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A Later Mesolithic activity area at Windmill Farm, The Lizard, Cornwall

GEORGE SMITH

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While ploughing an area of heathland at Windmill Farm on The Lizard, the farmer noticed a considerable scatter of flint objects. These were exposed in an area of dark soil which suggested that a midden or hearths might be present. Excavation of about 200 sq m in an immediately adjoining unploughed area (SW 6931 1470) produced a large assemblage of worked flint and chert of apparently unmixed Later Mesolithic type and revealed shallow features from which radiocarbon dates suggest several phases of activity over some 1500 years within the sixth and fifth millennia cal BC. Organic remains were limited, mostly charred hazelnut shells. The lithic assemblage, however, is very remarkable for the presence of over 900 microlithic elements and 2500 microburins with accompanying waste products. These numbers partly result from the sieving methods of retrieval but there were also over 400 larger flint or chert tools, including several large core tools, denticulate scrapers and over 70 pebble tools. The area was evidently a focus of microlith manufacture accompanied by a range of other activities.

During the spring of 1982 the Central Excavation Unit of the Inspectorate of Ancient Monuments of the Department of the Environment (now devolved into Historic England), in conjunction with Cornwall Archaeological Society, was carrying out a fieldwalking and surface collection project on the Lizard, concentrated largely on the area of gabbroic bedrock, but looking also at the archaeological impact of agricultural improvements to the Lizard heathlands. At this time Mr E D Bishop of Windmill Farm, Landewednack, was ploughing an area of heathland in order to improve it by reseeding, and in doing this noticed an area with a considerable quantity of worked flint. The discovery was reported to the Royal Cornwall Museum, Truro. Subsequently a surface collection was made from the field by members of Cornwall Archaeological Society, organized by Daphne Harris, as part of the ongoing Lizard fieldwalking project (Smith 1987). The gridded surface collection showed a concentration of worked flint and chert at the west side of the ploughed area, close to a small stream (Figs 1 and 2). One small area, at SW 6931 1470, showed the greatest density of worked flint, which was clearly just the edge of a more extensive scatter continuing in the adjoining unploughed area. The surface collection here included several narrow-blade geometric microliths, indicating this to be an area of Later Mesolithic activity. In addition, the upturned plough furrows showed several

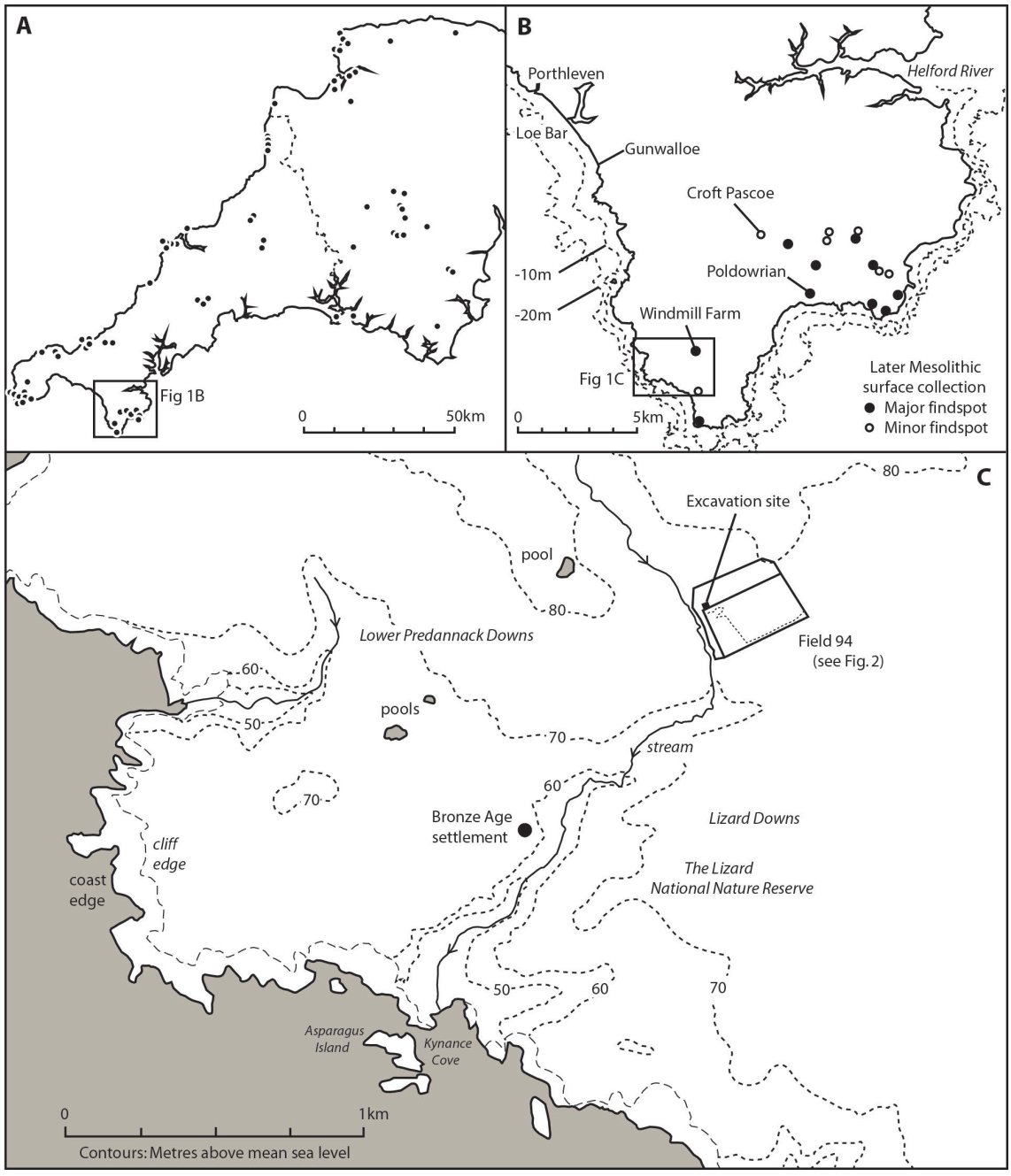

Fig 1 ***A*** *The distribution of lithic findspots in Cornwall and Devon identified as of Later Mesolithic date (after Jacobi 1979, fig 17).* ***B*** *The Lizard peninsula showing Later Mesolithic findspots from surface collection (after Smith 1987, fig 1). Submarine contours at 10m and 20m below present mean sea level, giving an indication of the Later Mesolithic and Earlier Mesolithic coastlines respectively.* ***C*** *The local topography of the Windmill Farm surface collection and excavation. Surface contours above mean sea level.*

dark patches suggesting the presence of sub-soil features. Fortunately, thanks to the quick response of the farmer, there was the opportunity to excavate some of this undisturbed area.

The excavation was carried out over three weeks in July 1982 with the help of members of Cornwall Archaeological Society. The post-excavation work was long drawn out because of the vast amount of artefactual evidence from what was just a very brief piece of fieldwork. It has been difficult to pull together the long-neglected elements of the work, involving illustrations carried out before the use of digital technology and text and illustrations lost because of the changes in digital formats. The results have, however, benefitted from further study of the lithic waste products and by the provision of additional Accelerator Mass Spectrometry (AMS) radiocarbon determinations.

Topography and historic background

Windmill Farm lies within an extensive area of historic heathland, including Lizard Downs to the south and Lower Predannack Downs to the west. Predannack is the name of a hamlet 2.8 km to the north west and is of particular interest in that it may derive from the only place-name occurrence of the Celtic word for Britain, 'Pridain' (Padel 1988, 146). Its occurrence and significance here is not fully understood, although the word may have once been applied to the whole of the Lizard peninsula, as the first part of Britain to be seen when approaching by sea from the south west.

The Downs are part of the Lizard plateau, an area of raised ancient sea-floor, lying around 100m (300ft) OD in height and cutting across a variety of igneous and metamorphic rocks. The Downs lie entirely on serpentine bedrock which in places is overlain by thin deposits of loess, producing acidic and poorly drained soils supporting low heathland vegetation. Much of the area is listed as a Site of Special Scientific Interest with several rare plants, including the nationally rare Cornish Heath (*Erica vagans*). The area of the excavation lay just outside this protected area but much of Windmill Farm's land is now a Cornwall Wildlife Trust nature reserve and, since 2016, part of the Lizard National Nature Reserve.

The heathland itself is unsuitable for arable agriculture although there are a number of settlements around its fringes, as well as abandoned post-medieval fields. Windmill Farm was established at the beginning of the nineteenth century, taking its name from the seventeenth-century Lizard Windmill which, in the 1820s, was notorious as the base of the Windmill Gang of sheep stealers and footpads (Johns 2002, 17–20). The windmill was conserved by Cornwall Wildlife Trust in 2015 as an observation tower for visitors.

Most of the heathland on Windmill Farm was enclosed by post-medieval field banks for pasture and shown as rough ground on the 1st edition Ordnance Survey 6 inch: 1 mile map (LXXXIV. SE) of 1888. The soils revealed by the excavation showed no evidence of previous cultivation but there are remains of peat stacks within the area, indicating that turf cutting for fuel had taken place. The excavation area lies about 1.5 km from the coast in a fairly level area of heathland, on the east side of a small stream which is bordered by a dense growth of willows. The stream does not have an eroded stream bed although further south west it enters a small valley which drops rapidly to sea level in a steep ravine, ending below the sheer cliffs of Kynance Cove. This ravine-like valley formed during periglacial conditions when it is thought that the present steep sloping cliff edges of much of the Lizard coast developed (Ealey 2012, 54).

There have been a number of finds of worked flint in the vicinity of the heathland, all those identifiable being of Mesolithic date, including a tranchet axehead and a pick from 1 km north-east of the present excavation (Wymer 1977, 38) and microlithic pieces from Asparagus Island (Mullion parish) at nearby Kynance Cove (Fig 1C; *ibid*, 39). There are several burial mounds around the moor showing Bronze Age activity as well as a settlement of Middle Bronze Age date close to Kynance Cove (Fig 1C) associated with small irregular fields (Thomas 1960). An airfield was created on part of the heathland during the Second World War, when numerous turf-built circles were recorded (Radford 1940); these have since been shown to be medieval or post-medieval platforms for temporary storage of dried turf for fuel (Dowson 1966; *cf* Herring 2008).

The surface collection

The surface collection was carried out by members of Cornwall Archaeological Society over an area

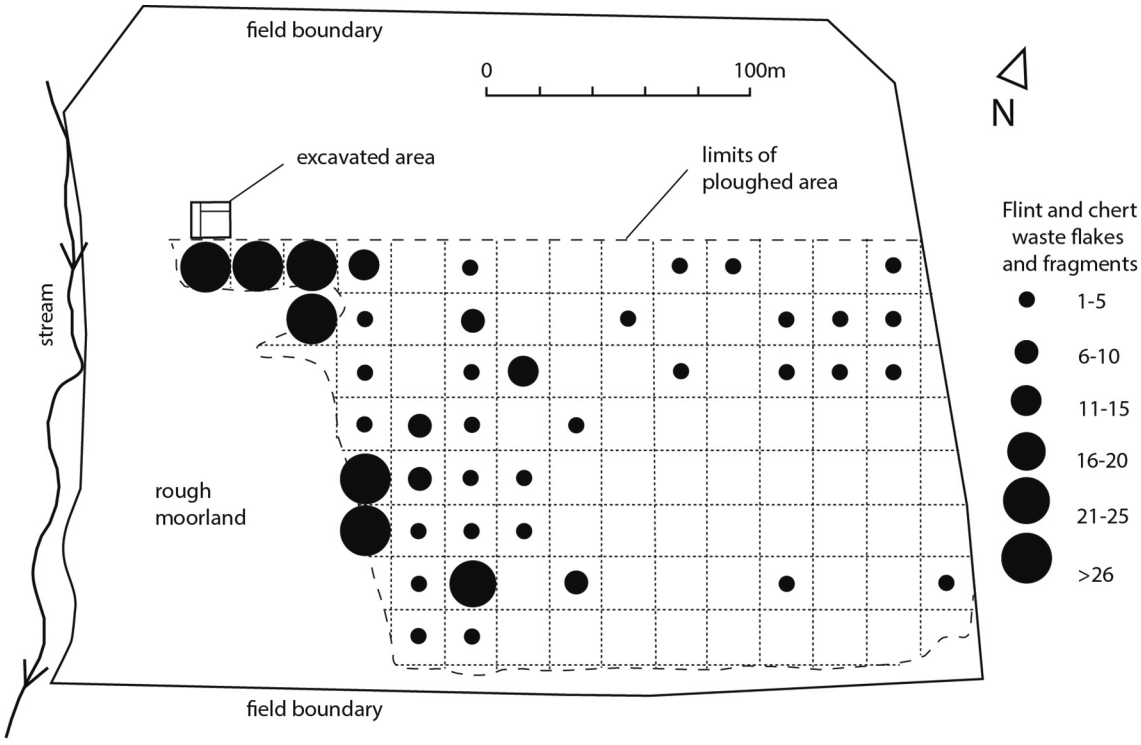

Fig 2 The surface collection of Field 94 showing the distribution of all flint and chert waste pieces by count and the location of the excavated area.

of approximately 220m by 160m using a 20m-by-20m grid. This produced 2,066 waste pieces of worked flint and chert in a widespread scatter with a distinct concentration at the western edge of the field (Fig 2), as well as 59 microliths, 60 microburins, 29 denticulate scrapers, six convex scrapers and a few core tools and utilised pebble tools. The indication was that the ploughing had only touched the edge of an extensive scatter with a greater density of lithic material further to the west but no other significant concentrations in the eastern part of the collection area. The ploughing had stopped at the west because the ground became increasingly wet as it approached the stream. However, within the extent of the recorded scatter were two separate foci, the most prolific at the northern edge and another, smaller one further south. Apart from waste pieces, both produced similar material, including narrow-blade microliths, microburins and denticulate scrapers. The northern area also produced a few other types of retouched piece, comprising a piercer, two blunted-back pieces and five casually retouched pieces as well as an axe or adze head (Fig 14, 117), a chopping tool, two picks and three utilised pebble tools. As far as could be seen, from the lithic types present, both foci were of the Later Mesolithic period (*c* 8000–4000 cal BC).

The excavation results

The immediate intention was to sample a small undisturbed area adjacent to the northern focus of the surface collection of worked flint and chert. This was expected to produce a large enough assemblage of diagnostic pieces, particularly of the microlithic elements, to allow wider comparisons. It might also produce material for radiocarbon dating, which would be important because of the lack of dated Mesolithic assemblages from Cornwall and Devon. There was also a possibility

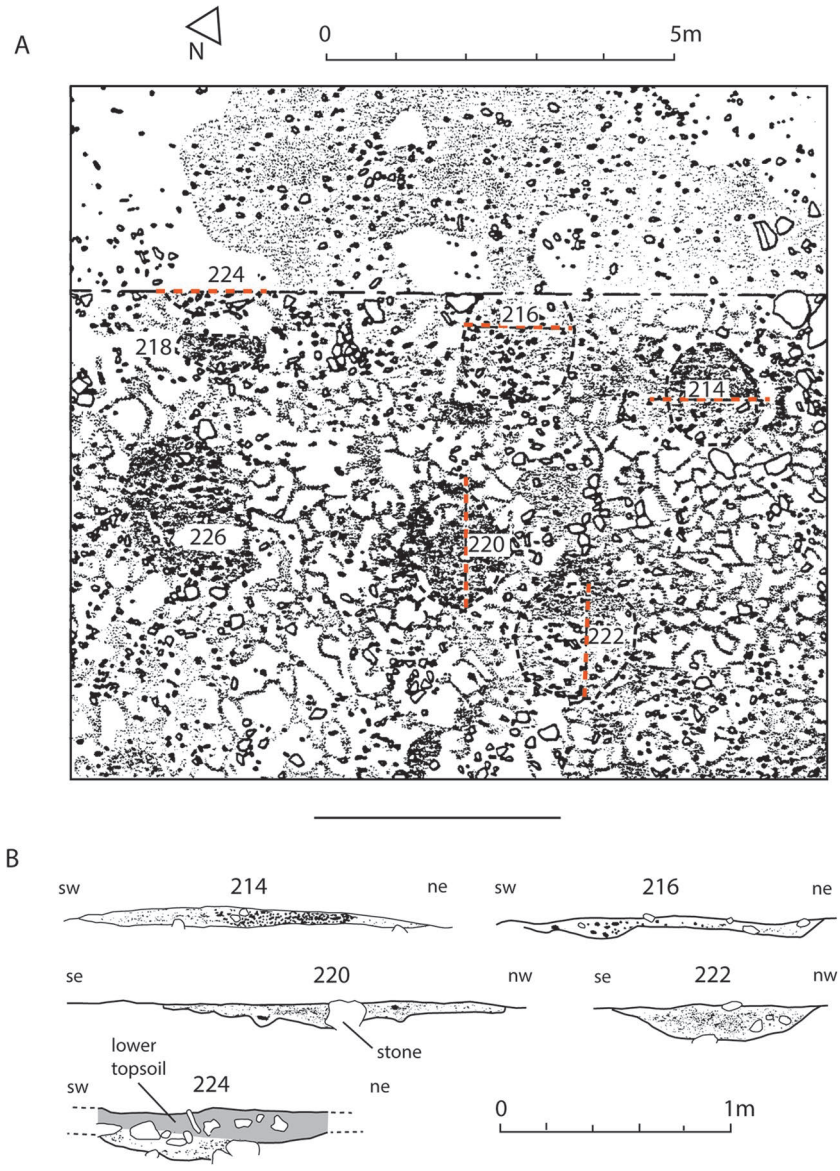

Fig 3 ***A:*** *Trench A excavated to the subsoil surface, showing features, the lines (in red) of drawn sections and natural soil patterning. The trench is shown with three or four horizons removed from the southern 11m x 7m area but only two horizons removed from the northern 11m x 3m strip.* ***B:*** *Cross-sections of the main features.*

that this was an undisturbed area of Mesolithic activity with associated features. The time available for the investigation was limited so work concentrated on one relatively small area. The excavation began as a 10m by 11m trench, A (Fig 3), but after turf stripping in the first week wet weather precluded excavation so the turf was removed from two more 3m wide trenches: B, 1m north west of Trench A; and C, 1m south west of Trench A. However, the quantity of lithic material being recovered from Trench A meant that these extra trenches were subsequently abandoned and work concentrated on Trench A.

After stripping of the turf and root mat the excavation was continued by trowelling. The soil contained a scatter of serpentine stone fragments and soil that appeared to be a natural sub-horizon of the soil profile undisturbed by cultivation. This soil was removed in non-stratigraphic horizons or spits each of about 100mm depth. Three spits were removed, with surface planning at each stage, until subsoil was exposed except at

the western end where the soil was deeper and a fourth, shallow horizon was removed. Figure 3 shows Trench A with three or four horizons removed from the southern 11m x 7m area but only two horizons removed from the northern 11m x 3m strip.

The first horizon was mainly the lower part of the humic turf horizon and produced relatively few finds, which were recorded by 1m x 1m grid square. The second horizon produced much more material, which was recorded by quarter metre grid square; that is 0.5m x 0.5m sub-squares lettered A, B, C and D within each 1m grid square. This horizon also revealed areas of darker soil as well as patches of small pebbles suggesting the presence of some kind of activity areas. The third horizon revealed the natural sterile subsoil of silty clay, a result of weathering *in situ* of the serpentine bedrock. Stone fragments exposed on the subsoil surface were fairly evenly scattered although with three areas of concentration: one between features [224] and [226], one between features [220] and [214] and another to the east of [214]. There was no indication that these were artificially arranged and it seems likely that they were just naturally occurring remnants of the underlying weathered bedrock. The subsoil surface revealed a network of 'polygons' caused by infiltration of humic material into frost or drying cracks (Fig 3). Merging with these were seven diffuse patches of darker soil which proved to be shallow hollows, originating within the overlying soil horizon and intruding only slightly into the subsoil (Fig 3, [214], [216], [218], [220], [222], [224] and [226]). Feature [226] was first seen as a darker area covering most of the western part of the trench and proved to be just a shallow depression in the subsoil surface, not an artificially cut feature, and the same may have been the case for [220]. However, the other, smaller features were more discrete and probably deliberately created hollows, although, as can be seen from the cross-sections (Fig 3, B), [214] was a shallow scoop entirely within the old soil horizon and only [222] was cut to any depth into the subsoil.

The fill of the features was similar in composition to the general overlying silty soil but distinctly darker. Four of the features, [214], [216], [218] and [220] as well as the hollow [226], contained concentrations of small pebbles, which were of a quite even size within each feature. Those in [214], [218], [220] and [226] were of about 5mm diameter, while those of [216] contained slightly larger pebbles, each of about 15mm diameter. The dark colour of the fill of these features proved to be due to the presence of fine fragments of charcoal – apart from [224], which was humic and peaty. Samples from features [214] and [220] were submitted for identification and radiocarbon dating (Appendix 3).

Sieving was employed on a sample of the excavated soil material. This comprised a 10-litre sample from one quarter metre square within each one metre square from the third and final horizon of removal of the general occupation horizon. These samples were washed through 10mm and 5mm meshes using a water pump. In one area samples from all quarter metre squares of the third horizon were sieved, affecting the appreciation of the distribution of microlithic objects (Fig 17). The final horizon of the northern 3m-wide strip of Trench A was not excavated, although the sieving samples were taken to allow plotting of the distribution of material over the whole area. Several shallow features were found and bulk soil samples from these were taken for later flotation for carbonised botanical material.

Sieving with the 5mm mesh significantly increased the number of lithics collected, typically about 200 waste pieces from each 10-litre sample, each piece with an average weight of less than 0.5g. The material recovered from the 10mm mesh was little different in quantity to that recovered by hand. The sieving did greatly increase recovery of the microlithic element, these being typically in the size range of 10 x 2mm to 20 x 5mm. Smaller fragments from these could have been recovered by finer sieving to an even smaller mesh size but would have added little to the assemblage except, perhaps, the identification of more impact spalls. All of the material was classified, counted and weighed but because of the quantity of material detailed analysis of the waste pieces and cores was only carried out on a selective sample of three 1m squares.

Artefactual evidence

Raw materials

The flaked pieces were predominantly of flint with a few of chert and a small number of heavier tools of other rock types. Pebble tools used a variety of

Fig 4 Trench A facing north. Excavation in progress of the final level, as shown in Figure 3.

Table 1 Raw material usage: core-tools and retouched pieces

	Flint		*Chert*		*Other stone*	
	Count	*%*	*Count*	*%*	*Count*	*%*
Microliths	955	96	41	4	-	-
Flake tools	448	97	13	3	-	-
Core tools	7	41	6	35	4	24

rock types and these will be discussed separately. The proportions of raw materials of the retouched pieces give a reasonable picture of the overall usage rate (Table 1).

Flint. This was of medium but varied flaking quality and of varying colours from yellow-brown through mottled translucent browns and mid-grey to dark grey. The evidence of the surviving cortex on flakes and of the many complete and broken pebbles shows that this all derives from beach material. These pebbles were mainly in the range of only 40–60mm in maximum size. The existence of flint pebbles on Cornish beaches is well known, probably deriving largely from submarine strata of chalk in the Channel Basin and its approaches eroded and redeposited in storm beaches during the low sea-levels of the last glacial period (Naylor and Shannon 1982, 12–29). However, no surveys of beach sources in this area have been carried out and these are needed to show the present availability and range of material. Large quantities of flint pebbles are present on the Loe Bar, near Helston, 8 km to the north west – mostly small, below the size of pebbles used here, but with a few larger, sub-rounded pebbles occasionally retaining some nodular concavities and of varied colour. Beach flint availability may be quite different now than during the earlier post-glacial period because of the subsequent rise in sea-level. The variety of colours of flint present at Windmill Farm suggests that there may have been more than one original source. There is very little patination on struck surfaces indicating that the objects were never exposed to alkaline conditions or surface weathering for any substantial period of time.

Chert. A small number of pieces, also from pebbles, are of a yellow-brown to mid-brown granular-textured chert similar to the Greensand chert of south Devon. It has a poorer flaking quality than the flint and correspondingly is less fragile and perhaps for this reason was used mainly for larger, 'heavy duty' tools. It may also have been selected because it occurred in larger sizes than the flint. Both flint and chert, although from different geological parent materials, appear to have derived from the same mixed secondary beach sources.

Other rock types. Harder rocks such as quartzite were used for some larger flaked tools and hammer stones, whereas somewhat less resilient rocks such as schist, gabbro and serpentine were used for pebble tools, as discussed later.

Assemblage overview

The totals for the excavated assemblage are shown, by main class, in Table 2. These exclude the objects from the surface collection, except for the adze / axe. The proportion of smaller pieces, particularly microliths and microburins, was greatly increased by sieving, as described above, and among the waste flakes and fragments a large proportion are under 10mm in length. Pieces below this size might be ignored in a non-microlithic industry but here were clearly significant. The recovery of material by sieving makes it difficult to compare the microlithic to non-microlithic tool proportions with other similar period but non-sieved assemblages.

The post-excavation analysis of the lithics, excluding the surface collected objects, comprised inspection of every piece by hand lens. No microscopic utilisation study was undertaken at that time but could very usefully be the subject of further research. Retouched pieces were examined and classified mainly by Roger Jacobi and Andrew David. The debitage was initially recorded by basic class, weighed and counted, as were cores and microburins, and detailed study of the debitage was restricted to a sample, consisting of the material from three one metre grid squares, 44, 66 and 146 (Fig 5A).

Cores and waste debitage

Francis Wenban-Smith

Approach, objectives and methods

As outlined above, the lithic collection was initially grouped into broad technological categories, one of which was knapped lithic waste, which comprised cores, waste-flakes (including blades), microburins and general irregular knapped fragments. The amount of lithic waste was substantially inflated by material recovered from the sieving programme, which (along with the desired microliths and technological pieces such as microburins) also included very numerous tiny and technologically undiagnostic chips and spalls. The amount of lithic waste was too great to allow full metrical analysis. Instead, a selective sample was studied, comprising all the material from three separate metre squares: 66, 44 and 146 (Fig 5; Table 3). As can be seen from Table 3, the combined collection from these three squares represents a mere 3.5 per cent of the overall quantity of lithic waste products recovered in the excavation.

Besides the small sample size (and not forgetting that the excavated area is itself only a tiny part of a much wider landscape of Mesolithic remains: Fig 2), the various inconsistencies in excavation

Table 2 Lithic artefact type sub-totals

Microliths and related pieces	*Flint*	*Chert*	
Microlith	759	31	
Microlith fragment unclassified	117	3	
Krukowski microburin	5	2	
Impact fragment	3	-	
Bilaterally trimmed point	35	5	
Notched flake	19	-	
Reject/Unfinished	15	-	
Corbiac? burin?	2	-	
Total	**955**	**41**	
%	96	4	
Larger retouched pieces	*Flint*	*Chert*	
Denticulate	246	6	
Pieces with notches	28	-	
Scraper	39	1	
Scraper/Denticulate	31	-	
Burin/Burin spall	3	1	
Nosed piece	1	3	
Piece with distal truncation	6	-	
Unclassified	7	1	
Casually retouched piece	87	1	
Total	**448**	**13**	
%	97	3	
Core tools	*Flint*	*Chert*	*Other*
Axe/Adzehead	-	1	-
Chopping tool	4	3	3
Pick	3	2	-
Total	**7**	**6**	**3**
Knapping waste products, flint and chert			
Cores	1467		
Waste flakes and fragments	72,717		
Microburins	2641		
Unworked pebbles	140		
Split pebble pieces	144		
Burnt fragments (weight)	48.64kg		

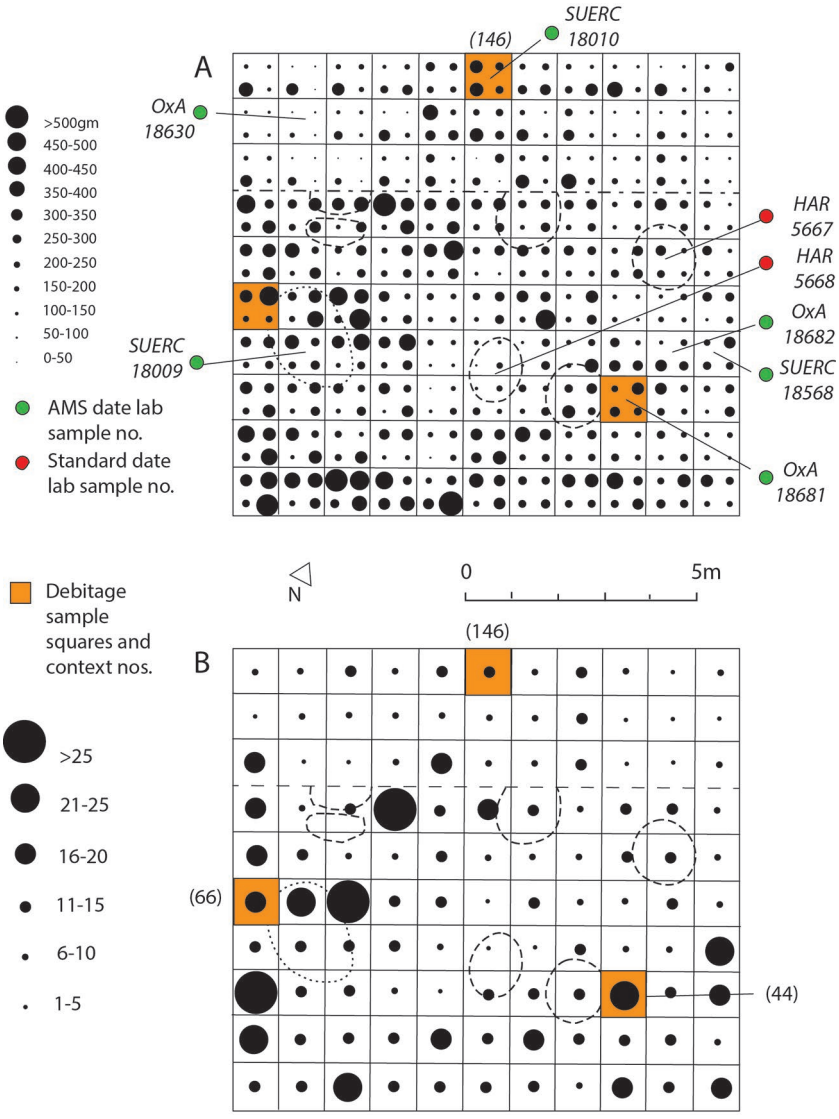

*Fig 5 Lithic debitage distribution from Trench A showing the outline of features. **A** Flint and chert waste flakes and fragments by weight showing the location of the three samples used for debitage study and the location of radiocarbon-dated carbon samples. **B** Flint and chert cores and core fragments by count.*

and recording methodology make it difficult to extrapolate the quantitative data from analysis of these squares to a wider interpretation of intra-site variations of knapping behaviour. For square 66, three spits were excavated, with one 10-litre sample sieved from 0.5m sub-square A of the third spit. For square 44, three spits were likewise excavated, but with five 10-litre spoil samples from the third spit (two from sub-square A and one from each of sub-squares B–D). And for square 146, only two spits were excavated, although one 10-litre spoil sample was taken and sieved from the un-dug third spit. Furthermore, the provenance of the sorted lithic waste material was often ambiguous as to whether it had come from a sieved sample or from the troweled spit. Therefore, although some speculations are based upon quantitative variations between some categories of technological waste in the three sample squares, the focus of its analysis is upon describing the lithic technology.

All the received lithic waste material was examined. The 'waste flakes' were categorised into debitage (≥10mm), spalls (<10mm), and 'worked' – this latter consisting of pieces (mostly broken microliths) that showed signs of having been retouched but which had been overlooked in the

initial sorting. A few pieces were also identified as microburins and added to that group. The overall breakdown of the analysed material is summarised in Table 3, both for each category as a percentage of the overall site collection and then as the percentage of each category within each square.

Lithic waste remains were slightly less abundant in square 66 than in the other two squares, bearing in mind that sieving was disproportionately applied in square 44, but that only two spits were troweled for square 146. The greater intensity of sieving in square 44 is reflected in the increased proportion of spalls and a slightly higher proportion of microburins than square 66. Square 146 stands out for a particularly high proportion of microburins, bearing in mind that this square was sieved less intensively than square 44. The ratio of debitage in relation to cores was very similar for squares 66 and 44 (about 26:1), but much higher for square 146 (about 39:1). This perhaps suggests the latter as an area into which debitage knapped elsewhere was brought (see below, Debitage), or from which knapped (or partly-knapped) cores were taken away.

Then, for each of the more-significant categories (cores, debitage and microburins) a selection of technological attributes was recorded as well as size measurements. The full analysis is published as a Historic England research report (Wenban-Smith 2021), and a summary of the key results is given below.

Cores (Fig 6)

Almost all of the cores were flint, with just one (a flake core from square 44) being chert; and more than 80 per cent of the flint cores were identifiable as beach pebbles from the very battered cortical remnants. Technologically (Table 4), they were dominated by small (25–40mm long, measured down the main blade removal face), single-platform blade cores (76 per cent of the cores examined), usually left with an unknapped cortical back (illustrated example, Fig 6, no 1). Other types of core represented were double-platform blade cores (Fig 6, no 2), globular flake cores (Fig 6, no 4) and single platform flake cores (Fig 6, no 3). The most diverse assemblage was in square 44, where approximately one third of the cores are minimally knapped testers or flake cores, and one quarter of the blade cores are double or multi-platform. The least diverse assemblage was in square 146, where all the cores had a single platform with a cortical back and 11 out of 13 were blade cores. The majority of blade cores were abandoned with the length of their blade-removal face at 30–35mm, corresponding with the average dimensions of the blades produced (below, Debitage) since most blades did not travel the full length of the core face. Two of the flake cores from square 44 (one of them being the only chert core) were particularly large and heavy (>60mm max length and >130g), showing the necessity for some flakes larger than those produced as a by-product of blade production.

Debitage

The debitage ≥10mm was divided into four broad technological categories: Unspecific, Core rejuvenation, Blade or Crested blade (Table 5). Blades were identified on a technological rather than a purely metric basis; that is, by being part

Table 3 Analysed lithic waste products, squares 66, 44 and 146 (%1 as part of the overall site collection for that category; %2 in relation to other categories within each square).

			sq 66			*sq 44*			*sq 146*			*all 3 squares*		
Initial sorting	*Site total*	*Analysis category*	n	%1	%2	n	%1	%2	n	%1	%2	n	%1	%2
Cores	1467	Cores	16	1.1	2.5	25	1.7	2.0	13	0.9	1.6	54	3.7	2.0
Waste flakes & fragments	72717	Debitage	421	0.6	65.6	656	0.9	53.5	515	0.7	61.7	1592	2.2	58.8
		Spalls	184	0.3	28.7	498	0.7	40.5	242	0.3	30.0	924	1.3	34.1
		Worked	7	0.01	1.1	18	0.02	1.5	6	0.01	0.7	31	0.04	1.1
Microburins	2641	Micro burins	14	0.5	2.2	34	1.3	2.8	59	2.2	7.1	107	4.1	4.0
Total	**76825**		**642**	**0.8**		**1231**	**1.6**		**835**	**1.1**		**2708**	**3.5**	

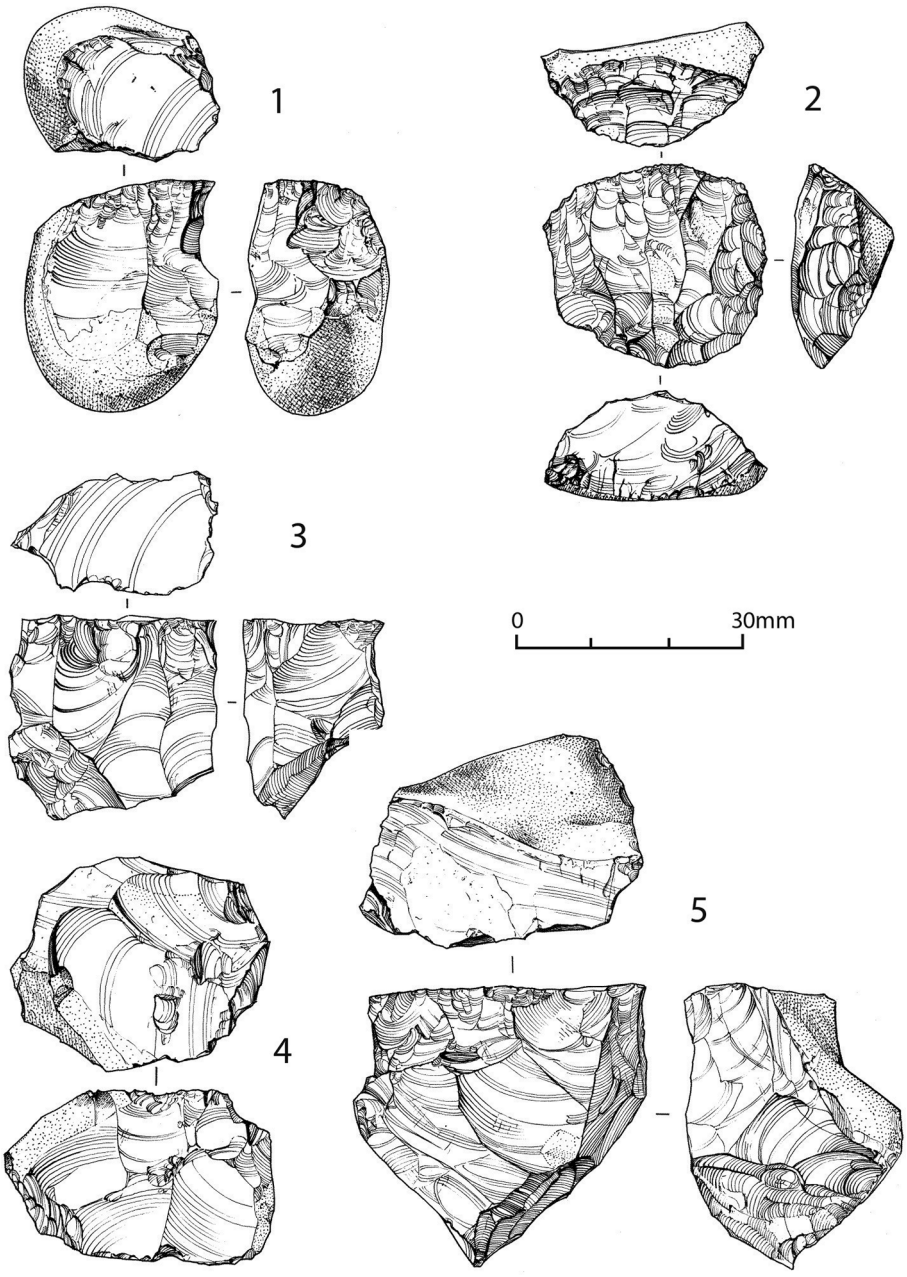

Fig 6 Examples of cores. Sample square 44: 1 Single-platform blade core, with cortical back. 2 Double-platform blade core. Sample square 66: 3 Single platform flake core. 4 Globular flake core. 5 Double-platform blade core. Scale 1:1.

Table 4 Cores

	sq 66		*sq 44*		*sq146*		
Core-type	*Flake*	*Blade*	*Flake*	*Blade*	*Flake*	*Blade*	*Total*
Abandoned, tester	-	-	2	-	-	-	**2**
Single-platform	1	10	6	12	1	11	**41**
Double-platform	-	2	-	3	-	-	**5**
Multi-platform	2	1	1	1	1	-	6
Total	**3**	**13**	**9**	**16**	**2**	**11**	**54**

of a reduction sequence with parallel removals – unidirectional or bi-directional -– rather than merely by having a length : width ratio ≥2, as sometimes done. All flakes were either technologically unspecific or from blade cores; there was no evidence of core-tool manufacture, although this does not establish that core-tools were not manufactured at the site as many flakes from their production would not have been diagnostic. Recognisable blades were approximately half as numerous as unspecific flakes, which probably reflects the strong predominance of blade-manufacturing at the site since many flakes from blade-core reduction would not be categorised as blades.

Recognisable core rejuvenation flakes were rare (n=4), as were crested blades (n=4). These low quantities probably reflect the small size of the initial pebbles being used as cores. There would not have been much scope for rejuvenation without the core becoming too short to be useful. Crested blades are distinctive blades removed from the face of a blade core to initiate an episode of blade production. They are formed by alternate flaking to create a bifacially-worked ridge down the front of a core. This ridge is then removed as the first blade, forming a distinct blade-like removal with a triangular cross-section. The straight parallel scars from its removal then guide the production of subsequent blades. Their paucity must reflect the technological preference of the blade production approach in use, since such flakes are very distinctive. As for core rejuvenation flakes, small pebble-like raw material would not support this approach to blade production, since the cresting process would leave the core too small to produce any useful blades. Several flakes (about 5 per cent) were noted that were wholly cortical, with a concave ventral surface, and with approximately equal length and width. These represent the initial removal of the top of a flint pebble before starting to shape it as a blade core, and therefore demonstrate that pebbles were often brought to the site before their reduction commenced.

The proportion of recognisable blades was less in square 66 (about 30 per cent) than in either squares 44 (38 per cent) or 146 (37 per cent). The proportion of cortex remaining on each piece of debitage was recorded as an indication of the stage of reduction represented. The unspecific debitage from square 66 had the highest proportion of more-cortical flakes and the lowest proportion of non-cortical ones, compared to the other two squares which were both very similar. In contrast, the blades from squares 66 and 44 had a similar profile for the prevalence of cortex, with 70 per cent of blades having none, 20 per cent having up to 20 per cent cortex and 10 per cent of blades with 20–80 per cent cortex. Square 146 had 80 per cent of blades with no cortex, 10 per cent with up to 20 per cent, and 10 per cent with 20–60 per cent cortex. These metrics suggest that perhaps square 66 represents an area where earlier stages of core reduction were more often undertaken, and that 146 represents an area disproportionately rich in blades from later stages of reduction, perhaps brought there for microlith production (below, Microburins).

A comparative analysis was done on the width: length ratio profile of the debitage. Pitts (1978; Pitts and Jacobi 1979) identified that debitage assemblages from Late Mesolithic sites had generally higher width : length ratios than Early Mesolithic ones. When Pitts' published profiles are compared with the profiles from the sample squares, there is a clear alignment with his Late Mesolithic group, which is in agreement with the independent evidence of radiocarbon dating and microlith typology at Windmill Farm.

Table 5 Debitage

Debitage category	*sq 66*	*- %*	*sq 44*	*- %*	*sq 146*	*- %*	*all 3 sq*	*- %*
Unspecific debitage	290	68.9	405	61.7	323	62.7	1018	62.7
Core rejuvenation	-	0.0	1	0.2	3	0.6	4	0.6
Blade	129	30.6	249	38.0	188	36.5	566	36.5
Crested blade	2	0.5	1	0.2	1	0.2	4	0.2
Total	**421**		**656**		**515**		**1592**	

Microburins

Microburins are a characteristic waste product from microlith production, representing the removal of (usually) either the proximal (bulbar) end, or the distal (tip) end of a small blade. More than 100 microburins were found in the samples, with a disproportionately high quantity in square 146 (Table 6), where there were twice as many in relation to the numbers of blades as in squares 66 and 44. This complements the data showing a disproportionately high number of end-stage blades in this square and suggests import into this area of selected blades for microlith production. Two types of microburin were present in roughly equal numbers. Figure 7 shows examples of microburins from the whole site. There was a remarkably consistent approach to their production, reflecting entirely right-handed knapping. Distal microburins were struck onto the right side of the ventral surface if the parent debitage is oriented with the distal end away from the striker, and proximal microburins were struck onto the right side of the ventral surface if the parent debitage is oriented with the butt end away from the knapper.

The widths of the microburins in all squares showed a strong peak for a width of 6–7mm, with some indication of a minor peak at around 10–12 mm. This contrasts with the width profiles of blade blanks, which was concentrated at 7–12mm in square 146, 5–14mm in 44 and evenly spread between 7 and 16mm in 66, with a shallow peak at 12–14mm for the latter. The preferred dimensions of blades for microlithic manufacture seems to have been around 7–10 x 20–30mm, which corresponds with the dimensions of the microliths from the site, which are a similar length and a little narrower, reflecting the backing retouch by which they were shaped and the removal of one or other end as a microburin. The widths of the blades have a tighter spread at a narrower width for square 146, supporting the suggestion that selected blades were imported into this area and then worked into microliths. This may be related to the fact that this grid square was notable for the predominance of triangular forms of microlith (see Discussion, below).

Table 6 Microburins

	Proximal	*Distal*	*Total*	*As % of blades*
Sq 66	6	8	14	11
Sq 44	13	21	34	14
Sq 146	31	28	59	31
Total	**50**	**57**	**107**	

The retouched assemblage

Roger Jacobi, Andrew David and George Smith

The totals of the main artefact classes are shown in Table 2. Those examples illustrated are indicated in the sub-tables for the individual tool types.

Microliths and other related pieces (Figs 8–10)

These include unclassifiable fragments and pieces made by microlithic-style abrupt retouch on small narrow flakes. The totals by type are shown in Table 7.

