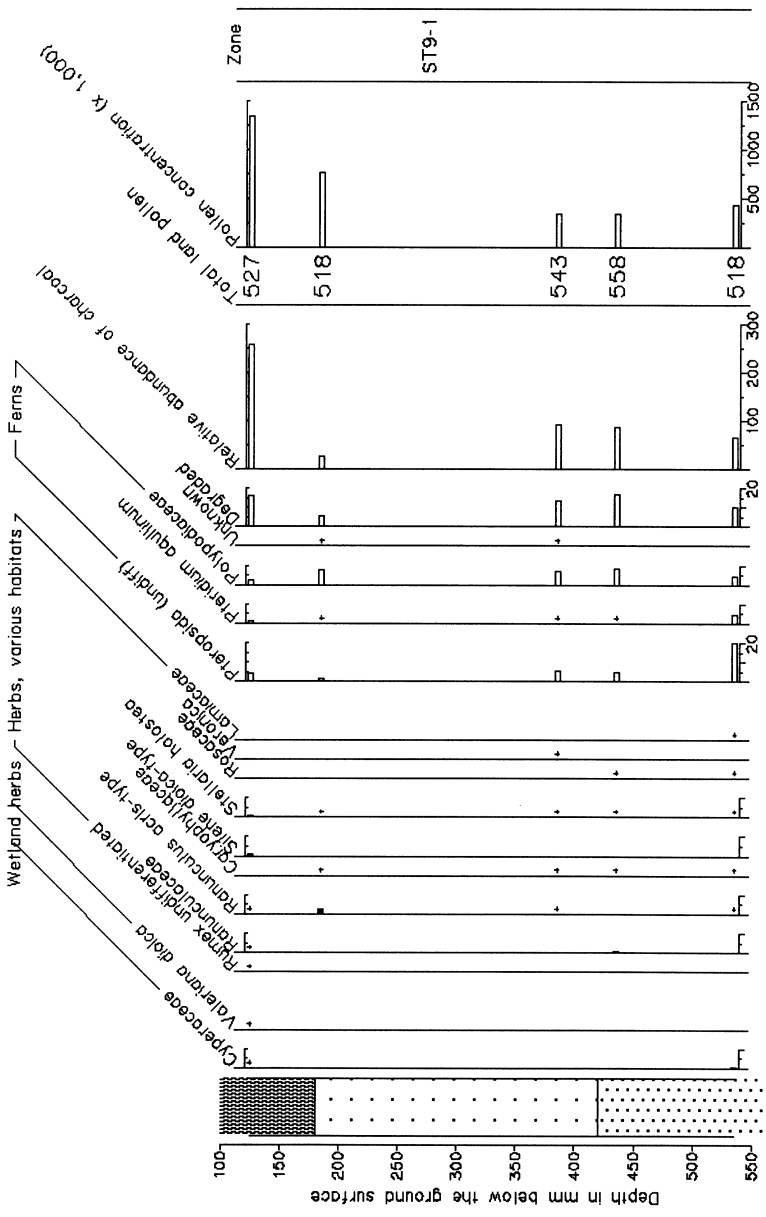

Fig 27b Site 9, pollen diagram from outer ditch fill (percentages of total land pollen)

zoned and the data are considered as one pollen assemblage.

ST9–1 Poaceae-Lactuceae LPAZ

This assemblage is dominated by herbaceous pollen, principally Poaceae which form 60–70% TLP. Anthropogenic herbs contribute around 15% TLP in all samples, with Lactuceae forming 6–14% TLP. *Plantago lanceolata* forms 3–9% TLP. Pollen of cereal-type is found at <0.8% TLP in all samples. Tree pollen does not rise above 10% TLP; with *Corylus*-type the most frequently represented tree pollen taxon. Grassland herbs such as *Succisa pratensis* and *Centaurea nigra* are found in all samples at 1–2% TLP and there are occasional pollen grains of *Potentilla*-type, Rubiaceae and *Jasione montana*-type. *Calluna vulgaris* pollen forms 2–5% TLP, rising to 12% in the uppermost sample. Microscopic charcoal is present throughout, increasing in frequency in the uppermost sample.

Interpretation

The pollen records from the Stannon sites represent different pollen catchments. The topogenous peat bog at site 86, between Stannon Down and Rough Tor, will have received pollen from its immediate surroundings and from the higher land on either side of this rather shallow valley; the area of the catchment will have changed over time, increasing as tree density around the bog declined. The pollen record from the buried soil at site 2 is likely to reflect a more limited catchment, largely the vegetation communities immediately around the monument site, before building commenced. The shallow peat from outside the cairn, which formed after the building phase, will have had a somewhat wider pollen catchment, as deforestation became more extensive. The pollen record from the ditch at site 9 is likely to reflect very local vegetation, growing immediately around the ditch and on the soils which were eroded to form the fill.

Table 15 indicates the suggested relationships between the local pollen assemblage zones at the various sites. The pollen sequence from site 86 has a series of six radiocarbon dates; however, the other sites examined have no independent dating. Therefore the relationships between the on-site pollen diagrams and the diagram from site 86 must be tentative. As far as possible they are based on the archaeological record, and dates for charcoal associated with the monuments.

Site 86

The pollen diagram from site 86 provides a record of vegetation change spanning the period from the later Mesolithic through to the early medieval period. The pollen record from the sub-peat soil and the basal peat suggests that from around 6160–5800 cal BC, the valley and surrounding uplands were dominated by oak-hazel woodland, with very little open ground. There was some birch growing in the area and alder was just beginning to establish on wetter ground in the valley. Other trees such as lime and elm must have been confined to lower altitudes. The interpretation of the tree pollen percentages, in terms of the composition of the Stannon woodlands, requires an appreciation of the complex relationship between recovered pollen assemblages and the producer vegetation communities. This relationship is not a direct one; among other factors it is influenced by the varying pollen productivity and the varying dispersal powers of different taxa. Birch, hazel and alder are all over-producers of pollen compared to oak (Moore *et al* 1991) and this leads to the conclusion that oak was probably co-dominant with hazel in the late Mesolithic woodlands of this part of Bodmin Moor. A similar type of woodland, hazel dominated with some oak and birch, has been recorded at the base of a pollen diagram from a peat mound at Rough Tor South (Gearey and Charman 1996), some 800m north east of site 86. This may somewhat predate the earliest woodland recorded from the site 86 valley. Direct comparisons between the two sites are difficult, however, as at Rough Tor South the two lowest radiocarbon dates are inverted: 5945 ± 65 BP, 5050–4720 cal BC (OxA-60011) at 2.8m depth, 8410 ± 90 BP, 7580–7100 cal BC,, (OxA-60010) at 2.2m depth (Gearey and Charman 1996).

The pollen record suggests that there were some small-scale disturbances in the late-Mesolithic woodlands of Stannon Down; this is indicated by the occurrence of occasional pollen grains of ribwort plantain and dandelion (or related Asteraceae) pollen. These plants could have flowered in natural openings in the canopy, but the presence of low frequencies of microscopic charcoal in ST86–1 suggests a possible link to the activities of Mesolithic hunter-gatherers. Birch may have acted as a secondary coloniser of small clearings created by

fire. Gearey and Charman (1996) noted evidence for small scale opening up of the woodland canopy during the Mesolithic in the pollen diagram from Rough Tor South. There is compelling evidence from Dartmoor for the deliberate use of fire by Mesolithic people between 7,700 and 6300 BP (Caseldine 1999; Caseldine and Hatton 1993; 1996).

At the Stannon 86 site, the basal radiocarbon date of 6160–5800 cal BC is from the sub-peat soil; the onset of peat formation, which indicates a local hydrological change to wetter conditions, is dated to 5610–5370 cal BC. This increase in wetness provided conditions suitable for the expansion of alder which began in ST86–1 and reached a maximum in ST86–2, when dense upland alder woodland became established in the valley. An expansion of alder pollen is a feature seen in early-mid post-glacial pollen diagrams from throughout Britain, though dates vary from the north to the south of the country. According to Bennett and Birks (1990), the alder expansion in the south-west peninsula occurred between 6000 and 7000 years ago, and was a response to the increasing availability of suitable wetland habitats. The alder expansion at Stannon fits into this established pattern: the main peak in alder pollen at site 86 post-dating 5610–5370 cal BC and pre-dating 4320–3970 cal BC. The occurrence of occasional large clumps of alder grains in the pollen preparations indicates that catkins were incorporated directly into the peat accumulating at site 86, and this accounts for some of the marked fluctuations in the alder pollen curve during ST86–2. The alder woodland extended in area at least as far as site 87, some 80m away, further up the same shallow valley; assessment data from the latter site showed very high alder pollen values in the basal peat which started to form around 4360–4040 cal BC (Tinsley 2000). It seems likely that alder woodland may also have extended much further down the valley, into the area which is today occupied by Stannon Marsh, forming a dense and extensive carr. The ground flora of the alder carr included royal fern and polypody fern, and both ivy and honeysuckle twined up the trunks of the trees. The pollen evidence indicates that oak continued to grow on the drier, better-drained slopes, away from the peaty valley bottom; the contribution of hazel to the Stannon woodlands had declined somewhat by this stage, although it was still present in the area, probably forming an understorey beneath the oak.

There is evidence for some opening up of the Stannon Down woods during the Neolithic period. In ST86–2 pollen of grasses reaches a small peak at 715mm and microscopic charcoal also increases slightly. The presence of pollen of ribwort plantain, sheep's sorrel, thistle and dandelion (all herbs associated particularly with grazing and disturbance by trampling of animals or people) at the same horizon suggests that there was some pastoral activity on the surrounding uplands at this time. The resolution of the sampling is quite low in ST86–2 and other individual phases of activity may well remain undetected in the pollen record. For example, the occurrence of a sandy layer in the peat at 725mm depth could be indicative of soil erosion associated with anthropogenic activity. It is not surprising to find this evidence of Neolithic pastoralism; on the summit of Rough Tor, which rises above the site 86 valley there is a hill-top enclosure regarded as dating from the Neolithic period (Johnson and Rose, 1994) and Neolithic artefacts were recovered in the early excavations at Stannon (Mercer, 1970). Gearey *et al* (2000b) presented pollen data from a number of sites in the wider area of this part of Bodmin Moor which led them to suggest a seasonal pastoral economy during the earlier part of the Neolithic, with a reduction in activity towards the end of this period. Evidence from site 86, where pollen of grasses and anthropogenic herbs is reduced towards the end of ST86–2 supports this conclusion. There is an increase in birch pollen at the same horizon and this could represent the colonisation of abandoned pastures by birch trees, though alternatively birch may have spread as a response to changing hydrology within the site 86 valley. In support of the latter hypothesis, the pollen concentration graph demonstrates that peat growth had slowed markedly by the end of ST86–2, suggesting drying out at the site. Alder pollen values also decrease somewhat, and it is certainly possible that birch spread into the carr woodland of the valley bottom, in response to drier conditions. The drier phase began at some time before 2010–1750 cal BC, which has been established for the ST86–2/ST86–3 LPAZ boundary, but conditions remained drier for a period after this date.

Part way through ST86–3, the rate of peat accumulation at site 86 increased again, and the stratigraphy suggests a return to wetter conditions. In response, alder expanded once more in the valley and birch was markedly reduced in distribution. The oak dominated woods, with their associated hazel understorey, which continued to occupy the drier slopes, declined somewhat around 2010–1750 cal

BC and it seems likely that this was linked to increasing activity by the Early Bronze Age cairn builders at Stannon Down. A series of radiocarbon dates from hazel and oak wood associated with site 2 fall between 1750 and 1410 cal BC. The sustained rise in grass pollen which marks the ST86–2/ST86–3 boundary, along with the presence of pollen of a wider range of anthropogenic herbs and increases in microscopic charcoal, all point to more intensive human use of the area post 2010–1750 cal BC resulting in the establishment of the first permanently open pastures.

A major landscape change occurred at the boundary between ST86–3 and ST86–4, which is dated to 1260–1000 cal BC. Grass pollen expands markedly, indicating a very significant extension in the area of open, non-wooded ground. The increase in frequency of all anthropogenic herbs recorded in the pollen diagram at this level, reflects a much more intensive use of the landscape, and the associated further increase in microscopic charcoal supports this view. The presence of a range of herbs typical today of upland acid grasslands, such as tormentil, devil's bit scabious and sheep's bit, plus the establishment of a continuous pollen record for heath plants such as *Calluna,* indicates the emergence of the vegetation communities which ultimately developed to form the modern landscape of Bodmin Moor. There is a radiocarbon date inversion in the middle of zone ST86–4, with peat at 460–470mm dated to 3110±60 BP, 1520–1210 cal BC (Wk-8502). The stratigraphically lower ST86–3/ST86–4 boundary gave a later date of 2915±35 BP, 1260–1000 cal BC (SUERC-3625). This was obtained on humic acid from the peat, while the upper, earlier date was from a humin fraction. The problems associated with dating from these fractions are discussed in the section on radiocarbon dating below (Jones, Marshall and Hamilton) but it seems likely that the later date from the ST86–3/ST86–4 boundary is the more reliable. This falls within the Middle-Late Bronze Age and the archaeological evidence from Stannon Down has established that this period was marked by the building of roundhouses and the spread of extensive field systems (Mercer 1970; Johnson and Rose, 1994); the increase in grassland which took place during ST86–4, which is deduced from the pollen evidence, would be the expected result of such activity. This picture accords with the convincing palynological evidence presented by Gearey *et al* (2000a; 2000b) from a range of sites around Bodmin Moor, which suggests that widespread, extensive and permanent clearance of woodland characterised the Bronze Age.

At the same time that the grasslands around Stannon were spreading, the carr woodland in the valley declined somewhat, probably becoming opened up by increased grazing activity in its drier parts, though alder still flourished in the wetter areas. Oak woodland continued to be present within the pollen catchment of site 86. There is even a suggestion in the pollen diagram that oak may actually have expanded a little at this time. The upland vegetation communities were probably quite variable depending on very local factors. In the De Lank valley, on the south side of Bodmin Moor, some 4km from Stannon, the pollen record from a small bog adjacent to Middle Bronze Age roundhouses has been examined (Jones and Tinsley, 2004); peat started to form there around 3444±39 BP, 1886–1630 cal BC (Wk-11549), and at this stage there was very little woodland left in the De Lank valley. The range of anthropogenic herbs and herbs of acid grassland in the De Lank pollen diagram in the Bronze Age phase were very similar to those found in ST86–4 from the site 86 valley. If the evidence from these two valleys is considered together, it suggests that a moorland landscape, similar in many ways to that of the present, was becoming widespread on Bodmin Moor by the Middle Bronze Age; it also appears that that the survival of woodland was patchy and localised but that, in the site 86 valley and on adjacent slopes, some significant areas of trees remained.

Towards the end of ST86–4 the stratigraphy and the pollen diagram clearly record a change in local conditions at site 86. The accumulating peat became less well humified, indicating wetter conditions on the bog surface. Bog moss spread extensively and pools of open water occupied by pondweed, in association with marsh St John's wort, flag iris, blinks and creeping jenny or purple loosestrife, were established. These wetter conditions started to develop some time before the ST86–4/ST86–5 zone boundary which is dated to 520–380 cal BC, and they continued into the beginning of ST86–5. The most notable features of this wetter phase in the pollen diagram are the peaks in spores of *Sphagnum* (bog moss), *Potamogeton* (pondweed) and *Hypericum elodes* (marsh St John's wort) (a very distinctive pollen taxon). These taxa suggest that a particular plant community was established on the site, probably similar to the *Hypericum elodes-Potamogeton polygonifolius* soakaway community

(M29) of the National Vegetation Classification (Rodwell 1991). This community is found today in south-west Britain, typically occurring in seepages and runnels round mires, on moderately acid to neutral peats, where there is seasonal fluctuation in the water table resulting in a submerged surface for part of the year. The two major constant species (marsh St John's wort and bog pondweed) from which the community is named grow in a carpet of *Sphagnum* moss (*ibid*).

At the end of ST86–4 the alder carr in the valley expanded again. The pollen diagram demonstrates that at the same time anthropogenic herbs declined a little and microscopic charcoal frequencies also fell. A decrease in use of the moors is indicated, around the date for the ST86–4/ST86–5 boundary, 520–380 cal BC. A decline in intensity of upland use has been noted at other sites in the south-west peninsula in the post-Bronze Age period. Quinnell (1994) commented on a widespread abandonment of upland settlements from around 1000 cal BC. Gearey *et al* (2000b) suggested that the main decrease in upland land-use pressure occurred in the later Iron Age or possibly even the Romano-British period at their Bodmin Moor sites.

Following the temporary decline in use of the moors at the end of ST86–4, grasslands once more expanded on Stannon Down and the surrounding slopes some time after 520–380 cal BC, in ST86–5. The pollen record indicates increased intensity of upland grazing, as anthropogenic herbs associated with pastoral activity again spread. The ditch at site 9 is believed to have been recut in the Iron Age, and there is supporting artefactual evidence of reuse of the site in this period (Quinnell below).

In the later Iron Age the valley alder woods declined significantly. The first records for beech pollen occur in zone ST86–5, indicating that beech was becoming established in the lowland woodlands at this time. A small increase in pollen of the heath taxa, particularly *Calluna*, along with a marked rise in microscopic charcoal, suggests the possibility that fire was being used to manage the upland grasslands, as heather can be encouraged to spread by firing (Rodwell 1991). An increase in heather pollen is also seen in the peaty soil sealing the ditch fill at site 9. Gearey *et al* (2000b) suggested alternative explanations for the later-prehistoric expansion of heather on Bodmin Moor, linking it to the development of increasingly acid soils, or to reductions in grazing pressure. The end zone ST86–5 is dated to cal AD 650–980; above this level the peat was disturbed so the pollen diagram does not extend into the later medieval and modern periods.

Site 2

Both of the pollen sequences from site 2 came from podsol soils with overlying peat. Beneath the cairn the peat horizon was significantly thinner than that found outside it, representing a much shorter period of accumulation which was terminated by the cairn

Table 15 Possible relationships between the pollen assemblage zones at the Stannon Down sites

Radiocarbon date for zone start at site 86	*Site 86*	*Peat and soil outside site 2*	*Soil beneath site 2*	*Site 9 ditch fill*	*Summary of environment at Stannon Down*
520–380 cal BC	ST86–5	ST2.1–4		ST9–1	Open acid grasslands with some heath, variable intensity of grazing. Valley alder woods decline.
1260–1000 cal BC	ST86–4	ST2.1–3			Oak-hazel woods decline as acid grasslands spread widely, grazing activity increases, heathland communities establish in some places. Valley alder wood slightly reduced.
2010–1750 cal BC	ST86–3		ST2.2–3		First permanent grasslands with some disturbed ground communities around monuments. Oak-hazel woods reduced but still widespread. Dense alder carr in valley.
	ST86–2	ST2.1–1,	ST2.2–1, ST2.2–2		Oak–hazel woodland with small temporary clearances. Dense alder carr in valley
6160–5800 cal BC	ST86–1				Oak-hazel woodland.

construction. The earliest pollen assemblages occur in the base of the sub-peat soils, both under the cairn and outside it; they are dominated by Poaceae and *Corylus*-type (ST2.1–1, ST2.2–1). Pollen records from soils require a different approach to interpretation, compared with those from peat. Within mineral soils pollen will have been subject to down-profile translocation following deposition on the ground surface, whereas within peats down-washing is likely to be minimal. In ST2.2–1, from beneath the cairn, quite a wide range of herb taxa typical of grazed acid grasslands were present as single grains and it is possible that these had been washed down to the B horizon from higher up the podsol profile, along with translocated humus. The two assemblages from the base of the sub-peat soils are likely to be similar in date. They give a clear indication that the upland grassland community, identified in the pollen diagram from site 86 as starting to establish by 2010–1750 cal BC, was already in existence and occupying the site of site 2 before building took place. The presence of hazel pollen and – higher up the sequence in ST2.2–2 substantial amounts of oak pollen suggest that at some period prior to cairn construction significant stands of oak and hazel grew close to the site. The lack of alder pollen, when compared with site 86, is a clear indication that alder was confined to the wetter valley locations on the margins of Stannon Down. Spores of *Polypodium* were frequent in the lower horizons of the sub-peat soils. These ferns could have grown epiphytically on the woodland trees; bracken was also established in the area, probably growing in woodland clearings. There are similarities between the pollen assemblages from both the site 2 sub-peat soils and the assemblage identified by Mercer and Dimbleby (1978) from a buried soil beneath the wall of a Bronze Age hut circle on Stannon Down. The soil beneath the hut circle was initially identified as a 'cultivation soil', but Dimbleby recorded a range of herb pollen taxa 'more characteristic of pasture than of arable land' as well as significant amounts of pollen of oak and hazel.

The pollen assemblage from the thin peat layer immediately beneath site 2 (ST2.2–3, Figs 26a and 26b), establishes the nature of the environment in which the cairn was built. By this stage the landscape immediately around the site had few trees and was dominated by open acid grassland with tormentil, devil's-bit scabious, common knapweed, sheep's bit and milkwort growing in the community; heather was also becoming established in the area. The environment appears similar to that represented at site 86 in ST86–4, the opening of which is dated to 2010–1750 cal BC, though in the valley there were significantly more trees in the form of the extensive wet alder carr and stands of oak on drier ground. There are no radiocarbon dates for the peat below site 2, and dates obtained for charcoal from postholes and pits at the site vary: the earliest, from hazel wood, is 2490–2290 cal BC with four other dates falling around the middle of the second millennium cal BC.

The pollen diagram from immediately outside site 2 shows a complete sequence from the sub-peat soil to the modern ground surface. The earliest peat outside the cairn exhibits a pollen assemblage (ST2.1–3, Figs 25a and 25b) similar to that in the peat beneath the cairn. It is likely that these two horizons were formed contemporaneously but radiocarbon dates are not available to confirm this. The sequence beneath the cairn has established that peat was spreading on parts of Stannon Down by the Early Bronze Age and the evidence from outside the monument indicates that it continued to accumulate slowly from this period onwards. The expansion of heather, which is seen in ST2.1–3, must reflect the increasing acidification of the surrounding environment. The abundance of anthropogenic indicators such as ribwort plantain, thistles, goosefoot family and daisy (or related Asteraceae), which occur in the same assemblage, indicates disturbed and probably trampled ground immediately around the cairn in the period after it was constructed, and the low tree pollen values suggest little woodland in the vicinity.

The evidence for anthropogenic disturbance is much greater in both of the site 2 pollen diagrams than for anywhere in the site 86 sequence. This is not unexpected; the wet carr woodland, which existed in the valley throughout the Bronze Age would have been marginal to the area of principal activity. Dispersal distances for the pollen of herbaceous plants are not great and hence only limited pollen from the disturbed ground communities penetrated the dense tree cover in the valley. Cereal-type pollen is recorded consistently, but at very low frequency, in the peat from outside site 2 in ST2.1–3, in the period presumably contemporary with or post-dating the cairn construction. Very occasional cereal-type pollen also occurred in the peat immediately below the cairn and at site 86 from LPAZ ST86–3 onwards. The significance of this pollen record for cereals is not clear; frequencies are very low, and the majority

of the associated anthropogenic herbs suggest pastoral rather than arable agriculture. Occasional charred macro remains of barley with some indeterminate cereal grains were found in posthole fills from site 2 (J Jones above) but the very limited nature of this macrofossil assemblage indicated that these were likely to represent chance burning, possibly of processed cereals grown elsewhere and brought to Stannon Down for ritual use. It is possible that occasional cereal pollen grains may have reached the site along with these imported crops. However, it is also possible that there were some small fields used for limited cereal cultivation within the largely pastoral landscape of Stannon Down, perhaps on patches of deeper soil in the more sheltered locations.

The pollen assemblage in the upper peat from outside site 2 (ST2.1–4) suggests a change in use of the surrounding grasslands. The range of anthropogenic herbs declines somewhat, which may reflect a reduction in grazing pressure; there is also evidence that heath communities contracted at this time. The tree pollen falls to minimal levels in this zone reflecting an environment similar to that of the modern moor. The low resolution of the pollen diagram and the lack of any dating make it risky to make direct comparisons with the longer pollen sequence from site 86. However, this change could be contemporaneous with the temporary reduction in use of the uplands which was recorded at the valley site around 520–380 cal BC.

When the sub-peat soils at the different site 2 locations are compared, it is clear that a considerably deeper sequence is preserved under the cairn than is present outside it. Beneath the cairn, the soil depth from the surface of the Ah to the rab parent material was 410mm, whereas outside the cairn there was only 190mm of mineral soil beneath the peat. The palaeosol beneath site 2 was interpreted as a humus-iron pan stagnopodzol by Ayala (above), and that from outside the cairn has very similar features, despite being shallower. It appears possible that during the period of cairn building and subsequent use of the area, trampling by people and possibly animals resulted in some truncation of the soil outside the cairn. If this is the case, then the pollen assemblages from the base of the two peats cannot represent exactly the same time period; that beneath the cairn should be older, although the pollen evidence indicates a similar environment. The presence of the thin layer of peat above the podsolised soil beneath the cairn is evidence that on this part of Bodmin Moor at least, there were patches of soils which had deteriorated substantially by the Early Bronze Age, although it would be wrong to extrapolate from this one site to infer widespread soil degradation by this period. Indeed, the soils beneath other excavated cairns on Stannon Down were rather varied in character. Ayala noted that although there was obvious evidence of acidification in the sub-peat soil beneath site 2, it did not exhibit any gley characteristics and therefore soil deterioration was not likely to have been the direct cause of the overlying peat development. The initiation of peat growth at this site was probably linked to climatic deterioration or deforestation of the area. In view of the pollen evidence, not only from the sites discussed in this report but also from those examined by Gearey *et al* (1996; 2000b), deforestation seems to be the most likely trigger factor.

Site 9

The fill from the outer ditch at site 9 postdates the period of monument construction. The fill may well have accumulated fairly quickly certainly its relatively uniform nature and the uniformity of the pollen spectra from the different sampling levels indicate this. The sandy-loam texture of the fill suggests that it originated from the erosion of soils surrounding the site, and this may also account for the relatively large number of degraded pollen grains which were found, compared with the pollen assemblages from the site 2 sites and site 86. The textural difference between the upper and lower ditch fill, which was noted in the field could well be a secondary feature, a result of post-depositional lessivage, rather than indicating two phases of fill. The date of the filling of the ditch cannot be established from the stratigraphic and pollen evidence: it could have occurred very soon after construction, although it seems more likely that the ditches would have been kept open while the site was in use and only filled as a result of in-washing of surrounding soil after the monument was abandoned. The Iron Age reuse of the site, attested by the presence of a small pottery assemblage and postholes, could have involved ditch clearance and therefore the fill may postdate this phase. Radiocarbon dates of 350–40 cal BC and 370–160 cal BC for oak and hazel-alder wood from the reuse phase indicate that the re-occupation occurred in the later part of the Iron Age and may therefore be associated with the expansion of grassland seen in

ST86–5 at the valley site. The frequencies of pollen of ribwort plantain and dandelion in particular are significantly higher in the ditch fill than those recorded at the site 2 sites; the pollen assemblage is clearly indicative of heavily disturbed ground around the site in the immediate post-occupation period, with virtually no trees in the immediate area.

Conclusions

The Bronze Age landscape

The evidence from the pollen diagrams discussed in this report reveals the varied nature of the upland landscape around Stannon Down in the Bronze Age. By the start of the phase of Early Bronze Age monument building it is clear that open, acid grassland communities were already established on some of the higher parts of the Down. These supported a range of herbs which thrive under a moderate grazing regime, plants such as *Potentilla* (probably *P. erecta,* tormentil), devil's bit scabious, sheep's bit and common knapweed. Heather (*Calluna vulgaris*), a strong calcifuge, was present in places, indicating that soils had already begun to degrade from the original acid brown earths which must have supported the early-Holocene woodlands. The evidence from beneath site 2 makes it clear that podsolisation and the development of thin peat was established, at least in some areas near the summit of Stannon Down, before the period of cairn building came to an end. Adjacent to the monuments there were plant communities typical of anthropogenic disturbance, with trampled ground supporting ribwort plantain, dandelions and thistles.

In damper places, such as the site 86 valley between Stannon Down and Rough Tor Moors, topogenous peat had been accumulating for some time and by the Bronze Age this was colonised by alder woodland which was dense in places and had honeysuckle and ivy twining amongst the trees. The ground flora of this woodland included ferns and wetland herbs. On drier ground, probably on the upper slopes of this valley and elsewhere, there were some stands of woodland dominated by oak and hazel, although in the immediate area of site 2 little of this survived. The macro evidence indicates exploitation of the local dry-land woodland resource; charcoal fragments recovered from the site 2 excavation (and from other excavated monument sites) were dominantly of oak and hazel (Gale above), and charred hazel nut fragments were recovered from the posthole fills and pits associated with site 2 (J Jones above). Gale reported that alder charcoal was rare at the Stannon sites, with just one occurrence in Context 244 from site 9. It therefore appears that the local oak-hazel stands were extensive enough to provide sufficient wood resources for the Bronze Age inhabitants of Stannon Down, and it was not necessary for them to exploit the abundant alder carr on the damp peat in the adjacent valley.

In the Middle Bronze Age, extensive field systems were built in the area around Stannon Down, with a settlement of roundhouses on the Down itself. The evidence from site 86 demonstrates the extensive spread of acid grasslands that was associated with this period, and the consequent decline in upland woodland. However, it is significant to note that even when Bronze Age activity was at its peak on the Down, alder woodland remained within the site 86 valley, albeit somewhat reduced in density or extent, and there were still some stands of oak with a little hazel on drier ground.

By the early part of the Iron Age, conditions had become increasingly wet in the site 86 valley, with pools of open water and spreading carpets of bog moss. The evidence from the pollen diagram from this site (and possibly also from the upper peat outside site 2, although this is undated) indicates that there was a decrease in the intensity of use of the moorland grazings at around the same time as this change, reflected in a small decline in the frequency of pollen of herbs associated with disturbance. However, there is not necessarily a causal link between the increase in wetness and the reduced use of the moor. Despite the fact that the influence of climatic deterioration has often been invoked to explain a general decline in upland settlement at the end of the Bronze Age, supporting palaeoecological data has not always been forthcoming. Gearey *et al* (2000b) were equivocal regarding the importance of climate as a factor in bringing about a downward shift in settlement patterns on Bodmin Moor at the end of the Bronze Age, suggesting that 'an interplay of socio-economic and environmental factors may be responsible' (*ibid*). At Stannon Down there is clear evidence for soil quality deterioration starting in the Early Bronze Age, demonstrated by the buried podsol at site 2. It seems likely that this was a consequence of deforestation leading to decreased evapotranspiration and increased surface wetness. As the acid grasslands and heath communities continued to replace woodland in the later Bronze Age,

degraded soils must have become more widespread and the development of iron pans and surface peat may have led to hydrological changes which affected the valley site. Gearey *et al* (2000b), take a somewhat different view in discussing their evidence for soil and pasture quality deterioration on Bodmin Moor from the Bronze Age onwards, suggesting that 'by the later prehistoric period, soil deterioration was not far advanced on a landscape scale and the quality of the sward remained fairly good'. Whatever the causal factors, the evidence from site 86 at Stannon clearly indicates increased site wetness at the ST86–3/ST86–4 boundary (around 520–380 cal BC). Whether this reflected a climatic shift or a local hydrological change is not clear; it does, however, coincide with a marked reduction in valley alder woods, which did not recover after this date.

The pollen evidence suggests that sometime after 520–380 cal BC, use of upland grazing again increased. The Stannon Down grasslands of post-Bronze Age times appear to have been particularly characterised by the spread of *Potentilla*. This was not just a local feature. Gearey *et al* (2000b) also recorded a post-Bronze Age increase in *Potentilla* at their Bodmin Moor sites. *P. erecta* (tormentil) occurs as a constant species in the heathland communities of the south west today (Rodwell 1991). It is low-growing and tends to flower more freely when grazing restricts taller growth. Heather, which is a strong calcifuge, spread locally around site 2 after it was built; site 86 also records a post-Bronze Age expansion in heather, and it was certainly growing near site 9 when the outer ditch filled in the Iron Age. Despite the acidification of the local soils, the expansion in heath communities was not sustained everywhere. In the pollen record from the peat profile from outside site 2, heather is seen to decline again in the uppermost peat (ST2.1–4), probably reflecting variation in moorland management regimes and/or grazing intensity.

Bronze Age agricultural activity

The palynological evidence from the Stannon sites suggests that the moorland economy during the Bronze Age was based on pastoralism. The herb pollen types which are recorded regularly at all sites fall either into the category of herbs of upland acid grasslands (for example, tormentil, bedstraw (Rubiaceae), sheep's bit, milkwort, devil's bit scabious), or they are members of the group of herb pollen taxa which are usually regarded as indicators of either pastoral activity or of ruderal communities (Behre 1986) such as ribwort plantain, dandelion or related Asteraceae and thistles. Herb pollen taxa more usually associated with arable activity (for instance, *Anthemis*-type (chamomiles) and Chenopodiaceae (goosefoot family) are largely absent. However, it is not possible to definitively separate pollen taxa associated with pastoralism from those associated with cultivation, as both activities involve disturbance of the ground allowing ruderal plants to establish. Reconstructions based on ratios of identified 'arable or pastoral indicators' are always likely to be imprecise (Edwards 1998). The analysis of the charred plant remains from several of the cairns did, however, record some cereal grains, although at very low frequency (J Jones above) and occasional cereal-type pollen grains also occurred sporadically in the Bronze Age horizons from site 86, in the peats associated with site 2 and in the ditch fill from site 9. Pollen production and dispersal from cereals is extremely low (Faegri and Iversen 1989), hence the significance of this cereal pollen record is greater than it might appear. However, there are well known problems in distinguishing the pollen of cereals from that of some of the wild grasses (Edwards 1998). In particular, it is difficult to distinguish pollen of *Hordeum* (barley) (which formed the majority of the occasional macro fossil cereal finds at Stannon) from pollen of *Glyceria* (sweet grass), which grows in mud by water and occasionally in wet meadows, unless preservation of the pollen is excellent. Sweet grass could possibly have grown in some wet places around Stannon Down, but is not likely to have been widespread and, on balance, it seems likely that the very sporadic finds of cereal-type pollen at the Stannon sites derive from cultivated grasses.

There is some supporting evidence regarding Bronze Age cereal cultivation from other parts of Bodmin Moor, although it was clearly a predominantly pastoral economy. In recent work from the De Lank valley, on the south side of the moor, low frequencies of cereal pollen were identified in peat of Bronze Age date and it was suggested that the shelter of the valley may have provided an environment suitable for the cultivation of crops in small fields, associated with a local roundhouse settlement (Jones and Tinsley 2000–1). On the basis of palynological evidence, Gearey *et al* (2000b) also considered that cereals might have been cultivated during the Bronze Age on the east of Bodmin Moor, in the Withey Brook valley. So, if

cereals were part (albeit only a small part) of the economy associated with the use of Stannon Down in the Bronze Age, where was cultivation taking place? Given the nature of the moorland and its soils, the suite of weeds species, and the lack of evidence for local crop processing in the macro remains (J Jones above), it seems likely that any cereal fields were at a lower altitude than the Stannon monuments, roundhouses and major paddock systems. However, there is always the possibility that there was some limited cultivation up on the moor, in small fields situated to take advantage of patches of better soil and local shelter.

The prehistoric pottery

Henrietta Quinnell, with petrographic comment by Roger Taylor

The assemblage consisted of 462 sherds weighing 4699g in groups of two distinct dates. Trevisker ceramics totalling 319 sherds weighing 3759g were found in site 2 (68 sherds, 551g), site 6 (15 sherds, 113g) and site 9 (236 sherds, 3095g). All were of gabbro admixture fabric, a gabbroic matrix to which other material had been added. There were 140 sherds (921g) of gabbroic Middle Iron Age South Western Decorated ware from site 9 and two similar sherds (14g) from site 10 together with one sherd (5g) of a granitic derived fabric. Sherds from all sites and contexts had been affected to some extent by infiltration of ground water; this resulted in varying degrees of iron and other mineral staining which made clear identification of inclusions difficult. Sherds or sherd groups were recorded as small finds and lists for all sites by small find (**SF**) number are included with the archive.

Fabrics

A range of sherds from each fabric group was first studied under a × 20–40 binocular microscope and a selection made for thin-section study. Details of the microscopic examination and thin sectioning are stored with the archive.

Bronze Age Trevisker gabbro admixture

The fabric is open, soft and gives the appearance of poor quality manufacture, although this is partly due to post-depositional factors. Surfaces are smoothed rather than burnished. Colour varies as sherds may be oxidised or reduced or vary from interior to exterior; much of the reduction appears to be subsequent to manufacture. Oxidised sherds tend to be 5YR 6/6 reddish yellow to 5/8 yellowish red and reduced sherds 5YR 3/2 dark reddish brown. Inclusions over 0.1mm in size comprised between 20% and 30% of the matrix and could be up to 5mm but with a modal size of 2.5mm. Eleven sherds were microscopically examined and seven of these subsequently thin-sectioned.

Initial macroscopic examination suggested that the majority of the sherds could be described as gabbro admixture – that is, made of gabbroic clay with some additional added non-gabbroic components – but that a few sherds might be gabbro without any additional material. This conforms to the usual fabric components of Cornish Trevisker Bronze Age assemblages; the background to these fabrics, their identification, terminology and interpretation has been summarised by Quinnell (1998–9, 24). In thin-section the matrix of all sherds examined was confirmed as gabbroic with inclusions of feldspar, amphibole, probable magnetite and sometimes pyroxene. All sections except no 6 contained quartz, which is not a natural component of gabbro but occurs in the overlying Crousa Gravels and so could occur naturally in weathered gabbroic clay. Section 1 contained fragments of gabbro rock, Section 3 altered basaltic greenstone from the Lizard area, Section 4 altered gabbro rock and Section 5 altered dolerite. Components all derive from the immediate area of the gabbro although the altered dolerite in Section 5 could possibly source to the periphery of a granite. Sections 2 and 7 contained possible calc silicate with zoisite, biotite hornfels and tourmaline, none of which are recognised from the Lizard area; it also contained altered dolerite. The former minerals can all occur on the periphery of the Bodmin Moor granite; the altered dolerite is also found there, but could also derive from dykes within the gabbro. Section 6 contains possible wood tin and possible cordierite, which do not occur on the Lizard; if these identifications are correct they are of metamorphic aureole minerals which could be marginal to the Bodmin Moor granite. In all three sections these non-Lizard minerals are present in a gabbroic matrix. The mineralogy of these sections is best interpreted by the transport of gabbro clay to an area peripheral to the granite where additional material was added before potting. The possibility of gabbro clay being moved around Cornwall to be

potted elsewhere has frequently been put forward in the past (see comment in Parker Pearson 1990, 19) but no identifications of minerals within a gabbroic fabric which could not originate in the Lizard have previously been made. The implications of the movement of clay prior to potting are discussed further below.

Microscopic and thin-section analysis did not support the division into gabbro and gabbro admixture fabrics because thin-section examination of a typical gabbro sherd (section 1) showed particles of rock likely to have been added to a gabbroic matrix. It is possible that gabbro sherds without additional material are present in the assemblage but, because of its stained and weathered condition, these cannot be confidently separated. Consequently, the whole assemblage is described as being of gabbro admixture. Difficulties with the division between gabbro and gabbro admixture fabrics from macroscopic and microscopic analysis have been commented upon by Williams (in Woodward and Cane 1991, 132) in relation to the assemblage from Trethellan Farm.

It is not possible to quantify the proportion of the assemblage likely to contain minerals indicating potting of transported clay because these minerals are difficult to clearly identify under hand lens or microscope due to staining from ground water. It must be stressed that even the presence of minerals such as calc silicate which cannot have a Lizard source is only tentative and that there are problems with the altered dolerites which may derive from dykes within the Lizard or from areas peripheral to granite. Closer identification of the likely source of some of the inclusions might be possible if polished thin-sections were prepared to enable electron microprobe examination but any detailed further research should be carried out on assemblages in which sherds survive with minimal post-depositional alteration.

Iron Age South Western Decorated gabbroic

The fabric is compact, hard and well made, generally with good exterior burnish and reduced to give a dark brown colour 5YR 4/2. Inclusions over 0.1mm in size comprised approximately 20% of the matrix and could be up to 2mm but with a modal size of 0.5mm. The most distinctive of these was feldspar giving, the fabric a speckled appearance which was removed by surface burnish. Seven sherds were microscopically examined, including pieces from vessels **P11** and **P13**, and two were thin-sectioned. Inclusions of feldspar, amphibole, magnetite and occasional pyroxene are consistent with the visual identification of the fabric as gabbroic, made from weathered clays from the Lizard. As with the initial identification of Iron Age gabbroic fabrics by Peacock in 1969, the components indicate the use of weathered clay without any added material. It should, however, be noted that all pieces examined contained quartz which occurs in the overlying Crousa Gravels and so could be present in weathered gabbroic clay (see above). The gabbroic fabric at Stannon appears remarkably cohesive, whether in visual examination or in microscopic study.

Abrasion

Sherd abrasion (Tables 16–18) has been graded according to the coding devised by Sorenson (1996) for the study of Bronze Age midden material at Runnymede. Grade 1 is low abrasion: 'The sherd has fresh breaks as indicated by the 'freshness' of the colour of the core, the unaltered surface, sharp corners and edges, and by the presence of pieces of temper which constituted obvious obtrusions' (*ibid*, 67). Grade 2 is medium abrasion: 'Some abrasion indicated by the absence of fresh breaks and patinated core colour, but sharp corners are still present'. Grade 3 is high abrasion. 'High abrasion is indicated by rounded corners and edges, the outline of the sherd is rounded, and its surface may be eroded'. Sorenson explains that the coding provides only a generalised guide and that the processes which lead to different grades of abrasion may differ in different circumstances, but that at Runnymede low abrasion is generally linked to rapid, undisturbed, midden accumulation.

As used below, sherds given as '2/3' are part-way between the medium and high abrasion as defined by Sorenson. Where a group of sherds is shown as '1/2 – 3', the codings indicate the range of abrasion. None of the material is coded '1' and '1/2' is used to describe 'fresh' sherds with minimal post-depositional alteration from groundwater. The problem of groundwater, with mineral deposition, has already been referred to and this, together with bioturbation, is likely to have caused considerable post-depositional alteration to sherds. Nevertheless *comparative* abrasion may be helpful in determining questions of disturbance and artefact redeposition.

Table 16 Details of gabbro admixture from site 2

Context	*SF no*	*P no*	*Sherds/ weight (g)*	*Average sherd weight (g)*	*Abrasion*
[7] fill of posthole [6]	22	P1	2/48	24	1/2
[17] fill of posthole [16]	35	-	2/6	3	3
[31] fill of pit [30]	45	P2	4/53	13	1/2
[31] fill of pit [30]	45	P3	4/40	10	1/2
[31] fill of pit [30]	45	-	8/144	18	1/2 – 3
[31] fill of pit [30]	-	-	30/53	2	1/2 – 3
[5] hollow in top of cairn	-	-	1/2	2	2
[3] soil over cairn	27	P4	3/50	17	1/2
[3] soil over cairn	19	P5	5/50	10	2
[3] soil over cairn	48	-	1/12	12	2
[3] soil over cairn	16	1s ?P1	4/68	17	1/2
[3] soil over cairn	18	?P5	4/25	6	2
Totals			**68/551**	**8g**	

Note on terminology

Non-distinctive is used of sherds without any formal or decorative features.

Opposed twist and ***parallel twist*** are used for double – or triple-line cord impressions on Trevisker vessels. 'Opposed twist' impressions are usually described as 'plaited cord' and 'parallel twist' as 'twisted' cord. This terminology allows for a clearer and fuller description of the cord impressions.

Site 2

Context and condition

Sherds come from five contexts. Those from posthole fill [7] are fresh and probably both from vessel **P1**. Those from posthole fill [17] are abraded and non-distinctive. The 46 sherds from pit fill [31] include fresh sherds from **P2** and **P3** and sherds with mixed abrasion from a further three vessels, of which one has cord-impressed body sherds: double line opposed twist. The sherd from [5] in the cairn top is non-distinctive. The 17 sherds from soil [3] over the top of the cairn and surrounding features, including **P4** and **P5**, are fresh or only a little abraded. This comparatively good condition, together with a piece of rim from **P1** otherwise buried in posthole [6], suggests these sherds were covered over with soil soon after deposition. If sherds had been deposited on the surface of [3] as it accumulated and left for any length of time, they would have become more abraded. The similarity of the vessels in the pits to those deposited in soil [3] as well as part of **P1** being present in both provides a close link between the activity represented by the pits and postholes and that on top of the cairn. Overall, the pattern of sherd size and abrasion indicates that the larger sherds, which are those with form and/or decoration, were deliberately deposited and quickly buried, whether in pits or in soil [3]. However, only small portions of any vessel are present. There was a background scatter of small abraded sherds in similar fabrics, these were probably present in the soil used to infill the pits. Sherds both from the postholes and pits and from soil [3] show signs of water percolation, with heavy ironstaining and iron oxide deposits in cracks and breaks; in some cases the surfaces of sherds lying uppermost have become soft and eroded while the remainder of the sherd is comparatively fresh.

Character

All vessels represented appear to be small, broadly Parker Pearson's (1990; 1995) Trevisker Group 5, probably used for eating and drinking. The vessels are characterised by neat double line cord-impressed designs, all except that on **P2** set within borders of similar double cord-impressed lines; **P2** and **P5** have small lugs. The vessels are visually very similar, in fabric, finish, form and decoration, suggesting that they could have been made as a group, despite the fact that sherds from **P1–3** were deposited in pits or postholes and **P4–5** from on top of the cairn, **P3–5** had been used before deposition to the extent that parts of the impressed decoration had worn away. The contexts in which they were found indicate that the vessels were deposited during the seventeenth to fifteenth centuries cal BC and are therefore earlier than the main assemblages known from Middle Bronze Age domestic sites. It may be noted that at

the settlement at Trethellan Farm, where determinations indicate occupation in the fifteenth to thirteenth centuries cal BC, Group 5 vessels are not present, their place being taken by small vessels which are plain, incised or finger-impressed (Woodward and Cane 1991). Group 5 vessels are virtually absent from other Middle Bronze Age settlement sites (*ibid*, fig 53) although they form around 10% of those described as from funerary sites from the Early Bronze Age.

These Group 5 vessels are small, with heights between 9 and 17cm and diameters usually 15cm or less; their capacity would generally be in the two to three litre range, rather larger than the half to two litre range most common for Beakers (Case 1995, 56). Their cord-impressed decoration is usually neat and well executed, as with the site 2 vessels. They are one of the two smallest Groups in the Trevisker range and appear to be confined to the Early Bronze Age and have therefore only been found on sites with ritual and funerary association. Their place is taken in the Middle Bronze Age by vessels of Group 6 and 6A, pots of similar size and, generally, shape which are plain or decorated with fingernail/tip respectively. The Group 5 and 6 vessels are described as for eating and drinking (Parker Pearson 1990, 10) but their capacity indicates a shared rather than an individual use. Cord-impressed ornament was obviously not considered appropriate for these small vessels in the Middle Bronze Age. Group 5 vessels have come from a range of Early Bronze Age sites. Published examples include that from a cist with a cremation – apparently part of a flat cemetery at Port Mellon, Mevagissey (Sheppard 1961), from a stone-capped pit at Harlyn Bay – 'Mrs Hurn's Urn' (Preston-Jones and Rose 1987, fig 3) – and from barrows with cremations at Trevelloe II, Paul, Escalls, Sennen, and Boscawen-un, St Buryan (Patchett 1944, fig 7). The majority of about 40 vessels represented in the Trelowthas barrow, Probus, also appear to have affinities with those of Group 5 (Quinnell in Nowakowski forthcoming).

Descriptions of illustrated sherds, all Trevisker (Fig 28)

P1 SF22 [17] in posthole [16]. Rim, internal diameter approximately 19cm, with slight external expansion and slight interior bevel. Decoration: impressed double cord with parallel twist. Bordered design with zigzag: a probable rim sherd occurs in [3]

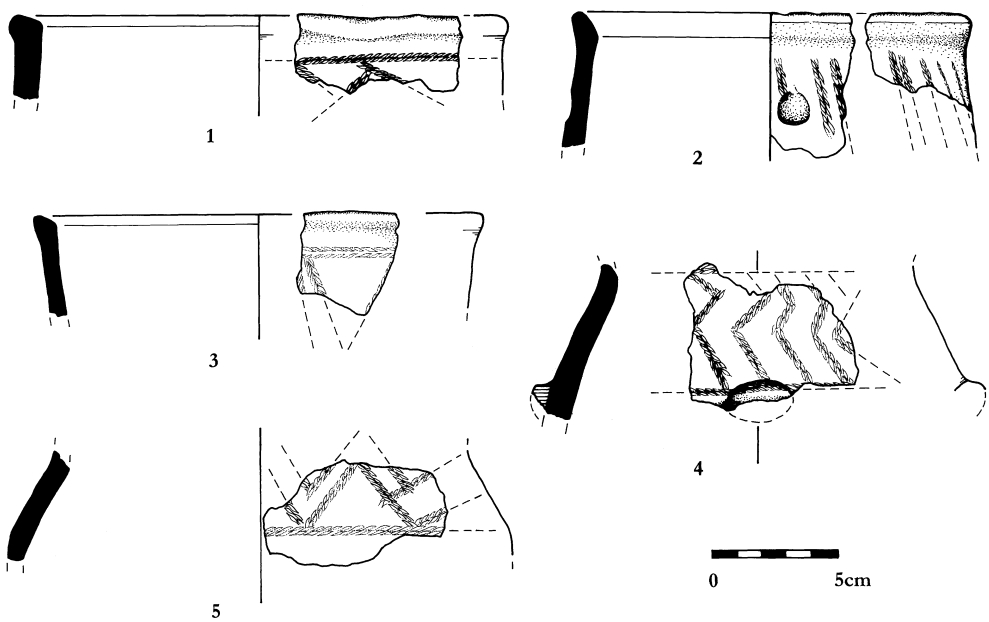

Fig 28 Trevisker pottery from site 2. P1 from [17] in posthole [16], P2 and P3 from [31] fill of pit [30], P4 and P5 from [3] soil over cairn. Scale: 1:3. (Drawing: C Thorpe)

P2 SF45 [31] in pit [30]. Rounded, slightly everted rim, internal diameter approximately 14cm, with internal bevel. Decoration: impressed double cord with parallel twist forming groups of near-vertical lines around vessel without a border. Part of small lug formed by finger/thumb impression after impressed decoration applied. Vessel appears to have a black coating on exterior but as this overlays wear on decoration likely that this relates to deposit of iron oxides.

P3 SF45 [31] in pit [30]. Rim, internal diameter approximately 16cm, with internal bevel. Decoration: impressed double cord opposed twist forming bordered design of diagonal lines. Decoration very worn in places.

P4 SF27 Soil [3] over cairn. Upper part of biconical vessel, rim, internal diameter approximately 14cm, everted with top missing. Decoration: impressed double cord opposed twist forming bordered design infilled with herringbone. Small oval lug on line of lower border present before impressed decoration. Decoration very worn in places.

P5 SF19 Soil [3] over cairn. Shoulder sherds from biconical jar, internal diameter at rim approximately 14cm. Decoration: impressed double cord opposed twist, bordered design with zigzag. Decoration worn in places.

Site 6

Context and condition

The two small body sherds from the possible remnant Old Land Surface [64] were notably abraded and the feldspar inclusions very weathered. These sherds did not appear to contain non-gabbroic inclusions, were not similar to any from this or other sites and had no datable features. The sherds from [52] are crumbs, with no comment possible. The ten sherds from posthole fill [65] include a base angle and all probably come from towards the base of the same vessel in gabbro admixture fabric. These sherds are distinctive in their lack of abrasion, consistent with the good preservation of an area of carbonised residue on the interior; they are likely to have been deliberately deposited and rapidly covered. One of these sherds was thin-sectioned (section 2) and contained inclusions within a gabbroic matrix which may indicate manufacture in an area peripheral to the granite rather than in the Lizard.

Character

Posthole fill [65] is associated with a radiocarbon determination calibrating to the sixteenth to fifteenth centuries cal BC. The single vessel represented by sherds in its fill is similar in general character to Trevisker material from the other sites. The vessel base had a diameter of approximately 12cm and could therefore have belonged to Group 5 vessel as **P1–5** from site 2. It is likely to have been made somewhere on the granite margins from imported Lizard clay.

Site 9

Phase 1 context and condition

The majority of sherds from cairn-ring [213], both gabbro admixture and Iron Age, came from quadrant 3, as is also the case for phases 2 and 3 contexts. Most of the material was considerably abraded, with no significant difference in abrasion or sherd size between the Bronze Age and Iron Age fabrics. The only distinctive piece was a gabbro admixture body sherd with narrow incised herringbone. The Iron Age material is assumed to be intrusive. The relationship between Bronze Age material and context is uncertain but small abraded pieces could, as in site 6, have been present in the material used in the cairn-ring.

Cist [243] contained admixture sherds in both fills [245] and [244]. Those in [244] included **P6** but were accompanied by a few Iron Age sherds. Single admixture sherds with incised lines occurred in both fills, and also one with fingernail decoration as (**P15**)

Table 17 Details of gabbro admixture pottery from site 6

Context	*SF no*	*Sherds/ weight (g)*	*Average sherd weight (g)*	*Abrasion*
[64] ? remnant OLS	15	2/6	3	3
[52] Phase 2 infill	1	3/2	<1	2
[65] fill posthole [53]	17	10/105	10.5	1/2
Totals		**15/113**	**7.5**	

Table 18 Details of sherds from site 9

Context	*Gabbro admixture*				*Iron Age gabbroic*			
	Sherds/ weight (g)	*Average sherd weight (g)*	*P no*	*Abrasion*	*Sherds/ weight (g)*	*Average sherd weight (g)*	*P No*	*Abrasion*
Phase 1 cairn-ring [213]	13/113	9		2/3	3/21	7		2/3
Phase 1 cist [243] fill [245]	12/19	1.5		2/3				
Phase 1 cist [243] fill [244]	27/107	4	P6	1/2 – 2/3	4/10	2.5		2
Phase 1 cist [247] fill [248]					2/17	8.5		1/2
Phase 2 inner bank [205]	43/356	8		2 – 3	26/123	5		1/2 – 2
Phase 2 [207] in ditch [206]	12/86	7		3	8/52	6.5		2
Phase 2 [204] outer bank	36/716	20	P7–9	2 – 3	4/39	10	P10	1/2 – 2
Phase 2 [208] outer ditch, fills [209] [210]					6/35	6	P11	1/2 – 2/3
Phase 2 [212] infill	12/188	16	P12	1/2 – 3	29/218	7.5	P13–P14	1/2 – 2
Phase 4 drain [214] fill [215]	5/37	7.5	P15	1/2 – 2/3	1/10	10		2
Phase 4 postholes								
[219]/[218]					1/5	5	P16	1/2
[223]/[222]	1/3	3		1/2				
[227]/[228]	1/17	17		3	5/39	8	P17	1/2
[231]/[230]					1/3	3		2
[235]/[234]					5/30	6		1/2 – 2
[237]/[236]					2/7	3.5		2
[239]/[238]	2/53	26.5		1/2 – 3				
[253]/[252]					1/3	3		2/3
[257]/[256]	1/20	20		1/2				
Phase 4 central infill [203]	32/506	16	P18, P19	1/2 – 2/3	33/177	5		1/2 – 2/3
[201] over site	18/354	20	P20	2 – 3	6/56	9	P21	1/2 – 3
Unstratified	21/520	25	P22	1/2 – 3	3/76	25		1/2
Totals	**236/3095**	**13**			**140/921**	**6.5**		

in [244]. Cist [247] contained only Iron Age sherds, one of which had rouletted decoration similar to **P13**. The amount of abrasion varies but overall the sherd size is small and it seems likely that much if not all, of the Bronze Age material, as well as that of Iron Age date, is intrusive in both cists.

Phase 2 context and condition

Inner bank [205] produced gabbro admixture and Iron Age sherds, the majority of both periods (34 and 22 sherds respectively) from quadrant 3. Sherd size is generally small, but Iron Age material is much fresher. Some Bronze Age material may have been included, already weathered, with the bank construction; alternately intrusive material had become eroded before inclusion in later disturbances. Iron Age material is likely to have been deposited in a fairly fresh state and perhaps comes from undetected disturbances from this subsequent occupation. There are few distinctive sherds: two Trevisker rims, two decorated Iron Age sherds and a well finished and scratched base.

Silt [207] in inner ditch [206] again produced sherds of both periods, mostly from quadrants 3 and 4. The Bronze Age sherds were markedly abraded, the Iron Age sherds fresher. The latter included a sherd of the well finished scratched vessel found in [205] and a piece with a slashed neck cordon.

The outer bank [204] contained sherds of both types, again mostly from quadrant 3. The abrasion of the Bronze Age material was mixed but with abraded material predominating; the few Iron Age pieces were much fresher, including **P10**. The average sherd size for both groups was much larger than for other phase 2 contexts. In addition to the Bronze Age **P7–9**, there was an eroded square lug broadly similar to **P19**.

The partial outer ditch [208] contained body sherds **P11** in a fairly fresh condition in lower fill [210] and abraded sherds in the upper fill [209]. All six sherds recovered were Iron Age.

All of these contexts on the circuit of the ring cairn produced more Bronze Age than Iron Age sherds, except outer ditch [208], and in a rather more abraded state. Some of the small and more abraded

Bronze Age sherds may have been present in material incorporated in the structure or which became deposited in ditch infills. Some of the abrasion on the remainder may relate to disturbance connected with the subsequent Iron Age occupation but, even taking this into account, the situation contrasts to that in site 2 where the condition of the material suggested immediate covering and protection. Most of the Bronze Age sherds could originally have been dropped in the open; casual discard as opposed to structured deposition.

Admixture sherds from infill [212] in the centre of site 9 had mixed abrasion; these included **P12**, which was fairly fresh, and a flat-topped rim with external expansion SF334, again fairly fresh. The Iron Age material, generally fairly fresh, included **P13** and **P14**, several small rim sherds and a base with a hole for an iron rivet (**P14**). Both groups came mainly from quadrant 1 (which contained the largest area of the infill) with some from quadrant 3, little from quadrant 2 and none from quadrant 4. The Iron Age material must be presumed to relate to disturbances connected with the structure of that date. The condition of admixture **P12** and rim SF334 suggest that some Bronze Age sherds may have been deliberately deposited and covered in the interior of the site but the more abraded material may have been casually discarded.

Phase 4 context and condition

Drain [214] contained admixture sherds and one Iron Age sherd. The Bronze Age material included the abraded **P15** but the other sherds were fresh: this strengthens the case for the deliberate deposition and covering of some Bronze Age material in the centre of the ring cairn (subsequently disturbed by the drain). The Iron Age sherd is a typical rim from a South Western Decorated jar, although abraded.

Five of the postholes contained only Iron Age sherds, three only admixture and one pieces of both dates. The former were generally fresh, the latter either fresh or markedly abraded. The Iron Age material includes several distinctive pieces including **P16** and **P17**; there were no distinctive Bronze Age sherds. It is unclear whether the pottery from the postholes comes from the packing or from post-pipes but the character of the sherds does not indicate deliberate deposition. The condition of the ceramics does not assist the separation of postholes into a Bronze Age and an Iron Age phase; it should be noted that [238] produced only Bronze Age sherds but an Iron Age radiocarbon determination.

Most of the admixture sherds from upper infill [203] belonged to **P19A** and **P19B**; the Iron Age sherds included several fragments from rims. Both groups have a wide range of abrasion. The large majority of both came from quadrant 1 with none from quadrant 3, a distribution reflecting that in [212] beneath. The presence of fresh sherds of both dates in this upper level is probably to be accounted for by comparatively recent disturbance of protected contexts. For both dates therefore this enhances the probability of fresh sherds having been quickly buried and protected during the appropriate period of site use.

Material from [201], soil over the site, mainly came from quadrant 3, with a little from quadrant 4. This reflects distribution in phase 1 and 2 contexts. Sherds of both periods were generally abraded; material included Trevisker **P20** and Iron Age **P21**.

Unstratified material was retrieved, some from quadrant 4 but most from quadrant 3, presumably the result of recent disturbance. Abrasion was mixed for both periods but the average sherd size for both groups was 25g, indicating that only large pieces survived or were noticed to be retrieved.

Character of the Trevisker assemblage from site 9

The general character of the gabbro admixture fabric was similar to that on sites 2 and 6 although the larger vessels found on site 9 tend to have more sizeable inclusions than occur on the other sites. Thin-sections 3–7 examined sherds from this site. Of these, only sections 3 and 4 indicated conclusively that all the inclusions were from the Lizard area. The altered dolerite in section 5, a sherd from inner bank [205], could come from the periphery of the granite, as could the possible wood tin and cordierite from section 6, a sherd from [207], the upper fill of inner ditch [206]. Section 7, from a sherd from outer bank [204], contained calc silicate and associated minerals which are not from the Lizard but could be found on the periphery of the granite. The petrology of section 7 is similar to that of section 2 from posthole [65] in site 6. It is probable that some of the pottery from site 9 was manufactured of Lizard clay transported to the periphery of the granite and mixed with materials from the latter area. The similarity between the petrographies shown by section 2 and section 7 shows that the manufacturing histories of at least one vessel from each of these two sites were apparently identical.

Radiocarbon determination OxA-13384 indicates that the inner cairn-ring may have been constructed in after the seventeenth or sixteenth centuries cal BC. Determination OxA-13381 from posthole [258] indicates the fifteenth or fourteenth centuries cal BC for charcoal from this phase 4 feature, while OxA-13380 indicates the fourteenth to twelfth centuries cal BC for charcoal from phase 4 posthole [224]. Because of the problems with redeposition and disturbance outlined above, it is difficult to relate any ceramics with certainty to phase 1. However, the seventeenth to sixteenth century cal BC date provides a *terminus post quem* after which the monument was in position and material could have been deposited upon it. The only really distinctive pieces that were reasonably fresh and so likely to have been covered in acts of deliberate deposition were **P12** and **P19A/B**, both from phase 4 material, but of course the abraded condition of the remainder may be due to post-depositional disturbance. Some small abraded sherds are likely to have been present before the ring cairn was constructed. For the majority of the pottery, however, there are two significant questions which cannot be definitely answered: should this be regarded as a single assemblage and how much of it was deliberately deposited as opposed to having been casually discarded?

The site 9 assemblage lacks the small cord-impressed Group 5 vessels which were the only significant components on site 2 and which were probably present on site 6. The 11 illustrated site 9 vessels can be broadly categorised according to the groups set out by Parker Pearson (1990; 1995) and Woodward and Cane (1991): **P8** is a variant of the large Group 1 cord-impressed storage vessels, **P9**, **P12** and **P22** are Group 2 smaller cord-impressed cooking or storage vessels, **P6**, **P7**, **P18**, **P19A** and **B** and **P20** are Group 3/4 incised small storage or cooking vessels, and **P15** with fingernail impressions is Group 6A, a small eating and drinking vessel differing from Group 5 in its decoration. This range of forms provides vessels for all the functions for which pottery is most commonly used but with the emphasis on storage and cooking rather than eating and drinking. In so far as comment can usefully be made from such a small group, it has close similarities with the Trethellan Farm assemblage. The square lug on **P19A** in particular occurs regularly there. However, there is no close comparandum in any assemblage for the other lugged vessel **P8**; the closest published piece is probably the vessel found with cremated bones but no accompanying mound at Largin Wood, Broad Oak near Liskeard (Trudgian and ApSimon 1976). The other feature for which comparanda are not easily available is the internal cord impressions below the rim on **P9**; unusually the Group 1 Trevisker vessel from the Stannon 3 cairn had an opposed twist cord-impressed decoration extending down the inside of its rim but the rim lacked an internal bevel as is usual with Group 1 vessels with ribbon handles, and the vessel was made out of a presumably local granitic clay (Harris, Hooper and Trudgian 1984, 151 and fig 6).