The pieces were classified by Roger Jacobi according to their general geometric shape, as in Table 7, but further subdivided according to the position and direction of retouch (Appendix 1). Retouch was applied wherever needed to achieve the required finished shape, whether normal or inverse. That is, 'normal' retouched on the non-bulbar face, or 'inverse' retouched on the bulbar face. The geometric shapes are generally assessed with the proximal (bulbar) end to the top, but this is not invariably so, which means that some microliths could be classified as lateralised to the

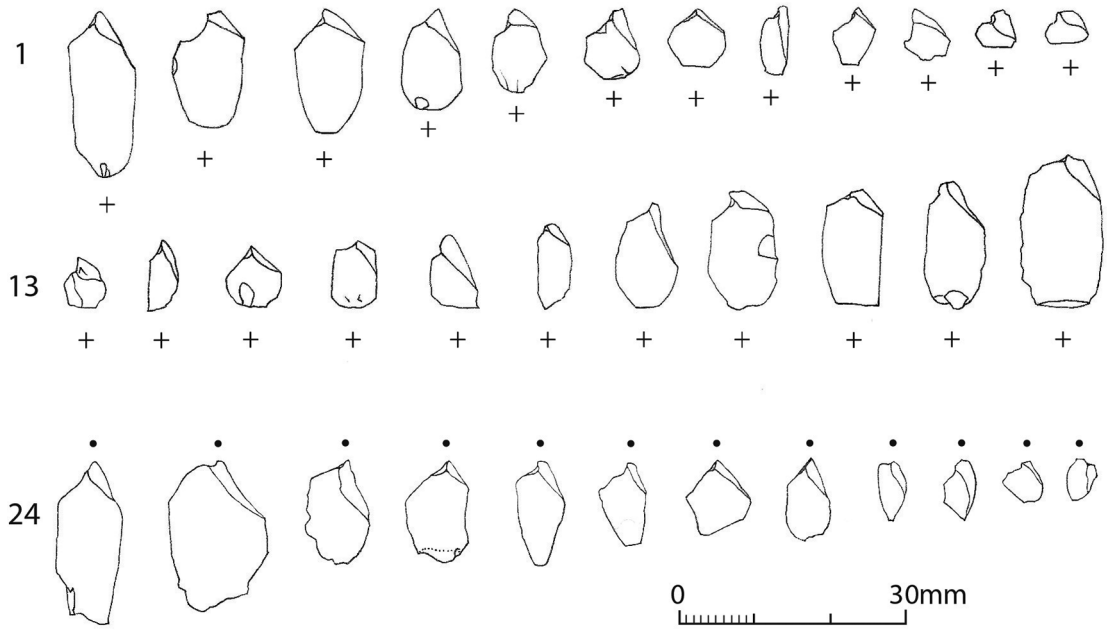

Fig 7 Examples of microburins, all ventral faces. 1–23 proximal. 24–35 distal. + point of percussion. • direction of missing point of percussion. Scale 1:1.

right or left, depending on which is considered to be the leading edge. In some cases it is impossible to tell which is the distal or the proximal end. Identifiable types with impact damage are included in the totals for each type but discussed in more detail later.

Obliquely backed (illustrated examples, nos 1–5): Straight or curving oblique truncation. Mostly backed on the left-hand side, viewed with the proximal end at the top.

Scalene triangles (for example, nos 6–11): Normally with retouch on all three edges. Broken pieces are frequent. Sizes will be discussed in a comparison of all microlith types below. Those pieces with retouch on only two edges are in the minority and it seems likely that the third edge was left unworked where it was already of an appropriate shape, or sometimes just has some minor inverse retouch. Most 'foreparts' are fairly complete triangles lacking only a small part of the 'tail'. More foreparts can be classified than lower parts, as many of the latter are so small that they may have been lost in the sieving process (Wenban-Smith, above).

Isosceles triangles (for instance, nos 12–17): These are difficult to identify because loss of any part of the distal or proximal end can cause uncertainty about the original proportions and any vagueness about the angularity can cause confusion with convex backed pieces (for example, no 16).

Unidentified triangles: These are fragments which are clearly three-sided but with insufficient surviving to identify proportions. Most are probably scalene triangles.

Convex backed (illustrated examples, nos 18–27): Normally these have a straight leading edge except that when the leading edge is convex they are very similar to lanceolates, only differentiated by the lack of basal retouch.

Lanceolate (nos 28–33): The only distinctive feature here is the presence of basal retouch to produce either a rounded or pointed base. This must be indicative of the way these pieces were mounted.

Straight backed (nos 34–39): The backed edge is often less than truly straight so there is some

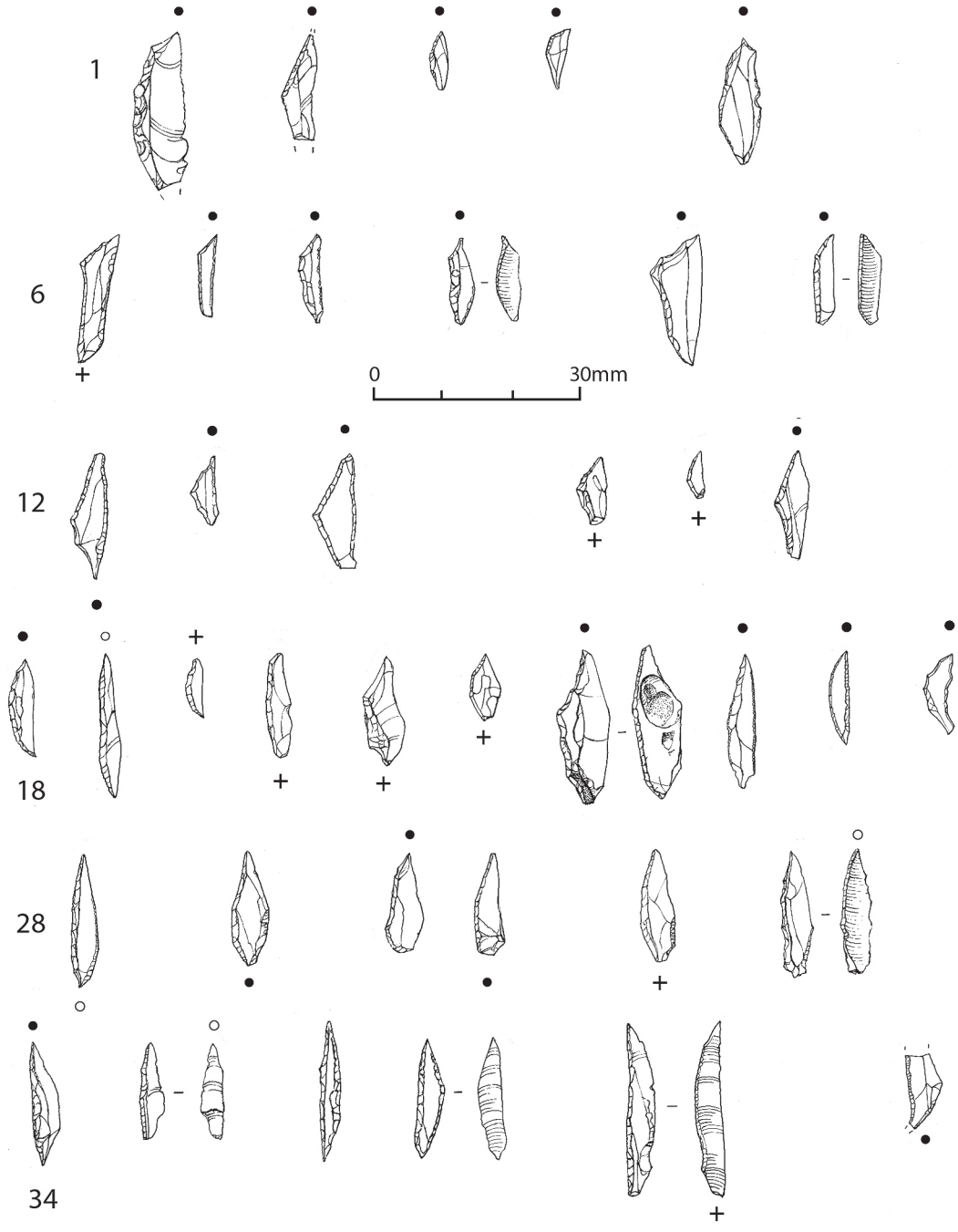

Fig 8 Examples of microlithic types. 1–5 oblique. 6–11 scalene. 12–17 isosceles. 18–27 convex. 28–33 lanceolate. 34–9 straight-backed. + point of percussion. • direction of missing point of percussion. Scale 1:1.

Table 7 Microliths and other related pieces

Type	*Count*	*Illus. example*
Obliquely backed	16	1–5
Scalene triangle	308	6–11
Isosceles triangle	24	12–17
Unidentified triangle	143	-
Convex backed	162	18–27
Convex or lanceolate	1	-
Lanceolate	31	28–33
Straight backed	46	34–39
Four-sided	1	-
Trapezoid	1	40
Sauveterrian point	1	41
Backed on two edges with bulb intact	6	42, 43
Straight inverse retouch only	1	44
Convex inverse retouch only	1	45
Unclassifiable forms	42	46–49
Bi-truncated with impact scar	1	63
Impact fragments	3	66–67
Bilaterally trimmed point	40	68–77
Notched flake	19	78–80
Reject/unfinished piece	15	81–85
Krukowski microburin	7	86–88
Corbiac? burin	2	89, 90
Unclassifiable fragments	120	-
Unclassified, missing	5	-
Total	**996**	

continuity between these and convex backed pieces.

Miscellaneous types and unclassifiable shapes and fragments (illustrated examples, Fig 9, nos 40–49): There is one possible trapezoid but it is incomplete so it could also be a large obliquely backed piece modified or re-used for production of another microlith. The Sauveterrian point is a sub-class of lanceolate with pointed base and in the same size range but distinguished by symmetrical retouch on both sides. Pieces retouched on two edges form a probably genuine minor group, sometimes classed as 'rods', but most of the rest can be seen as variants of common forms. The exceptions are a fragmentary 'hooked' piece (no 47), a short, broad point retouched on two sides (no 48) and a short, broad, bilaterally trimmed piece with a hollow base (no 49). No 48 was classified as a micro-rhomboid (Jacobi 1978, Class 3a), found also at Horsham-type sites in Sussex and comparable to pieces from Stamps, Sennen, Cornwall (Jacobi 1979, 65, 71, and fig 7).

Impact damaged pieces (Fig 9, nos 50–67): All those recorded are illustrated. These were included in the totals of microlith types in which the damage occurred but are discussed separately because the types of damage occurring on different types of microlith might be significant in terms of function and method of mounting. The numbers are insufficient to be conclusive but can be compared to similar evidence from other assemblages.

The occurrence of damage by microlith type broadly reflects the proportions of the main forms, with damage occurring on all but one of them (Table 8). Most were damaged in a similar way by a direct frontal blow, approximately in line with the long axis of the piece, causing removal of a small burin-like spall from the leading edge; in one case (no 65) causing a deeper fracturing of the microlith. Taken together, these suggest that all the various forms were mounted in a similar orientation and with a similar function. A possible exception to this is the fact that five of the scalene pieces with impact damage (nos 53–7), that is, over half of the total for that type, have fractures from oblique rather than frontal impacts, although not all from the same direction. This may show that some at least of the scalene triangles were being mounted in a different manner to the rest of the forms, perhaps as barbs rather than points.

Table 8 Impact damaged pieces

Description	*Total count*	*Impact damaged*	*Illustrated example no.*
Scalene triangle	308	8	50–57
Lanceolate	31	2	58–59
Convex backed	162	1	60
Convex or lanceolate	1	1	61
Obliquely backed	16	1	62
Bi-truncated	1	1	63
Unclassified	167	2	64–65
Impact fragment	3	3	66–67
Total		19	

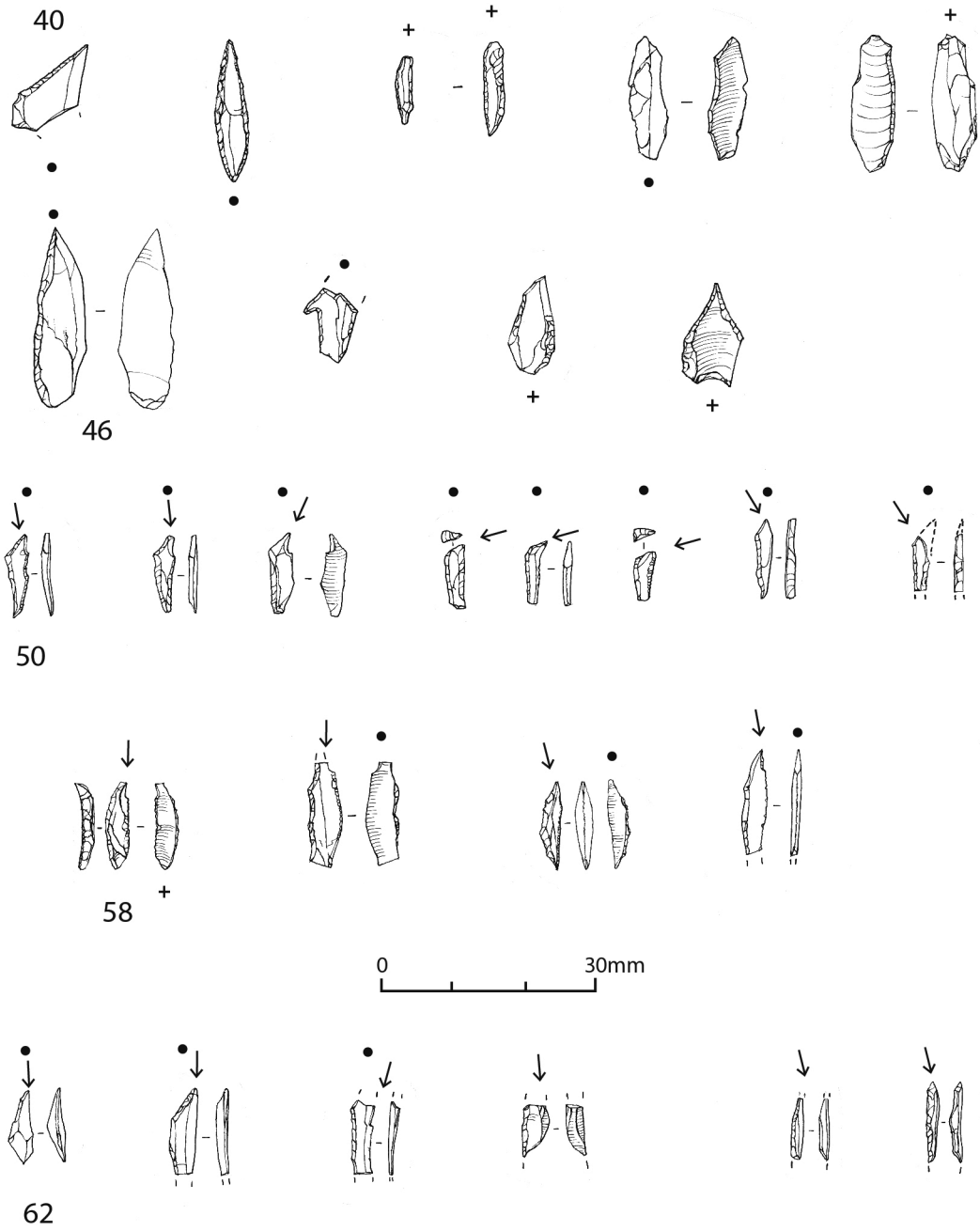

Fig 9 Examples of microlith miscellaneous shapes, points with impact damage and impact fragments. Miscellaneous: 40 trapezoid. 41–9 unclassified shapes. Impact damaged showing estimated angle of fracture: 50–7 scalene; 58–9 lanceolate; 60 convex; 61 convex/lanceolate; 62 oblique; 63 bi-truncated; 64–5 unclassified; 66–7 impact fragments. + point of percussion. • direction of missing point of percussion. Scale 1:1.

The presence of impact-damaged pieces shows that some re-arming of compound projectiles took place on site. However, the very small numbers of damaged pieces as a proportion of the whole suggests mainly mass manufacture for later use rather than just arming or re-arming for local use.

Other pieces produced with microlithic technology: The bilaterally trimmed pieces (for example, Fig 10, nos 68–77) form a distinctive group and possess two converging edges produced by abrupt retouch on the distal end of thin, broad flakes. Their overall form, however, as shown by the illustrated examples, is not regular and they seem likely to have been awls for which the precise shape of the proximal end was not important. Those pieces with curved or beaked points (Fig 10, nos 74–6) are of a type that is a feature of Late Mesolithic assemblages elsewhere, for instance in west Wales where they have been named 'becs' (David 2007; 2020).

The notched pieces with additional retouch (Fig 10, nos 78–80) may have been small concave scrapers, while the rejects / unfinished pieces (Fig 10, nos 81–85) are partially worked flakes abandoned prior to microburin removal. The Krukowski microburins (Fig 10, nos 86–88) are the remnants of microliths which have been snapped by the microburin technique and are so infrequent that they were obviously not a regular part of the manufacturing technique. Similarly, the two possible Corbiac burins (Fig 10, nos 89–90) may not be of a genuine tool type. Both are thin, elongated flakes with small burin-like spalls removed from the distal ends.

Larger retouched pieces

Denticulate scrapers (illustrated examples, Fig 11, nos 91–95): These constituted by far the largest single category of larger retouched pieces (65 per cent), excluding casually retouched pieces. All were made from thick pieces of split pebbles, often retaining cortex. These were flakes, not pebble segments split by the bipolar (or anvil) technique. The pieces all fall within a similar size range of 30–35mm at the largest dimension. All are very irregular with a number of short, squat, secondary flakes removed by heavy percussion to produce either a jagged 'denticulated' edge or a variety of snout-like protrusions (for instance, nos 96–102) or notches. The different shapes seem *ad hoc,* with no deliberate definition of form, and the group as a whole merges with notches, scrapers and some cores.

Pieces with notches (Fig 12, nos 103–5): These are thick pieces with only one or two flakes removed and so lack the serrated outline of the denticulates, although the two types are probably functionally indistinguishable. They are quite distinct from the small 'notched flakes' that are a by-product of microlith manufacture.

Scrapers (Fig 12, nos 106–109): These are identified by the presence of one edge with neat, steep retouch. Many also have modest denticulations or notches and there are various intermediate forms.

Other forms: True burins are absent apart from two pieces with burin-like removals and two possible burin spalls, all of which might result from accidental fractures. There are four pieces which have more elongated and awl-like projections than on some of the denticulates and so are here called 'nosed pieces' (for instance, 110). There are also six pieces with concave distal truncations, which are thick, elongated pieces snapped and retouched on the broken edge (for example, 111).

Core tools (Figs 13–15)

Picks (illustrated examples, Fig 13, nos 112–116): These large, thick pieces are all made on pebbles or large pebble fragments retaining a pebble butt, with the opposing end reduced to a strong point. Three are of flint, two of chert and one of dolerite (116). One example has both a pick point and a steep scraper edge (112) and another has a pick point and a denticulated edge (not illustrated).

Axe /adzehead or chopper (Fig 14, no 117): This came from the surface collection a short distance south of the excavation area and is made from a large pebble of Greensand chert, 124mm long, retaining its pebble butt. It is roughly shaped by transverse removals on three sides, two of which produced the working edge which was then further shaped. Although the edge is produced by a transverse blow this is not a typical tranchet axe core tool, examples of which have been found in Cornwall and are usually associated with Early Mesolithic material (for example, Jacobi 1979,

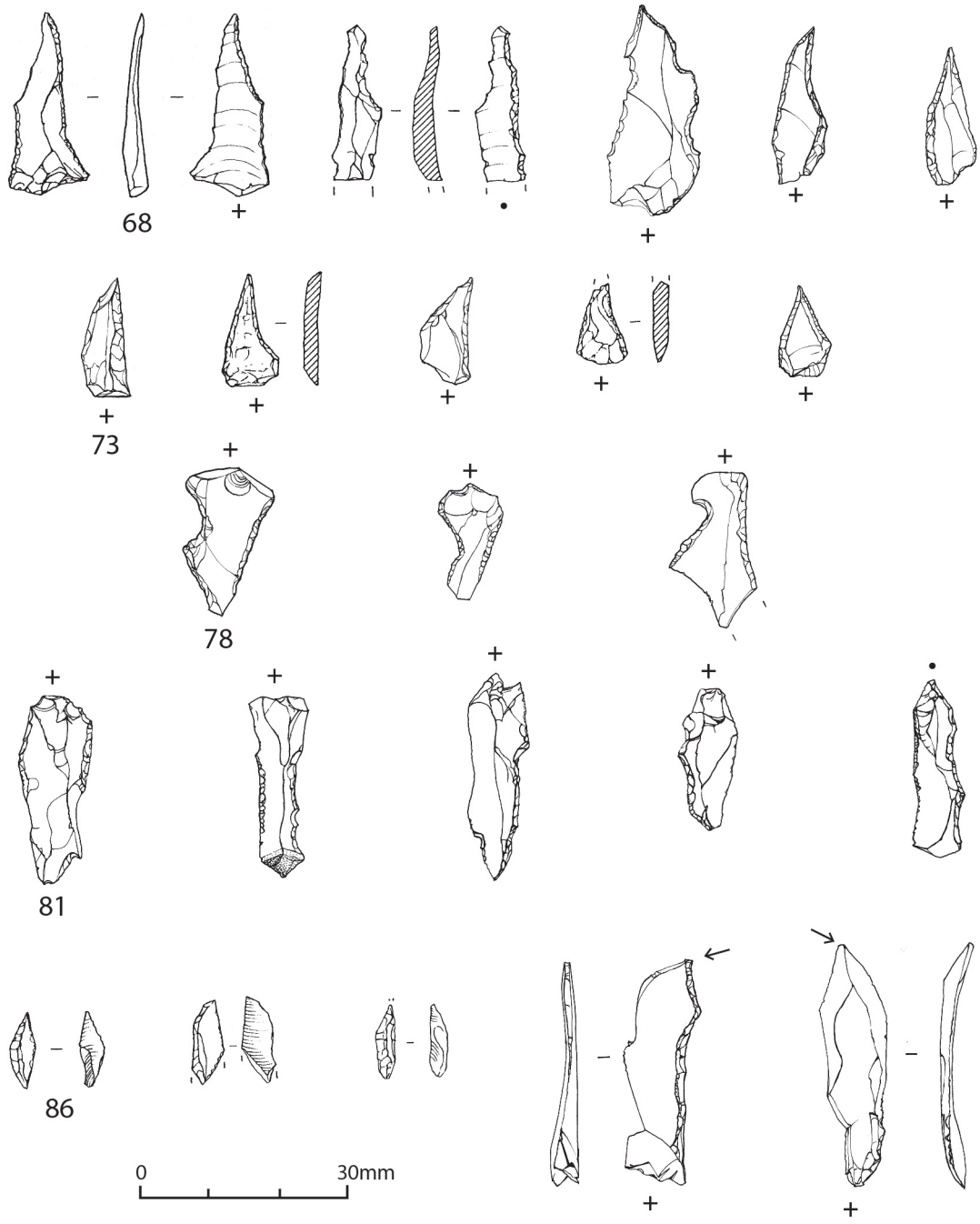

Fig 10 Other microlithic pieces: 68–77 bilaterally trimmed pieces. 78–80 notched pieces. 81–85 rejects/unfinished pieces. 86–88 Krukowski microburins. 89–90 Corbiac? burins. + point of percussion. • direction of missing point of percussion. Scale 1:1.

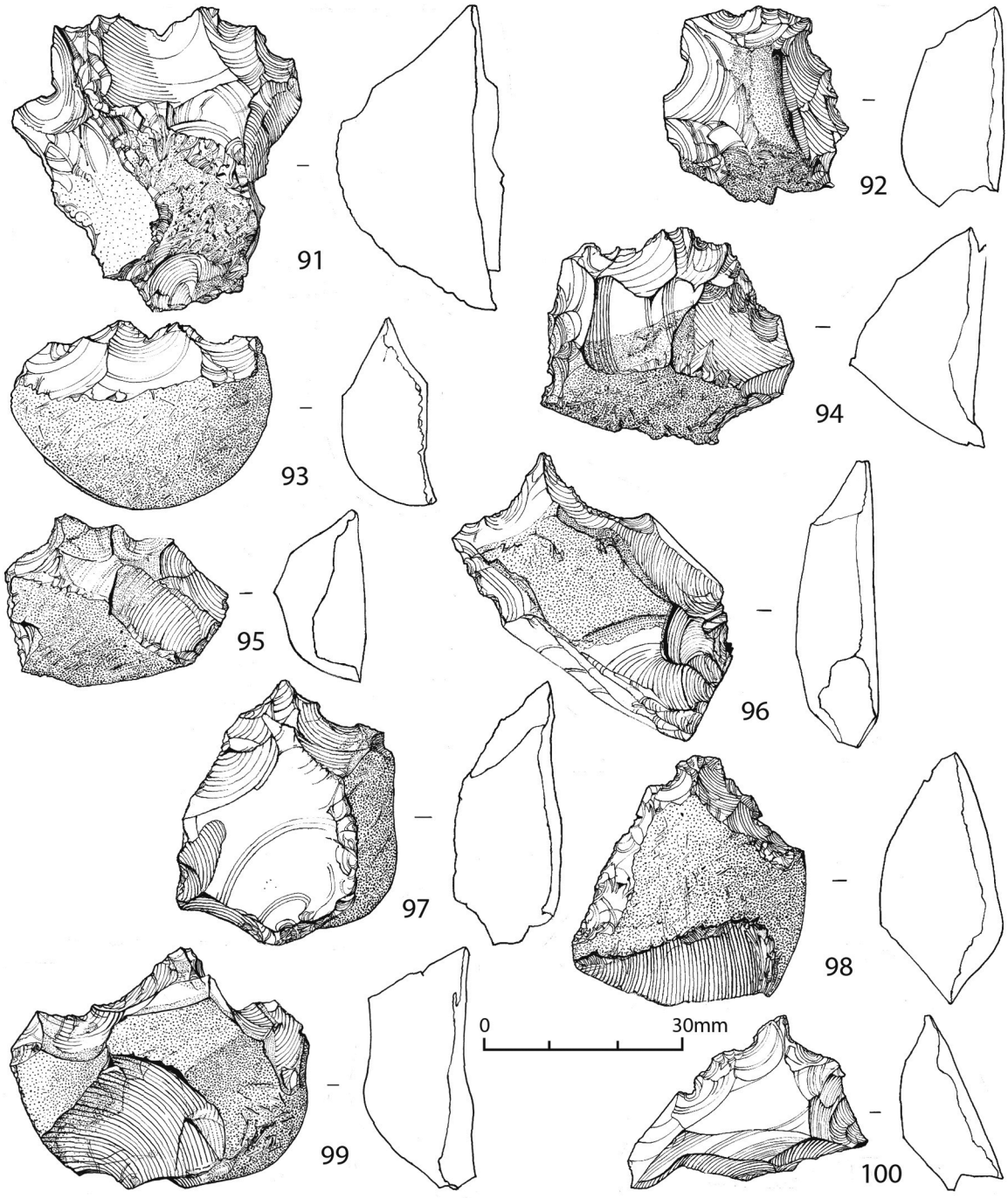

Fig 11 Examples of denticulates, 91–95 and denticulates with snout, 96–100. Scale 1:1.

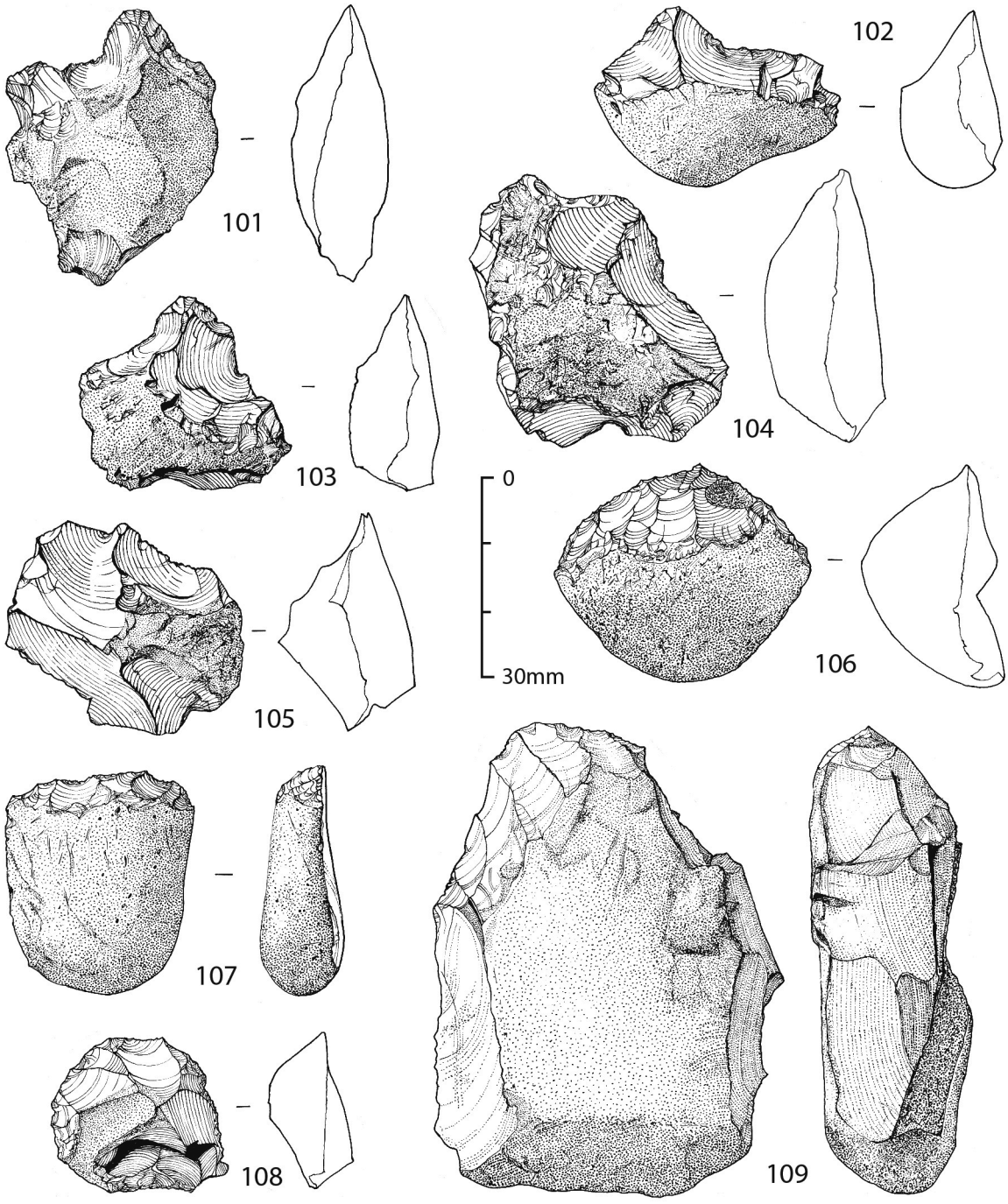

Fig 12 Examples of denticulates with snout, 101–102. Pieces with notch, 103–105. Convex scrapers, 106–108. Heavy scraper, 109. Scale 1:1.

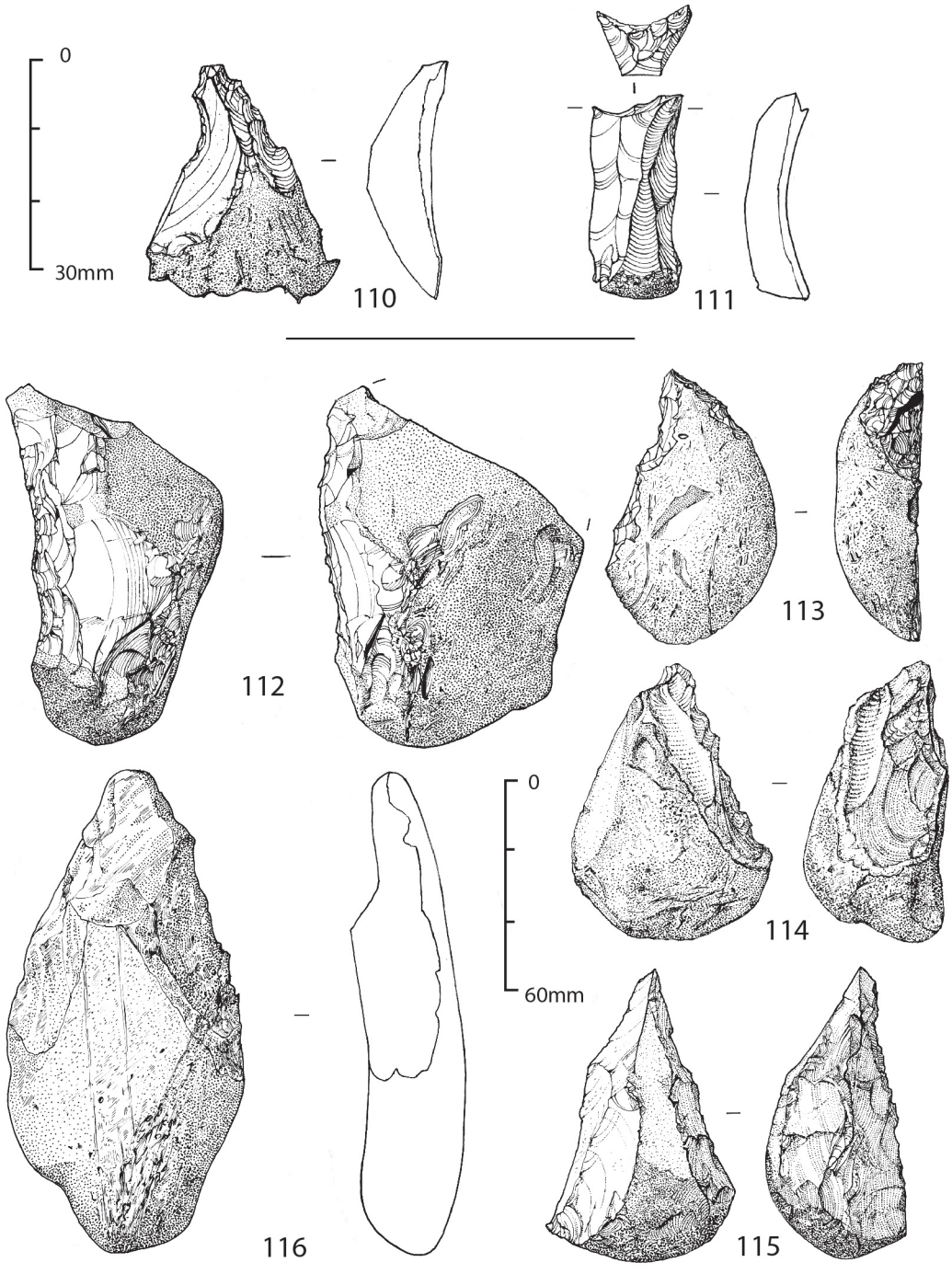

Fig 13 Other flaked tools. Nosed piece, 110. Piece with concave truncation, 111. Scale 1:1. Picks, 112–116. Scale 1:2.

54–5). The slightly asymmetric side profile suggests that it may have been used as an adzehead rather than an axehead but the presence of the pebble butt means it was unlikely to have been hafted so more likely was just an oddly shaped chopping tool.

Chopping /heavy cutting tools (Figs 14 and 15, nos 118–123): Ten pieces are large pebbles with bifacial (for example, 118) or unifacial (122) flaking around the distal end, to produce a strong, sharp edge. Most have a rather pointed shape and retain a pebble butt, resulting in a 'hand axe'-like

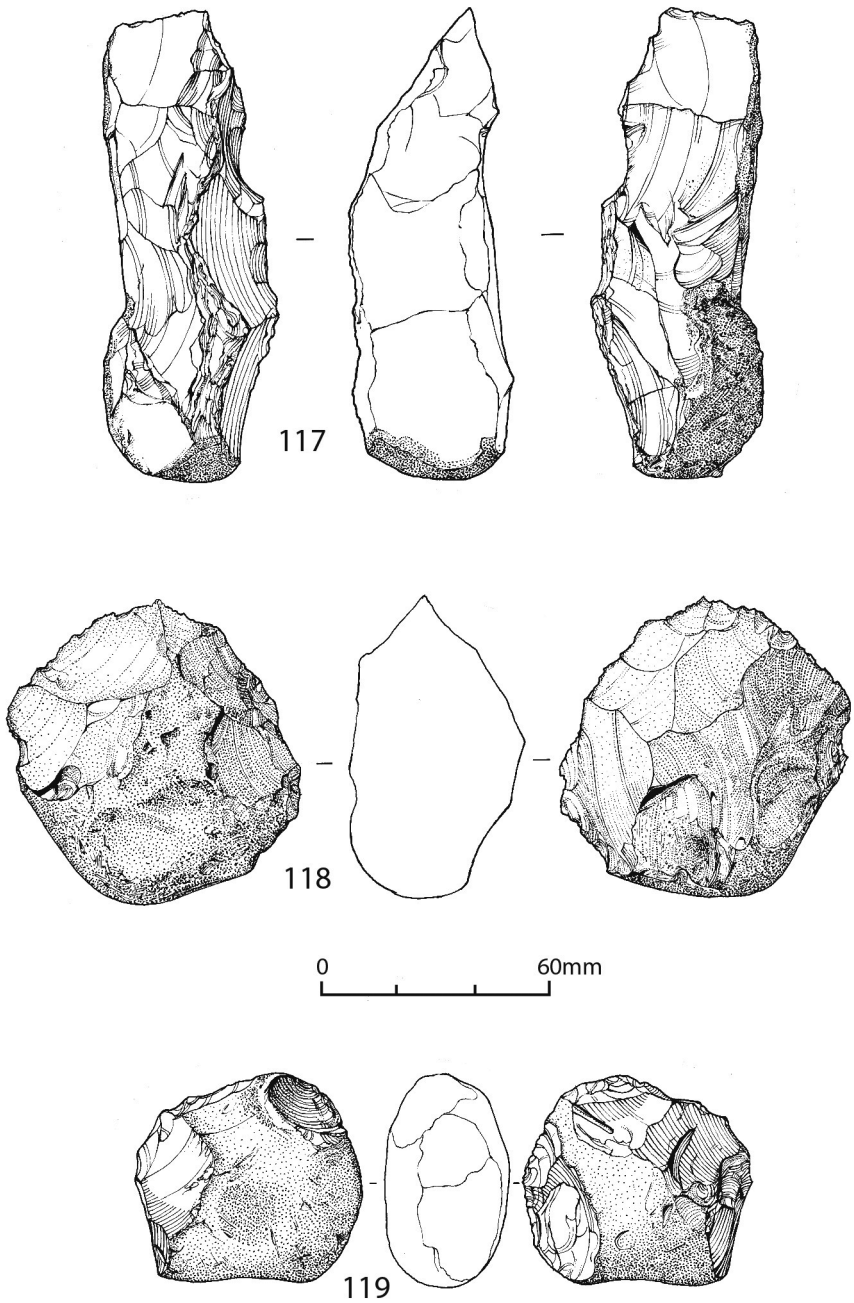

Fig 14 Axe/adzehead, chert, 117 and chopping tools, flint, 118–119. Scale 1:2.

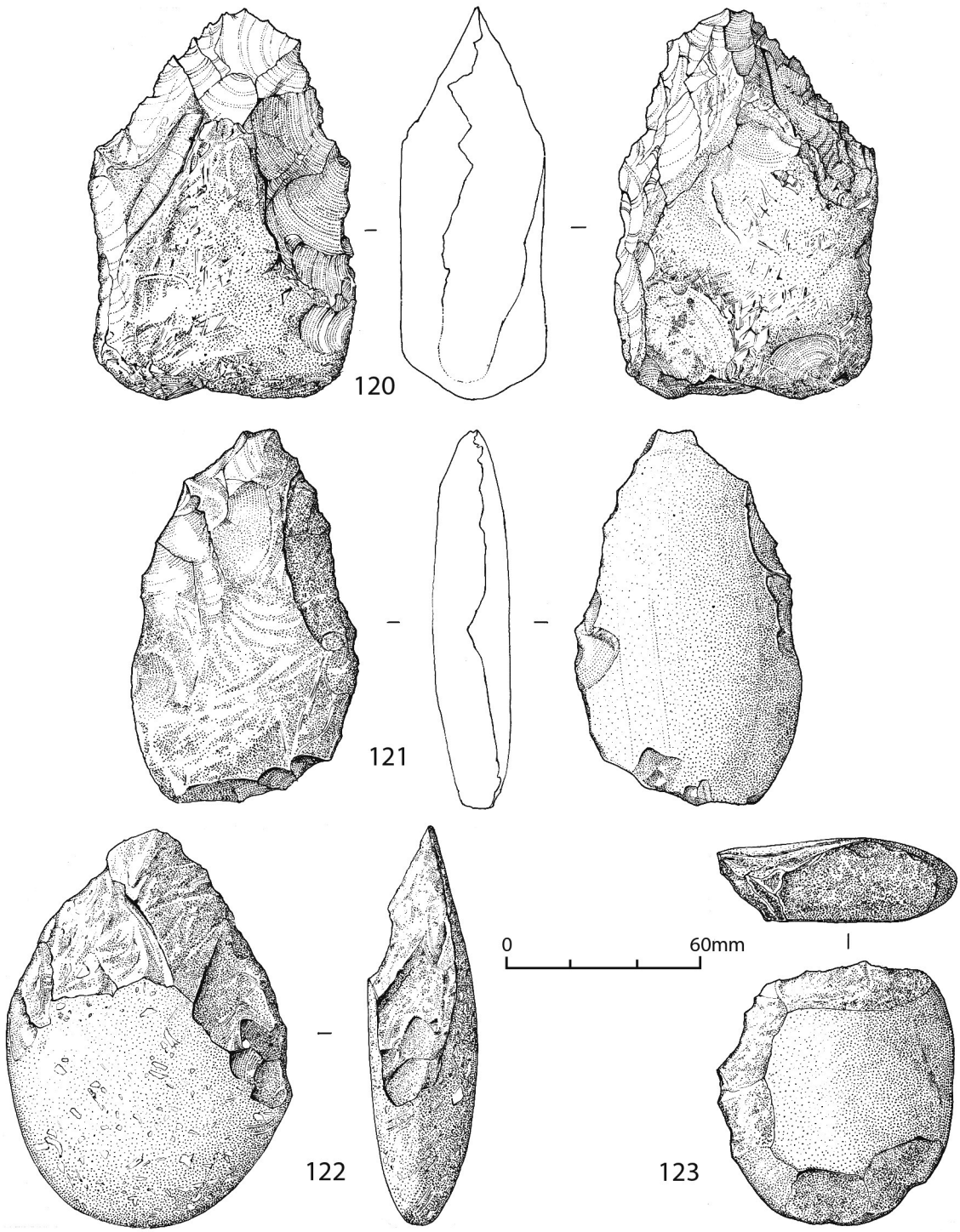

Fig 15 Flint and other stone chopping tools; flint 120, quartzite 121, 123, dolerite 122. Scale 1:2.

shape. On two pieces (not illustrated) the flaked edges were very irregular and so were classified as chopping tool / denticulate. Four were made of flint (including 118–120), three of Greensand chert, one of dolerite (122) and two of quartzite (121, 123). No 119 is blunted from heavy use. No 123 has a sharp edge around most of its perimeter, suggesting a rotary cutting action, rather than chopping. No 121 is unusual in being made on a thin piece split from a large pebble. In terms of size, width seems to be the most significant variable because it defines the size of the working edge. All ten pieces fall within a width range of 60–80mm and eight of them within 70–80mm. Length is more variable, 55–123mm.

Utilised pebbles (Fig 16, nos 124–131)

Although many of the retouched tools were manufactured on pebbles or pebble fragments retaining cortex there was also a range of tools comprising pebbles with only a limited amount of modification, sometimes just use-wear. This does include 'chipping' but is not 'flaking' since the type of material used will not fracture conchoidally or, in most cases, hold a cutting edge. The pebble tools are distinct from those pebbles partly modified by flaking to create picks and chopping tools (above).

The pebbles used are mainly thin and elongated in shape, and mostly of fine-grained igneous or metamorphic rocks which are hard but not strong enough to withstand repeated impact. The exceptions were the hammer stones, of tough, impact-resistant granite or quartzite, and the few heavily chipped pieces that were of coarse but highly resistant greenstone or gabbro. The types of modification identified were chipping, bevelling, faceting, pecking and scratching; the numbers of each and the raw materials used are shown in Table 9.

Chipping can be 'light' as in 124 or 'heavy' as in 125. The former seems likely to be just fracturing from use but that of 125 seems more likely to be deliberate, to form an edge.

Bevelling occurs either on one edge of a tip or, more frequently, on two opposing edges of a tip, as on 126–8. In six cases where bevelling appeared on only one edge of one end there was also light chipping on the reverse side of the same end. This suggests that the chipping was a by-product of the way the tool was used to produce the bevelling and which must therefore have involved considerable force.

Table 9 Utilised pebble tool types and raw materials

Description	schist	dolerite	greenstone	gabbro	rhyolite	Slate	quartzite	granite	serpentine	unidentified	Count	Illustrated example no.
Light chipping	4	4	-	3	3	2	-	-	-	6	22	124
Heavy chipping	8	1	4	1	1	-	-	-	-	2	17	125
Bevelled 1 edge	3	-	-	-	-	-	-	-	-	2	5	-
Bevelled 1 edge with chipping	6	1	-	-	-	-	-	-	-	-	7	-
Bevelled 2 edges one end	7	3	-	-	-	1	-	-	-	2	13	126-8
Bevelled 2 edges one end with chipping	1	1	-	-	-	-	-	-	-	-	2	-
Bevelled 2 edges on two ends	1	1	-	-	-	-	-	-	-	-	2	-
Scratched	-	1	-	-	-	-	-	-	-	-	1	-
Facetted	-	-	-	-	-	-	-	-	-	3	3	129-30
Pecked, hammer stone	-	-	-	-	-	-	2	1	-	1	4	131
Broken, unclassified	-	-	-	-	-	1	-	-	-	-	1	-
Utilised Total	**30**	**12**	**4**	**4**	**4**	**4**	**2**	**1**	**-**	**16**	**77**	
Unused complete pebble	54	7	6	7	0	3	3	1	4	20	105	

Faceting is similar to bevelling, except that it occurs on the edges of flat ovoid pebbles and on each is more extensive than on the narrow tips of the bevelled pebbles, and must have resulted from a different type of use; for example, nos 129–130.

Pecking results from repeated impact in use as a hammer; for instance, no 131.

Scratching. The one example was an elongated pebble (not illustrated) which had irregular, longitudinal scratches on one long face. These marks seem likely to have been produced as a by-product of using the face as base for cutting, in contrast to marks found on some pebbles from Mesolithic contexts elsewhere that were clearly deliberate or decorative features, for example from Trevose Head, north Cornwall (Jones 2015).

The most frequent types of modification by chipping and bevelling occurred on a similar size range of pebbles, mainly 100–140mm long, 30–60mm wide and 15–35mm deep. The facetted pebbles in contrast were short and thin: about 65mm long, 55mm wide and 15mm deep. The hammer stones were relatively small, in the range of 60–80mm long, 50–80mm wide and 35–45mm deep.

The proportion of rock types used for the modified pieces are paralleled closely in those of the 105 unworked, complete pebbles (Table 9), showing that a supply of suitable pebbles was sourced, collected and retained for future use. The material of unworked stone fragments was not recorded. Whether the range of rock types used was selected with preference cannot be ascertained without systematic survey of the local beaches to identify the proportions in which pebbles of the different materials occur. However, it seems likely that it was the particular combination of the finer material (mainly schist) that occurs as naturally formed long, narrow shaped pebbles that was important. This shape provides an easily-held implement with a potentially fine abrasive tip. It was a type of pebble that was carefully sourced, as casual survey of local beaches shows this type and size-range of pebble to be uncommon. The function of the bevelled pebbles has yet to be understood and several possible interpretations have been suggested but whatever that function was, it formed a significant role in the activities being undertaken here (see Discussion, below).

Interpretation and discussion

Lithic distribution

Debitage: the overall distribution plan of all waste flakes and fragments by weight, combining the hand-recovered and sieved material, is shown in Fig 5A, in which values have been evened out to compensate for the unequal coverage of sieving. The full distribution is only correct for the main 11m x 7m block of metre squares, as the northern three rows were not totally excavated, although the south-west quadrant of each square was sieved to allow the distribution of sieved material to be compared across the whole area.

There is a slight concentration towards the west of the area, although locally variable, suggesting that the spread of lithics must continue beyond the excavated area. There appears to be no relationship between lithic density and the shallow features [214], [216], [218], [220], [222] and [224] (Fig 5A, shown in outline). The distribution of cores and core fragments by count (Fig 5B) is generally similar to that of waste flakes and fragments by weight, as might be expected. Cores were mainly small, 20–40mm, averaging 31mm in length, sufficient for the creation of microliths that were no more than 25mm long. There were also a few larger flake cores. The sample of debitage that was studied in detail showed clearly that the focus was on microlith production and that there was some specialisation by area in the different stages of the process of reduction from pebble to blade to microlith (Wenban-Smith, above). The average core size corresponds closely with core sizes from other Late Mesolithic coastal sites in the south west that use beach pebble raw material; for instance, Poldowrian (St Keverne) in Cornwall and Westward Ho!, Devon (David 2007, fig 7.2).

Microlithic objects: The distribution of microlithic by-products and microlithic points (Fig 17) is difficult to assess because there was a breakdown in the processing program, in which a greater volume of soil was sieved from one area (marked with a dashed outline on each figure) than had been intended, raising the recorded density of microlithic pieces in the grid squares concerned.

This aberration in recovery rates also hinders the extraction of information from variations in the distribution of different classes of microlithic points. Triangles are by far the predominant type

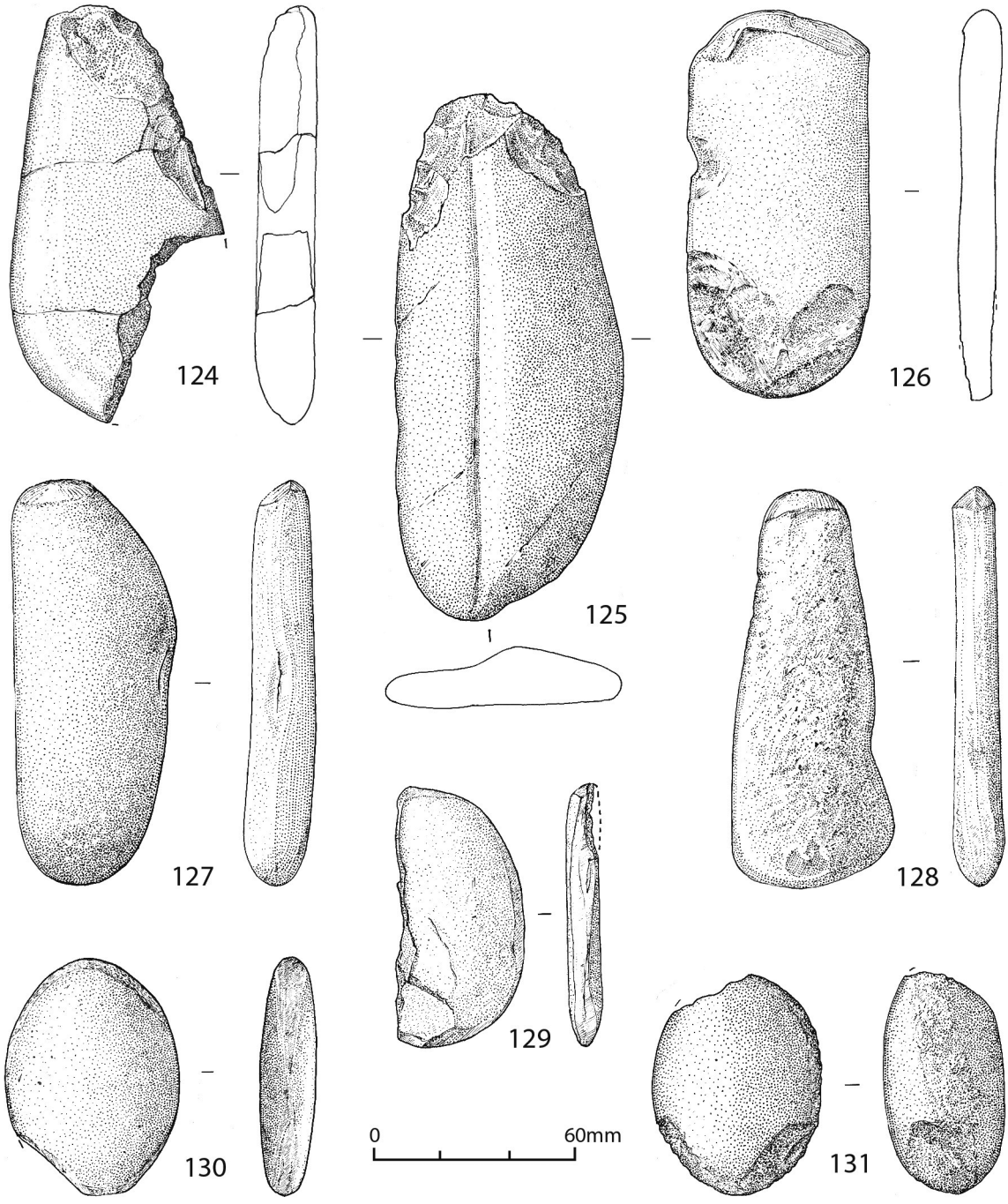

Fig 16 Utilised pebble tools. Chipped 124–125. Bevelled, 126–128. Faceted, 129–130. Hammer stone, 131. Scale 1:2.

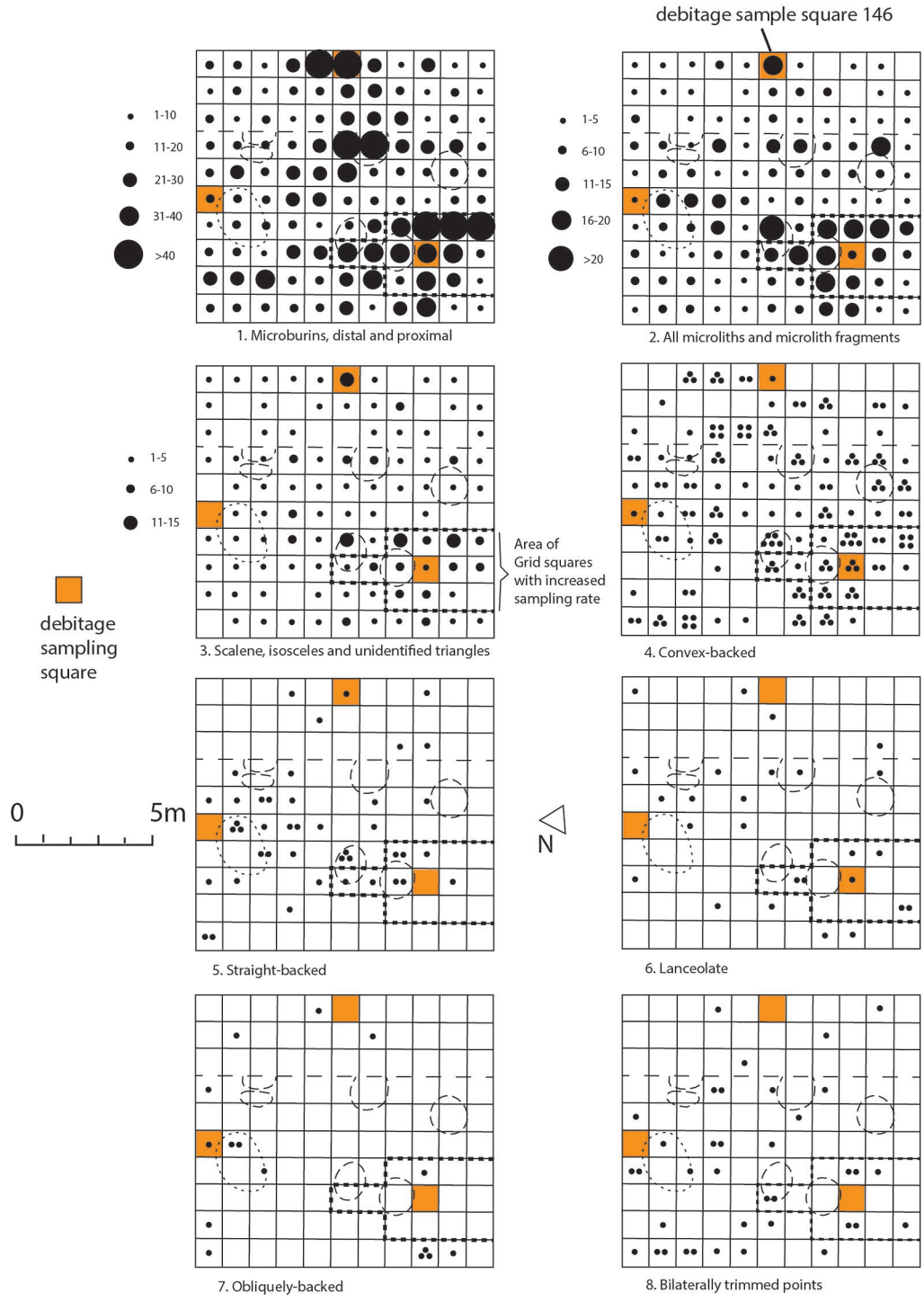

Fig 17 Trench A, distribution plans of microlith types against the outline of sub-soil features. 1–3, density shown by graded symbol sizes. 4–8 density shown by one dot per object.

present and what can be said is that the distribution by count of these is somewhat the inverse of the overall distribution of waste material by weight (Fig 5A) and probably shows that secondary working of blades took place separately from primary flaking, as suggested also by the sample debitage study (Wenban-Smith, above). Overall, the distributions of triangles, convex-backed and lanceolate microliths are similar to each other but a little different from that of straight-backed, obliquely-backed and bilateral points. These differences could reflect specialised areas of production or different areas of craft activity or areas of different periods of occupation. The latter would seem most appropriate, considering the range of radiocarbon dates produced, indicating that there were several episodes of activity over as much as one and half millennia within the sixth and fifth millennia cal BC (Appendix 3), and it would be understandable if there were stylistic or functional changes in the lithic types over this time span. The only dating evidence with a good chance of being closely associated with a specific class of microlithic point is that from square 146, in the centre of a clear focus of lithic material with a concentration of 14 triangles (11 scalene, one isosceles and two unidentified triangle fragments), the only other microliths present being one straight-backed and one convex-backed (Fig 17). The charred hazelnut shell from this square is estimated to date to *4710–4495 cal BC* (*95 per cent probability*, *SUERC-18010*), very late within the period in which scalene triangles and related microlith shapes were in use elsewhere in Britain (*c* 8000–4000 cal BC: Conneller *et al* 2016). The debitage from this grid square formed part of the debitage study and included an unusually high number of microburins and a range of narrower bladelets (Wenban-Smith, above). It is a distinct possibility that most of the objects from this grid square belong to a single worker concentrating on producing one type of triangular microlithic point from ready-prepared bladelets.

Other lithic artefacts: The distribution of larger retouched tools – scrapers, denticulate scrapers, notched pieces and pieces with a snout (Figs 18A and B) – is again generally similar to that of waste flakes and fragments (Fig 5A). This is perhaps surprising, since it might be expected that there would be some spatial differentiation between areas of activity, with the debitage representing mainly microlithic manufacture largely separated from the larger tools representing other activities. However, there is a rather different distribution of chopping tools and picks (Fig 18C). A more extensive excavation might no doubt have revealed more significant differences in the distribution of tool types as representing different activity areas.

Utilised pebble tools: The distribution of these (Fig 18D) is more like that of the overall weight of debitage than of microlithic points, perhaps suggesting some disassociation from the secondary lithic flaking process. Therefore, while the pebble tools may have been associated in some way with the lithic production process, they do not appear to have any obvious association with microlith production. For example, there are no pebble tools in or anywhere close to grid square 146, which as discussed above produced a significant concentration of microliths and microlithic debitage.

Site function

The features revealed consisted of shallow, ill-defined hollows, identifiable by their dark, charcoal-rich fills. The absence of heat-altered subsoil around the features showed that these were not repeatedly used as hearths or associated with high temperatures. One of the features, [214], did not even cut into the subsoil but existed only within the old topsoil layer (Fig 3). The sparse finds of charred hazelnut shells suggest that the hollows were not being used for large-scale hazelnut roasting. They could have been used just for broiling, for instance of fish or shell-fish, by placing the food in a hollow, covering with insulation material and then hot ashes. Such pit-cooking is economical and particularly suitable for fish. However, there would have to have been a hearth nearby. The charcoal identifications included oak as well as hazelnut shell. The oak at least was likely to have been the favoured fuel wood because palaeoenvironmental evidence from elsewhere on The Lizard shows that other tree species were available (see Environment discussion, below).

Four of the hollows were distinctive because their fill contained concentrations of small beach pebbles, generally absent elsewhere on the site. Three of them included pebbles averaging about 5mm diameter and one with pebbles averaging about 15mm diameter. An initial suggestion

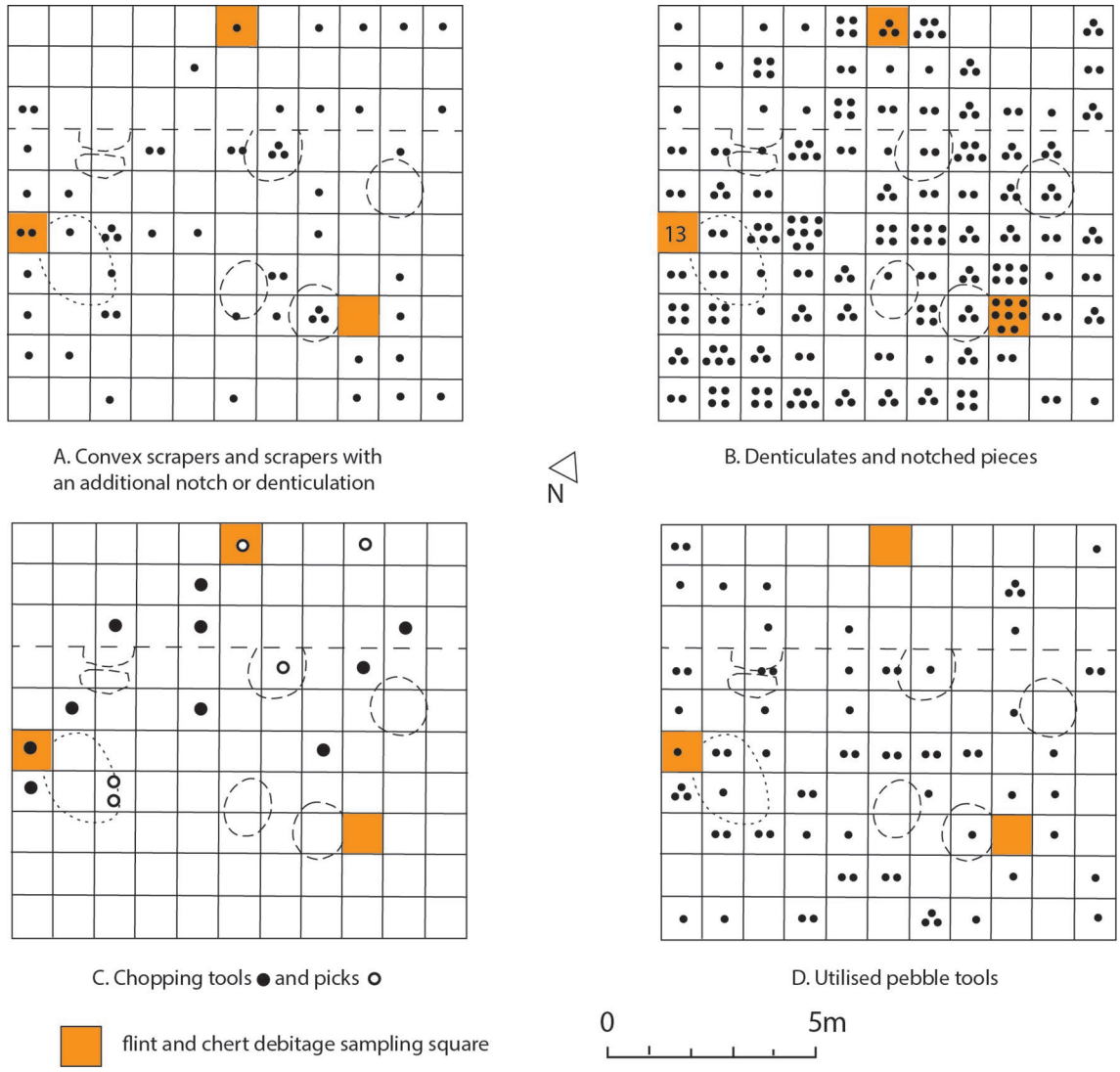

Fig 18 Trench A, distribution plans of larger flint and chert retouched tools, core tools and utilised pebble tools against the outline of sub-soil features. Density shown by one dot per object.

was that these may have been introduced as attachments to sea-weed fronds collected during coastal foraging and used as part of fish broiling within the hollows. However, finds of similar pebbles at the Mesolithic site of Hudder Field, North Cliffs, Camborne, on the north coast have been suggested to be gastroliths from seal stomachs, left after carcass processing or cooking (Jones *et al* 2019, 15–16). Although the interpretation of the pebbles is uncertain, their isolated presence in discrete features proves that they belong with some associated activity, whether deliberately or accidentally introduced. It is noticeable that these hollows are discrete and do not overlap, which might indicate that they belonged to a single phase of activity, rather than being a palimpsest of multiple features from repeated periods of activity. The presence of small pebbles in four of the pits, situated close together, also suggests that they may be contemporary with

one another; however, radiocarbon dates from two of them, [214[and [220], albeit from bulked samples, suggest otherwise (Fig 20 and Appendix 3). The possibility of residual material in a repeatedly used area seems likely but the *terminus post quem* from hollow 220 suggests that all four features are from close to the end of activity at the site, in the later fifth millennium cal BC.

In considering the lithic assemblage it must be borne in mind that the area sampled by excavation is just a relatively small part, probably no more than 1 per cent of the total spread of Later Mesolithic activity represented by the surface scatter (Fig 2). Although the excavation of such a small sample area could have happened on activity of quite limited duration, the radiocarbon evidence shows that activity, perhaps several episodes of activity, was in fact spread over some 1500 years. The overall accumulated assemblage includes a range of tool types, including projectile points, denticulate scrapers, other scrapers, chopping tools and utilised pebble tools: a variety and quantity of artefacts indicative of differing activities taking place intensively and repetitively over time. This suggests that it was more than just a transitory activity area or solely a lithic tool production area.

The large quantity of microliths and related debitage came from quite a small area, so is only a small proportion of the total quantity of artefacts present in the whole location, as indicated by the surface collection (Fig 2). Using the estimate, above, that the excavated area is no more than 1 per cent of the total activity area, then the total amounts of lithic material present could be in the order of 7 million waste pieces, around 150,000 cores, 79,000 microlithic pieces and 45,000 larger retouched pieces. Furthermore, the recovered lithic objects are not the entire contents of the excavated area, as only a portion of the excavated soil was sieved, the remainder just hand collected. The overwhelming number of microliths over other tool types shows that the manufacture of composite projectiles or other tools was an important activity, as also indicated by the study of samples of debitage (Wenban-Smith, above). Microliths seem to have been mass-produced for use elsewhere, perhaps as a supply for an annual stock. There are numerous broken points as well as unclassified fragments, which must result from accidental damage during manufacture. There are also a relatively small number of pieces with impact damage which suggests that some re-arming of composite tools was taking place on site, probably for local use. The predominance of scalene triangles and convex-backed pieces suggests that microlith manufacturing was for specific types of projectile for specific types of hunting or fishing.

A smaller number of microlithic pieces clearly had other functions, however, such as cutting, piercing or grooving tools, as shown by use-wear studies elsewhere. At Thatcham (Berkshire), for instance, use-wear studies of a selection of Later Mesolithic microliths showed only one with possible projectile use, while two showed use for piercing and three for boring soft or medium material such as hide or wood (Grace 1992). Production of microlithic points was on such a scale at Windmill Farm that for some reason a considerable number of complete pieces were left behind. This is shown by the high microburin to microlith ratio of 3.4:1 for classifiable microliths or 2.7:1 if unclassifiable fragments are included. Among the recovered sample the number of microburins found indicates that although about 800 complete microliths were lost or abandoned, at least 1700 were taken away. Even so, the rate of loss or abandonment of such pieces is hard to explain as just casual and accidental, considering the time and skill needed for their production or even the large-scale production process. Were the complete abandoned pieces in some way rejects? Such pieces were easily portable and could have been mass-produced to an accepted size and shape for use elsewhere at other times of the year and similarly for a range of different collecting, hunting or fishing activities.

The proportions of different microlith types being produced for use elsewhere would also have been dependent on the types of composite tools involved. Well-preserved finds of such tools from Britain and the continent show that multiples of microlithic points may have been mounted in sequence as barbs, with just one other type of microlith, such as convex-backed or lanceolate as a tip (for example, Aaris-Sorensen and Brinch-Petersen 1986; David 1998; Larsson and Sjöström 2011). The relative proportions of different classes of microlith may therefore relate to the type of projectiles being produced rather than any regional stylistic variation (*cf* Jacobi 1979).

The quantity and variety of lithic tools at Windmill Farm is notable compared to most other known similar period activity areas from the south west, and would suggest that this may have been

a 'base camp' of some kind. Therefore, despite the huge amount of microlith preparation, this was not just a single specialised production area. There are numerous heavier tools, dominated by the thick denticulate scrapers and variations on them, notched and nosed pieces and coarse scrapers. The presence of such tools is usually regarded as characterising a 'home' or 'base camp' site type (Mellars 1976). However, some of the smaller collections from Cornwall, such as Carn Greeb (Sennen) and Roskestal Cliff (St Levan), near Land's End (Jacobi 1979), which were unlikely to be base camps, do nonetheless include a similar variety of large tools, including denticulate scrapers and bevelled pebbles, all of which therefore seem to have been regular components of a tool kit at both 'home' and more temporary hunting /fishing / foraging site types.

Apart from the focus on microlith manufacture, the only items at Windmill Farm that do make it stand apart are the bifacial chopping tools, picks and the axe /adzehead, all of which are rarer in contemporary assemblages and may perhaps have been involved with woodworking and the creation of structures. Denticulate scrapers, notches and nosed pieces are so far of unknown function, even though commonly occurring. Some pieces have obvious 'noses' but no notches, others have notches but no noses – part of variation the significance of which, if any, remains obscure. The thickness of the pieces suggests heavy use. Similar objects have been found in lithic assemblages of Later Mesolithic type from inland locations in western Wales (David and Painter 2014; Walker 2016) and some of those did exhibit worn edges, so, whatever their function was, it did not belong with purely coastal activities, perhaps used in carcass preparation. Another function could have been the preparation of wooden shafts or mounts for microlithic pieces. Such mounts would be expected to have grooves for fixing microliths but burins, the tool for that job, are almost absent here. However, use-wear study at Thatcham (Grace 1992) identified microlithic forms that had been used for grooving. Larger retouched tools there had a variety of uses for cutting, scraping, whittling, boring and grooving and a variety of materials were being processed including fish, meat, hide, wood, antler and bone. Another result at Thatcham relevant to the interpretation of the Windmill Farm assemblage showed that, of non-microlithic pieces, the most used edges were on non-retouched flakes and there was also evidence for the mounting of non-retouched blade segments to create composite edge tools. Such evidence might also be expected here and further study of the debitage is needed.

The bevelled pebbles also ally Windmill Farm with other Later Mesolithic sites around western coasts. Their average dimensions (length 115.7mm; breadth 40.4mm and bevel width 24.3mm) fall within the statistical cluster of those recorded elsewhere for Cornwall, Wales and Scotland (David 2007, 146). At Poldowrian, for example, the equivalent dimensions are 112.7mm, 40.4mm and 23.8mm. Such implements have been the subject of much discussion. They are mainly found in coastal locations, previously claimed to be useful for coastal foraging, for example for detaching limpets; however, a few do occur further inland in Wales (David and Painter 2014) and in upland locations, for instance on Bodmin Moor (Herring and Lewis 1992). Experiments have shown that use of such elongated pebbles for limpet removal produces a rounded tip, unlike the consistent neat bevels seen here and elsewhere (Roberts 1987, 135–6). Some pebbles also have tip fractures showing that considerable pressure had been applied to the tips, suggesting use in working hard material such as bone. Similar bevelled-end tools are found in some Scottish Mesolithic shell-midden sites, including significantly smaller examples in antler or bone, but these are again of unknown function although in that case experimentation supports a connection with shell-fish collection, perhaps also including some stone-working and hide preparation (Barlow and Mithen 2000). As possible flint-working tools there is a distinct difference between the bevelled pebbles and the heavily used, rounded tips of the flint (and chert) 'fabricators' or 'rods' of Neolithic and Bronze Age assemblages. That could derive from differences in the type of retouching used, in that microlith preparation required the production of narrow blades followed by notching, snapping and then very fine abrupt edge preparation. Recent experimental work indicates that the bevels on such pebbles were manufactured, not just a result of the manner of use, and the tools were perhaps part of seal carcass processing tool kits (Fletcher 2005, quoted in Jones *et al* 2019; also Jacobi 1980).

Besides the bevelled pebble tools there are a few utilised pebbles classified as 'facetted', which are rounded, disc-shaped pebbles, rather than elongated, with narrow abraded facets around the edges. This type of artefact, found also at

Poldowrian (Smith and Harris 1982, 45) and at other periods in inland settings –at Star Carr (Clark 1954, fig 76), for example – must have been used in a quite different type of abrading activity from the bevelled pebbles, possibly for hide preparation.

The scarcity of hammer stones here is surprising. In an (excavated) area with some 73,000 waste pieces of flint or chert, 1500 cores and 448 larger retouched pieces, there are only four hammer stones. However, there was a similar very low presence of hammer stones at two other Later Mesolithic assemblages on The Lizard, at Poldowrian (*op cit*) and Beagles Point (St Keverne) (Smith 1987, 22).

The micro-blade industry could have used 'soft hammer' bone or antler hammers and punches, as identified at Thatcham in both the Earlier and Later Mesolithic areas (Healy *et al* 1992, fig 4 and table 8), but the many denticulate tools have pronounced flake scars that indicate hard hammer use. There is a very stark contrast between the coarse character of these larger tools and the fine work needed for blade and microlith production, and it seems certain that the initial breaking open of the pebble raw material would have required a stone hammer and probably even a hafted hammer. Possibly, a suitably sized pebble of a dense, hard rock, such as quartzite or greenstone, for instance, was not easy to find and, once hafted, was valuable and curated for future use.

Environment, economy and seasonality

In Cornwall flint is only available from beaches and so one would expect most lithic manufacture to be taking place close to the coast, as is evident, with concentrations where fresh water is also available from streams. The coast also offers significant and varied food resources from fish, shellfish, sea mammals and sea birds, which have some seasonal availability implications (Jacobi 1979, 76–86). Jacobi pointed out that the west coast of The Lizard was notable for a breeding population of grey seals (*ibid*, 82 and fig 19), a potential seasonal food source suggested also for the site of Hudder Field, Camborne (Jones *et al* 2019). Overall, Jacobi suggested that the south-west coast of Britain would have been of greatest economic value during spring, summer and autumn, with two peaks of productivity in March–April and August–November.

The lower sea levels of the earlier post-glacial exposed additional areas of land surface. Some of the bays of the south west, such as Mount's Bay, Penzance, and those to the east of The Lizard have produced remains of submerged forests, showing that there were some areas of coastal plain and productive intertidal zones, comparable to, for instance, the shallow shores of the Severn Estuary, with the potential for a rich and varied food resource. Nevertheless, the peninsulas of West Penwith, The Lizard and Trevose Head (Johnson and David 1982) were rather different topographically and must have held some special attraction for settlement activity. The steeply sloping sea-bed off the coast near Predannack Downs during the Later Mesolithic period, when sea-level rose from about 10m below the present to near present-day levels (Fig 1B–C), provided access to deeper waters as well as to a rocky shore, which provided a particular range of coastal resources in terms of fish, sea mammals and birds that might have attracted settlement at certain times of the year. One south-western coastal Later Mesolithic site to produce organic remains, the intertidal peats at Westward Ho!, north Devon, recorded shellfish and hazelnut shell as well as fish, cattle, pig, red and roe deer, a varied economic base that required exploitation of both inland and coastal resources (Balaam *et al* 1987); more extensive studies along the north side of the Severn Estuary have also shown that the later Mesolithic coastal economy would have included functionally and seasonally different areas of occupation determined by exploitation of different resources (Bell 2007).

Despite its current location 1.5 km inland it is reasonable to classify Windmill Farm as 'coastal', as has been argued for equivalent sites in west Wales (David and Painter 2014, 82–3). An area of 10 km radius around Windmill Farm, regarded as a feasible extent for exploitation by hunter-gatherers (Bonsall 1980, 465), would encompass the whole of The Lizard coast as well as the Helford and Loe estuaries, plus inland moors and forest, providing a varied and rich potential food resource, one that might support a settlement year round. Such a picture is more in keeping with recent proposals for more fixed foci of Late Mesolithic settlement in the south west, rather than entirely transient seasonal exploitation (Gardiner 2011). However, in practical terms, seasonal occupation at Windmill Farm seems almost certain. Despite a mild climate and high annual sunshine hours, The Lizard

peninsula is notable for high winds, with one study of Lizard Point from 1950 to 1959 recording gale force winds in about half the days of each month from November through to March (Turk and Turk 1976, 15). The Predannack and Lizard Downs are also poorly drained and subject to winter waterlogging. It seems likely then, that Mesolithic winter settlement was elsewhere, even if within the same exploitation range.

Independent of seasonality, access to flint and chert must also have been an important factor in settlement location, considering the absence of *in situ* sources of such material in the south west. Flint and chert from submarine strata in the Channel Basin must have been cast up on storm beaches. As sea levels rose throughout the Mesolithic it seems probable that access to suitable lithic materials became more constrained, limiting the choice of larger and better-quality pieces. The small, well-rounded flint pebble gravels of the Loe Bar and Gunwalloe Cove, 7 km to the north west, do contain occasional larger pieces and these may indicate the former presence of more abundant flint raw material. Collection and working of flint could probably be best done during periods when food resources were plentiful and available from a static location, again favouring a late summer period. The presence of charred hazelnut shells at Windmill Farm also suggests that activity overlapped September–October.

The small amount of palaeoenvironmental evidence of charred botanical material from the excavation consisted of oak wood charcoal, hazelnut shell and a few False oat grass bulbs (Balaam and Akeret, Appendix 2, below). These indicate a marked difference to the present-day environment, which is dominated by heather, gorse and purple moor grass over poorly drained gley soils. Much of this, including most of the Mesolithic activity area, has, since the excavation, been registered as a nature conservation area for its rare plants, bryophytes, lichens and invertebrates (West Lizard SSSI). The presence only of oak and hazel shows there was some woodland nearby (although somewhat at odds with other palaeoenvironmental evidence from The Lizard: see below). The hazelnut shells indicate that activity at least overlapped the autumn, although the small numbers present suggest that their collection was not a major part of the economy. Autumn activity is also indicated by the charred bulbs of False oat (Onion-couch) grass (*Arrhenatherum elatius* L.), one of them in hollow 222. Such bulbs have been found across Europe in contexts from the Later Mesolithic to the Iron Age, but of uncertain interpretation, often as part of Bronze Age cremations, possibly just as remnants of turves used for burning (Kubiak-Martens 2002; Roehrs *et al* 2013) but with a possibility of use for food, although one trial reported them to be inedible (Mears and Hillman 2007, 331). It is a tough, tussock-forming grass and in woodland areas is reported to be 'restricted to regeneration glades and open scrub' (Pfitzenmeyer 1962), so would support an interpretation of the Mesolithic occupation here as an occasionally reused clearance in woodland.

The area of the lithic scatter lies to the east of a small stream which would have provided an essential fresh water supply and probably, as now, supported a shelter belt of woodland. The previous fieldwalking project (Smith 1987) identified 11 new areas of Later Mesolithic activity on The Lizard (Fig 1B). All the larger lithic collections were next to a spring or stream, while the smaller collections were more dispersed, perhaps indicating briefly-used foraging / hunting camp sites (*ibid*, 63–5). Most of the presently recorded Later Mesolithic activity areas in the south west are close to the coast (Fig 1A) but this is biased by the need to exploit the flint and chert available there (Berridge and Roberts 1986), as well as by more intensively walked coast compared to inland. There has now been some targeted fieldwork inland, on Bodmin Moor, revealing the presence of many small scatters of lithics likely to represent widespread small-scale foraging / hunting activity in the Mesolithic and Neolithic (Herring and Lewis 1992; Jones and Lawson-Jones 2018). This extensive use of the landscape is further emphasized by the identification on Bodmin Moor and other inland sites of pits which have no associated flint scatters, some producing Mesolithic and some producing Early Neolithic radiocarbon dates (Jones and Lawson-Jones 2018, 24–6 and table 10). In some instances, therefore, it is clear that flint working in these periods may have occurred separately from other more domestic activities. Thus, at Windmill Farm, the large quantities of lithic material, which imply considerable intensity or persistence of use, may well be separate from as yet unlocated domestic living areas.

The present-day open heathland around Windmill Farm, like that on the upland of Bodmin Moor, appears barren and unproductive, but it has been shown that much of the south west, even on

the moorlands, would have been wooded at this time (Gearey *et al* 2000). Over the period that the Windmill Farm site was in use climate and temperatures in Cornwall gradually improved (Caseldine 1980, 8–10). Palaeobotanical study on The Lizard itself has also provided environmental evidence for the period corresponding to the Windmill Farm Mesolithic activity. Samples were taken from a peat-filled, periglacial palaeochannel at Hendra Farm, Ruan Major, 3 km to the north east of Windmill Farm. The lowest part of the column was radiocarbon dated to span a period from the early sixth to the late fourth millennium cal BC (Garbett 2013). At the start of this period the environment was dominated by pine and birch woodland with a significant component of hazel. The presence of pine gradually decreased over time, with hazel becoming dominant while oak, elm and lime also appear. By the end of the period alder was beginning to increase, becoming dominant after *3365–3115 cal BC* (*68 per cent probability*). Another palaeobotanical sample has been studied from valley-bottom peat deposits at Porthallow, St Keverne, 13 km to the north east (H Tinsley in Lawson-Jones 2000, 11–16, 23). This produced a radiocarbon date of the first half of the fifth millennium cal BC: 5200–4610 cal BC (2σ; 5950±90BP; GU-8238). This showed that by this time there was a mainly wooded environment with alder and willow around the peat-filled basin and oak and hazel further upslope. In contrast, it seems that mature mixed oak woodland may never have become dominant in the Windmill Farm area, perhaps because of the poor and often ill-draining, waterlogged soils of much of The Lizard. However, the indicated widespread presence of hazel woodland provides a suitable environment for Mesolithic foraging and a nut harvest peaking in October. This provides a good idea of the general palaeoenvironmental sequence on The Lizard.

Dating and typology

Current understanding based upon dating of typologically distinct lithic assemblages, and especially microlith forms, suggests that an Early Mesolithic, defined by the presence of large and simple forms of microlith, emerges in England and Wales from *c* 9400 cal BC (Conneller *et al* 2016). A subsequent Middle Mesolithic (*c* 8500–6700 cal BC), typical of some later assemblages in southern and central England, has not yet been identified in the south west. Instead, the finds from Windmill Farm, with many small 'geometric' microliths, are defined as Late Mesolithic, a period that first appears from *c* 8000 cal BC. Jacobi's study of English Later Mesolithic assemblages (1979) identified several regional groupings, based on a detailed analysis of the types and proportions of microliths from well-documented assemblages. One of these was a South Western group, comprising five assemblages from Devon and Cornwall and one from Dorset (Portland I). This group was characterized by assemblages where convex-backed pieces together with lanceolate pieces outnumber obliquely-backed, straight-backed pieces and scalene triangles. Two of these sites were from the west of Cornwall: Carn Greeb and Roskestal Cliff, both cliff-top sites near to Lands End. Two collections from The Lizard, from Goonhilly Downs and from Lizard Point, were too small to be included but were thought to be of the same general period (*ibid*, 63 and fig 17, nos 77 and 78). Significantly, the Windmill Farm microlith assemblage does not fit with this grouping. Convex-backed and lanceolate pieces (together 37 per cent of the assemblage) do outnumber obliquely-backed and straight-backed pieces, together only 3 per cent of the assemblage, but, more importantly, scalene triangles, at 59 per cent of the assemblage, far outnumber the total of convex-backed and lanceolate pieces, not counting the many broken, unassigned triangles. If the latter were included then the assemblage is totally dominated by triangles. In this it is dissimilar, for example, to the assemblage from the excavated site of Poldowrian, only 4 km to the east (Smith and Harris 1982), which was instead dominated by convex-backed and lanceolate pieces, with only a small proportion of scalene triangles. The non-microlithic component at Poldowrian was, however, in all other respects very similar to that of Windmill Farm. A single radiocarbon date from (bulked) charred hazelnut shell at Poldowrian, (where there were also some Early Neolithic artefacts) was 5630–5210 cal BC, 6450 ±110 BP (2σ; HAR-4568), which falls in the middle of the date range from Windmill Farm.

The implications here are either that groups with somewhat different assemblages of microlithic types were visiting The Lizard at points within the same general period, or that the same groups used different assemblages at different times, perhaps depending on different seasonal hunting needs. Of

course, the Windmill Farm assemblage itself, with its long duration of possible repeated visits, could merge within it a variety of different assemblage types / periods and could just be occupied at different seasons and be functionally different from the cliff-top site at Poldowrian and the other cliff-top sites used in Jacobi's analysis. The latter showed that those assemblages dominated by scalene triangles occurred widely elsewhere in England outside the south west but did not fit into any of his four proposed regional groupings. In fact, at Carn Greeb, Land's End, scalene triangles formed the largest single type at 40 per cent of the microlithic assemblage (although outnumbered by convex-backed plus lanceolates), as also at Penhale Point, Cubert, on the north Cornish coast, 61 per cent (Smith 1988), and at Culverwell, Dorset, 60 per cent (Jacobi and Tebbutt 1981). Culverwell has produced dates between *c* 6300 and 5700 cal BC (Palmer 1999), falling near the beginning of the Windmill Farm date range.

As discussed above, the forms present in the Windmill Farm lithic assemblage appear to be of a single technological character, although the radiocarbon dates indicate activity or episodes of activity over a period of about 1500 years during the sixth and fifth millennia cal BC. This is not immediately surprising since the technologically identified period of the Later Mesolithic is recognised as extending over a long period, *c* 8000–4000 cal BC (Conneller *et al* 2016). Although it might be expected that the long period at Windmill Farm might allow changes in tool forms to be detectable, there is unfortunately no contextual separation to assist in identifying these, a problem faced at other Later Mesolithic sites such as The Nab Head II, Pembrokeshire (David 2007). The microlithic assemblage there, as at Windmill Farm, was dominated by small scalene triangles.

There is a suggestion that earlier assemblages within the Later Mesolithic have larger scalene triangles than those from later assemblages, but that has yet to be explored further by wider analysis (David and Walker 2004, 317). There could be a case for identifying a few possible earlier components of the assemblage at Windmill Farm, although whether those represent an actual early phase of activity cannot be proven. These include the possible tranchet axe / adze, the more perfect examples of which are regarded as typical of the Earlier Mesolithic, a few obliquely backed forms (Fig 8, nos 1–5), a larger unclassified piece (Fig 9, no 46) and possibly some of the bilaterally trimmed points (for instance, Fig 10, nos 68–70) with a resemblance to some awl-like pieces (*mèches de foret*) among the Early Mesolithic assemblage from The Nab Head I (David 2007, 103). However, there is no firm evidence for an Early Mesolithic presence here and despite extensive fieldwork only one occurrence is known from The Lizard generally, consisting of several broad-blade, obliquely-backed pieces from Croft Pascoe (Ruan Major) on Goonhilly Downs (Smith 1984, 32–40).

Radiocarbon-dated activity from Windmill Farm is estimated to have finished by the end of the fifth millennium cal BC (*end windmill farm;* Fig 20), showing that there was some activity there at a very late stage of the Mesolithic with no lithic evidence of any subsequent activity of Neolithic or later date. Jacobi thought that a 'Latest' Mesolithic assemblage in Cornwall would be dominated by convex-backed pieces as found at the (undated) surface collection from Stamps, Sennen (Jacobi 1979; 1980; pers comm) and at Poldowrian, St Keverne (Smith and Harris 1982). It is of interest to note that there are no *micro-petit tranchet* microlith types (David 2020, 41, 44), nor any convincing examples of continental-type rhomboid / trapezoidal forms such as those recently and exceptionally encountered on the Isles of Scilly (Anderson-Whymark *et al* 2015), both of which are argued to occur very late in local Mesolithic sequences.

There is a marked change in lithic technologies and tool types in the south west following the Mesolithic, perhaps due in part to rising sea-levels that prevented access to larger flint pebbles. Instead, small pebbles were split on an anvil to produce bipolar cores and splintered (scalar) flakes (David 2017; Ballin 2021), none of which are present at Windmill Farm, either in the excavated area, or in the wider surface collection. That phase, presumed to be of Neolithic or later date, has a minimal tool repertoire dominated by small convex scrapers, casually retouched flakes and utilized, often scalar flakes, but, significantly, no microlithic points, and belonged to a very different subsistence base in which animal husbandry and crop cultivation had been introduced. After such a long period of use there was a complete cessation of activity at Windmill Farm and perhaps a gradual reduction in visits to The Lizard generally at this time. In contrast, the small moorland site of Croft

Pascoe was visited during the Early Mesolithic, the Later Mesolithic and the Early Neolithic (Smith 1984, 32–40). In all three periods the assemblage was dominated by projectile points, showing that it was of some particular attraction as a hunting base. The cliff-top site at Poldowrian, however, was revisited possibly only briefly and on a small scale, during the Early Neolithic period (starting at *c* 3800 cal BC in the south-west peninsula: Whittle *et al* 2011, 516–8), with several leaf-shaped arrowheads suggesting hunting activity associated with a radiocarbon date of 3960–3360 cal BC, 4870 ±130 BP (2σ; HAR-4052) from one pit. The latter date has an unhelpfully wide range but suggests that such activity at Poldowrian was broadly contemporary with that at the hill-top enclosures at Carn Brea (Illogan) and Helman Tor (Lanlivery), to the north and north east (Mercer 1981; 1997; Whittle *et al* 2011, 518). The abandonment of the Windmill Farm location, and its lack of later use, indicates some profound change in subsistence or society and perhaps environment, a change that was no longer focused on coastal locations, but around hill-top enclosures. However, The Lizard peninsula did retain a continuing alternative attraction in the form of the gabbroic clay from the St Keverne area on the east side of the peninsula, which was exploited for pottery, found widely, for instance at both the Carn Brea and Helman Tor Neolithic enclosures (Jones and Quinnell 2011).

The small-scale fieldwork at Windmill Farm demonstrates the extent and potential of this location for Mesolithic studies in the south west. As mentioned, despite the large lithic assemblage recovered, it derived from a very small sample of the activity area recorded by surface collection, making general interpretation difficult, if not unwise. Further work here would be of great value, sampling more widely, to look for evidence of other types and periods of activity. The area excavated was, in effect, an industrial area; domestic activity and perhaps structures must have been elsewhere, nearby. The apparent integrity of the lithic assemblage, as far as this can be judged, requires testing by further sampling and/or excavation, combined with more rigorous scientific dating. The latter would allow the duration of activity to be better understood and would explore and test the likelihood that Windmill Farm was, as often the case elsewhere in early prehistory, a persistently revisited locality (for example, Barton *et al* 1995; Milner *et al* 2018; David 2020). Use-wear analysis was beyond the scope of the project but could be applied in retrospect and should be part of any future fieldwork. Such work should include a search for better contextualised samples for radiocarbon dating. Background understanding could be improved by work at several as yet unexplored Mesolithic sites on The Lizard (Smith 1987) and systematic study of the occurrence of flint, chert and the utilized pebble rock types on local beaches. Perhaps of even greater immediate value would be better paleoenvironmental evidence. The lithic scatter continued into the wetter ground, close to the stream at the west where there might be better organic preservation, so further excavation there might be rewarding. There are also several pools on Predannack Downs (Fig 1C) that provide potential for environmental sampling. Such study would benefit the botanical history of the heathlands as well as providing a dated sequence of changes in the prehistoric environment.