The site 9 assemblage has some features in common with the material excavated by Mercer (1970, figs 15–16). This includes sherds from Group 1 and Group 2 cord-impressed vessels and from Group 3/4 jars with incised decoration. The small fingernail-impressed **P15** can be compared to Mercer's No 2/10 (*ibid*, fig 16); Group 5 cord-impressed small vessels appear to be absent from the Mercer assemblage. The square lug on **P19A**, which is common at Trethellan Farm, has probable parallels, although none are illustrated, in Mercer's excavated assemblage; this, however, has a number of vessels with cordons applied to girth or base not present on site 9. It can only be said that comparison between the site 9 and Mercer assemblages is not particularly helpful. Aspects of the ceramics excavated by Mercer are considered further below.

Returning to the question of the nature of ceramic deposition on site 9, broader contextual considerations may be helpful. Site 9 has a fairly complex sequence and a Trevisker assemblage of 236 sherds. These have an average weight of 13g, very close to the 13.6g of the large and mainly deliberately deposited assemblage at Trethellan Farm (Woodward and Cane 1991, 106). The adjacent sites 10 and 11 produced no Bronze Age material and the assemblages from site 2 and site 6 consisted of 68 and 15 sherds respectively. The latter sites are closer to the hut circles excavated by Mercer than site 9 but appear not have had any material deposited from the activities relating to these. In other words, ceramics from the domestic activities connected with the Mercer hut circles did not affect immediately adjacent sites and therefore were unlikely to have casually affected a site further away. Surely there is something about the nature of site 9 itself which attracted the deposition of ceramics. If the material was deposited by people resident in the hut circles, site 9 was selected because of its special character: deposition was not random. This is arguing that the

assemblage may have all been deliberately deposited, despite its poor state of preservation and the remarks previously made about casual discard. Site 10, effectively a single-phase monument, was not of a character for deliberate deposition to have been appropriate, nor were sites 2 or 6 in the phases after their completion. It is possible of course that site 9 was used for some form of temporary domestic activity, rather in the way that it subsequently was during the Middle Iron Age. However, the overall sherd weight suggests some form of deliberate deposition, probably religious, with sherds covered for protection, their abrasion being due to subsequent disturbances. This conclusion can only be tentative and cannot be extended sufficiently to draw conclusions about the longevity or date of deposition. For longevity, it can only be said that deposition during phases 2 to 4 was possible but equally all could have been redeposited during phase 4 with disturbance accounting for pieces in phase 2 contexts. Whatever the radiocarbon determinations from phase 4 postholes may imply in terms of the date of erection of the posts, they do indicate that charcoal of a date within a fifteenth to twelfth century cal BC range was present. There is no reason why the ceramics from their form and decoration should not be of the same date as the charcoal and perhaps linked to the period of activity in the hut circles excavated by Mercer. There does not appear to be any other ring cairn in Cornwall which has produced the range of vessels recovered from Stannon site 9; equally no excavated ring cairns came subsequently to be in close proximity to a settlement, with the potential this offered for some specialised form of religious re-use.

Description of illustrated Trevisker sherds (Fig 29)

PHASE 1

P6 (Fig 29) SF313 [244] in cist [247]. Trevisker body sherd with incised zigzag decoration. Vessel girth >30cm.

PHASE 2

P7 (Fig 29) SF219 outer bank [204]. Trevisker body sherd with close set, probably horizontal, incisions. Vessel girth >30cm.

P8 (Fig 29) SF229 outer bank [204]. Part of large Trevisker oval applied lug broken vertically. The surviving side has a broad thumbed groove leaving a flat-profiled section in the centre; parallel twist cord-impressed line across groove. Minimum vessel girth approximately 45cm.

P9 (Fig 29) SF234 outer bank [204]. Trevisker rim sherd with flat top and internal bevel, internal diameter >30cm. Impressed cord decoration with opposed twist forms poorly organised design on exterior and, unusually, on internal rim bevel.

P12 (Fig 29) SF187 infill [212]. Sherd from upper part of Trevisker jar, internal diameter 27cm; rim with internal bevel and some external expansion. Bordered decoration of impressed parallel twist cord infilled with opposed blocks of diagonal lines.

Phase 4

P15 (Fig 29) SF149 fill [215] from drain [214]. Body sherd with fingernail decoration, vessel girth approximately 15cm diameter. The fabric is the gabbro admixture general on the site. While fingernail decoration is generally more common on Beakers than on Trevisker ware, Beaker fabric is usually finer with smaller inclusions. Fingernail decoration occurs on small Trevisker vessels at Trethellan (for example, Woodward and Cane 1991, nos 24 and 59). A similar piece with fingernail decoration was found in the fill of cist [243].

P18 (Fig 29) SF125 centre fill [203]. Flat-topped out-turned Trevisker rim, internal diameter 25cm, with slight external bevel and larger internal bevel.

P19A (Fig 29) SF138, [143] centre fill [203]. About 25 sherds probably all from same vessel in fresh condition. Out-turned rim >40cm diameter, slight external and larger internal rim bevel. Zone of incised bordered decoration infilled with diagonal lines; square lug has incised lines from lower border. Similar rim sherd from smaller vessel, internal diameter 25cm, drawn as **P19B**.

P20 (Fig 29) SF245 [201] soil over site. Large Trevisker vessel; rim, internal diameter 30cm with external expansion and flat top. Girth sherd with incised bordered design infilled with diagonal lines does not join but is similar in fabric and finish.

P22 (Fig 29) unstratified. Body sherd from Trevisker vessel approximately 35cm girth diameter. Design of impressed cord, triple parallel twist, forming zigzag or chevron pattern.

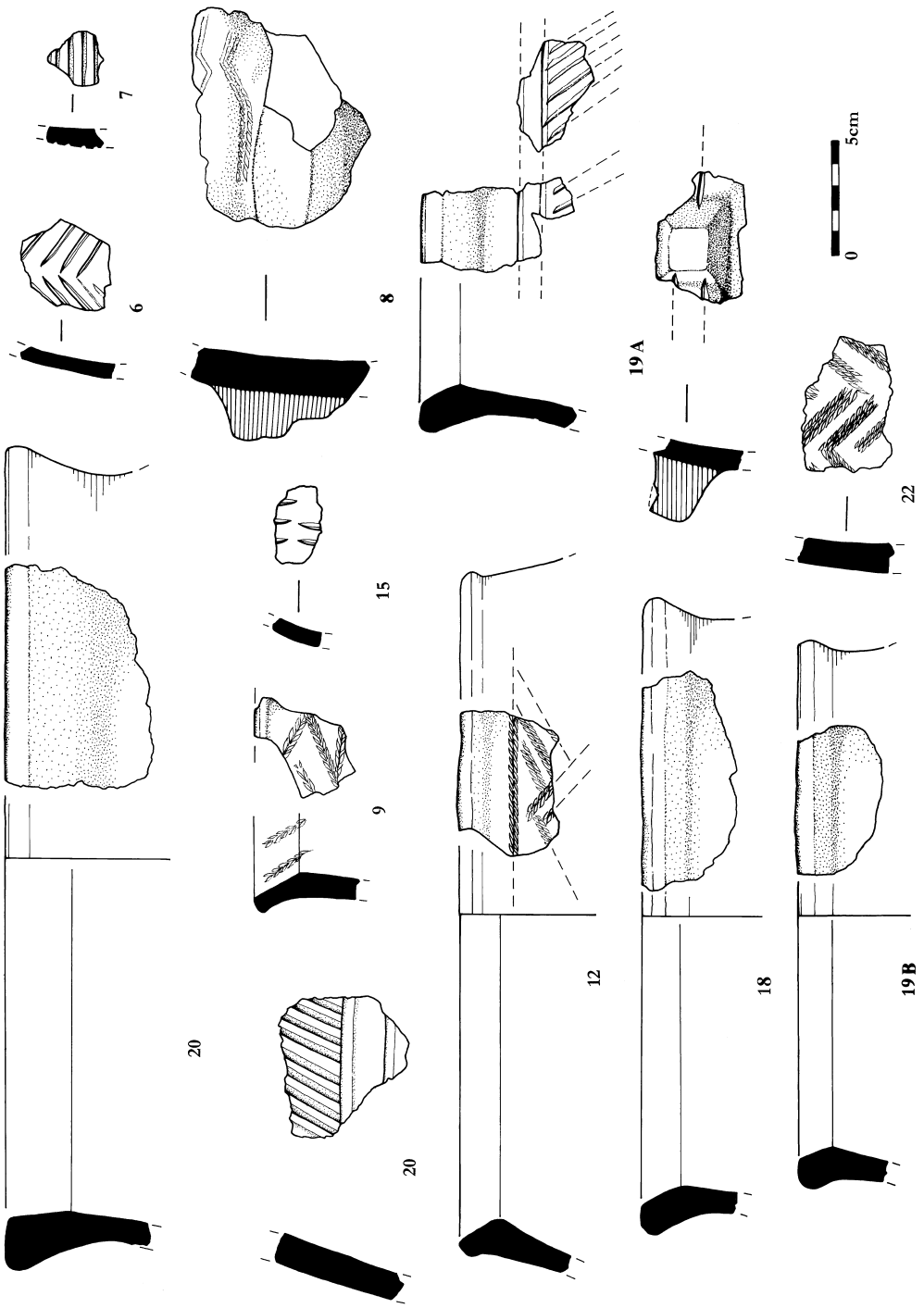

Fig 29 Trevisker pottery from site 9. P6 from [244] in cist [247], P7–P9 from outer bank [204], P12 central infill [212], P15 [215] in drain [214], P18, P19A and B from central fill [203], P20 [201] soil over site, P22 unstratified. Scale: 1:3. (Drawing: C Thorpe)

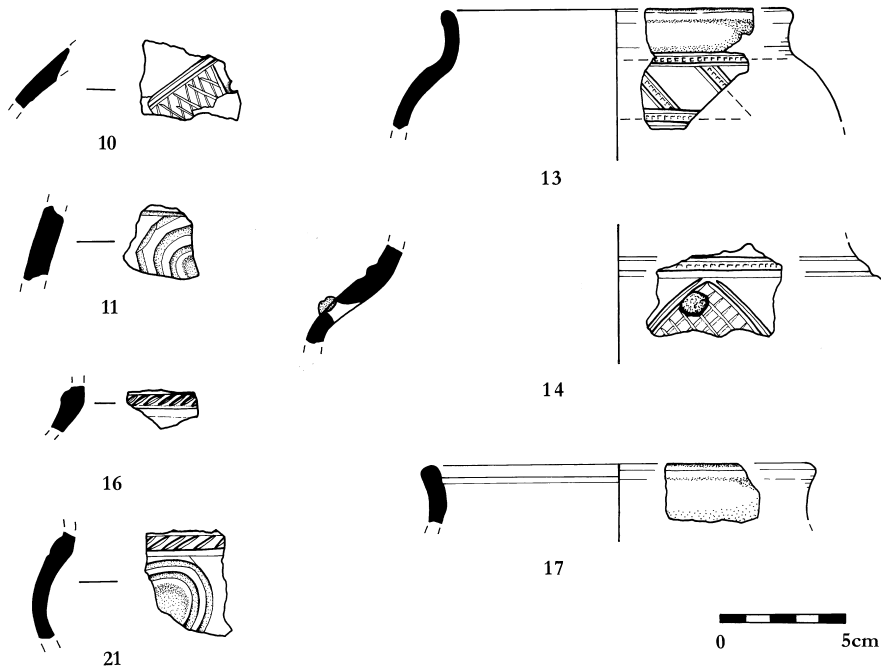

Fig 30 Middle Iron Age South Western Decorated pottery from site 9. P10 in outer bank [204], P11 outer ditch [208], P13–14 central infill [212], P16 [219] in posthole [218], P17 [227] in posthole [226], P21 [201] soil over site. Scale: 1:3. (Drawing: C Thorpe)

Descriptions of illustrated South Western Decorated sherds (Fig 30)

PHASE 2

P10 (Fig 30) SF234 SW Decorated. Outer bank [204] Body sherd from jar shoulder; exterior well burnished with lightly incised design including infilled triangle. Part of rivet hole present.

P11 (Fig 30) SF36, 67 SW Decorated. Outer ditch [208], lower fill [210]. Two burnished body sherds, one with irregular broad incised lines around a central depression or dimple below a horizontal line. The general style of **P11** is comparable to the vessels grouped as 'formative' at Trevelgue.

P13 (Fig 30) SF109 SW Decorated. Infill [212] Upper part of necked jar, rounded rim, exterior burnished. Decorated zone on shoulder defined and crossed by rouletting, bordered by incised lines. The use of a roulette producing a square impression, rather than comb-stamping, is indicated by the even patterning on the longer surviving line.

P14 (Fig 30) SF255 SW Decorated. Infill [212] Shoulder sherd from necked jar, good exterior burnish: decorated shoulder zone defined at top by tooled cordon with rouletting and containing triangle infilled with incised cross hatching. Roulette impressions are irregular and oval rather than square as **P13**. Perforation retains part of iron rivet for repair.

PHASE 4

P16 (Fig 30) SF332 SW Decorated. Fill [219] in posthole [218] Cordon from neck of jar with oblique incisions; sherd has good exterior burnish.

P17 (Fig 30) SW Decorated. Fill [227], in posthole [226] Rim sherd with internal groove, burnished on both sides.

P21 (Fig 30) SW Decorated. [201] soil over site. Shoulder sherd, good exterior burnish. Slashed neck cordon, incised lines, of which the outer has a ragged edge, around central depression; broadly comparable to the formative style from Trevelgue.

Site 10

The site produced three prehistoric pottery sherds. One body sherd, **SF20** from overlying soil [302], is of a fine ?granitic derived fabric weighing 5g, abrasion 3. Two other body sherds, from ditch [309], of the distinctive Iron Age gabbro fabric, together weigh 14g, abrasion 2. There is no Bronze Age material from this site.

Discussion

The Trevisker Bronze Age assemblage

Trevisker ceramics appear to have been current throughout the second millennium BC in Cornwall. During the first half of that millennium, during the Early Bronze Age, other ceramic forms such as Collared Urns and Food Vessels were also used but during the second half, during the Middle Bronze Age, Trevisker pottery was the only style in use. The Trevisker style was first distinguished in the publication of the eponymous settlement north east of Newquay in 1972 by ApSimon and Greenfield. That publication included an extensive study by ApSimon on style and sequence in Trevisker ware, and during the last three decades considerable attention has been paid to the possibilities of its chronological development. Seminal studies by Parker Pearson (1991; 1995) and Woodward and Cane (1991) focussed on functional variation between vessels of different styles and sizes. The initial study by ApSimon proposed a sequence of decoration in which plaited cord (opposed twist) was replaced by twisted cord (parallel twist) and then by incised decoration. The work by Parker Pearson and Woodward and Cane made it clear that this sequence was not generally valid: there may be some chronological development with ring handles on large vessels with plaited cord decoration belonging to the early part of the sequence and a gradual increase in the use of incised as opposed to cord-impressed decoration over time. The presence of incised vessels in the Early Bronze Age has been confirmed by their inclusion in a large assemblage from a barrow at Trelowthas, Probus, with radiocarbon determinations clustering around the eighteenth century cal BC (Nowakowski forthcoming).

The problems of chronological development are compounded by the differences in the context of deposition in the Early and Middle Bronze Ages. Sites of the first period have a funerary or ritual function, while those of the latter relate to settlement and domestic activities. Doubtless there is more to be learnt about stylistic and decorative changes within the millennium of Trevisker ceramic use. At present the chronology of style and decoration is of no real assistance to the understanding of the Stannon assemblage.

Mercer's 1968 excavations were published in 1970 before ApSimon's definition of the Trevisker ceramic style. Analysis of the 1968 Stannon assemblage placed heavy reliance on the ceramic sequence at Gwithian as then understood. Recent reassessment of the Gwithian material (Quinnell in Nowakowski 2004) indicates that different interpretations of this assemblage are appropriate in the light of modern knowledge and that comparisons made on the basis of interim study should be disregarded. The 1972 publication of the settlement at Trevisker included petrographic comment by David Peacock on the gabbroic fabric used, the first published statement regarding the use of this fabric for the style. Macroscopic examination of Mercer's assemblage now deposited in the Royal Cornwall Museum confirms that this is all likely to have been made in gabbro admixture fabrics. About half of the pieces of which illustrations were published can be identified.

Mercer published this assemblage in two groups, that from the hut circles and that from the Old Land Surface (OLS) underlying these. The OLS assemblage was characterised by plaited-cord impressions (Mercer 1970, fig 15, nos 1, 2, 4), stroke-decorated ware (*ibid* nos 10–13), a vertical perforated lug (*ibid*, no 3), and 'massively grooved urns' (*ibid* nos 7–9) together with raised cordons on bases (*ibid* nos 5–6). Mercer placed this assemblage at the beginning of the second millennium cal BC, contemporary with the use of Beakers and with the latest use (as then perceived) of ground stone axes, two of which were also found in the OLS (*ibid*, fig 19, 2–3). Re-examination of the 1968 assemblage and its illustrations confirm the plaited-cord decoration to be Trevisker and show the lug (no 3), for which Mercer specifically argued a Neolithic date, also to be Trevisker. The stroke-decorated wares are from incised Trevisker vessels as are the raised base cordons. For the 'massively grooved urns', only no 7 could be located and macroscopically identified as of gabbro admixture fabric. These do not yet have parallels recognised within Trevisker assemblages. It may be noted that a sherd from an early context at Trethellan Farm was regarded as distinct from the main Trevisker assemblage from the site and affinities for it were

suggested with the Stannon grooved and stroke-decorated wares (Woodward and Cane 1991, 122). It is possible that the 1968 'massively grooved urns' from Stannon and the Trethellan Farm piece are in fact Grooved Ware and that the OLS assemblage contains a small amount of Late Neolithic pottery as well as Trevisker material. A clearer statement about Grooved Ware links may be possible when the large assemblage from Tremough near Falmouth has been fully studied (Gossip 2003, 19). However, any Grooved Ware affiliations at Stannon relate only to the 1968 assemblage. These were considered and rejected for all of the 1998–9 assemblage.

Mercer's second group from the hut circles was characterised by stroke decoration, a single twisted-cord impression and occasional fingertip decoration; there were also applied cordons, some of which were decorated, and lugs. Unfortunately, neither the lugs nor the cordons were illustrated although some abraded pieces can be identified in the assemblage. Re-examination confirms that all this material is Trevisker. If the stratigraphic division between the levels producing the two ceramic groups is still considered valid – particularly in the light of the amount of bioturbation and disturbance in the 1998–9 sites – then the hut circle ceramics do appear different to those from the OLS, particularly with regard to the proportion with incised decoration. A date towards the end of the currency of Trevisker wares might well be appropriate for an assemblage with only one cord-impressed vessel (see discussion in Quinnell 1998–9). However, it should be stressed that only a small group of material came from the excavated hut circles; this may not have been representative of the pottery in use, most of which was presumably taken away from dwelling places after breakage and deposited with other material.

To date, the Mercer 1968 assemblage is the only published Trevisker group from hut circles on Bodmin Moor. Dudley's work on hut circles and enclosures at Garrow Tor in the 1950s remains unpublished. The artefacts, with a supporting archive prepared by Dr ApSimon, are now available at the Royal Cornwall Museum. Rapid examination by the author indicates that this includes Trevisker sherds both in gabbro admixture and in a non-gabbroic fabric, as well as sherds with other Bronze Age affinities. Also deposited in the Royal Cornwall Museum are the artefacts and archive from Dorothy Dudley's unpublished excavation of hut circles on Rough Tor. These produced no pottery, however, only flint and stonework.

The artefactual material available from Early Bronze Age ritual and funerary contexts on Bodmin Moor is currently very limited. That from the cemetery on Davidstow Moor 5km north east of Stannon includes sherds from three large vessels with plaited cord decoration in gabbroic fabrics, from sites I and XXIV (Healy in Christie 1988, Table h, figs 11 and 61). These were the only Trevisker vessels definitely identified from the cemetery, although site V produced a Collared Urn and site XXVI a Beaker, both in grogged fabrics. XXVI in that cemetery also produced gabbroic Grooved Ware sherds from an early context in the site's development (*ibid*, fig 71). The only vessel found in the three cairns excavated at Stannon in the 1970s (Harris, Hooper and Trudgian 1984) was Trevisker Group 1 of a granitic fabric, presumably locally made.

The overall distribution of fabrics and forms for the Early and Middle Bronze Age in Cornwall has been clearly presented by Parker Pearson (1990). Three quarters of Trevisker vessels from Early Bronze Age contexts were, on the thin-section work published, gabbroic. The great majority of Trevisker material from the Middle Bronze Age settlements at Kynance Gate, Gwithian and Trethellan Farm was also gabbroic. However, three of the 27 thin-sections published by Parker Pearson on the assemblage from Trevisker contained granitic material, in two cases with 'metasediments' (*ibid*, 31). The pattern of increase in the use of gabbroic fabrics in Trevisker assemblages from the Early to the Middle Bronze Age has been reinforced by recent work at Callestick (Quinnell 1998–9), Trenowah (Quinnell in Johns forthcoming) and Trevilson (Quinnell in Jones and Taylor 2004). If the assemblage from Mercer's 1968 hut-circle excavation is accepted from macroscopic examination as gabbroic, it falls on the north-east edge of the Middle Bronze Age zone of predominant use of gabbroic clays for pottery (Parker Pearson 1990, fig 8); north and east of Bodmin Moor there is currently something of a gap because of the lack of investigations. Put another way, in the present state of knowledge the evidence for connections between Cornish Bronze Age communities and the Lizard for ceramic materials peters out at present north and east of Bodmin Moor.

Parker Pearson (1990, 20) states clearly that all the gabbroic admixture clays contain only minerals derived from the gabbro or from areas immediately adjacent to it, and that there was therefore no evidence to support the idea of the manufacture of

pottery from gabbroic clays which had been transported to other areas. The suggestion of the movement of gabbroic clays for manufacture close to the eventual place of use was first put forward with the initial presentation of the Trevisker ceramic sequence by Arthur ApSimon in 1972 (ApSimon and Greenfield 1972, 155–6) and has occurred intermittently in the literature subsequently, partly because of the failure to locate manufacture sites in areas of gabbroic clay despite targeted fieldwork, partly because transport of potentially breakable pottery has appeared less feasible than that of raw clay. Now at Stannon, for the first time there, is clear petrographic evidence that some of the gabbro clay was mixed with minerals which occur around the granite periphery and not in the Lizard area. The recent assessment of Trevisker assemblages at Gwithian has identified a slab of unbaked gabbroic clay in Layer 3 (Quinnell and Taylor in Nowakowski 2004, Appendix 1); other features in Layer 3 have been tentatively identified as connected with on-site pottery manufacture. The full implications of the manufacture of gabbroic pottery at Gwithian await analysis of the assemblage but, coming at the same time as the petrographic evidence from Stannon, this means that the whole system of pottery manufacture in Cornwall during the second millennium cal BC needs review. The petrography of sherds from site 6 and site 9 at Stannon appear to be similar yet several centuries may separate the two. The recent work for Stannon and for Gwithian highlights two points. Firstly, ceramic petrology is not an exact science, and the more work which is carried out by geologists with a really detailed knowledge of the complexities of the rocks of south-west Britain, the more information we may expect to be forthcoming. Secondly, evidence for on-site manufacture of prehistoric pottery can be elusive and may very well have been overlooked at many locations previously studied.

Two features are very apparent with Trevisker pottery: the strong tradition which ensures broad similarity of vessels over perhaps a millennium, and the slightly differing features of assemblages from different sites. Within this long-lasting ceramic tradition, which must itself reflect other aspects of continuity within society, there are indicators for local groupings which again may have been long lasting. One reason for the mixing of local materials with imported gabbroic clay may have been a symbolic mixing of potting materials brought in from a trusted source with those from the local area of a community, reinforcing the specific local community character of the pottery; recent ceramic studies, especially those of inclusions, have moved a long way from the purely pragmatic (see especially Woodward 2002b). The overall ceramic similarities across Cornwall must indicate a considerable degree of contact between communities. Such contact would also be involved if groups were regularly visiting the Lizard to obtain clay for local manufacture, mostly likely to be transported by boat around the coast. The social dynamics involved will be explored further as work on Gwithian continues. It would be unwise, on the evidence from these two sites alone, to assume that all pottery was made away from the Lizard or indeed that no pottery was transported. The final pattern of ceramic production and distribution for second millennium BC Cornwall is likely to involve a complex mesh of movements of both clay and finished pots.

The 1968 and 1998–9 Stannon excavations provide a sequence of ceramic use through the second millennium BC, and perhaps earlier, which cannot be closely paralleled on other sites at present. It is quite possible that the 1968 material from the soil beneath the hut circles contains sherds of Grooved Ware in a gabbro admixture fabric as well as material in similar fabric which may belong to Trevisker vessels of the earlier second millennium BC. The soils beneath site 2, site 6 and site 9 all contained small abraded sherds in gabbroic fabrics but without distinctive features. The whole area therefore has a background ceramic scatter which may indicate activity stretching back into the third millennium BC. The deposited groups from site 2 and site 6 probably both belong to the seventeenth to fifteenth centuries cal BC, late in the Early Bronze Age in traditional terms, while the larger group from site 9 probably belongs within the fifteenth to twelfth centuries cal BC, quite probably contemporary with the occupation of the hut circles. Ceramics from site 6 and site 9 have similar petrography which indicates manufacture somewhere in the surrounding area incorporating clays brought in from the Lizard, reflecting patterns of behaviour which may have lasted for centuries and demonstrated strong links of identity between a community and its area of activity.

The Middle Iron Age South Western Decorated assemblage

The small assemblage from site 9 represents the first group of South Western Decorated ceramics found on Bodmin Moor. The only other Iron Age material from the Moor is that from Garrow Tor excavated by Dorothy Dudley in the 1950s. A brief comment was published by Dudley (1957, 48) and a summary paragraph by Silvester (1979, 179) but the site remains unpublished. However, the archive has now been deposited in the Royal Cornwall Museum and the ceramics have been rapidly examined by the author. In addition to Trevisker and probably other Bronze Age material, there is a small group of good quality gabbroic sherds of which the only distinctive feature is a carinated shoulder likely to belong to the Early Iron Age. The Garrow excavations also produced a La Tène I blue glass bead published by Guido (1978, 61). While the relationship between the bead and the ceramics is not at present clear, the Garrow ceramics appear likely to date well before the introduction of South Western Decorated ware.

The two radiocarbon determinations (OxA-13383 and OxA-13382) from postholes [226] and [228] in site 9 are statistically indistinguishable and indicate a date within the fourth to the first centuries cal BC, a range entirely appropriate for South Western Decorated ware. The small size of the assemblage and its cohesive character suggest that the activity to which it related may have been short-lived, perhaps occupying only a generation or two. The fabric of all sherds is similar in inclusion size, good quality clay preparation, firing and finish. All vessels are of a single form, best illustrated by **P13**, a jar with a rounded shoulder, upright neck and rounded, slightly expanded rim. This jar form is virtually the only form in which South Western Decorated ware was manufactured in Cornwall, but can occur in various sizes, as a comparison between **P13** and **P14** indicates. The decoration of the vessels is unusually complex. The dimples surrounded by incised lines on **P11** and **P21** and the use of rouletting to emphasise neck cordons on **P13** and **P14** and the pattern of incised lines on **P14** are unusual, while the dense criss-cross incisions infilling triangles on **P10** and **P14** are far less common than simple oblique lines. Of these decorative features, the published assemblage from the hillfort at Killibury (Miles 1977) contains only a few sherds with dense criss-cross incised lines. The much larger assemblage from the cliff castle at The Rumps (Brooks 1974) includes dense criss-cross lines and examples in which rouletting enhances neck cordons or straight incised bands, but nothing as complex as **P14**, and has no examples in which incised lines surround dimples. The complexities of the Stannon decorations are only matched, among published material, at the small hillfort of Carloggas, St Mawgan-in-Pydar, between Wadebridge and Newquay (Threipland 1956) and the hillfort at Castle Dore (Radford 1951); both assemblages include pieces with incised decoration centred on dimples and with roulette-enhanced designs.

The cliff castle at The Rumps and the multiple enclosure hillfort at Killibury, both south west of Stannon and to the north of the River Camel, have both produced assemblages of South Western Decorated ware made entirely of gabbroic clay. These two sites are on the northern edge of the area, to the west of Bodmin Moor, in which gabbroic South Western Decorated ware is the predominant Middle Iron Age ceramic. Stannon extends this distribution onto the north-west edge of Bodmin Moor. There are small collections from the multiple enclosure hillforts of Tregear Rounds (Baring Gould *et al* 1904) and Helsbury (unpublished, in the Royal Cornwall Museum) which appear, from published description in the first case and examination by the author in the second, to be of this form and fabric. Further north, in north Cornwall and in north Devon, the lack of data only relates to paucity of fieldwork. A small unpublished collection from the coast at Widemouth Bay near Bude appears, on examination by the author in the Royal Cornwall Museum, to be gabbroic South Western Decorated ware; a small South Western Decorated ware assemblage from excavation at the cliff-top enclosure of Embury Beacon, six miles south of Hartland Point in north Devon, was considered to be gabbroic, although no petrographic work was carried out (Jefferies 1974, 151).

Three examples of holes for repair with iron rivets were present in the Stannon assemblage, in **P14**, **P10** and in unillustrated **SF325** from [212], the first with part of the rivet still in place. Such repair holes occur in sherds from Tregear Rounds (Baring Gould *et al* 1904), Killibury (Miles 1977, P4) and The Rumps (Brooks 1974, fig 24 No 4) and no less than 17 in the unpublished assemblage from the Trevelgue Head cliff castle near Newquay (Quinnell in Nowakowski 2003). There appears to be a direct relationship between the amount of repair work and apparent distance from manufacturing source, a relationship clearly demonstrated by Stanford (1974, fig 81,

p174) for Middle Iron Age vessels made from Malvern Hills clay and distributed, like those of gabbroic clay, over a wide area. The number of vessels represented in the Stannon assemblage cannot be accurately estimated; parts of seven have been illustrated, and all the sherds, otherwise mainly featureless, need not have come from more than perhaps a dozen in total. This makes the proportion of repaired vessels far higher than for any other assemblage studied in Cornwall. The repairs may relate to the high quality of the vessels present but this in turn raises the question of the presence of these vessels on an apparently peripheral settlement site. Were certain special vessels perhaps selected for transport to and use on a subsidiary residence principally used for the supervision of sheep and cattle grazing on the moorland? There is obviously some link here more subtly connected with Iron Age social relationships than quality of ceramics and apparent status of residence.

The sherds were all small, with a mean size of 6.5g and generally abraded. The material found in the postholes did not differ sufficiently from the remainder of the assemblage for any suggestion of formal deposition to be made. It is assumed that the Iron Age material, as the Bronze Age, had suffered greatly from post-depositional disturbance after the abandonment of the site in prehistory. Even so, only very small parts of the vessels represented are present. Rough calculations indicate that these vessels, when complete, might weigh between one and two kilos according to size. The minimum of a dozen vessels might represent some 18 kilos of broken pottery, yet the assemblage consisted of less than one kilo. Where was the rest? Two sherds weighing 14g were found on site 10 but none of the other sites produced Iron Age material, nor did the excavations of adjacent hut circles by Roger Mercer. It may be that broken sherds were tipped at random with other refuse at a convenient distance away from the structure on site 9. However, the general pattern of artefact survival on settlements in the Cornish Iron Age and its local continuum into the Romano-British period indicates systematic disposal of refuse well away from domestic areas, presumably connected with its disposal as part of fertiliser (Quinnell 2004, 12.10). The small proportions of the vessels which survive at Stannon may indicate the usual practice of systematic rubbish disposal was also carried out on this upland site and, if use as fertiliser was involved, there are implications for arable farming connected with the site despite the lack of cereal grains found.

The radiocarbon determinations do not allow the Middle Iron Age activity at Stannon to be closely dated, partly because of problems with the application of radiocarbon dating during this period. And, because of these problems, even where as at Killibury, there are a number of determinations, chronology for the use of South Western Decorated ware, and for any developments within its period of use, has been very imprecise. The other factor here is the general scarcity of well stratified sequences. The large assemblage from the Trevelgue Head cliff castle includes material from stratified deposits which appear to indicate stylistic development (Quinnell in Nowakowski 2003) during the early stage of the currency of South Western Decorated ware. Work on analysis and publication of this assemblage has included a general scan and synthesis of Iron Age ceramics in Cornwall. It is therefore recommended that this report be used together with that on the ceramics from Trevelgue when this becomes available (Nowakowski and Quinnell forthcoming).

The stone artefacts

Henrietta Quinnell, with petrographic comment by Roger Taylor

Presentation

The assemblage contains a wide range of material; some pieces were gathered locally, others from various places to the west and south west between the site and the sea, and two from more distant sources in east Devon. Some pieces have been shaped, others have obvious use-wear. However, some are naturally of shapes suitable for artefacts such as rubbing stones but show no definite signs of use. Moreover, some unmodified pieces may have been deliberately selected for their appearance and their presence may have been as significant in on-site activities as artefacts with carefully crafted shapes. Therefore, all recorded stone sourced beyond the granite on which the site lies, or which show detectable signs of modification or use, is included in the following analysis. For most of the stonework there are brief tabulated descriptions, with more detailed comment and illustration where required. Where only a single dimension is included, this is the greatest whether of whole pieces or of fragments. Quadrants have been abbreviated: Q1, Q2, Q3 and Q4.

As Iron Age ceramics were restricted to site 9, all pieces from the other sites are assumed to be Bronze Age. For site 9, artefacts from contexts with Iron Age pottery are assumed to be of this date, although the re-use of Bronze Age artefacts is considered in certain cases.

Sourcing

Material described as local derives from the granite on which the site is situated; this includes vein quartz, which occurs within the granite, and limonite which occurs in marshy areas. The site is situated 2km from the edge of the granite; it is of course not possible to determine where on the Bodmin Moor granite, any of these pieces originated. Stream cobbles and pebbles could originate from the stream, tributary to the Camel, about 1km west of the site. Some stone derives from the aureole which extends 1–2km around the edge of the granite. Beyond this, pieces of material such as altered basic rock (greenstone) may come from the area between the Moor and the coast.

Stonework allocated a beach source has wear consistent with high-energy sea action. It is assumed that all these come from the coast. However, it is possible that remnant beach deposits remain to be located as there are areas inland between the coast and the site with erosion surfaces between 122 and 137m OD which would be appropriate for a former coastline of Tertiary date (cf discussion of Tertiary deposits in Selwood *et al* 1998, 195). The coast used to source cobbles may be that immediately to the west about 9km away or, in the case of the Staddon Grit cobbles, up to 30 km away to the south west in the area of Mawgan Porth and Porthcothan.

The stonework from Mercer's 1968 hut circle excavations has been rapidly examined in the Royal Cornwall Museum. The saddle querns and other cereal processing equipment described in the excavation report (Mercer 1970, 32) are not present and were presumably left on site; two of the three saddle querns were of granite, the third sandstone and the mullers were described as being 'predominantly of granite'. The small equipment present includes rubbing stones, slickstones and whetstones – or fragments – with a range of sources replicating those from the 1998–9 sites. These sources include, for beach cobbles, four examples of probable Staddon Grits sandstone. Three of these can be identified with 'four highly polished deliberately shaped plaques on the floors of Circles 2 and 6' which were interpreted as whetstones; the fourth is a small slab of fine-grained metamorphic siliceous sandstone from the north Cornwall area. These four pieces do appear to have been used as whetstones but only one has had its shape modified; they are in no way similar to the plaques **SF3** and **SF40** from site 2 described below.

Only the artefacts from site 2 sourced to east Devon demonstrate distant contact in the Late Neolithic or Early Bronze Age; no stone objects of these dates from sites in Cornwall have previously been sourced to this part of the south west. The Bronze Age and Iron Age assemblages both contain material from the same broad area extending beyond the site to the sea and from a similar range of beach deposits. The Early Bronze Age is principally represented by material from the 1998–9 sites, the Middle Bronze Age by a few artefacts from these sites and from Mercer's 1968 hut circles. The pattern of resource procurement for stone artefacts indicates a wider area than was evidenced by the settlement at Trethellan Farm (Nowakowski 1991, 141), where almost all stone came from within 3– 5km, at Trevilson, near Mitchell (Quinnell in Jones and Taylor 2004), where stone was similarly local.

The most distinctive and most distant stones at Stannon were the probable Staddon Grits sandstone beach cobbles sourced to the Mawgan Porth area some 30km away. Staddon Grits sandstones are a distinctive dark grey colour and have a fine grained hard texture suitable for a wide range of uses. They were not identified among the large assemblage at Trethellan Farm despite the site being within 10km of their source. At Stannon there is one cobble from site 2, six from site 9 and two from site 11, with at least a further four from Mercer's hut circles. They were used as whetstones, slickstones, hammerstones and rubbing stones. Whetstone **SF5** from site 11 should belong to the Early Bronze Age, while the hut circle whetstones should be Middle Bronze Age. The site 9 cobbles are considered to be Middle Iron Age (see below), although, given the amount of disturbance on site 9 definite dating is not possible. These Staddon Grit beach cobbles, supported by material from other areas beyond the granite and its aureole, demonstrate a pattern of stone procurement for artefacts which continued over some two millennia. The extensive area from which stone came contrasts with that of Middle Bronze Age settlements for which data are available and may relate in some way to a greater degree of mobility among communities using the granite uplands.

Site 2

The three artefacts incorporated in the kerb [29], **SF43** a burnt quartz beach pebble, **SF43** stream-worn vein quartz, and the East Devon grinding plaque **SF40**, make up an unusual group. Apart from the unique character of **SF40**, **SF43** is the only quartz beach pebble from any of the sites which had been burnt, and it and vein quartz **SF43** are the only examples of these materials recorded from the site, although they occur on sites 9, 10 and 11. These artefacts were all deposited on the west side of the cairn, together with decayed slate **SF41**. Their grouping points up the distinctive character of site 2, which is not a ring cairn. The cairn with its kerb appears to date from the late third millennium BC (OxA-1387) and the artefacts incorporated within might be more appropriately described as being Late Neolithic than as Bronze Age. If **SF40** does indicate Late Neolithic contact with East Devon, such contact is again evident in the later Early Bronze Age with the probable amulet **SF3**.

The two apparently unique objects, **SF3**, again from east Devon, and **SF20**, were deposited as a tight group with cobble fragment **SF9** in soil [3] in the area between pits [6] and [30]. The location of the group strongly suggests deposition in the phase contemporary with the pits in the seventeenth to fifteenth centuries cal BC; the deposition of these objects may relate to that of Trevisker pottery linked to this phase by its presence in the pits. The muller fragment **SF50** comes from this general area and may also be allocated to this phase. It may be noted that this later phase deposition did not include examples of the quartz pebbles which occurred on site 9 and site 10 in addition to **SF43** in the first phase of site 2. The summary published by Miles (1975, 72) remains the only attempt at a literature scan for these pebbles although they have frequently been recorded on barrows and related sites studied subsequently (for example, the Trelowthas Barrow, Probus: Nowakowski forthcoming). It is not known whether there is any ascertainable relationship between the presence of white pebbles and of different aspects of ritual practice.

It is impossible to say whether the limonite fragment **SF400** from pit [30] should be regarded as the result of deliberate deposition; there appear to be no parallels for this material in structured deposits of Bronze Age date.

Description of illustrated stonework from site 2

SF3 (Fig 31) Soil [3]. Triangular plaque or amulet of tabular sandstone 7mm thick with one corner broken off. Shaped originally as an isosceles triangle, it has an intact edge of 90mm; the apex has broken off about half way along the other edges, which would have been about 110mm long. The edges have been ground to shape and faint sets of striations on both sides suggest that the surfaces have also been ground. There are no comparanda for this object from Bronze Age sites in the south west but its background may lie in the range of carefully crafted whetstones and wristguards of the Beaker period and Early Bronze Age. This tradition occasionally includes amulets such as the thin, evenly worked oval from barrow 284 at Aldbourne in Wiltshire

Table 19 Stonework from site 2 (* indicates that a more detailed description is given below)

Context	*SF*	*Description*	*Petrology*
[10] on top of OLS, close to cairn, east facing Q3 baulk	50	Muller fragment with convex worn surface, edge worked, 105mm × 60mm × 40mm	Medium to fine grained granite, local
[29] in kerb Q1	41	Semi-circular small worked slate piece	(too decayed for study)
[29] in kerb Q1	40	Grinding plaque fragment *	Permian aeolian sandstone, from Exeter/Dawlish area *
[29] in kerb Q2	43	Unworked quartz lump, 78mm	Vein quartz with stream wear
[29] in kerb Q2	43	Unworked pebble, burnt, 19mm	Quartz, beach source
[30] in pit [31] Q3, soil sample 1033	400	Unworked fragment, 20mm	Limonite from iron pan in local marshes
[3] over cairn Q2	3	Triangular plaque, broken, possible amulet *	Fine grained glauconitic sandstone, Upper Greensand, east Devon *
[3] over cairn Q2	9	Cobble fragment, suitable shape for rubbing stone, no obvious use-wear, 32mm	Beach source, Staddon Grit-type sandstone
[3] over cairn Q2	20	Cuboidal grinding stone *	Altered and probably weathered basic igneous rock? from area between Bodmin Moor and Tintagel *

(Kinnes and Longworth 1985, 128). **SF3** appears, while large for an amulet, thin and fragile for a whetstone; its broad triangular shape appears appropriate for an amulet. A rectangular amulet with decoration around the perforation comes from Layer 3 at Gwithian, with Trevisker pottery associations (Cubbon 1998, fig 2; Quinnell in Nowakowski 2004, appendix 4); Dudley (1955–6) has published several less elegant examples including one associated with the standing stone at Kerris in west Cornwall.

Petrographic comment: The sandstone has a porous texture and consists of angular quartz grains (0.1–0.2mm) in a siliceous cement. Brown oxidised and rare greenish glauconite is present as rounded grains and angular aggregates (0.1–0.5mm). Muscovite occurs as a scatter of flakes up to 0.3mm. Silicified glauconitic sandstones of this type are characteristic of the Blackdown facies of the Cretaceous Upper Greensand, with potential source areas on the Haldon Hills or the western scarp of the Blackdown Hills in Devon.

SF20 (Fig 31) Soil [3]. Cuboidal block of altered igneous rock (greenstone) ground into rectangular shape 50mm × 50mm × 35mm. Profile slightly domed and edges rounded, one of the two larger facets much better finished than the other. This rounding of the edges has been accentuated by erosion subsequent to use. The shape is strongly reminiscent of a cushion stone for metal working; the classic examples are the pair from Lunteren in Holland with Beaker associations (Clarke *et al* 1985, fig 4.3). However, the stone is too soft and too gritty for such a use and the surface wear suggests abrasive activity. Occasional examples of small rectangular grinding stones occur in barrows, such as that from Goodmanham Barrow 87 in Yorkshire (Kinnes and Longworth 1985, 82), but no similar example of the cushion shape used for grinding appears to be known.

Petrographic comment: Soft altered/weathered basic igneous rock consisting of angular fibrous knots of mid-green amphibole (0.2–1.5mm) set in a soft, light greyish-green matrix of fine grained amphibole and altered feldspar with a grain size less than 0.05mm. The top and sides appear to have been ground flat. Erosion on the sides leaves the knots of amphibole standing out from the matrix. On the central, flat part of the upper surface the amphibole knots have flat facets and stand only slightly above the matrix. A source area outside the metamorphic aureole of the Bodmin moor granite is likely, probably from the area where basic igneous rocks occur to the south west of the site. An alternative source, suggested by its shape, is that it was worked from a cobble of basic rock.

The softness of the rock places limitation on its use in any hard percussive role. However, the texture, with harder grains in a softer matrix, gives it a distinctive abrasive character. The faceting of the amphibole grains on the upper surface could indicate that it has been used for abrasive purposes, perhaps in leather dressing.

SF40 (Fig 31) In kerb [29]. Grinding plaque using thin slab, at least 80mm × 75mm and 17mm thick, with wear, probably from grinding, on both faces; slightly weathered fractures. The original edges are those of a thin natural slab of tabular sandstone fragment with a brown iron cemented area grading to a red, more weakly cemented, edge. The slab does not appear to have been shaped before use.

Petrographic comment: The rock consists of 90–95% sand grains with the remainder formed of an iron-rich cement. Quartz occurs as well rounded to angular, white opaque to transparent colourless grains (0.1–1.1mm). The well-rounded grains have a distinctive frosted appearance characteristic of quartz rounded in an aeolian dune-sand environment. Feldspar also occurs as white well-rounded and angular grains (0.1–0.8mm) and a few composite quartz/feldspar grains are also present. There is indication of wear on both surfaces of the slab, some of the larger quartz grains having abrasion facets.
Aeolian sandstones of this type can be closely matched to the Permian Dawlish Sandstone that in places is cemented in brown tabular sheets by iron pan. The Dawlish Sandstone extends north eastwards from the cliffs at Dawlish along the west side of the Exe estuary and to the south and east of Exeter.

Site 6

The saddle quern fragment **SF401** is of interest for its inclusion in the ring cairn wall [89] at its southernmost point; objects found in infill of the next phase, including a faience bead **SF2**, were all found in its southern part. One side of the fragment retains part of a possible impact fracture which may indicate deliberate breakage. The construction of the wall and the incorporation of the quern fragment predates the mid second millennium cal BC determinations from the posthole ring subsequently inserted into the infill

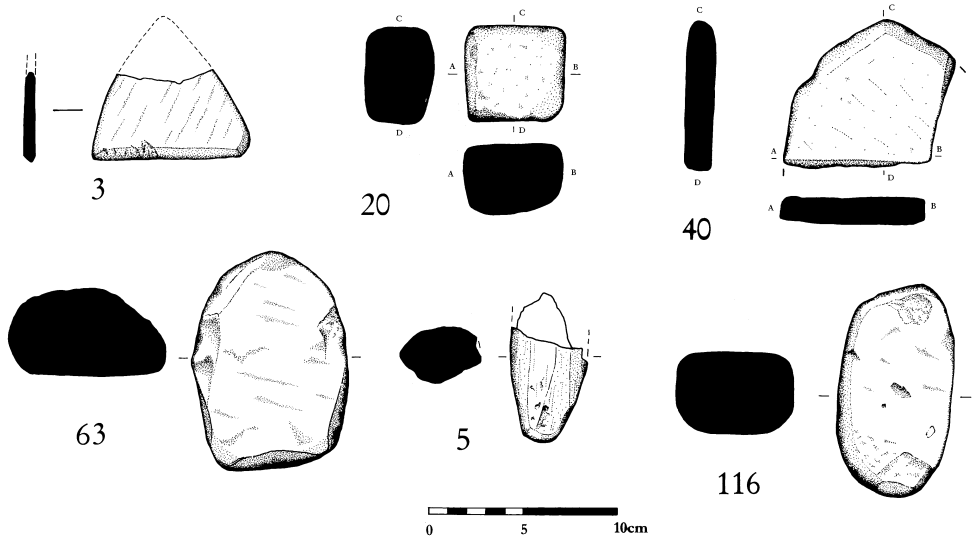

Fig 31 Stone artefacts from sites 2, 10 and 11. Site 2: SF3 Amulet [3] soil over cairn, SF20 cuboidal grinding stone [3] soil over cairn, SF40 grinding plaque in kerb [29]; site 10: SF63 Muller [306] over wall/exterior; site 11: SF5 Whetstone in [102] cairn, SF116 Rubber silt [106]. Scale: 1:4. (Drawing: C Thorpe)

and suggest that the quern fragment may belong somewhere in the early second millennium cal BC. A number of quern fragments have been recorded from Cornish barrows. Two broken pieces were found in the cairn surrounding the Beaker cist and menhir at Try, Gulval (Russell and Pool 1964, 23). A substantial piece was found in the ring cairn at Boscawen-Un which also contained Trevisker pottery (Borlase 1872, 221 with illustration; Patchett 1944, Table II, C10). A third possible broken example comes from Davidstow III (Christie 1988, 67); the surviving details of the quern are unclear but the barrow has a radiocarbon determination which places its construction at the beginning of the Early Bronze Age. Another broken piece comes from the ditch of the Trelowthas barrow but in a context which postdates the initial use of the site and is Middle Bronze Age (Nowakowski forthcoming).

The vein quartz piece **SF51** appears to have been selected for its triangular shape; it seems to have been wedged in position against the grounder which forms a major feature of the ring wall. Apart from **SF51**, site 6 is remarkable for the scarcity of stone work, in particular the absence of any non-local material and of quartz pebbles.

Site 9

All contexts with stonework have produced Middle Iron Age pottery except [202], [225] and [239], which are stratigraphically linked to Iron Age use or are later than it; thus all the stonework comes from contexts which are either Iron Age or have been disturbed during activity of that date. The stonework is therefore all assumed to be Iron Age unless there are reasons for inclusion or reuse of earlier material. The exceptions are the six small pebbles and single quartz piece which are similar to those which occur on the other sites and are likely to relate to Bronze Age ritual practices. The six pebbles all appear to have a beach source.

The table lists five pieces suitable for use as rubbing stones but without obvious use-wear. Three have a beach source, the others are respectively local and from an elvan dyke; several elvan dykes occur within several kilometres of the site. The two probable slickstones, naturally glossy, are from a beach, as was a hammerstone fragment. It is apparent that cobbles and other pieces suitable both in shape and material for particular uses were being selected and sometimes brought over some distance. This may suggest that suitable 'blanks' for different types of stone tool formed objects of exchange. Parts of

three whetstones are present, two with a beach source. Small objects such as the spindle whorls were generally of material sourced in the area of the granite aureole and could have been obtained within a few kilometres of the site. However, some pieces of altered basic rock derive from beyond the aureole, in the area between the Moor and the coast, most notably the altered gabbro piece **SF402** which originated somewhere in the Tintagel area. The cereal processing equipment is comparatively local, either from streams or surface material.

Description of illustrated stonework from site 9

SF148 (Fig 32) Central infill [203]. Amulet or unfinished spindle whorl. Rectangular piece 39mm by 35mm by 13mm with fresh oblique hour-glass perforation off centre in which the borings either side were incorrectly centred and which may be unfinished; both flat surfaces and one side retain surface of natural rock fracture, remaining sides have traces of grinding. A similar piece occurs at the Rumps cliff castle (Brooks 1974, fig 35 No 15). There appears to be no published study of the process of spindle whorl manufacture but experimental work indicates that the whorl is best shaped first and then the perforation centred within it (T Tuohy per comm). This sequence is supported by the comments on the large group from South Cadbury (Bellamy 2000). Given the limited amount of perimeter shaping completed, it seems unlikely that a circular shape was needed before the perforation was attempted and therefore that the object should be tentatively regarded as an amulet.

Petrographic comment: A soft, bleached, heavily altered/weathered fine-grained basic igneous rock. Cavities may indicate sites of feldspar phenocrysts.

SF216 (Fig 32) Outer bank [204]. Spindle whorl, 39mm across and 14mm thick weight 28g; well-centred perforation 6mm across with slight hourglass form and internally smoothed near-cylindrical inner section; narrow groove incised around exterior; part of one surface has flaked away. Groove has parallels in decorated examples from contexts with South Western Decorated pottery, for example at the Rumps (Brooks 1974, 35).
Petrographic comment: A soft, bleached heavily altered/weathered fine-grained basic igneous rock similar to **SF148** but with a weak cleavage. Source outside the thermal aureole of the Bodmin Moor granite.

SF117 (Fig 32) Central infill [212]. Spindle whorl, 37mm across, 7mm thick, weight 17g; smooth with a near-cylindrical, perforation 6 mm in diameter. Plain spindle whorls are much more common than those with any kind of decoration. Both **SF216** and **SF117** are likely to relate to Iron Age activity as stone spindle whorls do not occur during the second millennium BC; they are notably absent from the large artefactual assemblage at Trethellan, Newquay (Nowakowski 1991). The presence of spindle whorls indicates that the preparation of yarn, presumably of sheep's wool, occurred as part of Iron Age activity and, most probably, that women were present.

Petrographic comment: A fine-grained silty micaceous sandstone from a rock source outside the granite aureole.

SF301 (Fig 32) [239] fill of posthole [238]. Imperforate disc, 39mm across, 10mm thick. Wear around edges indicates use as a complete object such as a counter, and that it is not an incomplete spindle whorl.

Similar objects which may be interpreted as counters occur regularly in Middle Iron Age assemblages: there are at least four from the Rumps (Brooks 1974, fig 33 nos 18 and 22, fig 35 Nos 19 and 20), one from Killibury (Miles 1977, fig 42 no 41), a group of nine from Penhale cliff castle (Smith

Table 20 Stonework from site 6

Context	*SF*	*Description*	*Petrology*
[89] wall of site, Q1/4	401	Squarish saddle quern fragment; worn surface surviving 140mm × 130mm thinning from 70mm to 50mm	Fine-grained aplitic granite with coarse granite inclusions. Local surface material
[52] clay deposit in interior; placed against grounder in wall, Q2	51	Unworked quartz triangle, 87mm × 80mm × 25mm	Local vein quartz

Table 21 Stonework from site 9 and subsequent Iron Age activity (* indicates that a more detailed description is given below)

Context	*SF*	*Description*	*Petrology*
[204] outer bank, Q3	216	Spindle whorl *	Altered basic igneous rock *
[213] inner cairn-ring, Q1	342	Pretty pebble, 30mm	Beach pebble, quartz-veined fine hard sandstone
[213] inner cairn-ring, ?Q3	402	Unworked fragment, 65mm	Altered gabbro block from somewhere between Bodmin Moor and Tintagel
[205] inner bank, Q3	158	Muller *	Stream cobble, coarse granite
[206] inner ditch, Q4	41	Muller fragment, 80mm × 72mm × 40mm, surviving edge trimmed and worn surface convex	Fine-grained granite. Local surface material
[207] upper fill ditch [206], Q4	161	Slate disc/pot lid *	Micaceous slaty hornfels, from granite aureole possibly within 1km of site
[207] upper fill ditch [206], Q4	403	Crudely worked slate, 140mm × 125mm × 20mm	Micaceous slaty hornfels, from granite aureole
[207] upper fill ditch [206], Q4	39	Cobble fragment, possible use-wear as rubbing stone, 80mm	Beach cobble, lava or volcanic material; another piece unstratified Q3
[207] upper fill ditch [206], Q1	323	Unworked burnt? piece, 42mm	Sedimentary rock, not local
[212] Phase 2 infill, Q3	117	Spindle whorl *	Fine grained sandstone/siltstone *
[212] Phase 2 infill, Q2	153	Whetstone fragment *	Stream cobble, fine grained sandstone/siltstone of Staddon Grits type
[212] Phase 2 infill, Q1	166	Possible slickstone, 80mm × 60mm × 40mm; naturally glossy surface makes use-wear difficult to distinguish	Calcsilicate hornfels (calcflinta) beach cobble, hard and naturally glossy; primary source? northern aureole St Austell granite or Bodmin granite aureole
[212] Phase 2 infill, Q1	168	Cobble fragment, shape appropriate for rubbing stone but no definite use-wear, 70mm	Fine-grained granite beach cobble
[212] Phase 2 infill, Q3	256	Whetstone *	Beach cobble, fine-grained sandstone, Staddon Grits type
[212] Phase 2 infill, Q1	287	Cobble fragment, shape appropriate for rubbing stone but no definite use-wear, 70mm	Elvan cobble, probable beach origin
[212] Phase 2 infill East baulk, Q1/2	317	Cobble fragment with battered edge from use as hammerstone, 65mm	Flat beach cobble, medium fine-grained sandstone, Staddon Grits type
[212] Phase 2 infill, Q1	326	Pebble, 30mm	Vein quartz beach pebble
[212] Phase 2 infill, Q2	330	Muller *	Fine-grained megacrystic granite. Local weathered surface material
[213] inner cairn-ring, Q1	342	Pretty pebble, 30mm	Beach pebble, quartz-veined fine hard sandstone
[215] fill of drain [214], Q1/2	337	Pebble, 36mm	Beach pebble, vein quartz with ‘chatter marks’
[215] fill of drain [214]	404	Unworked quartz, 35mm	Vein quartz, local material
[215] fill of drain [214], Q4	150	Saddle quern fragment *	Fine-grained aplitic granite with inclusions of coarse-grained granite. Local weathered material
[215] fill of drain [214], Q4	338	Saddle quern fragment *	Coarse granite with small megacrysts. Local weathered material
[225] fill of posthole [224], SS 1078	405	Small whetstone fragment with wear striations, 17mm	Quartz tourmaline aggregate, from local vein in granite
[239] fill of posthole [238], Q3	300	Unworked fragment, 75mm	Fine-grained micaceous sandstone, Staddon Grits type, not water-worn
[239] fill of posthole [238], Q3	301	Counter *	Micaceous slaty hornfels with chiastolite from aureole
[203] central infill, Q1	136	Slickstone fragment ?, 97mm × 55mm × 30mm; naturally glossy surface makes use-wear difficult to establish	Beach cobble, quartzitic sandstone, Staddon Grits type

Table 21 *continued*

Context	*SF*	*Description*	*Petrology*
[203] central infill, Q1	147	Unworked, 30mm	Pebble fragment
[203] central infill, Q1	148	Amulet *	Altered basic igneous rock *
[203] central infill, Q4	406	Unworked, 30mm	Water-worn slate
[202] stones/peaty soil over site, Q3	66	Unworked block, suitable shape for rubbing stone, 130mm	Fine-grained aplitic granite. Local surface material
Unstratified, Q1/3	320	Pebble, 30mm	Beach pebble, vein quartz
Unstratified, Q4	328	Piece from cobble, possibly used as rubbing stone, 42mm	Elvan, from dykes within several km of site
Unstratified, Q4	407	Pebble, 50mm	Beach pebble, calcsilicate hornfels
Unstratified	408	Slab with opposed cup marks *	Fine-grained, slightly foliated, sandstone, Staddon Grits type, not water-worn
Unstratified	409	Pebble, 50mm	Beach pebble, calcsilicate hornfels

1988, 183) and about a dozen from Trevelgue cliff castle (Quinnell in Nowakowski 2003), although some of the Trevelgue examples could date to the Roman period.

SF153 (Fig 32) Central infill [212]. Whetstone, broken, surviving length 35mm, width 18mm, thickness 11mm. Both faces and both long edges show striations from use, one edge with subsequent damage.

SF256 (Fig 32) Central infill [212]. Whetstone using slightly damaged cobble, 137mm × 70mm × 25mm. Both faces have extensive use-wear traces and one end may also have been used as a hammer.

The shape of both **SF153** and **SF256** has been determined by the character of the cobbles selected; Staddon Grit sandstone tends to fracture into flat, bladed shapes. Whetstones of the narrow elongated shape of **SF153** and the broader oval shape of **SF156** occur in both Bronze Age and Iron Age contexts: compare those from Bronze Age Trethellan (Nowakowski 1991, fig 61) and Iron Age Rumps (Brooks 1974, figs 33–4). However, whetstones are such common and essential artefacts in Middle Iron Age assemblages that **SF153** and **SF256** can reasonably assigned to this date. The use of **SF256** in two ways, as a hammerstone as well as a whetstone, appears to be more common than the published descriptions of artefacts indicates, an aspect recently highlighted by Later Bronze Age material from Callestick (Quinnell 1998–9) and the multi-period assemblage from Gwithian (Quinnell in Nowakowski 2004, appendix 4).

SF161 (Fig 32) [207] upper infill inner ditch [206]. Slightly irregular slate disc, 65mm across and 12mm thick; trimming marks show around edge but with some subsequent wear. Although small, probably in the class of objects described as potlids. Similar discs occur in Bronze Age contexts at Trethellan (Nowakowski 1991, fig 64) and Gwithian (Quinnell in Nowakowski 2004, appendix 4), and also in the Iron Age as at the Rumps (Brooks 1974, figs 33–4). If the interpretation a potlid is correct, the small size would make an Iron Age date more appropriate than one in the Bronze Age because of the smaller size of pottery vessels.

SF408 (Fig 32) Unstratified. Part of slab, 100mm across, 12mm thick, and surviving 55mm wide. Pecked depressions, 'cup marks', 20mm across and 2–3mm deep, in each flat surface almost exactly opposite each other. Pebbles with opposed cup marks occur on Bronze Age barrow sites although their function has never been satisfactorily determined (see Roe 1985 for full discussion). The recent assessment of finds from Gwithian indicates that these may occur on cobbles and on slabs at other dates than the Bronze Age (Quinnell in Nowakowski 2004, Appendix 4). However, the Gwithian contexts do not include examples contemporary with South Western Decorated ware and a literature search has not revealed comparanda to **SF408** in reliable Iron Age contexts in Cornwall. Cup marks do occur on one side of several slate slabs at Trethellan (Nowakowski 1991, fig 65). **SF408** may tentatively be regarded as Bronze Age.

SF158 (Fig 33) Inner bank [205]. Plano-convex muller, 240mm by 130mm by 75mm. Worn surface

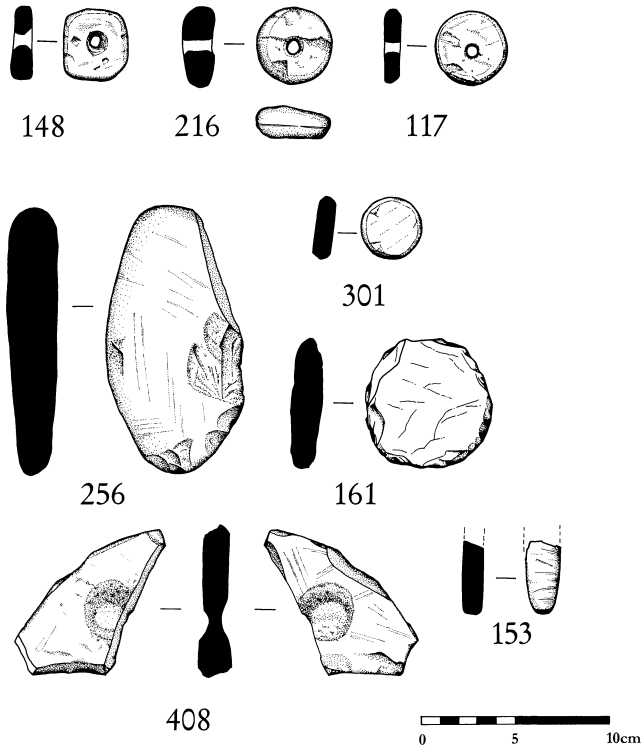

Fig 32 Stone artefacts from site 9. SF148 amulet central infill [203], SF216 spindle whorl outer bank [204], SF117 central infill [212], SF301 counter [239] fill posthole [238], SF153 and SF256 whetstones central infill [212], SF161 potlid [207] upper fill inner ditch [206], SF408 cupmarked slab, unstratified. Scale: 1:4. (Drawing: C Thorpe)

has been much used, with flattened constituent crystals and a slightly convex curve. The whole artefact, apart from the ends, shows pecking marks from shaping. These large plano-convex mullers are common on Middle Bronze Age settlements, notably at Trethellan (Nowakowski 1991, figs 57–8), and the description published by Mercer (1970, 32) suggests these may also have been present in the hut-circles excavated by him. The form appears to continue until a date within the Middle Iron Age, occurring for example at Boleigh in West Penwith (Quinnell 2000–1). At some date during the Middle Iron Age and the currency of South Western Decorated pottery, rotary querns were introduced and, although saddle querns continued to be used alongside this newer form until at least the sixth century AD, the large *shaped* plano-convex mullers are replaced by smaller and more variously shaped rubbers, for example no 35, fig 37, from the Rumps (Brooks, 1974). Given that the radiocarbon determinations indicate that the site 9 Iron Age occupation fell in the earlier part of the currency of South Western Decorated ware, either a Bronze Age or an Iron Age date is possible for **SF158**.