Acknowledgements

Many thanks must go to the farmer, the late Mr E D Bishop, for allowing the excavation and to his son-in-law, Mr G Ratcliffe, for reporting the find. Funds for the rescue recording were agreed by J Hinchliffe and Dr G J Wainwright of what was then the Inspectorate of Ancient Monuments. The work was supervised by the late Nic Appleton, the late Abigail Borrow, Tony Holmes and Andra Kurlis of the Central Excavation Unit, with the help of volunteers from Cornwall Archaeological Society, Jane Andrew, Geoff Berridge, Margaret Hunt, Mary Irwin, Caradoc Peters, Nancy Reed, Margaret Shirley and Vanessa Straker. Ron Caddy, Margaret Hunt and Nancy Reed both lived on The Lizard and their love and practical support for the archaeology of the area deserves special mention; it is much regretted that they did not live to see the results of this work. Of course, special mention must be made to the memory of Roger Jacobi, whose enthusiasm and detailed recording of the microlithic material contributed so much to the initiation and eventual publication of the work.

Despite the small scale of the excavation, the quantity of artefacts produced was very large and required a disproportionate amount of post-excavation work in cataloguing and marking. This was carried out by Abigail Borrow and the author with data inputting by Sheila Keyte and data processing by Brian Attewell; thanks to John

Fig 19 Windmill Farm excavation team. Left to right. ***Back row****: Margaret Shirley, Jane Andrew, George Smith, Ron Caddy.* ***Middle row****: Caradoc Peters, Geoff Berridge, Mary Irwin, Nancy Reed, Andra Kurlis, Nic Appleton.* ***Front row****: Tony Holmes, Abigail Borrow, Vanessa Straker, Margaret*

Hinchliffe for allowing this work to take place. The lithic identification was carried out largely by Roger Jacobi and Andrew David, who also contributed ideas and comments. Artefact illustrations were prepared mainly by Chris Boddington of the English Heritage drawing office, with Figure 6 by Judith Dobie and other illustrations by Ed Lyons, Andrew David and the lead author. Thanks must go, for all their help with the post-excavation, to the Historic England Teams at Fort Cumberland, Portsmouth – Brian Kerr, Claire Tsang and John Vallender.

The artefacts from the excavation will be kept at the Royal Cornwall Museum, River Street, Truro, TR1 2SJ.

Appendix 1 Microlith sub-classification

The classification of microliths carried out by Roger Jacobi included a more detailed sub-classification based on the location of retouch and overall shape and this is presented here in Table 10.

Appendix 2 Carbonised palaeobotanical remains

Nick Balaam and Ὸrni *Akeret*

Soil samples containing charcoal pieces were sorted and charcoal pieces identified by Nick Balaam at the Ancient Monuments Laboratory in 1985 and three radiometric radiocarbon measurements were obtained from these. Additional material, including some from soil flotation, was identified by Ὸrni Akeret at Palaeoecology Research Services in 2005, with the aim of obtaining material suitable for AMS radiocarbon dating.

Table 10 Microlith sub-classification

Class	*Description*	*Count*	*Illustrated example no.*
Oblique	Obliquely backed left	12	1–4
	Obliquely backed left with add. ret. on the l.e.	2	5
	Obliquely backed left with impact damage	1	62
	Obliquely backed right	1	-
	Sub total	**16**	
Scalene	Ret. 3 edges	160	6–8
	Ret. 3 edges with inv. ret. on l.e.	1	9
	Ret. 3 edges with impact damage	2	50, 51
	Ret. 2 edges	28	10
	Ret. 2 edges with inv. ret.	5	11
	Ret. 2 edges with impact damage	1	52
	Ret. 2/3 edges with impact damage	1	56
	Fore part, ret. 3 edges	86	-
	Fore part, ret. 3 edges with impact damage	3	53-5
	Fore part, ret. 2 edges	12	-
	Mid part, ret. 3 edges	4	-
	Mid part, ret. 2 edges	1	-
	Mid part, ret, 2/3 edges with impact damage	1	57
	Lower part ret. 3 edges	3	-
	Sub total	**308**	
Isosceles	Ret. 3 edges	4	12–14
	Ret. 2 edges	7	15–17
	Probable isos. triangle ret. 3 edges	13	-
	Sub total	**24**	
Unidentified triangle fragments	Forepart ret. 3 edges	53	-
	Forepart ret. 2 edges	22	-
	Lower part ret. 3 edges	20	-
	Lower part ret. 2 edges	9	-
	Frag. ret. 3 edges	2	-
	Frag. ret. 2 edges	1	-
	Midpart ret. 3 edges	25	-
	Midpart ret. 2 edges	11	-
	Sub-total	**143**	

Continued on next page

Class	*Description*	*Count*	*Illustrated example no.*
Convex backed	No bulb	79	18, 19
	Bulb intact	37	20, 21
	Bulb intact and gap between bulb and ret.	5	22, 23
	Bulb removed and inv. ret. on l.e.	2	24
	Convex ret. on l.e.	13	25
	Straight ret. on l.e.	19	26
	Straight ret. on l.e. and impact dam.	1	60
	Concave ret. on l.e.	4	27
	Inverse ret. around back	1	-
	Unclassified with bulbar end missing	2	-
	Convex or lanceolate with impact dam.	1	61
	Sub total	**163**	
Lanceolate	Pointed base	16	28, 29
	Rounded base	5	30, 31
	Bulb intact	3	32
	Rounded base with inv. ret. on l.e.	1	33
	Bulb intact and impact dam.	1	58
	Base damaged	3	-
	Base damaged and impact dam.	1	59
	Unclassified	1	-
	Sub total	**31**	
Straight backed	Straight backed	11	34, 35
	Straight backed with ret. on l.e.	23	36, 37
	Straight backed with inv. ret. on l.e.	9	38
	Straight backed with oblique basal ret.	3	39
	Sub total	**46**	

Abbreviations: add., additional; ret., retouch; inv., inverse; l.e., leading edge; imp., impact; dam., damage; pce., piece; frag., fragment.

Charcoal

Nick Balaam

All pieces were heavily impregnated with iron pan, making identification difficult. Attempts to remove the iron chemically were unsuccessful. Of those pieces that could be identified, 16 samples contained *Quercus* sp. and five contained *Corylus avellana* (hazelnut shell). Two samples from feature [214] (HAR-4626 and HAR-5667) and one from [220] (HAR-5668) were submitted for conventional radiocarbon dating. Each was a large sample made up of a combination of several sieved samples and, as all the identifiable material was *Quercus* sp., there is a likelihood of an age-at-death offset because of the inclusion of old wood.

Plant remains

Òrni Akeret

Plant material from hand collection and from sieved residues was sent for assessment of its suitability for radiocarbon dating (Table 11). Most of the remains were coated with sediment, requiring careful cleaning prior to submission for dating. Short-lived plant remains are preferable for

Table 11 Identification of plant remains from Windmill Farm
All remains charred if not noted otherwise. H: from hand collection: S: from sieved residue.

Context *Grid square*	*Sample* *Type*	*Result of identification*	*Suitable for AMS radiocarbon dating?*	*Selected for AMS dating*
7A	S	1 fragment of *Corylus* shell	Yes	
14A	S	2 fragments of *Corylus* shell; few charcoal fragments	Yes (*Corylus*)	
16A	S	1 unidentified charred object	No	
21A	S	1 unidentified object, possibly modern	No	
27C	S	2 charcoal fragments	With *caveat*	
29A	S	2 *Arrhenatherum* bulb fragments	Yes	
36A	S	1 unidentified charred object	No	
40A	S	Few charcoal fragments	With *caveat*	
43A	S	2 charcoal fragments	With *caveat*	
43B	S	1 *Arrhenatherum* bulb; 1 charcoal fragment	Yes (*Arrhenatherum*)	
44A	S	1 fragment of *Corylus* shell; 1 charcoal frag, 1 bark frag	Yes (*Corylus*)	
44A3	H	Few small fragments of *Corylus* shell or *Prunus* fruits stone	No	
44A3	H	1 fragment of *Corylus* shell	Yes	Yes
46D	S	2 unidentified charred objects (*Arrhenatherum*?)	No	
52A	S	1 fragment of *Corylus* shell	Yes	Yes
54A	S	1 *Arrhenatherum* bulb	Yes	
56B	S	1 tiny charcoal fragment	No	
60C	S	1 fragment of *Corylus* shell	Yes	Yes
61B	S	2 fragments of *Corylus* shell	Yes	Yes
61D	H	Few small charcoal fragments	With *caveat*	
68D	H	Few charcoal fragments	With *caveat*	
69A3	H	1 small fragment of *Corylus* shell	Yes	Yes
82A	S	1 *Arrhenatherum* bulb	Yes	
86A	S	1 small charcoal fragment	With *caveat*	
86D3	S	2 charcoal fragments	With *caveat*	
96A	S	Few charcoal fragments	With *caveat*	
99D3	H	1 charcoal fragment	With *caveat*	
111A	H	Few small fragments of *Corylus* shell or *Prunus* fruits stone	No	
111A	S	2 fragments of *Corylus* shell	Yes	
117A	S	1 fragment of cinder/slag	No	
127A	S	1 fragment of *Corylus* shell	Yes	Yes
141A	S	1 charcoal fragment	With *caveat*	
146A	S	1 fragment of *Corylus* shell; 1 piece of cinder	Yes (*Corylus*)	Yes
171C	H	Possibly coal	No	
180A	S	Few small charcoal fragments	With *caveat*	
223	H	From fill of feature 222. 1 charcoal fragment	With *caveat*	

AMS dating so that the date returned is likely to be close to that of the charring event. Such items found here were hazelnut shells (*Corylus avellana* L.), bulbs of false oat-grass (*Arrhenatherum elatius* L.) and possibly also fruit stones of cherry / plum (*Prunus*).

Appendix 3 Radiocarbon dating and chronological modelling

John Meadows, Christopher Bronk Ramsey, Gordon Cook and Peter Marshall

Nine radiocarbon measurements have been obtained from Windmill Farm; three from AERE Harwell in the mid-1980s, together with six from the Oxford Radiocarbon Accelerator Unit and Scottish Universities Environmental Research Centre (SUERC) in 2008 (Table 12).

The samples dated at Harwell were pre-treated using an acid-base-acid protocol (Otlet and Slade 1974). Two samples, HAR-4626 and HAR-5667, were then combusted to carbon dioxide, synthesized to benzene using a method similar to that initially described by Tamers (1965) and a vanadium-based catalyst (Otlet 1977) and dated by liquid scintillation spectrometry (Otlet 1979; Otlet and Warchal 1978). The other sample, HAR-5668, was combusted to carbon dioxide as outlined by Otlet and Slade (1974), and then dated by gas proportional counting as described by Otlet and Evans (1983) and Otlet *et al* (1983, 1986).

The samples dated at SUERC were pre-treated by the acid-base-acid protocol (Mook and Waterbolk 1985), converted to carbon dioxide in pre-cleaned sealed quartz tubes (Vandeputte *et al* 1996), graphitized as described by Slota *et al* (1987), and measured by Accelerator Mass Spectrometry (AMS) (Freeman *et al* 2004; Xu *et al* 2007). At Oxford the samples were pre-treated using the acid-alkali-acid protocol described by Hedges *et al* (1989), converted to carbon dioxide by combustion (Hedges *et al* 1992), graphitized (Dee and Bronk Ramsey 2000) and dated by AMS (Bronk Ramsey *et al* 2004).

Internal quality assurance procedures at both Oxford and SUERC, together with international inter-comparisons (Scott 2003), indicate no laboratory offsets and validate the measurement precision quoted.

Sample selection and characterisation

The sample size required for conventional radiocarbon dating meant that the material, in this case charcoal, had to be bulked together to make a sample of sufficient size for dating (about 15g). As emphasized by Ashmore (1999), this runs the risk that the sample will include fragments of various ages, resulting in a radiocarbon measurement that is the mean of all and the age of none (Bayliss *et al* 2012, ix). The identification of charcoal samples to age and species is also critical for interpreting the resultant radiocarbon date due to the old-wood effect (Bowman 1990, 15). The carbon in tree-rings is fixed from the atmosphere during their year of formation, thus the centre of a long-lived tree can contain carbon that is many hundreds of years older than the burning event. Only one of the samples submitted to Harwell was identified prior to dating, HAR-5668 (mainly oak), the other two were unidentified. Given the bulked nature of the material and the potential for an unknown age-at-death offset these measurements should provide reliable *termini post quos* for the contexts from which they were recovered.

The six fragments of hazelnut shell dated in 2008 as single entity short-lived samples (Ashmore 1999) should directly date the archaeological activity from which they derive.

Chronological modelling

The nine radiocarbon determinations are statistically inconsistent at the 5 per cent significance level ($T' = 1692.3$, $T'(5\text{ per cent}) = 15.5$, $\nu = 8$; Ward and Wilson 1978) and are therefore not of the same calendar date. The six measurements on single entity hazelnut shells are statistically inconsistent at the 5 per cent significance level ($T' = 1653.6$, $T'(5\text{ per cent}) = 11.1$, $\nu = 5$), and are therefore not of the same actual age. In fact, only two pairs of samples are statistically consistent at the 5 per cent significance level (OxA-18630 and SUERC-18009: $T' = 0.2$; SUERC-18568 and OxA-18681: $T' = 2.3$; $T'(5\text{ per cent}) = 3.8$, $\nu = 1$ in both cases) and could be of the same radiocarbon age. The radiocarbon ages of the three bulk samples are also statistically inconsistent at the 5 per cent significance level ($T' = 12.6$, $T'(5\text{ per cent}) = 6.0$, $\nu = 2$).

Simple visual inspection of the calibrated radiocarbon dates does not allow us to assess the date of activity at Windmill Farm accurately, since the calibration process does not allow for the

Table 12 Windmill Farm radiocarbon and stable isotope results
The results are conventional radiocarbon ages, corrected for fractionation using $\delta^{13}C$ values.

Laboratory number	*Sample number, material dated and context*	$\delta^{13}C$ (‰)	*Radiocarbon age (BP)*	Highest Posterior Density interval (95% probability) cal BC
SUERC-18009	CAS235-52 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–24.8	6935±35	*5890–5725*
OxA-18630	CAS235-127 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–25.1	6916±32	*6005–5860 (5%) or 5850–5720 (90%)*
SUERC-18568	CAS235-61 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–23.4	6145±35	*5210–4995*
OxA-18681	CAS235-44 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–26.1	6075±30	*5205–5180 (4%) or 5060–4895 (88%) or 4870–4845 (3%)*
SUERC-18010	CAS235-146 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–24.6	5750±40	*4710–4495*
OxA-18682	CAS235-60 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	–24.5	5440±32	*4350–4245*
(GU-6851)	CAS235-69 Plant macrofossil, charred nutshell, *Corylus* (Ò Akeret, Palaeoecology Research Services Ltd), from an extensive horizontal occupation layer that was hand excavated on a 0.25 sq. m grid	-	Failed, did not produce enough CO_2 to be graphitized and measured	
HAR-4626	Charcoal, unidentified, from organic-rich feature		6160±150	*5475–5430 (2%) or 5390–4770 (92%) or 4760–4725 (1%)*
HAR-5667	235-214; AML 8211184 Charcoal, unidentified, from a presumed fire pit, 214 (two sieved samples; AML 8211179 and AML 8211184)	–26.8	5920±180	*5295–5260 (1%) or 5220–4395 (94%)*
HAR-5668	235-220; AML 8211180 Charcoal, *Quercus* sp., mainly, from a charcoal rich feature 220 (five sieved samples, AML 822180–1, AML 8211185–6 and AML 8211188)	–26.8	5470±130	*4605–4045*

fact that the radiocarbon dates in this group are related: they all come from the same site. Bayesian statistical modelling is required to account for this dependence (Buck *et al* 1992; Bayliss *et al* 2007). The chronological modelling has been undertaken using OxCal 4.3 (Bronk Ramsey 1995; 2009) and the internationally agreed calibration curve for terrestrial samples from the northern hemisphere (IntCal20; Reimer *et al* 2020). The model is defined by the OxCal CQL2 keywords and by the brackets on the left-hand side of Figure 20. In the diagram, calibrated radiocarbon dates are shown in outline and the posterior density estimates produced by the chronological modelling are shown in solid black. The Highest Posterior Density intervals which

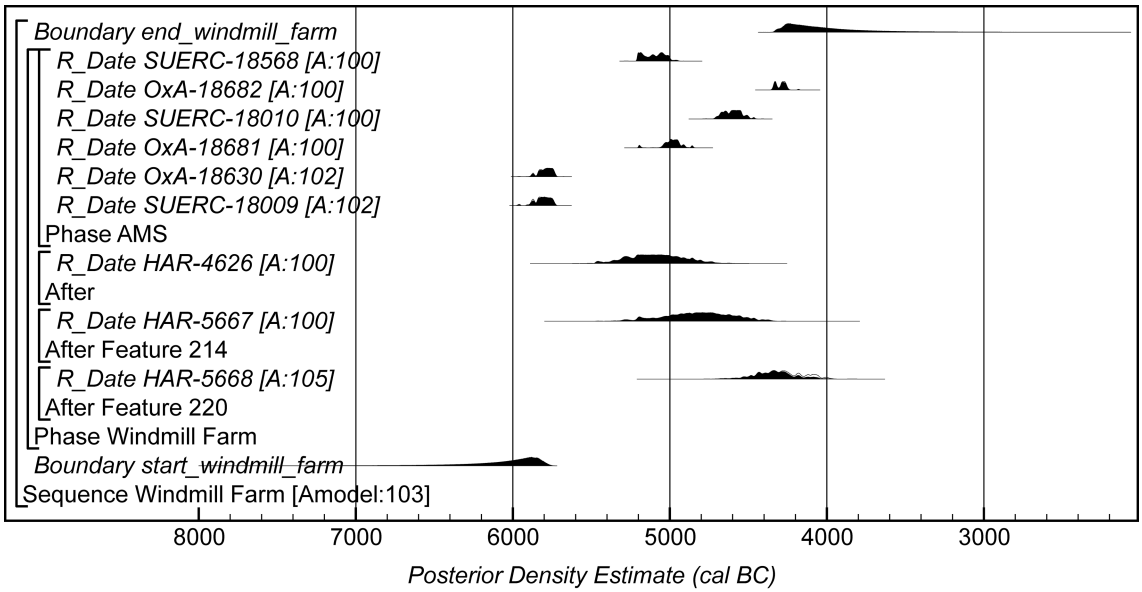

Fig 20 Probability distributions of dates from Windmill Farm. Each distribution represents the relative probability that an event occurs at a particular time. For each radiocarbon date, two distributions have been plotted: one in outline which is the result of simple radiocarbon calibration, and a solid one based on the chronological model used. The other distributions correspond to aspects of the model. For example, the distribution 'start_windmill_farm' *is the estimate for when activity started. The large square brackets down the left-hand side of the diagram and the OxCal keywords define the overall model exactly.*

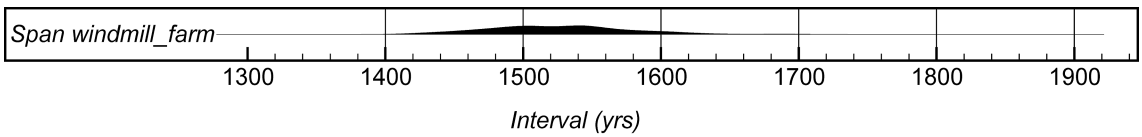

Fig 21 Probability distribution of the number of years during which dated activity at Windmill Farm took place, derived from the model shown in Figure 20.

describe the posterior distributions are given in italics.

The model (Fig 20) shows good agreement (Amodel: 103) between the radiocarbon dates and the assumption the activity took place at a uniform rate over a period of time (Buck *et al* 1992). The dated activity was clearly taking place throughout the fifth and sixth millennia cal BC over a period of *1420–1630 years* (*95% probability*; *windmill_farm*; Fig 21) probably *1465–1575 years* (*68% probability*). However, given that the lithic assemblage appears to be of a single, unmixed Late Mesolithic type and we can only infer that the charcoal and charred hazelnut shells reflect human activity, the question then arises as to whether the lithic assemblage is associated with any or all of the dates obtained?

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Investigations at Trethevy Quoit 2019: the anatomy of a Cornish portal dolmen

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with a contribution from ANNA LAWSON-JONES

Trethevy Quoit is one of the best-preserved Early Neolithic portal dolmens both in Cornwall and in the British Isles. In 2019 Cornwall Archaeological Unit, in partnership with Cornwall Heritage Trust and Cornwall Archaeological Society, undertook two geophysical surveys, followed by test pitting. Test pits excavated near to the quoit revealed a platform measuring approximately 10m by 25m constructed of quarried and deliberately fragmented pieces of metamicrogabbro stone (an intrusive igneous rock), which had been brought to the site from a local source. Study of the granite slabs of the quoit itself suggests that they were all from the same outcrop, a good candidate being the Caradon Hill area, approximately 1.5 km away.

The site is discussed in the context of Cornish chambered tombs, portal dolmens more widely, and the significance of the use of different materials. The results from the project were significant as they have revealed that Trethevy Quoit was a designed monument comprised of selected stones from a specific source, set upon a platform of quarried green-coloured stones. As such, it would have stood out as a visually striking monument in the landscape, which in the Early Neolithic would have been almost entirely devoid of built structures.

In July 2019, archaeological investigations at Trethevy Quoit, St Cleer (Fig 1), were undertaken over a five-day period by Cornwall Archaeological Unit in partnership with Cornwall Heritage Trust and Cornwall Archaeological Society. The project was grant funded by Historic England, Cornwall Heritage Trust and Cornwall Archaeological Society.

Trethevy Quoit was designated a scheduled monument in 1923 (National Heritage List for England 1017579) and in 1931 was gifted to the state; more recently it has been in the care of Cornwall Heritage Trust (CHT), on behalf of English Heritage. However, protection was limited to the visible monument and a 2m buffer zone around it. In 2017 CHT, supported by a grant from Historic England, took the opportunity to purchase the 1.25 ha field in which the monument stands, to safeguard its setting. The overall aim of the project described here was to obtain additional information on the extent and form of the monument, as well as evidence for activities in the area around it, which would help with future interpretation and management of the quoit and its setting.

The first core objective was to undertake a geophysical survey of the entire field in advance of the excavation, in order to better understand the archaeological potential in the field as a whole, as well as features associated with the quoit.

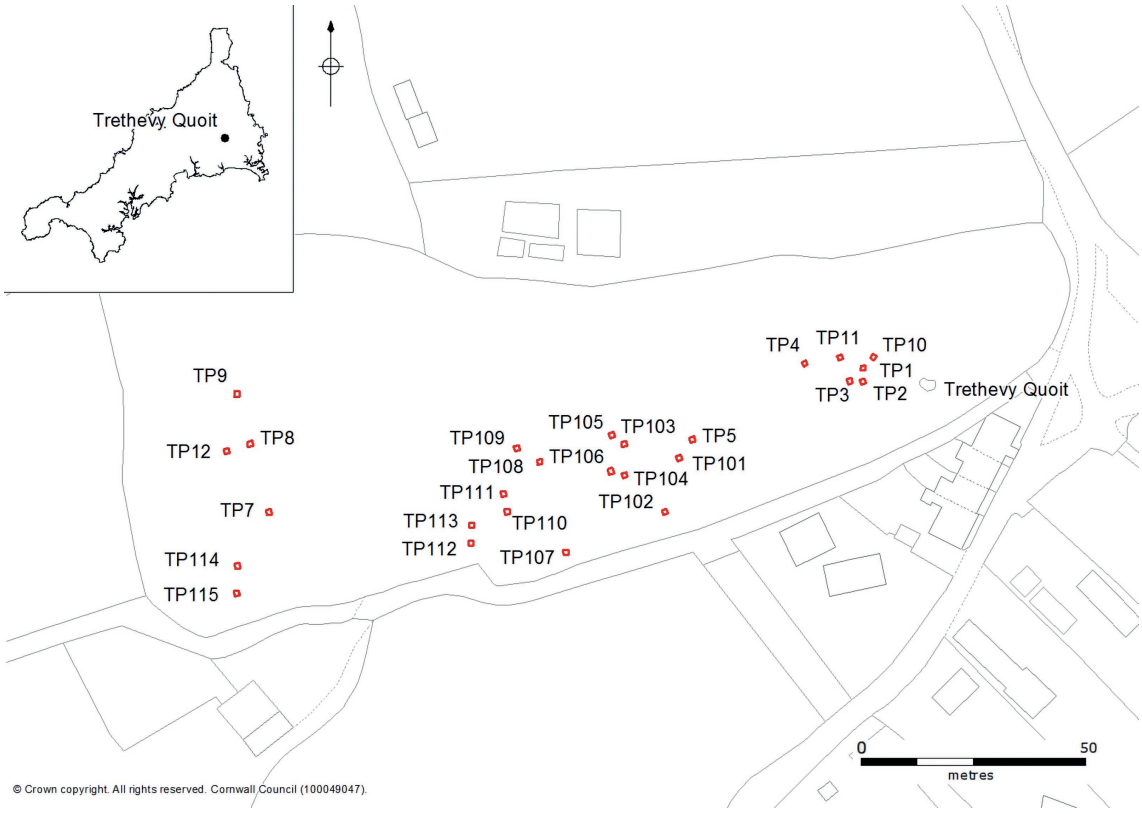

Fig 1 Location of the excavated test pits in the field to the west of Trethevy Quoit.

The second major objective was to investigate the unscheduled part of the field with targeted key-hole test pits, to establish the presence and the degree of preservation of any buried archaeological features identified by geophysical survey, as well as to identify and record any artefacts and recover information which would help establish a better understanding of the date and overall chronology for the quoit.

The third core objective related to providing opportunities for people to be involved in archaeological fieldwork and for engagement with the local community to raise public awareness of the importance of the monument. To achieve this, volunteers were given the opportunity to excavate and have hands-on experience of artefact processing, and school visits to the excavation and a public open day were held.

The aims of the project were largely achieved, with the geophysical survey revealing new features, which were confirmed by the test pitting, although no material suitable for radiocarbon dating was recovered. The engagement element was a huge success with many people volunteering with the geophysical survey and excavations, and several hundred children and adults attending during school visits and the open day (Jones 2019).

Trethevy Quoit and its setting

Trethevy Quoit (SX 2593 6881), located north east of St Cleer village and to the south of Bodmin Moor, is an outstanding example of a chambered tomb, or more accurately a portal dolmen, of the Early Neolithic period (*c* 3800–3600 cal BC). It comprises a massive capstone covering a chamber of large granite slabs, with a recessed transversely-set 'door-stone' forming the entrance, facing east-south-east. A smaller slab at the back of the monument leans

into the chamber, and the chamber's sides are formed by four large overlapping slabs. The front stone (the 'door-stone') has in front of it a small antechamber formed by a large upright on the south; there may originally have been a second stone to the north. The dramatically sloping angle of the capstone may be partly due to the collapse of the chamber's rear stone. The capstone is also distinguished by a hole in the corner above the 'door-stone'. It is uncertain whether this hole is artificial or natural (see discussion) but it is shown on the earliest illustrations of the site (for example, Norden 1728; Blight 1858, 228; Borlase 1872, 45–51). A second distinctive feature is a cut out opening in the bottom of the 'door-stone', which would have provided access to the chamber. Again, this feature is documented in the antiquarian literature (Pedlar 1850, 435–40) but its date is uncertain and no other Cornish chamber tomb is associated with a comparable opening (for example, Barnatt 1982, 134). Elsewhere in Europe and Britain, however, chambered tombs have been found to be associated with portal openings formed by one or more stones, which means a prehistoric origin for the feature cannot be entirely ruled out (for example, Fergusson 1872, 343; Corcoran 1969; Joussaume 1988, 20; Mitchell 1982, 132–7). The monument is set into what appeared to be a small low cairn (Figs 2 and 15). Much of the visible stone, however, appears to have been derived from later medieval or post-medieval clearance from the field.

Trethevy Quoit has been described in antiquarian and archaeological literature since the seventeenth century. The dolmen was documented and illustrated by John Norden in 1610, who referred to it as 'a little house raised of mighty stones' (Norden 1728, 88–9). Indeed, it is deservedly one of the best-known Neolithic monuments in south-west Britain. However, there is no record of either antiquarian or archaeological investigation, which means that the contents of the chamber are unknown. Excavations of chambered tombs elsewhere, however, would lead us to expect the chamber to have contained inhumation burials and potentially cremation deposits which had accumulated over a century or more (for example, Benson and Whittle 2007; Lynch 1975; Lynch 2014a). Later disturbance to the site is, however, apparent and the back-stone, for example, leans forward into the chamber area and bears drill marks resulting from an attempt to split it. Nonetheless, with the possible exception of Zennor Quoit (Zennor), Trethevy is one of the finest chambered tombs in Cornwall, and one of the best preserved portal dolmens in Britain.

The field in which the quoit is set is a gentle hill between two streams which run down from the granite boss of Bodmin Moor to the north. Trethevy Quoit lies about 600m beyond the granite of the Moor, and the predominating rocks are the metamorphic sedimentary slates, sandstones and siltstones of the Brendon Formation (British Geological Survey (BGS) 2021; Edmonds *et al* 1975). However, an intrusive igneous rock, metamicrogabbro (previously recorded as dolerite: BGS 1993), is mapped in the general area of the site (BGS 2021).

The Historic Landscape Character is Anciently Enclosed Land (Cornwall County Council 1996), which is land that has been enclosed since the medieval period, and the quoit is shown as enclosed on the St Cleer tithe map of 1840. However, the monument is in a marginal position within this landscape character type, being on high ground at the boundary between the holdings of Trethevy to the east and Tremar to the south west, although actually on Tremar land. Local memory suggests that the field was last ploughed during World War II, when a steam plough was used to break it in. It is certainly the case that coke, probably derived from a steam engine, was found in several of the test pits. Since World War II the field has been in pasture.

Immediately to the south of Trethevy Quoit the small hamlet of Trethevystone was established by the end of the nineteenth century (1st edition Ordnance Survey 25in: 1 mile, *c* 1880), reflecting the increase in activity and population in the area associated with nineteenth-century mining and quarrying.

Trethevy Quoit sits in splendid isolation at the eastern, higher end of the field. The ground noticeably drops away to the immediate east and slopes more gently away to the west. The abrupt drop to the east may be partially artificial, as it gives the 'doorway' an even greater impression of height. There would have been good views out from the site and Caradon Hill would have dominated the horizon to the north, although this is now somewhat screened by the trees on the northern field boundary. As discussed below, this view may have been significant to the monument's builders.

Although there are no other Neolithic monuments in the immediate vicinity, there are

Fig 2 The monumental east-facing portal entrance of Trethevy Quoit. Note the opening in the door-stone and the perforation in the capstone. The door-stone is approximately 3m tall. (Photograph: Cornwall Archaeological Unit.)

a number of important potentially contemporary sites a few kilometres to the north, around the south-east fringe of Bodmin Moor. The enclosure on Stowes Hill, Linkinhorne, 3.7 km due north, although unexcavated, is very likely to be a tor enclosure of Early Neolithic date (for example, Mercer 1981; Johnson and Rose 1994). There is a second, smaller tor enclosure on Tregarrick Tor, St Cleer (NHLE 1009698; Riley and Brown 1995), 2 km to the south west of Stowes Hill, and another 1.8 km to the north east of Stowes Hill on Notter Tor, Linkinhorne (Oswald *et al* 2001). Below Bearah Tor (North Hill), 5.5 km to the north of Trethevy Quoit, there is a collapsed chambered tomb constructed at the east end of a low mound or platform (Johnson and Rose 1994, 24–5, fig 17). There is an absence of documented artefact finds in the vicinity of the quoit, with the nearest object being a Neolithic chert axe-head (Cornwall Historic Environment Record, MCO 52796) from a garden in St Cleer, approximately 1 km to the west. Aside from these broadly contemporary monuments and the axe find, the remaining prehistoric sites in the area are all much later cairns and monuments of Bronze Age date, predominantly located on the granite of Bodmin Moor to the north.

The archaeological investigations

The archaeological investigations comprised two elements, geophysical survey and test pit excavation.

Geophysical survey

In advance of the test pitting, magnetometer and resistivity surveys were undertaken in April 2019 by Malcolm Wright and the Timeseekers (the results of which are in the project archive). The magnetometer survey identified comparatively few features. At the western end of the field a few pit-type anomalies were revealed, and to the west of the field's centre there was a north–south linear feature, associated with a removed boundary that was depicted on the 1840 tithe map. A scar from this boundary can be seen in the southern hedge boundary. To either side of the linear anomaly and at the southern end were what appeared to be larger amorphous pit-type features, and a scattering of smaller pit-type features was revealed in the middle of the field. The eastern end, where Trethevy Quoit is located, was much less interesting. As might be expected, there was a good deal of disturbance around the quoit itself, and the most significant feature in this area was in fact a water pipe which ran diagonally across the eastern part of the field.

By contrast, the resistivity survey picked up a number of areas of high resistance across the field

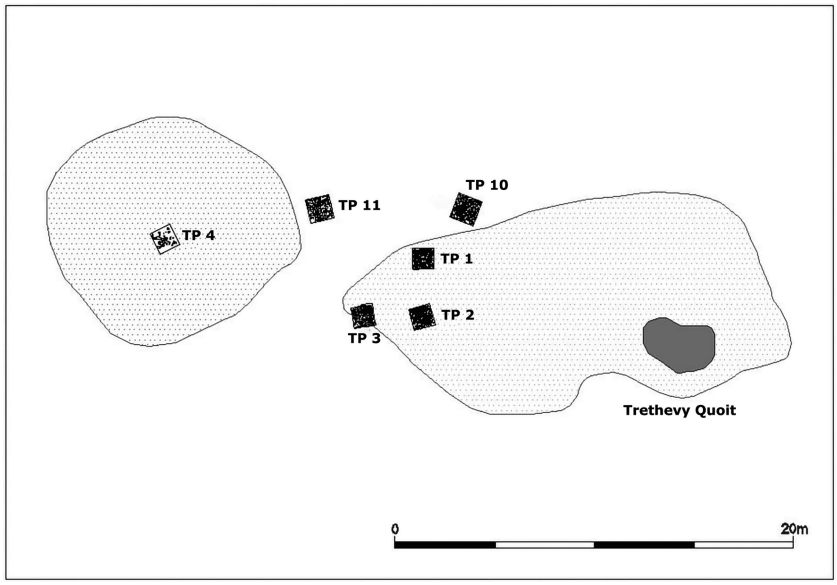

Fig 3 The excavated test pits to the immediate west of Trethevy Quoit, and the interpreted results from the resistivity survey, with areas of high resistivity stippled.

which were suggestive of stoniness. Most of these anomalies were pretty amorphous and potentially geological in origin. One area, however, was quite rectangular in shape (Fig 3) and it appeared to extend from the western side of Trethevy Quoit. In other words, there was the potential for the quoit to have been associated with a much more extensive cairn or platform than was previously known.

The test pits

Twenty-six 1m-square test pits (Fig 1) were excavated by volunteers, members of Cornwall Archaeological Society and Cornwall Heritage Trust.

All the test pits were carefully hand-dug in spits until a change in layer was visible or the natural subsoil was reached. All stones from the test pits were stockpiled so that they could be inspected by Calum Beeson, a geologist based in the Camborne School of Mines, before they were used to backfill the pits.

The geophysical survey informed the positioning of the test pits described below; however, a buffer zone of 2m was established beyond the Scheduled area around Trethevy Quoit to ensure that there was no direct impact upon the monument. The pits broke down into three clusters: six on the western side of the quoit, 14 in the middle of the field and six at the lower western end.

Fourteen contexts were recorded in the test pits. Of these, the topsoil (101), a dark brown loam layer, which varied from 0.11m to 0.38m thick, was found in all the test pits. The underlying natural subsoil was (103) a yellowish-brown clay. Slate bedrock was encountered in TP12 at the western end of the field.

Western side of Trethevy Quoit, stratigraphical summary

The six test pits which were excavated over and adjacent to the large resistivity survey anomaly ranged in depth from 0.25m to 0.6m, with an average depth of approximately 0.3m. Two layers were consistently recorded within the test pits: ploughsoil (101) and, where taken down to natural, the yellow clay subsoil (103). Where present, other layers in each test pit were given their own unique number. The test pit stratigraphy will be described from top to bottom.

The uppermost deposit was the ploughsoil layer (101). Beneath this in each of the test pits in this area was a layer of fragmented pieces of metamicrogabbro (102) (Mik Markham, pers comm). This stone was patinated and quite dull on exposure; however, wetting or splitting revealed it to be a dark olive 'green' colour. The upper levels of this layer had not been lain as a pavement, but there was evidence for sorting and it was notable that the smallest stones were on top, consisting of

pieces that did not exceed 0.11m in size and which still retained fresh, sharp edges. In most places the lower levels of this deposit were not exposed; however TP2 was sondaged and this revealed that (102) was up to 0.5m thick. The lower part of the deposit contained much larger blocky pieces of the metamicrogabbro. Between the stones was a very fine silty clay matrix, probably resulting from a natural soil accumulation in the spaces between the stones. This implies that quarried stones had been placed with some deliberation, the larger at the bottom with smaller jagged ones on the top, and that the platform had been left exposed (Figs 4 and 5). No evidence was found for a buried soil; however, only a limited area was exposed.

Layer (102) appeared to be well-preserved in test pits TP1, TP2, TP3 and TP10, which were closest to the quoit, but became more disturbed in TP11, and far fewer fragments of the metamicrogabbro 'greenstone' survived *in situ* in TP4 to the west. Evidence for ploughing was found in TP2, where a piece of iron from a plough or tractor had become embedded in the top of the layer. No prehistoric artefacts were recovered from below or within layer (102); however, a slate bearing incised lines was recovered from the top of (102) in TP2, which was initially thought to be similar to prehistoric incised pebbles from Cornwall (Jones 2015; Jones *et al* 2019). The date of this object is uncertain, although the quality of the slate, the fine incision of the lines and the compass design, might be indicative of a post-medieval date. Its position on top of the platform also means that it cannot be stratigraphically tied to the monument. It may, however, be broadly contemporary with a slate pencil nib found in TP11 (Lawson-Jones, Appendix, below).

It seems probable that layer (102) represents a low cairn or platform, extending at least to TP11 and perhaps as far as TP4, measuring approximately 25m by 10m wide. If an average thickness of 0.5m is assumed, the weight of the stone is 735 kg per metre square or about 180 tonnes in total (Richard Hoskins, pers comm). Such a platform is similar to others identified at other portal dolmen sites and chambered tombs in Britain, and this will be discussed below.

Fig 4 TP1 from the west, showing layer (102) in situ. *Patination of the surface masks the distinctive green colour which becomes evident when the stones are wet or freshly broken. (Photograph: Cornwall Archaeological Unit.)*

Fig 5 TP2 from the west, showing layer (102) half sectioned. Note the gradation of the stones from the smallest at the top to larger at the bottom. (Photograph: Cornwall Archaeological Unit.)

Middle of field, stratigraphical summary

The 14 test pits excavated in the middle of the field were predominantly over pit-type anomalies revealed by the geophysical survey. As in the immediate area of Trethevy Quoit, ploughsoil (101) covered either natural subsoil (113) or the bedrock (104). The recorded test pits ranged between 0.22m and 0.92m deep, although the average depth was approximately 0.3m.

Despite the test pits being located over features suggested by the geophysics, very few archaeological features were uncovered. TP106 was excavated to a depth of 0.6m and appeared to be over a pit, [111], approximately 0.5m deep with a bowl-shaped profile. There were hints that there had been a ring of stones (112), including slates up to 0.35m long, around the top of the pit. The fill of the pit (110), was loose brown silt. The pit did not contain any artefacts, although the loose fill strongly suggests that it was not prehistoric.

TP113 was excavated to a depth of 0.92m. Two soft silty brown layers, (116) and then (117), were recorded before the natural subsoil was reached. It is probable that an archaeological feature was located within TP113 although its edges could not be reached and no cut was discerned. Some large blocks of stone were recovered from the upper part of the test pit but these did not directly relate to the feature. However, it was located near to the removed hedge boundary, and the stones may be derived from it.

TP111 was also located near to the removed field boundary and was excavated to a depth of 0.6m. By contrast with TP113, the only layer identified was the topsoil (101) and artefacts were recovered which included post-medieval pottery and iron nails.

None of the test pits in the central part of the field produced features of prehistoric date and, with the exception of **SF1**, a hammerstone of prehistoric date in TP108 (see Lawson-Jones, below) and potentially an unworked flint from TP114, the majority of the artefacts were post-medieval in date. Significantly, and by contrast with the test pits around the quoit, there was a near absence of metamicrogabbro pieces.

Western end of field, stratigraphical summary

The six test pits excavated at the western end of the field were targeted on pit-type anomalies and a potential wall revealed by the geophysical survey. As was found across the field, in all but two test pits only two contexts were recorded, the ploughsoil (101), which covered the natural subsoil (113). The recorded test pits ranged between 0.3m and 0.48m deep, although the average depth, as in the rest of the field, was approximately 0.3m.

Only one certain feature was recorded, in TP115. This was an east–west aligned gully, or more probably a plough furrow [108], measuring 0.16m wide by 0.17m deep. It was filled by (107), a mid-brown soft silty loam deposit. The feature

produced a copper-alloy metal strap which is post-medieval in date and likely to have been used to repair a pot (Anna Tyacke, pers comm).

TP12 investigated an anomaly interpreted as a possible wall. It was excavated down to the natural which in this area was 0.48m deep. No trace of a wall was uncovered; however, the natural bedrock (114) was exposed, which may have accounted for the anomaly.

None of the test pits at the western end of the field produced features of prehistoric date and apart from one unstratified flint in TP9, the majority of the artefacts were of post-medieval date. In common with the test pits in the centre of the field there was a near absence of metamicrogabbro pieces.

Discussion

A major aim of the test pitting project was to shed more light on the context of Trethevy Quoit. The chamber itself was not excavated and few finds relating to the quoit were recovered, which means that the chronology of the site remains uncertain.

The wider context of the monument, however, is now better understood as a result of the project, as is the materiality of the monument itself, and these elements are the focus of the remaining part of this paper.

Cornish chambered tombs and wider connections

There are approximately 13 Neolithic chambered tombs recorded in Cornwall, and given the known destruction of sites (Johnson 1979; Barnatt 1982, 37–52; Herring 2016) it is likely that several more have been lost without being documented. In addition, there are other megalithic structures, such as propped stones and stone settings, at least some of which may also have their origins in the Early Neolithic period (Herring 1997; Blackman 2011; Jones *et al* 2012; Shepherd 2017). The number of chambered tombs and megalithic structures found in Cornwall therefore represents a significant concentration of Early Neolithic monuments, even by comparison with the rest of Britain. The majority of these sites are located in the west of the county and especially in West Penwith where there is a notable concentration, including at least six, if not seven, chambered tombs (for example, Kytmannow 2008; Jones 2016a; Herring 2016) (Fig 6).

Despite the aforementioned loss of sites, the overall distribution pattern is likely to be fairly accurate as non-chambered long mounds and cairns predominate in eastern Cornwall, and only a few chambered tombs are recorded in Devon to the east (for example, Griffith and Quinnell 1999; Sheridan and Schulting 2008).

Trethevy Quoit can therefore be seen as outlier of the densest distribution of megalithic chambered tombs in western Britain and indeed the Atlantic façade (for example, Cummings 2002a; 2009, chapter 4; Cummings *et al* 2015, 824; Sheridan 2004), where comparable megalithic, as opposed to the predominantly earthen, monuments, such as long barrows are found (Ashbee 1970; Field 2007). The majority of chambered tombs in Cornwall are, however, ruined and their original appearance uncertain (Fig 7). Although some, like Chun Quoit (Morvah), are 'simple' box structures covered by large capstones, the majority of the others are, in common with Lanyon (Madron), Sperris (Zennor) or Lesquite Quoit (Lanivet), so ruinous that their original structural form is uncertain (for example, Thomas and Wailes 1967; Miles and Trudgian 1976). This ambiguity has led to different archaeologists trying to fit sites with partial surviving elements into divergent typological schemes, often with little agreement (for example, Daniel 1950; Barnatt 1982; Kytmannow 2008). Fortunately, Trethevy is a well-preserved monument and its form is certain. It can therefore, alongside Zennor Quoit and Pawton Quoit (St Breock), be placed within the category of portal dolmen.

Portal dolmens

Portal dolmens are distributed along the Atlantic façade and have marked concentrations in Ireland, western Wales, and Cornwall (Fig 8). As such, they are indicative of early connections around the Irish Sea at around *c* 3800–3600 cal BC (for example, Sheridan 2004; Kytmannow 2008; Darvill and Wainwright 2016), and perhaps ultimately with north-west France, where 'ancestral' timber monuments associated with carinated bowl pottery are found (Alison Sheridan, pers comm). Indeed, in the absence of isotopic and aDNA information which is being used to demonstrate movements of people elsewhere in the Neolithic (Wysocki and Whittle 2000; Neil *et al* 2017; 2020; Cassidy *et*

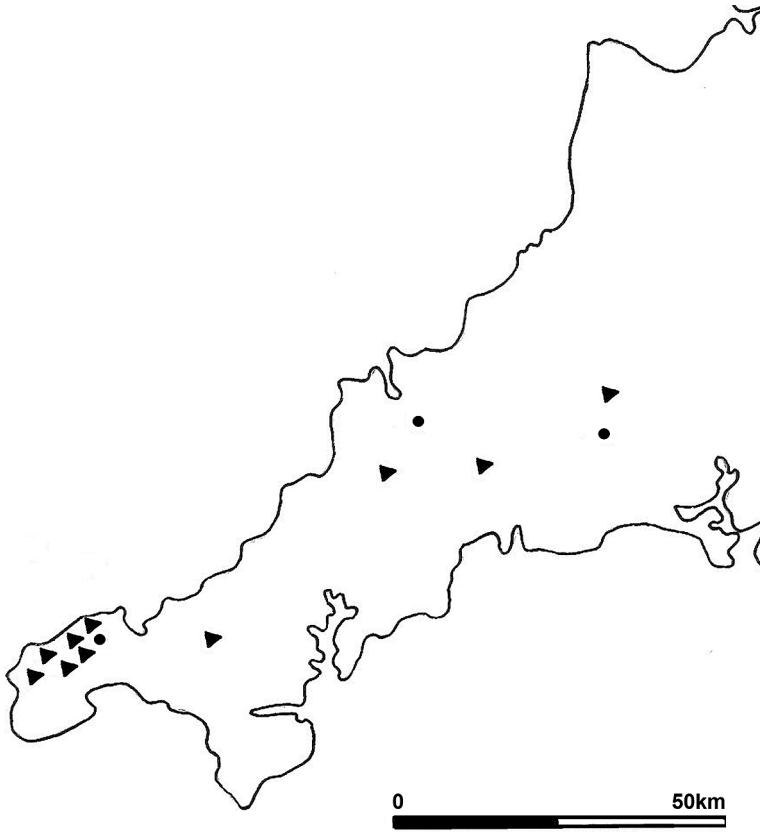

Fig 6 The distribution of chambered tombs and portal dolmens in Cornwall (triangles – chambered tombs; circles – portal dolmens).

al 2020), portal dolmens provide some of the best evidence for the exchange of people and ideas in the Irish Sea zone in the fourth millennium BC.

As exemplified by Trethevy Quoit, portal dolmens have a distinctive form, and as Francis Lynch has stated they represent some of the most impressive megalithic architecture in Britain and Ireland (Lynch 2000, 70). At the front are two large jambstones set either side of a door-stone, which is set back a little to create a definite frame. The door-stone can be flush with the capstone, as is the case at Trethevy, but sometimes as at Poulnabrone in west Ireland (Lynch 2014a, 40), it can be little more than a sill marking the threshold.

In some instances, as at Pentre Ifan in Pembrokeshire (Fig 9) or Zennor Quoit (Fig 10) in West Penwith (Grimes 1949; Thomas and Wailes 1967), the front façade of the tomb is further emphasised by flanking stones, so that a forecourt area is created. At Zennor Quoit the façade stones also created an outer chamber, like that at Trethevy Quoit.

The chamber is topped by a capstone, frequently set at a jaunty angle sloping down from the entrance (Darvill and Wainwright 2016). Often these capstones are spectacular outsized pieces of stone taken from tors (for example, Bradley 1998), which can give the impression of being balanced on insubstantial stones so that they appear to be 'floating'. Indeed, the act of raising the stone may have been one of the most significant aspects associated with these monuments (Whittle 2004; Richards 2004; Darvill 2010). Sometimes the significance of the capstone is highlighted by their decoration with rock art, usually in the form of simple cupmarks (for example, Darvill and Wainwright 2003; Sharp 2012; Cummings and Richards 2021). Likewise, the Cornish portal dolmens and chambered tombs are, as at Trethevy and Lanyon Quoit, surmounted by distinctive, awe-inspiring capstones weighing several tonnes. Rock art has also been documented on several sites including Chun Quoit and potentially Trethevy (Jones and Kirkham 2013).

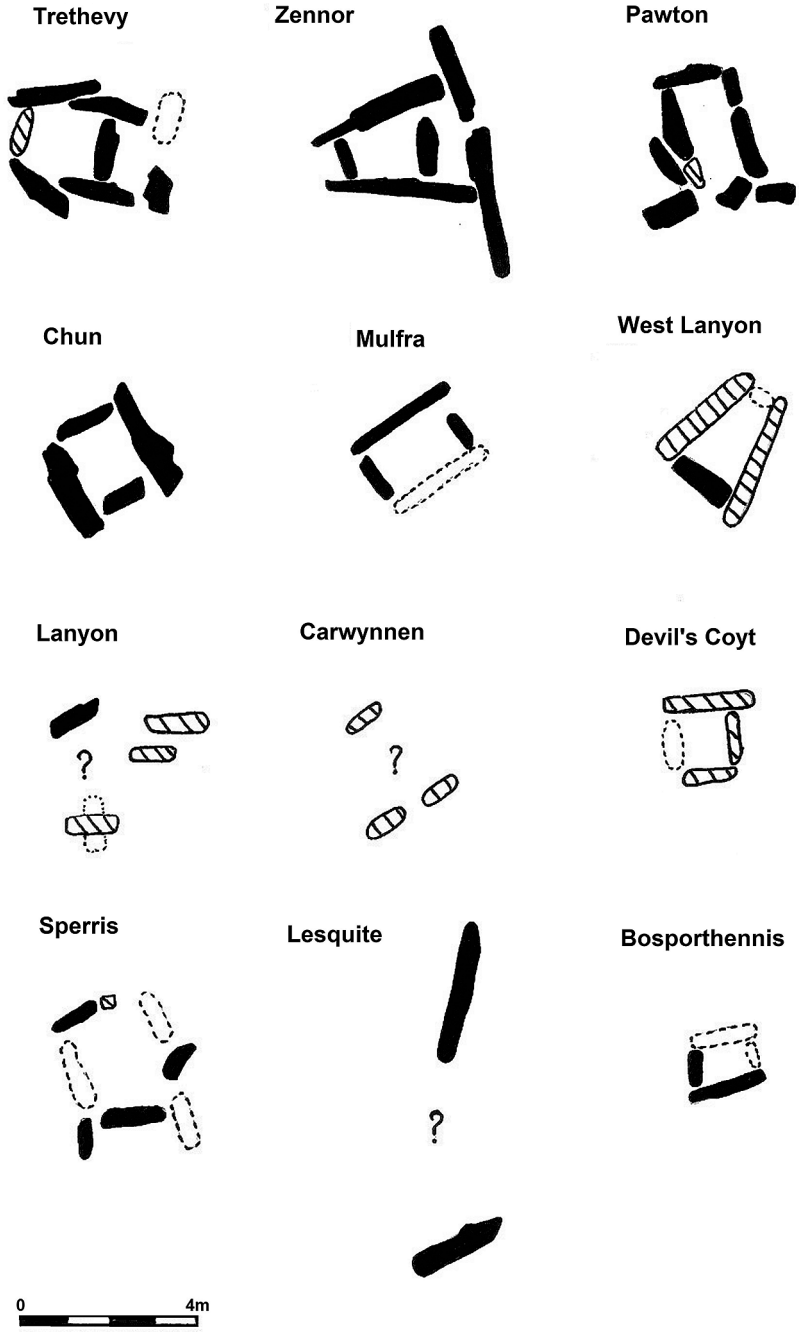

Fig 7 Cornish chambered tomb plans. The top row are portal dolmens, the second row are, like Chun Quoit, simpler closed chambers. Below this, plans become more speculative and categorisation difficult. (After Barnatt 1982, 44, fig 2.2.)

Platforms

The chambers of portal dolmens are sometimes found to have been associated with platforms or low cairns. At Trethevy Quoit a low cairn or platform of green metamicrogabbro stones, measuring approximately 25m long by 10m wide and up to 0.5m thick, extended from the western

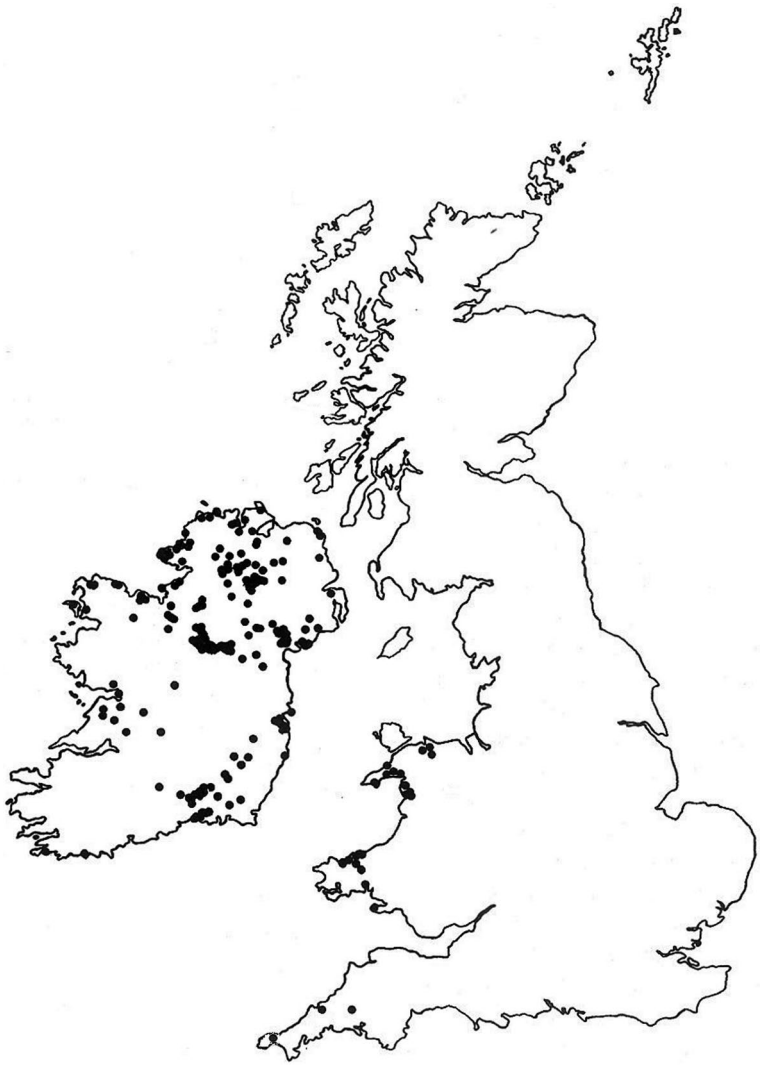

Fig 8 The distribution of portal dolmens in the Irish Sea zone, in Ireland, west Wales and Cornwall. (After Sheridan 2004.)

side of the chamber, and was clearly a major component of the monument. The lack of pieces of metamicrogabbro stone in the rest of the field together with the apparent grading of stones suggests that the feature did not cover the chamber. Indeed, there is little evidence to suggest that the chambers of portal dolmens were covered over and displaying the capstone may instead have been an important part of the monument (for example, Richards 2004; Whittle 2004; Cummings and Richards 2021, ch 2).

Elsewhere, where similar features have been recorded, there is a good deal of variation in size and shape. At Carreg Coetan in Pembrokeshire, a relatively small cairn was uncovered (Rees 2012), whereas by contrast at Pentre Ifan, a substantive low cairn or platform measuring approximately 42m long by 20m wide extending to the rear of the monument was revealed, which is likely have been two phased (Grimes 1949; Lynch 1972). At Dyffryn Ardudwy, Gwynedd (Powell 1973), the double portal dolmen was also associated with an extensive cairn or platform, measuring over 30m long by 10m to 16m wide (Fig 11). Many of the stones in this cairn are waterworn and pale in colour and, as will be discussed in relation to Trethevy, may have represented a deliberate choice.

Fig 9 Pentre Ifan, Pembrokeshire, showing the classic portal entrance arrangement and façade of the dolmen. (Photograph: Andy M Jones.)

Fig 10 Zennor Quoit, from the east, showing the very large façade stones. (Photograph: Andy M Jones.)

In Cornwall it is harder to find comparisons for the Trethevy platform, as few excavations of chambered tombs of any form have extended beyond the chamber itself. This means that evidence for platforms at other sites is limited, or uncertain, as at Lesquite Quoit where stony patches were uncovered in a trench near to the quoit, which might have belonged to a cairn or a platform (Miles and Trudgian 1976).

Turning first to the two other portal dolmens in Cornwall, Pawton Quoit has a low sub-rectangular mound or platform, which John Barnatt (1982, 128) recorded as measuring approximately 16m by 20m, but the site is unexcavated and the original shape of the feature uncertain (Fig 12). There is no clear evidence for a cairn or platform at Zennor Quoit, but the only documented excavation there was focused on the chamber and its contents.

Fig 11 The double portal dolmen at Dyffryn Ardudwy, near Harlech, showing the massive low cairn or platform of collected waterworn boulders. (Photograph: Andy M Jones.)

Fig 12 Pawton Quoit with its surrounding low mound or platform. (After Barnatt 1982, 129, fig 7.5.)

Three other Cornish chambered tombs, however, have produced evidence for platforms. At Bearah Common, Linkinhorne a trapezoidal cairn measuring 28m long by 14.5m wide at its eastern end and 5–6m at is western end has the remains of a collapsed chamber (Johnson and Rose 1994, 24). The original appearance of the reconstructed chamber at Lanyon Quoit is also uncertain but it does seem to have a low cairn or platform which extends from its southern side for approximately 27m (Whittle 1977, 60) (Fig 13). As at Pawton Quoit, the cairn has not been excavated; however, Barnatt (1982, 122) does record several cist-type features that appear to cut into the cairn. Although Neolithic cists are known in Britain and beyond (Benson and Whittle 2007, 81; Gibson 2007; Midgley 2005, 103–5), the majority are of Early Bronze Age date, and in Cornwall the earliest dated examples of cists are associated with Beakers or with Early Bronze Age burials (for example, Jones 2012; 2016a). This would suggest that the cists are very probably Early Bronze Age in date, thereby providing a *terminus ante quem* for the construction of the cairn or platform. Interestingly, the size of the cairn is broadly comparable to that of Trethevy. At Carwynnen Quoit (Nowakowski and Gossip, forthcoming) a platform or pavement comprised of small stones was uncovered. Unlike Trethevy, this feature appears to have been largely confined to the area of the chamber and does not seem to have extended far beyond the monument (Fig 14).

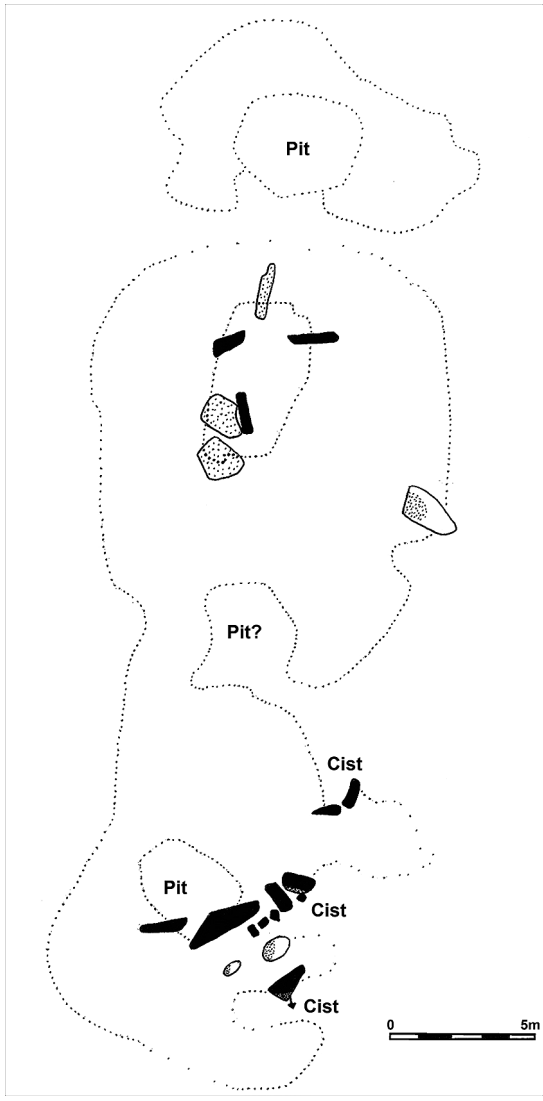

Fig 13 Lanyon Quoit with the low mound or platform extending from the southern side of the chamber. Note that a number of possible cists have been identified at the southern end of the platform. (After Barnatt 1982, 123, fig 7.2.)

In addition to chambered tombs with platforms, there are also long low cairns without chambers at Catshole (Altarnun) and Louden (St Breward), measuring 16m by 3m and 30m by 12m respectively (Johnson and Rose 1994, 24–6). Neither of these sites has been excavated, and in the past they have been interpreted as long cairns. However, it is also possible that they could be considered to be platforms in their own right, without a megalithic element.

Potentially, rectangular platforms with or without megalithic chambers could be argued to represent the form of 'ancestral longhouses' (for example, Bradley 2002, 30–2); however, contemporary houses of this form are rare in the south west, although a house was discovered at Penhale Round (Nowakowski and Johns 2015), and instead it might be appropriate to think of longhouses as being a potential distant source of inspiration, the memory of which made the form appropriate as 'houses of the dead'.

Evidence from excavations

The chamber area at Trethevy was not excavated in 2019 and there is no record of an antiquarian investigation ever having taken place. Elsewhere, the excavation of portal dolmen chambers has revealed that that they were repositories for human remains, although this is unlikely to have been their sole function (Tilley 1994; Cummings and Richards 2021). At one of the best preserved portal dolmen sites, Poulnabrone in Ireland, a minimum of 35 inhumed individuals were found inside the monument. When radiocarbon dated, these revealed that like many chambered long barrows which had been used for generations (for example, Bayliss and Whittle 2007), interments had been made over an extended period of time, spanning more than a century (Lynch 2014a, 182–3). At most excavated sites the archaeological record is rather poorer, with many portal dolmens being located in areas of acidic soils that have left little but small quantities of cremated bone, as at Carreg Coetan and Dyffryn Ardudwy (Rees 2012; Powell 1973), or have no surviving burials at all (for example, Grimes 1949). Likewise, artefactual assemblages are quite limited, with finds of Early Neolithic pottery and flint being most frequently recovered (for example, Lynch 1969; Kytmannow 2008, 96; Darvill and Wainwright 2016). Evidence for later activity is also encountered; from Carreg Coetan, for example, where radiocarbon dates revealed activity at the site much later in the fourth millennium cal BC (Rees 2012) and at Dyffryn Ardudwy where Early Bronze Age pottery was found inside the chamber (Powell 1973). Artefacts and evidence for activity outside the portal dolmens have also been found, such as the pottery recovered

Fig 14 Carwynnen Quoit, where a small platform beneath the area of the chamber was found during excavations. (Photograph: Cornwall Archaeological Unit.)

from the façade area of Pentre Ifan (Grimes 1949), for example.

In Cornwall, excavations at chambered tombs have produced very little in the way of artefacts or burials, and only one other portal dolmen chamber, Zennor Quoit, has been excavated (Thomas and Wailes 1967). Here the chamber was found to contain a small amount of cremated bone and the finds assemblage included Late Neolithic Grooved Ware pottery, as well as Early Bronze Age sherds and a whetstone. Clearly the chamber had been the focus for intermittent activity over a considerable period of time and the radiocarbon determination 4471 ±38 BP, 3345–3022 cal BC (UB-6755), fell in the Middle Neolithic. Only two other Cornish chambered tombs have associated radiocarbon determinations and both have finds assemblages indicative of extensive use. At Sperris Quoit the small unclassifiable chamber was found to contain cremated bone, which did produce an Early Neolithic determination of 4712 ±39 BP, 3628–3358 cal BC (UB-6754), although the finds assemblage comprised lithics which included a later Neolithic or Early Bronze Age plano-convex flint knife and a saddle quern. At Carwynnen Quoit a range of artefacts were recovered, which included Early Neolithic pottery but also Late Neolithic Grooved Ware, and a radiocarbon determination on burnt bone fragments proved to be of Middle to Late Neolithic date, 4371 ±19 BP, 3076–2913 cal BC (SUERC-55957) (Sustainable Trust 2014, 11; Nowakowski and Gossip, forthcoming). It is clear that, even if used rarely for burials or for the deposition of other artefacts, portal dolmens and other forms of chambered tombs in Cornwall continued to be significant places long after their original construction.

Moving beyond the interior of the chamber, it is notable that unlike portal dolmens in Wales, (Grimes 1949; Rees 2012; Powell 1973), no pottery and few prehistoric artefacts were recovered from around the field in which Trethevy Quoit stands. In part this might be because the area in front of the door-stone was not investigated. However, no prehistoric artefacts were recovered from the platform, and the pit-type anomalies on the geophysical survey which were specifically targeted by the test pits were found not to be of Neolithic date. Indeed, very few artefacts were recovered from the field as a whole. This is in contrast with other investigations in Cornwall, where Early Neolithic pits often containing pottery and worked stone are, if not ubiquitous, then in common with unstratified lithic finds, certainly widespread (for example, Cole and Jones 2002–3; Jones *et al* 2013; Jones and Lawson-Jones 2018). The low quantities of lithic artefacts or contemporary features beyond Trethevy Quoit might suggest that everyday activity did not take place in the immediate area of the portal dolmen; however, more trenching in the field would be required to be certain of this.

Trethevy Quoit: a monument of awe

Portal dolmens were amongst the first Neolithic monuments to be built in the south-west peninsula and their architecture can be seen to both represent a knowledge of wider practices and a local knowledge of suitable and indeed appropriate stone, which when brought to the site and combined together can be considered as an installation that would have created a sense of wonder and awe (Cummings and Richards 2021). More recent approaches to the study of chambered tombs have emphasised their materiality, including the choice of location, the source, texture, colour and biographies of their constituent stones (Cummings 2002b; Darvill 2010; Tilley 1996; 2004; Mens 2008). It has become apparent that the materials which comprised prehistoric monuments were more than just conveniently accessible stones and instead were redolent with symbolism and their own agency, and could be considered to be part of a network of human and non-human kinship relationships, that is to say animals and spirits which were considered to have their own 'personhoods', linking locales and landscapes and people (*cf* Sissons 2013; Johnston 2020, chapter 1; Brück 2021; Crellin 2021). By thinking in greater detail about Trethevy Quoit as more than just a container for human remains, from the perspective of its material biography, we can better understand how the monument came together and some of the symbolism involved in its construction.

Setting and location

The fact that this site was chosen for elaboration by the construction of a portal dolmen suggests that it was considered to be of great significance, and this is emphasised further because the granite stones of the quoit had to be brought to it from a distance.

Trethevy Quoit stands on a low hilltop just above a break in the slope to the east which serves to emphasise the monumentality of the entrance façade. The major hills and outcrops of Bodmin Moor lie to the north, and Caradon Hill, the most visually dominant hill from Trethevy, is situated to the north-north-east and is clearly visible as a side view beyond the quoit. In common with other dolmens (Tilley 1994; Kytmannow 2008, 121), Trethevy Quoit is not situated on the highest ground in the area and its visual impact would have been relatively local and most impressive when encountered from the east. Although it is not possible to be certain about the direction the monument was approached from, and the evidence for trackways found in other regions is absent (Coles and Coles 1986; Gibson 2021), it is plausible that paths running onto Bodmin Moor, which were perhaps used to take animals onto the moor from lower ground, may have followed the course of the stream valley to the east and would therefore have come quite close to the dolmen. As such, Trethevy Quoit could have been located in a transitional zone between the moorland and the lower-lying ground to the south.

Furthermore, although no palaeoenvironmental work was undertaken for this project, studies of Bodmin Moor have indicated that trees were widespread in the Neolithic on the flanks of the moors (Gearey *et al* 2000a; 2000b; Jones 2004–5) and that these were punctuated by clearings, which would have structured space, guided views and paths and potentially heightened the experience of approaching the portal dolmen (for example, Cummings and Whittle 2003; 2004, 70–2). As mentioned above, there is no evidence for occupation in the field prior to the construction of the portal dolmen and the nearest identified artefact scatters lie a couple of kilometres to the west. This of course does not mean that the locale in which the quoit was constructed did not have any interest for Mesolithic or earlier Neolithic communities. Trees and other natural features can be the subject of ontologies which are quite different from modern western conceptions of relatedness; stones, trees and bodies of water can, for example, be considered to be animate or contain their own agency (for example, Roe and Taki 1999; Äikäs 2017; Kõivupuu 2020). Barry Taylor (2020) has, for example, noted that there is evidence for trees and tree throws being the focus for special deposits during the European Mesolithic period. In Cornwall, placed charcoal-rich deposits have also been noted within some Mesolithic pits (Jones 2016b), and combined with selected quartz pebbles, may represent ritualised activity.

An alternative possibility is that, if the distinctive metamicrogabbro rock was visible as an outcrop, it may have been this which drew people to the place in which Trethevy Quoit stands. The green colour of the stone, which was also the same as that used for making axe-heads, may have marked it as a special place (for example, Jones, in preparation). We can at least say that the choice of locale made good use of the topography to ensure that the

monument was sited in a distinctive place when viewed from the east.

The constituent elements of Trethevy Quoit comprised a pavement of the distinctive green metamicrogabbro stones, which had been quarried from a local source, and the granite slabs forming the upstanding monument, which had to have come from much further away. We do not know which was the primary element; however, the granite element of the quoit will be discussed first.

Materials and design – the quoit

Unlike most dolmens, where local materials were used (Lynch 1975; Richards 2004; Cummings and Richards 2021), the stones used to construct the chamber of Trethevy Quoit were not locally sourced, as the quoit lies beyond the granite. Instead, they were brought to the site from a distance, with the granite outcrops found on Caradon Hill, approximately 1.5 km away to the north-north-east, providing a likely source (Calum Beeson, pers comm). The movement of stones of varying sizes, from easily portable axe heads to heavy standing stones, over very long distances across Britain is of course well-documented in the Neolithic period (for example, Clough and Cummins 1988; Bond 2016; Parker Pearson *et al* 2021). Nonetheless, given that each of the stones comprising Trethevy Quoit weighs several tonnes, with the capstone alone weighing around 10.8 tonnes (Barnatt 1982, 246), if the source was Caradon Hill their transportation represents no mean feat and could even have involved crossing the line of a stream valley; *contra* some critics (for example, John 2008), this reveals both the skilful manipulation of large blocks of stone over distances and a desire to use particular stones in the construction of the portal dolmen.

The desire to use selected stones in dolmens has in fact been noted by several scholars (Darvill 2010; Cummings and Richards 2021, ch 2), and the granite outcrops of the Cornish uplands are frequently weathered into visually distinctive forms that are likely to have attracted attention throughout prehistory. Granite tors were certainly associated with Early Neolithic enclosures on Bodmin Moor and elsewhere across Cornwall (Mercer 1981; 1997; Oswald *et al* 2001). The importance of these outcrops and tors, such as Rough Tor (St Breward), Carn Galva (Zennor) and Roche Rock (Roche), for local landscape cosmologies and potentially kinship networks is also indicated by the fact that they were referenced by later ceremonial monuments of Neolithic and Bronze Age date (Tilley 2010; Jones 2016a). Some granite outcrops have the appearance of chambered tombs and they may have been considered to be ruined ancestral monuments (Bradley 1998), which may have made them suited for 'reuse' in monuments. The referencing of the place in the landscape from where the granite was derived at Trethevy Quoit might also be indicated, as noted above, by the orientation of the dolmen, which is parallel to Caradon Hill from where the stones may have been obtained, and the profile of the hill looms large beyond the monument to the north-north-east (Fig 15). Comparable side-on views to distinctive topographical features have also been noted at other portal dolmens, including for example Pentre Ifan, where Carn Ingli forms a side view (Tilley 1994, 105; Cummings and Whittle 2004, 76–7); the visual referencing of Caradon Hill from Trethevy Quoit is perhaps unlikely to be coincidental.

In the case of Trethevy Quoit, the close similarity in colour and texture of the granite slabs might suggest that a particular granite outcrop had been chosen as an appropriate source of stone to construct the dolmen. Once on site the stones were fitted together to create the chamber and the capstone was placed upon it. In common with other chambered tombs, the capstone is visually distinctive (Cummings and Richards 2021, ch 2) and the top of the Trethevy capstone, with distinctive veins of quartz running diagonally across it, is undulating and weathered, revealing that it had been taken from the top of the tor (Fig 16). As noted by Emanuel Mens (2008) in relation to French megalithic monuments, this is a recurring pattern. That is to say, the dolmen's assemblage replicated the natural order of the tor from which it was taken.

This is a familiar pattern in Cornwall, with other megalithic capstones, such as the visually distinctive mushroom-shaped example on Chun Quoit, clearly being obtained from the top of outcrops (Fig 17). The Chun Quoit capstone had been inscribed with cupmarks (Jones and Kirkham 2013) and the capstone at Trethevy Quoit is also potentially cupmarked, although work to confirm this possibility has not yet been undertaken. The top corner of the stone is certainly perforated, although again it is uncertain whether this was

Fig 15 Trethevy Quoit viewed from the south. The 'jaunty' angle of the capstone is a striking feature of this view, and beyond to the north lies Caradon Hill, the probable source of the constituent stones. (Photograph: Cornwall Archaeological Unit.)

Fig 16 The capstone of Trethevy Quoit, viewed from above and from the west showing the weathered undulating surface resulting from its former position on the top of an outcrop. (Photograph: Ryan P Smith.)

deliberate or a naturally eroded solution hollow. Either way, its position over the entrance to the chamber is unlikely to be coincidental and it is probable that this feature could have marked it as a suitable capstone, indeed it has been found that *in situ* capstone-shaped stones in Cornwall were sometimes cupmarked (Jones and Kirkham 2013) and it is possible that the inscribing of stones with cupmarks may have denoted stones suitable for future use as capstones on dolmens (Cummings and Richards 2021, ch 3).

As well as choosing the top of a granite outcrop to be the capstone, there are other signs of selectivity in the construction of Trethevy

Fig 17 Chun Quoit with its distinctive mushroom-shaped capstone, which, like that at Trethevy Quoit, was taken from the top of a granite outcrop. (Photograph: Andy M Jones.)

Quoit. The stones forming the portal jambs also seem to have been carefully selected. The two stones flanking the door-stone are notable because they have an undulating texture. Close inspection reveals that they are quartz-rich, and the undulations appear to have been caused by the harder quartz bands in the granite eroding out from the softer matrix of the rock. In the Neolithic period, prior to this erosion, they would have been much whiter in colour and even more visually distinctive. The marking of thresholds and entrance facades to chambered tombs with coloured stones, or as at Stoney Littleton, Somerset, with a fossil ammonite, is in fact a feature of many Neolithic tombs (Cummings 2002b; Darvill 2004, 113; 2010). Quartz has frequent associations with prehistoric monuments and particularly tombs (Darvill 2002; 2010; Cummings and Richards 2021, ch 4), perhaps most notably in Ireland at Newgrange, where the front of the passage grave is associated with a large amount of quartz (O'Kelly 1982, 68–9; Lynch 2014b). In Cornwall quartz is also widely found in both Neolithic and Bronze Age contexts, with, for example, a kerb of water-rolled quartz blocks being used to encircle the platform around Hendraburnick Quoit (Jones, in preparation). It has been suggested that the colour white may have been associated with human bones and the regeneration of life (Bradley 2000, 126–9), and, as Darvill has argued, the whiteness of quartz may have meant that it was considered to contain a spirit or character of its own (Darvill 2002, 84–5). In other words, it is possible that at Trethevy Quoit there was a deliberate decision to use quartz-rich stones to form the portal jambstones, and these may have marked a threshold between two worlds, the exterior and the interior of the chamber, where the bones of the interred were deposited.

By contrast with other British portal dolmens, where access into the chamber would not have been easy (Cummings *et al* 2015, 831), at Trethevy Quoit the rectangular opening in the recessed door-stone, measuring approximately 1m high and less than 0.5m wide could have provided a means of entry and egress. As such it may represent another design element. This portal or 'oven door' opening, although unique in Cornwall, is as noted above paralleled at other forms of chambered tombs found elsewhere in Britain (Clifford and Daniel 1940; Darvill 2004, 112). The opening may have been a natural feature of the selected stone or a deliberate modification of a granite block, but it would certainly have made the chamber accessible for the deposition of human remains and artefacts. At the same time, in common with the quartz-rich portal stones, it clearly marked the access way

from the front of the monument and was small enough to ensure that entering the dolmen chamber would have involved stooping and crawling, thus inculcating bodily movement to ensure that appropriate posture and disposition was adopted (*cf* Bourdieu 1990). This, as noted for other megalithic tomb types, emphasised the threshold between conceptually distinct spaces (for example, Thomas 1988).

Materials and design – the platform

The platform had rather different origins, by contrast with the granite, as the green coloured metamicrogabbroic stones were not sourced at a distance from the portal dolmen but instead are likely to have outcropped locally, perhaps within 30m of the site (Mik Markham, pers comm). Nonetheless, their incorporation into the monument is no less impressive as it would have involved quarrying a hard igneous rock on a large-scale, perhaps in the region of around 180 tonnes, without the benefit of metal tools. As with the granite, the green stones used to make the platform are likely to have held symbolic meanings and associations and obtaining them may have been undertaken in prescribed ways. Quarrying stone has frequently been found in anthropological contexts to have been undertaken under ritualised conditions (for example, Topping 2019; Petrequin and Petrequin 2020). Green coloured stones in particular are likely to have been redolent with symbolism as they were used to make axe-heads from the onset of the Neolithic, with, as has been known for a long time, the epidiorites of western Cornwall being widely exchanged across Britain (for example, Elliott *et al* 1978; Clough and Cummins 1988). The Cornish greenstones do not seem to have been used to make stone tools in the Mesolithic (Jones *et al* 2017) and the colour and texture of the stone used in the platform at Trethevy is likely to have been both evocative of Neolithic lifeways (Thomas 2013, 375, 430) and in common with the granite, to have had associations with the wider landscape and taskscapes (for example, Ingold 1993; Gosden 1999, 128). Indeed, it may be significant that the surface of the platform did not appear to have become worn and was jagged, and no objects were recovered from it.

This lack of wear might indicate, as has been suggested for Dyffryn Ardudwy (Cummings and Richard 2021, ch 2), that the platform may not have been walked upon and was instead, like the granite component of the monument, intended to be viewed and to instil a sense of awe and wonder in the onlookers.

Conclusion

In summary, Trethevy Quoit is one of the best-preserved examples of an Early Neolithic portal dolmen in the British Isles. It is an example of a monument form that is located around the Irish Sea towards the northern end of the Atlantic façade, with notable concentrations in Ireland, west Wales and Cornwall. Their characteristic form comprising jambstones, a door-stone and a spectacular capstone set at a 'jaunty' angle makes them one of the most distinctive megalithic monument types in the repertoire of chambered tombs and megalithic stone settings erected in the first half of the fourth millennium cal BC.

The construction of Trethevy Quoit therefore reveals a knowledge of widely held traditions, as indeed do the building techniques which had no obvious parallel in the local Mesolithic. Its construction, given the range of other megalithic structures, also represents a deliberate choice of architecture and a desire to materialise a particular monument form.

Trethevy Quoit does not, however, just represent the process of replication of the portal dolmen form or of a particular social type, but rather embodies choices made by, and memories of, the community who built it (for example, Cummings 2003; Wunderlich *et al* 2021). These decisions include the place where it was erected, and the materials which comprise it. Investigations at Trethevy Quoit in 2019 revealed a low cairn or platform comprised of deliberately fragmented pieces of green stones, brought to the site in large quantities from a local source. By contrast, the character of the granite slabs forming the chamber of the quoit suggests that they were from the same rocky outcrop and had been transported from Bodmin Moor. These choices allowed for the articulation of relationships between people, both the living who built it and the deceased inside it, and with materials, places and landscapes; and for kinship networks both human and non-human to be established and embodied in a monument which would have inspired awe in those who gazed upon it (Fig 18).

Fig 18 Trethevy Quoit reconstructed. (Painting: Freya Lawson-Jones.)

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Appendix: worked stone

Anna Lawson-Jones

The test pits produced 194 pieces of stone, very few of which showed any sign of usage. Pieces that did show clear diagnostic signs of use included a worked flint flake, a cobble hammerstone, an incised slate and a slate pencil tip. Other stone may

Table 1 Numeric breakdown of the Trethevy Quoit stone assemblage.

(Items in bold are described in the text.)

Material	*No.*	*Description*
Unused slate	53	Predominantly small – 60mm or less
Used slate	**1**	Slate pencil tip – 21mm long (TP11)
Used slate	**1**	Incised slate – 119mm x 53mm x 7mm (TP2)
Heavy, granular, slate-like stone	1	Shaped/modified, thick rectangular piece of unknown function – 63mm x 25mm x 15mm
Slate pebbles	2	Thin, flat, water abraded slate pieces – under 30mm
Quartz – non pebble	9	Quartz chunks – under 40mm
Quartz – non pebble	1	Larger flake/slither, fresh-looking? – 32mm x 29mm x 7mm
Quartz pebbles	30	Predominantly oval – under 30mm
Variable mixed stone	87	None worked, all angular – up to 150mm
Distinctive stone fragments	5	Possibly shaped, pale and granular – 65mm to 230mm long. Possibly roughout parts? No use wear
Hammerstone	**1**	Quarter cobble with use wear – 72mm x 52mm x 42mm (TP108, SF1)
Flint – worked	**1**	Small, dark, used flake – 25mm x 15mm x 4mm (TP9)
Flint – unworked	**1**	Broken/tried (?) flint lump – 54mm x 45mm x 39mm (TP114)
Flint – pebbles	3	Unused flint pebbles. 2 small and one – 43mm x 31mm x 21mm

have been modified or partially shaped and some of the stone, particularly some of the slate, was burnt.

The following table gives a brief descriptive breakdown (with measurements) of all stone collected during excavation. A fuller description follows with context details for selected pieces (indicated in bold in Table 1).

The worked flint

The flint from TP9 (unstratified), is not sufficiently diagnostic to firmly date but is likely to be Late Neolithic or Bronze Age. Made from uniformly dark, fine-quality flint, it may be made of flint from a non-Cornish source. It appears relatively fresh and does not show any obvious post-depositional damage, abrasion or re-patination. It shows some very limited use wear on one edge, but is not comfortable to hold, is unlikely to have been hafted and does not have a coherent working edge. It is likely to represent a waste flake, produced during adjacent knapping activity, which saw attempted cutting use and rapid discard at the site.

A second larger, very differently sourced lump of flint was also found, in TP114. Although the two largest removals overlap on one side, it is possible that these breaks represent non-knapping-related, unintentional removals from a severely faulted, non-pebble flint. The two main breaks do not suggest hammerstone use. Its character and date are uncertain.

The hammerstone

SF1 from TP108 is a quarter of a hard, broken cobblestone. The cobble's original edges are rounded and comfortable to hold, and near flat on one side, although this is not the result of use. There are several quite deep, small circular depressions as well as a number of less clearly defined areas of bruising caused by percussion. It is likely that the cobble split during use as a hammerstone, before more substantial surface damage or shattering could occur.

Hammerstones are relatively frequent and durable artefacts which are found on many prehistoric sites. They had a multitude of uses, and as a tool type continued to be useful into much later periods when use was more spontaneous. During the prehistoric period, however, they were frequently deliberately selected and then introduced to sites, as is the case here. Many will have seen specialised use, while others are likely to have been valued as multi-purpose tools. The

date of this broken hammerstone near to Trethevy Quoit is uncertain, although its presence implies specific use and discard on the site, potentially at a point in time when the quoit was in active use and a significant focal point within the surrounding area.

The incised slate

TP2 (101), was made on a flat, rectangular piece of slate (Fig 19). The two long edges were formed by snapping, the damaged straight narrow edge has been trimmed, and the diagonal edge is a post-use break. The slate quality is superior to the other local slate found on site, suggesting a more distant source, possibly Wales, source of much of the world's slate (Hughes *et al* 2016). If this is a writing slate, it may originally have been contained within a wooden frame.

The incised lines are on one side only and form a series of predominantly straight, largely unrelated lines of variable length and clarity, running at different angles. Although normally single, they occasionally run as two closely parallel lines and in some cases are the result of line redrawing. The majority run across the top of a single long line which runs down the length of the slate from the broken edge. This long line is the main one of several lines which radiate out from a just visible, compass-like point, with other less clear lines crossing through the point diagonally. The date of the slate carving is uncertain. It has certain resemblances to an example of an incised cobble from the North Cliffs, Camborne (Jones *et al* 2019), however, the 'compass rose' might suggest a much later date.

The slate pencil tip

The slate pencil tip in TP11, is made from a fine-grained, slate-like material (possible soapstone) slightly softer than the incised slate. It is cylindrical with a tapered nib end. The pencil tip and the incised slate, which may have been a slate writing board, could be broadly contemporary – despite being found 7m apart. It is possible that they represent the remains of a nineteenth-century schoolchild's writing slate and pencil set.

The remaining stone assemblage

The remaining assemblage consists of a mix of mainly small, variable, unused material, some of which has been introduced to the site. Introduced material includes the pebbles, all of which will have come from either a beach (flint and quartz) or riverine location (quartz and slate). Some of the pebbles probably represent the use of sea-sand or seaweed manuring (particularly in the case of the very small pieces), while others might suggest slingshot or perhaps even personal offerings of

Fig 19 Fragment of slate with incised lines from TP2. (Photograph: Cornwall Archaeological Unit.)

collected or favoured natural objects, reflecting the site, its use and significance.

Five distinctive stone fragments (Table 1), although found at different locations around the site, are of similar material and may be related. They possibly represent an attempt to rough out a larger object, such as a quern, or had been used in hedging. There are no clearly utilised edges or surfaces, although several of the pieces do show repeated breaks consistent with use or shaping and the largest piece does have a curved external edge. All are quite abraded. Two of the pieces show a clearly defined, internal round depression and may in fact originally have been conjoined, but post-depositional damage has removed their join and definitive evidence for the round depression's production is missing.

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Recycling the past: monuments, manuring, masons, improvers, antiquaries and landscape change in post-medieval Cornwall

GRAEME KIRKHAM

During the post-medieval period many barrows and other earthwork monuments in Cornwall were targeted as sources of earth to be used either to deepen cultivation soils or for making 'composts' to maintain the fertility of agricultural land. Stone monuments, including cairns and megalithic structures, were quarried or broken up for stone for constructing buildings and boundaries. These processes were accelerated by the enclosure and improvement of large areas of former rough ground and rising demand for stone for constructing buildings and boundaries. They were aided by a decline in popular beliefs which had at an earlier time given some protection to monuments. A parallel rise in interest in antiquities and cultural heritage led to efforts to preserve monuments seen to be under threat and to conflict between those who sought to protect field monuments and others who viewed them as exploitable resources or obstacles to progress.

An understanding of the practices which impacted on monuments during this period has implications for modern interpretation of the archaeological record. Echoes of earlier debates between those who value and seek to understand and protect cultural heritage and those who view it as a hindrance to development continue into the present.

'The barrows go to manure our lands, the crosses to form our gateposts' – A H Cummings (1875, 193).

'Barrows and earthworks that have been enclosed in arable fields are doomed to disappear by degrees' – Charles Henderson (1930, 59).

Monuments in agricultural land which survive as low earthworks, or which are detectable only as geophysical anomalies or as soil or crop marks on air photographs, are often described as 'ploughed down' or 'ploughed out'. In fact, while modern mechanised ploughing up to the bases of standing earthworks undoubtedly causes significant damage through 'lateral erosion' or plough 'clipping' (French 2001; Oxford Archaeology 2002; English Heritage 2005, 18–19; Humble and Holyoak 2014), it is clear from examples of earthwork monuments which survive in good condition that in the pre-mechanised period ploughing with horses or oxen *over* undamaged barrow mounds or the standing banks and ditches of rounds or hillforts, for example, would not have been easily undertaken; in most instances it would have been physically impossible. In reality, many now

reduced or levelled earthwork monuments were initially damaged not by ploughing but rather by deliberate and systematic removal of the materials of which they were constructed.

In the spring of 1811, for example, the *Royal Cornwall Gazette* reported the discovery of an urn containing ashes and human bones in a stone cist under a barrow. The find had been made by two labourers employed to 'raze the barrow near Chacewater, called Creege Broaze barrow, for the purpose of manuring a field' (*Royal Cornwall Gazette* (subsequently *RCG*), 23 March 1811, p4). More than 70 years later, the Bodmin antiquarian William Iago was informed of the destruction of a barrow known as the 'Shepherd's House' on New Downs, Lanivet. When he visited the site he found that the barrow had been completely levelled; the labourer carrying out the work told him that his master had ordered him to 'rip it up, and spread it over the field' (Iago 1890, 196). Towards the end of the nineteenth century, the Reverend R Prior observed that some of the large group of barrows on Carland Downs, in St Erme and Ladock parishes, had already disappeared, 'others are disappearing with scarce a note being made of them, save their position being marked upon the ordnance map.' Of one of the barrows, on the margins of the group, he commented, 'only the smallest vestiges remain, as the rest of it has been scattered over the fields to enrich the soil' (Prior 1898, 435).

Nineteenth-century newspapers and antiquarian writers provide numerous similar accounts. There are also a few earlier examples. The ruined megalithic structure in Madron now known as West Lanyon Quoit (Fig 1) was discovered in about 1790 when the owner of the land,

> 'happening to be overtaken by a shower of rain in walking through his fields, took shelter behind a bank of earth and stones, and remarking that the earth was rich, he thought it might be useful for a compost. Accordingly he sent his servants soon after to carry it off, when having removed near a hundred cart-loads, they observed the supporters of a cromlêh, from which the coverstone was slipped off on the south side . . .' (Hitchins 1803, 228; Edmonds 1849a, 196).

Around the beginning of the eighteenth century, William Hals noted that the owner of lands close to a stone circle named the 'Dance Meyns' on Boscawen Downs, St Buryan, had told him that 'contiguous with those dans meynes, he caused not long since divers barrows of earth to be carried abroad in order to manure his lands' (Gilbert 1838, I, 141). (Hals' description combines elements of both Boscawen-Un and the Merry Maidens stone circles but it is probable that this account refers to the area around the latter (*cf* Edmonds 1849b, 230; Blight 1864, 38).)