SF330 (Fig 33) Central infill [212]. Muller using rectangular block shaped by natural breakage along joint fracture, with rough plano-convex profile and little, if any, modification; 205mm by 130mm by 70mm. Worn surface very slightly convex but with marked striations across width. **SF330** appears to be typical of the less regular mullers which occur from the Middle Iron Age onward and this artefact may tentatively be assigned to this phase.

SF150 (Fig 33) Drain [214] fill [215]. Saddle quern fragment, surviving dimensions 180mm by 110mm by 45mm thinning to 20mm thickness. The two surviving edges represent original rock joint fractures. Two sides represent broken edges but on both wear appear, to have continued after breakage;

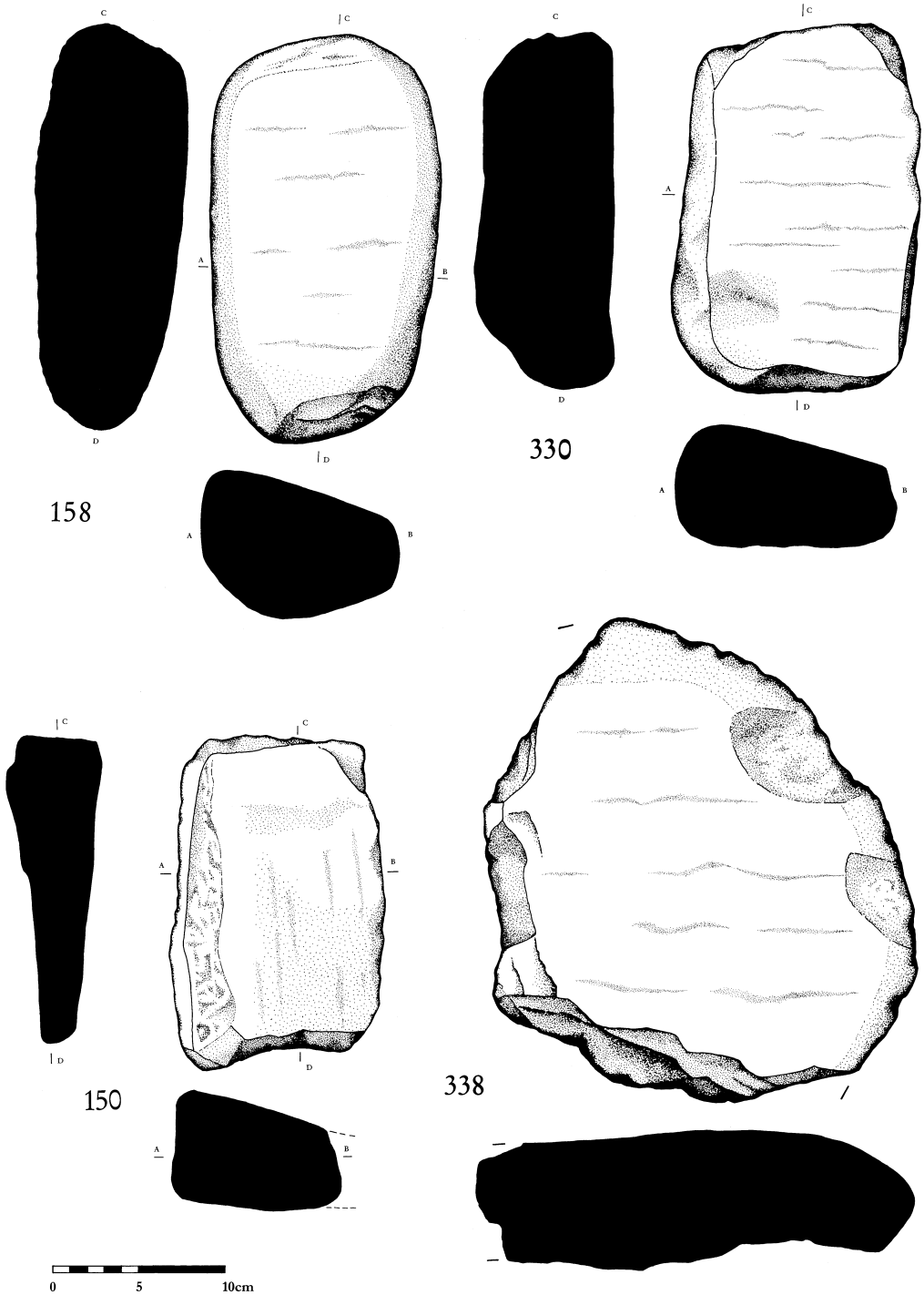

Fig 33 Stone artefacts from site 9. SF150 saddle quern fragment [215] infill drain [214]. SF158 muller inner bank [205], SF330 muller central infill [212], SF338 [214] drain infill [215]. Scale: 1:4. (Drawing: C Thorpe)

if correct this would mean re-use of a quern only 110mm wide.

SF338 (Fig 33) Drain [214] fill [215]. Saddle quern fragment using oval block, edges just possibly dressed. Surviving dimensions 250mm by 230mm by 65mm, thinning to 40mm. Sufficient wear has occurred to flatten large crystals. Two possible impact fractures on broken edges, indicative of deliberate breakage. One part of one broken edge is worn but this may be due to projection from drain [215] and consequent use as part of flooring. Both **SF150** and **SF338**, from drain [214], appear to be reused as constructional parts of the drain after breakage. It is possible that their origin is Bronze Age, from the settlement excavated by Mercer, and that they were collected for re-use, either because they were suitable flat stones or because of a deliberate intention to incorporate something of their previous function, thus linking the Iron Age settlement back to the much earlier one. One alternative is that these saddle quern fragments, one probably intentionally broken, were deliberately deposited during Bronze Age use of the ring cairn, as suggested for **SF401** from [89] in the site 6 ring cairn (see above). For site 9 there is the possibility that broken saddle querns together with the Trevisker pottery may have been associated in the fifteenth to twelfth centuries cal BC, with contemporary activity in the hut circles excavated by Mercer. Another alternative is an Iron Age date: the character of the mullers, especially **SF330**, indicates some probable cereal processing during this period and therefore the potential presence of accompanying saddle querns. The scarcity of charred cereals during the Iron Age phase of site 9, and indeed in all the phases and sites which are the subject of the present report, is notable (J Jones above). Detritus from cereal processing would not be expected to accompany Bronze Age processing artefacts as these may be argued to have been brought in and broken before deliberate deposition. If cereal processing took place during Iron Age activity on site 9, it seems certain that the grain was brought in from elsewhere already cleaned.

It is, of course, highly unlikely that the fragments found represent all the querns used on site 9. Until querns were broken they were valuable artefacts with strong associations to family groupings. Unbroken querns may well have been taken away at the end of activity, perhaps moved annually if site 9 was used on a seasonal basis in the Iron Age. It is therefore possible that a rotary quern could have been in use on the site in the Iron Age and removed before it was broken.

Site 10

The stonework includes three distinctive small beach pebbles, two from within the cairn wall, and four

Table 22 Stonework from site 10 (* indicates that a more detailed description is given beow)

Context	*SF*	*Description*	*Petrology*
[303] wall, Q2	74	Pebble, 55mm	Beach/stream pebble, micaceous slate
[303] wall, Q1	31	Pebble, 44mm	Vein quartz beach pebble, 'chatter marks'
[303] wall, Q4	163	Unworked quartz, 55mm	Vein quartz fragment, local
[308] in pit [307], Q4	410	Unworked, 114mm. Possibly selected for unusual shape, two conjoined spheres 50mm and 80mm across	Stream cobble, fine-grained aplitic granite
[305] lower interior infill, Q2/4	162	Unworked quartz, 65mm	Crystalline vein quartz, local
[304] upper interior infill, Q3	411	Unworked crystal, 27mm	Quartz crystal from granite, local
[304] upper interior infill, Q4	25	Pebble, 18mm	Beach pebble, translucent quartz
[304] upper interior infill, Q1	24	Unworked block, 80mm	Stream-worn fine-grained aplitic granite
[306] over wall/ exterior, Q1	63	Muller *	Stream cobble, fine-grained aplitic granite with coarse granite inclusion attached
[306] over wall/ exterior, Q1	412	Unworked quartz, 40mm	Crystalline vein quartz, local
Unstratified, Q3	413	Fragment with possible abraded facet, 45mm	Beach/stream vein quartz pebble, shattered by burning
Unstratified, Q4	414	2 unworked fragments, 50mm, 60mm	Probable stream pebble, coarse quartzite

pieces of vein quartz which have crystalline form to varying degrees. The cobble **SF410** from pit [308] has a double spheroid shape which presents a broadly phallic impression and, given its provenance, may not have been selected by chance. The presence of this small range of unmodified materials appears in keeping with the simple nature of the structure.

Description of illustrated stonework from site 10

SF63 (Fig 31) [306] over wall/exterior. Small plano-convex muller, 105mm by 75mm by 40mm. Some wear and possible shaping around edges. Convex worn surface. This object cannot be directly related to the use of the cairn.

Site 11

The material divides into four groups. The first from [102] was included within the cairn structure. That from [119] and [106] came from deposits which started forming soon after cairn construction. The third, from [107] and [103] hillwash deposits were stratigraphically later than the preceding two and may be related to Middle Bronze Age arable activity in the area. The fourth consists of recent deposits [105] and [108], turf [100] and unstratified material.

The cairn material contained a beach cobble whetstone **SF5** and an igneous rock fragment **SF252** sourced from beyond the aureole. The second group contained rubbing stone **SF116** and some pieces which may indicate the working of artefacts from slate sourced from the aureole. Neither of these two groups included quartz pebbles or vein quartz pieces. The subsequent hillwash deposits did contain an elvan pebble **SF77**, similar in general size and appearance to the quartz pebbles associated with ritual deposition, together with some vein quartz fragments and material sourced from a wide area, but none with shaping or use-wear. The recent and

Table 23 Stonework from site 11 (* indicates that a more detailed description is given below)

Context	*SF*	*Description*	*Petrology*
[102] cairn stones, Q3	415	Roughly trimmed circular block, 190mm	Coarse grained granite. Local surface material
[102] cairn stones, Q6	**5**	Whetstone fragment *	Beach cobble, fine-grained sandstone of Staddon Grits type
[102] cairn stones, Q4	252	Unworked fragment, 90mm	Very altered basic igneous rock, weathered on surface. From north beyond aureole
[119] silt around cairn, Q3	192	Unworked fragment, 40mm	Stream pebble, coarse quartzite
[119] silt around cairn, Q3	266	Possible trimming flake from worked slate, 80mm	Micaceous slaty hornfels with chiastolite crystals, from aureole
[119] silt around cairn, Q3	193	Possible trimming flake from worked slate, 80mm	Micaceous slatey hornfels with chiastolite crystals, from aureole
[106] silt around cairn tail [124], Q7	116	Rubbing stone *	Stream cobble, fine-grained aplitic granite
[107] hillwash soil, Q6	416	2 pieces unworked slate, both 95mm	Slate from beyond aureole
[103] hillwash soil, Q2	73	Unworked quartz, 50mm	Partly crystalline vein quartz. Local
[103] hillwash soil, Q5	70	Unworked fragment, 70mm	Stream/beach cobble fragment, basic igneous rock
[103] hillwash soil, Q4	80	Pebble suitable for small rubbing stone but no apparent use-wear, 60mm	Elvan beach pebble
[103] hillwash soil, Q2	77	Pebble, 30mm	Fine elvan beach pebble
[103] hillwash soil, Q3	417	Unworked slate, 115mm	Micaceous spotted slaty hornfels from aureole
[103] hillwash soil, Q2	418	Unworked slate, 120mm	Micaceous slaty hornfels with chiastolite from aureole
[103] hillwash soil, Q3	419	Unworked quartz, 38mm	Local vein quartz
[103] hillwash soil, Q5	420	Unworked quartz, 55mm	Local vein quartz
[105] recent silty clay, Q9	111	Unworked slate, 38mm	Stream-worn slate splinter
[108] recent silt, Q3	99	Whetstone fragment, worn facets on both sides, 50mm × 40mm × 18mm	Beach cobble, fine-grained sandstone, Staddon Grits type
[100] turf over site, Q3	305	Unworked cobble fragment, 70mm	Stream cobble, chloritic lode material
Unstratified, Q3	421	Unworked quartz, 50mm	Local vein quartz crystal fragment
Unstratified, Q4	295	Unworked quartz, 50mm	Local vein quartz fragment
Unstratified, Q5	259	Unworked pebble, 35mm	Probable beach pebble, slate
Unstratified, Q1	422	Unworked quartz, 10mm	Translucent vein quartz crystal, local

unstratified material contained a similar range with the addition of a whetstone fragment **SF99**.

None of this material assists with the interpretation of activities relating to the initial use of the cairn but rather to those of a later date. Whether the pebbles and vein quartz pieces from later contexts should be interpreted as having been redeposited or as a continuation of ritual activity from the Early Bronze Age tradition is uncertain.

Description of illustrated stonework from site 11

SF5 (Fig 31) Among cairn stones [102]. Whetstone fragment; surviving dimensions 77mm by 46mm by 25mm. Distinct wear facets on one face and one edge; traces of abrasive use on one end. One edge lost by break which has become worn, remainder by very recent breakage. Position indicates it is of Early Bronze Age date. Whetstones, unshaped or with various degrees of modification, are of regular if not frequent occurrence on barrows and cairns of this date in Cornwall; for example, that from the ring cairn at Trenance Downs on the St Austell granite (Miles 1975, fig 28, no 103) and summary by Patchett (1944, 37).

SF116 (Fig 31) [106] silt around cairn. Small rubbing stone, 115mm by 60mm by 45mm. Convenient handheld size with one worn, flat, facet; traces of apparent battering around ends are probably result of stream erosion. Its context may indicate a date prior to the formation of Middle Bronze Age soil.

The beads

Star-shaped faience bead SF2 from site 6, context [51]

Alison Sheridan

This bead was examined, recorded and analysed at the National Museums of Scotland (NMS) as part of a larger NMS-led initiative to produce a *corpus* of all British and Irish faience. The comments regarding the sourcing, dating and broader significance of faience derive from this larger study, a summary the results of which can be found in Sheridan and Shortland 2004.

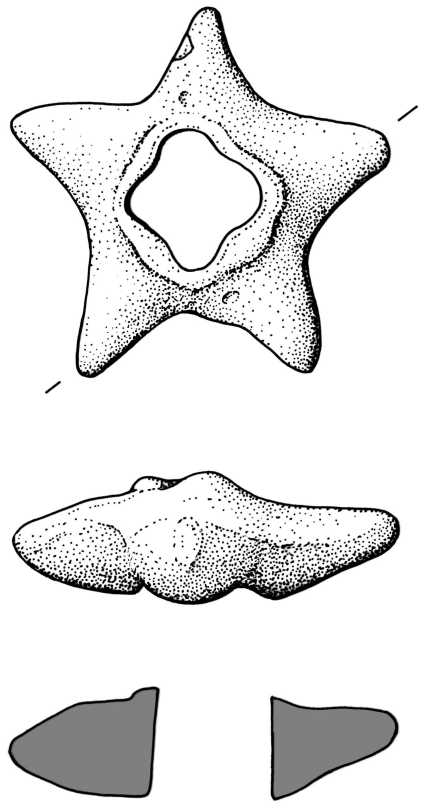

Fig 34 Star-shaped faience bead from site 6, x3. (Drawing: Marion O'Neil, National Museum of Scotland)

Description

Complete, five-rayed star-shaped bead, maximum diameter 17.2mm, maximum hole diameter 7mm, maximum thickness 5.4mm (Fig 34; colour plate 4). The bead has clear 'upper' and 'lower' surfaces, differentiated by colour and texture, this relating to its manner of glazing (see below). The upper surface is a bright turquoise and whitish-turquoise colour and is smooth-textured and shiny, while the lower surface is a greyish-buff with only a hint of turquoise, and is smooth and matt. A few small open vesicles and occasional small unfused sand grain are visible on this lower surface when viewed through a binocular microscope (at a magnification of x10), and there are a couple of glaze-filled vesicles on the inside of the hole and on the upper surface. The junction between the different colours, which lies part-way down the

sides of the rays, is marked by a thin and discontinuous band of light turquoise colour. Also present, on the side of one of the rays, is a small patch of white glaze (that is glaze with no colourant). In profile the bead is asymmetrical, with the upper side being flatter than the lower. The rays vary slightly in width, thickness and length, but all taper to rounded points and are fairly evenly spaced. They have a slight upward tilt. The hole, which is roughly central and perpendicular, is a diamond shape, with rounded corners; its upper surface is markedly lipped. The bead's upper surface undulates, dipping down towards the inter-ray hollows, while the lower surface curves more smoothly from the hole to the edge.

Manufacture

The bead's physical characteristics offer clues as to its method of shaping and glazing. The faience paste (see below) would initially have been shaped into a disc-shaped pellet; at this stage the paste would be moist and pliable. The hole would then have been made by pushing a stick – possibly a narrow withy – through its centre. To judge from the hole's current deformed shape, it may well be that the stick was removed before the shaping of the bead was completed; alternatively, a flexible tool was used to make the perforation. In either case, the perforating tool was removed before firing. The shaping of the rays appears to have been done by hand, rather than with a tool, to judge from the generally gentle curvature of the sides and edges. The rays were probably pinched out between the tips of a finger and thumb – this is what would have produced the diamond-shaped deformation of the hole – and definition of the inter-ray spaces completed by running a fingertip over the upper surface between the rays. Glazing appears to have been effected by dipping the upper side of the bead into a glaze slurry, or else painting that slurry on; the tinge of turquoise seen on the underside (whose colour is otherwise that of weathered core material) could relate to the addition of a small amount of glaze mix to the initial faience paste, perhaps to help strengthen the bead.

Composition

Faience is a non-ceramic vitreous material, the main component of which for both core and glaze is quartz; in Britain and Ireland, this came from sand, which was usually crushed. Plant ash was mixed with this to act as a fluxing agent (to help the quartz grains fuse during firing), and water – and perhaps sometimes an additional organic binding agent – was added to make the faience paste. The glaze, which could be added in various ways, consisted of the same materials plus a copper-based colourant (probably derived from bronze shavings) to produce the distinctive turquoise colour. It appears that tin may have been deliberately added to the faience paste used for British and Irish beads as a non-functional (but symbolically and socially significant) component (see Sheridan and Shortland 2004).

The Stannon Down bead was analysed non-destructively by Dr Kathy Eremin (NMS Department of Conservation and Analytical Research), using an Oxford Instruments ED 2000 X-ray fluorescence (XRF) spectrometer and a CamScan MX2500 scanning electron microscope (SEM), with a controlled-environment chamber that allowed the bead to be analysed without the need to coat it. I am grateful to Dr Eremin for the following comments on the results. The compositional results are semi-quantitative and allowance must be made for the fact that only the surface of the bead could be investigated; for fully quantitative results, a sample would have had to be taken, and this is curatorially undesirable. The SEM results were normalised to 100%. The results revealed that, despite the well-preserved appearance of the glaze, there had been some weathering of the bead through groundwater leaching, but sufficient survived to demonstrate that a mixed alkali had been used to manufacture the bead. This is in line with the results of other analyses for British and Irish faience, and distinguishes it from central European and more remote beads. Another characteristic feature that has repeatedly been found in British and Irish beads is the presence of specks of tin which have precipitated in the body of the bead.

The glaze contains copper and tin, reflecting the probable use of bronze shavings as a colourant; there is also a certain amount of what appears to be arsenic, which probably derives from the same parent material. The composition of the sand core material is of interest. The presence of appreciable levels of aluminium indicates that the sand was not pure, but was instead 'clay'-rich. A relatively high reading for iron was also obtained, through both XRF and SEM analysis, and nickel is present. There is also quite a high copper reading on the apparently unglazed side, as well as on the glazed side, and it is not impossible that this relates to the use of copper-rich sand. If this is correct, then a source for the sand in south-west

England would be fairly likely. However, this must be regarded as a tentative suggestion. A further point of interest is the presence of a mineral fragment, possibly a chrome spinel, that is rich in chromium, iron and aluminium. This is present as an impurity in the sand. This mineral has not previously been noted in the faience beads analysed during the NMS project. Chromium-rich spinel is found in two areas of Cornwall, on the Lizard and possibly at Polyphant (SW 262 821), which lies some 12 km to the east of Stannon (R Taylor pers comm). There is, therefore a tenuous possibility that the chrome spinel in the bead is of local origin.

Date, context and local and wider significance

The results of the NMS faience project allow us to situate the Stannon Down star bead within the broader context of faience use in Britain and Ireland. There are some 300 extant faience beads, plus records of at least 50 more, from around 120 findspots; the vast majority of finds have been in Wessex. Some 34 beads have come from seven findspots in Cornwall and Devon, with possible finds from three other sites (including Rillaton: Hencken 1932, 76). The south-west English finds include fusiform and biconical beads, from Boscregan (Borlase 1879) and North Molton (Fox and Stone 1951) that are skeuomorphs of jet and shale (and composite shale-and-gold) bead forms found in rich Wessex graves. These particular shapes of faience bead are not found elsewhere in Britain and Ireland, but are found in Brittany and the Netherlands. It seems likely that they were made in the south west and exported from there (Fig 35).

The Stannon Down bead is one of three star-shaped faience beads from Cornwall and Scilly (the others being from Trelowthas and Knackyboy (Jones and Nowakowski 1997; O'Neil 1952), and should be considered with a further lost example from Winterbourne St Martin in Dorset (Sydenham 1844, pl XVII). Excluding the latter, star-shaped beads are not found in Wessex, but instead are widely scattered around the Irish Sea and in north and central Britain (Fig 36). They vary considerably in size, shape and number of rays: while Stannon Down has five rays, the other south-western examples have six, and over the whole distribution area the total ranges from four to nine. They appear to have been made individually and this tallies with the general picture of faience production as having been a small-scale, localised activity while at the same time involving considerable sharing of design ideas and technical know-how over large areas (see Sheridan and Shortland 2004).

Was the Stannon Down bead made locally? The analytical results offer some intriguing 'feelers' towards the possibility of a local source for the sand, but the evidence is insufficiently robust to allow any definitive conclusion. Further investigation of the possible chrome spinel by a mineralogist may shed additional light on the matter. Even though it may be impossible to pinpoint a bead's place of manufacture, there is nevertheless good reason to argue that some, at least, of the beads found in Cornwall were made there. Not only is there the aforementioned distinctive south-western distribution of fusiform and biconical beads; in addition, the dark grey colour of the weathered cores of the Boscregan beads contrasts with the creamy-buff core colour of beads found in Wessex, and may well relate to the use of dark, local sand. (I am grateful to Sheridan Bowman of the British Museum for this observation). The core colour of the Stannon Down bead, while not as dark grey as the Boscregan examples, still distinguishes it from the predominant core colour of Wessex faience beads.

There are now more than 20 radiocarbon dates relating to the use of faience in Britain, Ireland, and adjacent parts of the Continent (Fig 37; to this can now be added a newly-obtained date from Barrow 16, Barrow Hills, Radley, Oxfordshire of 3455±40 BP, 1890–1650 cal BC (GrA-26608). These indicate that faience use probably started as early as the twentieth century cal BC, and continued until the fifteenth; the *termini ante quos* dates for site 6, ranging between 3267±31 BP and 3076±32 BP (OxA-13446, 13390–2), are not inconsistent with this overall pattern. The dated beads that are geographically closest and most closely comparable to the Stannon Down example, namely the star- and quoit-shaped beads from Trelowthas (Jones and Nowakowski 1997), fall in the middle of the date range for the currency of faience use. The dating evidence, taken with other evidence discussed at length elsewhere (Sheridan and Shortland 2004), allows us to dismiss the long-held view that faience was introduced to these islands by Egyptian or Mediterranean traders around 1400 cal BC. Instead, it appears that knowledge of faience manufacture was acquired through links between Wessex and central Europe around 2000 cal BC, following a reorganisation of the tin 'trade' with the increasing turn-over to bronze manufacture in Continental

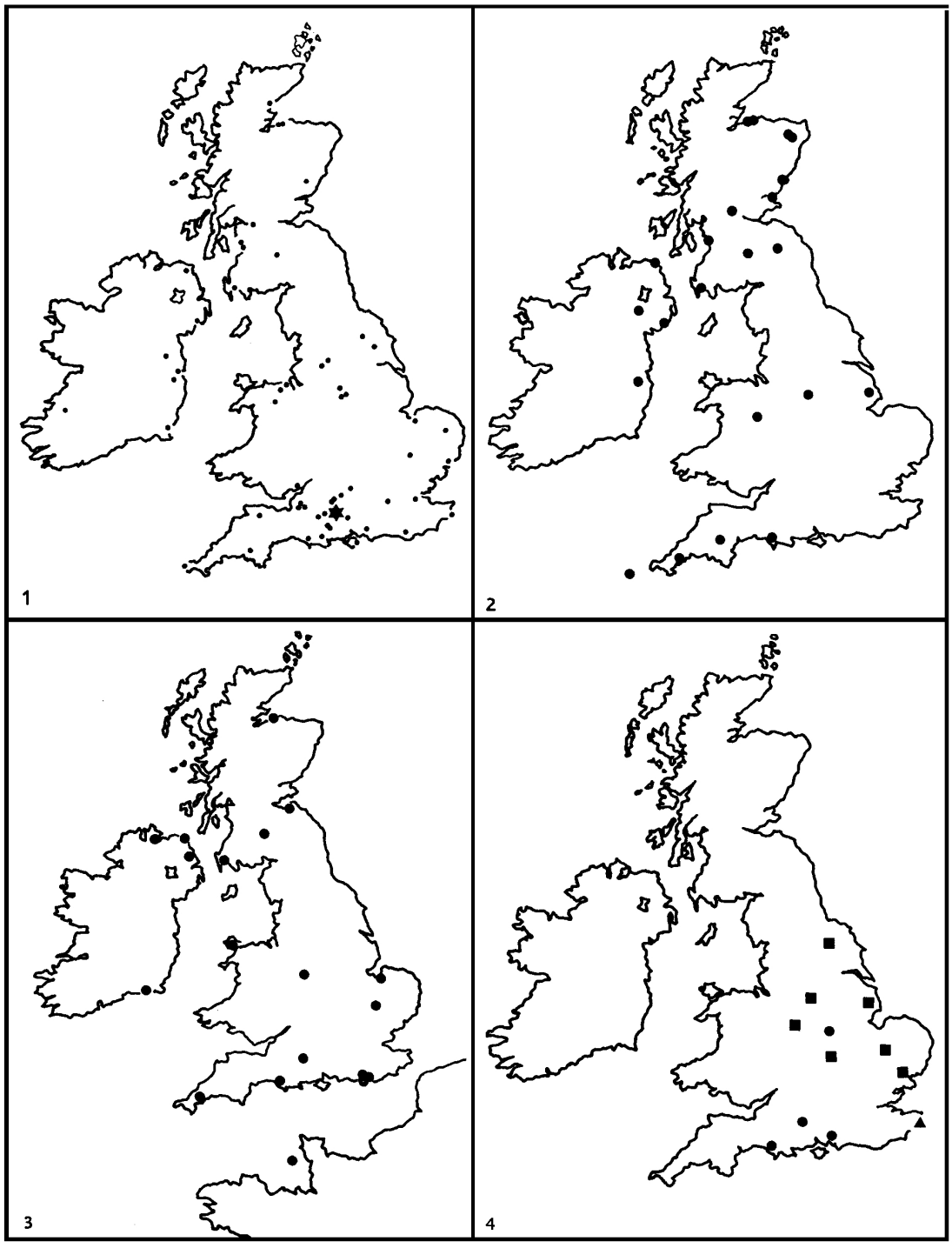

Fig 35 Distribution of faience beads and pendants in Britain and Ireland by type. 1: Segmented beads (major Wessex concentration indicated by star); 2: Star-shaped beads and pendant; 3: Quoit-shaped beads and pendants; 4: spherical (dots), oblate (squares) and chunky annular (triangle) beads

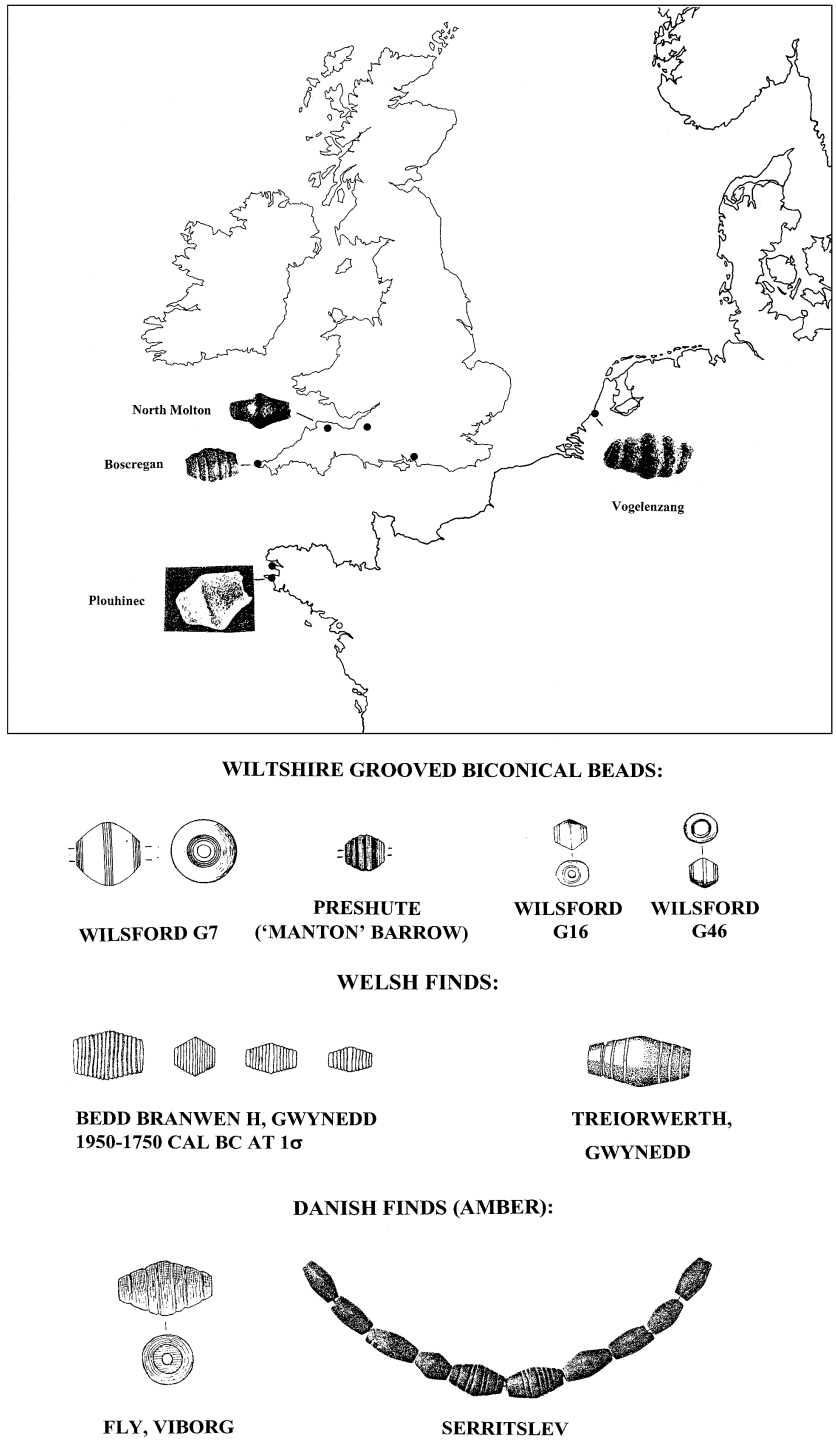

Fig 36 Distribution of fusiform and biconical faience beads, together with examples of the Wessex 'prototypes' in other materials that they emulate. Also shown are other examples of beads that copy the Wessex fashion, in shale-like material (from Wales) and amber (from Denmark)

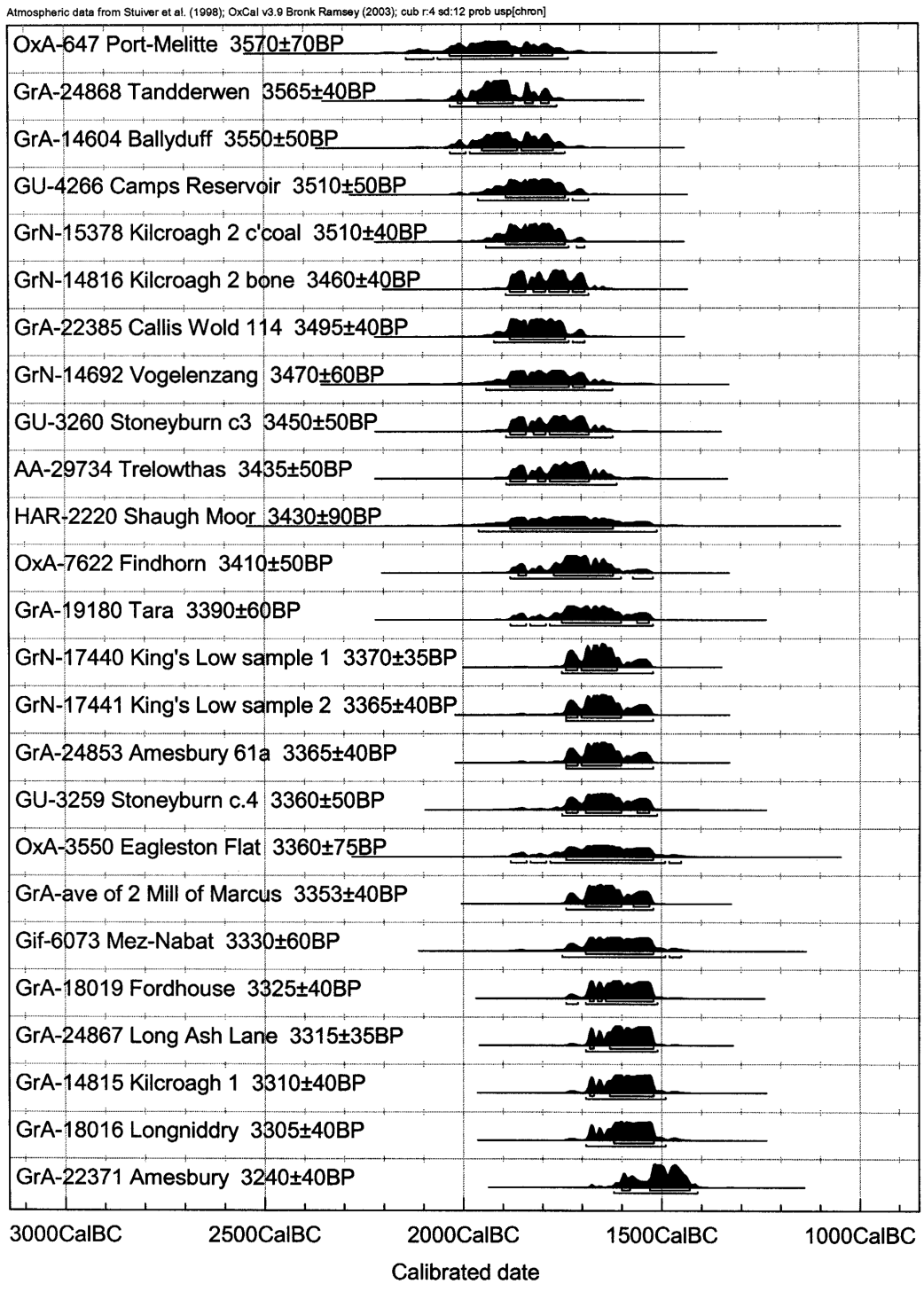

Fig 37 Radiocarbon dates relating to faience use in Britain, Ireland, Brittany and the Netherlands

Europe. Faience beads would have been prestigious novelties and, as argued elsewhere (Sheridan and Shortland 2003; 2004), may have been ascribed magical properties, being the result of a transformative technology and so very distinctive in appearance. The presence of 'supernumary' tin – itself a substance produced through a magic-like transformation – may well reflect both the conspicuous consumption of a valuable material and also a desire to maximise the supernatural power of faience. Its use as an amulet would make sense in a funerary context, since the safe passage of the individual to the Otherworld would be a concern.

Faience beads are indeed almost always found in funerary contexts in Britain and Ireland, and almost invariably with cremated human remains. Where these remains have been reliably sexed, they have been found to be female (or, in the case of multiple interments, to include a female). In view of this contextual predominance of funerary sites for faience finds, it is of interest that the Stannon Down bead appears not to have come from a similar context or, at least, that no evidence for funerary activity was found at this ring cairn.

Conclusions

The Stannon Down faience bead is made of a material known to have been in use in Britain and Ireland between the twentieth and fifteenth centuries cal BC. It is of a form found outside the Wessex 'heartland' of faience use, in the west, centre and north of Britain and along the east coast of Ireland. It would have been a prestigious item, and although it is impossible to determine whether it was made locally, this is a possibility. Faience jewellery is known to have been made on a small-scale, localised basis, and there is good reason to suspect that some, at least, of the Cornish faience finds were made in Cornwall. The requisite technical know-how for faience manufacture had probably been learned from Wessex-based specialists, through contacts relating to the tin trade.

Amber bead from site 2, pit [30]

Alison Sheridan

Description

Small, incomplete bead of brownish-red amber, opaque through weathering, with narrow central perforation; length 6.7mm, width 5.4mm, thickness 2.35mm, perforation diameter 2mm (Fig 38; colour plate 4). The bead is flattish and roughly rectangular with rounded corners; the neatly-drilled, parallel-sided perforation passes through its broad, flat upper and lower surfaces. Both these surfaces appear to be weathered fracture surfaces and there is a scar at one side (and a hairline crack) where a chip has been detached in antiquity. It is difficult to extrapolate the bead's original shape but, to judge from its smooth, gently curving sides, it may have been either an irregular, rectangular-ish bun shape or a slightly thicker version of its current shape. What is clear is that the amber had been shaped, probably from a small amber pebble: this is not an unworked (but perforated) piece of raw amber.

Discussion

The shape and size of this bead, together with the radiocarbon date of 3254±31 BP, 1620–1430 cal BC (OxA-13386), obtained from hazel charcoal from pit [30], allow us to consider it in relation to other amber beads of Early (and Early-to-mid) Bronze Age date in southern England, and in particular to those from graves conventionally labelled as 'Wessex 2'.

The use of amber ornaments figures prominently in the Wessex series of graves in general, which span the period 1950–1450 cal BC (Beck and Shennan 1991; Garwood and Barclay 1999, 285). A variety of bead forms is represented in these graves, as well as other amber items such as the gold-bound 'sun discs' from Preshute, Wiltshire (Beck and Shennan 1991, fig. 11.9.4). Even though we do not know the original shape of the Stannon Down bead, it does *not*

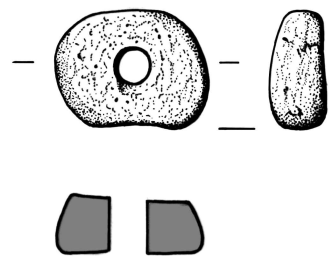

Fig 38 Amber bead from site 2, x3. (Drawing: Marion O'Neil, National Museum of Scotland)

closely resemble the round 'doughnut'-like beads seen in amber spacer plate necklaces such as the one from the 'Wessex 1' grave at Upton Lovell G2 (e), Wiltshire (*ibid*, fig 11.15.1); these beads are likely to have been manufactured between about 1950 and 1700 cal BC, continuing in circulation for some considerable time (Sheridan *et al* 2003). Nor does it seem to have resembled the small chunky disc beads as seen, for example, in a composite necklace from Shrewton barrow (G5J), Net Down, Wiltshire (*ibid*, fig 11.12.1). However, various other small amber beads, closer to the estimated possible shape of the Stannon Down example, are known from graves in Wessex (from a composite necklace from Southwick, Hampshire for example: *ibid*, fig 11.12.7). We know from dating composite necklaces that contain faience beads that the currency of use for this particular type of necklace extends to around 1500 cal BC; one such necklace (which includes small amber beads) from Solstice Park, Amesbury, Wiltshire, has recently been dated to 3240±40 BP, 1610–1410 cal BC (GrA-22371). This date is statistically indistinguishable with that associated with the Stannon Down bead (consistent (T'=0.1; T'(5%)=3.8; v=1, Ward and Wilson 1978).

Although Beck and Shennan exercised caution in suggesting a source for the Wessex amber (since amber is known to wash up along the east coast of Britain), their discussion did not preclude the likelihood that it had been imported into Wessex from Scandinavia as raw material and worked up into finished objects by craft specialists based in Wessex.

Bronze Age amber is relatively rare in Cornwall. What appears to be a minimally-modified lump was found at Caerloggas 1, St Austell, in the interior of a ring-banked enclosure; a Wessex-type dagger and piece of tin slag were also found at that site (Miles 1975). At Boscregan, a broken amber V-perforated button had been reused as a bead, and a further fragment of V-perforated button was found near Woolley barrow, Morwenstow (*ibid*, 165, 171). Finds in Devon include the famous dagger pommel from Hammeldon, a fragmentary oblate bead from the composite necklace at North Molton, and a pestle-shaped pendant from Halwill (*ibid*, 159, 165–6). All are of the dark reddish amber that was the preferred colour in Wessex (and indeed elsewhere in Britain and Ireland).

Although it would be wrong to portray Cornish Bronze Age elite material culture as a mere echo of Wessex fashions, the importance of tin-'trade' related links between the south west and Wessex cannot be denied (see Sheridan and Shortland 2004), and it seems wholly plausible to suggest that the Stannon Down amber bead – and the other south-western amber items – had probably been obtained from Wessex.

Glass bead from site 11, context [106]

Fraser Hunter

Translucent pale to mid-blue glass bead, annular with D-section; diameter 8.5mm, height 4mm (Fig 39; colour plate 4). Swirls from manufacture visible on surface. Cylindrical perforation 3.5–4mm in diameter.

The form of the bead is a common one, but the colour would be most consistent with a first millennium AD, post-Roman date.

A Bronze Age date for this bead can be ruled out on several grounds. Firstly, in its shape it does not closely resemble beads of known Bronze Age date, such as those from Knackyboy, Scilly (O'Neil 1952; Henderson 1988, pl 1). Secondly, although some Bronze Age beads (for example an annular bead from Glentrool, Dumfries and Galloway) approach the Stannon Down bead in colour, they tend to be

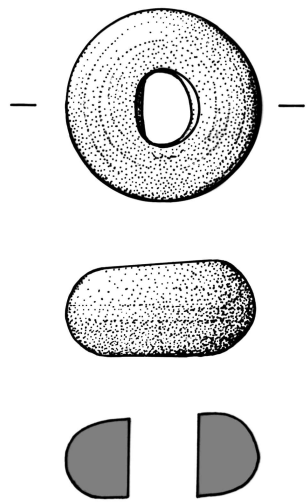

Fig 39 Glass bead from site 11. (Drawing: Marion O'Neil, National Museum of Scotland)

slightly more turquoise; Henderson explains this in terms of the use of a copper-based colourant, like that used for faience glaze (Henderson 1988, 438). Thirdly, its composition, as determined semi-quantitatively in NMS by Dr Kathy Eremin using a CamScan MX2500 scanning electron microscope, is not consistent with that seen in Bronze Age beads in Britain and Ireland. Its soda content of 11% is significantly higher than that seen in Bronze Age beads (*ibid*). Compositionally, it is on the borderline between being a mixed-alkali and a soda glass.

Flint analysis

Anna Lawson-Jones

One hundred and eighty three pieces of worked flint (including five pieces of chert) were found during the fieldwork at Stannon. The 1998 excavations produced 60 pieces of which 32 came from site 2 and five from site 6, a further 22 pieces were unstratified and a single piece came from M3. The 1999 excavations produced 115 pieces: 45 from site 9, six from site 10, 38 from site 11, 17 from site 15 and nine unstratified pieces. The 2000 evaluations produced eight pieces.

Only three deliberately deposited lithic artefacts, a flint blade (**L3**) from site 6 and a deliberately broken ovate knife (**L1**) from site 2, and probably a plano-convex knife (**L2**) from site 6, were found in direct association with the investigated monuments. The bulk of the assemblage has been interpreted as residual background 'noise' (potential exceptions are referred to in the text).

Patination was variable but rarely pronounced within the assemblage. Denser patination was not confined to the diagnostically earlier material, but instead appears to reflect a range of different buried contexts.

Abrasion levels were similarly variable but again rarely pronounced. Most of the assemblage exhibits relatively slight levels of abrasion, and in some cases additional post-depositional damage. The general pattern of abrasion has been primarily interpreted as the result of periodic surface exposure.

Post-depositional damage as a result of later activity was most clearly seen at site 9, where Iron Age activity took place within the monument. However, activity at all of the sites probably involved disturbance to an existing thin scatter of residual material.

The vast majority of the worked pieces exhibit soft hammering reduction (as opposed to hard hammering). Soft hammering even appeared to dominate primary flake production within the assemblage, although experimental work has shown that bulbs close to or on cortex are often diffused. No clear patterning was seen within the occasional hard hammered pieces, in terms of site or date. The broken end of a fabricator suggests that controlled hard hammering may have taken place, but this is subjective since fabricator use is not clearly understood and would seem to have been very varied.

Identification and context

The following section summarises the results of the excavation and evaluation work. Each site assemblage has been treated separately. Weights can be found in the general finds archive.

The majority of the flint artefacts do not reflect *in situ* activity (that is, they are not sealed within specific features or focussed within contemporary contexts). Rather they represent a more general scatter of mixed material associated with a diversely dated range of activity on and around Stannon Down. Because of the natural slope of the area it is probable that some limited movement of artefacts has occurred: some accumulation of lithic material of mixed date appears to have built up around the upslope periphery of some of the sites. An additional factor affecting the stratigraphic sequencing of the flintwork is the disturbance caused to earlier material by Early Bronze Age 'ritual' activity, Middle Bronze Age domestic activity and by Iron Age disturbance and structural reuse at site 9.

Site 2

Site 2 produced a total of 32 pieces of worked flint, five of which were burnt. Of this total, 16 were tertiary, 13 secondary and only two primary. The very low number of primary pieces, combined with the frequency of secondary pieces with very minimal surviving cortex, and the fact that only five pieces within the entire site assemblage constitute unmodified waste, indicate that on-site primary knapping either did not take place or was very limited. All pieces with surviving cortex were identified as being of pebble origin.

The flint assemblage comes from seven different contexts spanning all three phases of the monument,

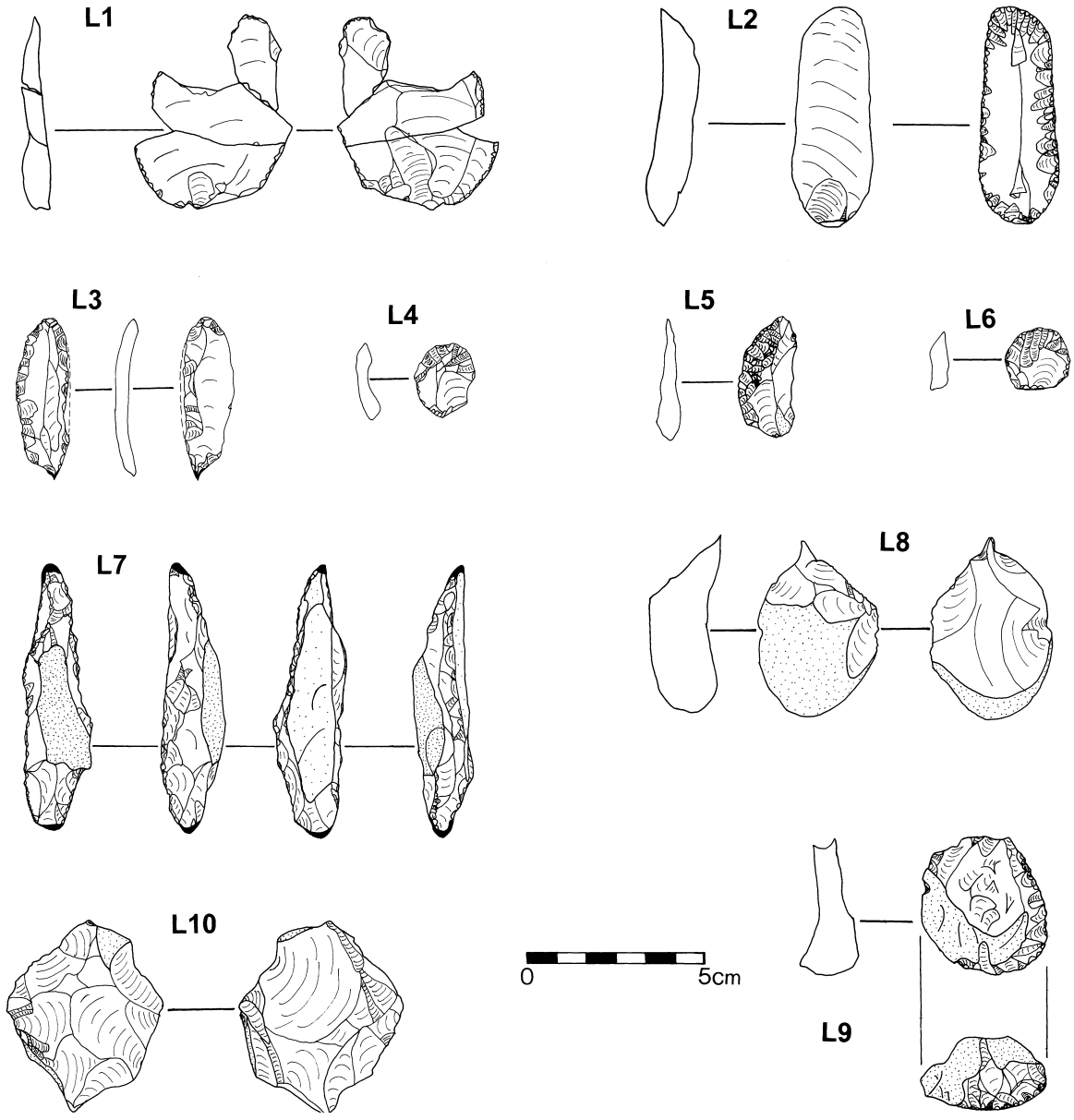

Fig 40 Flints from the excavations. Scale 1:2. (Drawing: A Lawson-Jones)

and from all four quadrants (Fig 4). Flint-producing contexts interpreted as being associated with phase 1 include [24], [29] and [5]. Layer [29], a stone kerb produced two flints, including an Early Bronze Age thumbnail scraper **SF44** (**L4**) (Fig 40). Layer [24] represents the earliest of the infilling sequence and contained two flints, including a utilised flake and part of a notably patinated knife blade **SF37**. The blade is likely to have been broken during infilling and was probably only accidentally included. Layer [5], a deposit within the cairn material contained a single, small, round, steeply retouched scraper **SF14**. The significance of its inclusion within this limited deposit is debatable. Scrapers, particularly thumbnail scrapers,

have been found in association with Bronze Age burials (Edmonds 1995, 140). In this instance it could possibly represent accidental inclusion, as it was not a particularly fine example, or possibly deliberate deposition given its location within the cairn.

Phase 2 involved the excavation of two pits and eight postholes. Flint was found in two of these features. Posthole cut [16], fill [17], produced a single bulbar end of a large, thick-butted, probable Bronze Age flake. Pit [30], fill [31], contained seven pieces of flint, including a burnt piece, waste, an abraded flake knife, a laterally retouched, thick, hinged probable knife and most significantly – several pieces of a broken ovate probable knife **SF46** (**L1**) (Fig 40). Not all of the pieces of the knife were included in the fill, but those that were adjoin. The knife appears unused (although the majority of its retouched 'working' edge is missing) and to have been made on a notably large, flat, good quality, distinctive honey-coloured flint flake. It was quite unlike any of the other material found within the site 2 assemblage. Found in its broken state during excavation of pit [30], it represents a deliberately broken and deposited artefact. Evidence has been found elsewhere for this symbolic form of disposal (Miles and Miles 1971, 5–29). Here its deposition within a partially stone-lined and stone slab sealed pit with other artefacts, charcoal and quartz stones further enhances its significance.

Phase 3 contexts found to contain flint include layer [3] and layer [1]. Layer [3] postdated the cairn and contained 17 flints, the largest number to come from a single context at this site. The material included four of the five burnt pieces, plus waste, knives (complete and broken), and scrapers, including a thumbnail example **SF8** (**L6**) (Fig 40), a crescentic/convex working edge example **SF26**, and a small side scraper form **SF39**. In addition, there were two multi-platformed flake cores **SF30** (**L10**) (Fig 40) and **SF47** (a chert example), and several variously proportioned flakes, complete, incomplete and/or snapped, including quite squat examples suggestive of a Middle to Late Bronze Age date. Layer [1] produced two flints, a waste piece and the probable end of an abraded fabricator **SF5**, presumably broken during use. The vast majority of the flints found in phase 3 contexts are considered to be Early to Middle Bronze Age in date and are similar to those described in Mercer (1970, 31).

Site 6

A total of five pieces of flint were found during excavation of site 6. None were burnt. Four of the five pieces were tertiary; a single secondary piece revealed a pebble cortex.

The material came from three different contexts and all four quadrants. No flint material was found in definite association with the first phase, but surrounding site 6 was layer [64], representing the remains of a pre-monument ground surface. Within this context was found a mid and a bulbar section of two different flake/blades, both with knife retouch (**SF4** and **SF21**). The good quality, fine grained, dark coloured parent material for **SF4** is suggestive of a nodular source, indicating a potential Neolithic date (Healy 1985, 18–20). If so, its presence would indicate pre-site 6 activities within the immediate area and should probably be interpreted as belonging to a general background scatter of Neolithic material represented by other definite nodular material within the 1998–9 excavation assemblages and by Mercer's discovery of a greenstone axe and another worked greenstone implement of Neolithic date (Mercer 1970, 36).

Phase two comprised the deliberate deposition of layer [52]. It produced a fine, complete, bilaterally retouched blade with a worked bulbar point **SF25** (**L3**) (Fig 40). It represents a multi-functional, good quality specialist tool, which has seen little use and is undamaged despite its relative fragility. Its location within this layer suggests intentional inclusion.

Layer [51] produced two pieces of flint, including a very fine plano-convex knife **SF33** (**L2**) (Fig 40). Dating to the Early to Middle Bronze Age period, the inclusion of this complete, but utilised artefact again strongly suggests deliberate deposition of good quality flintwork. The exact nature of its deposition is open to interpretation, but it would seem to represent a placed deposit.

Roundhouse M3

A single undiagnostic burnt flakelet was found during the excavation of a trench through house M3. Burnt flint is a frequent component of domestic lithic assemblages and represents a typical domestic site find.

1998 unstratified material

A small quantity of unstratified material was collected during the 1998 excavations, including 22 pieces of worked flint. Three of these pieces were burnt. Eight flints were found to be of nodular origin, of which five were of poor quality and have been categorised as various types of waste. These pieces are pale, mottled and slightly faulted, with a thick cortex. They represent 'tried' or tested raw material prior to discard, suggestive of primary knapping. The other nodular material comprised a fine-grained nodular flake with nibbled lateral retouch, a larger flake which appears to have had the majority of its original lateral edges lost through breakage, and a honey-coloured probable knife.

The remaining material is of either pebble or unknown source. Pieces include waste, flakes and blades, utilised, retouched, unused and unmodified material. A probable engraver with a thick burin removal, a thick hard-hammered flake, a broken thumbnail scraper and a cutting flake represent a date range from the Neolithic through to the Bronze Age.

Site 9

Site 9 produced a total of 45 pieces of worked flint, seven of which were burnt. Twenty six of the 27 pieces with surviving cortex had a pebble origin. There were nine primary, 19 secondary and 16 tertiary pieces, although a number of the secondary pieces had very little surviving cortex and were in fact borderline tertiary. If primary knapping did take place at site 9 it was of a very limited nature.

Flintwork was found in a total of 11 contexts. Those containing flint associated with the first phase include cairn-ring [213] and possible cist grave fill [244] (Fig 11).

Context [213] produced three flints including a rejuvenation flake subsequently modified to form a scraper, a large flat miscellaneously retouched flake and a thick flake knife with associated patchy gloss. The position of the gloss possibly indicates hafting abrasion (Rots 2003, 805–815). All of these pieces fall within a Neolithic to Bronze Age date range. Presumably unintentionally included within the cairn-ring, they almost certainly represent disturbed residual material. Cist grave cut [243], fill [244], contained a single retouched piece tentatively described as a projectile. It may represent deliberate inclusion within the fill. Disturbance at the feature's southern end complicates its potential significance as a deliberate deposit.

Flint was found within most of the second-phase features, including contexts [205], [206], [208] and [212] (Fig 12). Inner bank [205] contained eight pieces of flint, one of which was burnt. The pieces included a multi-platformed flake core (**SF211**) with crushing and gloss, a long convex scraper with a burin removal forming a point or engraver (**SF198)**, a possible fabricator, a pebble tool with an abruptly retouched point (**SF208**; **L8**) (Fig 40), two knives (one of which could be Early Neolithic), a split pebble and a section of burnt blade. All of this is likely to represent residual material.

Ditch cut [206], fill [207], produced four flints. These included a broken retouched flake, a retouched rejuvenation flake with possible point, a thick end and side scraper and a small, burnt, probable discoidal scraper. Outer ditch cut [208], lower ditch fill [210], produced a single bulbar blade section with bilateral retouch and bulb preparation scars **SF210**, which may well predate the Bronze Age. Layer [212] contained a total of nine flints, three of which were burnt. The flint material included retouched blades and flakes, including two knives one of which was backed (**SF183**), a small round scraper (**SF268**), a split pebble and a multi-platform flake core with subsequent percussive damage. This material is mixed in terms of date and degree of abrasion. Nearly a fifth of the phase 2 pieces are burnt which suggests that settlement activity accounts for their presence. Since two of the three contexts/features discussed here are ditches it is likely that at least some of the flint located within them will have originated from further away, possibly via hill wash or other disturbance (Waddington 1999, 85).

Layer [203] produced six pieces, including one chert and one flint waste pieces, a chert rejuvenation flake, a potentially unused backed and semi-invasively retouched knife (**SF188**) (**L5**) (Fig 40), a squat broad flake – one of the relatively few hard-hammered pieces noted within the assemblage and a second knife. The location of knife **SF188** (**L5**) is interesting in that it is one of the finest pieces to be associated with site 9 and yet seems to postdate the Bronze Age phases of the monument. However, its positioning brings to mind the deposition of a plano-convex knife (**L2**) at site 6. Perhaps **SF188** (**L5**) represents the same type of act of 'closure' (Bradley 1999, 218).

Phase 4 represents Iron Age activity on the site, with the building of a structure with postholes and

central drain within the cairn-ring. Posthole [236] (fill [237]) (Fig 23) produced two flints: a tiny waste chip and a larger primary flake/blade indicative of primary core preparation. Drain [214] produced only a single large flake from a multi-platform flake core. Its missing distal tip probably relates to the original excavation of the drain into underlying layer [212], illustrating the potential for intermixing of material at this later date, and the potential for early post-depositional artefact damage. No clear evidence for Iron Age flint working was recorded within the assemblage.

With the end of Iron Age activity the site was sealed by gritty soils, possibly associated with down-slope soil creep. This would account for the presence of three flints found within layer [201]. These were a single burnt, retouched flake, a chert flake/blade knife and a small waste piece.

Associated with site 9 are a further six unstratified flints, none of which were burnt. These consist of two knives, a serrated piece, two small rejuvenation flakes and a thick utilised flake. All fit comfortably within a Later Neolithic to Middle Bronze Age date range.

Site 10

Six pieces of flint came from site 10, one of which was burnt. One had a pebble origin, one was nodular in origin and the remaining four were derived from an unknown source.

None of the material represents primary knapping waste. Three of the pieces are from the wall [303] and two from post-prehistoric contexts [302] and [305]. Three of the pieces are secondary/tertiary waste; the unstratified piece is the bulbar end of a finely retouched, partially glossed, probably hafted chert knife, a miscellaneously utilised piece and the distal end of a bladelet with probable post-depositional damage.

The site 10 assemblage is very small and does not include any significant or apparently deposited pieces. It has a Neolithic to Bronze Age character.

Site 11

Thirty-eight flints were found in association with the site, eight of which were burnt. Fifteen had a pebble origin, one or possibly two were nodular and the remaining were all tertiary and of unknown raw material. With only two primary pieces and 15 secondary pieces on-site, primary knapping was clearly limited, or did not take place on-site at all; some of the secondary pieces had very small amounts of surviving cortex and were close to being categorised as tertiary.

The flints were concentrated around the cairn 'head' and 'tail', with a decrease in material further to the south. Hillwash from the north could account for the mixed and potentially later material on the northern edge of the monument (blocks two, three and partially four), while blocks five, six and partially four could reflect either contemporary or perhaps earlier activity concentrated around the natural rock formation underlying the cairn.

The upper cairn material produced a single waste chip. The layers predating the cairn contained two flints, the bulbar end of an utilised blade and a short, broad, hinged flake potentially used as an engraver. In addition a context sealed by the 'tail' produced a single piece of waste. The collapsed material derived from the cairn construction contained a burnt but essentially complete flake/blade knife (**SF2**) with end and side retouch. This is Late Neolithic/Bronze Age in date and could be contemporary with either the monument's construction or occupation to the north. Its location means that it is not an *in situ* find. The material derived from the cairn also contained a single piece of good quality broken flake with dorsal blade scars, lateral retouch and gloss.

Layer [103], a probable hillwash deposit produced 18 pieces of flint, by far the largest concentration from a single context at this site. It included four burnt pieces, together with waste, sections of bladelet, including a Mesolithic microburin (**SF33**), flake cores, including an exhausted opposed platform flake/blade core (**SF56**) with anvil damage. The assemblage also included a small 'nosed' scraper with semi-invasive retouch, a possible projectile (**SF9**), an end and side scraper displaying heavy use-related crushing, and a blade (**SF221**) with serrations running down one side, minimal retouch along the opposing edge and limited ventral gloss (possibly associated with hafting).