More than a century earlier Sir Richard Carew recorded that a farmer in the mid-Cornwall parish

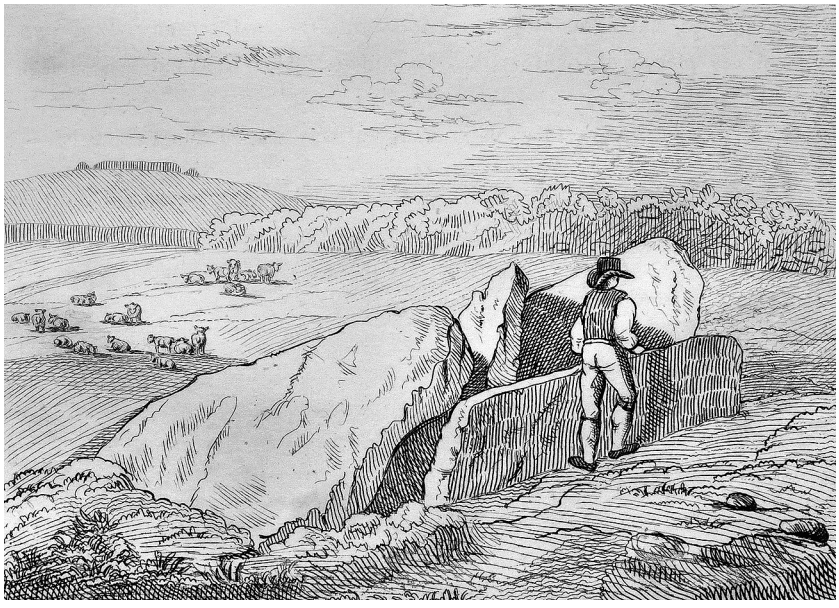


Fig 1 The megalithic structure known as West Lanyon Quoit, Madron, illustrated by William Cotton about 35 years after its covering mound of earth had been removed for making 'composts' (Cotton 1827, 61).

of Withiel had 'digged downe a little hillock or Borough, called Borsneevas . . . therewith to thicken his other ground'. In the process he found what was evidently a cremation burial within a chamber: 'three white stones, triangle wise (as pillers) [*sic*] supporting another flat one', under which was an 'earthen Pot, halfe full of a blacke, slymie, and ill-favouring substance, which (doubtlesse) was once the ashes of some notable person . . .' (Carew 1602, 148r, v; *cf* Norden 1728, 49). 'Borsneevas' can be identified as Bosneives, a farm about 1 km north of Withiel churchtown.

'A large portion of earth'

These reports highlight a practice whereby material removed from barrows and other earthwork monuments was used to increase soil fertility on agricultural land. The practice has only recently been recognised in archaeological literature but appears to have been widespread and to have been a significant factor in the post-medieval reduction and destruction of earthwork monuments, not only in Cornwall but also considerably further afield (Kirkham 2012).

In some instances the earth taken from barrows was used simply to deepen otherwise thin soils. The 'digging down' of the barrow near Withiel in the late sixteenth century was done by the farmer 'to thicken his other ground' and in about 1840 a barrow in the Mountain Barrows group near Pelynt in south-east Cornwall was cut into 'for the purpose of obtaining the earth that formed it, to scatter over the field and thicken the soil' (Couch 1846, 34). The farmer, 'encouraged by the success of having deepened the earth, where it was before very thin . . . proceeded to do the same by the largest barrow . . .' (*ibid*).

In most accounts, however, as with West Lanyon Quoit, the soil taken was used in preparing 'composts' or 'dressings' for agricultural land. Commercial fertilisers in the form of bone dust, imported guano (the solidified dung of sea birds) and various industrial and chemical manures were experimented with during the 1830–40s (for example, *RCG,* 22 December 1843, p4) but were not widely adopted in Cornwall until considerably later in the nineteenth century. Prior to this, farmers were of necessity engaged in a permanent quest for materials which could be added to soils to maintain and enhance their fruitfulness. This perennial struggle for fertility was an imperative of all pre-modern agriculture and demanded considerable time and effort from farmers not only in Cornwall but throughout the British Isles and beyond (*cf* Fussell 1955; Thirsk 1967, 167–8; Mingay 1977, 33–6). It is important to note that there is no indication that earth from prehistoric or other earthwork monuments was perceived as having any special virtue in promoting fertility: this was not 'magic' but rather a requirement for earth from whatever source as an essential constituent for producing well-mixed, fine-textured composts and dressings which could be spread evenly (*cf* Couch 1871, 118).

In Cornwall the materials typically used in making these included farm and household dung, sea sand (more or less rich in lime, depending on the shell content, but also effective in lightening heavy soils), seaweed, burnt lime, urban waste, ditch and road scrapings, silts from ponds, greenstuffs and a variety of other organic constituents (Kirkham 2012, 3–4). Farmers were ingenious and opportunistic in seeking out additional resources. In the late 1830s, 'decomposed leaves and other vegetable matter' were washed ashore after a gale from the submerged forest in Mount's Bay, and 'fifty or sixty loads were sold as "Mount's Bay Guano" ' (Anon 1872b, lxxxvii); the dialect word 'liggan' was recorded at Fowey, meaning 'manure composed of autumnal leaves washed down by a stream and deposited by side eddies' (Couch 1870, 177; *cf* Worgan 1811, 126–7). In 1844 a boat from Newquay went to Carter's Rocks, off Holywell Bay, 'in search of native guano' and the following year a Morwenstow farmer grew a record cabbage crop using guano obtained from a 'rock near Marsland Mouth' (*West Briton* (subsequently *WB*), 13 September 1844, p3; *RCG,* 24 October 1845, p2). Henry Quick of Zennor alluded in 1828 to a scandal caused by the removal of earth and human bones from a Cornish churchyard to 'dress and till the land' (Pool 1984, 39). When a 65-foot (19.5m) whale was stranded at Polzeath (St Minver) in the summer of 1796, 'the people of the neighbourhood cut it up and carted it away for manure' (Polsue 1867–72, III, 371).

This last instance echoes the well-established use for manuring of damaged or surplus pilchards and even, on occasion, of freshly caught fish for which there was no market. Pilchards, together with the salt used to preserve them, were praised by William Borlase as 'the cheapest, as well as

richest manure any where to be procured', adding that it was 'best when left to dissolve, temper and digest its salts in heaps of earth and sand, before it be carried forth upon the arable ground' (Borlase 1758, 87*; cf* Fraser 1794, 37; Rowe 1993, 283). The Truro agricultural writer W F Karkeek noted that for manuring turnips the usual ratio was nine tons of earth to one ton of 'caff' (fish refuse) (Karkeek 1844, 16).

These and other accounts confirm that the constituents of composts were always mixed with substantial quantities of earth as part of the preparation process. Samuel Colepresse noted in the 1660s the 'common dressing' of sea-sand, seaweed, dung and earth which was used on soils along the south Cornwall and Devon coasts (Stanes 1964, 279), and Bishop Richard Pococke, travelling in Cornwall in 1750, observed the practice of taking earth from around the margins of fields and mixing it with sea-sand or lime in heaps before spreading it over the cultivation surface (Cartwright 1888, 135); at the end of the century, Robert Fraser noted composts composed of sea sand, earth, scrapings from lanes and farmyard or town dung (Fraser 1794, 33). In 1845, Penwith Agricultural Association was given an account of an experiment in cultivating turnips with part of a field dressed with guano, the other portion manured with 'farm-yard dung, and earth from the neighbourhood . . . at the rate of ninety to one hundred loads per acre' (*RCG,* 13 June 1845, p2).

The potential for standing earthworks to be targeted for their content is implicit in a description of preparation for a wheat crop by the agricultural writer G B Worgan. Writing about 1808, he noted the use of dung, sea sand, seaweed and damaged pilchards as manures (1811, 120–31), but added that:

> 'one very essential object, and general practice, seems to be the collection of a large portion of earth: *if it cannot be procured from any other part of the farm* [my emphasis], a breadth of land about five or six feet, is ploughed up round the hedges of the field intended for the crop . . . the earth is carted into heaps, 15 or 20 cart-loads in each, and three or four such heaps on each acre; to which is added, either lime, sand, dung, or scrapings of roads, according to the spirit or ability of the cultivator . . . . Should the hedge-rows be destitute of this earth, and *none to be had anywhere else* [my emphasis] many farmers plough up, in the field intended for wheat, three or four furrows of about seven or eight inches in breadth, and at a distance of twenty to thirty yards from each other . . . These furrows are then chopped fine, and by barrows wheeled into heaps, making four or five to the acre . . . if dung, sand, and scrapings of the roads be used, great attention is paid to the pulverizing and incorporating them well together; these heaps are wheeled out, and spread before the seed furrow is ploughed' (Worgan 1811, 57–9; *cf* Couch 1871, 118).

Such operations were not exceptional: they were fundamental to maintaining fertility within the convertible husbandry system practised in Cornwall. Under this, a proportion of the fields on a farm were broken in from pasture every year and prepared for tillage; crops were taken from these fields for two or three years before they were again laid down to grass for several years as the farming cycle continued (Fraser 1794, 33; Karkeek 1845, 437; Tremayne 1845; Herring 2006, 96–7). Farm leases frequently specified not only the lengths of the cropping periods but also the dressings to be applied each time fields were brought into cultivation during the term of the agreement. A lease of 1797 for holdings in Quethiock and Menheniot, for example, specified that the tenant should dress each acre prepared for tillage with 120 seams (horse loads) of sea sand, or 50 bushels of well-burnt lime, mixed with at least 300 horse seams of earth (Kresen Kernow (KK) CY/3098). Another dated 1802 for a holding in St Enoder demanded 40 butt loads of 'good salt sea sand, dung, earth compost, well mixed, on each acre' (KK X141/28), and one of 1835 for a holding at Trebetherick, St Minver, ordered that each acre broken up for tillage be dressed with 12 carts of sea sand well mixed on the premises with earth and dung (KK DS/244).

These were not new practices. William Carnsew of Bokelly, in St Kew, recorded in early June 1576 that he had set his labourers to begin a 'sandryge' (sand ridge; a heap in which sea sand was mixed with other manures in the field), adding a week later that they had begun 'to carye donge 30 lood a daye to my sande ryge' (Pounds 1978, 42–3). In September he noted 'my men were at the sande ryge', probably spreading the resulting compost across the field prior to the autumn ploughing which commenced the following month (*ibid,* 50, 53). There are hints of comparable practices from substantially earlier. Medieval use of sea sand in manuring arable is well documented (Finberg 1951, 90–1; Kowaleski 2001, 59–60; Fox and Padel 2000, lxxxi, 5n, 45, 90, 134; Carew 1602, 19v) but water-worn pebbles recovered from the

ditch of the round at Trethurgy, near St Austell, occupied from the second to the sixth century AD, probably derived from sea sand or seaweed brought onto the site (Staines 2004, 157; Quinnell 2004, 224–5); in the later Roman period both seaweed and domestic midden material were used to create cultivation soils on windblown sand at Atlantic Road, Newquay (Reynolds, in preparation), and seaweed was probably also used on the early medieval fields at Gwithian (Fowler and Thomas 1962; Fowler 1983, 157; Bell 1981, 121).

'To afford manure for the adjoining field'

Soil removed from monuments was sometimes sufficiently rich to be valued as a manure in its own right, perhaps because the original earthwork had been at least partly composed of turves or soils from an old land surface (Fig 2). It was noted in 1849 that 'within the recollection of a person now living', a barrow about 5ft (1.5m) high adjacent to the south side of the Roman fort at Tregear (Nanstallon, near Bodmin) had been 'taken away for manure, and several holes have been dug for the same purpose where the ground appeared to have been enriched by some animal or other deposit' (McLauchlan 1850, 22). When Iago visited Tregear in the 1880s, the tenant pointed out several shallow depressions outside the camp as the former sites of barrows; 'for the sake of obtaining their fertilising contents, the earth had been somewhat scooped out beneath where they had stood' (Iago 1890, 212).

Tregear also provides evidence that barrows were not the only type of earthworks to be targeted. In 1828 it was noted that the rampart of the fort 'for a considerable time has been excavated for the double purpose of [creating] a hedge, and to afford manure for the adjoining field' (Stannator 1828, 96). Sixty years later Iago was told that the ramparts of the Roman fort were formerly

> 'very wide, sloping and overgrown, not like upright hedges. They had been reduced in thickness within living memory. There was a double rampart, he said, but now only a single one appears. The banks were excavated back from both faces towards their centre, thousands of cart-loads of earth and stone being removed to dress the fields enlarged by the digging' (Iago 1890, 212).

A similar project is implied by the discovery in 1779 by a Breage farmer of an urn full of coins, 'as he was narrowing a bank which formed the boundary of his field'; the bank, 'composed of earth and stones' and 1.8m high and about 3.3m wide, was described as forming the arc of a circle and was probably part of an already partly removed enclosure (Hitchins 1803, 225). A Penzance correspondent reported damage to Trencrom hillfort, situated on rough ground in Lelant, noting that 'Not long since a considerable portion of the lines [ramparts] were carted away, the stones for hedging, and the earth for manure' (*WB,* 12 January 1844, p4); in 1876 W C Borlase noted that the ramparts of the bivallate Faugan Round (Paul) were 'only visible on the east side (the remainder have been carted away)' (Millett nd, 16).

Lescudjack Castle hillfort, in the suburbs of Penzance, offers an extreme example. The hillfort now survives as a sub-circular scarp cut into the hillslope, with only a few metres of the former rampart extant as a standing earthwork (Kirkham, in preparation a). However, a description probably made in the early 1840s noted the rampart as '18 feet [5.4m] high on the outside and 6 feet [1.8m] high internally' (Morrab Library MOR/COL/12, 44: 9). With these dimensions it is probable that the former earthwork bank was originally at least 6–7m wide. In 1849 Richard Edmonds (1851, 343) reported Lescudjack as 'much injured by agricultural improvements'; a few years later it had, 'from agricultural improvements, almost disappeared' (Edmonds 1857, 365). The adjacent fields were at this period used for intensive production of early vegetables (Courtney 1878, 47–8). Post-medieval pottery and water-rolled stones found in the ploughsoil within the hillfort suggest that urban midden material from Penzance together with seaweed and sea-sand were used in manuring and it is likely that the hillfort ramparts were removed piecemeal for use in making the composts which kept the fields productive (Kirkham, in preparation a).

Enclosure ditches also provided material. The visitor who noted the destruction of the ramparts at Tregear fort added that the two accompanying ditches were 'filled by a fat loam' and that he had encountered a 'husbandman . . . casting out the loam for manure' (Stannator 1828, 96; *cf* Iago 1890, 115). The tenant of the holding on which Trebowling round (Gwennap) was situated was reported to have discovered a considerable

Fig 2 Two colour slides by Charles Woolf of Carvinack Barrow (Kenwyn), before and towards the end of its excavation by Dorothy Dudley in 1958 (Dudley 1964). The images give an impression of what the excavator called the 'great bulk' of the barrow, which was probably originally 4.2m high and more than 21m across; this is even more apparent in one of the published excavation photographs, showing one quadrant removed (Dudley 1964, pl II). The lower photograph shows the barrow's composition of mounded grassy turves and underlines both the quantity of material involved and the physical labour which would have been required in the past to slight similar monuments to the point at which they could be ploughed over. Above: ICS12/3771, 'Before Carvinack Barrow Dig, 1958'. Below: ICS12/3833, 'Removal of Robber Pit, Carvinack Barrow Dig' 1958 Aug – Oct.' © Charles Woolf Slide Collection, University of Exeter Penryn Campus.)

quantity of ashes and burnt stones while 'clearing out the ditch or *vallum* for manure' (Polsue 1867–72, II, 142) and Charles Henderson observed in 1916 that the outer ditch of one of the enclosures at Caervallack (St Martin-in-Meneage) had been 'dug up several years ago and much abrased [*sic*] in consequence but it is nevertheless still apparent' (Royal Institution of Cornwall, Courtney Library: Henderson MSS, Antiquities, 4, 1). Charles Thomas's excavations at Castilly henge, Luxulyan, in 1962 revealed substantial remodelling of the external banks but also found that a 'large quantity of upper silting had been removed from the ditch'; two sections across it revealed only 'a sorry remnant of the original dark silt' (Thomas 1964, 7, 8). Thomas suggested that a shallow layer found over the henge bank in one section represented the removed ditch fills, but this was extremely thin and unlikely to account for any significant proportion of the removed material (*ibid*, 8). The removal of the ditch fills was not dated but it is plausible that they were dug out for use in improving soils on the new farm established immediately adjacent to the henge in the 1860s (below).

'Clove up by the Farmer'

Paralleling the need for earth was a demand for stone. The enclosure and improvement of large areas of rough ground – downs, heaths and coastal cliff-land – during the eighteenth and nineteenth centuries required large quantities of material for constructing boundaries and for building houses and other buildings on the many new agricultural holdings created (below). Thus, when St Austell Downs were enclosed by Charles Rashleigh in the years around 1800, the monument known as One Barrow was 'obliged to be levelled; the finer parts of the earth to be used for manure, and the rubbish apparent upon it to be turned into a fence' (Whitaker 1804, I, 83); around 20 other barrows were similarly removed during the enclosure of the Downs (Williams 1739–41; Polwhele 1816, II, 194). In 1819–21 an area of coastal rough ground in St Columb Minor, now the Barrowfields area of Newquay (Figs 3, 4), was broken in by an improving landholder, John Cardell. Within the area was a group of 15 barrows, one of which he removed 'in order to mix the earth it contained with manure' (*WB,* 5 February 1819, quoted by Douch 1962, 93). Two years later the *West Briton* gave a long account of the barrow group, commenting

> 'We learn with regret that Mr Cardell proposes to remove the whole of these ancient monuments, in order to clear the ground they occupy for cultivation, and to obtain the earth they contain to mix with manure, and the stone of which the centre is composed, for making hedges; it being difficult to procure stone for that purpose in the neighbourhood' (*WB,* 10 August 1821, quoted in Douch 1962, 93–5).

The rapid post-medieval expansion of Cornwall's urban and industrial settlements also demanded stone for paving and for new housing and commercial, industrial, religious and public buildings (Kirkham and Cahill 2011). The mining industry was developing rapidly and similarly required stone for engine houses, chimneys, calciners, dressing floors, count houses, reservoirs and other structures; materials were also in demand for new harbours, bridges and other major works, as well as for more mundane uses such as road surfacing (Sharpe 2011; 2016; Herring 2008b, 163; Stanier 1999, ch 7).

Industrial-scale quarrying developed from about the mid-nineteenth century, but prior to that much of the material for boundaries and construction was obtained from surface stone (Stanier 1999, ch 3). In that context stone monuments were particularly vulnerable. Megalithic structures and standing stones in particular were of a convenient size and shape to be broken up to make gateposts, lintels and doorposts. The *Mên-Perhen* in Constantine, for example, until the mid-eighteenth century the largest standing stone recorded in Cornwall, 'made above twenty Stone Posts for gates when it was clove up by the Farmer'; the Longstone at St Mabyn, broken up in the mid-nineteenth century, 'yielded four large gate-posts, gave spans to a small bridge, and left much granite remaining' (Borlase 1754, 156; Couch 1883, 324).

Probably the best known such instance is the damage inflicted on Zennor Quoit in 1861, reportedly by a farmer seeking material for the linhay or cattle shelter built beside it (Fig 5). The Reverend W Borlase, vicar of Zennor, intervened and 'for 5s the work of destruction was stayed' (*Cornish Telegraph* (subsequently *CT*), 4 September 1861, p2; *cf* Herring 1987, 43–4; Pool 1971). This episode has been cited as the origin of the damage to the northern portal slab of the structure, but Richard Edmonds, more than a decade earlier, had noted that 'Traces . . . of the

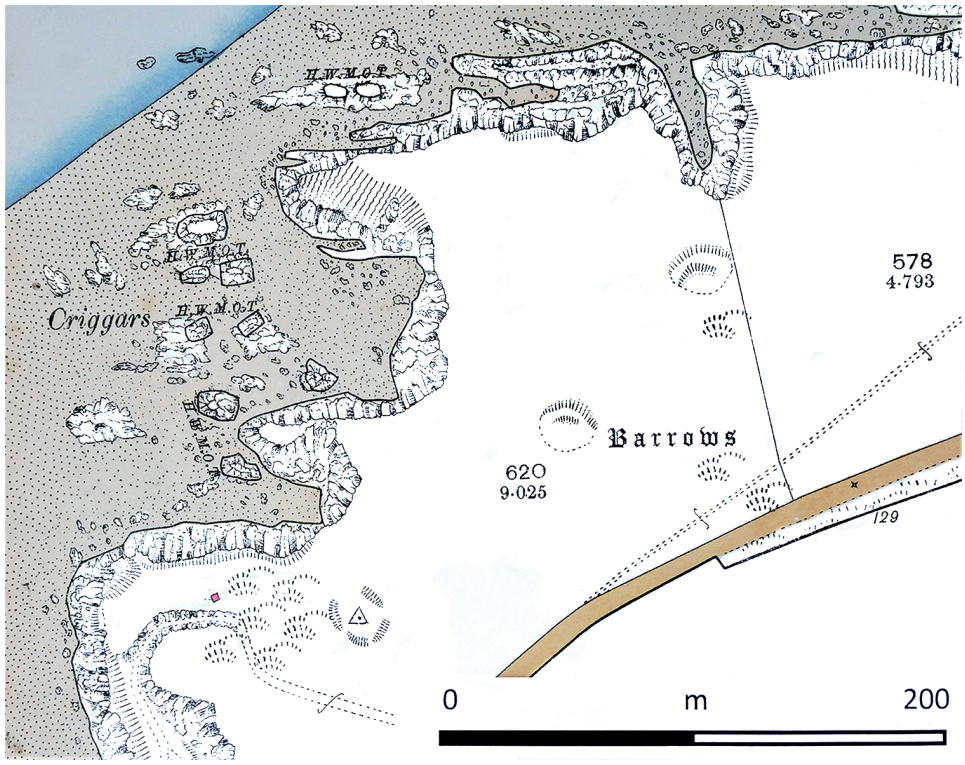


Fig 3 The Barrowfields area of Newquay on the Ordnance Survey 1st edition 25in map, surveyed in 1879, published 1883 (KK TF/2819); scale added. (Reproduced by courtesy of Kresen Kernow.) The map recorded three barrows which survived after the removal in 1819–21 of most of the linear group of which they had previously formed part. The depiction suggests that material had been taken from the landward side of the two barrows to the east; field inspection confirms this and indicates that the south-west side of the third has also been cut away (Parkes 2009). The surviving barrows are now Scheduled Monuments.

Fig 4 One of the Barrowfields mounds, looking north east, with a substantial quantity of material clearly having been removed from the side nearer the camera. 1m scale. (Photograph: Graeme Kirkham.)

borer are very evident in one of the two eastern slabs, which was cleft horizontally, not many years ago, and more than half its height removed'; on that occasion also the work had been stopped by the timely intervention of a local gentleman, on that occasion the landowner (Edmonds 1849a, 202).

Just as megaliths offered stone suitable for structural uses, cairns and other stone-built structures offered substantial quantities of stone conveniently gathered for carrying away. A 'large heap of stone' covering a megalithic structure was removed in about the late 1770s for repairing roads in St Minver (quoted in Johnson 1979, 10–11); the stones from a large cairn which stood on Brockabarrow Common (Blisland) were 'a few years ago . . . used for making the new turnpike-road which skirts the parish of Temple' (Maclean 1868, 24; HER MCO 4206). Thomas Carte recalled that early in the eighteenth century, on a hill he described as 'opposite' Carn Brea (perhaps Bassett Carn, Carnkie) there had been a

> 'prodigious heap of stones, of which some hundred thousand loads [*sic*] are still left, though the gentlemen in the neighbourhood, as oft as they had occasion for stones, have been continually fetching them from thence to make use of in their buildings; and the tinners having been several years employed in building a large *Aqueduct,* or (as they term it) *Audit,* five or six foot high, and more in breadth, for some miles in length through a valley to the north sea, in order to drain the water from a mine of the late Mr. *Fr. Basset's of Tehidde,* have carried thence many thousands of loads on that occasion. 'Tis plain, from the order in which these stones are placed, that it is a work of art . . .' [that is, not a natural feature] (Carte 1747, 103n).

Richard Thomas noted in 1851 that the 95 feet (29m) diameter Hangman's Barrow, in Crowan, was, 'formed of granite stones, many of which have been carried away' (Thomas, Statistics of Cornwall, letter 33: *WB,* 15 August 1851, p6). Thirty years later another antiquarian visitor recorded that part of the downs on which the barrow stood had been 'enclosed and cultivated, [and] many loads of stones were removed from the cairn for hedging purposes' (*Cornishman,* 13 January 1881, p8). The kerb of an entrance grave located in the crofts of Tregiffian, in St Just, had similarly been 'carried away for hedging' (Borlase

Fig 5 The portal dolmen known as Zennor Quoit. William Borlase recorded the structure set into a stony cairn (Borlase 1754, 218, pl XVIII), the whole of which has subsequently been removed, plausibly for use in constructing the walls of an adjacent droveway across the downs. Drill holes are visible along the horizontal break on the right-hand portal slab (see text) with, in the foreground, the uprights of a linhay or cattle shed, at least some of which may have come from the monument. (Photograph: Graeme Kirkham.)

1879, 210) and part of a large cairn in Zennor was 'conveyed away to be used in building a house' (Millett 1841).

Removal of stone for urban building was particularly prevalent in west Cornwall. Material was being taken from the walls of the Iron Age Chun Castle (Morvah – Madron) from at least the 1820s (Carne 1828, 245) and E T Leeds described the hillfort as having been in the first half of the nineteenth century a 'stone quarry to supply the needs of Penzance and its neighbourhood'; material from the site was reputed to have been used in paving the town and to construct the Penzance Union workhouse at Madron (built 1838) (Leeds 1927, 214; HER MCO 44282). Further removal of stone was reported at the end of the 1840s, with one of the landowners claiming to have warned the 'stone-carriers of Madron' that he would prosecute 'any person who removed a stone from Chun Croft' (*RCG,* 5 October 1849, p6; 12 October 1849, p7). Nonetheless, it was hinted that stones from Chun Castle were used in building a row of houses in Penzance in the late 1860s and in 1875 it was observed that 'thanks to local road-makers, much of the inside is now a mere stone-heap' (*CT,* 5 January 1888, p8; Anon 1875, 11); two decades later stone from the castle was still said to be being 'rapidly carted away' (*Cornishman,* 10 August 1893, p5).

The later prehistoric settlement at Bodrifty (Gulval) was similarly 'extensively robbed: the moorstone of this area was popular with builders in the early 19th century, when Penzance began to expand, and rusty iron hooks (from ox-yokes and traces?) are often found beneath the turf' (Crofts and Patchett 1952–3, 15). Dorothy Dudley, who took over the Reverend C B Crofts' excavations on the site, noted that the work had been hampered by 'much loose stone left lying about haphazardly fifty years ago, when the farmer sold stone to a contractor in Penzance . . . much was taken from the hut-circle walls and the pound-wall was left in a completely ruinous condition' (Dudley 1956, 3).

The courtyard house settlement at Chysauster (Gulval) was also quarried. Edmonds reported to the Royal Institution of Cornwall (RIC) in 1857 that stones forming the walls and roof over 'several yards' of the southern, lower part of a fogou had been 'removed for modern buildings' (*RCG,* 6 November 1857, p6). A few years later, Blight noted that although the 'huts' making up the settlement were still 'pretty entire, they are not so perfect as they were in 1849', many of the larger stones having been carried away for buildings; by this date the fogou had been 'totally demolished' (Blight 1861b, 39, 42). Early in the following decade W C Borlase concluded a detailed account of his recent excavations on the site in a local newspaper with the hope that by 'kindly inserting this notice you may assist me in preserving these ruins from the depredations of stone carriers, by awakening some public interest in them' (*CT,* 23 July 1873, p2).

The robbing of antiquities for building materials was less reported outside west Cornwall, but occasional instances were recorded. The captain of Tin Hill mine, in St Stephen-in-Brannel, reported in 1864 that there had been a large cairn or pile of stones within the nearby 'ancient British fortification' on St Stephen's Beacon; 'as a great many of them appeared suitable for building an engine house I set men to take them out' (Jenkin 1964, 26). In April 1889 F R Rodd, owner of Trebartha, North Hill, ordered the re-erection of the fallen stones of the Nine Stones circle on East Moor, on the boundary between Altarnun and North Hill; the Reverend A H Malan thanked him in the *Journal* of the RIC, commenting that the restoration of this 'relic of antiquity' served a good purpose in 'tending to shew the moor-men, especially those on the look-out for gate-posts, that labour (*i.e.* money) is expended on their preservation' (Malan 1889a). In the same contribution Malan noted recent damage to the Stripple Stones circle-henge, Blisland, stones having been removed and split for building a newtake wall, adding that 'Such spoliation should not be permitted; but in most cases it is difficult to prevent it, *in time'* [original emphasis] (Malan 1889b; *cf* Preston-Jones *et al* 2017). On the following page, however, Malan reported (without comment) that Rodd of Trebartha had, in the month after his restoration of the East Moor circle, ordered the building of a wall around the nearby Old Plantation below Ridge Hill and had accordingly 'driven an adit through the cairn on the top, in order to get stone for the purpose' (Malan 1889c). The spread remains of the cairn, now known as Ridge Barrow, were subsequently rebuilt to form an animal shelter (HER MCO 4519; 22094) (Fig 6).

Fig 6 The remains of Ridge Barrow, East Moor, North Hill, robbed for stone in the late 1880s for building a plantation boundary and subsequently rebuilt as an animal pen or shelter. (Photograph: Graeme Kirkham.)

'A face of improvement'

Most of the accounts of the slighting of monuments for the materials of which they were composed date from the nineteenth century, although the few earlier reports indicate that the practices were not new. The much greater number of references after about 1800, while due in part to a growing interest in and concern for antiquities, can also be attributed to the increasing ease of making such cases known through local newspapers – the *Royal Cornwall Gazette* appeared from 1801, the *West Briton* from 1810 – and via learned bodies such as the RIC, founded in 1818, and the Penzance Natural History and Antiquarian Society, established in 1839.

More particularly, however, the rapid growth from the later eighteenth century in the extent and intensity of agricultural activity in Cornwall undoubtedly put many more monuments in harm's way. High prices during the Napoleonic Wars prompted a substantial expansion of the area cultivated, to a great extent through permanent enclosure of rough ground (Worgan 1811, 46). A letter to the *Royal Cornwall Gazette* in 1814 noted that 'The late war has occasioned so-many and so great alterations in the face of the country, and the condition of the people . . . wherever I ride I behold lively inclosures, breadths of wheat or of clover, where 20 years ago, I saw nothing but heath and croft, and I find even the cross-roads [minor by-roads] with their adjoining fences in

good and creditable condition, which formerly were, the one neglected, and the other scarcely practicable' (*RCG,* 21 May 1814, p4). C S Gilbert (1817–20, I, 347), writing just after this boom period, observed that agriculture in Cornwall had improved more in the previous 25 years 'than it experienced during the whole of preceding ages . . . From Truro to Torpoint, the county wears a face of improvement, which cannot be contemplated without astonishment by those who reflect on what was its former appearance.'

The passion for 'improvement' was part of a wider movement occurring across Britain at this period (Wade-Martins 2004, chs 1, 2; Brown and Williamson 2016, 189–90), and was reflected in Cornwall as elsewhere in the adoption of improved rotations, crop varieties and livestock breeds, of 'new' crops such as turnips and potatoes, and of better farm equipment, not least a much increased use of wheeled transport (Karkeek 1845, *passim*; Rowe 1990, 392–3; 1993, 232–5; 1996, 73–5, 135–6; Overton 2006, 116–9). There was an increasing emphasis on production for the market, not least to supply the growing regional population: Cornwall's inhabitants increased from about 116,000 in 1745 to 191,000 by 1801, reaching a peak of more than 370,000 in the 1860s (Thomas 1990; Deacon 2007). Urban and industrial households, dependent on local markets for food, represented a substantial part of this increase (Barry 1999; Kirkham and Cahill 2011). Edward Lance, a Surrey agriculturalist, visited the Probus area in 1839 and, noting the 'improved' agricultural regime of the district, commented that the

> 'excellent markets of the western mining districts offer a great stimulus to the fattening of cattle, as well as the growth of corn. Indeed it is the great demand for the surface earth's produce which is weekly made at the markets of Truro, Redruth, St Austell and other mining parts, which prompts the Probus farmers so much to increase their returns . . . This it is which has made the Probus farmers have recourse to the subsoil plough, to dressing of lime of 100 bushels to the acre, at every wheat crop . . .' (*RCG,* 20 December 1839, p3).

Change was noticeable even in areas in the far west generally less favourable for agriculture, with the Reverend John Buller (1842, 2) noting that on larger farms in St Just the 'cultivation used to be very bad, but of late years a much improved system has been successfully adopted; the drill has been introduced, and as good crops of rota baga turnips for winter feeding, and the supply of the market, are grown here, as in more fertile soils.'

Demand from expanding urban and industrial centres elsewhere in Britain, boosted during the middle decades of the century by the opening of new links by steamship and the newly-completed railway link across the Tamar, also provided significant new markets for Cornish agricultural

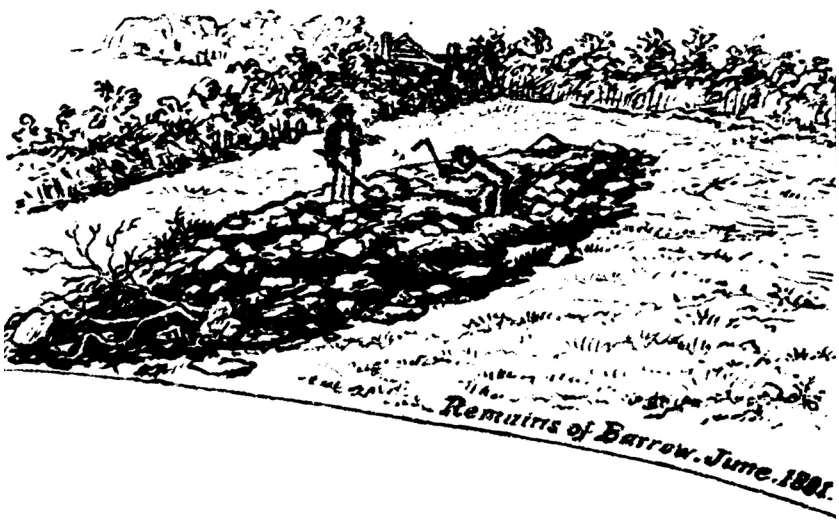


*Fig 7 Removal of a barrow near Hustyn, St Breock, in 1881 (Iago 1883, pl B). Iago explained that it 'often becomes necessary for farmers, in bringing land into cultivation, to clear away furze-grown cairns which may, or may not, be interesting as antiquities' (*ibid*). In this instance, 'The farmer required the land for cultivation, and with the assistance of a man proceeded to take out the barrow' (RCG, 25 November 1881, p7; Iago 1883, 142).*

output (for example Worgan 1811, 75; Lemon 1841, 204–6; Anon 1872a, viii; 1876, 254–5; 1882, 199; Punchard 1890, 522–3; Overton 2006, 119–24).

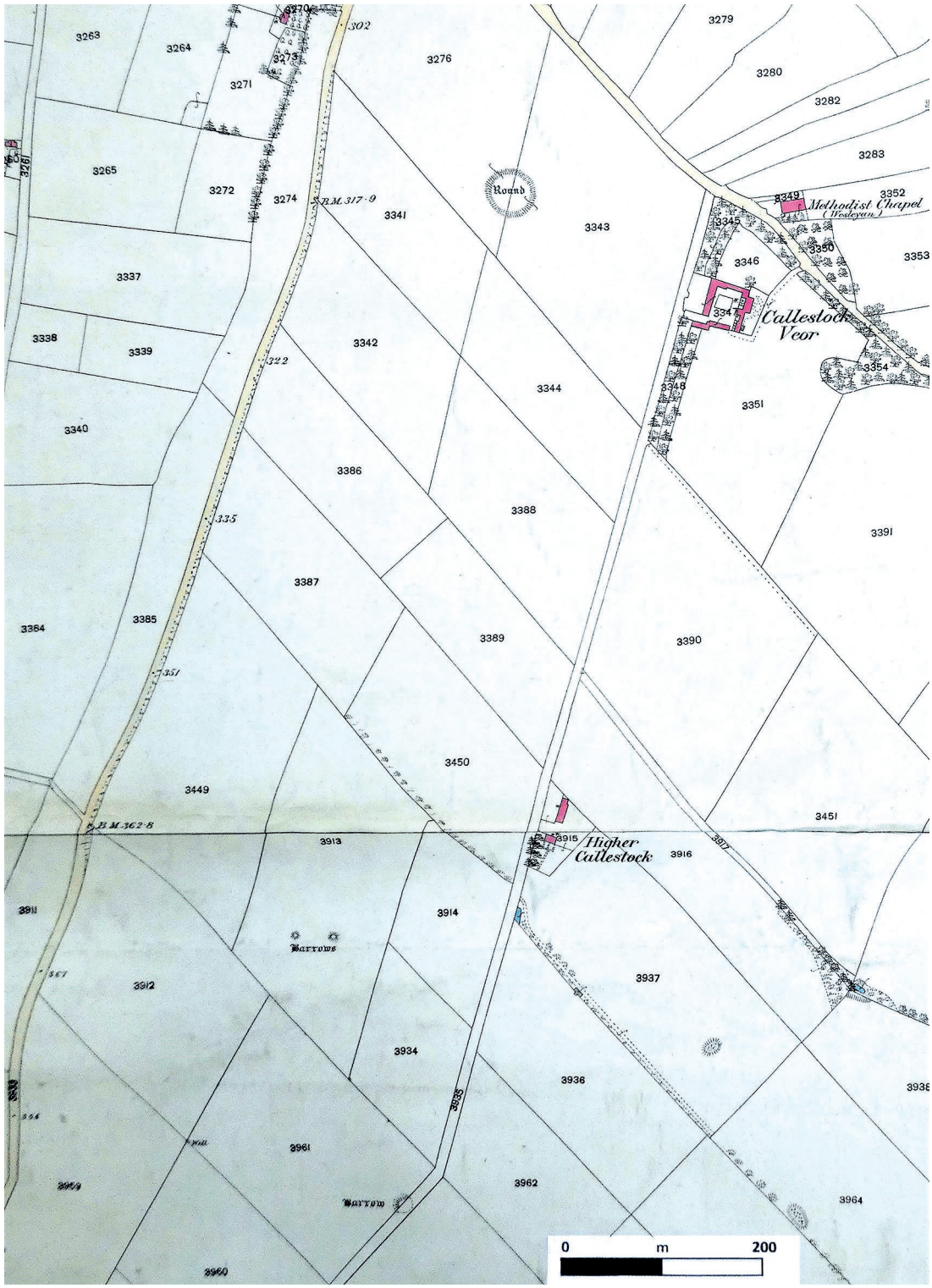
In the altered context of 'improvement', stone monuments and the mounds, banks and ditches of ancient earthworks which had survived unscathed to that point were increasingly likely to be perceived not only as barriers to efficient land use (Fig 7) but also as potential resources. The report of the discovery of West Lanyon Quoit cited above provides an early example (Hitchins 1803). The earth mound which covered it lay within the same field as the medieval settlement later known as Old Lanyon, inhabited from the eleventh or twelfth centuries until the fifteenth or early sixteenth centuries (Beresford 1994). Despite this, the barrow survived as a substantial earthwork until about 1790, early in the boom years of the Napoleonic period. Then, its 'rich' earth was noted by the landholder as 'useful for a compost' and the mound covering the quoit – 'near a hundred cartloads' (implying the use of wheeled transport) – was removed. At least one of the stones revealed when the mound was removed was later reported to have been split for use as 'the *"gravel"* (girder) of a country chimney' (*RCG,* 22 September 1843, p4). Descriptions such as this which hint at the quantities of material removed from particular monuments – in this instance 'near a hundred cartloads – prompt reflection not only on the process by which they were reduced but also the labour invested in their original construction.

'Waste land into fertile fields'

West Lanyon Quoit, as with Tregear Roman fort, the Pelynt barrows and Lescudjack Castle hillfort, lay within 'Anciently Enclosed Land', also termed 'Farmland: Medieval'. This is the historic agricultural heartland of Cornwall, settled, enclosed and farmed since at least the medieval period and in many cases from prehistory. Much the largest proportion of the monuments reported as having been targeted for earth or stone, however, was on Recently Enclosed Land; that is, former rough ground – heaths, downs, commons and coastal cliffs – which was enclosed and improved during the post-medieval period (Cornwall County Council 1996; Herring 1998; 2011). From the later eighteenth century the attention of improving landowners and agricultural and economic polemicists was particularly focused on transforming such areas of 'waste' and bringing them into more intensive and profitable uses than their primary traditional roles as seasonal rough grazing and fuel grounds (for example, Fraser 1794, 56–9; Karkeek 1845, 444–7).

Elsewhere in the south west this led to major projects such as Sir Thomas Tyrwhitt's investment around Princetown on Dartmoor and the Knight family's efforts to establish new farms on some of the least hospitable parts of Exmoor (Somers Cocks 1970; Harris 1987, 108–9; Milton 2006, ch 6; Orwin and Sellick 1970; Hegarty and Wilson-North 2014, 21–62). Landowners in Cornwall also undertook significant improvement projects, although generally on a smaller scale than these and with rather more realistic objectives and greater levels of success. Some enclosure of rough ground took place through parliamentary legislation, probably amounting overall to about 10,000 acres (4,000 ha) (Overton 2006, 115). This included areas in Boconnoc, Braddock and St Winnow parishes, where enclosure was initiated with an act in 1809, of 'Castle Dennis Downs' (Castle-an-Dinas Downs, St Columb Major) from 1815, and Feock Downs from 1811 (KK F/1/229; *RCG,* 24 June 1815, p3; 16 October 1819, p1; 31 August 1811, p1; *cf* Dudley 2011, 54–5). The latter was part of a much wider improvement project which also included land in Kea and Gwennap parishes; together, it was claimed, these schemes would 'convert vast tracks [*sic*] of waste land into fertile fields, and that in the centre of the most populous part of Cornwall' (*RCG,* 31 August 1811, p3).

In the mid-1840s Karkeek noted successful recent improvement and enclosure projects on rough ground in St Agnes, St Erme and St Stephen-in-Brannel (Karkeek 1845, 445–8) and, looking back in 1870, a *West Briton* correspondent recalled that over the previous 30 years, 900 acres (365 ha) of Callestick (formerly Callestock) Common in Perranzabuloe had been enclosed and cultivated (Fig 8), a 400–500-acre (160–200 ha) farm created by the Davey family from waste nearby at Tywarnhayle, and a further 1000 acres (400 ha) of common enclosed at Goonearl in St Agnes; the writer also applauded the forthcoming enclosure of part of St Breock Downs in St Issey by J S Williams of Caerhayes, as well as an 'immense tract of common' on Falmouth estate land at St Dennis (*WB,* 12 May 1870, p6).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In addition to these larger projects, many other substantial areas of rough ground were transformed through landowners making available numerous parcels of a few acres which incoming tenants were required to enclose and improve within a specified period. These areas of piecemeal smallholding creation are characterised by predominantly rectilinear systems of small fields with homesteads dispersed through them (Rowe 1993, 225–7; Sharpe 2005; Herring 2008a, 143–7; Dudley 2011, 47, 52–5; Kirkham 2011). Holdings of this kind can be identified from at least the 1660s (Sharpe *et al* 2010, 43–7) but the pace of their creation accelerated after the middle of the eighteenth century and continued through the nineteenth. While often referred to as 'miners' smallholdings', they also occurred in areas where industries such as quarrying and china-clay working were dominant and, on a more limited scale, in non-industrial areas, most notably on the downs and heaths of the Lizard (for example, Kirkham 2011, 111; 2014, 70–4; Johns 2002, 27–9; Taylor 2007a, 52; 2007b, 137–8).

In combination, these processes of enclosure and improvement created within a relatively short period distinctive and extensive new landscapes characterised by predominantly straight-sided fields and modest farmsteads which covered an area approaching 20 per cent of Cornwall's land surface (Herring 1998, 40). In some areas previously dominated by heaths and commons, the extent of change was dramatic: estimates based on historic landscape characterisation suggest that by about 1880 the area of rough ground surviving in St Agnes parish had been reduced to only about one-fifth of its extent at the end of the medieval period (Dudley 2011, 61–4, fig 51; *cf* Padel 2011, fig 67).

Fig 8 (opposite) Landscapes of improvement: part of the former Callestock Common, Perranzabuloe, shown on the Ordnance Survey 1st edition 25in map, surveyed in 1878 (sheets XLVIII.14; LVII.3). (KK X560/6; scale added.) (Reproduced by courtesy of Kresen Kernow.) Callestock common was recorded by the tithe apportionment in 1841–2 as a single block of 864 acres (350 ha); enclosed from about 1844 (Royal Cornwall Gazette, 3 March 1843, p3; 9 February 1844, p3; 23 February 1844, p3; ACSS V/P/2), the common was divided into several new farms, including Callestock Veor and Higher Callestock, with the new fields set out with ruler-straight boundaries, in this instance unusually not on a rectilinear grid. In the mid-nineteenth century Richard Thomas described the standing archaeology he had observed in this area: to the south, shown partly overlain by the road, was ' "Callestock Barrow", diameter 55 feet; about a furlong north of which are two low barrows, each diameter 45 feet; further N.N.E a quarter of a mile are two barrows, diameter of each 45 feet [not shown on the map, so presumably removed by that date]; a quarter of a mile westward is a barrow, diameter 40 feet [not shown]. Further northwards . . . are the remains of a circular entrenchment, single bank and ditch, about three quarters of an acre' (Thomas, Statistics of Cornwall, letter 39, West Briton, 7 November 1851, p6). Air photographs and excavation have subsequently revealed other archaeological features within the area shown on the map (HER MCO 7694; Jones 1998–9).