Layers [101], [104], [107] and [108] postdated the use of site 11. Both [101] and [104] produced a waste flake. Context [107] produced a probable backed knife (or possibly a multi-functional knife/scraper), plus a burnt 'nosed' plane-like scraper with semi-invasive retouch that is of probable earlier Bronze Age date. Context [108] produced a tiny, discoidal scraper.

In addition to the above, eight pieces of unstratified material were found during the excavations, two of which were burnt. Included

within these were the bulbar end of a minimally worked blade with opposed notches suggestive of hafting; a complete end and side scraper with a pronounced thick working edge (**L9**) (Fig 40), a rejuvenation flake and a thick plano-convex knife with missing bulb. This latter piece is again of probable Bronze Age date.

Site 15

This field boundary site produced a total of 17 pieces of flint, of which one was burnt. Four pieces were unstratified. Twelve flints were nodular in origin, two had a pebble source and three were from unknown sources.

The 12 nodular pieces are all problematic in that they do not seem to have been knapped, but rather smashed. It is possible that they represent one or more nodules imported to the site during the Neolithic period but subsequently smashed during the formation of [402]. All come from either context [402] or are unstratified. Context [402] postdates the construction of the main boundary but is essentially undated. It included only two pieces of unquestionably worked flint: a small round scraper of probable Bronze Age date and a piece of waste. Context [404] relates to the granite-built boundary itself and produced three worked flints. All were flakes, one possibly representing a snapped thinning flake and all are probably Bronze Age in date.

1999 unstratified material

Nine pieces of flint were found unstratified during the 1999 excavations. Approximately half of these have been classified as waste, including a thinning flake. At least one piece has a nodular origin, indicative of a Neolithic date. Worked pieces include a point and two miscellaneously retouched pieces one of which is a possible projectile. All of these pieces represent residual material reflecting the long-term prehistoric use of this landscape.

2000 evaluations

Eight unstratified pieces of flint were found during the 2000 evaluation trenching programme. Six of these were found within a gateway, almost certainly representing the disturbance and exposure of an underlying old land surface. Five of the six pieces represent undiagnostic flake waste, while the remaining piece is an elongate, complete fabricator (**L7**) (Fig 40), worked on three sides. It has a mottled grey brown colour, possibly suggestive of a non-nodular origin (but see Newberry 2002) and has clear heavy, smoothing abrasion at either end and a lighter, slight rounding of the frequent flake scarred edges across the central section of the tool (merging with the more heavily rounded ends). This piece is potentially Early Bronze Age in date although were also reasonably common in the earlier Neolithic (Edmonds 1995, 41). Fabricators are a recognised form of grave good, associated with deliberate deposition (Longworth 1984, 68), and are one of the few tool types regularly found in Bronze Age assemblages (Ford *et al*, 1984). A Cornish example of a deliberately deposited fabricator was one found within a barrow at Fore Down (Healy 1988, 140). The completeness of the Stannon Down fabricator, despite its length, relative narrowness and surface find spot, would strongly suggest that it had been sealed within a reasonably secure and undisturbed context until the exposure associated with use of the adjacent gateway.

A flint was located above cairn 38 and another in Area D (SX 13544 81099) (Fig 3). The core on a flake with a worked point from cairn 38 is similar to others found within Bronze Age assemblages, but is not diagnostically Bronze Age. The piece located within Area D probably represents a residual find related to a broadly prehistoric flint and chert scatter associated with the varied uses of the Downs in the past.

Raw material

The majority of the flint on which sufficient cortext survives to determine its origin derives from pebble sources. Flint does not occur inland naturally in Cornwall, which means that all flint has been physically and deliberately brought to the site. In the case of pebble flint Cornwall's coasts provide a surprisingly prolific and varied source of raw material. Although requiring transportation to site the flint available from this secondary source offered a wide range in terms of quality, colour and pebble size. Pebble material was used throughout the prehistoric period across Cornwall although its use is not in itself datable. It frequently produced an above average ratio of modified/utilised material with cortex, as compared to areas with easy access to primary flint sources. Restrictions imposed by the typically small size of pebbles necessarily resulted in the production of smaller flakes, blades and tools.

To facilitate the working of smaller cores anvils were sometimes used, resulting in distal crushing or flaking. Some evidence for this was seen within the assemblage.

Nodular material also features in the assemblage: a total of 25 definite nodular pieces were identified, representing 15% of the total (plus five other probable pieces). Two very distinct types of nodular material were identified. Good quality, black flint typical of imported nodular material found in a number of Early to Middle Neolithic assemblages (Lawson-Jones forthcoming; Healy 1985, 18–20; Christie 1986) is characteristic of that associated with chalk and flint outcrops. The nearest *in situ* source of black nodular flint, known to have been actively quarried and transported over long distances during the second to fourth millenniums BC (Berridge and Roberts 1986, 15), is at Beer Head (approximately 110km away) on the south-east Devon coast (Tingle 1998; Care 1982, 277). However, work by Newberry (2002) has shown that other sites producing good quality primary flint existed in Devon around the Blackdown Hills and also further west, to the north of Dartmoor at Orleigh Court, the latter representing a closer source to Cornwall. These newly highlighted sources offer a variety of material in terms of quality, nodule size, colour and type of cortex. At Stannon, the sites with good quality nodular flint were site 9 (three probable pieces), site 10 (one piece), site 11 (two definite and one probable), plus unstratified material for 1998 (eight pieces) and 2000 (three pieces).

In addition to the good quality, distinctively dark flint there was a much paler, poorer quality nodular material, primarily found at site 15 (nine pieces), plus unstratified material for 1999 (two pieces). Some of this material has definitely been knapped or reduced (see site 9) but there are in addition a number of pieces that seem more likely to have been smashed, apparently dashed on to the surrounding rocks, rather than knapped. It would seem that this particular material not only looked different to other flint in the assemblage but was also treated differently.

The surrounding area has not been cultivated or improved recently and the china clay access roads and tracks have not been surfaced with anything but locally quarried material. This means that this poor quality flint is unlikely to have been recently introduced. It also seems most unlikely that this material was transported to Cornwall from a 'tried and tested' quarry site. It is possible that these poorer quality pieces could represent material collected from secondary sources such as the Devon head and gravel deposits (Wainwright and Smith 1980, 106), but such derived flint is normally of a superior quality to that seen here. Alternatively it may be from one of the other primary or near primary nodular sources in Devon recently looked at by Newberry (2002). The mottled and sometimes speckled, frequently pale flint found at some of these other sources can exist as distinctively 'knobbly and elongated' nodules. Interestingly, the complete fabricator found during the 2000 evaluation work has a very similar colour range and pattern of mottling to some of this material.

Technology and date

Later Mesolithic and Early Neolithic

The earliest identified trend is characterised by the production of blades and bladelets, although flakes were also sometimes produced. This period primarily dates to the Mesolithic and Earlier Neolithic period, at a time when mobility associated with hunting and gathering dominated activity and site type. An estimated 15–20% of the assemblage fits comfortably within this period, although with Cornish pebble-based assemblages blade production does continue in piecemeal fashion throughout much of the prehistoric period. Characteristics include the controlled production of pieces with a length twice or more that of their width, good distal terminations, dorsal scars that tend to be parallel to the edges of the blade and bulbs that have frequently been shaped or modified prior to knapping. A good example of a finely executed blade with a worked bulbar point was found in site 6, context [52] (**SF25**). No specialised cores or waste products, such as crested blades, were recorded. The two exceptions are a brown chert blade core rejuvenation piece from site 9 (**SF105**), and a microburin associated with microlith production from site 11 (**SF33**) (Jacobi 1979; Wainwright 1960).

The nodular material also relates in part to this period, probably extending into the Middle Neolithic. The poor quality, pale faulted nodular material is potentially problematic in terms of date unless one accepts that it represents an unusual form of use/deposition of imported nodular material. The good quality nodular flint and flintwork is typical of material of this period. Where the flint has undergone modification, careful core reduction, core rejuvenation and fine retouch were frequent.

Within small assemblages, particularly those that do not contain discrete contexts with diagnostic or retouched pieces, Later Mesolithic and Early Neolithic assemblages are difficult to distinguish, particularly when there is a lack of such diagnostic assemblage markers as tranchet axes, microliths, and leaf-shaped arrowheads. The lithics from this merged period may reflect a long period of repeated seasonal or sporadic use, perhaps becoming more focused as the Neolithic period progressed.

Later Neolithic and Early Bronze Age

This period saw the production of larger, broader, thicker flakes and long flakes, plus a continuance of blade production for knives. Approximately 65% of the assemblage belongs to this period. Produced in a controlled manner from frequently well-maintained multi-platform flake and flake/blade cores, the resultant flakes and blanks could be used to produce a wide range of tools. Cores were maintained via rejuvenation and could be worked down until exhausted, often with more than one striking platform. An exhausted, opposed platform flake and (occasional) blade core, which additionally displayed anvil use was found on-site 11 (**SF56**). Variable forms of retouch – steep, shallow or serrated (for example site 11 **SF114**), ripple flaking and/or all over retouch – are a distinctive feature of this period, particularly the latter part.

Quite a broad range of knife forms were noted within the assemblage, including occasional plano-convex blade and partially ovate forms, with convex, concave or straight working edges, some with backing retouch. Site 6 produced a complete, extensively retouched plano-convex knife (**L2**). In addition, an apparently unused, deliberately broken, probable ovate knife made on a large, strikingly coloured flake was found on site 2 (**SF46 – L1**). A number of different scrapers, including end, side and round forms, were found. Some of these forms probably extended into the Later Neolithic from the Earlier Neolithic period. The most diagnostic scraper form seen was the Early Bronze Age thumbnail scraper, an example of which comes from site 2 (**SF44 – L4**). One of the two 'nosed' scrapers from site 11 (context [103]) displayed ripple flaking; an Early Bronze Age characteristic. A similar proportion of scrapers and knives were found within the settlement excavated by Mercer (1970).

Later Neolithic and Early Bronze Age material is often similar and can be difficult to distinguish without specific retouched forms or tool types diagnostic of the different periods. The majority of the tools described above could be either Later Neolithic or Early Bronze Age in date.

Middle Bronze Age

The third element recorded within the assemblage is a gradual decline in the quality and control of pieces made. Approximately 10–20% of the assemblage falls within this sphere. Flakes continued to dominate production, but are frequently squatter in shape, often with wider platforms and appear more prone to distal hinging. This is due to the lack of core preparation, as seen in some of the rapidly abandoned, rather haphazardly knapped cores within the assemblage. Few core rejuvenation flakes are associated with this period and abandonment of cores prior to exhaustion, sometimes with reuse as core tools, was noted. Non-exhausted multi-platform flake cores dominate the core types found within the assemblage. It is likely that their larger size, as compared with contemporary finished tools, made them more prone to movement downslope, and that their potentially different modes of discard, as waste, accounts for this apparent bias in their favour.

Overall, the Middle Bronze Age assemblage appears to broadly equate to Mercer's descriptions of his lithic assemblage as primarily consisting of flakes and blades of variable quality represented by both unmodified and modified material.

Discussion

Associated with the Early Bronze Age cairn and ring cairn sites at Stannon Down was a small assemblage of flintwork. This included both earlier and later residual finds and deliberately deposited material.

Formal deposition of flintwork was seen most clearly at two sites (sites 2 and 6), with the deliberate inclusion of purpose-made or selected artefacts within specific contexts. A complete plano-convex knife **(L2)** from site 6 dating to the Early Bronze Age was found in an apparently lightly used state outside the northern edge of the site in a layer interpreted as post-dating the final phase of the monument. The lack of abrasion and form of the Stannon plano-convex knife all indicate that incorporation adjacent to site 6 was an intentional act of deposition. Formal deposition of selected flint into a final sealing layer has been recorded elsewhere: at Davidstow 1, pieces of quartz, pottery and a flint blade were deposited into the sealing surface layer (Owoc 2001, 198).

The second example of a formally deposited piece of flintwork came from site 2, where three pieces of a flat, ovate knife (**L1**) were found inside pit [31]. The pit was positioned to the north east of the cairn in close proximity to other pits and postholes. The knife fragments join, indicating probable breakage at the time of insertion into the fill. The flint colour, a pale, near uniform honey brown, is unlike that of all the other flint associated with this site. It was of particularly good quality and derived from a large flake-producing core. Large knives are a common Later Neolithic/Early Bronze Age feature, as are large well-prepared flakes and a concern with colour (Edmonds 1995, 104).

The marked lack of primary waste material, particularly notable considering the primarily pebble-based raw material used, and the large proportion of secondary pieces which were very close to being classed as tertiary, strongly suggests that primary knapping did not generally take place on the sites looked at. Mercer (1970, 31) describes much of his settlement-related flint assemblage of 58 pieces as waste, although the proportion of primary to secondary and tertiary pieces is not discussed. The 31 illustrations (Mercer 1970, 42 and 43) suggest that secondary and tertiary pieces predominate, again suggesting that primary knapping, did not routinely take place within the immediate settlement area.

Interestingly, this pattern is less evident with the nodular material. Prior preparation of cores and/or production of blanks of nodular flint before transportation onto the Moor seem rare or non-existent, judging by the high proportion of corticated nodular pieces. Nodular flint use in Cornwall has frequently been found to be associated with high-quality working (Saville 1981, 101–52). This does not appear to be the case for this assemblage, although the fact that nodular material is both well represented and varied in terms of source is probably of significance. The good-quality material, despite the effort required to attain it, does not appear, except in preparation, to have been treated any differently to pebble flint. Although some of the pieces are nicely worked, proportionately they represent only a small percentage of the nodular material within the assemblage.

The poor-quality nodular material appears to have been treated in a very different and superficially much more casual way. Some of it seems to have been deliberately smashed on surrounding natural rocks and left.

Post-prehistoric artefacts

Carl Thorpe

Seventy-two artefacts dating from the medieval to modern periods were recovered during the excavations at Stannon Down. The finds are briefly discussed below by context. A detailed list of the finds is held in the site archive.

The medieval period (twelfth to fifteenth centuries AD)

This period has left most of the artefactual evidence, including 41 sherds of pottery, one possible stone cannon ball, an iron horse-shoe and an iron wedge.

The study of Cornish medieval pottery is still at an early stage. Most published sites lack stratified sequences, and their dating is often only established in relation to broad regional traditions. Close dating from a few rimsherds alone is not usually possible because coarseware forms could be of a long duration; some rim forms from Exeter continued unchanged from the late tenth to the early fourteenth century (Allan 1984).

Cornish Medieval Coarsewares

These are characterised by hand-made, thin-walled vessels, with a micaceous fabric, often with rounded quartz inclusions, sometimes with other crushed rock filler (for example slate). They are sometimes wheel finished and hard fired. They are long-lived forms, unchanging from the late twelfth to the end of the fourteenth century (Allan 1984; O'Mahoney 1989a; 1989b; 1994).

A total of 21 sherds of Cornish Medieval Coarseware were recovered from various contexts during the Stannon excavations. Site 10, produced an unstratified cooking vessel rimsherd *c* 1250 AD, while undiagnostic body sherds were obtained from site 10 contexts [302], [304], [305], and site 11, unstratified and context [103].

Cornish Medieval Coarseware, Bunnings Park/ Stuffle Ware

This pottery is hand-made, often wheel-finished, thin-walled, micaceous fabric with common inclusions of rounded quartz grains, hard fired with a pink-buff exterior and a grey core.

Some 20 sherds have been recognised, including two rimsherds (rim form *c* 1250 AD) and a basal angle sherd from cooking pots. During the 1998 excavations sherds came from unstratified locales to the south of the excavated sites. In 1999 unstratified sherds came from south of site 11 and from site 10 contexts [305], [306], [309], site 11 context [101], [103], and site 15 (unstratified).

Non-ceramic medieval finds

A fragmentary iron horseshoe was recovered from site 11, context [101]. Although too heavily corroded to allow positive identification, the general shape suggests that this is of medieval origin *c* 1300–1400 (Clark 1995).

A near-spherical stone object with a diameter of approximately 25mm was recovered from an unstratified context next to boundary 2 (Fig 3). Initially thought to be of iron, close examination shows crystalline structure indicating that it is actually composed of ironstone or haematite. There appear to be percussion marks and facets on its surface indicating a deliberate attempt to achieve this spherical shape. It has a weight of 7¾ ounces (220g). Interpretation of this object is tentative. It is possible that it is a prehistoric hammerstone, but an alternative interpretation is that this is a stone shot for a cannon. If the latter is the case then it is unusual. Stone shot were mainly in use from the late fourteenth century until the start of the sixteenth. The size and weight of the shot would suggest a small field piece.

Post-medieval period (mid sixteenth to eighteenth centuries AD)

Only three artefacts can be assigned to this period. These are two sherds of pottery and a clay pipe bowl.

North Devon Post-Medieval Glazed Red Earthenware (Barnstaple Ware)

The main centres of pottery production were in North Devon. Many of the forms have a long survival with little change and much of this pottery is only datable in association with other artefacts. Forms include plates, dishes, and bowls (Allan 1984; Grant 1983). A single sherd from site 11, context [101], was attributed to this ware. Unfortunately it was an undiagnostic bodysherd so further comment is not possible.

Cornish Post-Medieval Coarseware (Lostwithiel Ware)

Cornish Post-Medieval Medieval Coarseware appears to replace Bunnings Park/Stuffle Ware in the fifteenth century (O'Mahoney 1994). Forms include plates, dishes, and bowls (Allan 1984; Fairclough 1979). A single unstratified undiagnostic bodysherd was definitely attributed to this ware.

Clay pipe

A single unstratified clay pipe bowl was recovered from site 11. The shape of bowl is of a south-west pattern *c* 1640–60.

Non-ceramic post-medieval finds

A heavy iron wedge found at site 11 in an unstratified context appears to be a stone-splitting wedge. Given its length (120mm) and narrow width (8mm) it was probably used for plug-and-feather stone-splitting. Plug-and-feather quarrying occurred from 1800 onwards (Herring forthcoming b).

Modern period (nineteenth and twentieth centuries)

Activity during this period was indicated by the occurrence of several small abraded sherds of pottery.

Modern White Glazed stoneware

White-glazed stonewares were first made in large quantities from the late eighteenth century. They are difficult to date precisely unless a maker's mark is present. Twenty five sherds were recovered from Stannon, including two rimsherds that appear to have press-moulded decoration, suggesting a possible eighteenth-century date for at least some of this material; most of it, however, is likely to be of nineteenth-century date. All of the sherds are from post-prehistoric contexts on site 11.

Conclusions

The majority of the artefacts found are typical of assemblages from fields close to farming communities, the finds being derived from domestic midden material being utilised for the manuring and improvement of fields. Most of the finds date from the medieval period, mainly concentrated around the

thirteenth century. This sits well with the pattern of the field system in which they were found it. It is probable that this material was derived from the medieval settlement of Stannon that lies just to the west. All the material recovered was utilitarian domestic ware consistent with an agrarian economy.

If the identification of the stone as cannon shot is correct, it is difficult to know what sort of circumstance could have led to a cannon having been used at Stannon. Fifteenth-century Cornwall was an unstable place with many family feuds, the century culminating in the rebellions of 1497 (Rowse 1947), so it may represent a small unknown skirmish. However, it could also derive from artillery practice on the Downs.

Radiocarbon dating

Andy M Jones, Peter Marshall and Derek Hamilton

Twenty-three radiocarbon age determinations were obtained on samples of charcoal and peat fractions from Stannon Down

Methods

Five peat samples were processed by the University of Waikato in 1999–2000. The measurements were all made on the humin fraction (acid and alkali insoluble fraction). Fourteen charcoal samples were processed by the Oxford Radiocarbon Accelerator Unit in 2004 and measured by Accelerator Mass Spectrometry (AMS), according to the procedures described by Bronk Ramsey and Hedges (1997) and Bronk Ramsey *et al* (2000). The remaining four samples, all peat, were processed at the Scottish Universities Research and Reactor Centre (SURRC) in East Kilbride, and measured by Accelerator Mass Spectrometry at the Scottish Universities Environment Research Centre AMS Facility. Details of sample preparation and measurement are provided by Slota *et al* (1987) and Freeman *et al* (2004). These measurements were all made on the humic acid (acid insoluble and alkali soluble fraction).

All three laboratories maintain continual programmes of quality assurance procedures, in addition to participation in international inter-comparisons (Scott 2003). These tests indicate no laboratory offsets and demonstrate the validity of the precision quoted.

Results

The radiocarbon results are given in Tables 24–27 and are quoted in accordance with the international standard known as the Trondheim convention (Stuiver and Kra 1986). They are conventional radiocarbon ages (Stuiver and Polach 1977).

Calibration

The radiocarbon determinations have been calibrated with data from Stuiver *et al* (1998), using OxCal (v3.5) (Bronk Ramsey 1995; 1998). The date ranges have been calculated according to the maximum intercept method (Stuiver and Reimer 1986), and are cited in the text at two sigma (95% confidence). They are quoted in the form recommended by Mook (1986), with the end points rounded outwards to 10 years. The probability distributions (Figs 45–47) are derived from the usual probability method (Stuiver and Reimer 1993).

Objectives and sampling strategy

The aim of the dating programme was to obtain precise dates for specific contexts from the excavated sites and to provide a chronology for the interpretation of the palaeo-environmental results from the Northern Downs.

The first stage in sample selection from the excavated sites was to identify short-lived material which was demonstrably not residual in the context from which it was recovered. The taphonomic relationship between a sample and its context is the most hazardous link in this process, since the mechanisms by which a sample came to be in its context are a matter of interpretative decision rather than certain knowledge. All samples consisted of single entities (Ashmore 1999).

The taphonomic origin of the charcoal submitted included material from the fill of postholes – interpreted as relating to the use of structures rather than its construction, as suggested by experimental archaeology (Reynolds, 1995) – and from the primary fill of pits. Where possible, duplicate samples from these contexts were submitted, to test the assumption that the material was of the same actual age.

Ideally, both the humin and the humic acid fractions of each of the nine peat samples submitted would have been dated. However, due to the small size of the samples after pre-treatment, it was only

Table 24 Sites 86 and 87, radiocarbon results

Sample depth mm	*Laboratory code*	*Radiocarbon age (BP)*	*Calibrated date (95% confidence)*	*Material*
Site 86				
230–240	Wk-8503	1240±70	Cal AD 650–980	Peat (humin fraction)
400–410	SUERC-3626	2370±35	520–380 cal BC	Peat (humic acid)
460–470	Wk-8502	3110±60	1520–1210 cal BC	Peat (humin fraction)
540–550	SUERC-3625	2915±35	1260–1000 cal BC	Peat (humic acid)
625–635	SUERC-3624	3550±35	2010–1750 cal BC	Peat (humic acid)
755–765	Wk-8501	5920±55	4320–3970 cal BC	Peat (humin fraction)
895–905	SUERC-3623	6529±40	5610–5370 cal BC	Peat (humic acid)
920–930	Wk-8500	7100±70	6160–5800 cal BC	Organic soil (humin fraction)
Site 87				
1485–1495	Wk-8499	5420±60	4358–4047 cal BC	Peat (humin fraction)

Table 25 Site 2, radiocarbon results

Laboratory no	*Sample ref*	*Material*	*δ13C (‰)*	*Radio-carbon age (BP)*	*Calibrated date (68% confidence)*	*Calibrated date (95% confidence)*
OxA-13389	Posthole 6, sample 1011	*Corylus* (R Gale, 2003)	–24.2	3274±31	1610–1510 cal BC	1680–1450 cal BC
OxA-13388	Posthole 11, sample 1014	*Corylus* (R Gale, 2003)	–26.7	3223±30	1530–1440 cal BC	1600–1410 cal BC
OxA-13387	Layer 27, sample 1027	*Corylus* (R Gale, 2003)	–25.2	3919±31	2470–2340 cal BC	2490–2290 cal BC
OxA-13385	Posthole 32, sample 1035	*Quercus* sapwood (R Gale, 2003)	–23.8	3385±30	1740–1630 cal BC	1750–1600 cal BC
OxA-13386	Pit 30, sample 1033	Corylus (R Gale, 2003)	–23.0	3254±31	1600–1490 cal BC	1620–1430 cal BC

Table 26 Site 6, radiocarbon results

Laboratory no	*Sample ref*	*Material*	*δ13C (‰)*	*Radio-carbon age (BP)*	*Calibrated date (68% confidence)*	*Calibrated date (95% confidence)*
OxA-13391	Posthole 53, sample 1007	*Corylus* (R Gale, 2003)	–25.5	3215±30	1520–1430 cal BC	1530–1410 cal BC
OxA-13392	Posthole 76, sample 1023	*Quercus* sapwood (R Gale, 2003)	–25.2	3076±32	1410–1260 cal BC	1430–1220 cal BC
OxA-13446	Posthole 57, sample 1008	*Corylus* (R Gale, 2003)	–25.8	3200±28	1520–1430 cal BC	1530–1410 cal BC
OxA-13390	Posthole 57, sample 1010	*Corylus* (R Gale, 2003)	–24.9	3267±31	1600–1510 cal BC	1680–1450 cal BC

Table 27 Site 9, radiocarbon results

Laboratory no	*Sample ref*	*Material*	*δ13C (‰)*	*Radio-carbon age (BP)*	*Calibrated date (68% confidence)*	*Calibrated date (95% confidence)*
OxA-13380	Posthole [224], sample 1078	*Corylus* (R Gale, 2003)	–25.2%	2987±30	1300–1130 cal BC	1380–1120 cal BC
OxA-13383	Posthole [226], sample 1083	*Corylus*/*Alnus* (R Gale, 2003)	–25.0	2118±28	200–90 cal BC	350–40 cal BC
OxA-13382	Posthole [238], sample 1084	*Quercus* roundwood (R Gale, 2003)	–22.9	2183±29	360–170 cal BC	370–160 cal BC
OxA-13384	Layer [213], sample 1106	*Quercus* roundwood (R Gale, 2003)	–26.6	3326±31	1690–1520 cal BC	1690–1510 cal BC
OxA-13381	Posthole [258], sample 1085	*Quercus* roundwood (R Gale, 2003)	–24.1	3127±31	1430–1320 cal BC	1490–1310 cal BC

possible to date a single fraction by Accelerator Mass Spectrometry (AMS).

In the case of the five peat samples dated at the University of Waikato, only the humin fraction was dated. The humin fraction is composed of the actual organic detritus. The resultant date from measuring this fraction is subject to many of the same processes that might affect the dating of macrofossils in the same type of environment. Firstly, organic material that forms all or part of the humin fraction could be in-washed, which would result in a date that is too old. Contamination of this material by geological age carbon (for example, coal, hard-water error) would have the same effect. The humin fraction can also be too young, however, if for example the environment is prone to wet-dry episodes or bioturbation, allowing intrusive material to work its way down the sediment column. Therefore, the humin fraction is not necessarily homogenous, and so it is best to avoid dating it by AMS where the smallest contamination would greatly affect the resultant measurement. Humins may better be dated through conventional radiocarbon dating techniques, as it is unlikely that such contamination would provide a significant proportion of such a large sample.

The four peat samples dated at the SUERC consisted of the humic acid fraction (the *in situ* product of plant decay). Although they are produced *in situ* and imply a stability to the ground surface, it has been shown that they can be mobile in groundwater, both vertically and horizontally (Shore *et al* 1995), but that their mobility is probably limited. Therefore, humic acids cannot be relied upon either to always correctly date the level from which they were collected. However, unlike the humin fraction, humic acids are homogenous, as they are alkali soluble, and therefore can be dated through AMS.

These considerations are of particular importance in assessing the inversion in the radiocarbon dates obtained from site 86. In this instance, since each of the results under consideration is of a different fraction and both have the possibility of being contaminated, the two radiocarbon dates should be reviewed in light of the environmental evidence gleaned from pollen and litho-stratigraphic analyses. Either SUERC-3625 is too young or Wk-8502 is too old. As both are from the same layer of black, homogenous, very well-humified herbaceous peat, there does not appear to be any guide as to which scenario is more likely. However, the consistency with the stratigraphy of the results on humic acid and humin fractions lower down the profile does suggest that significant migration of younger humic acids down the profile is unlikely at this site (older ages are likely to be more significantly offset by a limited mobility of this fraction). For this reason, in the absence of other information, it may be suggested that Wk-8502 contained a proportion of reworked older organic material and that SUERC-3625 is to be preferred.

Results

Site 2

A single piece of *Corylus* charcoal from the placed deposit within layer [27] dates to 3919±31 BP, 2490–2290 cal BC (OxA-13387), and is the earliest scientifically dated context from any of the cairns. Four further measurements (see Table 25) were on single pieces of charcoal from three postholes [6], [11], [32], and pit [30] from the eastern side of the cairn. These four measurements (OxA-13389, 3274±31 BP; OxA-13388, 3223±30 BP; OxA-13385, 3385±30 BP; OxA-13386, 3254±31 BP) are not statistically consistent (T'=16.6; T'(5%)=7.8; v=3, Ward and Wilson 1978) and thus represent material of different ages. They do, however, point to a renewed phase of activity at site 2 some time in the mid-second millennium cal BC.

Site 6

Four charcoal samples from three of the postholes [53], [76] and [57] forming the secondary timber-ring phase at site 6 were dated. The four measurements from three postholes are not statistically consistent (T'=19.5; T'(5%)=7.8; v=3, Ward and Wilson 1978) and so represent material of varying ages. However, two measurements (OxA-13446 and OxA-13390) from posthole [57] are statistically consistent (T'=2.6; T'(5%)=3.8; v=1, Ward and Wilson 1978) and could thus be of the same actual age. The results suggest that the timber-ring phase dates to the mid second millennium cal BC.

Site 9

Five charcoal samples from site 9 were dated. A single piece of *Quercus* roundwood from a placed charcoal deposit within layer [213], sealed beneath the primary cairn-ring, provides a *terminus post quem* for its construction of 3326±31 BP, 1690–1510 cal BC (OxA-13384). The four measurements on

material from the postholes [224], [226], [238] and [258] are not statistically consistent (T'=958.4; T'(5%)=7.8; v=3, Ward and Wilson 1978), and clearly represent material of varying ages. However, the two measurements from postholes [226] and [238] are statistically consistent (T'=2.6; T'(5%)=3.8; v=1, Ward and Wilson 1978) and could thus be of the same actual age. The results therefore suggest two phases of posthole use, in the Bronze and Iron Ages.

Discussion

The dating of the Stannon sites has proved to be important on a number of grounds. Most obviously it provided an outline for the development of the monument group. This is significant because this is the only upland ceremonial complex in Cornwall to have a large number of dates associated with it; nationally there are very few cairn groups which have been so extensively dated (Lynch 1993; Wainwright *et al* 1979). The determinations from sites 2 and 9, and that from the secondary phase of site 6 (the primary phase could not be dated) indicate that the earliest site in the group was constructed at the eastern end. Site 2 appears to have been founded in the mid to late third millennium cal BC and site 9 towards the middle of the second millennium. The construction of site 6 could not be scientifically dated, but ring cairns have been dated elsewhere to the Early Bronze Age (Lynch 1984; 1993) and the faience bead **SF2** could suggest that it originated between 2000 and 1500 cal BC (Sheridan above). The dates from the secondary phases indicate that there was activity on site 2 at some point between 1750 and 1400 cal BC, at site 6 between 1600 and 1400 cal BC and at site 9 at a point between 1500 and 1100 cal BC.

Secondly, the radiocarbon dating has confirmed that the outline stratigraphical phasing was essentially correct and that stone monuments were succeeded by secondary timber phases. Given the recent evidence from Wessex (Gibson 1998; Parker Pearson and Ramilisonina 1998) and from other sites in Cornwall (Miles and Miles 1971) for primary timber monuments being rebuilt in stone, this is significant as it cautions against using generalised interpretative models.

Thirdly, the dating indicates that although monument construction began during the Early Bronze Age period, there was renewed or continued interest in earlier sites towards the middle of the second millennium cal BC, just before the period when we might expect the Stannon settlement to have been constructed. In particular, the determinations from the timber phase of site 6 span the Early to Middle Bronze Age transition period, while two of the dates from site 9 are firmly within the Middle Bronze Age. This is a period where there has been little evidence for ceremonial activity and much more for the establishment of settlements (for example Nowakowski 1991; Jones and Taylor 2004).

Finally, the Iron Age determinations from the structure within site 9 are the first for this period from Bodmin Moor and are important because they confirm that the Moor continued to be used beyond the end of the Bronze Age.

Conclusions: ceremonies and settlements

The purpose of this section is not to repeat preceding discussions regarding the chronological sequence in the landscape but rather to provide an assessment of themes highlighted by the investigations at Stannon. These include monument morphology, complex development, the role of placed deposits, the structure of the complex area and the role of social memory in changes to sites over time. Such an assessment is possible principally because all of the monuments within the ceremonial complex were excavated.

Monument morphology

The excavated cairns can be divided into two groups: circular monuments relating to the ring cairn tradition and cairns with linear 'tails'.

Circular cairns

Three of the sites (6, 9 and 10) were circular monuments related at a broad level to a tradition of round monuments which are found across Britain during the Neolithic and Early Bronze Age periods (Bradley 1998a). At a narrower level they are related to ceremonial cairns which are found in the uplands of Britain and, focused more closely still, they fit into a regional Cornish architectural tradition (Jones 2005). Ultimately, like all monuments, they have unique features which relate to their biography of use, the result of the ways that existing ritual

traditions were perceived by their builders and reinterpreted by later users.

Sites 6 and 10 and the initial phase of site 9 were relatively simple ring cairns. The enclosure of level or hollowed areas by simple walling is found in many other upland areas of Britain, including Wales and Devon (Lynch 1984; 1993; Butler 1997; Turner 1990), although the coursed walling found at site 9 is difficult to parallel. The areas enclosed by these sites are similar to sites on Dartmoor (Wainwright *et al* 1979; Ward 1988; Butler 1997).

Site 9 was more complex, with several phases of remodelling. Although precise parallels are not easily found, elements such as the banks, ditch and orthostats are all seen within the repertoire of excavated barrows and cairns in Cornwall and the wider south-west region (for example, Wainwright 1965; Christie 1988; Jones 2005). The closest parallels for the embellishment of site 9 are probably from Davidstow Moor, 4.5km to the north of Stannon on the edge of Bodmin Moor, where several barrows (including sites 3, 8 and 22) were encircled by a combination of banks and ditches (Christie 1988).

The absence of evidence for burial within sites 6 and 10 is paralleled by other excavated ring cairns in the south west (Butler 1997, 194; Griffith 1984b; Quinnell 1997); indeed, the lack of evidence for burial activity within the Shaugh Moor ring cairns convinced the excavators that they were not funerary sites at all (Wainwright *et al* 1979). Many Cornish barrows show a comparable paucity of traces of funerary activity (Jones 2005). The cist [243] and stone-lined grave [247] at Stannon site 9 were placed on the periphery of the site. The cist was of similar dimensions to other recorded cist graves in Cornwall and Devon (Worth 1967; Thomas 1975) and the rather smaller stone-lined grave possessed similarities with the inhumation grave cut beneath Watch Hill barrow (Miles 1975). Neither feature produced objects which could strictly be regarded as grave goods and if either originally held an inhumation burial they must have been for a child and an infant. Another possibility is that the cist was not intended to function as a grave but rather to hold structured deposits: it contained 39 sherds of Bronze Age pottery and a possible flint arrowhead (Lawson-Jones above). Other cists in Devon and Cornwall have been found to have been so full of artefacts and deposits that there would have been little room for a body (Quinnell 2003; Jones 2005). It is also worth noting that both the cist and the grave at site 9 were situated outside the ring cairn and therefore do not appear have been central to the activities on the site.

Charcoal-rich pits were found within site 6 and site 10 and similar pits and burnt spreads have been identified at ring cairns in Wales (Lynch 1993, 136), Devon (Wainwright *et al* 1979) and Cornwall (Christie 1988). The location of these pits, close to the perimeters of the sites, is also similar to those of other ring cairn and enclosure barrow sites (Brenig 44, Lynch 1993; Cocksbarrow, Miles and Miles 1971), although central pits have been found in ring cairns on Dartmoor (Wainwright *et al* 1979). The finding of a faience bead within site 6 is paralleled by the discovery of faience beads in a non-funerary pit within a ring cairn on Shaugh Moor in Devon (Wainwright *et al* 1979). Again, this suggests that ring cairns in the south west, while not strongly associated with burial, could be the focus for the deposition of objects for other purposes.

Site 6 was enclosed by a continuous wall and had no obvious entrance. Sites 9 and 10, however, were penannular and possessed entrances which faced north east. At site 10 the entrance consisted of a simple gap in the wall but at site 9 the entrance became more formal and was marked with paving. The entrances shared the same orientation as that created by the 'tail' on site 11, aligned towards Rough Tor.

The inclusion of large natural stones within the wall circuit was a feature of all three excavated ring cairns. At site 6, this took the form of an *in situ* grounder incorporated in the north-western quadrant. A placed quartz object recovered from in front of this stone suggests that some importance was attached to it. At site 9 a less imposing grounder was located in the southern part of the cairn-ring. Large stones were also erected as orthostats within the northern perimeters of sites 9 and 10 and the 'tailed' cairns, sites 2 and 11, were also associated with natural stones (see below). The inclusion of grounders and large stones is a feature of several excavated ring cairn sites in Cornwall, including Colliford CRIVC and Caerloggas I (Griffith 1984a; Miles 1975). Elsewhere, a ring cairn with multiple rings at Cefn Caer Euni in Wales had a boulder in the middle (Lynch 1986, 96–97), while Moel Goedog II had a large boulder in its perimeter which was thought to be an earthfast rock (Lynch 1984, 33).

Site 6 was the only one of the three ring cairns at Stannon to have been deliberately infilled. The deliberate infilling of Bronze Age sites is a process which has become recognised in Cornwall,

especially in relation to roundhouses (Nowakowski 1991; Jones 1998–9), but it has also been identified as a feature of excavated ring cairns in other upland parts of Britain (Lynch 1972; 1984; Ward 1988) and of other forms of barrows in Cornwall, including Trenance, Watch Hill and Davidstow 22 (Miles 1975; Christie 1988; Jones 2005).

Site 6, and possibly also site 9, had a later timber phase; this was not found in site 10. At site 6 this phase seems to have occurred at the end of the Early Bronze Age, *c* 1500 cal BC and at site 9 possibly somewhat later. Secondary post-rings on barrows are difficult to parallel; they are normally found in the primary phases of sites (Ashbee 1960; Case 1952; Gibson 1998) or are not demonstrably later (Catling 1982). Recent theoretical models developed for ceremonial sites in southern Britain have argued for the replacement of timber phases with stones and suggested that this was linked to the veneration of ancestors (Parker Pearson 2000, 204–5). However, secondary post-rings have been found in association with some barrows in the Low Countries (for example, Glasbergen 1954) and on Cranborne Chase, Dorset, the Early Bronze Age barrow Ogden Down 3 was encircled by concentric timber post-rings which have been radiocarbon dated to the Middle Bronze Age (Green 2000, 115). Secondary timber phases dating to the later part of the Bronze Age are also being found within stone circles in Scotland (R Bradley, pers comm).

Upland cairns with timber phases are less common, although Brenig 44 in Wales had an exterior ring of posts associated with its primary phase (Lynch 1993) and post-rings were found at Cocksbarrow and Caerloggas I on the St.Austell Downs (Miles 1975). More commonly found at upland cairn sites are orthostatic stone-settings. For example, an arrangement of standing stones was erected inside of the perimeter of Moel Goedog I (Lynch 1984) and an external ring of orthostats was associated with the cairn at Higher Draynes (Wainwright 1965). In Cornwall, free-standing timber structures dating to the end of the Early Bronze Age and Middle Bronze Age have been found at, for example, Bosmaugan, near Lostwithiel (Cole 1999) and Tremough, near Penryn (Gossip and Jones forthcoming).

The 'tailed' cairns

Sites 2 and 11 each had two elements, a small circular 'head' and a linear 'tail'. Parallels with sites elsewhere include, for example, Shaugh Moor cairns 70 and 71 on Dartmoor (Wainwright *et al* 1979) and, on Bodmin Moor, Colliford site CRIII (Griffiths 1984). The sealing of a deposit of charcoal beneath site 2 has parallels with Colliford site CRIVA (Griffith 1984a) and cairns in Devon (for example, Pollard 1967; Wainwright, *et al* 1979). The head of the site 11 tailed cairn covered an orthostat and was on top of and around a prominent natural granite outcrop. Similar arrangements are again found on Dartmoor and on Bodmin Moor. On Dartmoor, the small Gnats Head cairn was found to cover nothing but a natural flat slab of stone (Butler 1997, 197) and, at Shaugh Moor, cairn 71 surrounded a natural grounder (Wainwright *et al* 1979, 21). The latter site is also significant because it was situated close to other monuments, including two ring cairns and another cairn. Similar examples of cairns enclosing rocks also exist on Bodmin Moor (Johnson and Rose 1994, 34), with both simple (for example, Colliford site CRIVB; Griffiths 1984) and more elaborate cairns incorporating natural outcrops and grounders (for instance, Showery Tor; Barnatt 1982). The areas surrounding small cairns have rarely been excavated but evidence for activity around cairns has been found at Chysauster in Penwith (Smith 1996), for example, and at Parc Maen in Wales; the latter was surrounded by charcoal pits and standing stones (Marshall and Murphy 1991). As at Stannon site 2, cairn size does not always appear to affect the life of structure. Radiocarbon determinations from the Parc Maen site indicate that it was a focal point for activity over several centuries.

It is less easy to find comparanda for the 'tailed' element of sites 2 and 11, as only relatively few broadly comparable sites have been identified or investigated. As suggested earlier, the origins of the tail may lie in the Earlier Neolithic period, with long cairns; site 2 is securely dated to the start of the Early Bronze Age, however, and although site 11 is undated, analogy with site 2 suggests that it is probably of similar date. A handful of extended cairns have been recorded elsewhere. In Wales, a short annexe was attached to an Early Bronze Age cairn, Aber Camddwr II; this was only 2m long and covered a charcoal filled pit, although it was further extended by standing stones on the same alignment (Marshall and Murphy 1991, 54–58). In Derbyshire, two round cairns are linked by a linear 'body' at Longlow (Bateman 1861, 182; Jewitt 1870, 36, fig 23), but unlike the Stannon sites, the linear part of the structure was found to cover burials.

Other possible 'tailed' cairn sites are unexcavated and therefore of uncertain date. The Penn Beacon summit cairn on Dartmoor (Butler 1997, 157–8) could be a Neolithic long cairn or a 'tailed' Bronze Age site. Peter Herring has identified a number of long cairns on Bodmin Moor which are possibly Neolithic (for example, Catshole Tor; Herring 1983) and which could be seen as having circular rather than trapezoidal ends (P Herring, pers comm). Two of these long cairn sites, at Trewortha (PRN 1013.12) and Leskernick (Herring 1997, 180), are also closely associated with wider ceremonial or funerary complexes. The Trewortha long cairn is located amongst at least 12 round cairns (P Herring, pers comm), while the Leskernick cairn is part of an alignment which includes a pseudo-quoit and a round barrow (Herring 1997, 177). A small number of 'tailed' round cairns have been identified elsewhere on Bodmin Moor which are also likely to date to the Earlier Bronze Age. These include a 5m diameter cairn on Scribble Downs with a 'tail' 12m long extending from its western side (PRN 12701) and a large cairn (8.4m in diameter) with a possible 6m long structure extending from its western side near Rough Tor. Once again, these sites are situated within or on the edge of larger complexes of circular monuments (P Herring, pers comm).

Although the 'tails' on both site 2 and site 11 extended from the western sides of the cairns, they each 'pointed' towards different prominent rocky features on the horizon. At site 2 the alignment was towards a minor outcrop 1km to the south east on Louden Hill, whereas site 11 was clearly aligned towards Rough Tor. One of the major effects of these 'tails' is that they give circular monuments a sense of orientation in the landscape. At ring cairn sites 9 and 10 this was achieved by the alignment of the entrances on Rough Tor.

As at sites 6, 9 and 10, prominent natural rocks were also associated with sites 2 and 11. Site 11 covered a small tor and the 'tail' of site 2 terminated on a large rock. A secondary timber phase was also found at site 2, although this took the form of a linear arrangement of posts which may or may not have been contemporary with one another. External post-settings have been found adjacent to other cairn sites in Britain, as at Parc Maen in Wales (Marshall and Murphy 1991) and Colliford CRIVA and Davidstow Moor site 2 (Griffith 1984a; Christie 1988) in Cornwall.

Development of the complex

Two opposing models have been proposed in recent years to explain how barrow cemeteries reached their final forms. Barrett (1990; 1994) and Garwood (1991) have both suggested that barrow cemeteries on the Wessex chalk accreted over time: the construction of round barrows in linear groups could have enshrined genealogical relationships in a highly visible way and the rituals which took place at them may have been concerned with establishing and maintaining lines of descent and the passing of rights from one generation to the next.

Lynch (1993, 144), however, has argued that the excavated upland cairn cemetery at Brenig in Wales was conceived as a group from the outset and that certain sites within it were intended for ceremonial purposes. At Brenig the cemetery did not grow at a steady rate; rather, additions to it were probably made over an extended period. Lynch suggests that a ring cairn site had the fullest and longest use within the cemetery and was used for several centuries.

Recent analysis of Cornish barrow groups by the author, including those at Davidstow, Treligga and Botrea, suggests that they were intended to be experienced as a whole and that there was evidence for the deliberate structuration of space for a variety of ceremonial activities (Jones 2005). At Stannon the radiocarbon dating and artefactual evidence could support the linear development model: the dates may indicate that there was an east to west spread of the ceremonial complex, from site 2 to site 9. However, sites 10 and 11 at the western end of the complex could not be dated. The probable Early Bronze Age date of the latter 'tailed' site, however, suggests that it was constructed early in the life of the complex.

In addition, sites 2 and 9 were the only ones which had determinations associated with their primary phases. When the full range of determinations from sites 2, 6 and 9 are considered they suggest a degree of overlap. Although the earliest cairn, site 2, may have been at the eastern end, and the latest, site 9, in the west, there was also contemporaneous use of the different sites. Indeed, sites 2 and 11 may have provided two early focal points around which the subsequent ring cairns sites 6, 9 and 10 were constructed. Each of the sites may have been conceived as having its own 'life cycle', going through pre-planned phases in a predetermined sequence (Bradley 2002b). At any one time the various sites would have been at different stages within their 'life cycles'. Thus, a visitor to the

ceremonial complex in the middle of the second millennium cal BC may have witnessed deposits being placed next to site 2, a timber ring inside site 6 and a relatively newly constructed site 9. In contrast, site 11 might have appeared as an ancient monument, a marker pointing the way to Rough Tor, whereas site 10 was an empty circular space, kept clean and tidy. Possible reasons for the differences between spaces in the complex are discussed below.

Stones, pots, beads and trees

There has been a growing recognition that artefacts frequently do not enter the archaeological record as a matter of accidental discard but rather can be demonstrated to have been deliberately incorporated (for example, Richards and Thomas 1984; Pollard 1995). Many deposits will have entered contexts such as pits and ditches as a result of the ritualization of domestic activities (Bradley 2003) but others found on ceremonial or funerary sites are likely to have been deposited as part of conscious ritual acts. Artefacts from cairns and barrows have traditionally been taken to represent grave goods associated with the social standing of the deceased (see discussion in Jones 2005). In the context of barrow sites in Wessex, John Barrett (1994) has argued that not all of the artefacts found within barrows were grave goods and that many are likely to have been associated with the state of mourning and to have been cast off at the end of the rituals. However, given the almost total absence of obvious burial activity within the Stannon ceremonial complex it is unlikely that deposited objects were associated with the dead or mourners. Indeed, the sites with the strongest evidence for the deliberate deposition of objects (sites 2 and 6) were completely lacking in evidence of funerary activity. Instead it will be argued that a more complex set of meanings were being invoked and that many of the artefacts can be regarded as 'dedicated objects' (Osborne 2004, 1–10) associated with the transcendent power associated with natural rocks. To demonstrate this argument four categories of object will be considered: stones, pottery, beads and wood. Although evidence from all five Stannon sites is included, emphasis is placed on sites 2 and 6 as these produced the largest number of *in situ* finds and had not been disturbed by subsequent activity.

Stones

Stones are found in three types of context at Stannon, as *in situ* grounders, as unworked portable objects and as shaped artefacts. All three categories of stone are likely to have held meaning, particularly since prehistoric communities may not have held sharp distinctions between cultural artefacts and natural objects (*cf* Tilley 2004). It should also be remembered that although the period during which the Stannon complex developed is referred to as the Bronze Age, for much of this time metals were not common. Stones, on the other hand, were. They were vital elements in people's daily lives from their use as tools and building materials to their symbolic importance as markers of cosmological places in the landscape and occurrence as portable talismans and amulets.

As noted previously, *in situ* natural grounders were incorporated into four of the five sites. At site 2 the north-western end of the 'tail' terminated on an earthfast stone. In this way the 'culturally constructed' became at one with the 'naturally present'. A similar process occurred at site 11, where the 'head' of the tailed cairn ended upon an outcrop. The difference here was that the monument engulfed and denied access to the rock. Additionally, two orthostats were driven into the living rock, indicating perhaps a desire to control or subdue the properties of this place, or to tap into them. At site 6 a large grounder was incorporated so that it formed a triangular projection extending into the interior of the site. The action brought the rock into the enclosed space and made it into a focal point; its importance was highlighted by a triangular vein quartz object (**SF51**) which was wedged upright at its base. Thus, at different sites the *in situ* rocks were treated differently but in each case there was an apparent desire to connect with the rock, to incorporate and venerate them combined with a need to modify and control.

Large unmodified stones deposited with formality were found at three sites (sites 2, 9 and 10). At site 2 the major component of the kerb was large unshaped granite stones with high quartz content. These stones differed in texture and in colour from the other stones which were used in the cairns and were therefore presumably carefully selected. The 'special' nature of the kerb is also indicated by other stones which were wedged into it; including a burnt quartz pebble, a shaped semi-circular slate and a stone plaque

originating geologically in east Devon (**SF40**). The 'tail' of site 2 may also have been made from specially selected stones: its terminal stone was markedly triangular. At sites 9 and 10 a pair of unmodified stones were erected on the northern sides of the cairn walls.

Unmodified portable stone objects were found on all five of the excavated cairns. They included water-worn pebbles, vein and pebble quartz and large unmodified granite stones, which were erected as orthostats. Again, the range of items is comparable to other excavated barrows where this level of detail has been recorded (Miles 1975; Christie 1988; Jones 2005).

Portable quartz objects were found at all five sites. At site 2 vein quartz (**SF43**) from a stream and a quartz pebble (**SF43**) were incorporated into the kerb of the cairn and a quartz block was found within pit [30]. The triangular vein quartz object (**SF51**) found at site 6 had been deposited inside the site (see above). Quartz pebbles from streams and beach sources as well as locally occurring vein quartz were found inside sites 9, 10 and 11. In particular, site 10 contained three small beach-derived pebbles (Quinnell above). These instances fall within the wider association of quartz pebbles and blocks with Cornish cairns, barrows and other prehistoric monuments (for example, Jones and Nowakowski 1997; Miles and Miles 1971), and with ceremonial monuments in western Britain in general (Darvill 2002).

Other unmodified portable stones were also recovered. Site 2 produced an unworked sandstone cobble fragment (**SF9**) and at site 11 a fragment of non-local igneous rock (**SF252**) was found within the cairn material. Site 10 produced a number of beach and stream pebbles, including an unusually shaped stream cobble (**SF410**) which had been deposited into pit [310].

Modified stone artefacts were recovered from all of the sites, most commonly flints. Fine flint artefacts had been formally placed within site 6 and in pits near to site 2. Other types of worked stone were also deposited. At site 2 a triangular plaque from East Devon (**SF3**) and a cuboidal stone (**SF20**) were deposited beside the cairn. Another plaque fragment (**SF40**) was incorporated within the kerb. A broken saddle quern fragment (**SF401**) was found in the wall of site 6 and another (**SF338**) in the Iron Age drain at site 9. An unstratified cup-marked pebble (**SF408**) was also found at site 9. Complete and broken saddle querns have been recovered from a wide range of ceremonial monuments and ritualized contexts dating from the fourth to second millennium BC and are likely to have carried a range of symbolic meanings associated with transformations and fertility (see, for example, Darvill 2004; Jones and Taylor 2004). Cup-marked stones have been found within a wide range of Bronze Age monuments and there is a marked concentration from barrows in north Cornwall (Ashbee 1958; Trudgian 1976; Christie 1985). However, the cup-marks on the pebble from site 9 appear to be related to some form of functional use and differ from other recorded examples.

Whereas the *in situ* grounders might have represented powerful places in the landscape which were appropriated by monuments, the portable objects were, as Richard Bradley has noted (Bradley 2000, 96), 'pieces of landscape', which were brought to the monument. This is especially true for unmodified stones which were carried to the cairns from the coast, streams and other parts of the landscape. By depositing these artefacts 'symbolic' properties associated with other places and parts of the landscape might have been referenced and drawn upon. In particular, the excavated sites produced significant amounts of quartz in both pebble and vein form. As Darvill has argued, the whiteness of quartz and its frequent association with watery places such as streambeds may have meant that it was considered to have a spirit or character and was symbolically linked with the element of water (Darvill 2002, 84–5). A belief that quartz had its own spirit is suggested by the burial of a quartz block within pit [30] next to site 2 and the triangular quartz vein object in site 6. The number of beach- and stream-derived pebbles from the cairns also testifies to a link with water and wet places in the landscape.

If the unmodified stones represent the introduction of naturally occurring objects into the social arena, the modified stone could be taken to represent the introduction of personalised artefacts. These had been shaped and altered and, as well as holding the symbolic properties of the materials from which they had been made, would have contained sets of meanings associated with their form and their owners. The broken saddle quern in site 6 may have had links with fertility, whereas the flints and sandstone plaques perhaps indicated links with distant communities or individuals. In short, these stone artefacts would have possessed biographies of use and memory. The deposition of modified stones

at sites 2 and 6 may therefore be seen as part of the pattern of veneration at these sites. The fragmented nature of the two plaques and discoidal flint knife from site 2, and of the saddle quern from site 6, suggests that once deposited they were not intended for further use.

However, while unmodified *in situ* grounders and stones may have been imbued with natural symbolic properties and stone artefacts with biographical properties associated with ownership and use, it is important to remember that they are all part of a continuum which goes beyond simple notions of culture and nature. This is indicated by the triangular stones and grounders found within and around sites 2 and 6. At site 6 a triangular *in situ* grounder and a portable quartz vein object were found inside the site. At site 2 a triangular sandstone artefact was placed next to the cairn, while the terminal 'tail' stone, a natural grounder, was also triangular. It is therefore likely that the symbolic importance of these stones also lay in their shape.

Pottery

Bronze Age Trevisker Ware pottery was recovered from three of the five cairns (sites 2, 6 and 9). In common with much of pottery which has been recovered from other Cornish barrows and cairns (Jones 2005), none of the vessels from Stannon were complete and none can be considered as grave goods. There are interesting parallels between the vessels deposited on sites 2 and 6 and contrasts between these and those from site 9. On sites 2 and 6 small assemblages of fragmentary vessels were deposited into pits and postholes or, in the case of site 2, buried. All of the sherds were from small vessels and many of the sherds were unabraded, implying that they had been deposited soon after breakage. A smaller number of more abraded sherds from similar vessels were recovered from around site 2. Similar small vessels have been found on other Early Bronze Age ceremonial sites in Cornwall (Quinnell above) and their size suggests that they might have been associated with eating and drinking. Anthropological studies have shown that pottery is often associated with complex symbolism and its breakage surrounded by taboo and rituals (Barley 1994, 92–112). The deliberate breakage and burial of pottery is therefore likely to have been meaningful and was intended to highlight and reinforce particular ritual acts during communal gatherings at site 2 and 6.

By contrast, site 9 had seen deposition of greater quantities of much larger Trevisker vessels. The assemblage is much more abraded, but this could have been caused by Iron Age disturbance to the site. As at sites 2 and 6, none of the vessels were complete, but the vessels deposited in site 9 appear to have been cooking or small storage pots and to have parallels with examples from Middle Bronze Age settlement sites (see Quinnell above). In part, the differences in the ceramic assemblages at sites 2 and 6 from that of site 9 can be explained on purely chronological grounds: the assemblages at the former are dated to the end of the Early Bronze Age while that from site 9 is firmly within the Middle Bronze Age. However, other factors may also been at work. The pottery may have been deposited as part of ritualized activity by the inhabitants of the newly formed Middle Bronze Age settlement at Stannon (Quinnell above). Another possibility is that as site 9 came towards the end of its use as a ritual monument it was appropriated by a group associated with the roundhouse settlement. In this way older practices associated with communal gatherings and the deposition of ceramics were re-asserted and manipulated within the context of a new setting of roundhouses and fields.

Beads

Three beads have been recovered from stratified contexts at Stannon Down; a fourth, a post-Roman glass bead, was found in a residual context at site 11 (Hunter above). A shale bead of Early Bronze Age date was found within the entrance to roundhouse M4 during the excavation of the settlement in 1968 (Mercer 1970, 32) (Fig 41). On the basis that

Fig 41 Shale bead from the 1968 excavations at Shannon. The bead is 20mm long. (Photograph: Anna Tyacke. Copyright: Royal Institution of Cornwall.)

miniature macehead pendants tend to be Wessex 1 in date in Wessex, a general date bracket of *c* 1950–1700 cal BC is likely (A Sheridan, pers comm). This is significant as the roundhouse settlement is likely to postdate 1500 cal BC. The bead may therefore have been curated for two centuries or more before it was deposited.

The 1998–9 excavations recovered two beads, one of amber and the other of faience, both of which had been formally deposited. In considering these beads a number of similarities emerge between the way that they were treated and the meanings that may have been associated with them. The amber bead was found inside a pit next to site 2, a cairn built several centuries prior to its deposition. The pit also produced pieces of a deliberately snapped flint knife (**L1**), Trevisker pottery and a large quartz block. The faience bead (**SF2**) was placed inside site 6 during the infilling of the ring cairn. Although undated, it is likely that the site was not infilled for some time after its construction. The infilling deposits also produced a finely worked flint blade (**L3**) and a triangular vein quartz object (**SF51**).

Both these beads were manufactured from exotic substances (Woodward 2000), which may well have been considered to have supernatural qualities (Woodward 2002a; Sheridan and Shortland 2004, 276). In common with the majority of other British beads from barrows, they had presumably been removed from necklaces (Woodward 2002a, 1043) and were deposited as individual objects.

The faience bead might have been manufactured in Cornwall, although it is perhaps unlikely that it was made in the immediate locality of Stannon, but the amber bead is likely to have been obtained from Wessex (Sheridan above). Both beads are likely to have carried meanings which were at least in part associated with places beyond Bodmin Moor. It is possible that both were also heirlooms at the time they were deposited. In particular, the worn nature of the amber bead from site 2 suggests that it was an ancient treasured object. In short, both beads were perhaps ancient and powerful objects manufactured from 'magical' substances and associated with distant places and people. Their deposition occurred at established monuments which were associated with outcrops of rocks. It is therefore argued that they were deposited as part of the veneration of these places.

Trees

If inorganic materials such as stone can be resonant with meaning, this is also true for organic materials. The environmental analyses from Stannon have indicated that trees were abundant in the wider landscape (colour plates 1–3) and, as Cummings and Whittle (2004, 71) have argued, trees may well have added to the symbolic significance of monuments, not least because of their wide range of uses in daily life. The symbolic importance of trees to prehistoric communities of later periods is reasonably well documented. Iron Age Britons were noted by classical writers as identifying deities with trees and sacred groves were associated with temples and places of worship (Green 1986, 22). Earlier evidence for the symbolism of wood is the restricted range of tree species used for carved anthropogenic figures which were formally deposited in watery places throughout the Bronze and Iron Age periods in Britain and Ireland (Coles 1998).

In Cornwall in general and at Stannon in particular, organic materials such as wood or unburnt bone do not survive in the acidic soils. However, evidence for the importance of trees is evident at Stannon in two ways: first in the form of charcoal, which was formally deposited at all of the sites, and secondly by the erection of timber posts within or next to two of the sites (sites 2 and 6) (see below). Charcoal was formally placed within pits and postholes at four of the five excavated cairn sites. At site 2 a charcoal-rich deposit was placed in the centre of the site during its primary phase and subsequently large amounts of charcoal were placed into the pits on the north-east side of the monument. At site 6 charcoal was placed into the primary pits and was found in the ring wall. The evidence from site 9 was more disturbed but a placed deposit of charcoal was found beneath the primary phase ring wall [213]. A charcoal-rich pit in site 10 was the only feature associated with it.

In common with a large number of excavated ceremonial sites in Cornwall and the south west (Tilley 1996, 173; Jones 2005; Worth 1967), most of the identifiable charcoal from all of the excavated sites was oak. Its inclusion in and dominance of the charcoal assemblages within the postholes and pits at sites 2, 6, 9 and 10 can hardly have been accidental and, given the range of trees which were available in the landscape (see Tinsley above), must have represented deliberate selection. Indeed, it seems that

oak was consciously chosen for use on these sites, reduced to charcoal by burning and incorporated into the fabric of the cairns. In this manner, perhaps, the symbolic property or essence of the tree was captured and placed into the appropriate context.

Conclusion

Throughout this section it has been argued that the deposits which were placed within or next to the excavated cairns carried meanings. The discussion has focused on stones, pots, beads and stones but it is very probable that other perishable types of deposit were also made. However, although each of the placed deposits carried its own properties or essences, they were rarely deposited by themselves: most of the recovered deposits were in combination with other items. Thus, for example, charcoal was often found together with quartz and pottery. Deposits were also frequently composed of fragmented, crushed and worn objects. Overall, therefore, additional meanings are likely to have been created by the combination of items and substances in complex associations.

Structuring space

Landscape and place

Many recent discussions of monuments in the Neolithic and Early Bronze Age have become concerned with looking beyond the confines of the excavated area or the space occupied by a monument and identifying linkages with their wider settings (Bradley 1998; 2000; Tilley 1994). This has immediately raised problems, not least because of alterations to the environment which have taken place over several millennia, but also because the meanings of many terms which we use in discussing the placing of monuments, including 'landscape' and 'place', may not have been understood in the same way in the Bronze Age.

The first set of problems relating to the changing character of the Stannon monuments' settings can be reduced to some extent by the use of environmental data, the good survival of monuments on Bodmin Moor and by the use of techniques such as GIS (Geographical Information System) terrain modelling (colour plates 1–3) (Tapper and Jones this volume). Problems relating to terminology are thornier because words such as 'landscape' have accrued particular sets of meanings which are rooted in the development of western thought over the last couple of centuries, meanings which can vary according to the theoretical perspective of the writer. The following brief commentaries indicate the way in which these terms are used here.

Landscape. The study of past landscapes forms an important area of study for archaeologists, because it offers an invaluable way for identifying patterning of sites which can be used to construct interpretative hypotheses. It is argued here that landscapes are natural as well as cultural in form; for as Layton and Ucko (1999, 6–8) have argued, landscapes possess a real physical form which affects the way that they are perceived and inhabited. However, it is also taken here that meanings and metaphors which are attached to landscapes are not fixed (Knapp and Ashmore 1999). Landscapes are polysemic, having more than one meaning attached to them and work on a variety of levels, which can be associated with status, gender, kin groups or the individual (Bender 1993; Cummings and Whittle 2004). Likewise, the boundaries of a landscape are not fixed; they can change according to the way they are experienced and moved through.

Place. In common with landscapes, what constitutes a 'place' is deeply abstract or culturally determined. They may be natural features, points along pathways, spaces associated with particular memories or events, sites of deposition, or locales which have been marked in some way by a cultural construction, such as a monument (Tilley 1994; Bradley 2000). Place is taken here to include all of the above, but in particular monuments are seen as constituting places of meaning within the wider landscape. Therefore, the Stannon ceremonial complex is taken to consist of a number of 'places' associated with certain actions, which were linked with other 'places' in the wider landscape, including Stannon stone circle, the cairns on the Northern Downs and the Rough Tor area.

The remainder of this section is concerned with discussing the way that the wider landscape around Stannon was organised, as well as the way that places within the Stannon ceremonial complex were structured.

Ordering the landscape

It is clear that prehistoric monuments were frequently sited according to local cosmological schemes and that prominent natural features were often referenced as part of this process (Tilley 1994;

Bradley 2000; Cummings and Whittle 2004; Jones 2005). A convincing body of evidence has accumulated which demonstrates that natural features, including prominent hills, rocky outcrops, the sea and watercourses, were all focal places where monuments were located or on which they were aligned (Cleggett 1999; Watson 1991).

Furthermore, several writers have argued that human occupations, including settlement activity and monument construction affected the way places in the landscape were used by subsequent generations. For example, in the Stonehenge region certain types of ceramics are never found together and some parts of the landscape became the focus for monuments associated with death whereas others were associated with those used by the living (for example, Parker Pearson 2000; Thomas 1999).

In Cornwall the importance of natural features, particularly rocky outcrops and tors, for the siting of monuments has been recognised by a number of authors (Herring 1993, 58–9; Bender *et al* 1997; Bradley 1998b; Tilley 1995; Jones 2005). It is also evident that certain areas on Bodmin Moor, including the area around Rough Tor, had accrued meanings which were associated with ceremonial activity, so that there were discrete sacred areas (Barnatt 1982; Johnson and Rose 1994; Tilley 1995; Jones 2005). The area around Rough Tor contains a particularly dense scatter of cairns, barrows, stone circles and other ceremonial monument forms. Early Neolithic activity is attested by the construction of long cairns in the area, probably including the massive bank cairn on the western slopes of Rough Tor (colour plate 1). During this time the Tor itself was marked out by an enclosure, which although probably Early Neolithic in date, was modified in the Bronze Age by the addition of tor cairns (Tilley 1995, 41). In the Early Bronze Age, Showery Tor, a prominent rock stack at the northern end of the Rough Tor massif was encircled by a large cairn. Cairns, barrows and complex cairns were constructed on the surrounding downs, ridges and hilltops in sight of the tor (colour plate 2). Each one of these groups of monuments had its own distinctive layout and character. There were also stone circles at Stannon, Louden Hill and Fernacre (Johnson and Rose 1994, map i), again visually referencing Rough Tor. The chronology of these sites is uncertain; some may be Neolithic but others may date to the Bronze Age. Currently, the only radiocarbon determination from a stone circle on Bodmin Moor falls within the Early Bronze Age (B Bender, pers comm). What is certain is that for communities on the Moor during the earlier Bronze Age the stone circles would have been extant monuments imbued with meanings.

The five monuments which comprised the Stannon ceremonial complex were therefore part of a wider landscape and were located on the south-western approach to Rough Tor. The tor was a distinctive topographic feature in the landscape which, it is argued, formed the focus for ceremonial activity and movement through the landscape. A fuller account is given elsewhere (Jones 2006), but with this in mind, the following interpretative model is offered.

The environmental evidence suggests the presence of substantial numbers of trees in the areas between the monument complexes (colour plate 2). It is likely that these formed an element of a designed landscape of paths and places which cued people and created an appropriate mindset as they moved towards the Stannon ceremonial complex and beyond from the lower ground to the south. At the southern end of this experienced landscape, near to a tributary of the River Camel, is the Stannon stone circle. As several writers have noted (Gray 1908; Barnatt 1982; Tilley 1995), Rough Tor dominates the horizon to the north east. This would have been true regardless of the presence of trees. The link between the stone circle and Rough Tor is further strengthened by the fact that when viewed from the circle around May Day the sunrise is framed between the peaks of the tor (Barnatt 1982, 169). Although its constituent stones are diminutive, with a diameter of around 40m this monument is one of the largest circles in Cornwall (*ibid*, 168) and could clearly hold large gatherings. Burials have not generally been associated with Cornish stone circles and there are no barrows or cairns which might have been funerary monuments in its immediate vicinity. We can therefore envisage that the circle was associated with gatherings of the living. Proceeding north across Stannon Down, cairn cemeteries were located on Louden Hill to the east, but the first major group of monuments to be encountered between the stone circle and Rough Tor was the Stannon ceremonial complex. The individual sites have been described and the practices associated with them will be addressed below. However, it is noteworthy that at this point there is a change in the form of the ritual spaces encountered, from one of incorporation (the large area enclosed at Stannon circle) to segmentation: the monuments within the Stannon complex were not constructed to hold large numbers of people; they were instead

designed to accommodate smaller gatherings for smaller-scale and perhaps less public actions. The symbolic link with Rough Tor was maintained, with three of the five sites being aligned towards it, although other rocks were referenced within the monuments themselves and in the near distance.

Leaving the ceremonial complex space and climbing higher still to the north, the monuments on the Northern Downs were reached. Here, small monuments were located in the shadow of Rough Tor. The small cairns were spread out, breaking up the community still further as individuals dispersed across the Down to visit the numerous small sites. Excavation of three of the cairns showed that at least two of them were probably associated with burial (Harris *et al* 1984). It is likely that this area was associated with death and it has been suggested that funerary feasts took place at one of the excavated cairn sites (Parker Pearson 2003, 12). Again, Rough Tor was dominant through its proximity; clitter structure 54 was also aligned towards it. Finally, people would have ascended the slopes of Rough Tor and entered the enclosure around its summit. In doing so they would have been reminded of the mythological past and brought back together again as a community within the space of the enclosure.

Experiencing the complex

Having discussed the way that the ceremonial complex could have fitted into a broader landscape, it is now possible to consider how places within the complex were experienced. In its diversity of monument forms, the Stannon Down complex shares points in common with other upland groups of monuments in the south west and beyond (Lynch 1993; Barnatt and Smith 2004; Wainwright *et al* 1979). Indeed, comparable complexes of monuments on Dartmoor have been referred to as 'sanctuaries' by Aileen Fox (1964) due to the large number and variety of ceremonial and funerary monuments within them. Complexes of funerary and non-funerary monuments are found across Cornwall (for example, Miles 1975; Jones 2005). However, no two cemeteries or sanctuaries are the same and each possesses its own biography.

At Stannon the 200m length of the ceremonial complex was not undifferentiated space populated by monuments of near identical appearance. As at other Cornish cemeteries, monuments within the complex were distinct from one another and were not evenly spaced (see Christie 1988; Jones 2005). Sites 2 and 6, grouped at the eastern end were separated from the three remaining monuments (sites 9, 10 and 11) by a space of some 100m, thus forming two distinct areas or zones.

Individual monuments within both areas were separated by distances of 15m to 25m. Again, the loose association of monuments is a recurring feature of Cornish cemeteries and it is likely that this enabled distinct and contrasting ritual practices to be associated with different places within the ceremonial complex (Jones 2005). A fuller interpretation of these practices is published elsewhere (Jones 2006) but a brief discussion follows.

As we have seen, certain monuments within the complex were associated with the deposition of artefacts (sites 2, 6 and 9) and others were not (sites 10 and 11). The eastern area of the complex (sites 2 and 6) was associated with the deposition of small Trevisker-ware vessels and stone objects, including a cushion stone, a triangular quartz block, triangular sandstone plaques from Devon and exotic beads of faience and amber. Objects deposited at sites 2 and 6 were placed within or next to the monuments. Both sites were linked with *in situ* rocks and neither directly referenced Rough Tor, although it would have been visible from both of them. Neither site was of a funerary nature but was instead associated with the fragmentation of pottery and, presumably, the separation of beads from necklaces, and the deposition of portable stones beside or within monuments which covered the living rock. Finally, both sites were marked by timber phases (see below).

Sites 10 and 11 in the western area of the complex were not strongly associated with the deposition of artefacts and did not have timber phases. These sites must have reached their final form quite quickly and were not apparently the focus for renewed attention. A single fire was lit within site 10 and a water-worn stone placed within it, but again this might have occurred early in its history. All three sites were aligned on Rough Tor and were associated with large orthostats. At site 11 the orthostat pierced the living rock and was then covered, whereas at sites 9 and 10 stones were left as free-standing monoliths. Site 9 differed from the other sites in the western area of the complex in that two probable burials were placed on its margins at an early stage; it was subsequently remodelled into a complex ditched monument, quite unlike any of the others. Later still, timbers may have been erected and pottery and other artefacts deposited. However, this activity was subtly different

from that in the eastern area of the complex. The ceramic vessels which were deposited at site 9 were much larger than those at sites 2 and 6 and less care may have been taken over the way that they were deposited. Exotic objects such as beads were absent and, if timbers were erected, they did not form a ring as in site 6. It is suggested that the later activities at site 9 were associated with the reinterpretation of ritual tradition around the time of the construction of the Middle Bronze Age settlement.

The monuments and activities in the eastern area of the complex can therefore be contrasted with what was occurring in the western zone. The east was associated with rituals and feasting for the living and with propitiation of local rocks through the deposition of artefacts. The western end of the complex was not (in its initial phases) used for the deposition of artefacts; here, rocks were taken from the ground and set upright and at site 11 a rocky outcrop was 'stabbed' with an orthostat. Monuments were kept clean and Rough Tor was referenced. Burials occured but the deceased were not provided with grave goods. If the eastern end of the complex was concerned with feasting and deposition, this end was not. Only centuries later does it appear that site 9 in the western zone was appropriated for the purposes of communal rituals.

In summary, it has been argued that there was a diversity of ritual practice within the Stannon ceremonial complex, suggesting that its space was not associated with the development or enshrinement of genealogies. Instead, the complex was associated with the reproduction of communities through interactions with and control of natural landscape features which were important in local cosmologies. However, the meanings and interpretations of those features were not fixed and altered over time.

Memory and actions

John Barrett has observed that monuments continued to have significance long after their builders had died and original meanings had been forgotten (Barrett 1999). Richard Bradley (1998b, 20) has pointed out that prehistoric people were not architects or archaeologists and that they would have had to interpret the remains of the monuments in the world around them. Monuments would therefore have possessed 'biographies'; the creation of these histories or mythologies would have involved drawing upon both social memory and interpretation of what was on the ground (Gosden and Lock 1998; Holtorf 1998). However, at certain times mythological sites can be thrown to the fore to justify action in the present (Bradley 2002a, 112–24).

At Stannon there is evidence for later prehistoric human activity in the form of stone monuments and settlements over a span of some 2000 years. During this period there were major changes in the way that the landscape was used and sites occupied. There were marked periods of intensive use followed by what must have been long periods when little of what occurred can be detected in the archaeological record. This does not imply that sites were not used, but that human activity associated with them did not require overtly conscious displays. The remainder of this section focuses on three periods which were associated with major alterations to the excavated sites: the end of the Early Bronze Age, the Middle Bronze Age and the Iron Age.

The end of the Early Bronze Age (1700–1500 cal BC)

By about 1700 cal BC it is likely that sites 2, 6, 11 and possibly 10 already had long histories as focal or gathering places in the landscape and were enmeshed in a wider mythologised landscape cosmology. However, activity at these sites may not have been intense, or may not have involved the large-scale deposition of artefacts or the construction of timber structures. At some time after 1700 cal BC all this changed. At the eastern end of the complex a new cycle of activity commenced between 1600–1400 cal BC, firstly at site 2, followed by site 6. Objects were deposited next to site 2 and the ceramic assemblage may indicate feasting. At both sites timber structures were erected in the form of free-standing posts beside site 2 and a post-ring within site 6.

The use of timbers on ceremonial sites has been the focus of some recent re-evaluation. Several commentators have pointed out that in Wessex timber was usually used in the primary phases of monuments and stone in subsequent phases (Gibson 1998; Parker Pearson and Ramilisonina 1998). Analogies have been made with Madagascar, where timber is symbolically associated with the living or the recently dead and stone with the ancestral dead. Based on these analogies, it has been suggested that some monuments became associated with the ancestors; parts of the Wessex landscape were associated with the dead and others with the living (Pitts 2000, 257–8; Parker Pearson 2000).

Actual timbers did not survive on the excavated sites at Stannon, but postholes, which would have supported timbers, were found at two, possibly three, of the sites. As we have seen, a series of posts were erected on the eastern side of the site 2, while a post-ring was inserted into site 6. Individual posts may also have been erected within the interior of site 9. However, these post-settings were not associated with the primary phases of the site, occurring instead during the final stages of ceremonial activity. If the argument that timber was metaphorically linked with life or with the living in Cornwall, then its deployment could instead be viewed as a way of renewing ancient sites for use by the living.This suggests that at Stannon monuments were not moving from the realm of the living to that of the dead.

If the metaphor of timber components representing the living is accepted, then it may be that ancient 'historical' places were being actively renewed and consciously brought into the domain of the living. At some point between 1690 and 1510 cal BC, site 9 was constructed at the western end of the complex, possibly one of the last ring cairns to be constructed on Bodmin Moor. The reaffirmation of the ceremonial complex at this time is of interest, as this is a period which nationally saw the start of a decline in monument building and from *c* 1500 cal BC the first widespread appearance of settlements (*cf* Barrett *et al* 1991). It is possible that activities within the complex occurred at a time when there was growing pressure upon communities to break with traditional practices by enclosing the land and laying out permanent settlements. Seen in this context, the reuse of monuments can be viewed as a way of retaining social cohesion by drawing upon tradition. In this way, relationships between people, sites and the landscape could be reaffirmed and links with the past maintained.

The Middle Bronze Age settlement (1500–1000 cal BC)

The Stannon settlement and other adjacent settlements were probably constructed some time after 1500 cal BC, separated by substantial boundaries (colour plate 3). The environmental evidence suggests that extensive grasslands were being established at this time through clearance of woodland and it is possible that destabilisation of the soil led to the formation of colluvial deposits on the lower ground. In short, the period is likely to have witnessed drastic changes to the landscape and, consequently, to personal freedom of movement. However, links with the past were maintained: roundhouses were built on the upper edge of the plateau, adjacent to the earlier monument complex, but not upon it. Similarly stone field boundaries were constructed; some of these incorporated monuments within them but did not destroy them. On the adjacent downs, cairns were frequently incorporated within the field walls and on the slopes of Rough Tor the bank cairn became part of the field system. The construction of roundhouses close to the ring cairns at the Stannon settlement is unusual and is not easily paralleled; most settlements were separate from monument complexes and barrow cemeteries. However, the location of the earlier complex on a terrace and its architectural appearance could have made it easier for incorporation into the settled landscape of the Middle Bronze Age; a somewhat similar complex of ring cairns and small cairns on Shaugh Moor (Wainwright *et al* 1979) was also near to a settled landscape. In short, it is possible that the low walls of stone were interpreted as ancient houses rather than ceremonial cairns. Some three thousand years later archaeological surveyors reached the same conclusion.

Bradley (2002, 71–82) has noted that on Dartmoor, Early Bronze Age ceremonial monuments profoundly influenced the way that subsequent prehistoric settlements were constructed and oriented. The existence of earlier monuments did not merely dictate where field walls or roundhouses could be built but also shaped and provided a context for later ritualized activity. At Stannon, there is good evidence for continued or renewed activity within site 9 after 1500 cal BC. Superficially the deposition of the pottery and the possible timber phase has similarities to events at sites 2 and 6. However, there are differences in the vessels chosen for deposition and in the form of the possible post-setting. It is argued here that these differences occurred because there had been a break in the use of the complex but the later activity within site 9 was based on a social memory of the 'right way' of acting there.

The question arises as to why people should have wished to live near to ceremonial monuments, incorporate cairns within their field systems and continue to venerate ancient sites. The answers may lie in a desire to legitimise the present by embedding parts of it in the past and with the way in which of mythologised monuments were interpreted (Gosden

and Lock 1998). Barrett (1994) has argued that the Middle Bronze Age saw a change in the tenure of the land, so that defined blocks became associated with particular communities. It is possible that increasing activity at ceremonial sites had led to individual communities having growing attachments with particular parts of the landscape (Jones 2005). The construction of the Stannon roundhouses next to the ring cairns may have been an attempt to manipulate the past by forging symbolic genealogical links with a mythological community; the half-remembered rituals performed in site 9 could also be seen in this context. Indeed, the performance of these rituals may have enabled or permitted the settlement to be built. In this way a new world of paddocks and fields could be constructed, but social tensions could be avoided by making links with the past.

The Middle Iron Age structure (c 300–200 cal BC)

Approximately seven centuries after the last evidence for occupation in the Middle Bronze Age settlement (Mercer 1970) an Iron Age dwelling was erected within site 9. At face value the apparent abandonment in the intervening period could be taken to imply major social upheaval or environmental deterioration (*cf* Burgess 1980). In reality the gap in the occupation record is likely to be more apparent than real; the environmental record indicates that there is no evidence for a major climatic downturn until well into the Iron Age (see Tinsley above). It is also likely that patterns of transhumant pastoralism which were established during the Bronze Age continued throughout the Iron Age and beyond (Herring forthcoming a). In some ways the construction of the structure within site 9 also represents continuity with the past and continuing reuse of old sites; however, the link here is tenuous and there is little evidence for a respect of the past. Indeed, much of the unstratified Bronze Age pottery which was found on the periphery of site 9 could have been casually emptied out from the interior of the site and dumped. At this time occupation may have been linked to a personal history involving a desire to inhabit a place which was already known to the occupant, a familiar place on a slight eminence, a place where the 'old ones' had lived some time ago, where people met and the animals grazed amongst the ruins. This time the past was not brought to the fore, but blended into the landscape.

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The project archive has been deposited in the Royal Institution of Cornwall, Truro, accessioned as TRURI: 2005.7.

Cornish Archaeology 43–44, 2004–5, 141–144

Stannon Down: a note on the landscape modelling

BRYN TAPPER with ANDY M JONES

One of the objectives of the Stannon project was to use environmental and archaeological information to produce a series of 'snapshots' to construct impressions of the probable appearance of the landscape at key moments (colour plates 1–3). The purpose of the exercise was to try and bring the landscape alive in a visually dynamic manner. The production of a series of models was not only important in terms of illustrating the paper but also in highlighting the changing appearance of the Moor which has directly resulted from anthropogenic impact on the landscape over several millennia.

It is, however, important to note that the reconstruction models were very much based on an educated interpretation of current knowledge and should not be used in a deterministic manner. Indeed, a major problem with attempting the reconstruction modelling was the fact that much of Stannon Down had been radically altered by the extractive china clay industry (Fig 1). Little information survived about how Stannon looked before the industry had taken hold, other than the contour-less Ordnance Survey first edition 1:2500 map (*c* 1880) and a photograph from Stannon stone circle looking towards Rough Tor taken in the early twentieth century (Gray 1908). Reconstruction of the topography of the Down is therefore based on the integration of surviving elements of the landform with unaffected areas beyond the perimeter of the pit.

The three illustrated models (colour plates 1–3) represent interpretative reconstructions of the Later Neolithic, Early Bronze Age and Middle Bronze Age landscapes (Jones, this volume). The periods selected for illustration were those which provided the largest body of environmental and archaeological data and which were linked with the broader research aims of the project. No attempt was made to reconstruct, for example, the Mesolithic or medieval landscapes.

Reconstructing the landscape: GIS method

The modelling of three phases of the Stannon Down prehistoric landscape was undertaken within a Geographic Information System (GIS) (ESRI's ArcGIS 8.3 and ArcScene) using survey, excavation and palaeo-environmental data from Stannon Downs and the Northern Downs (Mercer and Dimbleby 1978; Johnson and Rose 1994; Jones, this volume), as well as published environmental information from the wider landscape (for example, Gearey *et al* 2002). Known archaeological sites were placed in their landscape context with the data obtained from palaeo-environmental samples providing evidence for vegetation cover.

The landscape models are based on a combination of modern and historic OS maps, InterMap digital elevation data and archaeological sources held in Cornwall and Scilly Historic Environment Service's offices, Truro, Cornwall.

Using InterMap's cell-based digital terrain model (DTM) (5m pixel resolution with a root mean square error (RMS) of between 0.5–1.0m) it was possible to extract an area of cells representing the topography of the wider Stannon Down area, including Rough Tor and Brown Willy. This included the area covered by the china clay works. These cells were converted and interpolated to 1m interval contours as vector line data (Fig 2).

Fig 1 Stannon china-clay works, looking south west, 31 August 2004. The principal sites excavated in 1998 had been covered by the large spoil dump just right of the centre of the image. The area termed Northern Downs is on the left hand side of the photograph. (Historic Environment Service, F66–063)

To reconstruct the landscape to something like its original topography it was necessary to isolate and remove the modern elements by clipping away the modern contours within the area of the works leaving only those contours outside.

Two methods were employed to reconstruct the topography prior to china-clay working. Firstly, contours were digitised, at 1:1000, from a scanned and geo-referenced early Ordnance Survey map (1965 1:25,000 OS sheet SX18, geo-referenced to an accuracy of 1.2m) for areas that had not yet been incorporated into the works at the time of the map publication. These 'new' contours were then inserted into the original contour data. Secondly, where contour information was not available for the extent of the china clay works up to 1965, the terrain was interpolated as a TIN (Triangular Irregular Network) to model or 'smooth' the landscape as it may have been prior to the china clay works, using known elevation data from around the edges of the site. The interpolated TIN area was then converted to 1m interval contours and integrated with the original contour data which was then itself used to create a cell-based DTM producing a seamless landscape model without the china-clay works.

The majority of the monuments identified in the reconstruction models were located from the Cornwall and Scilly Historic Environment Record's (HER) Sites and Monuments database, although some new sites were added and updated from the results of the Stannon Down excavations. The sites were incorporated as point data only; given the scale of the landscape models and difficulty in representing individual sites in detail as visible entities in such a wide landscape. The exceptions, however, are the linear features of the Rough Tor enclosure, Rough Tor bank cairn and the Middle Bronze Age field systems. The Rough Tor enclosure has been mapped and modelled from an HES survey (Preston-Jones 1994, 43–44).

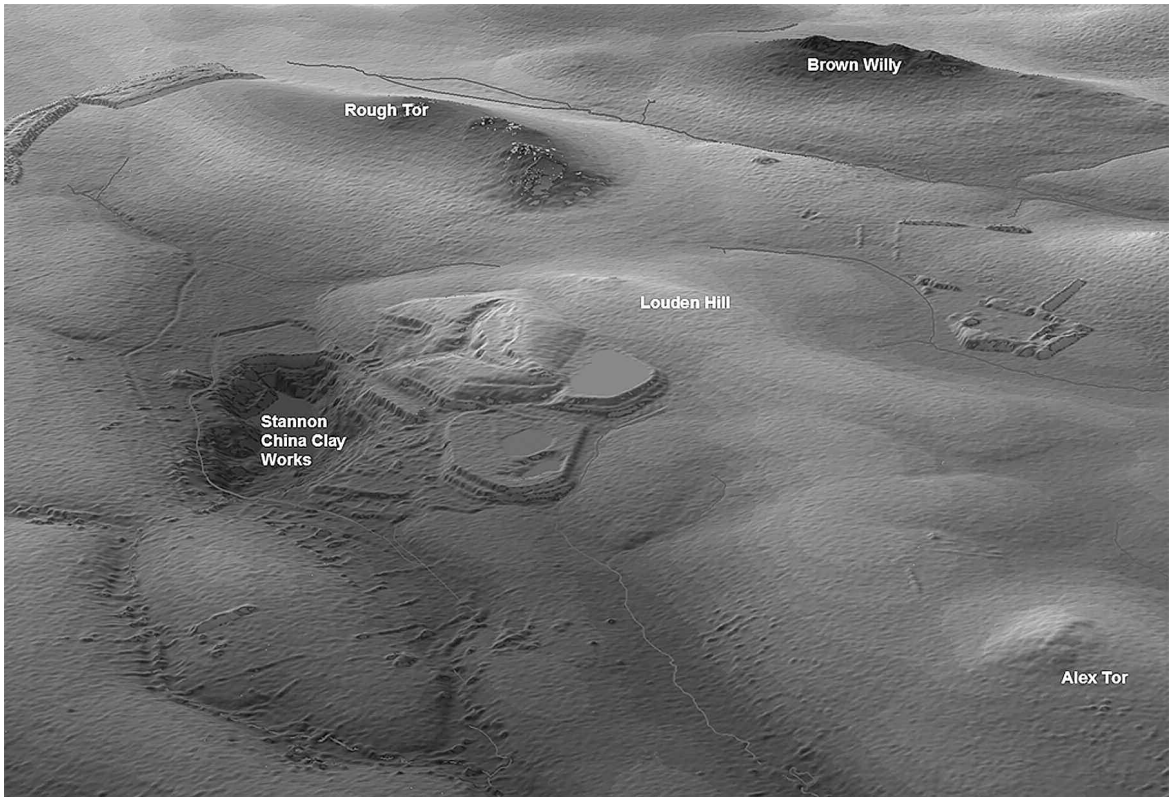

Fig 2 Digital surface model of the present landscape

The archaeological data was digitised as vector-based polygons, lines and points and added to the DTM. All sites drape over the DTM according to their surveyed location. Most, particularly non-linear ones, have been represented as points since actual scaled representation would render many invisible at the scale at which the models are presented. Linear monuments such as the extensive field systems identified through aerial survey and the 1994 1:2500 Bodmin Moor Survey were shown according to their surveyed positions, although no width and height dimensions were rendered. All landscape features, including archaeology, hydrology, tors, clitter areas and trees drape as vector-based layers over the DTM. Their dimensions are based on actual survey details.

Tree coverage was achieved through the random generation of points within a defined polygon area, that is to say, the extent of the landscape model. The various topographic zones, based on contour divisions, were assigned differing numbers of trees to reflect relative intensity of coverage and to mimic as far as possible the appearances in the pollen record of three species in particular: alder, oak and hazel. To represent the early cleared tors and hills no trees were generated above the 300m contour, while in the valleys their coverage was intensified, with a grading between the two. The tree species were crudely represented by 3D modelling to reflect the basic, average dimensions of the three species, by using a software extension plug-in enabling control of height, diameter, canopy layers, trunk height and width. The modelled trees took into account the slighter smaller stature of trees found on Bodmin Moor.

To represent the Bronze Age clearances and increasing expanses of grassland a random selection of tree points was made for each species with 50–70% being removed between each chronological model. This was an iterative process undertaken in discussion between the authors and Peter Herring and Peter Rose, who had surveyed the area. Additionally, the representation of clearances around monuments was achieved by 50m buffers of the monuments which were then used to select and remove trees within that distance.

The hydrology for the models was taken from the OS MasterMap. Modern watercourses associated with the china clay works including leats and drains were removed. The clitter, rocky outcrops and tors were digitised from the Bodmin Moor 1:2500 survey as polygons at 1:1000 and given notional heights of between 2–9m. This was only undertaken for Rough Tor in order to emphasis its particular topographic significance.

The models have been rendered in British National Grid coordinate system. The lighting was achieved by setting the sun's azimuth to the north-west, at 315° with an altitude of 30°. All the models have x1.5 vertical exaggeration.

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After the flood: building recording at Minster Church, Boscastle, in 2005

JOHN ALLAN

During the Boscastle flooding of August 2004, the nearby church of St Materiana at Minster (SX 1109 9048; Figs 1, 2) suffered serious flood damage. Water poured through the south doorway, filling the church to a depth of about 1.8m. The Victorian pews were damaged or displaced (Fig 3) and were all

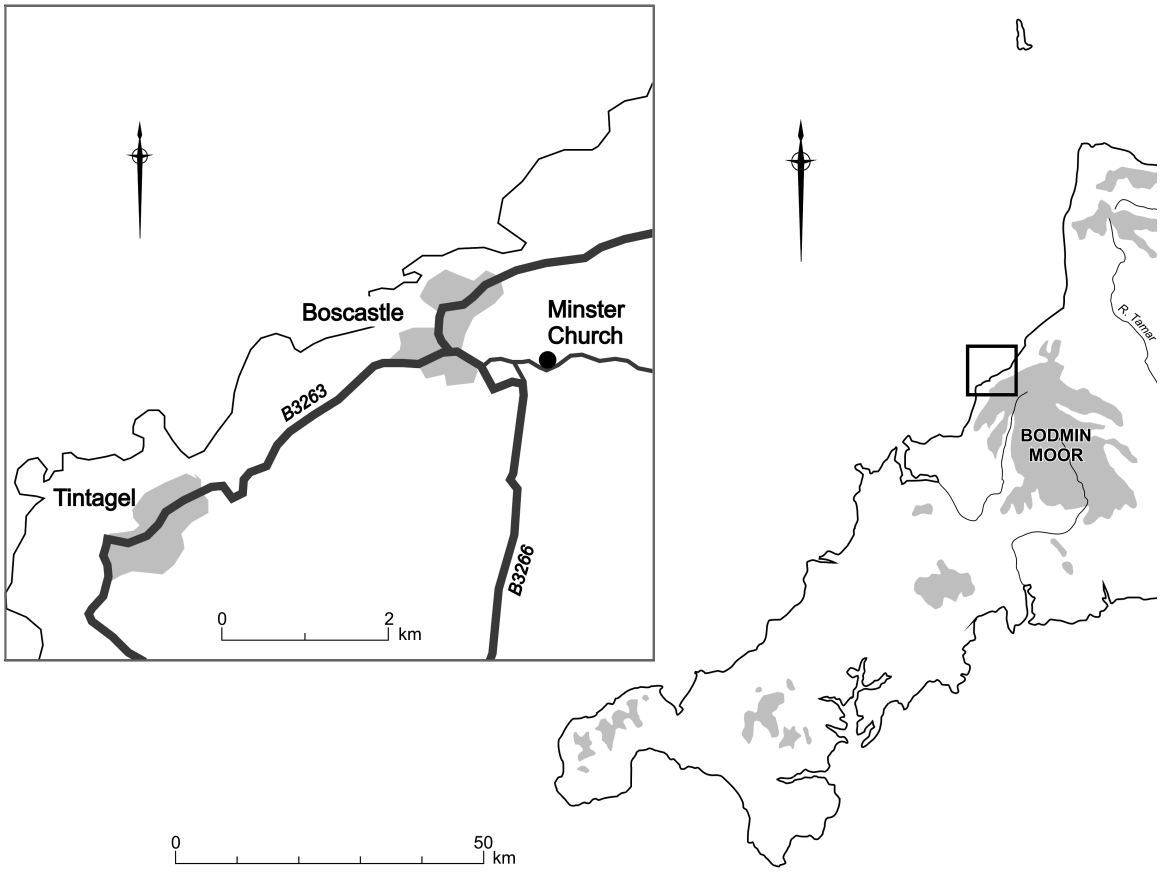


Fig 1 Minster church: location

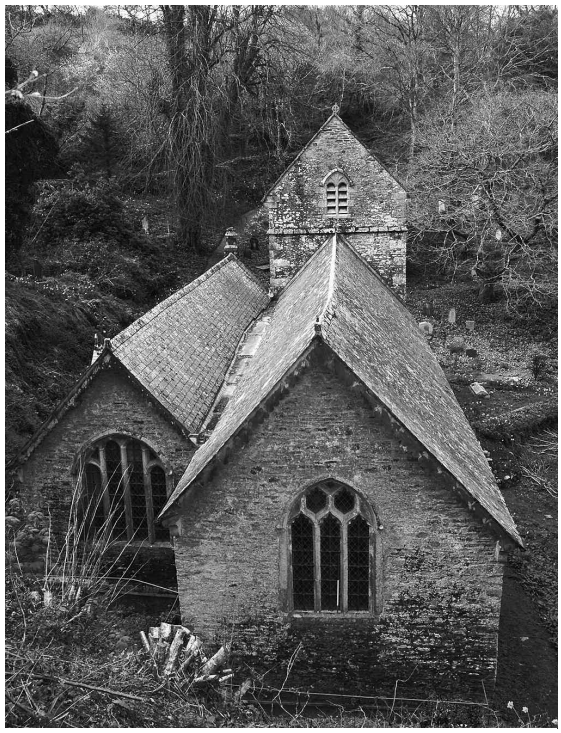


Fig 2 View from above the eastern end of the church, showing the site dug into the steep slope of the valley (photograph: G Young)

removed subsequently. As a condition of consent for proposed repairs to the church, Truro Diocesan Advisory Committee (DAC) stipulated that a programme of archaeological recording should be carried out before any building work began. In March 2005 the Rector and Churchwardens of Forrabury and Minster invited Exeter Archaeology (EA) to carry out this work, following a brief drawn up by Cornwall County Council Historic Environment Service advice team. The occasion provided an unusual opportunity to record the floor of a medieval parish church and to make observations on the structural history of the building.

Beautifully situated in a steep wooded coombe on the south side of the Valency valley, Minster has attracted much interest from historians and students of architectural history. The significance of the site as the setting of a pre-Conquest monastic community with its shrine dedicated to St Materiana has been considered by Charles Thomas (Thomas 1993, 19–20). It was subsequently the site of the small alien priory of Talcarne, founded before 1190 as a daughter house of St Sergius at Angers. Even before the French wars of the later Middle Ages there were at most only three monks, and only one in 1381. The buildings were ruinous by 1386 and the priory was dissolved before 1407 (Henderson 1925, 164–5; Knowles and Hadcock 1971, 84, 89). The chancel of

Fig 3 The interior immediately after flood damage, 17 August 2004, showing displaced pews (photograph: R Clark)

the present church, in Early English style, has in the past been taken to be a surviving fragment of the priory dating to *c* 1200, but Professor Thomas has made a case for reinterpreting the remains as a survivor of a church dating to the late pre-Conquest or early Norman period (Thomas 1993, 15, 19–20). The disposition of other priory buildings on this steeply sloping site is uncertain.

Charles Spence wrote an account of the church before its restoration in 1870 (Spence 1856, 109) but the first detailed study of the fabric was published by Sir John Maclean in his *Parochial and Family History of the Deanery of Trigg Minor* (Maclean 1873, 604–13). Another valuable early description is that by Harbottle Reed, written at the end of the nineteenth century (Reed 1899). Later accounts such as those of Sedding (1909), Henderson (1925, 165–6) and Pevsner (2002, 120) offer no significant advances on these early studies.

Approach

It was readily apparent upon initial inspection that large areas of an early, probably medieval, floor had been exposed by the removal of the Victorian pews. The base frames of the pew platforms had been laid directly upon this floor. Around the sites of the pews the modern floor level of the surrounding aisles with their Victorian tiles had been created around 1870 by dumping approximately 0.30m of spoil over the old floor, leaving the bases of the pews in sunken areas lined in brick.

Following discussion with John Gould of Cornwall County Council and with Bob Platts of Parkes Lees, architect to the scheme, it was agreed that the process of archaeological recording should be entirely non-destructive: the old floor would be cleaned and recorded, a membrane laid over it and new pews constructed on broad foundations above the membrane. Recording therefore consisted of cleaning and drawing the old floor, examining its relationships to the walls and piers of the standing structure, and examining the structural relationships between the internal wall surfaces in the small unplastered strip below the Victorian floor level. At the time that recording was carried out it was also uncertain whether it might prove necessary to remove some wall plaster affected by the flooding, so Ms Eddie Sinclair, a specialist in early painted surfaces, was invited to join the Exeter Archaeology team to search for any evidence of early colour schemes (Appendix 1). Finally, it was agreed that any new findings should be related to the overall building history of the church.

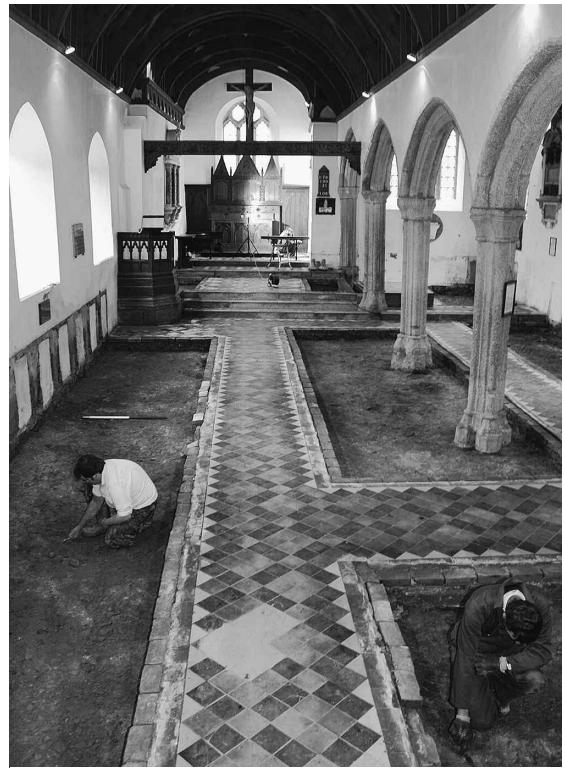


Fig 4 General view of the excavation in progress, 4 April 2005, looking eastward from the west tower (photograph: G Young)

The sequence of archaeological deposits

One feature preceding the late medieval lime-mortar floor was observed. Immediately below the base of the respond at the west end of the nave arcade, a patch of floor had decayed. Upon removal of dark humic soil, a large flat stone with a near-vertical southern face, embedded in lime mortar and orientated with the aisle, was seen (Figs 5 and 6). The removal of a small amount of the humic soil beside this stone showed that there was another immediately below, and the face of a third stone could be seen below that. This was certainly the southern face of a wall of slate rubble bonded in lime mortar, underlying the south arcade and demolished upon its construction. The fragment can be interpreted as a small portion of the former south wall of the nave; its discovery shows that prior to the construction of the south aisle, the

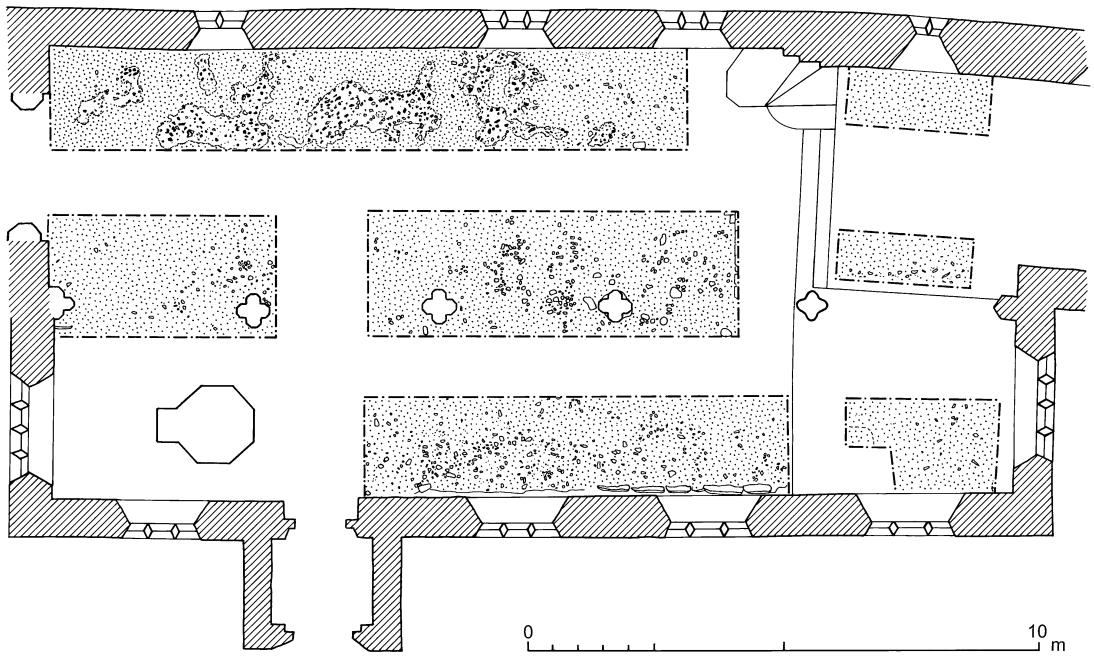


Fig 5 Minster church: plan of excavated areas (drawing: J Read)

Fig 6 South wall of the early nave (below scale), on which the western respond of the south aisle (top right) stands (photograph: G Young)

church extended as far west as it does today, and that the south wall was on the same line as the present arcade. This strongly suggests that the difference in orientation of the chancel and nave, which is a pronounced feature of the plan of the rebuilt church of the early sixteenth century, was also a feature of the church which preceded it.

Nearly all the other features encountered are interpreted as elements of the major reconstruction of the church in Perpendicular style in the early sixteenth century. The building of the lower courses of the north wall of the nave must have proceeded at an early stage in this programme, since they acted as a retaining wall within which slate had been dumped to form a new building platform, over which the mortar floor of the new church was laid. On the south side, the south nave wall was demolished to the level of the new floor, then skimmed with the mortar of this floor. The granite bases of the piers of the new south nave arcade certainly overlay the new floor surface, which could be traced below them (Figs 4 and 6). On the southern side of the nave and in the choir this floor was very well preserved and appeared almost unworn, retaining its flat mortared finish. In the south aisle it was in rather poorer condition, much of the top surface being eroded, leaving the slate fragments in the mortar standing slightly above the surrounding floor surface (Fig 7). On the northern side of the nave the surface was much more heavily eroded, decaying in patches to expose the underlying slate (Fig 4). Examination of these weathered patches revealed no sign of an underlying floor. Figure 5 shows a detailed, measured, drawn record of the state of the floor. The area at the east end of the aisle must in fact have been slightly later in date than the remainder, since it belonged to an addition to the aisle (see below). It was, of course, impossible to show that all the floor surfaces in the separate areas exposed were contemporary with one another, but since those in the nave and aisle were all level with one another, and only a single floor was visible, this seems very

Fig 7 Drain along the internal face of the south wall (photograph: G Young)

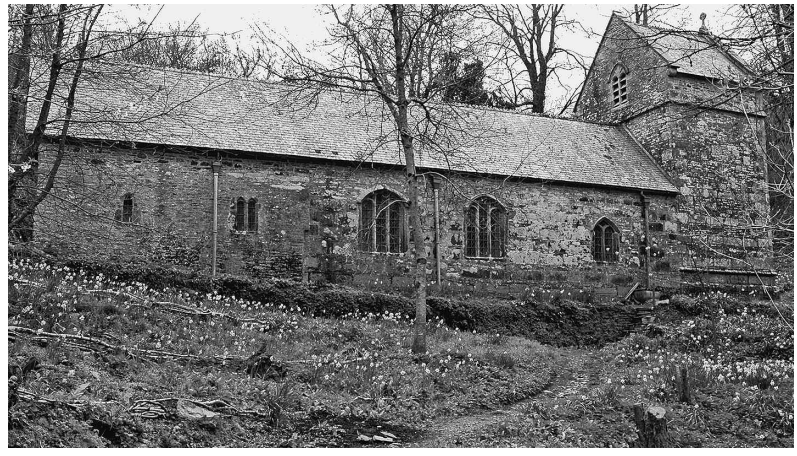


Fig 8 View of the north side of the church, showing the early chancel and later nave and tower (photograph: G Young)

likely. The extent of decay in the floor on the north side of the church can hardly be the result of wear, especially since the floor would probably have been protected by pews. It seems more probable that it results from a period of dereliction when the roof above had decayed, allowing damage by water and frost.

Although evidence was sought for fittings such as the position of an altar at the east end of the south aisle, only one feature was found in the floor. Along the inner face of the south wall, a simple drain had been formed by leaning long slate slabs against the wall, tilted with their higher edges against the wall (Figs 5, 7). The outer faces of the slates had been buried in fragments of bedrock, over which the mortar floor had been laid. The drain must have been laid to collect water seeping into the church at the foot of the south wall, where the church was dug deeply into the hillside.

It was anticipated that graves might have been cut through the floor, but it was sufficiently well preserved to show that none cut the floor in the areas examined. Minster retains several wall monuments and a considerable collection of slate ledger stones, now re-arranged around the walls; the church has evidently been much used for post-medieval burials. The absence of graves from below the Victorian pews suggests that these areas had been inaccessible for burial. The most likely circumstance in which this would have been the case would be that pews had occupied these areas. The rather sad fragments of two sixteenth-century bench-ends, now reused to form a credence table in the chancel, are evidence that there were formerly at least some early pews in the church. The question of whether others survived until the church restoration of 1870 was a matter of dispute at the time. According to one commentator, ancient carved oak seats were discarded (Anon 1881); this was vigorously denied by J Piers St Aubyn, the architect of the restoration, who claimed that they were all deal box pews of more recent date (St Aubyn 1881). Support for the initial claim came from a second source (IGF 1881) and almost two decades later Harbottle Reed (1899, 187–8), evidently unimpressed by the restoration, confirmed that before 1870 there were 'very fine' carved benches.

The wording of Joan Rawle's petition for a faculty to erect a new pew in the church in 1761 indicates that it was then almost filled with pews:

> [being] destitute of a convenient seat or pew in the said parish church for herself and family to hear divine service… [she petitions…] That there is a vacant plot in the said parish church of Minster between a seat belonging to Cotton Cary Esqr and a seat belonging to Mr William Farnhams situate in the south part of the said church to which no person claims a right (Devon Record Office, Faculty Cases, Cornwall: Minster 1).

The archaeological evidence suggests that this situation must have obtained from the early sixteenth century. Pictorial evidence confirming that there were indeed late medieval pews in the nave is presented in Appendix 4 below.

Structural history

Examination of the standing structure shows that the church displays three fairly clear phases of construction (Fig 15).

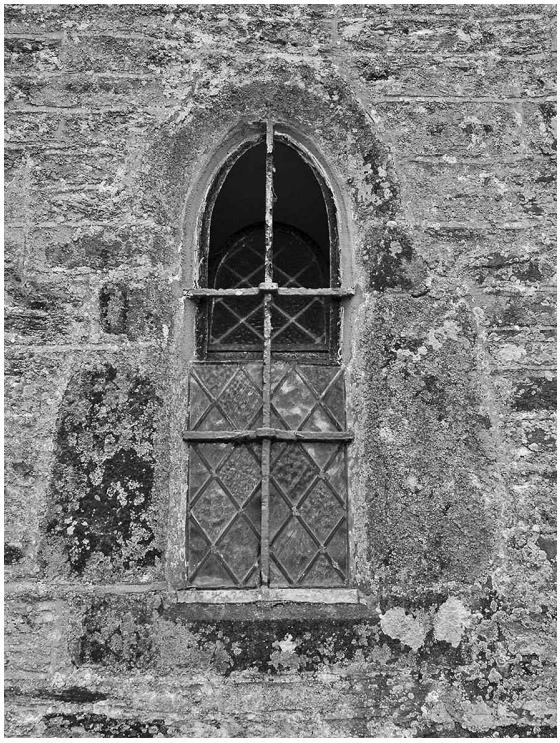
Phase 1: the chancel

This lay outside the brief of the present project, and deserves more detailed study and recording in the future. The oldest parts of the church are the thick north and east walls of the chancel. The north wall retains two early windows. That to the east is a single light with a slightly pointed head (Fig 9). That to the west (Fig 10) is of two simple lights; the outer faces of the heads of each light have been recut. The lower part of the western jamb of the chancel doorway is visible in the wall between the windows; the long sill stone also survives. The visible architectural features belong in all likelihood to the priory church of *c* 1200; we were not able to distinguish earlier fabric, but the question of whether any is present needs more work.

The east window of early Perpendicular form is an insertion into this fabric. It consists of three lights with cinquefoiled ogee heads under a plain label. This could be as early as the late fourteenth century, in which case it too may have been part of the priory building.

Phase 2: the rebuilding of the nave and the south aisle extension

At the junction of the chancel and nave the ragged end of the wide wall of the old chancel still remains; to the west, the entire church has been rebuilt. The north side of the nave is its display side, composed of large blocks of granite ashlar interspersed with bands of slate. This suggests that the church was viewed in



Figs 9–10 The two windows in the north wall of the chancel (photograph: G Young)

the later middle ages principally from the valley to the north, rather than the higher south side used today. The lowest course of this north wall is clearly composed of reused fabric, consisting of large blocks of granite, each retaining a moulding along one long side (Fig 11). The obvious source of such monumental blocks is the fabric of the dissolved priory. In the past it has been suggested that the priory buildings were incorporated in the rectory which stood on the north and west sides of the church and was eventually dismantled in 1765 (Reed 1899, 187). The presence of reused fabric in the late medieval parish church suggests that at least some monastic buildings had been demolished by the fifteenth century.

The two more easterly of the three windows in the north wall (the third has been rebuilt) match those in the south nave aisle. All these belong to a distinctive form of 'South Hams window' (so named in Colvin 1999) with three uncusped lights, no cusping in the spandrels above the lights, a low two-centred frame and a label with large square label stops ornamented with floral ornament. The match extends to the forms of the mullions and sills, and strongly suggests that the rebuilding of the north side of the nave and the provision of a new south aisle were parts of the same building phase.

Late nineteenth century accounts of the church record that the tower was rebuilt in 1870 (Maclean 1873, 605; Reed 1899, 187). The structural break between the medieval and later work is not obvious in the standing building. Sedding (1909, 286) records that the old tower was dismantled down to the plinth; in other words, almost completely rebuilt. Like the north nave wall, the tower incorporates reused granite blocks; one on the west side displays a carving of a pair of shears, while one on the south side shows a portion of a traceried head, also in low relief. Like the reused blocks in the north wall of the nave, these may well come from the dissolved priory.

On the outer face of the north elevation there is a clear straight joint between the nave and the tower. Examination of the relationship between the two shows clearly that the tower is the later: it overrides the nave and its lowest stringcourse abuts the nave. Above the plinth this simply reflects Victorian rebuilding, but the joint extends down to the foot of

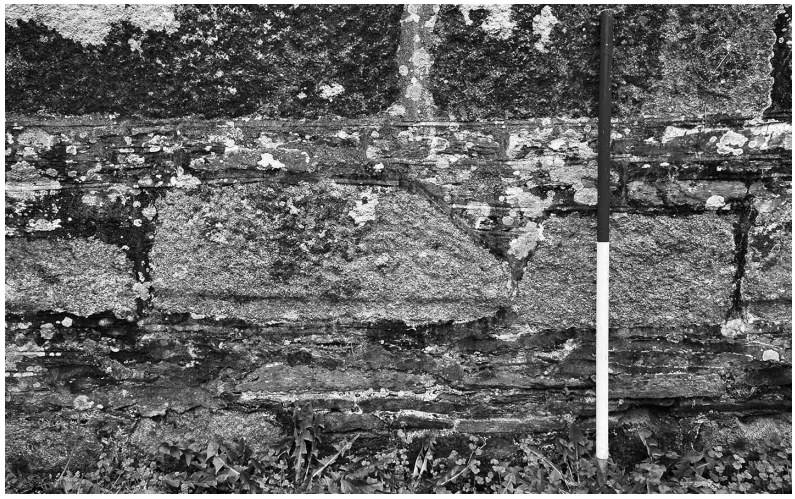


Fig 11 Minster church: reused granite blocks in the north wall of the nave (photograph: G Young)

Fig 12 The base of the tower, abutting the nave. One of the reused granite blocks in the north wall of the nave is visible at the bottom left edge of the view (photograph: G Young)

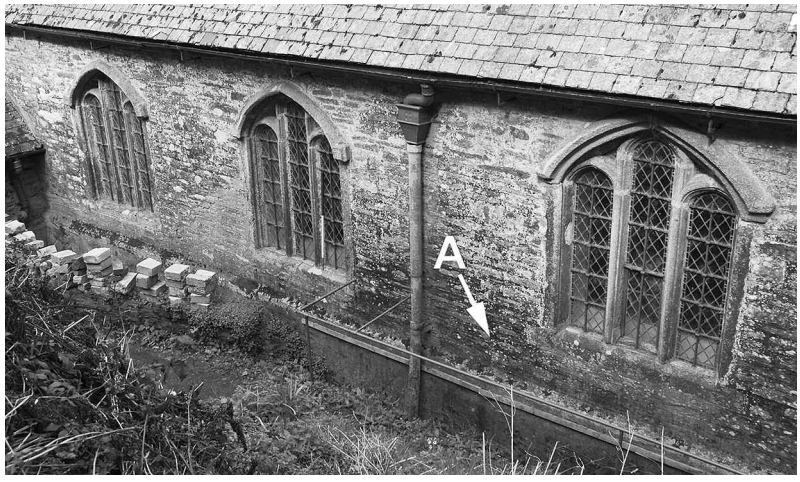


Fig 13 The south aisle wall, showing two different styles of 'South Hams windows'. The junction of the two phases of building is marked at A (photograph: G Young)

the external face of the north wall. Upon inspection of the small unplastered area of masonry exposed at the foot of the junction of the north and west walls within the nave, however, the two walls appeared to be built together. The same was true at the junction of the arcade, south aisle and west nave wall. It seems probable, therefore, that all these walls were built in a single programme, starting with the north wall of the nave. There is no evidence for the claim made by Sedding (1909, 286) that the medieval tower is of two phases, the lower parts below the plinth being thirteenth-century work.

A *terminus post quem* for this phase of building is indicated by the South Hams windows: this style of window was introduced *c* 1500 (Colvin 1999, *passim*). On the other hand it is earlier than the eastern chapel, datable to the period 1508–38 (see below).

Phase 3: the chapel at the east end of the south aisle

Several pieces of evidence show that the eastern bay of the south aisle, which flanks the chancel, was added to the nave aisle. A straight joint between these two phases of masonry is visible on the outer face of the aisle (Figs 13 and 15); the large quoins to the west show that the nave aisle is the earlier of the two. Comparison of the windows shows that, although the windows of both phases display typical examples of 'South Hams' tracery, they are different in detail (Fig 13). The windows of the eastern bay have mullions of a different profile and simple sloping plain chamfered mouldings for label stops.

The same distinction is also evident in the south arcade. All the free-standing piers except the most easterly match one another, and the responds engaged to the walls at each end of the arcade also match the more common form. The exception is the

Fig 14 The arcade of the south aisle, showing two styles of Perpendicular pier (photograph: G Young)

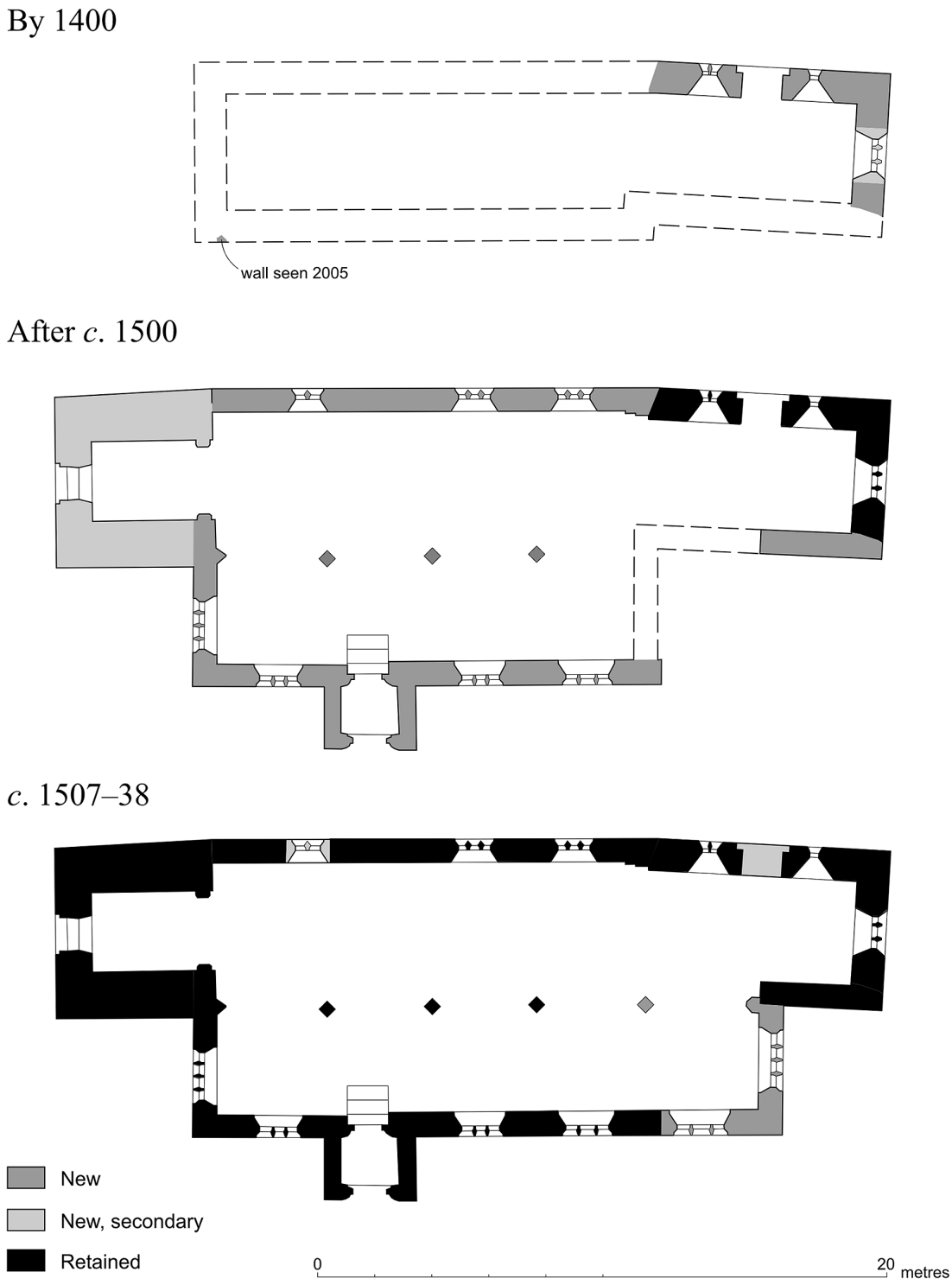


Fig 15 Minster church: plans showing development (prepared by T Ives)

pier at the junction of the choir and nave, whose capital is shallower than the rest and whose base has a different plan and a concave profile without the upper moulding evident on the other bases (Figs 4, 14). In view of the evidence of the exterior, it is clear that the east wall of the aisle must initially have adjoined the junction of nave and chancel. The addition of a single-bay chapel to the east entailed the removal of the end of the arcade and the insertion of a new pier in the place of an engaged half-column. The fact that the half-column now standing at the east end of the extended aisle matches the rest of the arcade suggests that this first stood at the end of the nave aisle and was dismantled and moved one bay eastward when the new chapel was built beside the choir.

Maclean (1873, 605) records that ancient glass showing the arms of John Trelawney, rector of the parish from 1507 until his death in 1538, was once in the eastern window of this chapel; this period would be an entirely acceptable date for this style of work. If the dating is accepted, the two phases of work on the south side must be close in date.

Appendix 1: Results of paint sampling

Eddie Sinclair

The writer was invited to examine the wall surfaces which had been submerged in the flood to ascertain whether they retained any evidence of paint or plaster of historic significance. Samples were taken from each wall. A full archive report describing the methods used and results obtained is lodged in the site archive (Sinclair 2005). Briefly, the investigation and subsequent analysis indicated that the earliest surviving plaster and paint are of mid to late nineteenth century date; they probably belong to the restoration of 1870, but might be even later in date. The walls had been treated with successive simple colour washes. The earliest was a white limewash, perhaps a temporary coat. This was followed by a limewash tinted with fine red iron oxide, which was found on all four walls. This in turn was overlain by two further red layers, the earlier one a very bright layer of pure red iron oxide, which may have been in an oil or casein binder. The second was based on the pigment lithopone, which came into common use in the 1920s and 1930s. Since that time the church has been redecorated three times using thick layers of traditional white limewash.

Appendix 2: The geology of an architectural fragment

Roger T Taylor

A loose rectangular block with one chamfered side was found to the north of the church. It is clearly an architectural fragment, presumably of medieval date. It was identified as Polyphant stone by J Allan; this is of some interest, since no Polyphant stone is visible in the standing fabric. A small sample was submitted to the writer for microscopic examination. The fragment is a distinctive green fine-grained matabasal rock. Under the microscope it appears to be an ultrabasic rock rather than the typical Cornish greenstone. Polyphant stone is an ultrabasic rock; the examination confirms the initial visual identification.

Appendix 3: The subsequent stripping of plaster from the walls

Following the completion of the archaeological recording described above, monitoring of the state of the wall plaster was carried out. It became apparent that the plastered surfaces were continuing to suffer badly from damage by salts. Since Ms Sinclair's analysis of the plaster had demonstrated that it was of recent date, plaster was stripped from all the wall surfaces of the interior of the church to a height of about 2m. Unfortunately the writer was not informed of this potentially important opportunity to study and record the walls of the church, so no detailed recording was carried out, but Mr R Clark submitted for our inspection a number of photographs of the exposed wall surfaces. A point that became apparent upon the removal of plaster was that the walls of the north side of the church stand on as much as 0.7–1m of upstanding natural slate (Fig 16), whilst the interior of the church and an area outside it have been terraced into the natural bedrock.

Appendix 4: A newly discovered painting of Minster church

Simon McNair Scott and John Allan

A watercolour of the interior of Minster church before its drastic restoration in 1870 has recently come to light (colour plate 5). This is a record of considerable interest, throwing fresh light on the controversy which arose later in the century about the age of the church pews; it also shows the nature of the nave floor and the position of the font before

Fig 16 The north aisle following the removal of internal wall plaster, showing upstanding bedrock (photograph: R Platts)

1870. The painting, measuring 0.23 × 0.33m (9 × 13in), is on paper dated 1836. It came from a collection at Bryan Hall, Banningham, Norfolk, via the London art dealers Abbott and Holder. The words 'Minster church' are inscribed on the recto and 'W. Muller 1852' on the verso. Sadly this cannot be the celebrated artist William James Muller, since he died *c*1845. The style is that of the Prout family of artists.

The view is certainly of the Minster in Cornwall: the Norman font with its distinctive cross-hatched decoration, the form of the late medieval arcade and south doorway are all readily recognisable. It looks approximately southward from the nave to the south porch. In the foreground are two pews sitting on raised pew platforms. Their bench-ends are clearly of late Gothic style, broadly datable to the late fifteenth or sixteenth century. This confirms the view of the critics of Piers St Aubyn, the architect of the restoration of 1870, that there had been medieval bench-ends in the church, rather than Georgian box-pews. The presence of pews in the nave from at least the sixteenth century accounts for the preservation of the late medieval floor below them. However the bench-end to the left of the view may have been reset, since the moulding along its bottom edge seems to have been removed. This feature, sometimes seen in other churches, no doubt reflects decay resulting from contact with a wet floor. The painting offers other suggestions that in the 1850s the church was suffering greatly from damp: the lower part of the font and the south wall have a greenish wash. The font is visible in its traditional position close to the south doorway; it was moved to the west in 1870.

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Acknowledgements

I am grateful to John Gould of the Truro Diocesan Advisory Committee and Cornwall County Council, who prepared the brief for archaeological works and provided very helpful discussion about our approach to the project, and Bob Platts of Parkes Lees Architects Ltd, who was the architect of the repair scheme. The excavation was undertaken by the writer with J Bell, G Langman and G Young of Exeter Archaeology. I am grateful to Bob Clark, churchwarden of Minster, who helped us in various practical matters. Dr Jo Mattingly kindly sent us a copy of her typescript notes on Minster. My colleagues Stuart Blaylock and Richard Parker commented on the text. Finally, I wish to thank Professor Charles Thomas for his thoughts on the early history of the site.