'Now built up into neighbouring cottages or fences'

This rapid expansion of the area of actively farmed land put at risk large numbers of monuments on areas of rough ground which had formerly been remote from agricultural operations. The thin, impoverished soils found on heaths and downs demanded substantial inputs of composts and 'dressings' to improve their fertility; in parallel the creation of new enclosures required very large quantities of stone. Adam Sharpe (2016, 280) estimates that the establishment of a new smallholding of a few acres could involve construction of approximately 1.5 km of new stone boundaries which, together with a dwelling and ancillary buildings, might require perhaps 7500 tonnes of stone. In the late 1840s Edmonds noted a large barrow or cairn, 80 ft (24m) in diameter and 5–6ft (1.5–1.8m) high, on Lady Downs, Towednack: 'Large as this now is, it was much larger some years since: and two others which were near it, and of still greater magnitude, have been lately removed, the stones being now built up into neighbouring cottages or fences' (1849b, 235–6; *cf* 1862, 34). Lady Downs was former rough ground which at precisely this period was being divided and enclosed into smallholdings

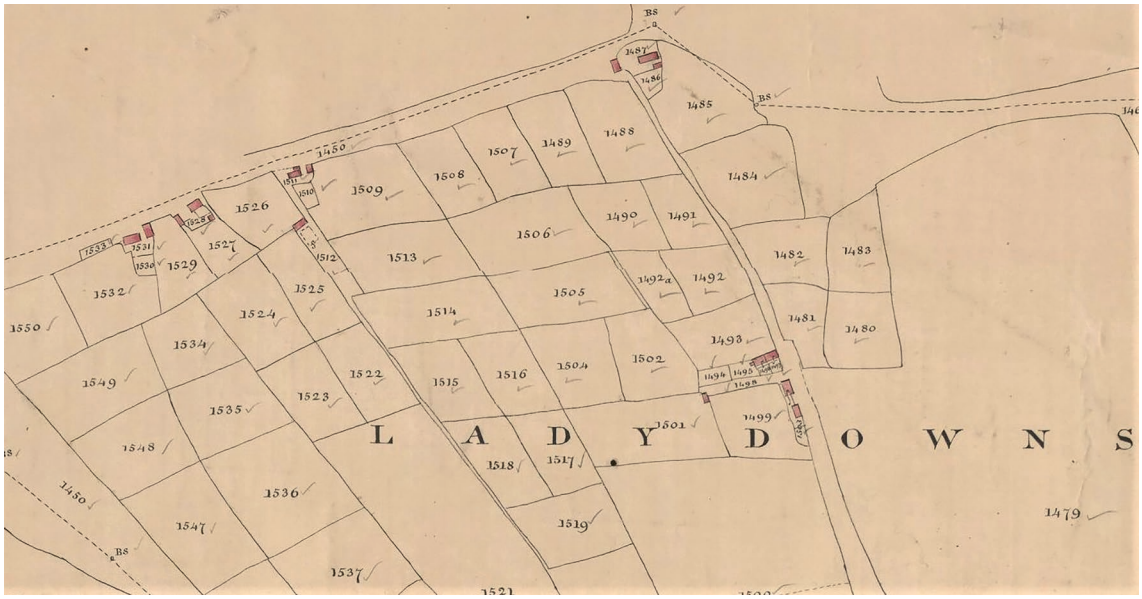

Fig 9 Lady Downs, shown on the Towednack tithe map of 1839 (KK TM/226). (Reproduced by courtesy of Kresen Kernow.) By this date a substantial area of the Downs had been enclosed, sub-divided and improved as smallholdings; later maps show that the process continued through the nineteenth century. The large barrow recorded by Edmonds as having been partly removed to build 'neighbouring cottages and fences' (see text) was located in the large enclosure at right (TA 1479), recorded as 'The Great Croft'. Henry Quick, the nineteenth-century Zennor poet, wrote of the settlement: 'My father, he, at Lady Downs, / Leased a few acres of croft ground, / And built a little cottage there, / High rent thirty shillings per year / Of which he small improvements made / Before he in the grave was laid . . .' (Pool 1984, 13).

(Fig 9). In St Just-in-Penwith Buller noted that the 'broken remains' of stones which had formerly made up a complex of multiple circles described by William Borlase at Botallack 'are now imbedded in the walls of miners' cottages, and the hedges of the adjacent fields' (Buller 1842, 94). The Presidential address to the RIC in 1870 highlighted the consequences for stone monuments on Bodmin Moor of the 'large and industrious population' attracted by the expansion of industry during the previous half century: 'For the walls of cottages and the fences of paddocks, all stones – whatever their picturesque or traditional character, – whether on Duchy, or on other private property – even portions of *(the Hurlers)* ancient rock circles, if suitable for the mason and the hedger, have been broken and carried off' (Anon 1871, xiv).

There are hints that proximity to earthworks offering a potential supply of soil may on occasion have been a consideration in determining the location of new holdings. Thomas Tonkin, writing in the 1730s, noted that the ditch of the linear earthwork known as the Bolster Bank at St Agnes was about 20 feet across, with 'p[ar]ts taken up by my fathers tenants, for orchards and gardens' (de Dunstanville 1811, 356). Borlase, describing the Bank a few years later, noted the ditch 'level'd & widen'd in many places and turned into little orchards & gardens'; another portion he described as 'level'd into little meadows and by means of homes built upon it no longer to be seen' (quoted in Johnson 1980, 83). Two barrows south west of Zelah (St Allen) had 'of late years been destroyed by persons who have placed cottages and gardens on their sites' (Thomas, Statistics, letter 40: *WB,* 21 November 1851, p6) and Edmonds, visiting the round at Castle Kayle (Hayle) in 1861, found 'much of the earthworks levelled for making a garden for a cottage lately erected by the road side' (Edmonds 1862, 214).

Further east, a new 14-acre farm known as Castle Hill was created during the 1860s on Innis Downs, Luxulyan, beside the earthwork of Castilly henge. The new house, outbuildings and townplace were constructed over the sites of three barrows shown on the 1840 tithe map (Fig 10). The destruction of the barrows and the removal of silted material from the ditch of the henge identified by Charles Thomas (above) can both plausibly be linked with improvement of the adjacent rough ground commons to create the arable fields of the new farm.

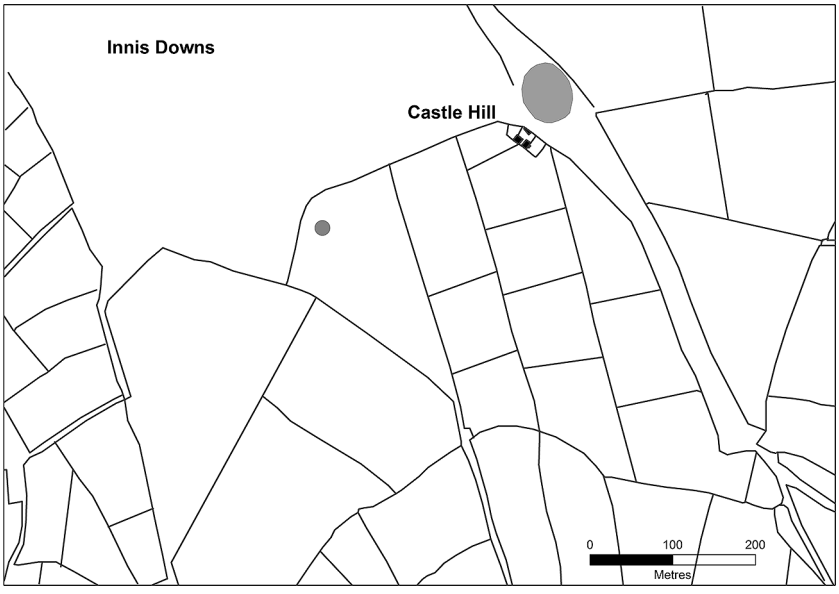

Fig 10 Above: Castilly henge (top right), shown on the 1840 Luxulyan tithe map (KK TM/130), with three barrows immediately adjacent on the west side and another approximately 300m further to the west. The large enclosure south of the henge earthwork was at this date part of the commons held jointly by the tenants of Trescoll, situated off the map to the south. (Reproduced by courtesy of Kresen Kernow.) Below: The same area redrawn from the Ordnance Survey 1st edition 25in map (surveyed 1879), showing the fields of the new farm of Castle Hill, created during the 1860s, laid out across the former common, with its buildings and 'town place' on the site of the middle of the three adjoining barrows and the other two in the group removed. The barrow to the west survives but has itself had material removed from around the sides (see text).

'Our prehistoric monuments were then disregarded'

Several nineteenth-century commentators asserted that superstitious beliefs held by the rural population, of the potentially unlucky consequences of disturbing monuments, had formerly worked to protect them from harm, but that such beliefs were strongly in decline. 'Ancient remains were formerly very superstitiously regarded; and it is to be regretted that this kind of respect for them amongst the ignorant is dying out, as it preserved many from destruction,' noted Blight (1861a, 18); similar remarks were made by William Bottrell about west Cornwall and by Otho B Peter in the east (Bottrell 1873, 34, 137; Peter 1902, 108–9; Kirkham, in preparation b). The changes in attitudes to monuments which these commentators detected in the rural population was paralleled by shifts in perceptions among other social groups. The folktale collector Robert Hunt referred in his *Popular romances of the west of England* to the remains of a 'coit or cromlech' in Bosporthennis Croft, in Zennor, which 'some years since' had been broken to provide stone for two oven beds in Penzance (Hunt 1865, I, 196n). A brief enquiry about the monument in a local newspaper in 1871 brought details from 'W.B.', almost certainly William Bottrell, with the added comment:

> 'About thirty years ago all the quoits in the west country might have been carried away for oven-beds, and the long stones (menheres) [*sic*] for gate-posts – as many of the latter, within our remembrance, have been – and no objection would have been made by the lords of the soil.
>
> 'Our prehistoric monuments were then disregarded and fast becoming forgotten . . . there was little notice taken of them, and nothing done for their preservation, until Mr J. T. Blight, Mr Tom Cornish, and a few other members of the [Penzance] Antiquarian Society exerted themselves to make these interesting objects better known and guarded from further spoliation by ignorant tenantry; through the supineness of absent or careless proprietors' (*CT,* 4 October 1871, p2).

Public interest in antiquities was certainly increasing by the period at which Bottrell's comments were made – the revived Penzance Natural History and Antiquarian Society described its objects in 1865 as the spreading of information about the antiquities of west Cornwall but also 'their preservation from the ruthless hand of the spoiler' (*RCG,* 25 August 1865, p5) – but he was being somewhat ungenerous to the efforts of the preceding generation of Cornish antiquaries. As early as 1821 the *West Briton* had expressed 'regret' at the removal of the Newquay Barrowfield group (*WB,* 10 August 1821, cited in Douch 1962, 93–5) (Figs 3, 4), and later in the same decade the Penzance banker and geologist Joseph Carne decried the 'ravages which have been committed on the monuments of this country . . . If this species of Vandalism, or worse than Vandalism, be allowed to continue, Borlase's Antiquities of Cornwall will, ere long, become a purely historical work, without the possibility of being illustrated by a single monument' (Carne 1828, 244).

In the early 1840s the Cornish press carried several letters listing archaeological monuments in west Cornwall which had recently been damaged or destroyed. The letters, signed 'P' and subsequently reprinted in the nationally circulated *Gentleman's Magazine,* were by the Reverend Henry Penneck, a leading light in the Penzance society. 'P' observed that the

> 'spread of our daily-increasing population into the most secluded districts unveils to public gaze those monuments which were formerly little known and seldom seen, and the demand for stone for the new houses, &c., everywhere building will shortly consign the remainder, as it has so many already, to the tender mercies of the stone-carrier and the mason. As a single specimen of this sort of procedure in the now densely-inhabited parish of St Just in Penwith, I may mention that some of the circles described by Mr Buller only two years ago can no longer be found [Buller's *Statistical account of the parish of St Just* was published in 1842]. They have been used in building cottages &c &c although in St Just stones are probably more plentiful than blackberries' ('P' 1844, 487–8).

In 1849 the same author reported having found the *Men Scryfa* inscribed stone (Madron) 'lying prostrate in the Croft where it had stood, but which having recently been broken up for tillage has been cleared of all but this and a few other blocks too large to admit of their being easily carted away except piecemeal' (*RCG,* 5 October 1849, p6) (Fig 11). He recalled that the stone had previously been re-erected in the 1820s, at the time that the capstone of Lanyon Quoit was replaced.

> 'At that period the act of raising it was simply one of laudable reverence, for, whether standing or prostrate, its situation in an out of the way Croft, seemed to

> promise it a sufficient security from injury. The case, however, is widely different now, when there is such a demand for our granite; and, as the surface blocks are specially coveted, not only because they are more durable than most of the quarried material, but also because they are cheaper, leave being readily obtained for their removal which renders the land available for tillage, — it is much to be feared that the *inscribed stone,* no longer distinguished by its upright position, will be treated with as little ceremony as the nameless ones amongst which it lies Should no effort be made to preserve it, it seems indeed more than probable that it will shortly pass into the hands of the masons' (*ibid*).

Echoing Carne's comments two decades earlier, Penneck was concerned that future antiquarians would have to console themselves with the illustration of the *Men Scryfa* in Borlase's *Antiquities*. 'To that work too they will, at no distant day, be obliged to resort, in order to form a guess what the neighbouring relic, Chun Castle, once was, so rapidly is it disappearing; for, although the hill side is covered with stone, its vile destroyers, if not with deliberate malice, at least with very perverse taste, prefer to pillage its ramparts and even its massive gateway' (*ibid*).

'A miserable spirit of narrow-minded utility'

Blight, in the introduction to his *Ancient crosses and other antiquities of the west of Cornwall,* first published in 1856, explained that the 'destruction of many monuments of remote antiquity which formerly existed in the West of Cornwall, and the mutilation which several others have sustained by mischievous and ignorant persons' had induced him to 'preserve the forms' of some of those that remained in his engravings (Blight 1858, iv). A review of his book in the *Royal Cornwall Gazette* quoted this passage approvingly, adding that it 'reflects much disgrace on those who have either destroyed or mutilated any of those interesting monuments of by-gone times and manners' (*RCG,* 2 May 1856, p5). The *Cornish Telegraph* (16 April 1856, p4) similarly commended Blight's volume on the basis that the 'antiquarian of the year 2,000 may have a reliable source of information when even granite has succumbed to the ruthless chisel and the practical mind, that delighteth more in a gate-post or a pig's trough than in the way-side cross and its interesting associations'. A review of Blight's second edition thanked him

> 'for a work which is so admirably adapted to awaken an interest in those enduring records of the past, to rescue them from that ruthless vandalism of the nineteenth century, in whose eyes nothing that is old is sacred, and which is ready to sacrifice the richest treasures of antiquity to a miserable spirit of narrow-minded utility' (*London Evening Standard,* 4 August 1859, p4).

The visit to Cornwall in 1862 by the Cambrian Archaeological Association brought further attention to antiquities. The *Men Scryfa* was again re-erected, although it was noted that 'had not the Cambrians proposed to visit . . . this celebrated stone would have remained for a long time to come, in its fallen state, or it might have been taken away, like some others of the kind, and used for a gate-post' (*WB,* 8 August 1862, p5).

The forthcoming visit also prompted a Penzance correspondent, signing himself 'A Cornish Man',

Fig 11 The Men Scryfa, Madron, in the late nineteenth century. Now in improved pasture, the stone was then in a furze croft. The inscription was evidently enhanced for the photograph. (© Penlee House Gallery & Museum, Penzance / Gibson Archive.)

to suggest that 'complete lists' should be made of antiquities of all kinds, 'so that we Cornish men may really know what we possess.' He further suggested that

> 'steps should be taken for immediately stopping any impending acts of destruction with which some of our most curious objects are threatened. For instance, Lanyon Quoit is now in danger of being broken up, because the owner of the land wants stone, and cannot find any, –no, not any stone in his neighbourhood! In the same way the miners at the foot of Carn Brea still wage war on those tempting blocks of granite: and, whether they form parts of the ancient circuit of walls of that fortress or not, they are in daily risk of being blasted and used up; all, no doubt, because there is no stone any where else in the district! . . .
>
> I think too that no more barrows should be levelled, any where in the county, under pretence that arable land is scarce, until after the visit of our Cambrian friends . . .' (*RCG,* 22 November 1861, p6).

This prompted a reply from 'A Landowner' of Bodmin, which, in what may have been an intentionally provocative statement of Gradgrind philistinism (Charles Dickens' *Hard Times* had been published only a few years earlier), set the utilitarian values of 'improvers' and efficient farming in opposition to such expressions of public interest in antiquities and proposals for their protection. The anonymous author asserted that he had himself been of service

> 'to the Country generally by the re-claiming of waste land, and by the improving, and draining, and levelling, if you please, of all my arable fields; and I must certainly plead guilty to having had several barrows laid flat in the course of such operations. But allow me to say something by way of excuse. In the first place, how do I know that they are "barrows"? What is there about them to shew that they are old? Who can claim them as any memorial of his family? And in the next place, when they are dug into and levelled, what is found there? Perhaps an old earthen pot full of bones, perhaps an old bit of copper like a spear head, perhaps a bit of stone shaped like the head of a hammer? But then, Sir, letting alone the question of the age of these things, I would know what is the *use* of them? — that is the question. As I say, Sir, what is the use of such things in days like these? Will any of my tenants ever want articles of this kind? What is the *use* of keeping a heap of stones or earth standing in the midst of a field only because it contains old things? Is it not much more *useful* to get rid of such a heap, and to make the field uniformly smooth?
>
> Besides this, tenants object to have such unsightly excrescences disfiguring their land; and my own farm bailiff assures me that great discontent would prevail if I attempted to interfere when a tenant chose to get rid of any obstacle to his plough.
>
> I cannot see the use of keeping old things of this kind on the land, when I know that the removing of them not only improves the land, — but also thereby improves future rents. This is an aspect of the question which should never be lost sight of — the improving of the land and the increasing of the rent; here there is something tangible; something positively useful; whereas the old heap of stones and the things they may contain are of no value nor use whatever!' (*RCG,* 13 December 1861, p6).

Curiously, no public response from the antiquarian community in Cornwall seems to have been forthcoming. The death of Prince Albert on the day following its publication may have diverted attention or the numerous reports of public and civic mourning appearing in the press in subsequent weeks not allowed space for a reply.

The ideological passion for 'improvement' shown by the Bodmin landowner was shared by others. Peter Williams, when praised for the enclosure and cultivation of coastal rough ground on his property at Angrouse, Mullion, including the removal of at least one cairn (Borlase 1872, 234–7), responded that he was 'perfectly satisfied with the results of my labour, and would also say that had there been ten times the number of acres belonging, I should endeavour to bring such under cultivation' (*WB,* 2 October 1873, p6). An account of reclamation of rough ground at Kennall Vale noted that 'at Kennal [*sic*] the great granite blocks are viewed with the same kind of active destroying hatred that fills the breast and nerves the arm of a backwoodsman as he surveys the huge roots which even the friendly fire cannot consume' (*WB,* 17 March 1870, p4).

This passion for improvement on a landscape scale was mirrored by the outrage expressed by those commenting on damage to and the loss of monuments (above). The mutual incomprehension of those engaged in the destruction and those appalled by the actions of the 'vile destroyers', 'in whose eyes nothing that is old is sacred', is evident in protests such as that by the Reverend Buller on the removal of stone from roundhouses on rough ground in St Just: 'many of the most perfect, which were constructed with choice stones and those best adapted to the purposes of house-building, have

been . . . barbarously plundered' (Buller 1842, 103). Blight, visiting Castallack round, Paul, in the 1860s and finding that much of the stone forming an 'avenue' and inner enclosure had been removed, observed the 'complaisant smile' of the labourer who told him that 'the old Round had been dug into last year, for the sake of the stones' (Blight 1865a, 66; *RCG,* 5 May 1865, p7). The antiquarian correspondent who noted the removal of stone from the Hangman's Barrow in Crowan also reported that a finely sculptured medieval roadside cross nearby (Langdon 1999, 26) had first been moved from its original site, then trimmed and drilled for use as a gatepost and subsequently 'about buried' in a newly built hedge, adding bitterly that 'Considerable ingenuity must have been displayed by the hedger so as to cover all the interesting portions of a very valuable relic and yet leave exposed a comparatively insignificant part' (*Cornishman,* 13 January 1881, p8). (He or she added that there were two institutions in Cornwall 'which boast of their attention to our old and important antiquities. The real protection of these treasures is, to my mind, a more valuable work than giving long-winded speeches on icthyology'! (*ibid*).)

Ironically, it was the destruction in 1869 of an entirely natural feature, the huge perched rock known as the Tolmen in Constantine, which initiated a public reaction which in 1882, the year after this last complaint, resulted in the passage of the Ancient Monuments Protection Act, which, with subsequent amendments, provided a legal basis for listing and protecting selected ancient monuments (Evans 1994; Naylor 2010, 146; Kirkham 2018, 90–2). (Preparation of a list of Cornish monuments to be protected under the legislation was delayed by World War I, however, and the first schedulings did not take place until the mid-1920s (Preston-Jones 2011, 95; *Western Morning News,* 15 September 1925, p4; 29 November 1927, p3).)

This was, then, a period during which perceptions of monuments as features in the landscape became sharply divergent. Those working the land, for whose predecessors monuments had been landmarks and, for some, the focus of popular beliefs and traditions (Kirkham, in preparation b), increasingly marked the materials of which monuments were composed as potential assets: the significance was in the earth, not the earthwork, in the stones ready-gathered for carting away for sale or use rather than the feature – cairn, cist or courtyard house – they formed. To 'improvers', monuments were a hindrance to efficient use of the land, 'unsightly excrescences' potentially blocking an increase in the rental value of property. For Cornwall's antiquarians, within a discipline only slowly emerging from primary dependence on Classical and Biblical written sources, and only beginning to understand the need for careful and coherent investigative and recording methods, there was a growing realisation that monuments were, in the words of John Blight when reporting the damage inflicted on Castallack round, 'more valuable than books in elucidating the early history of our country' (Blight 1865a, 70). In the same year he observed that, other than the accounts given by Dr Borlase, and the 'few similar narratives' in the reports of the RIC,

> 'our knowledge of the internal arrangements of the barrows hitherto opened, has been gleaned chiefly from the labouring classes who have in their agricultural or mining pursuits accidentally broken into them. It would be desirable to investigate others, taking careful notes and drawings of what they might contain, and then restore them, as far as possible, to their original condition, replacing bones and rebuilding the mounds' (Blight 1865b, 37).

North and east Cornwall . . .

The accounts cited in this paper of materials 'recycled' from archaeological monuments relate almost entirely to mid- and west Cornwall; very few reports of similar activity have been identified from the eastern or northern portions of the county and those are, by comparison, late. At West Carne, Altarnun, for example, the Reverend Malan noted the survival of parts of an 'ancient rectangular rampart, as have not succumbed to the ravages of agriculture and hedge-building' (Malan 1888, 342); Otho Peter, describing earthwork enclosures in north-east Cornwall, commented that the rampart of Tregeare Beacon in Egloskerry had been 'partially demolished'; enclosures at Tresparrett Posts and Pengoldbury, both in St Gennys, were similarly 'partly demolished' (Peter 1902, 110–11). A cairn in Carthamartha Wood, Lezant, was reportedly dug into for stone for roadmaking in about 1907 (Walford and Quinnell 1997, 80).

This difference in reporting may to some extent reflect differences in the processes of landscape change in this area during the post-

medieval period. While much rough ground was improved for agriculture (for example, Herring 1998, fig 50), there was evidently a considerably lower incidence of smallholdings in the north and east and thus perhaps substantially less *ad hoc* local demand for stone and manuring materials. However, it also seems probable that the distance of these parts of Cornwall from newspaper offices and the learned antiquarian societies – not only in Truro and Penzance but also those in Plymouth and Exeter – may have limited the extent to which antiquarian observations from those areas saw print. By contrast with mid- and west Cornwall, the local gentry and professional classes, may also have had a less developed interest in antiquarian matters. Otho Peter, based in Launceston, was an exception, but he acknowledged the lack of local censure for damage to the enclosure earthworks he described: 'Masons and roadmakers are allowed to quarry under their old ramparts for stone and no newspaper thunders, or judicial lightning flashes upon them' (Peter 1902, 109). Fifteen years earlier, the Reverend Malan of Altarnun, hosting an RIC excursion to Bodmin Moor, similarly implied an absence of active local interest in antiquities. Barrows and cairns in the area had been opened recently, he noted,

> 'and the "crocks" broken when found not to contain gold. It was most desirable that the urns should in all cases be preserved . . . and the only way to secure this was to enlist the interest of people beforehand by letting them know that there existed in the county a society of antiquarians who would be willing to purchase uninjured specimens. The simplest way of doing this was by the society itself coming among the people, and making itself visible to them, visiting the old crosses, stone circles, &c, and showing the local world that the old British and early Christian remains were known to antiquarians' (*Cornish and Devon Post*, 3 September 1887, p4).

The low level of antiquarian activity in east and north Cornwall resulted in neither area featuring prominently in the emerging literature on the county's antiquities and little apparent awareness of what existed. Hencken (1932, 131–2) commented on the number of hillforts in east Cornwall, especially the north east, 'where other antiquities are almost absent'; his gazetteer of archaeological sites in Cornwall listed only one of the enclosures described by Peter and a handful of artefact findspots; his map of 'sites worth visiting' showed nothing in the north or east of the county. In the 1990s Cornwall Archaeological Unit specifically targeted parts of both areas with Rapid Identification Surveys, noting that they had previously been 'relatively neglected by field archaeologists' (Herring and Thomas 1993, 5; Thomas and Buck 1994, 2).

. . . and further afield

Reports from beyond Cornwall of monuments targeted for earth and stone suggest that comparable practices occurred widely (Kirkham 2012, 14–15). John Leland, visiting Anglesey in the late 1530s, noted stone from barrows being used in making enclosures:

> 'In tyme of mynde menne usid not in Termone [= Tir Môn, Anglesey] to seperate theyr grounde, but now stille more and more they digge stony hillokkes yn theyre groundes, and with the stones of them rudely congestid they devide theyre groundes after Devonshire fascion.
>
> In digging of these [they] digge up yn many places yerthen pottes with the mouthes turnid douneward, conteyning [*cineres et ossa mortuorum*]' (Toulmin-Smith 1906, 90).

A seventeenth-century incumbent of Nettleton, Somerset, reported of three large barrows at Williton that 'by the often digging, and often carrying away of much earth from these, to dress the ground adjoining, some times in one, and some times in another, have been found fragments of men's bones, and sometimes sepulchres composed each of three broad stones . . .' (Gray 1931, 10). Another Somerset antiquarian, the Reverend John Skinner, first entered Stoney Littleton long barrow through holes in the covering mound caused by the removal of stones for repairing local roads (Coombs and Coombs 1984, 83). A farmer in an area of late enclosure of rough ground on Beacon Hill, near Maesbury in the eastern Mendips, was reported to have found several urns while 'digging over a tumulus or barrow in order to cart away the earth' (*Dorset County Chronicle and Somersetshire Gazette,* 12 November 1840, p3); a few years later a correspondent to the same newspaper noted having passed through a field where a barrow had recently been opened and finding 'as many as seven or eight bones of the human frame. They had been deposited with the chalk, &c. for a top dressing' (*ibid,* 22 April 1847, p4).

R H Worth (1906, 63) noted Exmoor barrows targeted for stone, commenting that a barrow from which stone was taken 'might also be likely to be reduced in height for the sake of the earth it contained'; 'trenched' barrows, he added, were 'always . . . found in the vicinity of hedges and enclosure walls.' In south Devon, Peter Orlando Hutchinson was told by an elderly labourer that in the late eighteenth century he and his father had been employed in levelling the earthworks of Belbury Castle hillfort, south west of Ottery St Mary, to 'bring the land into cultivation'; at the time the site was 'wild heath . . . they raised the earth in the middle of the camp from what they got from the banks around it' (*Exeter Flying Post,* 6 September 1871, p3; Butler 2000, 154–5). Hutchinson's excavation in 1859 of a barrow at Lovehayne, between Sidmouth and Lyme Regis, was prompted by the threat of its imminent removal: 'For the sake of the stones and earth of which it was composed, the farmer had condemned this barrow to destruction' (*Western Times,* 1 October 1859, p6; *cf* Butler 2000, 137–9; Jones and Quinnell 2008, 41–2). Monuments between Moretonhampstead and Hennock, on the eastern edge of Dartmoor, were similarly removed: 'The outer part is cleared to cultivate the ground, and the Cairn is broken down for the sake of the flat stones to cover gutters [field drains] and crossings; and a field of eleven acres partially cleared of the numerous sepulchral monuments upon it, produced such a crop of barley as sufficed to pay the rent of the estate' (*Exeter and Plymouth Gazette,* 25 June 1842, p4).

'To find a concealed treasure'

Of course, not all disturbance to monuments in the historic period was caused by reuse of their materials. W H Box, in his account of the Pelynt barrow group, observed that 'Several other barrows have been opened at different periods, some for the materials of which they are composed, others with a hope of gain, and many for the sake of convenience' (Box 1847, 43) (Fig 7). Treasure hunting appears to have been a factor over a long period. In 1237 Henry III requested his brother Richard, earl of Cornwall, to have barrows in Cornwall dug into in search of treasure, as had been done in the Isle of Wight (*CCR 1234–1237,* 433). The Devon Assize Rolls for the following year recorded several cases of individuals and tithings in the county who were subject to penalty under treasure trove law for not having reported that 'mounds' had been dug into, suggesting that treasure-seeking was relatively common (Summerson 1985, 18, 25, 37, 45, 46, 76, 81, 83, 100). Equivalent sources for Cornwall are not available until slightly later but, in 1284, four men were presented for having opened a barrow at Allet (Kenwyn) in search of treasure, and at about the same time a man was killed in St Germans by the fall of a stone under which he was digging on a similar quest (1302 Assize Roll: National Archives, Just1/117A m.56d §26 (Hundred of Powder); m.62 §3 (East Hundred). I am grateful to Oliver Padel for these and the Devon Eyre references.)

In the post-medieval period Carew related the story of a gentleman who had dug for treasure beneath the *Cunomorus* inscribed stone at Fowey, Hals noted a group of tinners driving a 'hole or adit' into one of the Four Burrows (Kenwyn – Perranzabuloe) in search of treasure at the end of the seventeenth century, and Blight reported a miner who had dug a pit in the ring cairn on Trewavas Head (Breage), in response to a dream of a 'crock of gold' (Carew 1602, 136v; Polsue 1867–72, II, 316; Blight 1867b). The re-erected *Men Scryfa* was felled again in the late 1840s when the farmer 'dug around and beneath it, in the hope of finding buried treasure' (*RCG,* 5 October 1849, p6).

Early in the eighteenth century, after a quantity of Roman coins were found in a barrow in the 'fields of *Luggan'* (Illogan),

> 'the tinners straight took the alarm; and leaving their mines, fell to work upon the like *Tumuli* in the neighbourhood, striving who should get first to the centre of those heaps, where they expected to find a concealed treasure. But great was their disappointment, when, in the middle of them all, they found only a little building of stone like an oven, in which was inclosed sometimes one, sometimes more, and in one of them nine urns, with ashes in them all, but not so many with coins in them, as there were of those which had none at all' (Carte 1747, I, 104n).

The Rillaton barrow, below Stowe's Pound, was opened in 1837 by labourers ostensibly seeking stone to build an engine house, although something of the same frenzy for treasure is evident in an eyewitness account of the event: 'On a fine spring morning I saw a crowd of half-nude men digging ruthlessly into the old grave Barrow . . . It was the prospect of gold that induced those excited men to make such frantic efforts to open the Barrow'

(Smirke 1868; Hind 1907, 262). On this occasion, the desire for treasure was rewarded by the finding of the Rillaton gold cup (Hawkes 1983).

To treasure-seeking may be added the impact of antiquarian delving. Shortly before the visit of the Cambrian Archaeological Association in 1862, a letter to the *Royal Cornwall Gazette* (9 May 1862, p4) expressed the hope that measures would be taken to identify barrows for the visitors which were 'intact – that is, which have not already been opened. I know personally how much disappointment may be caused by digging into a Barrow, at meetings of this kind, and finding that it had been previously rifled . . .' W C Borlase claimed that he had himself 'examined' more than 200 'sepulchral mounds' in Cornwall and suggested that more than half of the 'many thousand barrows strewn over the wilder portions of the Duchy' had been opened 'as a matter of curiosity' (Borlase 1872, ix; 1885, 182–3). From a modern archaeological perspective, in terms of their contribution to enhancing understanding of the features excavated, many of these interventions were undoubtedly as futile and unproductive as the 'ill-managed', 'guzzle and swipes affair' carried out on Tichbarrow in 1864, or the large pit dug into the 'great Barrow of Hustyn', on the St Breock Downs, 'by some young gentlemen, as I was informed, when they resided near it' (Trudgian 1976, 46–7; Iago 1883, 143).

The implications

Treasure seeking, antiquarian investigation and the robbing of earth and stone from monuments have all had an impact on the archaeological record and little of what was uncovered by any of these activities was well recorded. Beyond this, however, the past exploitation of the component materials of monuments which this paper has highlighted has some further implications for archaeologists.

Most obviously, given the likelihood that some proportion of monuments has been completely effaced, there is a very substantial possibility that distribution maps based on surviving monuments and the limited range of historical sources may not provide an accurate picture of 'original' distributions. Interpretations based on such maps need to be qualified by some assessment of the potential for loss, if only at the relatively broad-brush level of Historic Landscape Character. To take an obvious example, it seems probable that in Recently Enclosed Land, particularly in areas where there were numerous smallholdings, a significant proportion of any notional original population of cairns and other stone-built monuments is likely to have been removed. Earthwork monuments which originally incorporated ditches and are therefore potentially visible to remote sensing, are perhaps less likely to be permanently 'lost', even where the standing portion has been completely removed; recent geophysical surveys at the Mountain Barrows, Pelynt, and at Tregear, for example, have successfully located the former positions of a number of removed or reduced barrows (Frieman and Lewis 2016; Nicholas nd). Such discoveries depend on suitable geology for prospection, however, and either active research or archaeological investigation prompted by proposed development.

When considering the form of standing monuments, both stone structures and earthworks, the possibility must be borne in mind that material may have been removed, perhaps in substantial quantities, and that such interventions could potentially have produced significant changes in overall shape and scale. In the mid-nineteenth century, Dr Box suggested in his discussion of the Pelynt barrow group that classification of barrows according to form could only usefully be done for those on 'elevated ranges of hills, or such, as are found on the open downs, or commons, which have hitherto escaped the curiosity of man; for in the arable districts, their shape, and dimensions, have been so completely distorted and reduced, by repeated agricultural operations, that both are involved in uncertainty' (Box 1847, 41). Richard Thomas noted a probable instance of such a 'distortion' on a barrow in Wendron parish, the largest of a group of four close to the Helston – Redruth road, which he described as 'of peculiar formation; instead of sloping regularly to the ground, it is abruptly cut off all round its edge, about three feet high' (Thomas, Statistics, letter 34: *WB,* 29 August 1851, p6). Similar observations have been made about the forms of Condolden Barrow (Tintagel), a barrow at Nettings Park in Davidstow and Killigrew Barrow (St Erme) (Barnatt 1982, 205; HER MCO 3176; Grinsell 1994, 38); a barrow in Recently Enclosed Land west of Castilly henge was almost 20m in diameter in 1852 but is now only about 15m across and has a similar sharply defined scarp around its edge (Thomas, Statistics,

Fig 12 Two nineteenth-century depictions of Pawton Quoit, which stands within Recently Enclosed Land on the St Breock Downs. Above: The frontispiece to Richard Warner's Tour through Cornwall in the autumn of 1808 *(Warner 1809). Below: A sketch by Nicholas Whitley, c 1840 (Anon 1841, 30, fig 3). Barnatt (1982, 130) recorded the present height of the mound in which the Quoit is set as about 1.2m: even allowing for some licence by the artists, particularly in the case of the earlier image, it appears that, as with West Lanyon Quoit (Fig 1), a significant amount of mound material has been removed.*

letter 45: *WB,* 30 January 1852, p6; HER MCO 2408). These could have been unusual structures with atypically high kerbs or peristaliths, or may perhaps have been subject to heavy plough clipping, although for those recorded in the pre-mechanised period this seems less likely. It appears more probable that they had been quarried around their edges from time to time as convenient sources of earth for making composts in the adjacent fields. Carne Beacon, Veryan, the largest barrow in Cornwall, was noted in the mid-nineteenth century as 28 ft (8.4m) high with a circumference at the base of 350 ft (105m), but 'must have been originally much larger, as a considerable portion on one side has been removed' (Adams 1856, 23). Pawton Quoit, in Recently Enclosed Land on St Breock Downs, also appears to have lost material from its mound: when Richard Warner visited it in 1808 the megalithic structure was set in an 'oblong depression, three feet deep'; eight decades later Iago suggested that the prominence of the stones making up the monument was the result of the removal of material 'for purposes of agriculture . . . a kist, now called the "Druid's Altar", has been laid bare, and appears like a cromlech on the remains of a mound' (Warner 1809, 322–3; Iago 1894, 99; *cf* Iago 1883, 142n) (Fig 12).

Cairns showing signs of disturbance are often classified by modern field survey as having been subject either to unknown antiquarian investigation or treasure hunting. As noted above, both certainly occurred but the methods used by those seeking stone probably left essentially similar traces. In the case of Ridge Barrow on East Moor, the stone robbers drove a wide passage through the centre of the cairn (Fig 6); W C Borlase, describing his investigation of a cairn at Tregaseal, near St Just, noted that it appeared to have been opened previously, 'a broad trench having been driven by stone carriers into the centre' (Malan 1889c; HER MCO 4519; 22094; *WB,* 18 September 1879, p6). In the case of two barrows on Conquer Down, Towednack, dug into

by Thomas Cornish, John Blight and others in 1862, their investigations simply extended trenches already made by labourers removing stone for use in building adjacent enclosure boundaries (Blight 1865b, 34–6).

Some monuments were not simply reduced in scale or changed in shape by the removal of material but rather completely altered in appearance. At West Lanyon Quoit, for example, only the large granite components of the former mound-covered structure remained (above; Fig 1). Citing Lukis (1885) in support, Iago proposed that the small stone circle at Duloe, in south-east Cornwall, might originally have been the kerb of a barrow, 'the internal mound of which has been removed for purposes of agriculture' (Iago 1894, 99). The recovery of an urn from the circle (Pedler 1864, 18; Borlase 1872, 127–9; Dunkin 1873, 46–7; Tregelles 1906, 399–401) together with staining which extends some distance up the sides of the quartz upright stones, provide some support for the possibility that it was in some phase a mounded funerary structure which was subsequently denuded.

It is clear that substantial quantities of material have been removed from many enclosures and other earthworks. Penzance's Lescudjack Castle (above) offers an extreme example but similar interventions are apparent on, among many others, the outer circuits of the bivallate enclosure at Lestowder (St Keverne) (Tangye 1995, 177) and of the hillforts at Prideaux (Luxulyan), Helsbury (Michaelstow) and Bury Castle (Cardinham), as well as the entire southern half of Killibury (Egloshayle). In the latter case, the tithe map shows that the earthworks here had largely been removed well before the present farm complex was constructed (Fig 13). Many rounds similarly show signs of their earthworks having been substantially reduced or, as in the large numbers of cases where a former enclosure has only been identified by geophysics or from air photographs, removed in totality, as with that recently identified near Roundwood, Feock (Jones and Lawson-Jones 2020 [this volume]). (Not all such activity can be placed in the post-medieval period: it is clear from air photograph transcriptions that many of the field systems in Cornwall laid out in the early medieval or medieval periods over earlier agricultural landscapes could only have functioned if the earthworks of former settlement enclosures had already been substantially removed (for example, Rose and Preston-Jones 1995, fig 3.2; Young 2012, figs 19–22, 33–4, 39–42).)

Peter Herring (1993, 20), documenting the post-medieval removal of earth from a large lynchet at

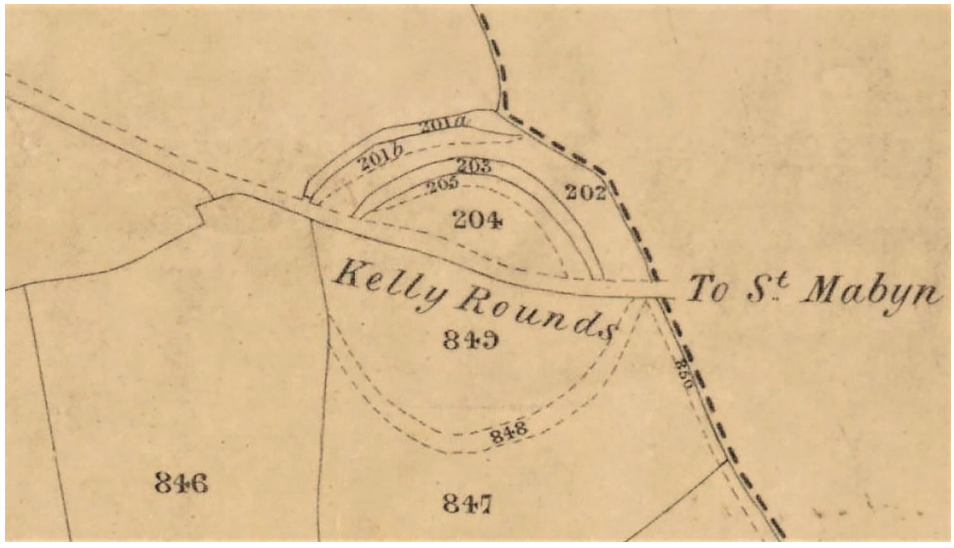

Fig 13 Killibury hillfort, shown on the Egloshayle tithe map of 1841 (KK TM/52). By this date the earthworks within the fields to the south of the road had already been substantially levelled. (Reproduced by courtesy of Kresen Kernow.)

Foage, Zennor, has pointed out that the form and scale of surviving lynchets within field systems may not be a good indicator of the 'intensity or duration of cultivation' which produced them: shallow lynchets may be so because soil from them was re-distributed from time to time; large ones may have maintained their size because they were never so used. Importantly, lynchets which have been re-worked may lack direct archaeological evidence of their real age (*ibid*). The reports cited above of the removal of material from the ditches of the Roman fort at Tregear, a round at Trebowling and probably also the enclosure at Caervallack, also warn that careful interpretation is needed when apparent recuts of ditches are detected in excavations. Such recuts are sometimes suggested as evidence for past maintenance or refurbishment of particular sites. However, unless they are demonstrably stratigraphically related to a sequence associated with the original use of a site, it is possible that they derive from removal of material for manuring purposes at a much later period, as suggested above for Castilly henge.

Interpretation of finds from fieldwalking or metal detecting on agricultural land also needs to acknowledge that past agricultural practices may have moved archaeological deposits found in ploughsoils some distance from their original contexts. An Ordnance Survey surveyor reported in 1875 that he had recorded an oval enclosure, most probably an Iron Age – Romano-British round, on rough ground at Trevorrian in St Buryan. The farmer had told him that his father, 35–40 years earlier, had taken 'several cart-loads of black earth out of a place in the Croft, and that there were some old broken pots and bones amongst the earth' (Borlase 1876). Intriguingly, surface collection in the 1990s in a field on the same farm, some 200m to the north east of the probable site of the round, recovered pottery identified as Iron Age or Romano-British (HER MCO 41703); the field was recorded as arable by the tithe survey of *c* 1840 and it is certainly plausible that the finds in the ploughsoil derived from material which had been taken from the site of the round. Similarly, Frederick Hirst, describing his excavations in the 1930s on the settlement at Porthmeor, Zennor, noted that enclosure H9, an oval space which was probably originally a room in a courtyard house, was 'known to have been used as a garden in recent times and it is said that when it went out of use the soil in it was removed to a field near the Cliffs east of Porthmeor Cove' (Hirst 1937, 52). In this instance the distance over which material was transported was probably about 1 km. Earth from a large barrow on coastal rough ground at Crickabella, Gunwalloe, was carried some 2 km inland to the farm of Gwills (Cummings 1875, 190). Clearly, where such large-scale and comprehensive removal of material potentially incorporating artefacts has taken place, individual finds or even significant assemblages of artefacts recovered from cultivation soils may not be on or even close to their original locations.

Other accounts similarly record material from archaeological contexts being carried away. Twenty cart-loads of decayed limpet shells found in a trench in a field near the cliff at Ballowall, St Just, presumably an ancient midden, were removed by a farmer as 'dressing for his land'; querns, mullers and part of a stone bowl were found below the deposit, underlining the potential for artefactual material to have been incorporated in the removed material (Borlase 1879, 194). Quantities of a 'dark sand' occupation layer adjacent to the Iron Age cist cemetery at Harlyn Bay, St Merryn, were given to a workman 'for fertilising his garden'; at least one artefact was recovered from this material and surplus sand from the site was said to have been in 'much request for gardening purposes' (Bullen 1912, 21–2). Hundreds of loads of earth were reported to have been carried away for manuring from deep deposits in the 'base court' of the medieval castle at Ruan Lanihorne (Polsue 1867–72, II, 148).