Cornish Archaeology 43–44, 2004–5, 159–164

Discoveries along the Mullion to Lizard South West Water pipeline

DICK COLE, ANDY M JONES and ANNA LAWSON-JONES

During the winter of 2004–5, Cornwall County Council Historic Environment Service (HES) undertook archaeological recording along the route of a new South West Water sewage transfer pipeline between Mullion and Lizard village (SW 66850 18958 to SW 71455 12730). The archaeological project was funded by South West Water.

Figure 1 shows the route of the northern and southern parts of the pipeline; the central portion was positioned within the existing corridor of the A3083 road and is not shown. The programme of recording included the stripping of topsoil under archaeological supervision in five areas considered to be of high potential, a wide-ranging watching brief, test pitting in the vicinity of a possible flint scatter near Grochall and the recording of historic boundaries cut by the pipeline corridor.

The watching brief identified a series of archaeological features which included a scatter of prehistoric flints found in association with Beaker, Neolithic and Iron Age pottery, a curvilinear feature of possible prehistoric or Romano-British date, two charcoal-rich pits or hearths, one of which was dated by fragments of Romano-British pottery found within it, and a large number of ditches, boundaries and other landscape features from the medieval and post-medieval periods. The results of the project have been set out in an archive report (Cole 2006). This short account focuses specifically on the discoveries of prehistoric and Romano-British date.

Artefact scatter

A total of 47 prehistoric flints and 53 sherds of pottery made up of Beaker, Neolithic, Iron Age, early medieval and undated ceramics were recovered from an area 1 km to the east of Mullion (SW 6925 1858), close to a number of Bronze Age barrows (Fig 1). The artefacts were retrieved from an area measuring 6m square which was gridded in 1m squares and carefully cleaned. A group of 14 stakeholes was found clustered in the northern part of the excavation area. Consistently 0.08m-0.1m in diameter, the holes had a similar depth, tapering to a point. No artefacts were recovered from the fills of these slight features and they remain undated. The area had also been crossed by three modern ploughmarks and a land drain of relatively recent date.

The flint assemblage is of mixed Neolithic and Bronze Age character. The number of probable soft-hammer reduced pieces and the limited number of decortication (primary) flakes on the site would indicate that this was not a primary core working area. The assemblage lacks the classic Early Bronze Age tool forms often found in association with Beaker pottery, but some of the blades may be earlier, potentially of Early to Middle Neolithic date. The relatively high number of points and piercers, and the low number of some other tool-types, could suggest some form of specialised site such as a leather working area. The flint scatter probably extends further to the north and east.

The pottery, as with the lithics, was very mixed. Most of the assemblage was made up of undatable gabbroic and non-gabbroic sherds. Two of the sherds may be of Neolithic date as they contain vein-quartz; vein-quartz, however, has been found in fabrics of both Early and Later Neolithic date (Smith 1981, 161–2; Quinnell forthcoming) and the sherds are not

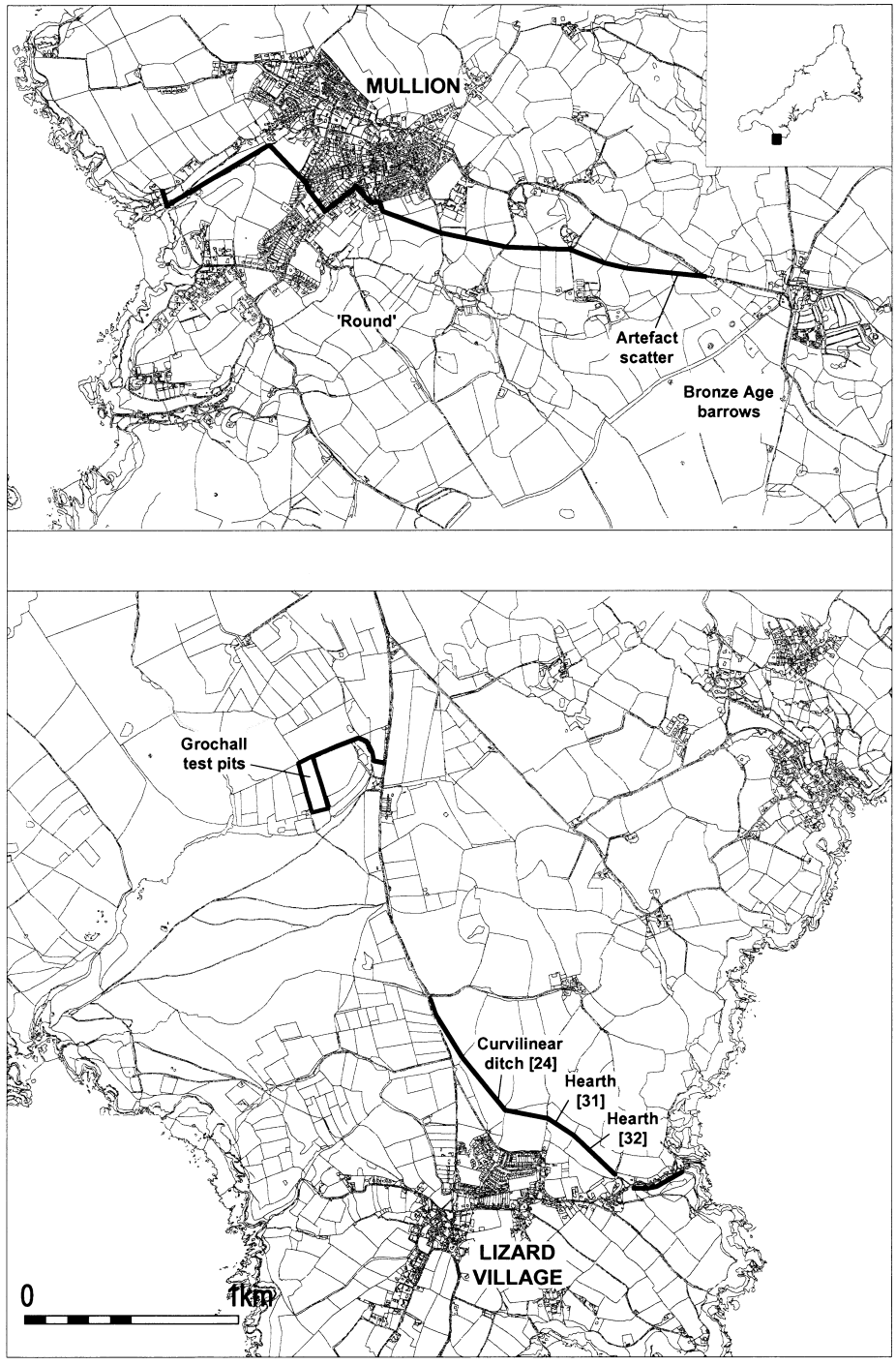

Fig 1 Location of archaeological sites along the pipeline corridor. (Based on Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office. © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Cornwall County Council Licence No. 100019590, 2007).

sufficiently diagnostic to give a more precise date. Up to 24 of the sherds can be identified as being derived from Beaker-type vessels, dating to the Early Bronze Age (c 2500–1700 BC), one of which was comb stamped. This is only the second significant find of Beakers on the Lizard Peninsula, the other being a mound at Poldowrian (Harris 1979). However, it is surprising that only one sherd is decorated and the remainder of the group can only be identified by fabric. No Middle Bronze Age ceramics were identified but an undecorated rim sherd from an Iron Age South West Decorated vessel was recovered, as was a sherd of probable Sandy Lane Ware of *c* AD 1100.

Several of the sherds were coated by a dark organic concretion. Some of this material adhering to two sherds of the Beaker-type pottery was submitted for radiocarbon dating, of which one sample failed. The remaining sample (Wk-16807) gave a determination of 5164+36 BP, 4050–3930 cal BC at 95% probability). This is an Early Neolithic date, far too old for the pottery that it was derived from. However, two of the sherds of pottery and some of the flints could be of a comparable date and this may suggest that the concretion was derived from a land surface contemporary with the earliest flints and that it was this that was dated rather than the pottery from which submitted samples were taken. It appears that flint was first deposited onto a land surface sometime during the Early Neolithic and that sporadic small-scale activities occurred in the area from then on. Unfortunately, no structures or cut features were uncovered which could be linked with any certainty with phases of the artefact spread.

Test pits at Grochall

A sewage treatment works was constructed within a field associated with the post-medieval holding of Grochall. The assessment report produced in advance of the fieldwork (Taylor 2003, 20) identified Grochall as the possible location of a flintworking site, artefacts from which are housed at the Royal Cornwall Museum, Truro; the well-known Mesolithic site at Windmill Farm is nearby to the north (Smith 1984).

A series of 12 test pits was excavated within the area (centred on SW 6970 1455) to ascertain whether there was any evidence for artefactual remains (Fig 1). The test pits were spread relatively evenly across the field and a total of 36 artefacts was recovered, most of which were eighteenth- to twentieth-century pottery sherds. These had probably found their way into the field through manuring. The lithic material consisted of three flint and five chert pieces, all of which were Late Neolithic in character. That these artefacts were recovered from high in the topsoil and the fact that no primary waste was found suggests that initial core knapping was not taking place at this location.

Fig 2 A curvilinear boundary of possible prehistoric or Romano-British date, from the south (Historic Environment Service)

Fig 3 Furnace or oven [32] from the west, following its partial excavation (Historic Environment Service)

Iron Age – Romano-British activity

The sites of two possible enclosed settlements (rounds) of Iron Age or Romano-British date lie close to the pipeline corridor, both having been identified from air photographs by the National Mapping Programme. The more northerly of these rounds lies to the south of Mullion (Fig 1), but no evidence of comparable date was found in the fields along the pipeline route to the north, except for a single sherd of Iron Age pottery found in association with the artefact scatter noted above and a single unstratified sherd of a Romano-British jar.

The southern enclosure lies to the north east of Lizard village (Fig 1) and the pipeline was excavated through land to the west of it. A large number of archaeological features were recorded along this strip of the pipeline corridor, within which the topsoil was removed under archaeological supervision. Many of these comprised post-medieval boundary remains and ditches. However, there was also a scatter of features and finds which, although minor, were suggestive of a pattern of Iron Age – Romano-British occupation underlying the modern landscape. A ditch (at SW 70680 13010) contained two sherds of Iron Age pottery and three features of likely Iron Age or Romano-British date were also recorded. These were two pits and the western part of a very slight curvilinear ditch (SW 7057 1036) (Fig 2), which was significantly different to the linear boundaries of later date recorded nearby. The two pits, both containing evidence of *in situ* burning, were recorded in adjacent fields. A possible hearth, pit [30] (at SW 70845 12965), was 2m in length, but had a maximum depth of only 0.18m. The cut was fairly irregular due to the very stony natural subsoil into which it had been dug. It contained a single fill [31], a silty clay containing moderate amounts of shillet fragments and a number of granite blocks ranging in length from 0.15–0.28m, one of which was clearly a rubbing stone. The fill also included a number of pebbles and six fragments of slag. A total of 14 sherds of Romano-British pottery indicate a probable date for the feature. Thirteen of the sherds were of a gabbroic fabric and probably date to the second century AD. One sherd was more closely identifiable, being from a later Romano-British storage jar (Trethurgy Type 16) which is likely to date to the third to fifth century AD (Quinnell 2004, 120–1). A total of nine pieces of flint were also recovered from this context; of later prehistoric date, they were largely undiagnostic and it is likely that the hearth had been excavated through an earlier lithic scatter.

Pit [32] had been excavated into a slope (SW 71000 12855) and clearly represented a furnace or oven (Fig 3). It had a rounded northern end about 0.85m in diameter with near vertical sides and a thinner extension to the southern end about 0.5m wide. From the base of the circular end, the floor sloped up evenly, with two slight breaks in the slope, to the surface of the field. Overall the feature was 1.9m long. Three contexts were recorded within the structure, which contained shillet stones. The bottom

fill [35] was a mid greyish brown silty soil, with evidence of burning at the base of the pit. The middle fill [34] was a similar deposit to [35], although with less evidence of burning. The top fill [33] was also a greyish brown soil, but much more clayey in nature. All three deposits contained granite as well as shillet pieces. No artefacts were recovered during the excavation to conclusively date this feature but it is also thought likely to be of Romano-British date.

Discussion

The excavation of the pipeline corridor uncovered material remains possibly extending over six millennia, showing a considerable time-depth of human activity in the Mullion-Lizard area. The study identified a clear focus of prehistoric activity close to the Bronze Age barrows which survive along the A3083 road leading to Lizard village, with a second focus of prehistoric and Romano-British activity close to a prehistoric enclosure to the north west of Lizard Village.

Acknowledgements

The watching brief and archaeological recording was funded by South West Water. The authors thank Matt Mossop, Jo Sturgess, Sean Taylor and Megan Val Baker for assisting with the fieldwork, as well as Carl Thorpe, who undertook work on the artefacts and Henrietta Quinnell who commented on the Beaker pottery. The Ordnance Survey mapping is provided by Cornwall County Council under licence from the Ordnance Survey in order to fulfil its public function to disseminate information to a wider audience. Persons viewing this statement should contact the Ordnance Survey if they wish to licence Ordnance Survey mapping for their own use.

Finds from the project have been deposited in the Royal Cornwall Museum, Truro (Truri 2006.10).

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Cornish Archaeology 43–44, 2004–5, 165–168

Our founder in the field

CHARLES THOMAS

Early in 1931 Mr Benjamin Mitchell of Magor Farm, Illogan, uncovered early walls and pottery when ploughing a field next to his farmhouse (*Western Morning News* (Plymouth), 16 February 1931). The remains were tentatively identified as those of a Roman villa and it was decided, possibly because Dr T F G Dexter at the Royal Institution of Cornwall (RIC) had sent sherds to R G Collingwood and to the British Museum, that excavation was essential. At the instigation of the RIC and the Federation of Old Cornwall Societies, a fund-raising Cornwall Excavations Committee was formed. Its first chairman, my grandfather Charles Vivian Thomas, was a County Councillor for the adjoining Camborne ward. His interests in practical archaeology, to judge from his library, were confined to current work in the Holy Land, but he and other prominent Cornishmen raised what would today be a large sum in a short time. Mr Mitchell agreed to an excavation after the harvest. J P Bushe-Fox, then Chief Inspector of Ancient Monuments and a member of the committee, nominated a young graduate, B H St J O'Neill (himself a future Chief Inspector), to direct the work. Lt Col Frederick Christian Hirst, by then living at Tregerent, Zennor, and well known to Dr Dexter, R Morton Nance and others on the committee, was invited to be O'Neill's 'assistant' (director). He was present during almost all the work and, after O'Neill had returned to London, Colonel Hirst stayed on to complete the work and arrange the backfilling. The excavation took place from 8 September to 3 October 1931. O'Neill's report was published in the *Journal of the British Archaeological Association* (O'Neill 1933) and numerous extra copies in special covers were 'Issued to Subscribers to the Excavations Fund'. This certainly maintained interest and when in 1932–33 the committee agreed to adopt and sponsor Hirst's first season at Porthmeor, Zennor, a further £122 was raised more or less at once.

Most of the Magor finds went to the RIC at Truro but at the invitation of C V Thomas and Canon J Sims Carah, Penponds, chairman and president respectively of Camborne Old Cornwall Society, a selection – pottery, some mosaic tesserae, oyster shells, pieces of Godrevy sandstone guttering – was given to the recently-founded museum room in Camborne Public Library. Seventy years later this small but important repository closed, by then with various items missing, and what was left at Camborne was packed up and, in 2005, taken to Helston Folk Museum.

O'Neill's published report contains 14 photographic plates, almost all by Gibson of Penzance. In these, cuttings have been tidied, decks cleared for action and there is a dearth of human interest. In summer 2005 while at Helston Folk Museum helping to identify lithic objects from Camborne, long separated from their labels, I was shown a small (55 × 80mm) black-and-white Kodak print which I remember used to be displayed in the Magor table-case. On the back is written (seven lines): 'A scene during the / Excavation of the / Roman Villa at Magor / Farm, (Cornwall crossed out) Camborne. / The first Roman villa / ever found west of / Exeter.' The handwriting is distinctive and, although very few would now recognise it, belongs to the late Stanley A Opie of Redruth, a keen but always solitary local archaeologist; he would certainly have visited Magor during the work.

The photograph (Fig 1) dates from perhaps halfway through the dig, say in late September, and views the site from the south-east corner. Local workmen engaged through the Excavations Fund, and perhaps the odd volunteer, are at work. (Note the iron-wheeled barrows, locally 'gurries', as used on all the mines, now obsolete.) The youthful O'Neill stands at the back, directing; he may even be wearing a tie. Foreground, back to the camera, crouched for action, is Frederick Christian Hirst in characteristic pose (and dress).

Although Stanley Opie's panoramic view is the most informative image of Hirst at the Magor excavation it is not the only one. In 1984, compiling the story of F C Hirst's background, career and archaeological interests for the West Cornwall Field Club's 50th anniversary (Thomas 1985), I was able to contact various cousins and collateral relatives. His niece, Mrs Warmsley, kindly gave me a few photographs from the 1930s – most were of Porthmeor – among which was another Magor item (Fig 2). Mrs Warmsley was unable to say who had taken it; she thought it might have been the late W Stuart Best of Dorchester. On the back in pencil is written 'Remains of Roman type / villa being unearthed at / Magor Farm, Redruth / Sept. 1931', and below, in his niece's hand, 'Col F.C. Hirst'. This photograph certainly shows Hirst walking along a baulk (during the lunch-break?) but does not tell us quite as much as Opie's, on which we may now concentrate.

As well as showing the first President of the West Cornwall Field Club on site, Figure 1 makes a point not brought out by the Gibson views. The name-element *Magor* is recorded for this farming tenement in 1302 as *Magoir, Magoer* (Gover 1948, 584), and, like Maker in the Rame peninsula opposite Plymouth (much earlier, *Macuir*) (*ibid.,* 231), is ultimately derived from British Latin *maceria,* Classical *maceries*. This may have developed a Cornish form *magoer,* translated by Padel (1985, 156) as ' "wall" (probably in the sense "ruins, remains")', but perhaps

Fig 1 Excavations at the Magor villa, 1931. (Photograph: Stanley Opie; courtesy Helston Folk Museum)

Fig 2 Excavations at Magor, 1931 (photographer unknown)

implying 'composite walling, masonry walling' (as opposed to the native tradition of dry-stone construction). How did the name arise here? It is clear in Figure 1 that the walls of the villa were barely below grass and in 1931, ploughing a field that had presumably long been kept in pasture, it was 'fragments of a tessellated pavement' that first caught Mr Mitchell's attention.

O'Neill argued, mainly on the basis of the coin finds, that the original use of the villa closed with an abandonment dated 'approximately to the period AD 230–40', and that it was then partly re-occupied by 'persons living in a much more lowly state than its original builders' during the decade AD 270–80. At Gwithian, however, a few miles down what is now the Red River – and the source of the oysters, sandrock and probably other natural material found at Magor – the open settlement at Porth Godrevy (site GT) and the round at Crane Godrevy contained scraps of samian, a batch of (probably) third-century barbarous radiate coins and sherds of undated buff amphorae in contexts probably later than AD 240; indeed, more like the fourth century and, at Crane Godrevy, even the fifth century (Fowler 1962).

There is no suggestion that the Magor villa continued as a homestead throughout the post-Roman period. No traces were found of the successive native wares (Gwithian Style, grass-marked pots and platters, bar-lug pots and Sandy Lane style 1) that characterise, successively and in quantities, occupation from the fifth to eleventh centuries at various Gwithian sites. Hirst's prowess as a careful excavator, demonstrated at Porthmeor, must reassure us that these diagnostic pot types simply did not exist at Magor. However, O'Neill's report, having dealt with the Roman-period finds, also lists and illustrates various wheel-made rims – one, interestingly, 'found after the excavation and submitted by Mr S A Opie' – which suggest a domestic presence in the vicinity in the thirteenth and fourteenth centuries (O'Neill, 1933, 40, pl XX). These were 'all from the topsoil' (*ibid.,* 40) and some are assigned to Rooms 4, 5, 8, 10 and 12. These may derive from the spreading of domestic middens onto nearby fields from the contemporary farmstead, the location of which is not known, but could, perhaps, hint at an occupation, or re-occupation, of the modest villa house.

The conclusion should be that, first, by the 1200s the walls of the villa *were* still visible, standing to no great height, overgrown perhaps but above ground level; second, that this alone explains the name of

Magoer in 1302. Whoever then farmed the place, presumably as tenants of the Bassets at nearby Tehidy, may have inhabited a structure partly run-up on Roman period foundations.

In 1931, any evidence of this – of a mainly timber building, say – might well have been missed. An excavation (re-excavation?) today would possibly find just that. Again, as we would have expected of him, Colonel Hirst set out in a long footnote (O'Neill, 1933, 3, fn 2) the most detailed measurement by triangulation 'for finding the villa at any future time'. This small tribute to our founder comprises rather more than a couple of nostalgic photographs.

Acknowledgments

By the kindness of Janet Spargo, curator, and Helston Folk Museum, the author was able to obtain a copy of the photograph reproduced as Figure 1.

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Cornish Archaeology 43–44, 2004–5, 169–170

An early medieval buckle from Phillack

ANNA TYACKE

An unusual early-medieval cast copper-alloy buckle frame, with terminals in the form of sub-triangular animal heads, has recently been found in Phillack parish and recorded under the Portable Antiquities Scheme (CORN-EC5F13) (Fig 1). The style of decoration is derived from Anglo-Scandinavian traditions and can be dated on art-historical grounds to about the ninth to eleventh centuries.

The buckle, not now complete, is triangular in plan, although the frame may originally have been D-shaped – as is the case with other comparable objects – and have been bent into its current form subsequently. The frame is semi-circular in cross-section, with a flat reverse. At the apex of each of the points of the triangle, there is a sub-triangular animal head terminal with circular eye sockets which may have originally been settings for stones (Fig 2). One of the three terminals is missing, but would probably have been similar. The surviving portion of the buckle is 42mm long and 38mm wide; the larger surviving animal head terminal is 5.5mm in thickness.

The frame is chamfered on the outer edge, but has a flat upper surface which is ornamented with a zigzag pattern, with some barred ornament along the chamfered surface. Underneath, the curving part of the frame is chamfered inwards slightly from the outer edge. The pin and bar are missing; the bar would originally have connected the missing terminal with its opposite. A recess between the eyes of the other larger surviving animal head represents the pin rest.

Several similar items have been found in Suffolk, including examples from Orford (SF7560), Nacton (SF-9F02E3), Claydon (SF-79DAF8) and Mendham (SF-76F478). The Mendham example was attached to the belt by means of an additional plate wrapped around the pin-bar and cut in at the outer edges to accommodate the frame. Other examples include one from the Fransham area of Norfolk (NMS-9B0AC7) and an interesting pair of rectangular variants also found in Suffolk (HAMP-BA9FC0, LVPL-99FBD2).

A similar buckle frame comes from Old Sarum, Wiltshire, although not from a dated context, and is in the Ashmolean Museum (Hinton 1974, no 32); it is illustrated by Cuddeford (1996, 16, no 15).

Fig 1 The broken buckle, as recovered. (Photograph: Anna Tyacke)

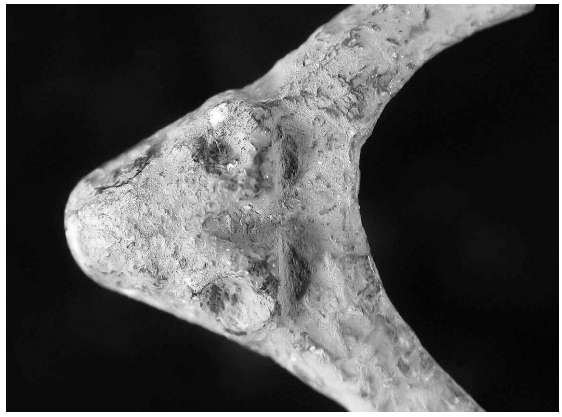

Fig 2 Detail of one of the animal head terminals. The eye sockets may once have held stones. (Photograph: Anna Tyacke)

A simple triangular animal head is common to Scandinavian, Anglo-Scandinavian and late Anglo-Saxon art. The buckles appear not to have been found in Scandinavian Viking-period contexts, but they do closely parallel the Borre-style of later early medieval Scandinavian art, dated to the tenth century (Helen Geake, pers comm).

Buckles of this kind have not been identified from Irish contexts to date, but triangular-headed animal motifs are commonly found on tenth-century strap ends in Ireland; these were probably made in Hiberno-Norse Dublin but are likely to have been based on Anglo-Saxon forms (Eamon Kelly, pers comm). They have been found on high status *crannog* sites in the Irish Midlands that were in commercial contact with Dublin and an example has also come from the vicinity of a Viking house at Truska, Co Galway. The animal form is found on moulding on a buckle plate from the royal *crannog* of Coolure Demesne, Co. Westmeath, which also produced other Viking Age material (O'Sullivan *et al,* 2007, 96).

The context for the presence of such an apparently exotic piece in Cornwall is unclear. It is distant from the find-spots of comparable buckles and little other contemporary decorative metalwork of Anglo-Saxon or Scandinavian styles is known from the south west. The site of Phillack church was a Christian centre from at least the fifth or sixth centuries, with stonework suggesting that it was a place of some status in the late pre-Conquest – early Norman period, coincident with the apparent date of the buckle (Thomas 1994, 197). The dedication of the church recorded in the tenth-century to *Felec,* a name probably cognate with Welsh *ffelaig, ffelyg,* 'lord, chieftain, leader, governor', may give some support to the traditional association of Riviere, adjacent to the churchtown, with the post-Roman Cornish 'king' Teudar (*ibid*.). Phillack has also been suggested as an early market centre (Preston Jones and Rose 1986, 164) and proximity to the East Pool of the Hayle estuary suggests that it may have been a landing place in coastal trading networks of this period (Thomas 1994, 198). Whether the buckle came as an object of trade in itself or was a casual loss by one of those involved in such activity is, of course, unknowable, but further work may throw light on whether it more probably arrived via direct links with eastern or southern Britain or through wider networks around the Irish Sea.

- The buckle was found by David Edwards while metal detecting in Phillack parish and has been donated to the Royal Institution of Cornwall. Details of this and the other finds noted above with PAS numbers can be found in the Portable Antiquities Scheme online finds database, www.finds.org.uk

The author is the Portable Antiquities Scheme Finds Liaison Officer for Cornwall, based at the Royal Cornwall Museum.

Acknowledgements

Thanks are due to the finder, David Edwards of the Kernow Search and Recovery Club, and to Hayle Harbour Company (Richard Ford, Manager) on whose land the find was made. The author is also grateful for the generous help given by Helen Geake, Finds Advisor, Portable Antiquities Scheme, and Eamonn P Kelly, Keeper of Irish Antiquities, National Museum of Ireland.

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Recent work by Cornwall County Council Historic Environment Service (HES)

2002–2003

Monuments Protection Programme

Two projects were carried out for English Heritage under the Monuments Protection Programme, drawing up proposals for designation of sites as Scheduled Monuments. One project continued with schedulings in the Restormel Borough Council area, the sites including Bronze Age barrows, Iron Age cliff castles and settlements, medieval crosses and holy wells. The second project has begun the process of designations for industrial monuments, in support of the Cornish Mining World Heritage Site bid.

- Project officers: Ainsley Cocks, Cathy Parkes.

Godrevy headland

This area is subject to considerable erosion from path formation and car parking. The National Trust commissioned HES to carry out a measured survey to inform future management decisions. The work was carried out during January 2003 and in particular provided a detailed record of abandoned medieval and post-medieval fields.

- Project archaeologist: Neil Craze. Project manager: Nigel Thomas.

Porthcothan, Constantine Island, and Booby's Bay

HES undertook a rapid archaeological survey of National Trust properties at Porthcothan, Constantine Island and Booby's Bay. The archaeological resource at Booby's Bay and on Constantine Island is particularly rich, deposits of wind blown sand having preserved many prehistoric artefacts and features, including extensive middens. Many of these have been recorded by previous archaeological investigations but fresh evidence is constantly being exposed by the work of wind and wave erosion. The foreshore also contains a wreck, thought to be that of the *Carl,* lost in 1917. The property at Porthcothan, in addition to containing the remains of at least one barrow, was found to preserve the pattern of medieval strip fields.

- Project officer: Sean Taylor. Project manager: Peter Herring.

Gillan Creek

The National Trust commissioned HES to carry out a rapid historic landscape assessment of its property along and around Gillan Creek (SW 778 252), a small shallow creek to the south of the Helford. The assessment considered seven small areas of property; Lannarth Hills, St Anthony's Wood, Tregithy and Gillywartha in the west, and the Herra, Coneysburrow and Trewarnevas in the east. These creekside areas of anciently enclosed land had a range of agricultural and maritime features, with fieldwork identifying two former quay areas and updating field notes on known sites, including a stunning area of ancient oak woodland and the curious Herra promontory. The Herra contains a complex range of sites including a number of earthworks, some of which could originally date from the Bronze Age, and appears also to have been used as a Civil war battery opposite the

contemporary site at Little Dennis. Close by are Gillan quay and the remains of a fish cellar.

- Project officer: Peter Dudley. Project manager: Peter Herring.

St Michael's Mount causeway

To inform proposed repairs to the famous causeway linking Marazion to St Michael's Mount, the National Trust commissioned an assessment of its historical and archaeological importance. Although it is now subject to increasingly heavy and frequent vehicle use, and has been subjected to repeated repairs, there remain significant sections of historic stonework held in place by cambered kerbs. Most of this is at least nineteenth century in date but there is some much earlier fabric at the extreme Mount end. Recommendations to the Trust included making repairs using original methods and materials as far as possible; reducing vehicular use and preparing a full-scale photographic record as a base against which future monitoring can take place.

- Historic buildings consultant: Eric Berry.

Trenance Valley

HES carried out an archaeological assessment and recorded archaeological features along the corridor of the green trail for cyclists and walkers along the trackbed of a disused mineral railway line through the Trenance valley, leading from the Wheal Martyn Museum to St Austell. The railway line itself was built by the Great Western Railway in 1920 to serve the valley and its various china-clay works, including Lansalson, Boskell and Trethowel; it closed in 1968.

- Project officer: Dick Cole. Project manager: John Smith.

Chysauster

HES conducted a watching brief on behalf of English Heritage on works to improve access for people with disabilities to Chysauster, a well-preserved Romano-British courtyard house settlement and surrounding field system of about the second to fourth centuries AD. The work involved widening a gateway and excavation of a new shallow ramp at the foot of the hill where the path to the settlement commences, and construction of two new stiles in field boundaries. The hedge sections were recorded, as were the post holes for the new stiles. During excavation of one of the postholes a Roman-period spoon of *Cochleare* type was discovered. It has a small bowl and a long prong-like handle, a form common in Roman Britain in the first and second centuries AD, and believed to have been used for eating shellfish, the long prong having been used to open the shells; alternative uses, including the taking or measuring of medicines, have also been suggested. Interestingly, the handle on the Chysauster find has been bent over and cut some 20mm from the bowl, resulting in the loss of most of its length. This was a deliberate act, suggesting that the spoon may have been deliberately cut up for scrap, perhaps indicating that it was not used at the settlement itself but instead arrived in a consignment of scrap metal destined for re-use. It is one of the few spoons found in Cornwall, the most recent being a similar example from excavation of a Romano-British settlement at Atlantic Road, Newquay, in 1998, the main occupation of which has been dated to the third and fourth centuries AD.

- Project officers: Carl Thorpe, Matt Mossop. Project manager: Charlie Johns.

St Mawes

As part of a South West Water programme, a trench was machine excavated under archaeological supervision parallel to the present sea wall frontage at St Mawes. Archaeological deposits were exposed, including the vertically set stonework of a quay wall, probably of later seventeenth or early eighteenth century date, and a series of culverts. Remains were also found of yard walls which formerly subdivided the area now occupied by the waterfront road.

- Project officers: Sean Taylor, Matt Mossop. Project manager: Andy Jones.

Stenalees

A comprehensive photographic survey was carried out of the upstanding remains of the twentieth-century Shilton Tanks complex, near Stenalees, in the heart of the china-clay district. The remains included two sets of settling pits (associated with a former pan-kiln), associated buildings, chimney, mica and sand drags. The archaeological recording was carried out in advance of the demolition of the structures prior to expansion of tipping in the area.

- Project officer: Dick Cole. Project manager: Nigel Thomas.

City Wharf , Truro

Archaeological recording was carried out before demolition of the former Cornwall Farmers building on City Wharf, prior to redevelopment of the site. A watching brief was also undertaken during groundworks. Reclamation of the river bank here and development of buildings along the wharf formed part of the rapid development of commercial and industrial activity on Truro's river frontages during the nineteenth and early twentieth centuries. The central chimney at City Wharf was constructed at some time before 1876 to power a steam sawmill, one of a number of timber businesses in the vicinity. During archaeological monitoring, the base of a substantial boiler house was recorded, together with the foundations of the chimney. These were inserted rather awkwardly into the earlier shillet and Newham stone wall of the building. Within the brick-lined flue evidence of a damper mechanism was recorded.

- Project officers: Jo Sturgess, Dick Cole, James Gossip, Matt Mossop, Neil Craze. Project manager: Nigel Thomas.

Foundry Square, Hayle

No 24 Foundry Square was formerly the offices of Harvey's foundry and shipyard complex in the nineteenth and early twentieth century. The firm of Harvey and Co was world-renowned for the manufacture of steam engines and other mining equipment. Renovation and regeneration works in Hayle prompted a programme of historic building recording. The building's present form is an adaptation of a more complex structure; the firm's earlier casting shops were once to the rear, separated from the street frontage by a tramway which ran through the ground floor of the structure. In the later nineteenth century the rear part was substantially remodelled and became part of the office suite. A drawing office was housed in an oddly shaped wooden first-floor extension, supported on iron piers above the tramway. Eventually the tramway was removed and its former trackbed paved with granite cobbles. By this time (*c* 1890s) the ground floor frontage had become a shop front, where smaller foundry products were displayed. Upstairs was a treasury and wages office, and the strongrooms with cast iron doors survive. Throughout the building are various other reminders of the building's location at the centre of an ironworks, with finely decorated cast piers and other structural elements.

- Historic buildings consultant: Eric Berry. Project manager: Nigel Thomas.

Davidstow creamery

The creamery was built on a dispersed part of the World War II Davidstow Moor airfield. E C Harris, on behalf of Dairy Crest Dairies, commissioned HES to carry out an historic building record of seven Handcraft-type huts, formerly used for WAAF accommodation, and two Stanton air raid shelters, prior to development work at the creamery.

- Project officers: Charles Johns, Neil Craze. Project manager: Nigel Thomas.

Cornwall and West Devon Mining Landscape World Heritage Site Bid Project

GIS mapping of all former mining areas and mine sites, associated industries, parks and gardens and miner's smallholdings was completed. These datasets have been supplemented by extensive information on mining towns and villages brought together through the Cornwall Industrial Settlements Initiative and Cornwall and Scilly Urban Survey. Records for all the major sites within the draft Bid Areas were entered into the Historic Environment Record. Scheduling of important monuments within the draft Bid Areas was reviewed as part of the Monuments Protection Programme (see above). The bid itself was postponed by a year to enable revision of the draft Bid Areas.

- Documentary researcher: Sharron Schwartz. Archaeological mappers: Ainsley Cocks and Stephen Mills. GIS advisor: Bryn Perry-Tapper. HER advisor: John Smith. Consultant: Barry Gamble. Project manager: Adam Sharpe. Project coordinator: Jeanette Ratcliffe.

Cornwall & Scilly Urban Survey

Reports on St Austell and Helston launched during 2002–3 were the first of a series of detailed 'characterisation' studies of Cornish towns produced by the Cornwall & Scilly Urban Survey (CSUS). The project, based within HES, was aimed at supporting regeneration planning in 19 urban centres in Cornwall by providing detailed information on the historic environment of each, highlighting key elements which make up local character and 'sense of place'. In the process of carrying out the St Austell and Helston studies, the CSUS team developed a

pioneering approach to urban characterisation, based on gaining an overall understanding of the development of the historic environment in each town and identifying elements which make it unique and distinctive. A number of discrete 'character areas' were identified and described in each town. The CSUS reports also highlight regeneration opportunities based directly on historic buildings, features and streetscapes and recommend ways of managing and conserving the historic environment to enhance the contribution it makes to regeneration.

The national significance of this project, the first to link characterisation to regeneration, was acknowledged by a visit from English Heritage's Urban Panel, accompanied by Sir Neil Cossons, chair of English Heritage, and Sir Stuart Lipton, chair of the government's Commission for Architecture and the Built Environment (CABE). Members of the Panel heard presentations on CSUS and were given a guided 'walkabout' of St Austell by the team to demonstrate its ground-breaking approach. The Panel's report was enthusiastic, commending 'the innovative CSUS project as a template to demonstrate in the national context how the historic environment can contribute positively to urban regeneration'. Additional funding for the project was provided by the South West of England Regional Development Agency, in recognition of its positive influence for regeneration. Other sponsors were English Heritage and Objective 1.

Fig 1 Incised granite paving on the Terrace, Market Jew Street, Penzance. Historic components of the built environment such as this were among the elements highlighted in the characterisations carried out on 19 towns by the Cornwall & Scilly Urban Survey. (Photograph: Historic Environment Service)

- Project officers: Kate Newell, Stef Russell. GIS: Bryn Tapper, Steve Mills. Project manager: Graeme Kirkham. Urban characterisation consultant: Nick Cahill. Project coordinators: Jeanette Ratcliffe, Peter Herring.

[The CSUS project was completed in 2005. Reports on Bodmin, Camborne, Camelford, Falmouth, Hayle, Helston, Hugh Town (St Mary's, IoS), Launceston, Liskeard, Penryn, Penzance, Newlyn, Newquay, Redruth, St Austell, St Ives, Saltash, Torpoint and Truro can be viewed and downloaded via the Historic Environment Service web portal: www.historic-cornwall.org.uk. This site also provides access to reports on the 55 settlements covered by the Cornwall Industrial Settlements Initiative also undertaken by HES.]

National Mapping Programme

The Cornwall and Isles of Scilly Mapping Project (COMP) forms part of English Heritage's National Mapping Programme (NMP); this aims to map all archaeological sites visible on air photographs to a consistent standard. During the year 400 square km were mapped, 340 site records were updated and more than 1,500 new records created. The area around Bude and Morwenstow was completed during the year, as were the Isles of Scilly. In addition, 25 km of the south coast between Looe and Par were mapped and work has begun in Restormel District.

Three themes dominated during 2002–3, the first of which was tin streaming. Little investigation of Cornish tin streams has been done away from Bodmin Moor but the most extensive streamworkings are to be found in the Restormel Borough Council area and the NMP has provided the opportunity for them to be surveyed for the first time. So far 145 streamworks have been added to the 275 already recorded in the Historic Environment Record. Streamworking is one of the earliest

techniques employed for the extraction of tin ore with references dating back to the fourteenth century. In essence streaming involved the separation of tin ores found in gravel deposits from associated waste. This was done by passing a flow of water through the deposits, washing away clays and silts while retaining the heavier tin ores. The large amounts of waste and gravel resulting from this washing process were left, often in series of parallel banks. One feature of the Restormel workings is that the spoil is frequently piled in individual mounds arranged in linear fashion rather than as continuous banks; workings at Ennisworgey are a good example. Air photography is a particularly effective method for surveying streamworks: often the remains on the ground are complex and confusing but from the air can be seen to form distinct patterns.

A second theme was the recording of World War II remains. The special value of air photographic survey is that secondary features, often in use only for a short time and never recorded, can be identified. One example was a series of circular features 5–7m in diameter sited in urban areas. They have been interpreted, based on anecdotal evidence, as emergency water storage tanks for fire fighting purposes. The tanks had been removed by July 1946 as they no longer appear on photographs taken after that date. Examples have been recorded within the grounds of St Lawrence's hospital, Bodmin, and at Tywardreath.

A third element was the mapping of more than 60 new Iron Age and Roman-period rounds, these in areas which have not been extensively flown and which generally have soils not conducive to crop mark production. To date during the project, in the region of 500 new rounds have been identified, roughly one third of all known rounds in Cornwall. Those mapped this year have a wide range of size and form. One striking feature, however, is the relatively high proportion with straight sides and angular corners. These can be four-sided or have more than four sides, and may have one or more ditches. Rectilinear enclosures are in no way unusual in Cornwall but because of the high numbers in north and east Cornwall it is tempting to see them as forming a regionally distinct group.

- Project officers: Carolyn Dyer (English Heritage), Emma Taylor, Andrew Young. Project manager: Steve Hartgroves.

Scheduled Monument Management Project

Indian Queens preaching pit

In April 2002, conservation works were undertaken within the preaching pit at Indian Queens (SW 918 586). The pit dates from the nineteenth century and is on the site of an old open-cast tin mine known variously as Wheal Fatwork and Virtue, Wheal Cornwall and Indian Queens Consols. The circular, amphitheatre-like pit, which comprises a central area, tiers of turf seats and a stone-faced preaching platform, is in generally good condition, but the site's trustees were concerned about the condition of five sets of granite steps which had had become uneven and slumped. Volunteers from the British Trust for Conservation Volunteers re-set the steps, making sure that each step was level and stable, making up the ground with local sand supplied by Imerys.

Boskenna Cross

In February 2002, the twelfth-century wayside cross in St Buryan, west Penwith (SW 4258 2426) was hit by a car and knocked from its pedestal, damaging the granite at the bottom of the shaft. Restoring the cross involved moving the half-ton pedestal back from the edge of the road so that it would be safer from traffic in the future, as well as re-fixing the cross to its pedestal with a new stainless steel pin and lime-based mortar. The work was carried out by Adrian Thomas and David Cutting, and funded by Penwith District Council.

St Michael's Mount

In addition to the remains of its castle and monastery , the Mount also has a unique collection of Cornish crosses. In June 2002, conservation and recording work was carried out on two of these by Sue and Lawrence Kelland and Andrew Langdon, with support from the St Aubyn Estate and the National Trust. Both are medieval lantern crosses, displaying carved images beneath canopied niches. One is on public display on the balustrade outside the chapel; this required simple filling of cracks with a lime-based mortar. The other, in Lord St Levan's private garden, was 'enhanced' with a Roman cement pinnacle and rosettes in the early eighteenth century, and the conservation work here involved stabilising these decorations, which were eroding badly. Lichen was also carefully cleared, to reveal the medieval sculpture.

Jacobstow

A little-known holy well in Jacobstow in north Cornwall was rescued from oblivion in a project arranged jointly with the North Cornwall Heritage Coast and Countryside Service, the Shepherd family of Trefrida Farm and Mary Carter of Jacobstow. Before its restoration in July 2002, St James's Well (SX 191 962) was semi-ruined, overgrown by scrub, and hidden in a willow-grown bog which was heavily churned by cattle. The work involved fencing to protect the well from cattle, sympathetic re-building by Malcolm Ure, and surfacing the ground in front of the well to provide easier access. The culmination of the project was a festive pageant and pilgrimage involving pupils from the local school.

Castle-an-Dinas, Ludgvan

Rogers Tower, a late eighteenth century folly, is a notable feature in the landscape of west Penwith. It stands on the inner rampart of Castle-an-Dinas, Ludgvan (at SW 485 350), a spectacular multivallate hillfort dominating the approach to the Land's End peninsula, and commanding outstanding views over Mount's Bay to the south and St Ives Bay to the north. The folly was built by the Rogers family of Treassowe, at about the time they moved their seat to Penrose. Built at the time of the Napoleonic Wars, its purpose may have been partly as a summer house and partly as a point from which to keep an eye on shipping activity in Mount's Bay. In the Second World War it served as a Home Guard look-out. Last repaired in the 1960s, the folly was badly in need of re-pointing. Castle Granite and Penwith District Council contributed to funding the work, which was carried out by Adrian Thomas and David Cutting.

- Project officer: Dick Cole. Project manager: Ann Preston-Jones.

Lower Boscaswell, St Just

HES was commissioned by the National Trust to carry out an assessment of recently acquired land immediately to the west of Lower Boscaswell village (SW 376 348). The area contains the sites of prehistoric, medieval and post-medieval field systems, represented by surviving boundaries as well as recently removed ones, Iron Age and Romano-British settlements, the well-known Iron Age fogou, a crow (a stone-built storage place) of uncertain date, post-medieval mining features including leats, adits, shafts, a wheel pit and a miners' shelter. There is also a 1930s swimming pool. A number of additional sites within the area have been identified through finds collected by local field-walker Dave Weddle. These include Mesolithic and Neolithic flint scatters indicating possible knapping sites or winter camps, concentrations of Bronze Age finds indicating possible settlement and barrows, concentrations of Iron Age, Romano-British and early medieval finds indicating settlement, and medieval and post-medieval finds associated with the settlement of Lower Boscaswell.

- Project officer: Joanna Sturgess. Project manager: Peter Herring.

Penhale Sands, Perranzabuloe

HES carried out a rapid archaeological assessment of land associated with the Penhale Army Camp to the east of Perranporth (SW 770 575). The project was funded by the Defence Estates section of the Ministry of Defence. Penhale Army Camp encompasses a large area of the northernmost portion of the Perran Sands hindshore dune system. The study area covered 378 ha of sand dunes and coastal grassland, much of which is used as a training area. The sand dunes largely lie to the south of the enclosed buildings complex, while the land to the north is coastal grassland; much of the landscape here was formerly agricultural land associated with Penhale Farm, a settlement first recorded in the tenth century. The survey recorded more than 250 archaeological sites and historic structures. Most had previously been identified as part of the Cornwall Historic Environment Record or by the National Mapping Programme (air photographs). The remainder were recorded as a direct result of desktop research and fieldwork. Features were mapped using a Geographical Information System (GIS) and listed in a database linked to the mapping. The mapping and database can form layers in both the Historic Environment Record and Defence Estates records.

Penhale Sands incorporates some of the best preserved historic landscapes in Cornwall, with remains of settlements and field systems of various periods sealed by subsequent sand blows. In addition to important archaeological sites, including the Iron Age cliff castle on Penhale Point and three Bronze Age barrows on Ligger Point (both Scheduled Monuments), there are Mesolithic flint scatters and

Iron Age, Romano-British and medieval pottery. Extensive traces of probable medieval field boundaries are also likely to survive, although these remain hidden by dunes. The remains of pre-Norman buildings and associated field systems were excavated to the west of Ellenglaze in 1966–7, while relict medieval fields also survive near St Piran's Church, outside of the study area to the south. Most extant abandoned field systems in Cornwall are in upland areas, particularly on Bodmin Moor; the Perran Sands examples offer the potential for study of early field systems in lowland Cornwall.

The study area also includes a wealth of mining remains, mostly associated with a series of north-south lead lodes (Wheal Golden, Penhale Mine, East Wheal Golden, Phoenix Mine) or the Great Perran Iron Lode (Gravel Hill Mine, Halwyn Mine). Above-ground remains are limited however, as the various engine houses were destroyed in the 1940s or before.

- Project officers: Dick Cole, Bryn Tapper. Project manager: Peter Rose.

National Trust surveys, North Cornwall,

Three landscape assessments were commissioned by the National Trust on the north Cornish coast, at Tregardock (SX 102 916), Forrabury (SX 095 911) and Hillsborough (SX 102 916). These were the latest in a number of Trust-funded surveys in this under-studied area of Cornwall, with previous examples at Dannonchapel, Home Farm (Boscastle), Tintagel East and California Quarry. All three properties lie fully exposed to the Atlantic winds and are typical of this part of Cornwall, located on plateaux with the occasional tight valley descending to steep cliff slopes and on to shattered and precipitous cliffs of grey and black slate. Tregardock and Hillsborough have had little or no previous archaeological work.

Tregardock is a windswept strip of coastal margin and incorporates a fault line yielding galena (lead ore) and smaller amounts of silver. The lode was referred to *c* 1580 by William Carnsew, Cornish advisor to the Company of the Mines Royal, who proposed a scheme to extract the ore by damming water and then releasing it; a technique known in the north of England as 'hushing'. It appears that the plan was put into action, further notes suggesting that the attempt resulted in some loss of life. Mining was certainly renewed by the mid nineteenth century when a number of trackways, adits, shafts and buildings including a small engine house were built in and around Minehousedoor Cove.

The remains of the slate industry at Pentargon quarry, Hillsborough, are similarly dominated by the grandeur of the landscape, the site overlooked by a spectacular waterfall and sheer cliffs. Here, features such as whim platforms and strong points (for hoisting) were absent, the extractive process reliant on the instability of the cliff face for fresh exposures. To the west of the quarry, the 'tail' of Penally Point, together with the offshore rock, the Meachard, creates a natural breakwater protecting the harbour of Boscastle. Fieldwork identified a series of sites and features associated with the activities of this once busy port.

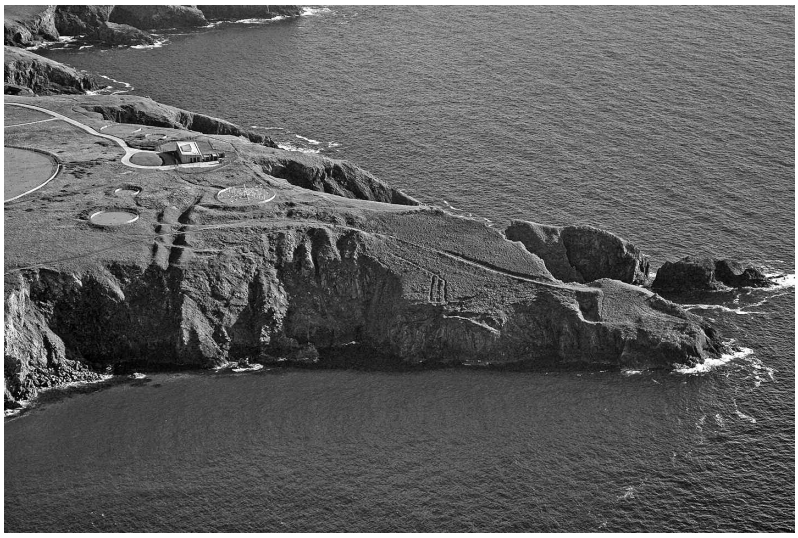


Fig 2 Penhale cliff castle. (Photograph: Historic Environment Service, F66–004)

Above Boscastle harbour is Forrabury, and, while this again has a spectacular natural setting, it is the nationally important stripfield or stitch (as they are known in Cornwall) system that is of primary significance. The open field system has been previously studied in a number of brief archaeological notes and through an in-depth ecological assessment; the aim of the survey was to provide a more comprehensive archaeological overview of the property. The system is one of five remaining areas of actively farmed open strip cultivation in Britain. It covers 20.5 ha and has 42 surviving strips, four of which remain in private ownership. The strips are bounded by stone and earth balks which in places form quite sizeable lynchets. The medieval open field was a communal field system whereby a group of tenants of a single estate held intermixed scattered strips grouped in bundles called cropping units. The tenants then had the right to graze in common the open field and any rough ground beyond. Elsewhere in Cornwall, the enclosure of many of the open fields was a much earlier development than in parts of England, although several other survivals in Cornwall were documented into the nineteenth century in marginal upland and cliff top locations.

- Project officer: Peter Dudley. Project manager: Peter Herring.

The Loe and Penrose

HES was commissioned by the National Trust to carry out a rapid historic environment survey of Penrose and the Loe, a substantial property near Helston (SW 642 256). Formerly the seat of the family of Penrose, the house and estate was bought by Hugh Rogers of Treassowe in Ludgvan in 1771. Successive generations of the Rogers family added to the house and enhanced the ornamental aspects of the estate by a process of building, plantation and landscaping, taking full advantage of the view over the Loe, which, Nicholas Pevsner observed, 'seems as if it were an artificial serpentine lake especially built as a vista for the house'.

Loe Pool itself, once famed for the quality and size of its trout, was formed by a gradual build up of sand and shingle at Loe Bar, which blocked the mouth of the River Cober before the beginning of the fourteenth century. Until 1867 it was the custom to cut through Loe Bar if the lower part of Helston became flooded in the winter, the townsfolk presenting a leather purse containing three half pence to the Lord of Penrose for permission to do this. On the south side of Loe Bar is a monument to HMS *Anson*, which was wrecked there in December 1807 with the loss of 100 officers and men. This tragedy inspired Henry Trengrouse, a Helston cabinet-maker, to invent the rocket apparatus which has saved some 10,000 lives since 1875.

The estate includes most of the farms surrounding the Loe, many first recorded in the medieval period, and many of the field systems are clearly derived from medieval strip fields. There is also evidence of prehistoric occupation in the form of rounds at Castle Wary, Higher Penrose, Nanspean and Chyvarloe, and relict fields south of Loe Bar and north of Porthleven. Industrial archaeology is also present: Wheal Pool and the Helston Valley Tin Company works at Castle Wary near Helston, and Wheal Penrose and Wheal Rose on the cliffs east of Porthleven. The last was probably the most important and profitable mine in the Lizard district, producing lead, zinc and silver for over 200 years.

- Project officer: Charles Johns. Project manager: Peter Herring.

A38 Cultural Heritage Management Plan

HES was commissioned by Halcrow Group Ltd on behalf of the Highways Agency to prepare a Cultural Heritage Management Plan (CHMP) for the Agency's network area 1 in Cornwall. The study route corridor was the A38 between the Carminow roundabout near Bodmin and the Tamar Bridge at Saltash. The project was a national pilot designed to test guidance prepared by the Highways Agency in 2001 on the procedures and standards to be adopted by highways managing agents when producing CHMPs for regional road networks. The use of GIS (Geographical Information System) was at the core of the project methodology.

The objectives of the pilot study were to record archaeological and historic sites, monuments and features within and adjacent to the Highways Agency estate through desk study and field survey. HES produced an inventory of archaeological and historic sites within the study area, verified where possible through fieldwork, recording information about their history, current condition and survival. The fieldwork was carried out by drive-by and walkover. These sites were then entered into a GIS-based dataset that could be easily integrated into the existing Highways Agency environmental database.

The A38 is one of the three arterial roads serving

Cornwall and is in essence a much-improved nineteenth-century route, upgraded to a turnpike road, linking the market towns of Bodmin, Liskeard and Saltash. It is clear from cartographic and morphological evidence that the area was previously served by a network of winding lanes and tracks joining farms and small rural settlements. The survey identified more than 500 archaeological and historical sites within 500m of the road, with 68 of these falling directly within the Highways Agency's 'hard' and 'soft' estates (that is, the road corridor and associated grass verges, banks and cuttings). A diverse range of sites was recorded, from the Bronze Age to the early twentieth century. Unsurprisingly, the archaeology and recent history of the road is reflected by numerous early modern bridges, viaducts, milestones, public houses and toll houses found along its length. A number of industrial sites, including quarries, lime kilns, quays and mine shafts, testify to industrial activity adjacent to the road, and also illustrate the importance of the Fowey, Lynher and Tiddy rivers for power and transport. The medieval landscape through which the road passes for much of its length is reflected by the many settlements, farmhouses, chapels, crosses, manor houses and barns and, in the Glynn Valley, by extensive tracts of ancient woodland. Lodges mark the entrances to later ornamental estates. There were also numerous houses, nonconformist chapels and blacksmiths' workshops along the road.

An historic landscape characterisation study was also completed for the road corridor in order to place it more securely in its local landscape context. After crossing the Tamar, the A38 mostly passes through an undulating landscape of Anciently Enclosed Land with small settlements and hamlets, many originating in the medieval period. Considerable swathes of this ancient landscape have been altered in the post-medieval and modern periods, principally through boundary removal. A distinctive feature of the western part of the road is the valley-side woodland, much of it of ancient origins, along the Glynn valley. At Turfdown the study area rises onto Recently Enclosed Land, formerly open rough ground.

● Project officers: Bryn Tapper, Dick Cole, Sean Taylor. Project manager: Andy Jones.

De Lank, St Breward

HES was commissioned by South West Water to undertake an archaeological watching brief during pipeline rehabilitation works over a distance of 2 km between De Lank waterworks (SX 1191 7547) and Bradford (SX 1320 7668). The fieldwork followed a desktop assessment. The work included recording boundaries where they were breached and the sampling of palaeo-environmental deposits affected by the pipeline. [See Jones, A M, and Tinsley, H, 2000–1. Recording ancient environments at De Lank, St Breward, Cornwall, *Cornish Archaeology,* 39–40, 146–60.]

● Project officer: Carl Thorpe. Specialist (pollen analysis): Heather Tinsley. Project manager: Andy Jones.

Scarcewater, St Stephen-in-Brannel

Imerys Ltd commissioned HES to undertake archaeological evaluation trenching in an area centred on Pennance Farm (SW 9270 5388) in advance of a proposed expansion of a china clay tip at Scarcewater, St Stephen-in-Brannel, near St Austell. The trenching was undertaken in order to determine the nature of potential archaeological features that had been identified by an archaeological assessment and two geophysical surveys. Eighteen trenches were initially excavated in four of the five areas surveyed by the geophysical survey. Positive results were obtained from the majority of the trenches. The results of the geophysical survey with the information collected from the evaluation trenching revealed elements of a series of well-preserved prehistoric and medieval landscapes containing both ritual and settlement components. [A full report on the results of the evaluation and subsequent large-scale excavations at Scarcewater is in preparation.]

● Project officers: Sean Taylor, Imogen Wood. Project manager: Andy Jones.

Tremough (CUC) Campus

HES carried out excavations at Tremough CUC (Combined Universities in Cornwall) Campus in advance of the construction of new university buildings. The work had been preceded by a series of watching briefs, geophysical surveys, excavations and fieldwalking. The site (SW 767 347) is located on the top of a hill overlooking Penryn and with far-reaching views to the south east and towards Carrick Roads and the sea. The 2002 programme involved archaeological supervision of the removal of topsoil across 4 ha of the development site, followed by detailed recording by excavation. The excavations

were funded by Falmouth College of Arts Developments Ltd. The excavation team was assisted by numerous volunteers, including members of Cornwall Archaeological Society and students from Truro College. The key phases identified by the excavations are described below.

Late Neolithic (3000–2500 BC)
Five Late Neolithic posthole structures – rings of postholes typically six or seven metres in diameter – were discovered, roughly aligned on a north west – south east axis, with a dispersed group of shallow pits beyond the western end of the alignment. The post rings were expected to represent the remains of Bronze Age houses, but remarkably they were found to be associated with pottery identified by Henrietta Quinnell as Late Neolithic Grooved Ware, which is rarely found in Cornwall. This Grooved Ware assemblage forms the largest of its type in Cornwall (approximately 300 sherds from 40 vessels). Other structures included two posthole alignments and a group of five small pits.

Romano-British period (AD43–AD410)
The Romano-British period saw the creation of a curvilinear enclosure ditch in which an oval post structure was erected; the function of this may have changed from light industrial to domestic use over time. It has similarities with other Romano-British structures excavated in Cornwall, although these tend to have been in upland zones where the use of stone as a building medium was more prevalent. A greisen bowl fragment and carved stone weight were recovered from the structure; examples of similar objects have been found at contemporary sites such as Trethurgy. The enclosure ditch was not very deep and was probably for stock-keeping. A system of rectangular field plots was located to the east of the enclosure.

The medieval and post-medieval landscape (AD 410 to the present)
The principal element of the medieval field pattern was a long sinuous ditch running across the excavation area on an approximate west-east orientation. Ancillary to this were ditch systems running south and north creating subdivisions of the strip-field system, probably developed by the thirteenth century. Parts of these boundaries have been preserved in the post-medieval landscape as stone-faced Cornish hedges on the same alignments. The Romano-British field system, defined by small sub-rectangular fields, had a relationship with the medieval system, suggesting that the boundaries of the earlier fields were still discernible, and possibly in use, at the time of the medieval layout.

[A full report on archaeological work at Tremough has now been published in the *British Archaeological Reports* series: Jones, A M, and Gossip, J, 2007. *Archaeological investigations of a later prehistoric and Romano-British landscape at Tremough, Penryn, Cornwall,* Oxford, BAR Brit ser 443.]

● Project officers: James Gossip, Sean Taylor. Excavation team: Paul Bonnington, Peter Dudley, Carmelo Grasso, Jonathan Moller, Matt Mossop, Emma Ruddle, John Smith, Alec Trevarthen and Imogen Wood. Volunteers: Gwen Bragazzi, Jean Hughes, Christine Wilson, Mick Triplett, Vanessa Beeman, Sally Ealey, Russell Bennet, Jenny Wittamore, Hugo Glazier, John Davey, Pam Worthington, Lee Westcott, Louise Knight, Ian Gerrard, Andrea Gerrard, Alessandra Parsons, Adam Spring, Stella Redgrave, Fiona Jacques, John Kirby, Richard Prest, Ian Blackmore, Colin Greenwood, Roger Farnworth, Jacky Trevivian and Konstanze Rahn. Specialist advice: Carl Thorpe, Henrietta Quinnell (artefacts); Vanessa Straker (environmental data). Project Manager: Andy Jones.

Quay Street, Lostwithiel

HES undertook archaeological trenching and historical research at Quay Street, Lostwithiel, on behalf of Gardiner Theobald Management Services, in advance of redevelopment. The site was located within the medieval town, opposite the 'Duchy Palace' complex. The latter, built by Earl Edmund in 1289, was an administrative centre for the management of the Duchy's Cornish estates, the venue for the county court and election of knights of the shire, a coinage hall for the taxation of tin, and the stannary prison. The land opposite the Palace was the river frontage and possibly the quay for the Duchy administrative buildings, shire and coinage halls. By 1549 at the latest, the plot was in the hands of the knightly Curteys family, who also owned a quay downriver at Pill. A wall located during the recording work probably represents the late medieval quay and other walls located closer to the road frontage may have been the foundations of buildings shown on a 1734 engraving by Nathaniel and Samuel Buck. By the mid eighteenth century much of the site had been reclaimed from the river and a new quay

wall built. Subsequent silting of the river and further reclamation resulted in the construction of a further quay wall. Importantly, the excavations led to the recovery of a large assemblage of medieval Lostwithiel ware ceramics. A report on the project will be published in a future volume of *Cornish Archaeology*.

● Project officer: James Gossip. Project staff: Peter Dudley, Sean Taylor. Historical research: Dr Joanna Mattingly. Project manager: Andy Jones.

Old Post Office, Trevena, Tintagel

The National Trust commissioned a programme of historic building analysis of the building known as the Old Post Office in Trevena, Tintagel, to enhance its interpretation and inform future conservation. This building is the best known of its type in Cornwall due to its picturesque vernacular appearance. It is unusual not only for the extent of survival of historic fabric but also because much of its structure is visible and not hidden beneath later accretions and finishes. The building's name is derived from its use as a Royal Mail District Receiving Office in the middle years of the nineteenth century. The study considered all the available information about the building, including its history and the surviving historic fabric and features, and put these findings into the context of what is known about comparable buildings in Cornwall and beyond.

The Old Post Office was probably built in the late fourteenth or fifteenth century for one of the twelve chief burgesses of the borough; with the adjoining barn, it occupies the width of at least two medieval burgage plots. In the first half of the nineteenth century the building was held as part of a farm owned by the Symons family. Subsidiary businesses were also run from it: in the 1830–40s boots and shoes were made there and in the 1850s and 1860s part was used as a draper's and grocer's shop. For a few years in the early to mid 1870s, the building was used as the village post office and clothes were made there in the early 1880s. By this time, however, the property was becoming neglected and within a few years was uninhabited. By the later nineteenth century Trevena had become known as Tintagel, mostly due to its popularity with tourists. It had also caught the attention of artists, photographers, writers and poets and there was concern for the survival of the older buildings against a background of rapid change in the village. The Old Post Office was purchased by the artist Catherine Johns with a view to its preservation. In the 1890s Miss Johns commissioned a restoration of the building by the Arts and Crafts architect Detmar Blow and in 1903 it was acquired by the National Trust.

The building survey confirmed some of the conclusions of previous investigations but also added to the complexity of the interpretation. It identified a single-storey, three-room and through-passage medieval house, with replacement of its roof in the sixteenth century, a hall fireplace inserted a little later and then a table outshut added to the hall. Upper floors were created in areas adjacent to the hall during the seventeenth century. Fireplaces at the present gable ends are later insertions. Many distinctive features of the present Old Post Office such as the porch doorway, mullioned window and the numerous greenstone slit windows may be derived from other now-demolished buildings: most of these features appear to have been added to the building during the early to mid nineteenth century and may represent an attempt to romanticise it, reflecting Trevena's increasing association with the Arthurian legend.

● Historic buildings consultant: Eric Berry. Documentary research: Dr Joanna Mattingly. Project manager: Nigel Thomas.

Town Mills, St Columb Major

Planning consent to convert derelict buildings at Town Mills into a dwelling prompted a historic building recording project. Town Mills was established as a manorial corn mill in the later medieval period, when the town of St Columb Major was prospering under the patronage of the Arundell family. The present buildings date to the eighteenth and nineteenth centuries. Although this mill continued in use into the middle years of the twentieth century, its function changed in its later years from a grinding mill to a refining and storage plant: its millstones were removed and the space used for a variety of cleaning processes. The principal mill building is a four-storey structure which bears evidence of enlargement and heightening. It has two wheelpits, one on the north side and another to the south which still contains its iron water wheel. Several structures adjoin this building, one forming a frontage along the road, with others to the rear. A rear wing, built prior to 1907 and representing the last phase of expansion of the mill, was in dangerous condition at the time of the study and was photographed before being demolished as part of the

planning consent. A group of small cottages once adjoined the mill buildings. These and the plot behind them represented the dwellings and gardens of the miller and other millworkers.

- Historic buildings consultants: Eric Berry (vernacular building analysis), Anthony Hitchens Unwin (millwright and documentary research). Project manager: Nigel Thomas.

Poughill Mill, Bude Stratton

An assessment of the survival and significance of Poughill mill and its fittings was undertaken to assist in the development and consideration of proposals for its conversion. The mill is first documented in the early seventeenth century but the present three-storey building dates from the mid nineteenth century. The structure remained relatively unaltered, although the machinery inside was likely to have been renewed. A large overshot water-wheel was found to be extant but the leat no longer carries water and has been partly destroyed further upstream. The mill's processing machinery survived in very good condition. A detailed miller's journal survives for this mill, a rare occurrence, giving a valuable insight into the mill's operation in the nineteenth century.

- Historic buildings consultants: Eric Berry (vernacular building analysis), Anthony Hitchens Unwin (millwright and documentary research). Project manager: Nigel Thomas.

2003–2004

Scheduled Monument Management project

Gun Rith menhir

In January 2003 the Gun Rith menhir fell. The accident was not witnessed, but in retrospect was no surprise, for the stone was leaning and known to be loose and had been recorded by W C Borlase in the 1870s as having scarcely any foundation. Located in the parish of St Buryan at SW 4294 2448 and standing in a hedge in a field close to both Tregiffian entrance grave and the Merry Maidens stone circle, the stone is an important component in the prehistoric ritual landscape of the area. The challenge was to restore it in such a way that its original character, including the 'lean', would be replicated, while ensuring that it would be secure. Preliminary archaeological excavation by Charlie Johns and Chris Southwell of HES showed that the ground in the vicinity of the stone had been disturbed down to the natural rab, probably by Borlase's excavation, but indicated that the stone had been rather more deeply embedded than Borlase had supposed. There were no significant finds. The stone was lifted back into place in June 2003. For security, and in order to help retain the former height and lean of the stone, the stone was socketed into a large granite base-stone, set flush with the ground. The hedge into which the stone had originally been set was rebuilt in such a way that it now curves around the back of the stone, leaving the full height of the monument visible. The work was carried out by Adrian Thomas and David Cutting and was part-funded by Penwith District Council.

Trevelgue Head

A third year of management works to archaeological remains on Trevelgue Head, near Newquay, was carried out in 2003. Previous work had concentrated on the remains of the Iron Age cliff castle but this year the aim was to infill a large eroded area of a Bronze Age barrow on Porth Island. Access is by a footbridge, which meant that alternative methods were required for transporting the materials necessary to carry out the work. Loose shillet and soil were airlifted onto the headland by helicopter with the kind assistance of 771 Naval Air Squadron from RNAS Culdrose. A total of 48 'builders bags' of material were placed into cargo nets and flown one by one onto the headland. The airlift took place on 29 October 2003 in very wet and windy weather with assistance from a sizable ground crew from RNAS Culdrose and more than 20 staff from Restormel Borough Council.

Hobbacott

Changes in land height on the Bude Canal were managed by means of six water-powered inclined planes, up which small, wheeled, tub-boats were hauled on rails. The biggest of the inclined planes was at Thurlibeer, in Launcells parish (SS 243 047), a remarkable piece of early nineteenth-century engineering and now a spectacular landscape feature. Today, the incline is a grassy ribbon running straight up the hillside, defined by tree-grown hedges. The lower part is particularly well preserved, with stone walls defining the basin and the central peninsula which separated the 'up' and 'down' boats. Scheduled Monument Management funding helped

with fencing so that the inclined plane can be carefully grazed.

Pendrea Cross

Pendrea Cross is a medieval granite wayside cross located on a verge to the south-west of St Buryan, at SW 4059 2534. It was discovered in 1943 and set up on a modern base in 1959. In 2001 it was found that the cross was loose on its base, that the base had become buried beneath a build up of earth and vegetation and that the cross as a whole was practically invisible beneath the overhanging boughs of a nearby hawthorn. In August 2003 work took place to cut back the overhanging tree and the cross was lifted and its base moved to a more prominent position on the verge. The cross was then securely re-bedded. The work was undertaken by Adrian Thomas and David Cutting, aided by Geoff Hoad's digger and with recording by Andrew Langdon.
- Project officer: Dick Cole. Project manager: Ann Preston-Jones.

Tintagel

HES (Projects) undertook a characterisation study of Tintagel to inform the design of enhancement works to the streetscape carried out as part of a regeneration programme coordinated by the County Council's Countryside Projects Team (Environment and Heritage). The characterisation study highlighted the importance of the wide former market street, the principal feature of the medieval town. Improvements were also made to Tintagel Castle's access and facilities.
- Project manager: Nigel Thomas. Historic buildings consultants: Eric Berry, Nick Cahill. Historical research: Dr Joanna Mattingly.

Wheal Peevor

Wheal Peevor, near Redruth, is an outstanding example of the typical surface layout of a Cornish tin mine during the mid to late nineteenth century. An archaeological assessment of the mine was undertaken on behalf of Kerrier District Council, in advance of a Heritage Lottery bid to fund the consolidation of the structures and to open up the mine for improved public access as part of the Mineral Tramways Trail network. The pumping and winding engine houses are located at right angles about the engine shaft, and the stamps engine house and dressing floors are positioned on the hill slope to facilitate the gravity-driven ore processing methods of the period. The mine count house is extant in addition to extensive remains of the stamps loadings, calciners, settling tanks, buddles and service buildings. The three engine houses within the sett were in place by 1876 and the mine produced 3,280 tons of refined tin ore until the low price of metal forced closure in around 1889. The site was last trialled for tin in 1967 but no production ensued.
- Project officer: Ainsley Cocks. Project manager: Adam Sharpe.

Tamar valley mines

Tamar Valley Countryside Service requested the Historic Environment Service (Projects) to collate specific site information for use in the preparation of a Heritage Lottery Fund (HLF) application (totalling £5.1 million) for a range of projects within the Tamar Valley Area of Outstanding Natural Beauty (AONB). These included consolidation and preservation works to mine buildings within Devon Great Consols Mine, the opening of part of a railway track to provide public access from the mine to Morwellham and to link with other sites to the south at New Quay and Gawton mine. Other related projects included the compilation of a large GIS-linked database (nearly 800 sites) of archaeological and site management information forming part of a Conservation Management Plan for Devon Great Consols Mine, Bedford Mines, Wheal Russell, Morwellham and New Quay, and emergency remedial works at Gawton Mine.
- Project manager: Colin Buck.

Wheal Pool, near Helston

A total station survey was carried out at Wheal Pool engine house (SW 6528 2628) on the Penrose estate, Helston, as part of an archaeological building survey prior to consolidation works by the National Trust. Cartographic and documentary evidence suggested that the engine house with its associated boiler house dates to the latter half of the 1850s when the mine, after a period of disuse, was reworked for silver-lead and tin.
- Project officers: Jo Sturgess, James Gossip. Project manager: Adam Sharpe.

Rosewastis Mill, St Columb Major

The remains of this nineteenth-century watermill stand isolated in a valley below Rosewastis Farm. HES carried out recording in advance of conversion to a dwelling.

● Project manager: Nigel Thomas. Historic buildings consultant: Anthony Hitchens Unwin.

Dolphin Town, Tresco, Isles of Scilly

A watching brief was carried out during construction of a new playing field on Tresco. The work revealed a prehistoric settlement comprising at least five stone buildings (houses and attached enclosures) as well as a possible ritual structure constructed of large granite slabs with kerbing. Pottery ranged from Bronze Age to medieval. To preserve the site the Tresco Estate relocated the new playing field and the exposed features were recorded and reburied. [An account of the project will be published in a forthcoming volume of *Cornish Archaeology*.]
● Project officer: Sean Taylor. Project staff: Katharine Sawyer. Project manager: Charles Johns.

Tregarrick Farm, Roche

Archaeological recording was carried out at Tregarrick Farm as part of an assessment for R S Developments in advance of the construction of housing. The project area was situated in fields to the north of Roche Rock, a distinctive landmark surmounted by the ruined medieval chapel of St. Michael. A group of ten hearth-type pits were recorded which were found to contain structured deposits, including sherds of Early Neolithic pottery, flints, a small saddle quern and charred hazelnuts (*Cornish Archaeology,* **41–42,** 107–43).
● Project officers: Dick Cole, Peter Dudley. Project manager: Andy Jones.

HMS Scylla, Whitsand Bay

An archaeological assessment was carried out of the seabed in Whitsand Bay where the Leander class frigate HMS *Scylla* was to be sunk to form an artificial reef. The assessment was carried out for the National Marine Aquarium, Plymouth, with help from the Royal Naval Hydrographic School at HMS *Drake* and marine consultants Kevin Camidge and Peter Holt. The location in which *Scylla* was placed was modified to take account of the results of the seabed survey analysis in order to avoid disturbing possible wreck sites in the area.
● GIS archaeologist: Bryn Perry Tapper. Project manager: Charles Johns.

St Just Regeneration Project

The spectacular cliff-edge mines of the St. Just district in west Penwith are physical evidence for the many centuries of industrial activity in the area but also make a significant contribution to the character of its landscape and are important factors in drawing visitors to this part of Cornwall. In 1992, following the final closure of Geevor Mine, the *St Just Mining District Survey* carried out by Cornwall Archaeological Unit provided an audit of the heritage assets of the area, setting out a structure for their beneficial management. The National Trust has subsequently used this report to inform its acquisition strategy in west Penwith and obtain grants to undertake a range of consolidation, safety and interpretation works. The review of assets undertaken as part of the bid for World Heritage Site status for Cornwall and west Devon's mining heritage revealed that much work still remained incomplete, and that some of the most visited sites in the St Just area were in poor structural condition. In recognition of the important contribution these make to the economy of the area, funds were made available for conservation and safety works from the Objective One budget as part of a larger package of works, the St Just Regeneration Project. This included urban regeneration projects within St. Just and Pendeen and local access, interpretation and marketing schemes. The National Trust and English Heritage contributed additional funding and HES helped draw up the project specification and provided ongoing consultancy. The principal activities have centred on Levant, Botallack and the Kenidjack valley. At the former, the works to Man Engine Shaft and its attached access tunnel completed a major project to conserve the site and won a Civic Pride award; to the north, the rebuilding of an historic cliff retaining wall ensured that a popular coastal path could continue in use and included the reconstruction of a section of tunnel forming part of the mine tramway system. Other works were undertaken at Rosewall Hill, St. Ives, and at Baker's Pit, Nancledra.
● Project manager: Adam Sharpe.

Whiteford Park, Stoke Climsland

HES was commissioned by Duchy College to produce archaeological and historical assessments of Whiteford Park and used these, together with an ecological assessment, to prepare a long-term conservation plan for the parkland. A similar plan

had previously been produced for Ethy Park, near Lerryn. Most of Whiteford's parkland is owned by Duchy College but two important areas are in private hands: the site and remains of Whiteford House and its surrounding complex of buildings, and the Temple, a late eighteenth-century ornamental structure. Three sites beyond the parkland were also studied as important peripheral landscape elements related to Whiteford: two plantations and the folly on the summit of Kit Hill.

Sir John Call in the later eighteenth century made Whiteford the most significant landscape park in this part of Cornwall. The house and temple were not only eye-catchers but also places from which vistas opening out down the Luckett valley were to be viewed. The views were carefully framed and enlivened by groves, plantations and scattered trees, and extended beyond a long curving ha-ha to serpentine lakes in the valley. Longer views took in the hills of Dartmoor and more local ones were to Stoke Climsland church and Kit Hill. The park was maintained and even extended in the nineteenth century but the Call family fortunes turned in the late Victorian period and in the early twentieth the house was abandoned and then demolished. The parkland became part of the Duchy's home farm at Stoke; the temple survives, as do many of the original scattered trees. The ha-ha is a clear earthwork and the lakes have been recently cleared and re-watered. The aims of the restoration plan are to fully re-establish the parkland nature of the landscape while maintaining it as active agricultural land, and to enable a greater range of people to enjoy it.

- Project officer: Peter Dudley. Historical research: Dr Joanna Mattingly. Project manager: Peter Herring.

Atlantic Coasts and Valleys Project

This survey of the historic and natural environment and landscape of a 1 km wide strip of coastal land running from Pentire Head (St Minver) to Hartland Point (Devon), was commissioned by North Cornwall District Council to inform the preparation of a bid to the Heritage Lottery Fund for the Atlantic Coast and Valleys Project (ACVP). This is intended to revitalise the environment of this area, returning to good health coastal and valley-side rough ground habitats that have suffered from the suspension of grazing, re-establishing historic landscape character in an area where the development of scrub has obscured definition of the historic environment, and thereby enhancing the beauty of a well-loved and well-protected landscape. A key indicator species is the Large Blue butterfly (*Maculinea arion*), extinct in the area from the 1940s but recently reintroduced at Dannonchapel. The butterfly has a complex life-cycle which includes dependency on the Myrmica ant (*Myrmica sabuleti*) and wild thyme (*Thymus polytrichus*), both of which require fairly closely cropped rough grazing. Such land use was traditional on the coastal rough ground of the area until the last few decades when intensive agricultural methods led to a decline or cessation in use of farm margins.

The project has integrated information on the historic and natural environment to understand past land use and to set a framework for the future. This involved GIS-based historic landscape characterisation (HLC) and habitat mapping for three periods – the present, *c* 1880 and *c* 1840 – and historic species records for 19 key species. The rise and fall of these species reflect the principal changes to habitats and biodiversity. In addition a critical review was made of the Landscape Character Areas defined for the ACVP study area in the 1994 Cornwall Landscape Assessment and the two relevant English Nature Natural Areas profiles ('the Culm' and 'Cornish killas and granite').

- Project officer: Megan Val Baker. GIS assistance: Bryn Tapper. Project manager: Peter Herring.

Isles of Scilly Rapid Coastal Zone Assessment

The Rapid Coastal Zone Assessment (RCZA) for the Isles of Scilly was the first such study to be commissioned after the National Heritage Act (2002) enabled English Heritage to assume responsibility for all monuments on, in, or under the seabed around the coast of England within UK territorial waters. The aim of the assessment was to improve knowledge and understanding of the submerged heritage by extending existing terrestrial, shoreline and intertidal assessments of the islands out to the 12 nautical mile limit in order to achieve integrated management of the whole of the historic environment in Scilly. A primary goal was the assimilation of wreck data provided by the maritime section of the National Monuments Record and the United Kingdom Hydrographic Office into the Cornwall and Scilly Historic Environment Record (HER), each site being mapped on GIS with a linked record entry in the HER database. A total of 771 recorded wreck sites were input into the HER and 340 existing HER entries for coastal and intertidal sites were verified and enhanced. Digital maps and

text data on heritage assets within the project area have been provided to Isles of Scilly Council and the Isles of Scilly Area of Outstanding Natural Beauty to assist in future decision making. Other aspects of the project included identification of threats to the historic resource, incorporation of the results of the National Mapping Programme (air photograph plotting) for Scilly, extension of the existing Historic Landscape Characterisation for the islands into the marine zones, development of a methodology for rapid application of criteria to assess the absolute and relative importance of individual sites, and recommendations for ongoing positive management of the historic environment.

- GIS archaeologist: Bryn Perry Tapper. IOS RCZA team: Ainsley Cocks, Peter Herring, Cathy Parkes, Megan Val Baker, Emma Trevarthen and Andrew Young (NMP). Maritime heritage consultant: Richard Larn. Project manager: Charles Johns.

Cotehele House, Calstock

The National Trust commissioned HES to carry out historic building analysis on Cotehele House to improve understanding of the structure, enhance its interpretation and inform future conservation; the principal objectives were to establish more accurate dating, phasing and functions of the house. A particular element was the relationship of Cotehele with other Edgcumbe family estates, particularly Mount Edgcumbe, which was built in the early 1550s and later became the main family seat. Study methods included analysis of the fabric of the buildings, including the character of the stonework, architectural features and evidence of alterations. On-site recording was carried out by annotation of floor plans and photographic views of interior spaces, as well as creation and annotation of photographic elevations. The building investigation was aided by a study of historical sources. Only a few building records survive, but in combination with physical analysis of the structure, a sequence of 16 building episodes or phases of use was identified. Tree-ring samples yielded dates of *c* 1520 for the roof timbers of the Great Hall and the North Range. The decorative arch-braced roof trusses over the Parlour Wing, however, were discovered to be later nineteenth century replacements.

The survey confirmed that Cotehele is both the largest and the best preserved house with late medieval origins in Cornwall. The complex probably began as a hall house which was developed into a courtyard plan building by the late medieval period. During the sixteenth century, and to some extent during the seventeenth, the house was the subject of successive phases of refashioning. Some of these were extremely ambitious, structurally daring and often visually exciting. Many of the walls were heightened, windows and doorways were added or enlarged or in some cases simply replaced with more fashionable ones. Parts of the house that have particularly gained in interest from the survey findings include the gatehouse tower and its associated staircases and room spaces, the north-west tower and its later alteration and the chapel and its relationship with adjacent parts of the house. The discovery of a former courtyard (curtain) wall embedded in a later building was of particular interest, as was the extensive survival of sixteenth-century roof structures. The survey also revealed that every part of the house has many more layers of phasing and interest than had previously been observed.

Cotehele retains evidence of a medieval plan that was altered and added to in the late fifteenth and sixteenth centuries and was further altered, in more subtle ways, in the following centuries. It has remained fundamentally unchanged since the late nineteenth century, however. It was not largely abandoned by the Edgcumbes following the construction of Mount Edgcumbe, as has been suggested previously; apart from some apparent periods of a decline in use it appears that generally Cotehele continued to have a significant role and was the subject of continued investment for much of its history. Where Cotehele differs in its development from other great houses in Cornwall is in the way in which the Edgcumbe family applied that investment. Elsewhere, in Cornwall and beyond, fashions often brought completely new designs, with consequent changes to the character of the buildings and gardens. At Cotehele the emphasis appears to have been on subtle enhancement of the existing house, which has therefore preserved much of its character over many centuries.

- Project officer: James Gossip. Historic buildings consultant: Eric Berry. Historical research: Dr Joanna Mattingly. Project manager: Nigel Thomas.

National Mapping Programme

During this, the tenth year of the air photograph mapping project, a further 550 square km were surveyed and 1548 new sites recorded. Mapping in south-east Cornwall was completed and continued in the Restormel china clay district. An area of 100

square km was recorded along the Devon-Cornwall border, north of Launceston. Plotting of the Isles of Scilly was undertaken to complement the Rapid Coastal Zone Assessment (see above).

Two themes dominated the mapping: prehistoric enclosures and the remains of military activity. In south-east Cornwall, for example, within a group of six adjoining fields at Padderbury, no less than five curvilinear enclosures were recorded, two of which are new to the Historic Environment Record. A possible Neolithic cursus monument, dating to *c* 3000 BC, was first spotted on air photos by the farmer, during liaison with the Historic Environment Countryside Advice Service to draw up a Countryside Stewardship Scheme. This feature is located roughly 1 km north of Downderry and consists of two parallel ditches 93m apart and at least 320m long, perhaps up to 800m or more.

At the other end of the chronological range, vertical images taken between 1946 and 1995 illustrated very clearly the development of Bodmin Earth Station over this time. This was an MOD listening station and the sequence of air photographs makes it possible to trace alterations in the layout of the station on several occasions throughout the Cold War and technological changes in the types of transmission and receiving masts.

A huge variety of military remains were mapped on both sides of the Tamar in the Downderry, Saltash and Plymouth areas. Some standing defensive remains in this strategically important zone can be dated to the late fifteenth century, although the majority are of seventeenth-century date (for example, Plymouth's Royal Citadel) or later. Civil War and Napoleonic structures still stand, notably the late eighteenth-century group of redoubts at Maker Heights and Mount Edgcumbe. A series of defences known as Palmerston Forts were built to protect Plymouth in the mid nineteenth century. Lastly, defences built for the two World Wars and during the Cold War were located in the form of anti-aircraft batteries, observation posts, pillboxes, storage depots and training camps. Although the majority of military sites in this area have been well documented, a number are less well known. More than 30 emergency water storage tanks in Torpoint, Saltash and Plymouth were mapped and at least 20 barrage balloon sites have been plotted to date.

- Project officers: Carolyn Dyer (English Heritage), Emma Trevarthen. Project manager: Andrew Young.

Higher Boden, St. Anthony-in-Meneage

An Iron Age fogou at Higher Boden on the Lizard peninsula was first recorded as an 'artificial cave' in 1816 by Richard Polwhele, the vicar of Manaccan. Knowledge of the location of the feature was lost in the early twentieth century, the entrance possibly backfilled by a farmer. In 1991, while laying a water pipe, Mr C Hosken, the present farmer, discovered a loosely filled shaft from which he recovered Iron Age or Romano-British pottery and fragments of rotary querns. Mr Hosken also cut a small trench to locate the fogou last seen 75–80 years ago. It was found to be an earth-filled, stone-walled passage, 1.4m wide and buried 1.85m below the ground surface. The site was examined and recorded by Cornwall Archaeological Unit (CAU, now HES) and in 1992–3 English Heritage's Ancient Monuments Laboratory undertook a geophysical survey of the surrounding area which indicated that the fogou was located within a rectangular ditched enclosure, possibly a 'round', and surrounded by other signs of settlement and several phases of ditched fields. In July 1996, while Mr Hosken was sanding the field, a small hole opened up giving access to another passage, this time a rock-cut tunnel some 4m long. This was almost certainly another part of the fogou investigated in 1991. Conservation concerns and a need to understand the fogou and its context more fully in advance of Scheduling led English Heritage to fund an evaluation by HES. A number of geophysical anomalies were targeted, including the ditch of the round, curvilinear features within it and various amorphous features outside the enclosure. In addition, a fieldwalking exercise was carried out involving children from Garras, St Martin and Manaccan primary schools and A-level archaeology students from Truro College.

A large anomaly to the west of the enclosure proved to be the remains of a Bronze Age round house, approximately 8m in diameter. The house was set into a hollow cut into the natural shillet. Further investigation showed that the floor was covered by sherds of pottery from a very large Trevisker-ware vessel, dating to *c* 1400–1000 BC, decorated with incised lines and twisted cord-impressed chevrons, placed with the decoration upward. Recent discoveries have indicated that round or oval structures set into hollows were the usual form of Bronze Age house in lowland Cornwall. Such structures often contain deliberately placed broken pottery, perhaps connected with a ritual procedure accompanying house

abandonment. However, because of the unusual nature of the pottery it is not yet certain if the Boden example is a domestic structure.

The 3m wide ditch forming the northern side of the rectilinear round was excavated to a depth of 2.5 m, but is likely to be considerably deeper. Large sherds of pottery, provisionally identified as Iron Age, were recovered from the ditch fills. Other trenches within the round revealed a variety of features producing Iron Age finds, including three large ceramic beads and a copper alloy brooch fragment as well as Romano-British pottery and sherds of post-Roman platters. Three Roman coins (second and third centuries AD) were recovered by metal detectorists working with the archaeologists.

The 1991 trench on the fogou was re-opened and extended, revealing a passage constructed from coursed stonework with two large orthostats on either side defining a point at which the tunnel narrowed. The coursed stone walling became deeper, curving to the north east. The walling was corbelled and although there were no *in situ* roof stones, there were stones in the fill of the fogou which could have spanned the passage. The interior of the fogou appeared to have been deliberately backfilled. Above the fogou floor were silty soil deposits from which Iron Age pottery, a polished pebble and a small blue glass bead were recovered. A comprehensive soil sampling strategy was adopted in order to retrieve charred plant remains and charcoal samples for radiocarbon dating.

It is hoped that further research-led excavation will be possible, to widen this tantalising glimpse of a site occupied from the Bronze Age to the post-Roman period with a high degree of preservation and abundant cultural material. The Bronze Age pottery is unusual for its quality, size and decoration, and the fogou is also well preserved; both of these features may indicate a high status, or otherwise special, site.

● Project officer: James Gossip. Project staff: Matt Mossop; Anna Tyacke, Finds Liaison Officer for Cornwall (Portable Antiquities Scheme). Project manager: Charles Johns.

Glasney College, Penryn

Evaluative excavations were carried out at the site of Glasney College, Penryn in June 2003. A small team of HES staff was assisted by approximately 70 volunteers, mainly from the local community of Penryn. Glasney College was one of the major ecclesiastical centres in medieval Cornwall and was probably where the trilogy of religious plays known as the *Ordinalia* was written in the early fifteenth century. In 1549 the college was dissolved and the buildings were subsequently dismantled. The site eventually became a playing field with only a small portion of an arch surviving above ground. The exact position and layout of the church became lost over ensuing centuries. Following an assessment of the site by HES and consultation with English Heritage (the site is a Scheduled Monument), five evaluation trenches were targeted to locate and assess the condition of the church. Many walls had been robbed out, although ghost walls were present which enabled the building to be accurately located and its plan to be ascertained. Some surviving structural elements were found, the most substantial being the buttressed corner of the chapel at the south-east end of the church. The eastern wall of a probable chapter house was also located, as well as the junction between the south aisle and transept. More than 1000 artefacts were recovered during the evaluations, including the best collection of medieval tiles ever found in Cornwall, carved finials, cusps and other fragments of Beer stone from monuments or screens, evidence of gilding and red paint, medieval pottery, ridge tiles, slates, lead, glass fragments and part of a figure sculpture.

Initiated by the Friends of Glasney, the project was funded by the Heritage Lottery Fund, English Heritage and local bodies. [An account of the Glasney excavation will appear in a future volume of *Cornish Archaeology*.]

● Project officer: Dick Cole. Archaeologists: Jo Sturgess, Peter Dudley, Imogen Wood. Historical consultant: Dr Joanna Mattingly. Project manager: Andy Jones.

Nancemere, Truro

HES undertook a programme of archaeological recording for Cofton Ltd during enabling works in advance of a housing development at Nancemere, Truro. An archaeological assessment and geophysical survey had identified several sites of probable prehistoric or Romano-British origin over an area of approximately 3 ha. Archaeological features were exposed across the majority of the topsoil-stripped area, including a hearth pit containing sherds from a probable Beaker, a Bronze Age ring ditch, probably the remains of a barrow, enclosures or field systems with associated Middle Bronze Age pottery and Romano-British field

systems associated with occupation of a round to the south east. The round constituted the most significant archaeological site. A 12m-wide area was stripped through the enclosure. Numerous features were recorded including the outer ditch, a stone-lined hearth, 'working areas', postholes, metalled surfaces, drainage gullies and a multi-phased entranceway. Preliminary assessment suggests that the site was occupied during the first to second centuries AD with the following sequence of events:

Phase 1: Construction of the round, defined by a ditch up to 1.5m deep and 3m wide and a rampart. Terminals to the ditch and rampart revealed a west-facing entrance.
Phase 1a: Modification of the entrance and rampart. The terminals of the rampart were revetted with stone coursing and a compact metalled surface extended into the round interior.

Phase 2: The entrance was extensively modified. A new ditch removed the causeway in the entrance and upcast material was used to fill the hollow of the earlier entrance. Stone structures in the base of the new ditch may have acted as post-pads for a timber structure which spanned the ditch.

Phase 3 (post-Roman activity): A hearth formed from orthostatic slabs was situated in the centre of the round. Iron slag recovered from the hearth indicates small-scale metal working. The presence of grass-marked pottery suggests that it was in use between the sixth to ninth centuries AD.
● Project officer: James Gossip. Archaeologists: Neil Craze, Peter Dudley, Matt Mossop, Alex Osbourne, Stuart Randall, Emma Ruddle, Megan Val Baker, David Williams, Andrew Young. Project manager: Andy Jones.

Archaeology beneath the towans: excavations at Gwithian, 1949–1969

For archaeologists of a certain generation, mention of Gwithian is synonymous with the discovery of ancient plough marks, unique Beaker houses and rare 'Dark Age' pottery found during the hey-day of amateur archaeological fieldwork in Cornwall. The exceptional preservation of ancient land surfaces sealed beneath the undulating sand dunes – the towans – has ensured Gwithian a special place within British archaeology. Between 1949 and 1969 more than 70 sites were discovered and investigated at one level or another in an area of some 4 square miles. Interim statements on the results of the project appeared from time to time but the results were never fully published. In 2003 a team of specialists was brought together by HES to assess and appraise the substantial archives of finds, photographs, plans, notes and drawings. This was the initial phase of a major project and was made possible by English Heritage with financial support from the Aggregates Levy Sustainability Fund. Working in close consultation with Professor Charles Thomas, the original project director, the team began the process which it is planned will eventually lead to the publication of an integrated and detailed account of the archaeological work at Gwithian. During the 12–month initial phase approximately 24,000 artefacts dating from the Neolithic to the post-medieval period were catalogued, reboxed and rapidly assessed by the team. Finds included all classes, from potsherds to metalwork, flints to animal coprolites. The stratigraphic integrity of the excavation records has also been appraised and more than 40 notebooks, 400 field drawings and 5000 photographic images were ordered, indexed and assessed.

Gwithian continues to provide key cultural sequences for understanding Cornwall's archaeology and collectively the results of this major project stand as a testament to a landscape approach to archaeology which was innovative for its day. The exercise has not only re-emphasised the national and regional importance of archaeology at Gwithian but has also provided an opportunity to revisit the richness and potential of this unique landscape.
● Gwithian team: Polydora Baker, Paul Bidwell, David Dungworth, Glynis Edwards, Vanessa Fell, Jennifer Foster, Catherine Freeman, Rowena Gale, Raumes Gallois, Andrew Hammon, Gareth Hatton, Anna Lawson-Jones, Janice Light, Jackie McKinley, Henrietta Quinnell, Alison Roberts, Vanessa Straker, Joanna Sturgess, Roger Taylor, Charles Thomas, Anna Tyacke, Sue Watts, and with help from Megan Val Baker, Freya Jones and Chris Southwell. Project manager: Jacky Nowakowski.

2004–5

St Veep church

Archaeological recording work for the Parochial Church Council in advance of roof repairs at St Veep church, combined with dendrochronology (tree ring

dating), produced useful results for the building itself as well as a better general understanding of wagon roofs. The principal findings were that the nave roof was constructed in the 1460s, sometime after the tower had been added to the building, and that the roofs of the south aisle and nave have similar date ranges, despite significant design and detail differences. Timbers of the north aisle roof have felling dates in the range AD 1524 to AD 1549, so are probably just pre-Reformation. Structural relationships helped to reveal a series of building episodes, proving that the east end of the south aisle is later than the original part. This survey represents only the beginning of a better understanding and dating of Cornish churches and it is essential that the process of recording continues as opportunities arise.

- Project officer: Megan Val Baker. Historic buildings consultant: Eric Berry. Project manager: Nigel Thomas.

Cornwall Wildlife Trust reserves

HES was contracted to carry out archaeological assessments on Cornwall Wildlife Trust reserves at Lowertown Moor, Higher Trevilmick and Crift Farm, all of which are close to Helman Tor. Desk-based research and fieldwork identified the defining historic character and archaeological features for each reserve to guide the Trust's future management. Lowertown Moor is marked by extensive streamwork pits and heaps, some now capped by rafts of 'quaking bog' vegetation. Close by, Higher Trevilmick is crowned by the granite mass of Helman Tor, a nationally important archaeological landscape which includes a Neolithic tor enclosure and a Bronze Age hut circle and associated field system; a nineteenth-century quarry-worker's shelter is cut in to the underside of a natural tor outcrop. At Crift Farm are the intriguing remains of a nationally important medieval longhouse (twelfth to fourteenth centuries AD) associated with metalworking and the reprocessing of tin slag; it is also documented as the site of a medieval windmill. The longhouse was excavated by the University of Bradford in the 1990s and recommendations were made to the Trust on consolidation works to the surviving remains.

- Project officer: Peter Dudley. Project manager: Peter Herring.

South Penquite, Blisland

South Penquite is a 200–acre organic farm with a well-preserved historic landscape on the north-west margin of Bodmin Moor. The owners commissioned an archaeological assessment to aid development of the farm as an education resource. This assessment formed part of a geo-diversity action plan undertaken by Earthwords which was funded through the Aggregate Levy Sustainability Fund.

South Penquite's historic landscape contains a well-preserved medieval field system with its boundaries and associated settlements and an extensive Bronze Age landscape of hut circles, field systems and cairns. Quarries associated with the De Lank quarry complex and an area of tin streaming also lie within the farm. [The historic environment report is available to download from the South Penquite website: www.southpenquite.co.uk.]

- Project officer: Peter Dudley. Project manager: Peter Herring.

Hingston Down mine

HES carried out an archaeological assessment of Hingston Down mine, north of St Anne's Chapel, Gunnislake, for Cornwall County Council's Countryside Service, in advance of a land reclamation scheme funded by Objective One, SWRDA and the Aggregates Levy Fund. Management of ecological, archaeological and historic mining features relating to the site's mining heritage and enablement of safe public access were the basis for the scheme. An archaeological assessment provided historical and archaeological information, together with recommendations detailing short- and long-term conservation. This assessment was part of a wider scheme to consolidate some of the important remaining mine sites on the Cornwall side of the Tamar Valley, following a first phase carried out in 1999–2001.

- Project manager: Colin Buck.

Roundwood, Feock

Roundwood lies between Cowland and Lamouth Creeks, on the Fal. The wood holds the remains of an unusual late prehistoric promontory fort, within which is an oval earthwork enclosure – the 'round' of the place-name. Within the wood are also the remains of a leat system which formerly served a copper smelting works which operated briefly on the

foreshore in the late eighteenth century. The present quay was built in the early nineteenth century, replacing an earlier one, and used to ship copper ore from the Chacewater area and receive return cargoes of coal. Much of the promontory is now in the hands of the National Trust and is a Scheduled Monument. The Trust commissioned HES to survey and record part of the leat system in advance of works to stabilise a collapsing section of the cliff edge behind the quay. Sections were cut and recorded across two linear features, one of which was almost certainly a leat, but the other is likely to have been a twentieth-century military trench, possibly associated with D-Day preparations or training in the area. A measured survey was carried out on the earthworks in the vicinity of the works, including a small reservoir and a complex of associated leats. A watching brief was also conducted during the stabilisation works.

● Project officer: Graeme Kirkham. Project manager: Peter Herring.

Tintagel Haven

A group of structures associated with the export of slate during the nineteenth century were suffering from the combined effect of weathering and visitor pressure. A regeneration scheme for Tintagel included consolidation of these structures to preserve the remains for the future. HES carried out a detailed archaeological survey and made recommendations for the consolidation work. A number of structures were identified, mostly associated with nineteenth and early twentieth century slate working and shipment and with boat haulage from and to the beach. These included horse whim platforms, strong points, slate dressing and storage areas and buildings such as crib huts, workshops and stores. The two whim plats and strong points on either side of the stream were probably constructed for the purpose of loading and unloading ships in the Haven and for winching smaller boats up from the beach.

Fig 3 The early nineteenth century quay at Roundwood. (Photograph: Historic Environment Service)

● Project officer: Jo Sturgess. Project manager: Nigel Thomas.

Harvey's Foundry stable yard, Hayle

Regeneration activity in Hayle included work within the wagon house, stables and fire engine house of the former foundry complex. Teams of horses and wagons once housed here were used to deliver the foundry's products, including waterwheels and steam engines, across Cornwall. A survey of the building exteriors was carried out by Cornwall Archaeological Unit in 2000, but safety issues restricted access to the interiors at that time. A building survey by HES in 2004 enabled a complete record to be made.

The wagon house had a first floor added to what was previously a loftier but single storey interior. Mid nineteenth century plans refer to this building as stables and brick-arched recesses in the rear wall may relate to animal stalls. The front of the building has a pair of wide wagon doorways and an upper storey which appears to have served partly as a groom's quarters, being equipped with a small fireplace. One end of the ground floor is likely to have been a tack room. Similar complexity was shown in the stable block. This two-storey L-shaped building was first mapped in the 1840s. The north-west wing is evidently earlier, with the north-east wing added later as an extension. Removal of render in the ground floor of the north-east wing revealed that this part originally had doorways which faced away from the stable yard and towards Foundry House. This wing had evidently later been reversed, and the original rear cob wall pierced with new openings and faced with brickwork. Review of historic mapping suggests that the late eighteenth century foundry may have been in this area.

● Project officers: Megan Val Baker, Katie Watkins, Imogen Wood. Project manager: Nigel Thomas.

'Tom's House' Higher Porthmeor

The National Trust commissioned a building survey of this Grade II listed stone building, originally a two-storey farmhouse of seventeenth- or more probably eighteenth-century date with nineteenth-

century alterations. The building lies on the south side of the coast road (B3306) at the north-east end of the hamlet of Higher Porthmeor in west Penwith. Analysis showed that it was originally a two-storey granite farmhouse with a roped thatch roof, a form of roof covering widely used in west Penwith during the seventeenth and eighteenth centuries. During the latter half of the nineteenth century the roof was removed, the walls of the building heightened and a new roof constructed with a scantle slate covering. In addition, parts of the existing walling were replaced and repaired and a new floor structure and first-floor partition wall inserted.

● Project officer: Jo Sturgess. Project manager: Nigel Thomas.

Mullion to Lizard pipeline

HES archaeologists monitored trenching over a distance of 4.5 km on a South West Water sewage transfer pumping main between Mullion and Lizard. Features found during the work included flint and pottery scatters and two hearth pits, one of which contained Roman-period pottery and slag. A second pit, near Lizard village may have been some form of furnace. A large number of field boundaries and ditches from the medieval period were also recorded. [The prehistoric features identified on the pipeline route are reported in this volume.]

● Project officer: Dick Cole. Project staff: Matt Mossop, Jo Sturgess, Sean Taylor, Megan Val Baker. Project manager: Andy Jones.

Carvedras smelting works, Truro

An archaeological watching brief was maintained during works at Carvedras workshops in Truro, formerly an eighteenth-century tin smelting complex. The excavation of a large quantity of redeposited backfill within the building revealed a number of buried walls. Some of these were connected to the existing walls and are likely to be the remains of a basement or cellar. Other walls lay on a slightly different alignment and may represent an earlier structure on the site.

● Project officer: Sean Taylor. Project manager: Charles Johns.

Scheduled Monument Management Project 2004–2005

Nine Maidens (Boskednan) stone circle

Nine Maidens stone circle (SW 4342 3512) stands on upland rough ground in west Penwith; 11 of an original 22 or 23 stones survive. Although relatively remote, the downland is well used and paths frequented by walkers, school parties, horse riders, cyclists and even trail bikes converge on the circle from several directions. As a result, parts were becoming eroded and muddy while others were overgrown with gorse, obscuring the stones. After extensive consultation a plan was devised with Defra and the Nine Maidens Down commoners to enhance the condition and appearance of the circle. Undertaken by Adrian Thomas, David Cutting and Geoff Hoad in early summer 2004, this involved scrub clearance, drainage, footpath restoration and the re-erection of three fallen stones. Associated archaeological work involved a survey, a watching brief while drainage trenches were dug and preliminary excavation, by HES archaeologists Charles Johns and Sean Taylor, of the ground beneath the stones that were re-erected. The original stone sockets were successfully relocated and used to guide their reinstatement.

Sancreed crosses

Two granite wayside crosses in the churchyard at Sancreed in west Cornwall (SW 420 293) were repaired and restored. In the case of one, the restoration simply involved lifting the cross from the hedge out of which it had slipped and replacing it in a new base in exactly the same location. The Sellan Cross was lifted, repaired by replacing a corroded iron pin with one of stainless steel and then relocated on a new base to a new and more prominent position close to the church. The work was carried out by stonemasons Adrian Thomas and David Cutting.

Nance Wood

Nance Round (SW 664 450) is an Iron Age or Romano-British enclosure located on a prominent north-facing spur, overlooking the steep-sided valley leading down to the harbour at Portreath. The edges of the ramparts and ditches have been damaged by ploughing and for many years the ramparts have been cloaked in scrub vegetation. When new owners took over Nance Farm in 2000 they signed an English Heritage Management Agreement which agreed a series of measures to protect and enhance

the setting of the monument. This included scrub clearance, the first phases of which were carried out by the British Trust for Conservation Volunteers in November 2003, November 2004 and February 2005.

Towan Holy Well
The Scheduled Monument Management Project, in partnership with Pentewan Old Cornwall Society, undertook the repointing of the roof of Towan holy well, near St Austell (SX 0145 4890). The bulk of the work and organisation was done by the Old Cornwall Society, with the Project facilitating consent to work on the Scheduled Monument and carrying out preliminary recording. The Old Cornwall Society's archive, which includes photographs and descriptions of the early twentieth century restoration proved an invaluable source of information. Analysis by historic buildings specialist Eric Berry showed Towan Well to be an early sixteenth century building, restored in the eighteenth and early twentieth centuries.

Perran Round
Perran Round (SW 7721 5646) is the best preserved *plen an gwary* (medieval playing place) in Cornwall. It is leased to the St. Piran Trust. Ongoing scrub clearance and maintenance by the Trust raised serious questions about how best to remove gorse from the monument and a small excavation was undertaken to investigate whether scrub growth had damaged the banks of the round and to advise on the most appropriate way to control the scrub without damaging the monument. This showed that efforts to physically remove gorse roots from the bank would cause considerable internal disturbance and damage. It was recommended that the gorse should be trimmed back as close as possible to the bank and the roots treated to prevent re-growth.

St Piran's Church
St. Piran's Church (SW 7721 5646) is one of two religious structures which survive in the sand dunes in the northernmost part of Gear Sands, some distance to the north of Perranporth. The medieval church for the parish of Perranzabuloe, it was abandoned to the encroachment of sand in the early nineteenth century and subsequently part-excavated in the early twentieth century. HES worked with the St Piran Trust to develop a project to excavate the sand from within the interior of the ruined church and carry out a range of related conservation and interpretation works to improve the amenity value and setting of this important monument [This work was carried out in 2005–7]. To inform the development of a detailed project design for this work, two small test pits were excavated which examined the nature and depth of deposits within the structure.

Halligye fogou
The Scheduled Monument Management Project undertook an unusual initiative at Halligye fogou on the Trelowarren estate (SW 7133 2394), in partnership with the estate, English Nature and English Heritage. The Iron Age fogou, one of the finest in Cornwall, has the additional interest of being home to an important colony of Horseshoe bats. To safeguard the bats, the fogou's main entrance is closed during the winter hibernation period; however, people have continued to access the fogou through a small hole in the roof, a nineteenth-century creation, resulting in erosion to the fogou and disturbance to the bats. English Heritage agreed that the hole could be blocked to protect the bats, prevent further erosion to the fogou and restore its integrity. HES undertook a survey and watching brief while the work was undertaken.
- Project officer: Dick Cole. Project manager: Ann Preston-Jones.

St Just Regeneration Project

During 2003–4, attention was focussed on major decontamination and conservation projects at the arsenic works and other 1907–14 period mine buildings at Botallack and at the complex of stamping mills and arsenic works in the lower Kenidjack Valley. Significant structural works were also undertaken at the northern end of the Levant site and parts of a former china clay works at the Baker's Pit Nature Reserve were stabilised for Cornwall Wildlife Trust. Once these major works had been completed, it was possible to deploy conservation teams to tackle a range of smaller, but no less sensitive sites around the district. The team who had carried out the work on the arsenic works at Botallack took on the conservation of the extensive, but very ruinous buddle floors at Botallack, a task involving around 1000 square metres of pointing and some carefully-judged rebuilding. At Wheal Cock, to the north, most former buildings survive only as low ruins, the one exception being the miners' dry, where the remains of three buildings are set around

a yard. The complex appears to be in part early nineteenth century in date, although it is evidently multi-phase. Not only is this structure of historic interest as one of the earliest surviving mine buildings in the St Just area, but it stands in an area of SSSI-designated clifftop heath in a stunning location just off the coast path. Although the building had deteriorated badly in recent years, this has now been arrested through limited rebuilding and full re-pointing. At the Crowns the lintelled flue which once served the boilers of Pearce's Whim has also been sensitively consolidated, as have the remains of the boiler house adjacent to the Crowns pumping engine house. At Priest's Cove repair works to the slipway ensured the continuation of the local fishery, while at Levant, extensive trenching for improved site drainage provided a rare opportunity to examine sub-surface deposits within the site, allowed us to reinstate one of the original mine ponds and install power cabling to the man engine tunnel.

In addition to building consolidation, the project has incorporated a programme of shaft safety works. The majority of this work has been undertaken utilising the hedge and fence method used by the National Trust throughout west Penwith. Shafts have recently been made safe at Wheal Cock, Botallack, Rosewall Hill and Carn Gloose. Other shafts have been re-fenced at Carn Gloose, on Rosewall Hill, in the Cot Valley and at Cape Cornwall.

- Project officer: Adam Sharpe.

Boscastle

HES undertook a survey of Boscastle following the devastating floods which struck on 16 August 2004. The floods fortunately resulted in no loss of life but they did cause severe damage to one of Cornwall's most distinctive and best-preserved historic harbour settlements. Immediately after the disaster it was clear that there was a desire in the local community, and from agencies with interests and responsibilities in Boscastle, that repair, reinstatement and rebuilding should be undertaken quickly, but that Boscastle's unique character and distinctive sense of place should be maintained. Soon after the disaster the National Trust approached the Historic Environment Service advice team and a project was quickly set up with backing from English Heritage, the National Trust and North Cornwall District Council to provide information and advice to guide works in Boscastle.

Boscastle's historic settlement is divided into two parts. The upper portion, known as Town, is a good example of a distinctive form of planned medieval settlement based on a castle site, an axial main street and a market place, set along a ridge-top; Tregony and Helston are similar. The lower portion, that most affected by the floods, is made up of two areas known as Bridge and Quaytown. The settlement here lies close to the seaward end of the Valency valley and focuses around the harbour and an historic river crossing point. Boscastle has one of the few sheltered harbours on Cornwall's north coast and a quay there was documented in the sixteenth century. The project included an assessment of documentary sources, including maps and photographs, to obtain a detailed understanding of the historic development of the settlement and of its historic topography, buildings and other features. Fieldwork was undertaken to record historic fabric and characterise buildings and streetscapes. Generous assistance throughout the project came from the local knowledge of Anne and Rod Knight of Boscastle, who are compiling and maintaining a comprehensive community local history archive.

Bridge and Quaytown are now notable for a well-preserved group of post-medieval buildings and other structures associated with industrial activity, fishing and the settlement's important role as a port and commercial centre: coal and a wide range of consumer goods were imported through Boscastle harbour and sold across a wide area of north Cornwall; slate from nearby quarries was the major export. Surviving buildings include former corn and manganese mills, a lime kiln, malthouse, two or more pilchard cellars, warehouses, coal stores, stables and workshops, as well as pubs, merchants' houses and other dwellings. In the first half of the nineteenth century Boscastle's trade fell into the hands of a small group of merchants and some of the effects of the vicious rivalries between these individuals are still evident in the historic environment.

Much of what is now visible in the area is nineteenth century in date, including two well-engineered routes – the Private Path and New Road – which were created to provide easier routes to and from the harbour for road traffic. There are also a number of houses which probably date from the seventeenth century, however, and there is documentary and archaeological evidence for a variety of early industrial and commercial activity, including a pottery. From the mid nineteenth century Boscastle developed additionally as a genteel holiday resort, with interest stimulated by its

spectacular natural setting in the Valency valley and proximity to some of Cornwall's finest coastal scenery. This element of its past is clearly visible in the presence of a number of high-quality Victorian and Edwardian villas, guest-houses and hotels, as well as a network of cliff walks. In the twentieth century the dominance of the visitor trade led to the conversion of many of Boscastle's older buildings for tourism-related uses, but this fortuitously preserved the historic port and its associated components in unusually complete form.

In addition to producing an historical account of Boscastle's development and an inventory of its principal historic features, the project identified a number of past flooding episodes and assessed responses to the risk of flooding evident in the locations and uses of historic buildings. It also provided an overview of the ways in which changes in historic land use inland may have affected water run-off. The report summarised the historic character of the two areas most affected by the flooding, in terms of the key features of their settlement topography, architecture, materials and other distinctive factors, together with indications of appropriate principles for managing future change. It also made recommendations for more than 130 sites and features in the lower Bridge and Quaytown areas.

Finally, the clearing-up process after the floods provided an opportunity for cooperation with other agencies. Particular instances included detailed advice to highways engineers on reinstating the distinctive cobbled rainwater gullies in High Street and Fore Street, Boscastle, and inspection with the Environment Agency of management works along the River Valency upstream. The opportunity was also taken for archaeological observation and recording of a number of historic buildings and features revealed or otherwise made accessible during repairs and reinstatement.

• Project officer: Graeme Kirkham. Urban characterisation advice: Nick Cahill. Historic buildings specialist: Eric Berry. Project managers: Peter Herring, Veryan Heal.

Trerice, Newlyn East

HES was commissioned by the National Trust to carry out an archaeological survey and initial historical assessment of the Arundell family's great house at Trerice. A detailed three-dimensional measured plan of the area around the house was made, and the outer grounds were sketch-surveyed. A tree survey was also undertaken and readily available primary and secondary historical sources were consulted.

Trerice is among the most innovative of Tudor Cornish houses and is now one of the most well known and best preserved; its associated barn is also a rare survival from the period. The house's east front of fine yellow-grey stone set with glinting windows and topped with curving, scrolling gables, seemingly casually cast into the side of its valley to lie among the sprouting sycamores like an old gold crown, has become an icon of the Tudor age for the people of Cornwall, and for its many thousands of visitors. With the continuing expansion of nearby Newquay, the house and barn have acquired a new importance, conserving the ancient agricultural character of the landscape and its farm-based wealth in a district increasingly built-up and dependent on the tourism and service industries.

The Trerice complex developed from a medieval hamlet and later manorial precinct to an ambitious layout associated with the great house of around 1570. The Tudor core can still be seen: a domestic and ornamental zone east of the house and the farmstead centred on the surviving great barn on its west. The house and barn are flanked on either side by three main enclosures, like green steps climbing the slope. The enclosures have superficial similarities, all now garden terraces, but these are the result of sequences of changes culminating in the second half of the twentieth century when those at the rear were terraced and surfaces throughout were laid to lawn. Despite the alterations, their origins and functions can be identified through a combination of archaeological and historical evidence. The three steps to the front, the public side, represent a rare suite of Tudor high-status ornamental grounds – bowling green, forecourt, and formal garden – largely undisturbed below ground, and so retaining potential for buried features such as paths and beds. The more altered enclosures to the rear were used for agricultural activity and their complex history of growth, adaptation, decline, and conversion to garden reflects both changing farming practices and shifts in the status of such activity relative to domestic life.

The survival with limited modification of the Tudor layout of the core of Trerice over the following centuries when the Arundells held the property, and from the later eighteenth century when

it was in the hands of the Aclands and other families, has its own fascination. It shows the influence on gardens, as on houses and the activities of their people, of conservatism and pride, and family and wider history. Other, natural, constraints were imposed by the confines of the site nestling among valley slopes, a siting that had earlier attracted settlement and manorial status to Trerice in medieval times through its shelter, springs, and fertile lands.

Also of significance for their contribution to understanding the development of Cornish farming and ornamental landscapes are remains in the outer areas of National Trust land at Trerice, now fields and overgrown woods. These include banks from Trerice's earlier medieval strip field system and a previously unrecorded eighteenth-century landscape park attributed to the last Baron Arundell of Trerice, marked by walks, trees, and a series of silted lakes. It reflects the naturalistic design characteristic of such parkland, but on a relatively small scale, suggesting the play of some of the same conservative influences that preserved the Tudor front of Trerice. The park's greater lake system, below the main car park in an area known as the Wilderness, is now abandoned to the woods, but still has well-preserved curving water features, dams, walks and original trees. The gardens and grounds have been valued in modern times primarily as a quiet setting from which to view the renowned house and barn. Now, following this survey, the inherent significance of these areas can also be seen, enhancing and expanding the historic interest of the structures.

- Project officer: Cathy Parkes, aided by Peter Herring, Nigel Thomas and Megan Val Baker.

Mineral Tramways Conservation Management Plan

A conservation plan developed by HES will inform conservation works and improved access to industrial heritage sites as part of the Mineral Tramways Heritage Project, managed by Cornwall County Council's Countryside Service. The Mineral Tramways concept was developed in the 1980s by the former Cornwall Archaeological Unit (now HES) as a means of developing the network of nineteenth-century mining tramways in a broad zone from Devoran through Camborne and Redruth and across to Portreath. These are both trails in their own right and also link and provide access to many important industrial heritage sites which were formerly served by the tramways.

Works have been carried out to mineral tramways sites and trails over the past 14 years. The Mineral Tramways Heritage Project (MTHP) is the final phase of the main works to implement the Mineral Tramways Strategy. It involves building consolidation and provision of safe public access within 13 mining heritage sites (mainly former mining or industrial complexes), and the creation of four new trails (about 30 km) in addition to the already established Mineral Tramways network.

The sites are United Downs mine (Ale and Cakes) at St Day, Betty Adit dressing floors (Brea), Consols (St Day), Cusvey engine houses (Wheal Fortune mine, Gwennap), Grenville New Stamps (Troon), Higher Condurrow (Camborne), Marshall's Shaft (Troon), Penhallick leats (Brea), Thomas' Shaft (Carn Brea), Tolgus calciner (Redruth), Unity Wood mine (Chacewater) and Wheal Fortune mine (Gwennap). The trails consist of the Portreath Branch Line, the Redruth and Chasewater Railway Trail, the Tehidy Trail and the Tolgus Trail.

- Project officers: Bridget Gillard, Ainsley Cocks, Jane Powning. Project manager: Colin Buck.

National Mapping Programme

During 2004–5 the mapping of Cornwall was suspended temporarily to allow the project team to work on a small area in central Devon. This change was in response to proposals to build a biomass-fuelled electricity generator plant at Winkleigh airfield, a disused World War II site some 15 km north east of Okehampton. The preferred biomass crop is *miscanthus*, otherwise known as elephant grass, a fast-growing plant from south-east Asia which can reach a height of 3.5 metres. In favourable conditions it can yield 20 tonnes of dry matter per hectare per year and it is estimated that up to 10,000 hectares will be required to fuel the proposed generator. There are concerns within the archaeological community over the cultivation of *miscanthus*. It requires deep ploughing prior to planting, is harvested in winter which is likely to lead to soil compaction, and requires grubbing up at the end of its productive life. Collectively these factors pose a significant threat to buried archaeological remains.

Defra guidelines recommend that for a biomass plant to be viable, sources of energy crops be limited to within a 40–km radius of the generator site. The planting catchment area therefore included all of central and north Devon and even parts of east Cornwall. Much of this landscape is traditionally one

of long-established permanent pasture, with only marginal improvement in recent times. Because of the pastoral tradition and a lack of development in the region, little research or survey work has been undertaken and, in consequence, knowledge of the archaeological resource is limited. English Heritage is supportive of renewable energy but has, as the statutory body, an obligation to weigh the advantages of such proposals against the potentially adverse impact on the historic environment. There was therefore an urgent need for further research and hence the Winkleigh NMP project. To gain a rapid overview of the likely archaeological potential of the entire area the project focused on four sample transects, each comprising four quarter map sheets. The transects were selected with the aim of testing the various landscape zones, soils and geologies within the wider catchment as well as taking into account Historic Landscape Character zones.

The first seven map sheets completed resulted in more than 400 sites entered into the project database, of which two-thirds were previously unknown. A wide variety of sites was mapped, including a Neolithic causewayed camp at Raddon Hills, Exeter, a range of prehistoric enclosures (presumed to be settlements), a Roman military complex at North Tawton, a large number of medieval or later field boundaries and a number of remains dating from World War II. One of these was a possible prisoner of war camp at Kenn, to the south west of Exeter, which, if verified, would be a new addition to the national register of such camps. Additionally, several nineteenth-century catch meadow irrigation systems were recognised. This was a method of land improvement intended to bring on an early growth of spring grass and requiring the creation of parallel leats running along the contours across hill-slopes. Water holding tanks provided a flow of water along the leats which were allowed to periodically overflow, the water spilling down the slope.

- Project officers: Carolyn Dyer (English Heritage); Emma Trevarthen. Project manager: Andrew Young.

Anchor Warehouse, Penryn

Proposals to convert the surviving building prompted an historic building analysis of the standing structure, together with an archaeological watching brief of below-ground remains, both inside and immediately west of the surviving building. The archaeological recording works were funded by Harbour Village Ltd, the site's developers. The survey provided a detailed record of the workings and development of this prominent building at a time when Penryn was a busy industrial town. The Anchor warehouse, situated on the quays near the mouth of Penryn creek, was founded in the 1840s by the Meade brothers, merchants in Penryn, who undertook bone milling as well as importing other manures such as guano. This structure was constructed as a purpose-built steam-powered bone mill and manure processing works. Imported cattle were slaughtered in Penryn's abbatoirs, the by-products of hides being processed in local tanyards and the bones crushed for manure. The business at the Anchor Warehouse later expanded into production of superphosphates by treating bonemeal with sulphuric acid, one of the earliest steps in the manufacture of chemical fertilisers. The business continued until the earlier part of the twentieth century.

The surviving structure once formed the centre of a larger industrial complex, but other buildings that once occupied the quayside were demolished during the twentieth century. Earlier trenching works revealed substantial landfill above the mud of the creek to form the present quaysides. Similar work to the west revealed the upper parts of a medieval harbour pier.

A watching brief revealed areas of brick floors and the sites of two boilers to the west of the surviving building. One of these was located within a brick-built boiler house and supplied steam to a small beam engine located in the adjacent engine house. This replaced a boiler sited within the main building. Later the boilers seem to have provided steam for various chemical processes that took place on the site. An unexpected find was the site of the slew mill, used to crush the bonemeal. This comprised three granite drums, one *in situ* and forming the base of the mill, the others being runner stones, which were originally upright and turned on an axle rotating in a circular trough, similar to a cider mill. A machinery plinth close to the engine's crankshaft probably supported gearing and a drive shaft to the mill. An underground reservoir about 4m square which once provided water storage for the site was also revealed. This feature, roofed with concrete, is associated with later working of the site, perhaps contemporary with the 1915 date inscribed on a concrete pier of the building.

Inside the building fireboxes and long brick-lined flues were found below the present floor level. Most

of these connected with the extant internal chimney. The site of the later boiler house was also revealed. Within the engine house the cylinder bedstone for the rotative beam engine was discovered beneath a twentieth-century concrete floor. Bolt holes through the granite indicated the cylinder was 30 inches in diameter. There was also ample evidence within this building that the original steam engine was replaced, probably in the early twentieth century, by either a gas or oil engine. Inserted timber beams blocked the higher levels of the building and would have precluded use of a beam engine.

- Project officers: Neil Craze, Matt Mossop, Jo Sturgess, Carl Thorpe. Project manager: Nigel Thomas.

Red River, Rosewarne

The Red River took its name from the colour of the iron oxides in the fine waste material disposed of by mines along its banks during the eighteenth and nineteenth centuries, mines such as Dolcoath, South Crofty, Roskear and Wheal Seton. Although these sands and slimes had been processed, they still contained significant amounts of tin and numerous tailings works sprang up along the Red River to reprocess and refine this waste material. HES was commissioned by Scott Piesold, contractors acting for the Environment Agency, to undertake a watching brief during excavation of a series of trenches in advance of works for the Red River pilot project, set up to reduce polluted mine water discharges suspended in the Red River near Rosewarne. Documentary research indicated that the trenches proposed in the valley bottom to the north of Rosewarne would intersect features associated with the two of the many Red River tin salvage works. Two trenches proved to be on disturbed ground but the third revealed two lined, U-shaped ditches, part of a series of elongated parallel settling tanks documented on the 1880 and 1907 Ordnance Survey 1:2,500 maps. A wooden settling tank was also uncovered adjacent to these ditches, probably dating from a later phase of operation. Trench 4 exposed two rectangular cuts with some hewn wooden planks in their bases. Two smaller trenches here showed a good cross section of deposits. The waterlogged conditions allowed for good preservation of the wood and the possibility of obtaining datable organic deposits. Four samples from Trench 3 analysed for tin residue content provided a useful indication of the high levels of fine cassiterite available to these tin salvage works.

Because of the scarcity of surviving evidence for these tailings works, the importance of these excavation findings is high, especially because of the finding of undocumented timber-constructed tanks and other features. It is clear that most if not all of the mapped buildings on the site would have been timber framed and roofed with galvanised sheeting or timber planks, but whilst these were generally mapped by the Ordnance Survey, small-scale detail was not. Again, although the settling strips plotted on the 1880 and 1907 OS mapping are known to have been very common within the Red River valley, few survive as earthworks, and this is the first occasion on which it has been possible to determine to what degree they survive in apparently 'blank' areas and to investigate their construction and dimensions. It is clear that their survival is likely to be far more extensive than had previously been thought and that archaeological watching briefs are capable of providing worthwhile information about a relatively poorly-documented industry.

- Project officer: Emma Ruddle. Project manager: Adam Sharpe.

Scarcewater, St Stephen-in-Brannel

HES was commissioned by Imerys to undertake excavations ahead of the construction of a china clay tip covering 30 hectares at Scarcewater, near St Stephen-in-Brannel. This resulted in the investigation of the largest area ever to have been excavated in Cornwall, from March to November 2004, and produced evidence of how this landscape had been used over thousands of years. Previous fieldwork had already revealed a long history of ceremonial and settlement activity spanning some five millennia. Geophysical survey had located a Bronze Age ring-ditch and later prehistoric (Late Bronze Age/Iron Age) roundhouses and a hilltop enclosure within the development area. Ditched field systems were also identified which are likely to date to this period. Subsequent evaluation trenching confirmed the importance of these sites and led to the recovery of pottery dating to the Bronze Age, Iron Age, Romano-British and medieval periods.

The site was split into three 10 ha divisions (Areas 1, 2 and 3) and finds and features were uncovered which appear to represent phases of prehistoric activity in the Neolithic, Early Bronze Age, Middle Bronze Age, Later Bronze Age/Iron Age and the Romano-British period.

Evidence for Neolithic activity occurs in the form of a small number of pits, some of which contained evidence of burning suggesting that they were used as hearths. A small quantity of flints is also likely to date to this period. The area does not appear to have been intensively settled during the Neolithic, but was perhaps visited on a fairly regular basis, perhaps by bands of people on hunting trips or pastoralists moving their flocks and herds between lower-lying ground and the St Austell uplands.

The Early Bronze Age was less clearly represented. Some of the many scattered pits investigated may be of this period, as may two circular sites defined by ditches, located on the summit of the hill in Area 2. The first site was defined by a segmented ditch which measured 12m in diameter. It produced only a quartz pebble and an abraded sherd of pottery. The second site, 9.7m in diameter, was encircled by a penannular ditch with an entrance which faced to the east. A small assemblage of Iron Age pottery was recovered from the site. In advance of radiocarbon dating, it is possible that the ring-ditches were either ceremonial sites of the Early Bronze Age which were reused in the Iron Age, or are in fact of Iron Age date.

The Middle Bronze Age (1500–1000 BC) produced the first clear evidence of permanent settlement: three roundhouses and a scatter of pits were found in Area 1. The roundhouses were arranged on a north east to south west alignment and all three had south-facing entrances. The houses are characteristic of this period in being slightly hollowed into the ground. The smallest was only 5m in diameter and was found at the north-west end of the settlement; the largest, at the south-west end, was 12m in diameter. The larger roundhouse was also the only one to have had two consecutive buildings constructed within the hollow. All three roundhouses were associated with Trevisker ware pottery and all three were purposefully dismantled and the hollows backfilled when the houses were abandoned. Stone walls were built around the perimeters of the disused sites so that they remained as prominent places in the landscape long after their inhabitants had departed.

Perhaps most significantly, because of the rarity of this sort of evidence, traces of unenclosed or lightly enclosed Later Bronze Age and Iron Age activity were detected across all three areas. In Areas 1 and 2 this was represented by the enclosure of part of the hilltop by a shallow ditch, a few ditched boundaries and possibly by three sub-rectangular post-built structures. The hilltop enclosure has already been radiocarbon dated to the Bronze Age/Iron Age transition. Because they were not set within hollows, preservation of the post-built buildings was quite poor. Further analyses will be needed to accurately date these buildings. Artefacts from some of the boundary ditches also suggest that fields defined by ditched field boundaries were present during this period. The two ring-ditches discussed above could also belong to this period. If this is the case they would provide a rare glimpse into Later Bronze Age or Iron Age ceremonial activity.

In Area 3 carinated pottery dating to the Later Bronze Age was recovered from within a pit and from a D-shaped enclosure with a central post-built roundhouse inside it. Interestingly, the western side of the enclosure, which faced onto the historically unenclosed downland, was open, whereas the side facing the settlement areas may have been palisaded. Radiocarbon dating and analysis of the artefacts are needed to accurately date this site.

The Romano-British period was represented by the ditched boundaries of a rectilinear field pattern and by human burials. The ditched fields appear to have been associated with an unenclosed settlement, which probably lay to the south of the project area. Two human burials were located close to a deeply cut boundary which may have marked the northern extent of the settlement zone. The first burial was inside a stone box or cist which had been set into the ground. No traces of human bone survived but a few sherds of Romano-British pottery were recovered. The second burial was found within a deeply-cut grave. Although no bones survived, a slight stain on the bottom of the grave indicated where the body had been. Finds from this burial included a copper alloy brooch and iron hobnails from a pair of boots or shoes.

- Project officer: Sean Taylor. Project staff: Abigail Brown, Carmello Grasso, Neil Craze, Graeme Kirkham, Anna Lawson-Jones, Matt Mossop, Emma Ruddle, Stuart Randall, Konstanze Rahn, Francis Shepherd, Christopher Southwell, Helen Thomas, Anna Tyacke, Dave Williams, Imogen Wood. Project manager: Andy Jones.

Higher Besore, Threemilestone (Richard Lander School)

During summer 2004, excavations by a team from HES in advance of the development of the new Richard Lander School and access road on the outskirts of Truro revealed a large and remarkable

Iron Age settlement. The work was commissioned and funded by the Property Client Group, Planning, Transportation and Estates, Cornwall County Council. Earlier evaluation – geophysical survey and trial trenching in 2003 and 2004 – demonstrated archaeological potential in this area, so at the beginning of the development mechanical topsoil stripping for the preparation of the new school playing fields was carried out under archaeological supervision. This revealed an Iron Age settlement of 14 structures. Seven of these were roundhouses, each approximately 10m in diameter with an entrance on the east and surrounded by a circular ditch, possibly an eaves-drip gully to collect rainwater from the roof. Postholes indicated the positions of the posts which supported a timber roof structure. Hearth pits were also found. The depth of the surrounding ditches suggests that they would have provided material with which to construct walls, which in some houses seem to have been built of naturally occurring white quartz stones; these had tumbled or been deliberately pushed into the roundhouse ditches when the buildings went out of use. Potsherds recovered from the postholes and roundhouse ditches included elaborately decorated later Iron Age South Western Decorated Ware as well fragments of amphorae used for wine imported from Italy, perhaps during the first or second centuries BC. Fragments of industrial residues from some ditches and postholes suggest small-scale industrial activity on the site.

The other structures were oval, the larger ones about 14m long, the smaller ones only 7m. The larger oval structures had surrounding ditches with entrances, like the roundhouses, but in all but two cases lacked the concentration of internal post-holes and hearths. Typically, one roundhouse and one large oval structure were grouped together and in two cases the group included a smaller oval structure. At present the roundhouses are interpreted as domestic buildings, the larger oval structures as stock enclosures, cereal storage areas or other areas of outside activity. With two exceptions these structures appear to have been unroofed. The small structures could be animal pens or cart sheds. To the west and south of the settlement was a complex of ditches, probably defining contemporary field systems. Late Iron Age pottery was also recovered from these ditches.

Previous archaeological work has indicated that the usual form of settlement in Iron Age Cornwall was in 'rounds'; that is, defended farming settlements enclosed by ramparts and ditches. The settlement uncovered at the Richard Lander School site is a rare discovery in that it appears to be unenclosed, a form virtually unknown in Cornwall, although some sites have been suggested from air photographs, as at Pentire Farm, for example, close to the Rumps cliff castle. It is even more interesting because there are two rounds close by. One of these, excavated in 1960 and 1974 in advance of housing development on the outskirts of Threemilestone, produced South Western Decorated pottery and contained both circular and oval structures. Activity within the round is therefore apparently contemporary with the Richard Lander site. The proximity of another round identified by air photography and geophysical survey raises questions regarding the relationships between unenclosed and enclosed settlement and, if they are contemporary, suggests a densely occupied area of differing settlement types.

In addition to the Iron Age settlement, evidence of Late Bronze Age activity was revealed. This included pits and postholes, one of which was found to contain fragments of Late Bronze Age pottery known as Plainware and part of a sword mould so far unique in Cornwall. These artefacts date to around 1100 BC. The pits and postholes occurred in two groups, each probably indicative of roofed structures; one of these postholes contained a large saddle quern for grinding cereals.

● Project officer: James Gossip. Project staff: Peter Dudley, Neil Craze, Carmello Grasso, Lynne Hendy, Anna Lawson-Jones, Hilary Orange, Konstanze Rahn, Stuart Randall, Theresa Rowell, Emma Ruddle, Jens Samuel, Marc Steinmetzer, Jo Sturgess, Helen Thomas, Anna Tyacke, Megan Val Baker, Katie Watkins, Imogen Wood. Volunteers: Fred Brown, Steve Crabb, Abby Dunk, Jeremy Hargreaves, Jean Hughes, Karen Kitson, Louise Knight, Sally Oakley, Adrian Rodda, Ryan Smith, Trudy Staynings, Mick Triplett, Amy Wearing, Nigel Williams and Christine Wilson. Project manager: Charles Johns.

Cornish Archaeology 43–44, 2004–5, 201–202

Exeter Archaeology: projects in Cornwall, 2004–2005

2004

7–9 Crockwell Street, Bodmin SX 8163 7837

A. Collings, N Goodwin, A Passmore and C Whitton of Exeter Archaeology carried out an assessment, followed by evaluation, a watching brief and building recording for Parkes Lees Architects on this site, which lies within the presumed area of medieval occupation and beside the Bodmin Town Leat. Excavation revealed a rock-cut well and pits of thirteenth- to fifteenth-century date, and fragments of later houses. Nos 7–9 Crockwell Street were the only standing structures; they had been built as a row of three houses with timber partition walls, possibly in the seventeenth century, but had undergone extensive changes in the late eighteenth or early nineteenth century and had been amalgamated into a single unit. (Exeter Archaeol. Proj. 4839)

Hatt House, Botus Fleming SX 3974 6234

R Parker, P Manning and G Young of Exeter Archaeology conducted a building assessment for H and F Symons and Jonathan Rhind Architects to inform proposed alterations. The core of the house is a much-altered range of sixteenth- or perhaps early seventeenth-century date whose best room was at its northern end; the addition of a floral plasterwork ceiling wreath here marks improvement *c* 1700. A larger east wing was added in the early eighteenth century; this is one of several progressive brick buildings of this date around Plymouth. It is likely to date to *c* 1730–40 and was probably built for William Symons of Hatt, who became High Sheriff of Cornwall in 1736. Although the house's structural history is more complex than hitherto realised, the early eighteenth century wing is especially well preserved. (Exeter Archaeol. Rep. 04.56)

Harlyn Inn, Harlyn SW 8782 7529

C Whitton of Exeter Archaeology carried out archaeological recording for Mr J Haywood on land beside the Harlyn Inn, immediately to the east of the Iron Age cist cemetery excavated in the early twentieth century. Terracing for a caravan park had unfortunately destroyed almost all archaeological deposits in the areas examined. However, along the northern boundary of the site a buried soil was observed. It was rich in charcoal and had been overlain by two phases of deep sand deposits. A radiocarbon determination from a hazel nut in the buried soil gave a radiocarbon date of 1920–1680 cal BC at 95% probability. (Univ of Waikato Wk-14323). (Exeter Archaeol. Rep. 04.22)

68 Church Street, Padstow SW 9150 7547

J Bell of Exeter Archaeology carried out a watching brief on this site for Mr H Grundy in advance of a house extension. The property lies immediately to the west of the Althea Library site, reported previously *(Cornish Archaeology* 41–42). An area of 9.9 × 10.6m was exposed. It contained no graves of the eighth- or ninth-century cemetery, supporting the conclusion that the western edge of the cemetery had been found on the adjacent site. (Exeter Archaeol. Project Rep. 5238)

9 Well Street, Tregony **SW 9241 4480**

J Bell of Exeter Archaeology carried out a watching brief for Mr and Mrs L Barton on this site, which lies adjacent to almshouses of 1695 and near the putative site of a small castle. No artefacts or features earlier than the eighteenth century were found. (Exeter Archaeol. Project Rep 5265)

2005

Church of St Materiana or Merthiana, Minster **SX 1109 9048**

Recording by J Allan of Exeter Archaeology for the Parochial Church Council followed damage in the Boscastle flood of 2004. Two phases of early sixteenth century fabric were distinguished, the first a major rebuilding of the nave with south arcade and south aisle, the second a chapel flanking the south side of the chancel; they employ slightly differing forms of 'South Hams'-style windows. Extensive areas of undisturbed mortar floor contemporary with the earlier phase were recorded. (See this volume for full report.)

Cornish Archaeology 43–44, 2004–5, 203–209

Obituary

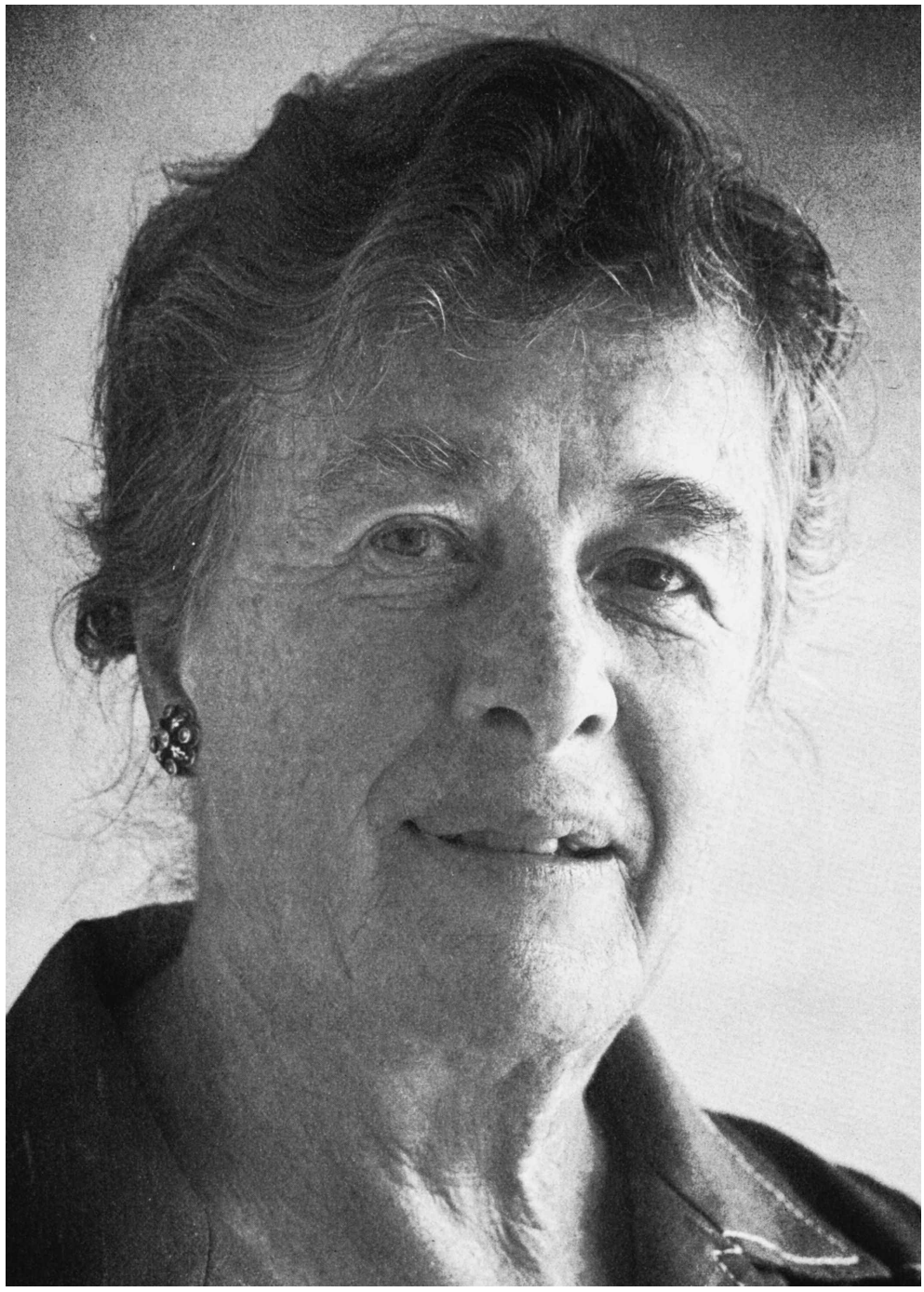
Aileen Fox 1907–2005

Aileen Fox, who died on 21 November 2005, had an enduring influence on the archaeology of south-west Britain through research she undertook while lecturing at the University of Exeter from 1947 until 1972. She joined the West Cornwall Field Club soon after arrival in Exeter and so was a founder member of our Society. Although never a committee member or officer of our Society, concentrating her input into county archaeological society affairs through her involvement with our sister society in Devon, her impact on Cornish archaeology was considerable through her writing and the results of well-selected research projects. In Cornwall she is principally known for her identification of the Roman fort at Nanstallon and for her account of the region's archaeology, *South West England* (1964). In retrospect it may appear strange that she was never nominated as our President, but after formal retirement in 1972 she departed for new archaeological challenges in New Zealand.

Aileen was born on 29 July 1907 and came from a comfortable upper middle class background, her father Walter Henderson a solicitor. She was presented at court in 1926 and, after overcoming some parental opposition, read English at Newnham College, Cambridge, in 1926–9. Naturally sociable and confident, she formed a wide range of acquaintance at Cambridge. At something of a loose end after her degree she decided to take part in an excavation, building on latent interests inspired by her travels with her father. She obtained an introduction to J P Bushe-Fox, Inspector of Ancient Monuments, and went to work in a voluntary capacity at the Roman site of Richborough in the summer of 1929. The next year she returned to Richborough as Bushe-Fox's paid assistant to arrange the site museum and prepare finds reports. Through work at Richborough she made numerous archaeological acquaintances, including Bryan O'Neil, Ralegh Radford, and Reginald Smith and Christopher Hawkes from the British Museum; with the latter she had an incipient romantic affair.

In 1932 she worked with Dorothy Liddell at Hembury hillfort in Devon and, in the same year, met her future husband Cyril Fox, who lost his first wife in a drowning accident later that year. The close companionship of her father and friendship with many older eminent scholars made her comfortable with the prospect of marrying, in 1933, a man 25 years her senior. Cyril Fox, at that time the Director of the National Museum of Wales, was knighted in 1935 for his outstanding work on British prehistory and his development work at the museum. After marriage, Aileen integrated her developing career with the demanding roles of a supportive wife to a high-profile husband and with the raising of three sons. With Cyril or alone, she carried out fieldwork and excavation on a wide range of sites and these provided the foundation for her life-long interest in the Iron Age and its fortifications and in Roman sites in Britain. From 1940 until 1945 she consolidated her knowledge by lecturing at University College, Cardiff, where she realised how much she enjoyed disseminating archaeological knowledge through teaching.

In 1945 Aileen accepted the challenge of three seasons' work investigating the Roman levels of



Lady Aileen Fox, 1907–2005.
(Photograph from the Proceedings of the Devon Archaeological Society, *vol 37, 1979; reproduced by permission)*

war-damaged Exeter before its rebuilding, the earliest systematic 'rescue' programme of its kind (Fox 1952a). This led to an invitation to take up a Special Lectureship in the then University College of the South West in 1947. Initially part-time, this became full-time after Sir Cyril's retirement in 1948, when the family moved to Exeter. As Senior Lecturer she remained at Exeter until retirement in 1972. At Exeter she energetically pursued the development of the teaching of archaeology, only thwarted in the establishment of an archaeology department by the mesh of university politics and of (male) personalities. Throughout her career she was deeply conscious that women had to fight for much that men took for granted and this background injustice was an enduring motivation. Her enthusiasm for her subject, taught unusually for the 1940s and '50s with a strong emphasis on fieldwork, has made her teaching a warm and inspiring memory to several generations of archaeologists, the late Desmond Bonney, Graeme Guilbert and John Allan among them. Archaeology finally achieved its own Department at the University of Exeter in 1998, and now has 14 academic staff and over 200 students.

In 1947 there was no other archaeologist employed in Devon or Cornwall. Over the next 25 years Aileen became involved in all aspects of local archaeology, playing pivotal roles in the Devon Archaeological Society (President 1963–4) and the Devonshire Association. She became archaeological consultant to Devon County Council and played an active part in the local development of the Council for British Archaeology. Her concerns were the protection of archaeological sites and appropriate provision for excavation when development made destruction inevitable; here, as always, she displayed her force of character and persuasive powers. She continued rescue excavations in Exeter until the mid-1960s but recognised that modern techniques and area excavation now demanded full-time staffing. The establishment of the Exeter Museums Archaeological Field Unit in 1971 was largely the result of her efforts, efforts rewarded in that first year by the major discovery of the bathhouse of *Legio II Augusta* in the Cathedral Close. The Unit, now named Exeter Archaeology, continues to provide a high-standard archaeological service in the City and throughout the South West, and she remained a firm supporter of its successive directors.

The impact of Aileen's work in south-west Britain can only be properly appreciated from the standpoint of the times in which she was working. In 1945 there was no formal evidence for a Roman military presence in the region. By 1964, when the first edition of *South West England* was published, her investigations had demonstrated fortlets at Old Burrow and Martinhoe on the Exmoor coast and a probable auxiliary fort at North Tawton. In *South West England* (1964, 140) Nanstallon is identified as a probable fort and the military context thus described: 'A probing thrust to the west in the sixties or seventies [AD] is thus a distinct possibility, designed to open up the peninsula and prospect for metals.' During 1964 Aileen provided the first evidence for a Roman military presence at Exeter (Fox 1968) but it was not until 1971 that excavations by Exeter Museums Archaeological Field Unit indicated a Roman fortress and the presence of a legion. Between 1965 and 1969, Aileen, together with her collaborator, historical geographer William Ravenhill, conducted four seasons of excavations at Nanstallon in order to demonstrate conclusively its military function. This was the kind of research project typical of Aileen and of its time, carefully chosen to provide definite results which would have a major impact on the archaeology of the area.

Nanstallon had been suggested as a Roman fort partly because of its shape, more specifically because of first century AD finds made during the levelling of its earthworks. The excavations confirmed its identification. It had been a small fort, with one principal period of building and some modification; study of the finds indicated occupation between 55–65 and *c* 80 AD, in line with the broad period of military occupation in the south west emerging from work at Exeter. Study of the illustrations in the report (Fox and Ravenhill 1972) show that the buildings in the eastern half (the west was left for investigators of the future) were only partly dug, in line with established practice during the 1960s. Their plans were therefore reconstructed. Fox's measured consideration of these and of the finds lead to her conclusion that the most likely garrison was a *cohors equitata*, a mixed unit of infantry and cavalry. Data indicated that the fort had been deliberately decommissioned.

A series of four interim reports were published in *Cornish Archaeology* (Fox and Ravenhill 1966; 1967; 1968; 1970). These present year-by-year plans which demonstrate the sequence in which the military buildings of the interior of the fort were investigated, a time-depth interpretation which is missing from the full report. The interim reports also provide year on year accounts of grants and

individuals involved, again supplementing the full report.

Apart from Nanstallon, Aileen's only excavation in Cornwall was at Trevinnick, St Kew, again with William Ravenhill. This took place in 1968, when a change in ownership at Nanstallon meant an interruption in the work there, and investigated a rectilinear earthwork traditionally identified from its appearance – there were no previous finds – as a Roman fort. This time, however, appearances were deceptive (Fox and Ravenhill 1969). The enclosure was 'native', with a single entrance. Trial trenches in the interior revealed two curvilinear structures, interpreted as stock enclosures. Trevinnick indeed proved to be an example of the rectilinear version of rounds then being demonstrated at Carvossa (Carlyon 1987). Fox and Ravenhill suggested that these sites might show influence from Roman forts such as Nanstallon, with a tentative date from the minimal quantity of finds from the site put in the first or second centuries. Today, recent work at sites such as Boden (Johns and Gossip forthcoming) shows that rectilinear enclosures in Cornwall can go back to at least the fourth century BC. The presumed Roman military influence on site planning can now be seen very much as a 1960s idea. However, the date for the Trevinnick site can still not be refined beyond the brackets originally put forward. Despite some three decades of further fieldwork by other workers, at the time of Aileen's death no further Roman military earthworks had with certainty been located in Cornwall.

In Devon, Aileen's first excavation campaign outside Exeter took place in 1951–2 on fields and hut circles at Kes Tor, Dartmoor. Their exceptional size and state of preservation had attracted her attention and presented the challenge of dating. She was encouraged in this by Stuart Piggott: 'I do wish that you would try and knock some sense into all those stone huts' (Fox 2000, 117). At this time Later Bronze Age and Iron Age settlement had been identified over much of the chalk uplands of southern Britain, yet the most recent summary of Dartmoor settlement ascribed it all to the Early Bronze Age (Worth 1945). The excavations resulted in the first detailed plans of hut-circle interiors, complete with postholes and dating evidence based on ceramics and evidence for iron smelting. The latter led to ascription of the hut circles and their associated fields to the Early Iron Age. Although recent studies (author) have thrown doubt on this dating and the context of the iron smelting, the amount of detail recorded and published was far in advance of anything previously published for Dartmoor (Fox 1954). The report includes a number of illustrations by Sir Cyril. At this time he was still very active, carrying out fieldwork with Aileen and publishing his own syntheses such as *Life and death in the Bronze Age* (1959). He died in 1967.

On Dartmoor, Kes Tor was followed by Dean Moor, an enclosed hut circle group threatened by the construction of the Avon dam, in seasons from 1954–6. Nine hut circles were investigated and published to a high standard (Fox 1957). The settlement was ascribed to the Late Bronze Age. The pottery is in fact Trevisker ware of the Middle Bronze Age but this was not to be recognised as a distinctive grouping until ApSimon's publication of the eponymous site in 1972; through until the 1980s the dating of Middle and Late Bronze Age ceramics was not clearly understood. Overall, the clear indications from Kes Tor and Dean Moor that the Dartmoor settlements started in the period after the Early Bronze Age have stood the test of time and have influenced how scholars have viewed moorland settlement in Cornwall and on Exmoor. It is typical of Aileen's clear-cut approach to research problems that she regarded her two excavations as broadly conclusive and showed no inclination to explore the topic more broadly by, for example, investigation of a site on Bodmin Moor.

Hillforts had always interested Aileen: she and Cyril had carried out extensive field work in South Wales. In south-west Britain this continued and led to the publication of two substantive papers (Fox 1952b; Fox 1960). In these she identified multivallate hillforts with wide-spaced earthworks as highly distinctive of Devon and Cornwall and of South Wales; in the south west, close-spaced multivallate forts of the Hembury type were virtually never built west of the Exe. Dating evidence was summarised, relating the forts to the Middle Iron Age and the occurrence of South Western Decorated (Glastonbury) pottery: this dating has been supported by subsequent excavations. Aileen's exploration of function for these forts, linking layout and topography, emphasised the likely relationship between these factors and a predominant pastoral economy of local Iron Age groups. This interpretation has been widely accepted. The papers included a number of clear plans of Cornish earthworks such as Hall Rings (Pelynt), Helsbury Castle (Michaelstow) and Largin Wood (Braddock) (Fox 1960, figs 12, 13, 16).

Another contribution to Iron Age studies was triggered by the find by Sheila Pollard in 1970 of an elaborate and well-preserved mirror on a settlement site preceding a Roman villa at Holcombe in East Devon. For its publication (Fox and Pollard 1973), Aileen drew on a wide knowledge of decorated Iron Age art to identify a 'western mirror school' and compile a catalogue of all mirrors then known. This was her last substantive piece of British research before retirement and the subject was one to which she had a particular attachment, partly because of the significance of complex decoration on artefacts she linked strongly to women. This interest led her to follow closely the results of the Bryher cist burial excavations with both sword and mirror; sadly their full publication (Johns 2002–3) did not appear until after her death.

All this work, and very much more not detailed here, underpinned *South West England* (Fox 1964). This was commissioned by Glyn Daniel for Thames and Hudson's Ancient Peoples and Places series. Aileen accepted the commission with pleasure: 'I felt this would be a good opportunity to pull together my ideas and the results of my field work and to produce the first synthesis, long overdue, of early human settlement in the south-west as a whole' (Fox 2000, 126). *South West England* presents a clearly written account of the area's archaeology from the Neolithic period until *c* 600 AD. While much of the interpretative background has now become outdated (for example, the explanation of immigration and invasion as causes for cultural change), the factual data and extensive illustrations (98 plates and 51 line drawings) still form a valuable resource, as does the bibliography to each chapter. It is a skilful drawing together of the results of (then) modern fieldwork interwoven with reinterpretation of antiquarian work, such as that of W C Borlase at Carn Gluze or P O Hutchinson and R Kirwan at Farway. *South West England* was so successful that a second edition (Fox 1973) was brought out by a new publisher. The decade between the two editions necessitated substantial rewriting, especially on the Roman period, with appropriate extensions to the bibliographies. Charles Thomas (1974) finished his review of the second edition for *Cornish Archaeology* thus: 'Lady Fox is a brave woman, and a gifted and fluent authoress. Her regional archaeology can most warmly be commended, and should appeal as much to the advanced student of the peninsula's past as to the fresh beginner.' These comments are still valid today, provided only that readers remember that the data surveyed and the interpretative frameworks within which they are set have now been overtaken by another three decades of research.

On her retirement from Exeter in 1972 Aileen decided to leave staff in the University, Museum and Field Unit, many of whom were in posts created because of her campaigning, to 'get on with' (her own words) the archaeology of south-west Britain, while she accepted the offer of a visiting lectureship at Auckland in New Zealand. She recognised that she needed a new challenge and a new outlet for her energies. The initial appointment was for one year, subsequently extended. There followed a two-year post at Auckland Museum and then the voluntary position of Honorary Archaeologist until 1983. In New Zealand archaeology was still the small world she had first encountered in Britain in the 1930s, although on the brink of major expansion, and provided numerous challenges of the type she enjoyed. Moreover, the principal field monuments, the Maori *paa* or fortified settlements, had some similarities with the hillforts of southern Britain. She conducted excavations at Tiromoana Pa, carried out field survey work with students and became heavily involved in the work of the Archaeological Committee of the Historic Places Trust, which necessitated the compilation of a national register of sites. She was excited by the challenge that the recent Maori archaeology presented, by prehistoric sites which could be studied in tandem with documentation provided by colonial settlers. Extensive publications resulted, including three monographs (Fox 1976; 1978; 1983), each of which has provided an enduring contribution to the study of archaeology in New Zealand. She was also instrumental in the establishment of the *New Zealand Journal of Archaeology*. The esteem and affection with which her colleagues came to hold her is well expressed in the *festschrift* presented to her on her departure, *A lot of spadework to be done* (Bulmer *et al* 1983). The title comes from a typically forthright comment made by Aileen about a New Zealand project; its use for the *festschrift* reflects the warm atmosphere in which her help was accepted and appreciated.

Aileen made frequent return visits to Devon and on one of these her contribution to south-western studies was recognised by the dedication to her of *Prehistoric Dartmoor in its context*, the proceedings of a major conference organised by the Devon Archaeological Society in 1979. The volume

included an appreciative account of Aileen's work by her former collaborator William Ravenhill (1979) and a bibliography of her publications to date by Valerie Maxfield (1979). Aileen finally left New Zealand in 1983 and returned to Devon to live and work. Her paper on the ingots from Bigbury Bay (Fox 1995) and a handbook on Devon hillforts (1996) are significant examples of her late work. In 1985 the award of an Honorary Doctorate by Exeter University provided validation of her long career and proved the source of very great pleasure among the growing restrictions of age. She continued to play an active role in local archaeological affairs, and took a lively interest in current work, continuing to visit excavations and leading a visit to Devon hillforts in her ninetieth year. In 1998 she was awarded Honorary Membership of the Prehistoric Society in recognition of her contribution to the prehistoric archaeology of south-west Britain.

Aileen's final contribution to archaeology was her delightful autobiography (Fox 2000). Written in the 1980s and published in 2000, it is a highly readable account of her life, work and married life, and provides fascinating background to all the research and activities described above. It is also remarkable for the 'flavour' it provides of the character of archaeological life in Britain through the seven successive decades of her involvement. She was very much the archaeological daughter of the pre-war decade in which she started out and in which research over a wide chronological span was acceptable. She liked order and clear-cut explanations. Her search for these among the many quagmires and unknowns areas of south-western archaeology have left us with a legacy of writings which will form the foundations of future research and still be enjoyable to read. For those of us who knew her, who in large part owed their posts to her energy and far-sightedness, acquaintance with Aileen was a privilege and a pleasure. For us all she has left a large legacy of writings, no ends untied, no research unpublished. A long life in archaeology lived fully to the end.

Henrietta Quinnell

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Cornish Archaeology 43–44, 2004–5, 210–212

Obituary

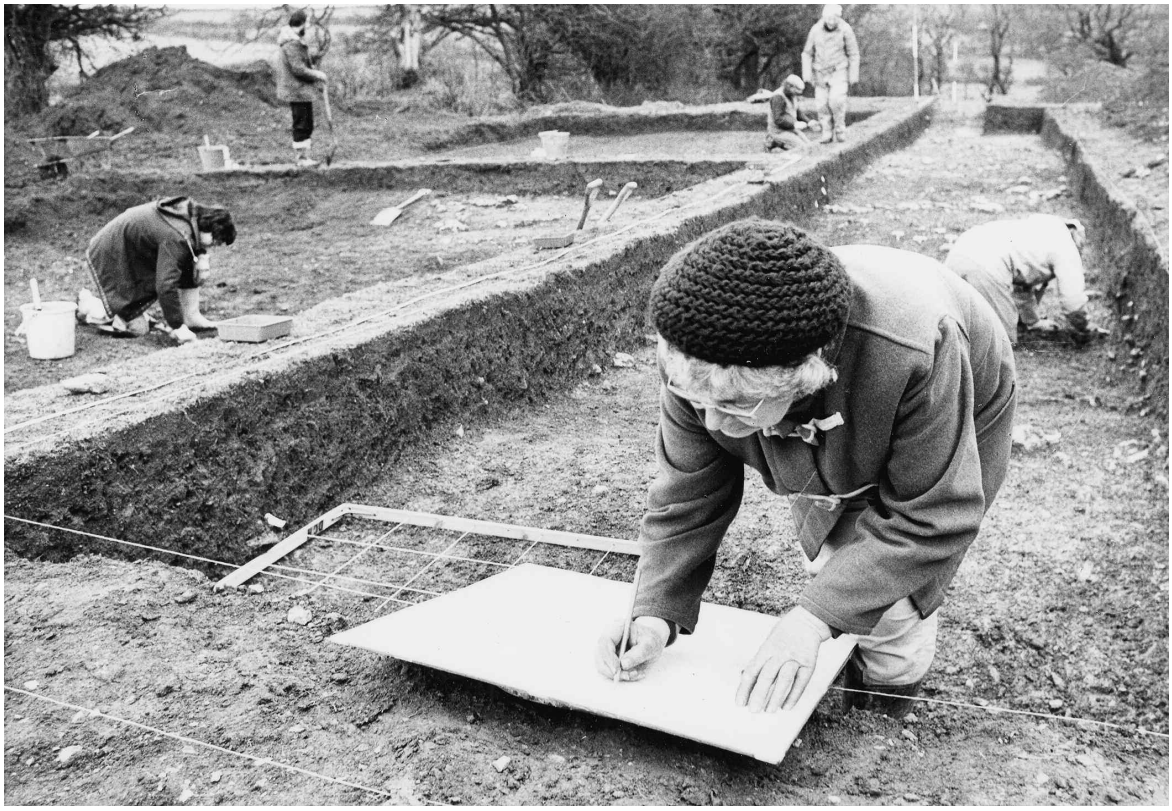
Daphne Harris 1912–2005

With the death of Daphne Harris in June 2005, the Society lost a former editor of *Cornish Archaeology* and an archaeologist who, starting as an 'amateur', made a major contribution to the subject in Cornwall from the 1970s until the early 1990s. She was a member of the West Cornwall Field Club and a founder member of the Cornwall Archaeological Society.

Daphne was born in 1912 and grew up in Bridgend, South Wales. She read Medieval and Modern Languages at Somerville College, Oxford, and became a highly influential teacher of French, working in Oswestry and Brighton before moving to Truro High School just after the war. Her success in teaching and the impact of her strong decisive character are evident from the affection with which she is remembered by her pupils. Her long-standing interest in archaeology was first sparked by Charles Thomas and she then put it to practical use on local sites during the 1950s and 1960s. She became a skilled and valued worker on a number of now-classic sites: Gwithian under Charles Thomas, Garrow under Dorothy Dudley, the cliff castle at the Rumps with Reg Brooks, the courtyard houses at Goldherring with Brett Guthrie. During this period, a now-vanished 'golden age', the finances and logistics of excavation made it possible for individuals and local archaeological societies to organise and fund really important work. Excavations largely staffed by volunteers such as Daphne were significant social events and have lived long in the memories of all concerned. However, towards the end of her teaching career, its commitments and family concerns lessened her involvement in archaeological work for some years.

Daphne retired from teaching in 1972. She had long intended that on retirement she would make archaeology her principal occupation. She joined the University of Exeter Department of Extra-Mural Studies evening classes in archaeology held in Truro and rapidly became involved in numerous Cornwall Archaeological Society projects. In 1975 she joined the committee as Membership Secretary, an onerous position which she held until 1992. In the same year the Society initiated a two-year training excavation at Killibury hillfort in conjunction with the University Extra-Mural Department. Key participants subsequently prepared the report (Miles 1977): Daphne drew the plans and, with Sandra Hooper, prepared the difficult section on stratigraphy. This experience both of modern excavation recording and report publication was the springboard from which she went on to run her own excavations.

In 1975 the Cornwall Committee for Rescue Archaeology (CCRA) was set up, the forerunner of the present Historic Environment Service of Cornwall County Council. This was the first organization in Cornwall to employ full-time archaeologists to deal with the problems of archaeology and development in the county. Under a single director, Nicholas Johnson, it has provided through the years a gradually increasing range of services, supported by a growing number of staff. Daphne represented the Cornwall Archaeological Society on the original Committee for Rescue Archaeology and continued as its representative on its successor panel as the organization moved into closer association with the County Council as the Cornwall Archaeological Unit (CAU) in 1984. Her



Daphne Harris at the Cornwall Archaeological Society rescue excavation at Shortlanesend, March 1979 (photograph: Peter Brierley)

contribution through her long service until 1988 was highly valued by Nicholas Johnson, his staff and other committee members.

Daphne's first significant excavation as director was a collaboration with Nicholas Johnson at the round at Carlidnack in 1976 (Harris and Johnson 1976). A second round was dug at Shortlanesend in 1979 (Harris 1980). Both these sites were of Roman date and the work was carried out for CCRA and the Society with financial support from the Department of the Environment, The same arrangements supported the excavation of small cairns at Stannon on Bodmin Moor in 1976 (Harris *et al* 1984). In 1978 the Society initiated a field-walking programme on the Lizard in an attempt to locate sites at which pots had been manufactured from gabbroic clay. Daphne played a major part in this project and in that year excavated the Beaker site at Poldowrian as a Society excavation. The interpretation of this site is still uncertain but it appears probable that it related to burnt mounds (Harris 1979). From 1979 until 1983 the Lizard Project was extended to involve the Central Excavation Unit of what is now English Heritage under George Smith and included a series of excavations on sites under threat of agricultural damage (Smith 1987). The Bronze Age hut circle at Poldowrian was excavated by Daphne in 1980 as part of the extended project (Smith and Harris 1982). All these excavations were rescue work, very much a mark of both the times and of Daphne's pragmatic temperament. All were promptly and impeccably published. She saw her contribution in excavation as recording archaeological data for the future and she played, as a skilled but unpaid local excavator, a valuable part in Cornish archaeology in a period before CAU had developed to the stage at which it could organise rescue excavation work.

During the 1970s and '80s major attempts were made to publish reports on excavations which had stalled because excavators lacked the time or resource to complete the work. Daphne co-authored Castle Gotha with Andrew Saunders (Saunders and Harris 1982) and provided the illustrations for Threemilestone round (Schwieso 1976). These are just two examples of her determination to see archaeological work properly completed. It was only natural that this attitude and competence led her to take on the role of editor of *Cornish Archaeology* for five volumes between 1987 and 1991. Here the Society owes her a very great debt, more especially as two of those volumes were publications of very substantial excavations, Colliford in 1989 and Trethellan Farm in 1991. In 1996 she was elected a Vice-President of the Society. She could indeed have become President: asked by then outgoing President Charles Thomas in committee back in 1988 whether she would consider this, she replied characteristically 'no thank you, I would much rather remain editor'!

Behind the scenes Daphne was active in most of the Society's activities and the description of her excavation and editing achievements does not do full justice to her involvement over some 25 years. She was always willing to help out with necessary tasks and underpinned the Society's presence at the Royal Cornwall Show through most of the 1970s. Here her ability to engage young children in the mysteries and excitement of archaeology was clearly demonstrated. Her preference was always for practical as opposed to academic work, yet her one excursion into the re-examination of data from a classic site, Castle Dore, provided a valuable reworking of its interpretation (Quinnell and Harris 1984).

Daphne's contribution to Cornish archaeology after retirement was a major achievement. It lies in few peoples' characters to develop such a successful and satisfying second career. Daphne was a shrewd observer with a wry sense of humour: she tended to keep her thoughts to herself most of the time but somehow her friends sensed how these were slanted. In 1976, when her skills in excavation, writing and drawing were being put to maximum use, she sent me a Protest Carol which I still treasure. It is a reworking of the *Twelve Days of Christmas* and it seems appropriate to end this tribute with its final verse.

> On the twelfth day of Christmas Henrietta sent to me
> 420 Castle Gotha features (for which there are not enough days in the year, let alone days of Christmas) all at the same level to be organised into a stratigraphy,
> Eleven lumps of gabbro,
> Ten section drawings,
> Nine Bodwen sherds,
> Eight scraps of bronze,
> Seven lots of pottery,
> Six test hole fillings,
> Five huts of post holes,
> Four Killibury site books,
> Three maps of Europe,
> Two books of Beakers,
> And the report on our Killiburee.

Henrietta Quinnell

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Cornish Archaeology 43–44, 2004–5, 213–216

Review

Trethurgy. Excavations at Trethurgy Round, St Austell: community and status in Roman and post-Roman Cornwall, by Henrietta Quinnell, 2004. Truro, Cornwall County Council. ISBN 1903798124 Pb, £16.60. xvi + 302 pages.

Trethurgy is the only Cornish round which has been fully excavated. It is one of 1000 or so rounds known in the county, but few have been examined in recent times and some important sites such as Grambla and Penhale remain unpublished. Excavation demonstrated that the enclosure was occupied between the mid second and sixth centuries AD, and that it contained a series of distinctive stone-walled oval houses. This much has been known since the time of the excavation in 1973, but only short summary accounts have so far been available. When the flyer announcing the appearance of a full report on Trethurgy dropped onto my desk my interest was therefore aroused: the appearance of a report on a famous excavation fully 30 years after leaving the field is a notable event. Previous experience of so-called 'backlog' reports, however, invited a note of caution; relief that a report has finally seen the light of day can give way to disappointment. The standards and priorities of work undertaken in the mid 1970s were inevitably different from today, and comparison with recent projects can be harsh. 'Facts' confidently asserted in earlier interim reports, and passed on in subsequent syntheses for want of further detail, frequently seem less certain when all the evidence is to hand. The other complicating factor is that such reports are often written by individuals who never even saw the original excavation, for it is an exceptional excavator who can maintain enthusiasm and motivation over several decades. But, early in reading this report, any such fears were quickly shown to be unfounded for the volume is nothing less than a triumph. It is also much more than an excavation report, for it has used the findings revealed in the four months of fieldwork as the basis for a comprehensive assessment of the state of our knowledge of Roman Cornwall at the start of the twenty-first century.

It is often asked who reads excavation reports these days (the Council for British Archaeology commissioned a report entitled *From the ground up* in 2001 to address exactly this question). Canny excavators, especially those from universities with research assessments in mind, have taken to producing two products. A synthetic discussion in a national or international journal where they can be confident that it will be read, while the full and detailed account appears as a monograph which is considered to have done well if sales reach three figures. *Trethurgy* will undoubtedly gain a wider circulation for it is an essential text for anyone interested in Roman and post-Roman Cornwall. The authority with which Henrietta Quinnell discusses her findings recalls classic excavation reports of the 1970s and 80s such as William Manning's first report on his excavations at the Roman legionary fortress at Usk in Monmouthshire, published in 1981. Just as the starting point for any consideration of the earliest Roman campaigns into Wales must start with the results and discussion contained in that report, so must any future consideration of early first millennium AD settlement in Cornwall begin with *Trethurgy*. Quinnell deserves the highest credit for seeing this project through to the end, for it must

have been a lonely pursuit that was at times both daunting and frustrating. The prospect of a team of full-time paid specialists working to an adequate budget and utilising project management techniques would have seemed fanciful when the post-excavation analysis commenced in 1973. How different things would be if Trethurgy was dug now. Far greater resources would be available and there is a growing expectation that, given appropriate funding, it should be possible to publish excavations within three years of coming off site. While most archaeologists now accept that the rapid dissemination of the results of fieldwork should be the norm in professional practice, an inevitable consequence is that there is little or no time to undertake ancillary research beyond standard reportage. The current system thus promotes a situation where competent excavators present their results and discuss them at a site level, but further synthesis and appreciation of wider significance is presumed to be the domain of those who work outside an environment where funding is tied to specific projects.

This is what makes this report different, for Quinnell has thought about the archaeology of Cornwall for decades. Here she brings much of that research together, and there is hardly a single aspect of the material culture of Trethurgy that does not receive some telling insight or comment. While she generously credits those who have assisted her, this report bears her distinctive stamp and characteristic honesty throughout. For instance, she is quick to highlight failings in the site record that have become apparent in retrospect, such as the lack of environmental sampling. The environmental record is indeed weak, especially given that bone did not survive, and future work on other sites of this period in Cornwall should make a conscious effort to increase our understanding of both environmental conditions and the agricultural economy.

In some ways *Trethurgy* might be seen as an old-fashioned report, but this is categorically not a criticism. It presents the stratigraphy and artefacts in detail (the type series for gabbroic pottery is particularly valuable). Indeed, it is fortunate that the period during which the report has been in preparation has seen the fad for microfiche come and go, while the current fashion for digital archives is not yet fully upon us. Following the detailed reporting of what was found the volume concludes with 30 pages of extensive discussion. This is rigorous and scholarly but also continually tries to answer the question of what it would have been like to live at Trethurgy round. There is a distinctly humanising theme to much of the discussion, and I particularly enjoyed the commentary on the colour reconstruction illustration. Individual and group identity and distinctiveness are also much to the fore. Such topics are very much in vogue in the study of Roman archaeology at the moment and *Trethurgy* will be a quarry for postgraduate students researching aspects of 'romanisation' (a word one is not really allowed to use in academic circles these days without numerous caveats explaining what you actually mean by it).

There are too many issues raised by the report to discuss in detail here, so I will limit comment to two themes that particularly interested me. It is now a commonplace that the Roman invasion is archaeologically invisible in the rural settlement pattern of most parts of Britain. For instance, in the Upper Thames valley in Oxfordshire and Gloucestershire the late Iron Age patterns of settlement continued little altered until the second century, when many sites were abandoned or drastically changed their character. Similar sequences are now being recognised in other parts of Roman Britain, so proliferation of rounds in Cornwall in the second century is but part of a wider pattern of discontinuity in rural settlement at this time. Much harder to parallel, however, is the evidence at Trethurgy for continued occupation through the fifth and into the sixth century. Quinnell suggests that this is a reflection of a lack of integration into the Roman economy, which thus insulated the community from the profound effects experienced in most of the province in the fifth century caused by the collapse of the market-based administration. Establishing a chronology in this period is notoriously difficult and future excavations should incorporate extensive programmes of radiocarbon dating, preferably using samples from known contexts that can be statistically related, so that we have the best chance of narrowing down dates in the period between AD 350 and 550.

Another interesting question relates to the *civitas Dumnoniorum*. There can be a tendency to view the *civitates* as uniform entities by virtue of their assumed common administration. The archaeological evidence, however, points clearly to the distinctive culture of Cornwall west of Bodmin Moor (although this may to some extent be emphasised by our almost total ignorance of settlements in east Cornwall and west and north

Devon in the Roman period). In the past this has been interpreted as a consequence of 'romanisation' emanating from the major towns of south-eastern England and trickling down to the far flung *civitates* such as the *Dumnonii* and *Demetae* of South West Wales where it finally ran out of puff. Quinnell, however, emphasises issues of local identity and distinctiveness, and one wonders just how much the effects of the Exeter-based administration were ever really felt in this part of Cornwall.

Trethurgy is an excellent excavation report, one of the best of its kind. It sets the standard for work on Roman Cornwall henceforth. While it will be a challenge for younger scholars and excavators to do better, I'm sure Henrietta will be the first to encourage them to try.

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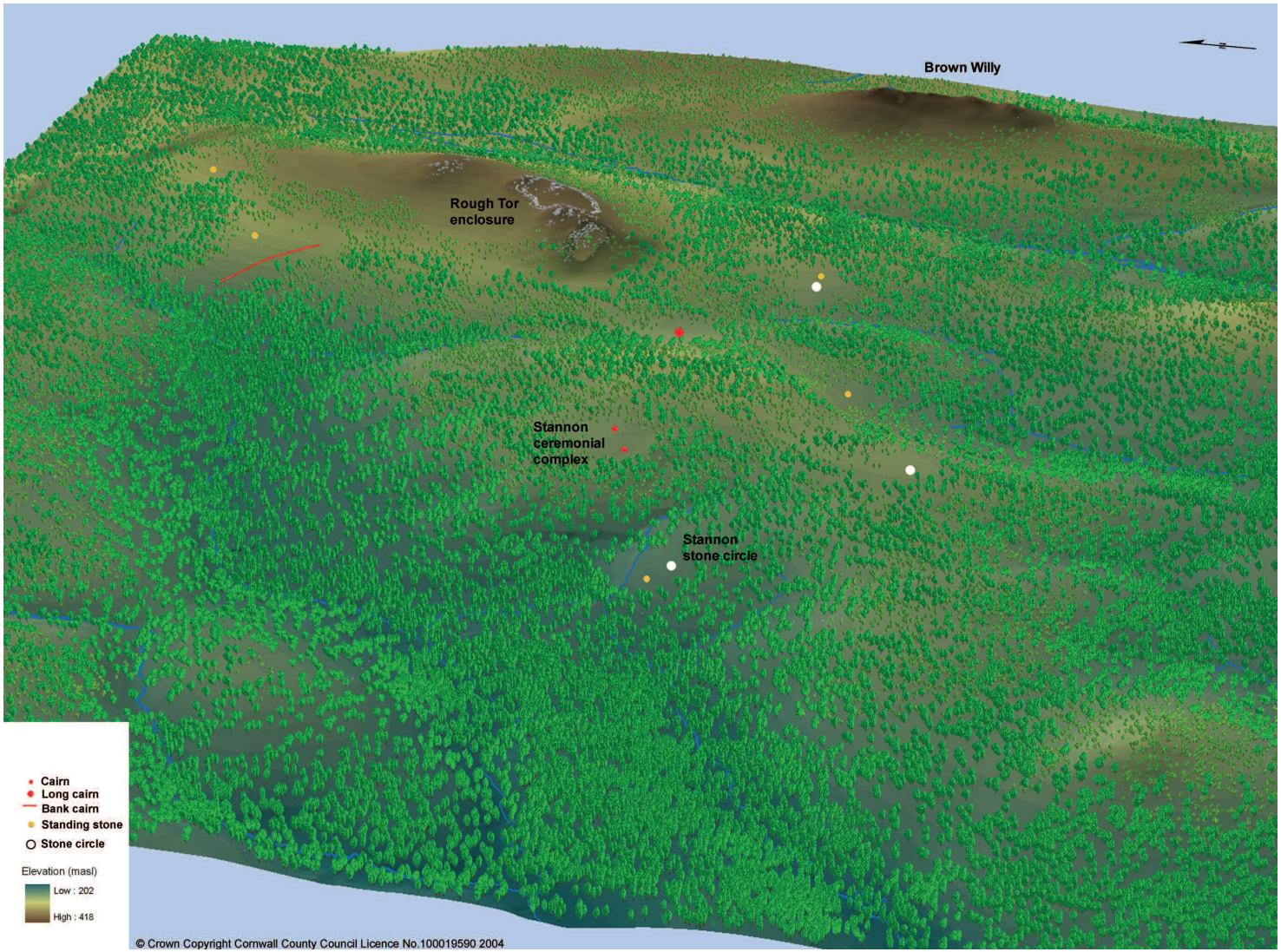
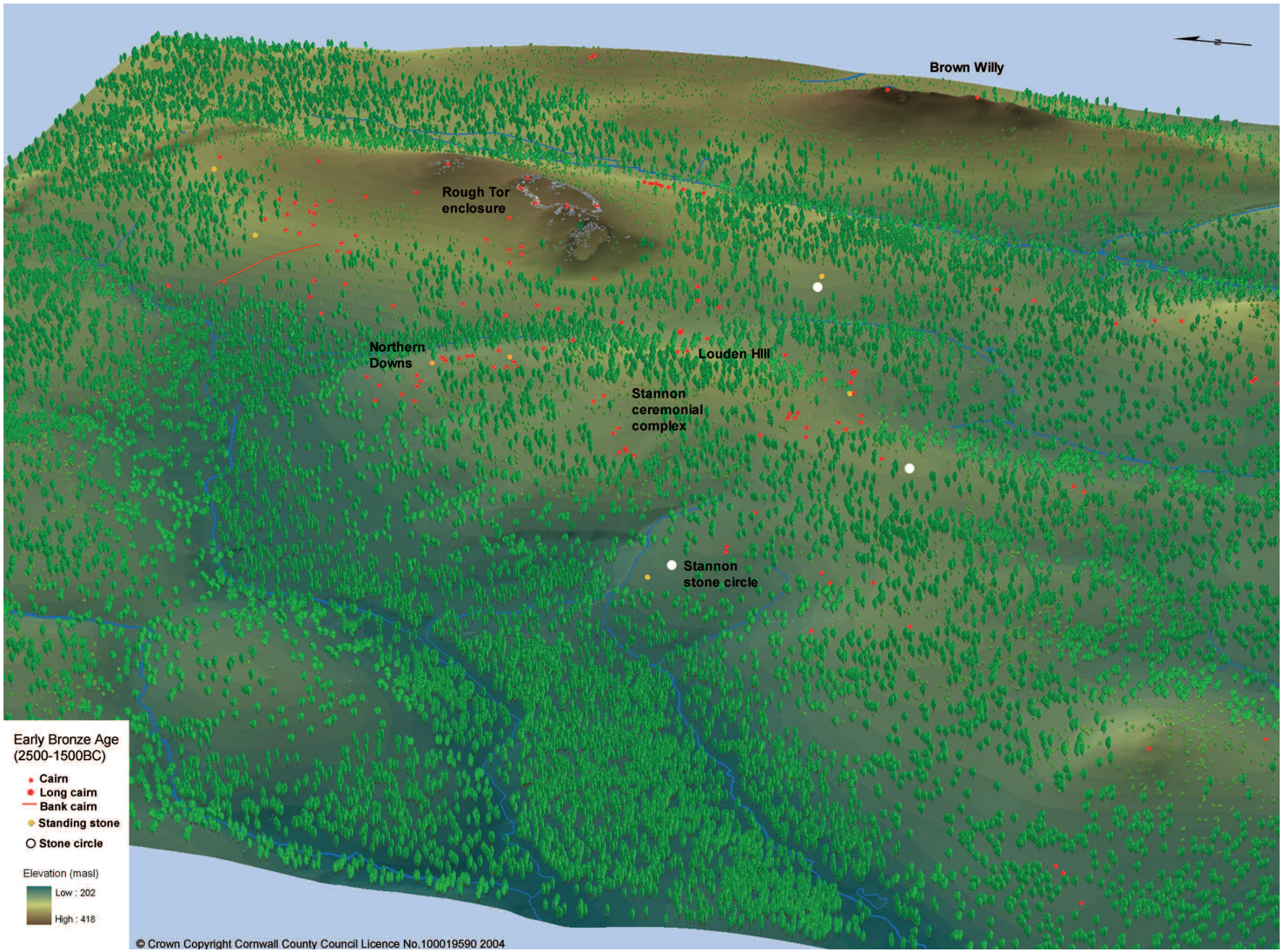
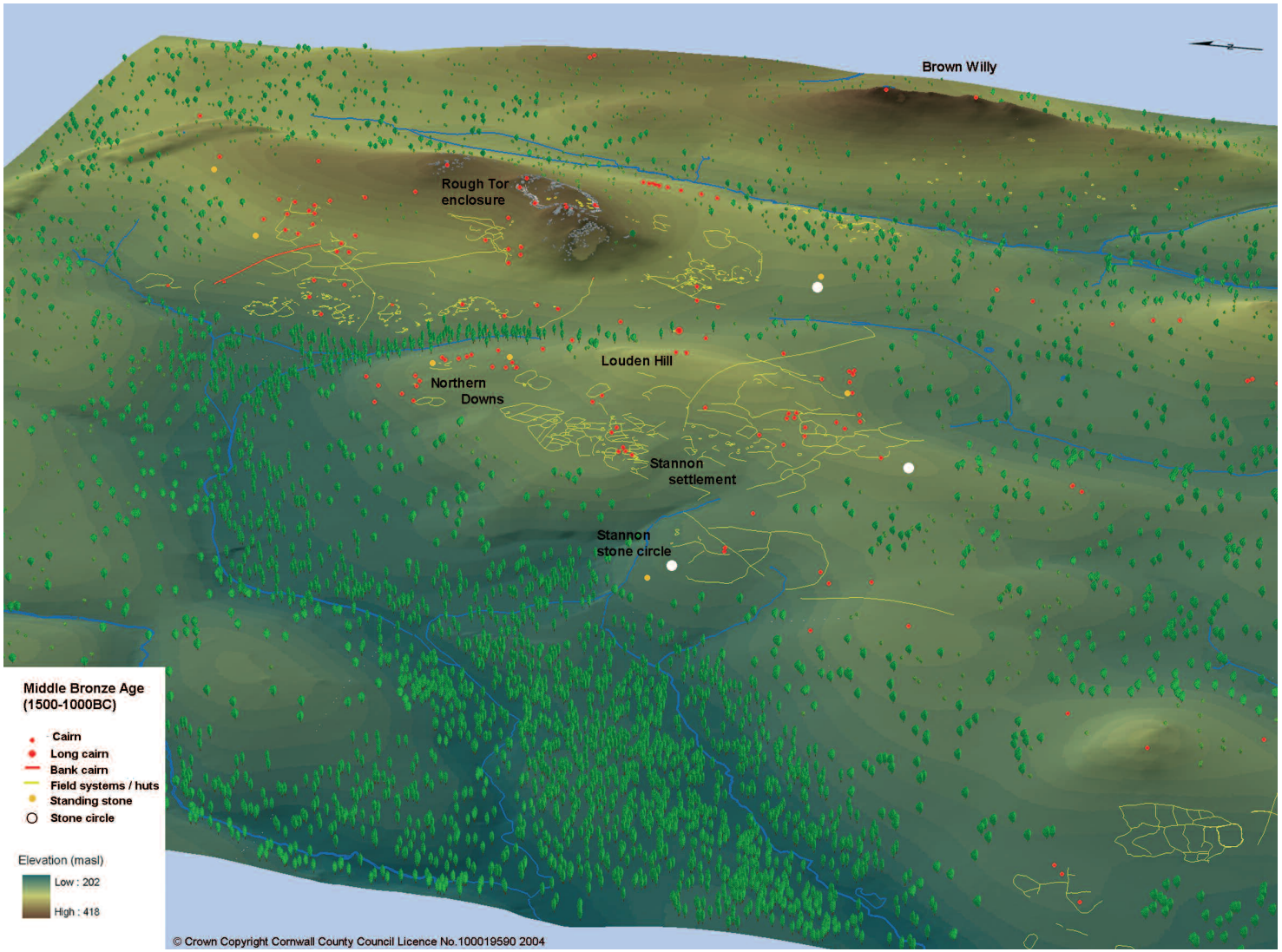


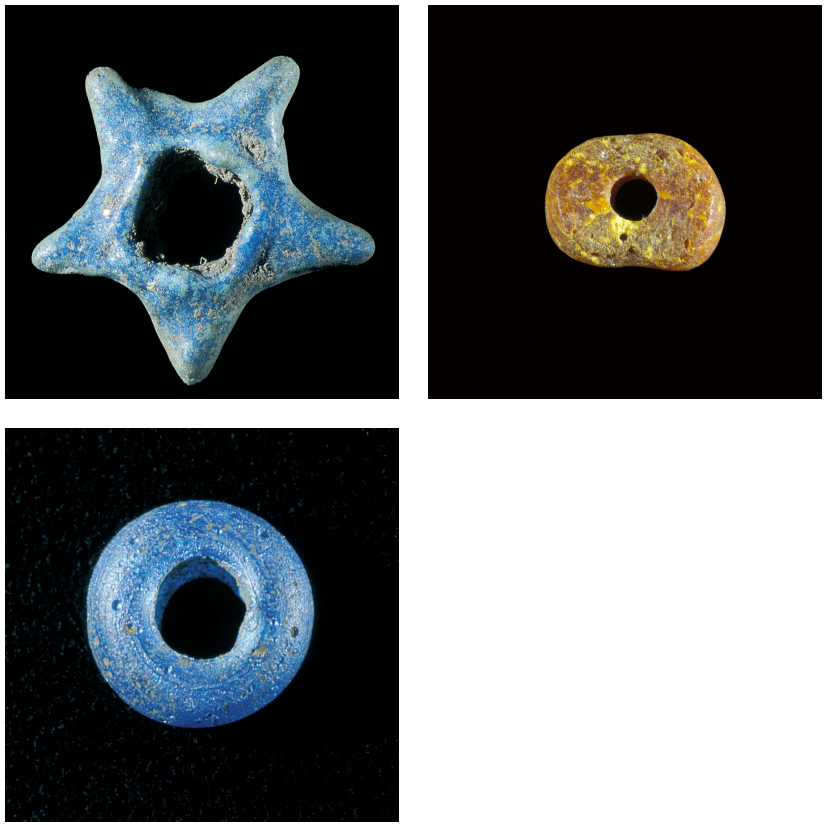
Colour plate 1 Stannon Down and north-west Bodmin Moor: reconstruction of the Later Neolithic landscape. (See A M Jones, Settlements and ceremony: archaeological investigations at Stannon Down)



Colour plate 2 Stannon Down and north-west Bodmin Moor: reconstruction of the Early Bronze Age landscape. (See A M Jones, Settlements and ceremony: archaeological investigations at Stannon Down)



Colour plate 3 Stannon Down and north-west Bodmin Moor: reconstruction of the Middle Bronze Age landscape. (See A M Jones, Settlements and ceremony: archaeological investigations at Stannon Down.)



Colour plate 4 Three beads recovered during the Stannon Down excavations. The five-pointed star faience bead and the amber bead are of the Early Bronze Age; the blue glass bead dates from the post-Roman period. (See A M Jones, Settlements and ceremony: archaeological investigations at Stannon Down)

Colour plate 5 Watercolour, dated 1852, looking southward from the nave of Minster church to the south porch (from a private collection). (See J Allan, After the flood: building recording at Minster church, Boscastle, in 2005)