In the case of stone monuments, in addition to those which have been destroyed or substantially quarried, it is evident that many worked stones have been removed into completely new locations and contexts. This is well known to have been the case with early medieval inscribed stones and large numbers of medieval stone crosses (for examples, Langdon 1896, 20–25; Langdon 1999, *passim*; Kirkham 2016, 186–7), but has also been the case with several of the prehistoric cup-marked stones in the record. Examples include a large slab bearing two or three cup-marks now incorporated into a hedge at Trewey, Zennor, one with up to 21 cup-marks formerly used as a gatepost among farm buildings at Treave, St Buryan, and another, now lost, which was recorded in use as a stile at Great Bosullow, Madron (HER MCO 1754; 1480; 650). It is now impossible to know whether such stones were originally examples of 'landscape' rock art

– rocks inscribed in association with a specific location – or whether they represent material removed from barrows or cairns dismantled for their stone content and placed in a new context (Jones and Kirkham 2013). A substantial slab inscribed with cupmarks and, very unusually, a linear motif, which was recorded in the 1860s near to Goldherring (Sancreed), cannot now be located and was presumably removed either by moorstone workers or in the process of rough ground improvement (Blight 1867a; Iago 1890; HER MCO 632).

Both the archaeological record and understanding derived from it are also likely to have been influenced by the mode of discovery of particular types of artefacts. Past accounts of discoveries made during the removal of material from barrows, for example, indicate that what has survived in collections may not be representative and certainly only accounts for a small proportion of what has been unearthed. Some urns uncovered by seekers after earth and hedging stone were passed to interested antiquarians, but many more were destroyed or reburied. Among those that were retained there is likely to have been considerable under-representation of both less ornate and less well-fired ceramics, and in particular of vessels found in numbers or which were particularly delicate: the rural workers demolishing barrows would hardly have been equipped or inclined to deal with multiple fragile 'finds'. Three out of four urns recovered from a barrow in St Columb Minor in 1819 were said to have been broken, 'Owing to the carelessness of the workmen' (*WB,* 5 February 1819, quoted in Douch 1962, 93), and Buller (1842, 90) noted three urns broken when the remains of a barrow were cut across in making an enclosure on Bosavern Common (St Just) in the late 1830s and two others 'broken by the workmen who found them' on Brân Common (Sancreed) at the same period. William Borlase recounted the opening of a barrow at Chycarn, St Just, in 1733, in which around 50 urns were said to have been found around the 'central and principal one, which alone, because it appear'd to be neatly carv'd, he carry'd home to his House, the rest (all of which had some remains of Bones and Earth in them) were thrown away and broke, as of no consequence' (Borlase 1754, 220–1). Writing at about the same time, Thomas Tonkin recounted the breaking open of a barrow known as Creeg Mear on the commons of Lambourne, Perranzabuloe, by a man seeking hedging stone, in which he had

> 'found nine urns full of ashes; which, being disappointed of what he sought for, for the barrow was all of earth, except three or four rough stones which formed the hollow, he brutally broke immediately to pieces; and when I expostulated with him about it, and told him I would have paid him his charges, his reply was, that whenever he met with any more, he would bring them to me, but these were a parcel of old pitchers good for nothing' (Gilbert 1838, III, 319).

Conclusion

This paper has reviewed some of the considerable evidence from the post-medieval period for the targeting of earthworks and stone monuments for the materials of which they were composed, and the use of these materials in maintaining the fertility of agricultural land or as building and hedging stone. This 'recycling' of archaeological materials appears to have increased in frequency in the later post-medieval period and to have been accompanied by a significant shift in perceptions: archaeological features, many of which had formerly been important elements in popular beliefs and perceptions of landscapes (Kirkham, in preparation b), were effectively redefined as potential resources for achieving fertility and, not least, creating the new landscapes of improvement. This shift came about within the broader context of new markets and increasing population prompting demand for land and its produce, and particularly of the conversion of former rough ground into smallholdings and farms.

In addition to changing popular beliefs, the period also saw the rise of 'rational', utilitarian ideologies of improvement relating to land and its resources. In parallel, there was an increasing awareness for some individuals of the presence of archaeological features within rural landscapes and a growing sense that standing monuments represented what is now perceived as 'cultural heritage'; as such, they were ascribed significance and value and efforts were made to oppose their destruction.

For archaeologists in the present these past practices of reusing material from monuments have implications for the way in which certain aspects of field archaeology are described and interpreted. It is clear, for example, that great care

is required in using phrases such as 'ploughed down' or 'ploughed out' to describe substantially reduced monuments: the probability is that in most instances the features were, at least initially, deliberately dismantled. Earthworks and stone-built monuments which show signs of disturbance are probably at least as likely to have been subject to robbing of their materials as to have been the target of antiquarians or treasure hunters.

Even monuments which appear relatively well preserved may have been to some extent altered by relatively recent interventions. A recut to the ditch of a prehistoric earthwork, for example, *may* relate to maintenance during its original period of use but could equally be the work of a post-medieval farmer seeking material for a compost. The findspots and associations of artefacts found by field collection or metal detecting may in some instances bear little relation to their original locations if they were redistributed with earth used in manuring. Identifying signature traces of the past agricultural practices involved – and finding indicators in these traces for what is in effect the 'archaeology of improvement' – present particular challenges.

Finally, it is worth recalling the extent to which the recent past has been marked by enormous progress in the way that archaeological remains threatened by change have been treated. Since the 'rescue archaeology' movements which developed in the 1960–70s, we have seen the strengthening of protection to scheduled sites offered by the 1979 Ancient Monuments and Archaeological Areas Act and the comprehensive provisions for the historic environment enshrined in, for example, Planning Policy Guidance (PPG) 15 (1994) and 16 (1990) and the National Planning Policy Framework (2012, revised 2018 and 2019). Historic features and landscapes have been protected through national agri-environment schemes such as Environmentally Sensitive Areas (1987), Countryside Stewardship (1991) and Higher Level Stewardship (2005), as well as by more local conservation initiatives (for example, Preston-Jones 2011) and informed curation by bodies such as the National Trust and Cornwall Heritage Trust. The progress represented by all these measures has made it seem that the debate between those who value and seek to conserve cultural heritage and those who see it as a hindrance had been won decisively in favour of the former. The long (although by no means complete) list of monuments and landscapes protected through their inclusion on the National Heritage List for England, the careful framework which has been put in place to manage change and promote sustainable development, and the vast body of development-led archaeology which has taken place in the past few decades, all testify to an apparent victory over the 'despoilers' of the past by those who seek to give due weight to the significance of its physical remains.

And yet, echoes of former debates, of questions implicitly not very different from 'What is the *use* of keeping a heap of stones or earth standing in the midst of a field only because it contains old things?' – 'What is the use of such things in days like these? – continue into the modern era, and re-emerge, overtly or obliquely, whenever it is proposed that planning legislation should be relaxed, deregulated or set aside in order to facilitate development. Political pressure for such deregulation has increased very significantly in recent years, most recently demonstrated in the *Planning for the Future* White Paper, published in August 2020, with a consequent perception of a real threat to continuing comprehensive protection of the historic environment through the planning system (Chartered Institute for Archaeologists nd). The proposals contained in the White Paper prompted a joint response from the Council for British Archaeology (CBA) and Chartered Institute for Archaeologists (CIfA) indicating their concerns, particularly that

> 'effective protections for the historic environment are retained within any new system. Specifically, any new system will need to ensure that there are appropriate provisions for archaeological assessment of sites to inform permissions and development proposals, and robust procedures for mitigation of harm to heritage assets . . .' (CBA blog, 29 October 2020).

Barbarians and despoilers, if not already at the gates, undoubtedly still lurk close by.

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Neolithic and Beaker pits, Bronze Age roundhouses and Iron Age fields and burial above the Loe valley: a summary report on excavations at Higher Nansloe Farm, Helston, 2017

JONATHAN HART

with a contribution from GRACE JONES and HENRIETTA QUINNELL

In 2017 Cotswold Archaeology undertook excavations at Higher Nansloe Farm, Helston. The earliest remains comprised a small assemblage of Late Mesolithic to Early Neolithic flints, seven Early Neolithic pits and a Beaker period pit. A pair of Middle Bronze Age sunken-floored roundhouses was also found, and these showed evidence for deliberate dismantling. Occupation resumed in the Late Bronze Age when a possible roundhouse was built, perhaps within an enclosure. Early to Middle Iron Age rectilinear fields were found across the site, associated with funnel-like entrances and trackways. Other Iron Age remains included a concentration of pits which might have been related to cooking, and a group of three graves. One of these graves produced a notable assemblage of metalwork, including a spearhead and knife blade; another yielded the largest assemblage of Early Iron Age Plain Jar Group pottery yet retrieved from a single feature in the south west. A possible square or rectangular building lacked dating evidence but might have been Iron Age or Early Neolithic.

Between April and June 2017 Cotswold Archaeology (CA) undertook excavations at Higher Nansloe Farm, Helston (centred on NGR SW 65897 26703; Fig 1) at the request of Coastline Design and Build Ltd. The site is 2.3 ha in extent, 0.39 ha of which was selected for archaeological excavation within four areas. Prior to the current development, the site comprised a grass field. It is located just off the brow of a hill (71m aOD), part of high ground forming the eastern slope of the valley of the River Cober. The river flows through the Loe valley 600m to the west before emptying into the sea at Porthleven Sands, 3.2 km distant. The site overlies slate and siltstone of the Mylor Slate Formation (BGS 2016).

The earliest recorded remains in the locality comprise several possible Iron Age or Roman 'rounds' (enclosed settlements) recorded within the Cornwall Historic Environment Record (HER; Fig 1). However, while some are suggested by curvilinear cropmarks and others indicated by place-names, none have been tested by excavation.

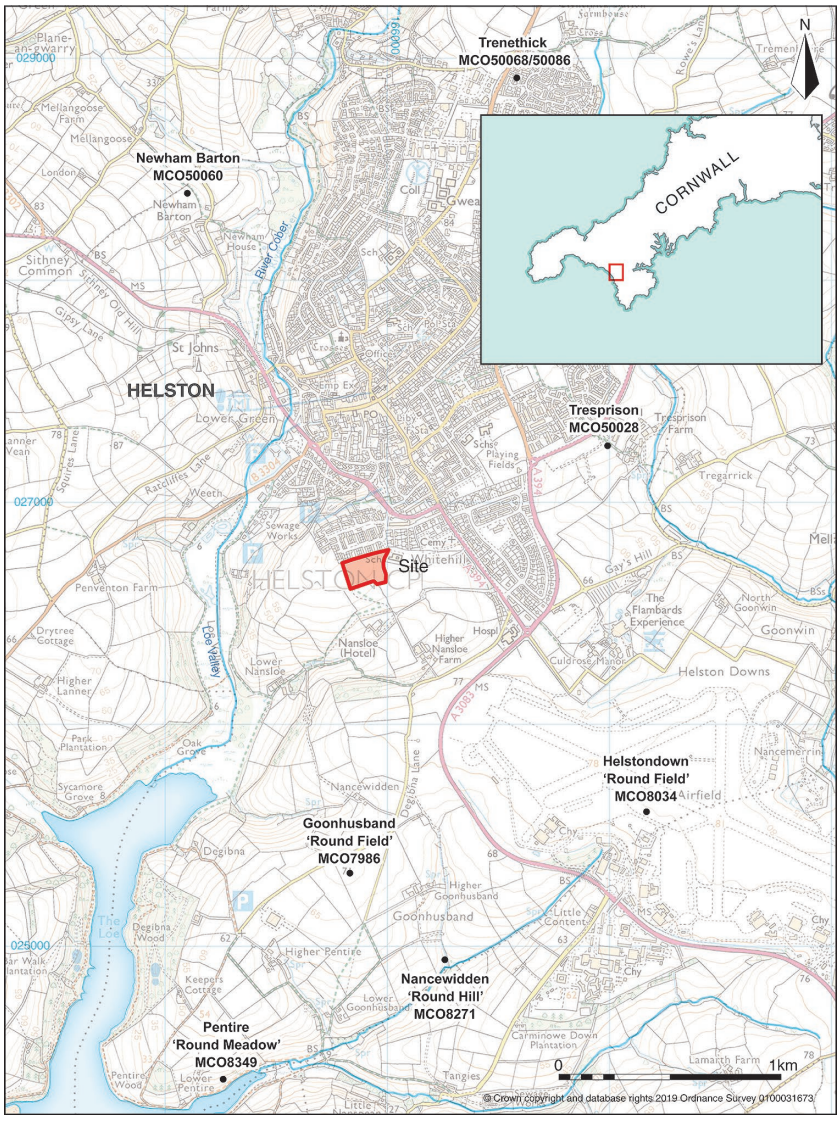

Fig 1 Site location plan, also showing the distribution of Iron Age or Romano-British enclosed settlements ('rounds'), as recorded in the Cornwall Historic Environment Record. The three northern sites were identified as cropmarks but the southern sites are suggested only by field-names, such as 'Round Field'.

During the medieval period, the site lay within the rural hinterland of Helston town and Nansloe hamlet and it remained in agricultural use until the present development.

Archaeological work within the site began with a geophysical survey (AOC 2016) and evaluation (CA 2016) which identified Iron Age field boundary ditches and pits. Based on these results, Cornwall Council requested archaeological excavation within two areas (Areas 1 and 2; Fig 2). Five additional trenches were excavated along the site's eastern edge to test for the presence of a possible boundary for a round. In the event, no such boundary was encountered but the five trenches did contain significant remains not detected during the preliminary works, and they were therefore extended to become two additional excavation areas (Trenches 8 and 9). This report presents a summary of the findings, full details of which are available in a report published on CA's website (CA 2020).

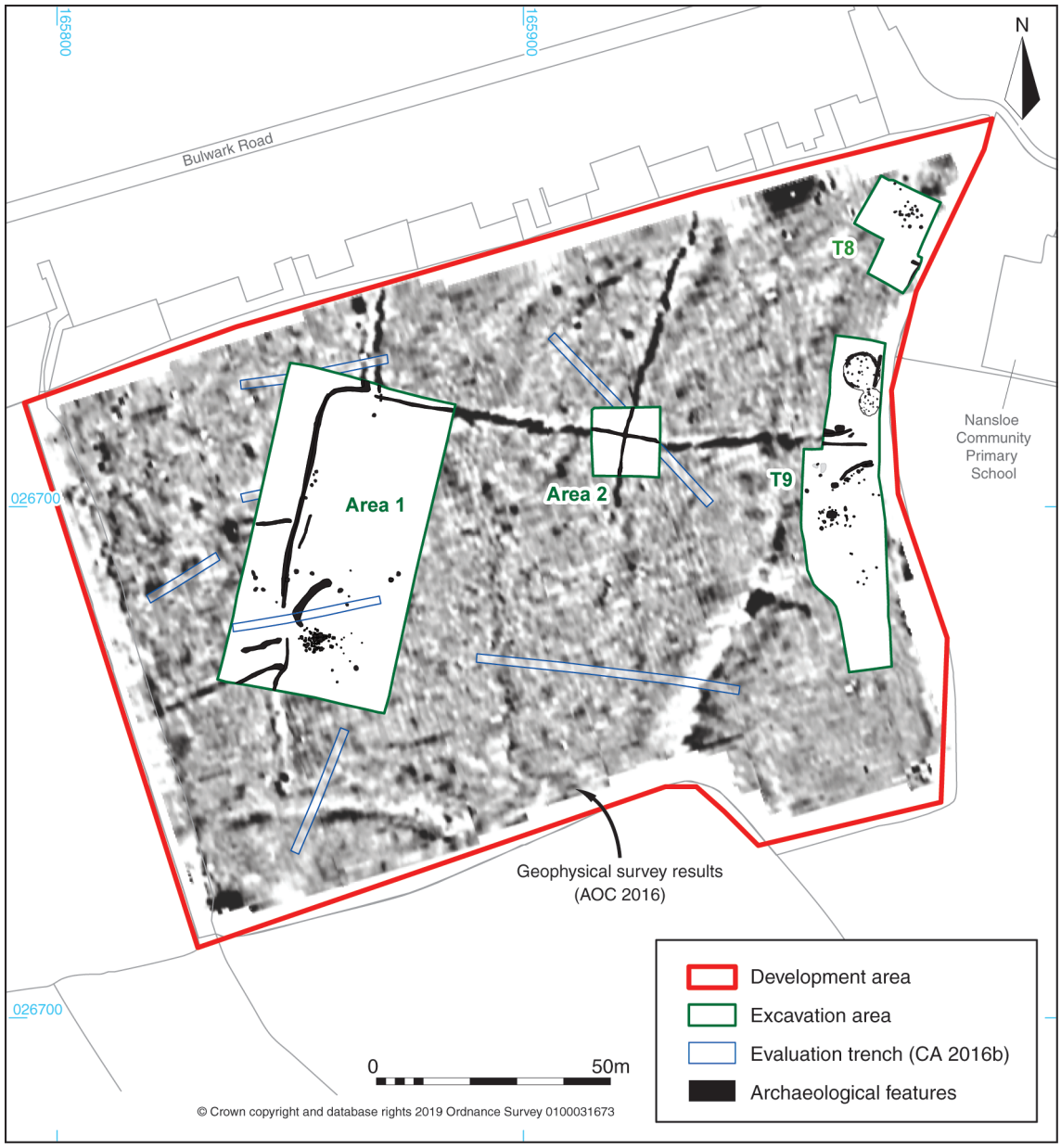

Fig 2 The site, showing excavation areas, evaluation trenches, geophysical survey results and archaeological features. Area 1 included Neolithic pits, a Beaker pit and an Iron Age pit group. T8 contained a possible Late Bronze Age structure and in T9 were Middle Bronze Age houses and Iron Age burials.

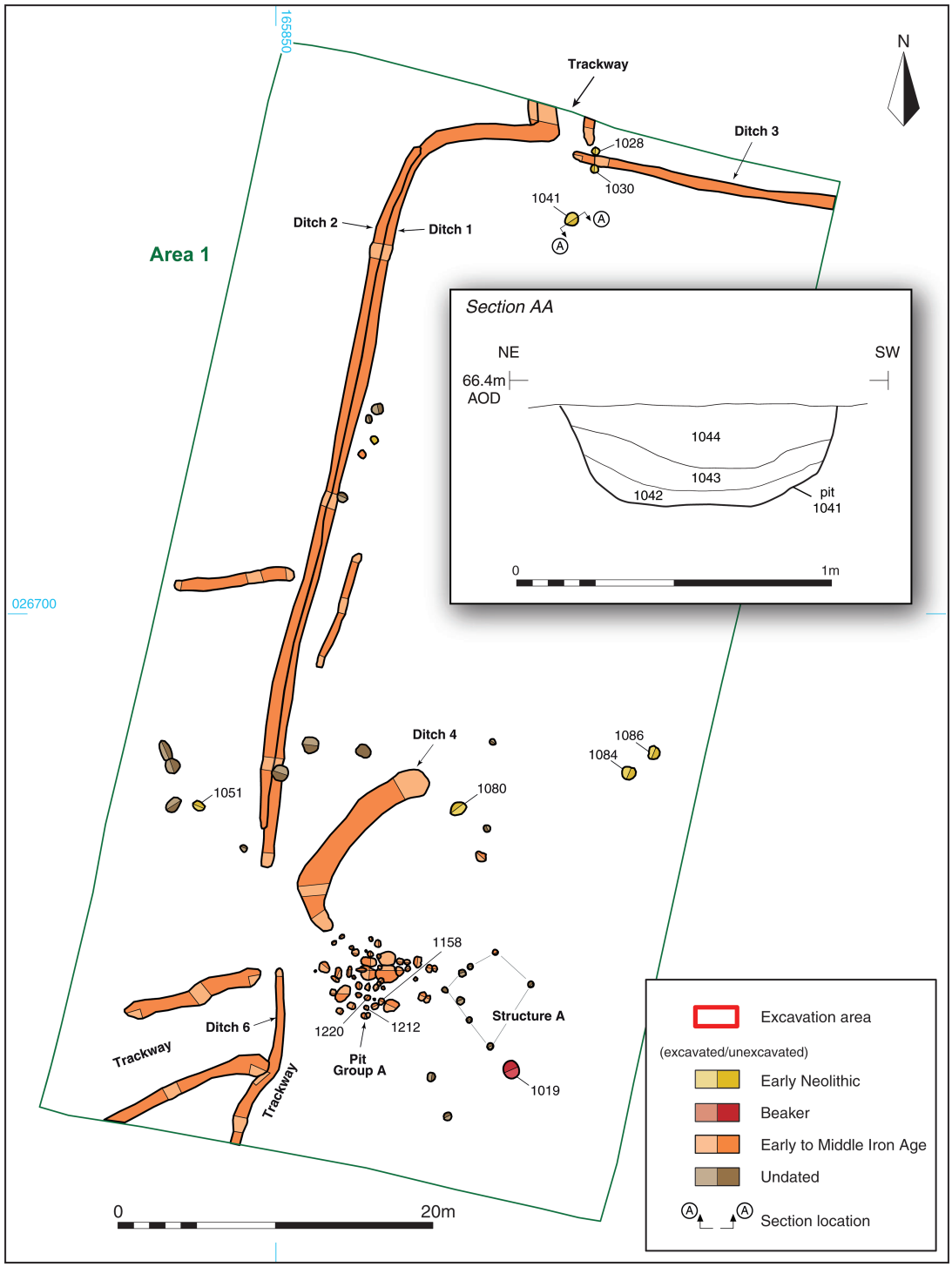

Fig 3 Plan of Area 1, with inset showing section through Early Neolithic pit [1041]. Early Neolithic pits: a group of three in the north, [1028], [1030] and [1041]; and a line of four to the south: [1051], [1080], [1084] and [1086]. Beaker pit: [1019]. Pit group A: this produced Middle–Late Iron Age radiocarbon dates and pit [1158] contained an iron ferrule (Fig 9, 4).

Results

Archaeological remains were found within all the excavated areas and are reported on below. Calibrated radiocarbon dates are quoted at the 95.4 per cent confidence level.

Early Neolithic (4000–3000 BC)

Seven pits scattered across Area 1 (Fig 3) produced small quantities of Early Neolithic gabbroic coarse ware pottery (127 sherds, 1438g). The forms included large vessels with possible cordons or lugs, and simple, open bowls (Fig 4, **P1–7**). Flint assemblages consistent with Early Neolithic dating were recovered from some of the pits, and a few more flints, probably of the same date, were found in residual contexts elsewhere on the site. The 53 flints were mostly debitage (knapping debris), in the form of flakes, blades and bladelets, but seven flints show secondary working as tools, including three scrapers and a microdenticulate, tool types used for hide and plant processing. Most of the pits were bowl-shaped cuts 0.45m to 1.05m wide and 0.1m to 0.35m deep with single fills. In contrast, pit [1041] in the northern half of Area 1 was a steep-sided, flat-based cut, containing three horizontal fills (Fig 3, section AA) which together produced flints, pottery and charred plant remains, including hazelnut shells, apple-type fruit, barley and hulled wheat grain fragments and an emmer wheat spikelet fork. One of the charred hazelnut shells from the second fill (1043) was radiocarbon dated to 3648–3522 cal BC (SUERC-87421).

Beaker period (2400–1800 BC)

Pit [1019], within the southern part of Area 1 (Fig 3), contained five sherds (42g) from a Beaker pottery vessel of gabbroic fabric, decorated with scored lines made using a cockle shell and horizontal rows of square impressions (Fig 4, **P8**).

Middle Bronze Age (1500–1100 BC)

Middle Bronze remains comprised two roundhouses and associated features in Trench 9, on a gentle south-east facing slope (Figs 5–6, 8). These are dated by the presence of gabbroic pottery (60 sherds, 515g) which includes sherds with impressed cord decoration comparable to Trevisker pottery (Fig 4, **P9–11**). The gabbroic fabrics included a few sherds of gabbroic admixture, having a granitic component which could have been added locally.

Roundhouse 1 was built into a circular cut 7.5m in diameter and 0.55m deep (Figs 5 and 6). A drystone wall (9004, 9005, 9059) built against the inner face of the cut survived intermittently as a single course of granite blocks; granite is not local to the site, but sources are present 4 km to the north east on the Wendron Moors and 5.5 km to the west around Ashton. No flooring survived but postholes forming a post-ring 0.5m inside the wall line may have held upright roof supports. Near the centre of the roundhouse was shallow oval feature [9226] which contained a single deposit of scorched clay, perhaps the remnant of a hearth lining or oven superstructure, although a sample of the fill produced only a single charred barley grain (*Hordeum vulgare*).

Two layers within the roundhouse post-dated the postholes and wall line and relate to its disuse. A thin silty clay layer (9006), with oak and hazel charcoal and a single charred barley grain, perhaps derived from the possible hearth / oven. Rubble layer (9008) derived from the roundhouse walling and produced three abraded sherds of decorated Trevisker pottery. These deposits only partially filled the roundhouse hollow; the remaining depth was filled by two silty bulk deposits which yielded 19 sherds of Trevisker pottery.

Roundhouse 2 was built into an oval cut 5.5m long, 4.25m wide and 0.3m deep which adjoined the cut for roundhouse 1 via a short passageway. A segment of stone wall, (9159), survived along the inner edge of the cut. No floor survived, but postholes and stakeholes were present, some of which may have held an oval arrangement of roof supports. Feature [9188], near the centre of the base, contained scorched clay and is interpreted as a hearth or oven. These structural remains were overlain by demolition deposits, the earliest of which, layer (9165), produced three sherds of Trevisker pottery, one with impressed cord decoration. Above this, rubble layer (9022) derived from the former walling. It yielded eight sherds of pottery (including Fig 4, **P11**), a stone saddle quern / grinding slab, and half of a large stone used as a grain rubber, as well as a moderate assemblage of charred cereal grains, mainly barley, but also hulled wheat and emmer / spelt wheat (*Triticum dicoccum/spelta*). The remaining hollow was filled with brown silty clay which produced 24 small

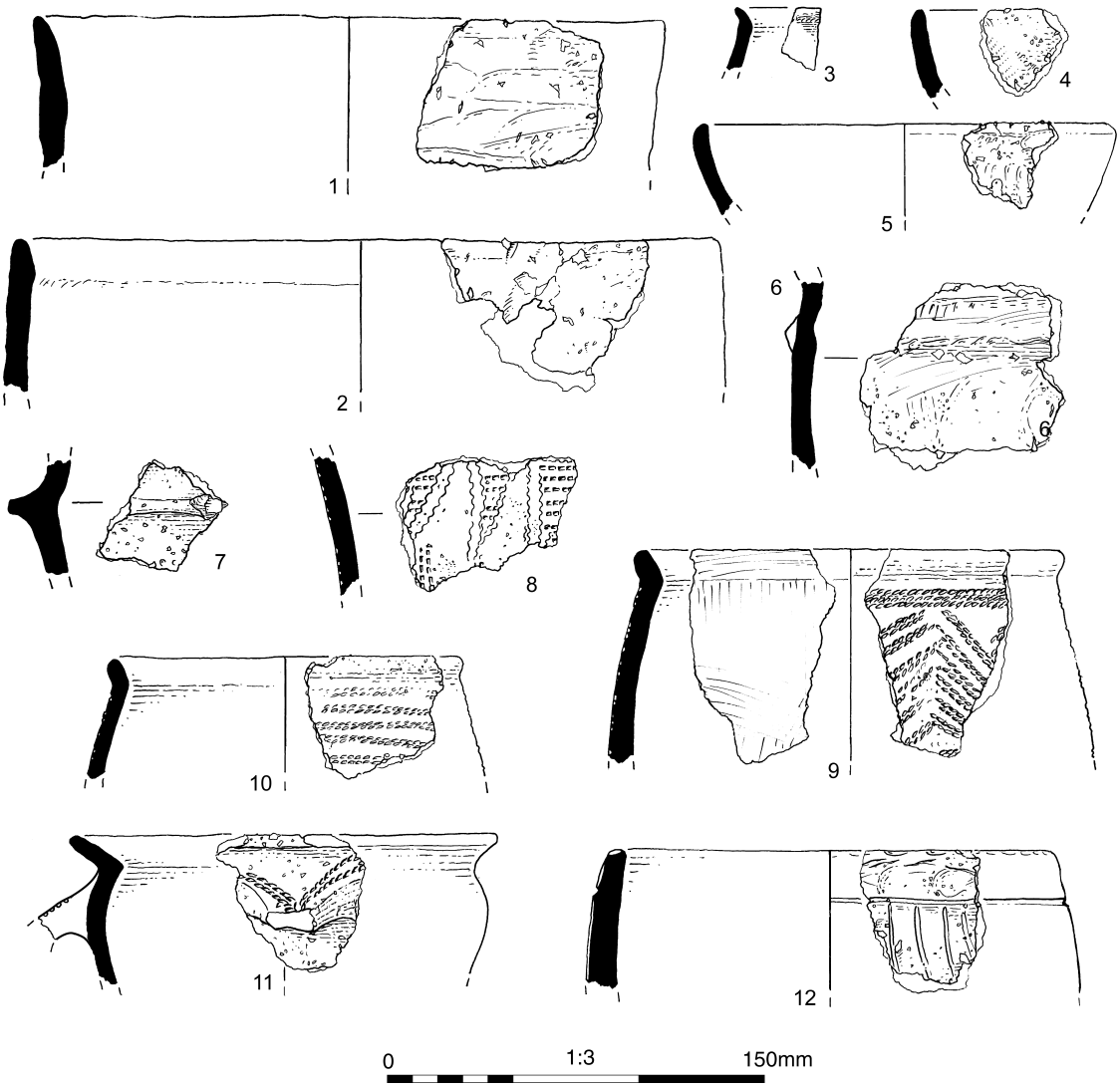

Fig 4 Selected early prehistoric pottery: P1–7 Early Neolithic gabbroic coarse ware; P8 Beaker vessel with shell-impressed and cord-impressed decoration; P9–11 Middle Bronze Age Trevisker pottery; P12 late form of Trevisker pottery. (For full descriptions see G Jones 2020a, 46–51.)

sherds of Trevisker pottery and a perforated slate disk, possibly a vessel lid.

Posthole [9074], 20m south west of roundhouse 2 (Fig 8), was 0.95m wide and 0.6m deep and contained granite packing stones. A decorated Trevisker ware jar rim sherd (Fig 4, **P9**) came from its uppermost backfill. Some 5m to the north east of this were two small pits, [9033] and [9052], of which pit [9033] had been cut into one of two adjacent infilled tree-throw holes. It also produced a rim sherd from a decorated Trevisker ware jar (Fig 4, **P10**).

Late Bronze Age (1100–700 BC)

Late Bronze Age remains were found within Trench 8, 25m north east of the earlier roundhouses (Fig 7). They comprised shallow ditch terminal

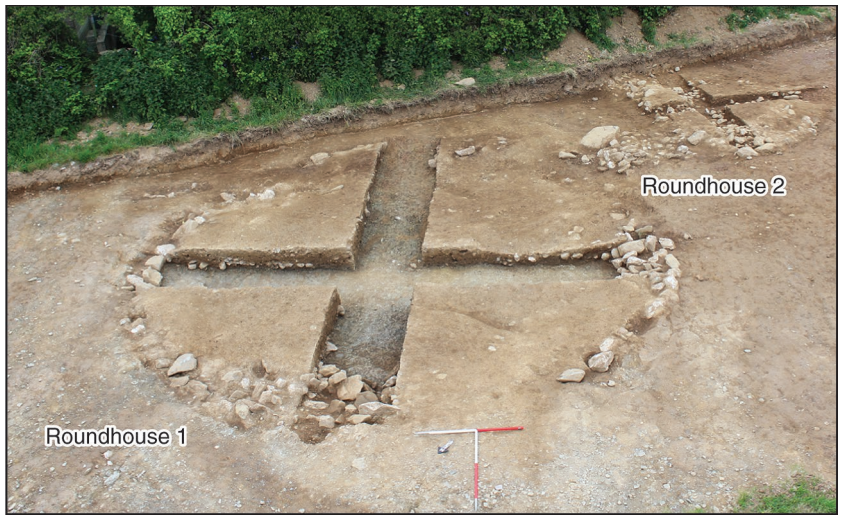

Fig 5 Roundhouses 1 and 2, looking south-east (1m scales). (Photograph: Cotswold Archaeology.)

[8005] and an amorphous cluster of postholes and small pits, these possibly indicating the presence of a circular structure (structure B), some 6.5m in diameter. They were dated to the early part of the Late Bronze Age by the presence of 11 sherds in a late form of Trevisker ware pottery. **P12** (Fig 4), from posthole [8042], in a gabbroic admixture fabric, has incised linear decoration and is similar in form and decoration to a bowl from Porthleven (Quinnell 2011b, fig 17, P5); the Porthleven assemblage displays traits of the Trevisker tradition but is associated with late radiocarbon dates of 1120–910 cal BC and 1130–910 cal BC.

A small quantity of charred plant remains, including barley, was recovered from posthole [8050].

Early to Middle Iron Age (600–100 BC)

The remains of an Iron Age field system, up to three graves and clusters of pits and postholes (pit group A) were revealed in Areas 1 and 2 and Trench 9 (Figs 3 and 8). These have been broadly dated by Iron Age pottery (192 sherds, 500g). For the majority of the Iron Age features, the recovered pottery was only broadly datable, but the assemblage includes an important collection of Early Iron Age Plain Jar Group sherds of the sixth to fourth centuries BC, associated with one of the graves (Jones and Quinnell, below), and sherds in the Middle Iron Age South Western Decorated tradition dating to the fourth to first centuries BC collected from pit group A.

The field system

The field system, revealed in combination by the various phases of investigation, extended across the site (Fig 2) and included rectilinear fields together with trackways. The ditches defining these were broad, shallow cuts with homogenous silty clay fills which produced a few sherds of late prehistoric pottery. Within Area 1, a trackway leading to a field from the south west had been blocked off by ditch 6 which formed the edge of another trackway leading from the south (Fig 3). North of this, an entrance gap led into the field where a short ditch (ditch 4) may have been intended to funnel or sort livestock, perhaps protecting pit group A (described below) to its south. A funnel-shaped entrance was evident within Trench 9, defined by ditches 3 and 7 (Fig 8).

Pit group A

To the immediate south of ditch 4 was a dense concentration of 51 shallow pits and postholes, labelled as pit group A on Figure 3. Some were intercutting, while a dark layer including charcoal and scorching (1205; not illustrated) sealed some of these features and was itself cut by others, overall suggesting some longevity to the represented activity. Many of the pits / postholes contained dark deposits which produced scorched stones, fired clay and charred plant remains, including grains of barley, emmer wheat and spelt wheat, hazelnut shell fragments and seeds of oat / brome grass and celtic bean. These features also produced small

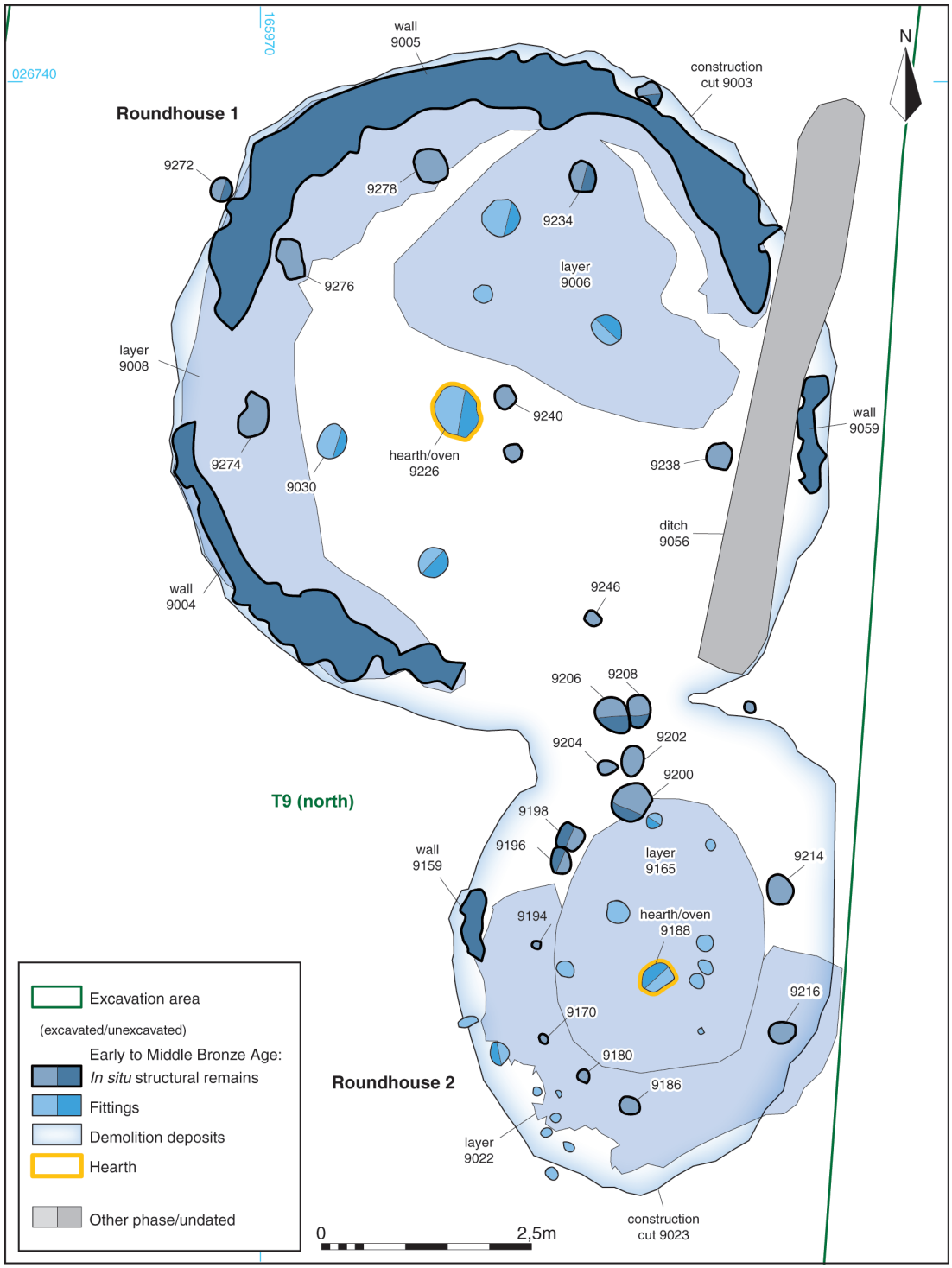

Fig 6 Plan of roundhouses 1 and 2.

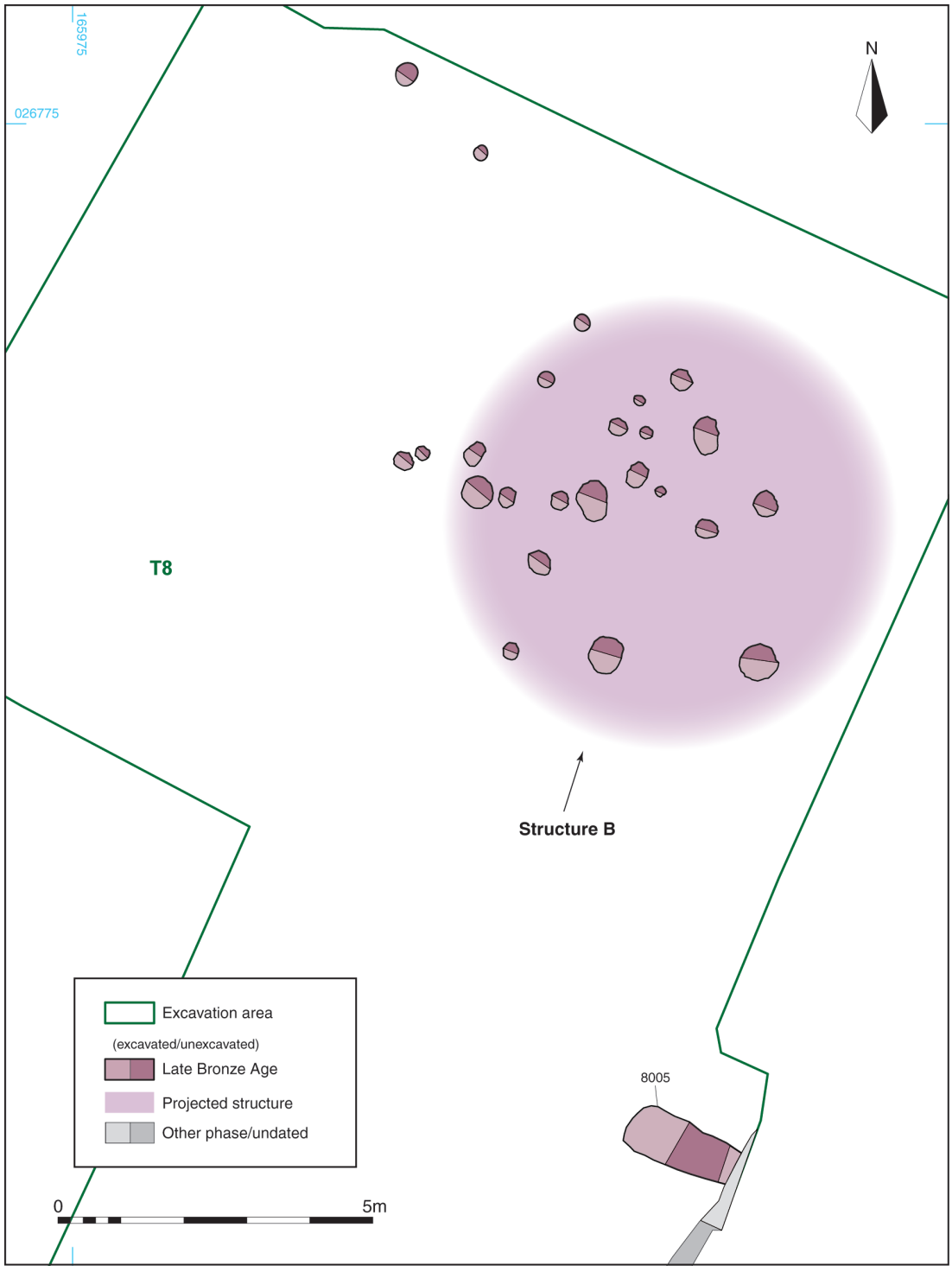

Fig 7 Plan of Late Bronze Age remains in Trench 8.

quantities of burnt bone, unidentifiable to species, and not specifically identifiable as either animal or human, as well as charcoal, mainly from oak, with small quantities of hazel. Among this group, pit [1158] yielded a folded iron strip with a rivet hole and with mineral-preserved wood (Fig 9, 4). The item cannot be identified with any certainty, but might have been a spear butt. Hazel charcoal from pits [1220] and [1212] produced radiocarbon determinations of 355–58 cal BC and 174–1 cal BC respectively (SUERC-87423 and SUERC-87422), ranges spanning the Middle to Late Iron Age.

The pottery from the pit group was Iron Age and included a small amount of material closely identifiable as of the Middle Iron Age South Western Decorated tradition

Immediately east of pit group A was a rectilinear arrangement of postholes which seems to have defined a small fenced enclosure or a building, structure A, 4.1m by 3.8m in extent (Fig 3). None of the postholes contained dating evidence and structure A is of uncertain date; Early Neolithic pits and Beaker pit [1019] were also nearby.

Burial activity

Iron Age remains within Trench 9 comprised two cist graves, a possible pit grave and a few pits and postholes (Fig 8). Immediately south of field entrance ditch 7, an alignment of postholes may have supported the posts of a fence line. Postholes [9050] and [9047], 2m south of this fence line, were set 1.25m apart and may have supported posts for a two-post structure such as a drying rack; a similar posthole pair was present 4m to their south east (not illustrated).

The two stone cists were found south west of ditch 7. Although neither contained evidence of inhumation burials and only one contained small quantities of unidentifiable burnt bone, both are interpreted as graves on the assumption that any unburnt bone has been lost to the acidic soils. The stones of the cists included slate and quartz, local to the site, but also granite. (For section drawings of the cists see CA 2020, figs 12–14.)

Cist [9101] was east–west aligned, in a cut 1.25m long, 0.95m wide and 0.55m deep, and had been lined and capped with stones; internally it was 1.2m long, 0.75m wide and 0.6m high. No bone or artefactual material was found within it.

Cist [9253], 5m south of cist [9101], was built on a slightly different alignment. It was in a cut 2.1m long, 1.05m wide and 0.4m deep, lined along its base and sides with substantial stone blocks and slabs creating an internal space 0.95m long, 0.95m wide and 0.5m deep. Capping stones were absent, although this may reflect truncation. The cist contained a blackish lower fill which produced a large assemblage of charred cereal grains, mainly barley with some emmer and spelt wheat. Other remains included charred hazelnut shell fragments and oak and hazel charcoal. Above this lower fill, and extending beyond the cist to the edges of the construction cut, was the upper fill, another blackish deposit. This produced two small fragments of unidentifiable burnt bone, an unburnt grain rubbing stone and a group of three iron objects comprising part of a spearhead with mineral-preserved wood from the shaft (and a fragment of unidentifiable unburnt bone adhering to the concretion), part of a curved knife blade, and a bar fragment (Fig 9, 1–3). The metal items were found outside the cist, although within the construction cut, but it is unclear whether this represents post-depositional disturbance or their intended locations.

Cist [9253] lay within a cluster of pits and postholes, among which an oval arrangement of postholes (structure D) may represent a structure or screen surrounding the cist. Two layers extending to the immediate east seem to represent material ploughed out from the cist, including parts of its structure and fills. One layer contained a large saddle quern which may have originated as a grave good within the cist, or may have been deliberately placed as part of the cist structure itself. The second layer included charred plant remains, primarily barley grains but also emmer and wheat grains and chaff, along with unidentifiable fragments of burnt bone.

Possible grave [9129], south of cist [9253], was a vertical-sided circular cut 0.8m wide and 0.75m deep. A sample from its lowest fill produced a large assemblage of charred cereal grains, mostly barley with a few hulled wheat grains, as well as small quantities of burnt bone, unidentifiable to species, and two pieces of copper wire, possibly from a brooch spring. Above this was a sandy silt fill which produced further charred cereal grains. These lower fills were sealed by a horizontal stone slab above which the third fill was deposited along with a stone saddle quern or grain rubber and a possible stone grain rubber fragment. The uppermost fill was a grey-brown silty clay. Together these fills, both below and above the stone slab, produced

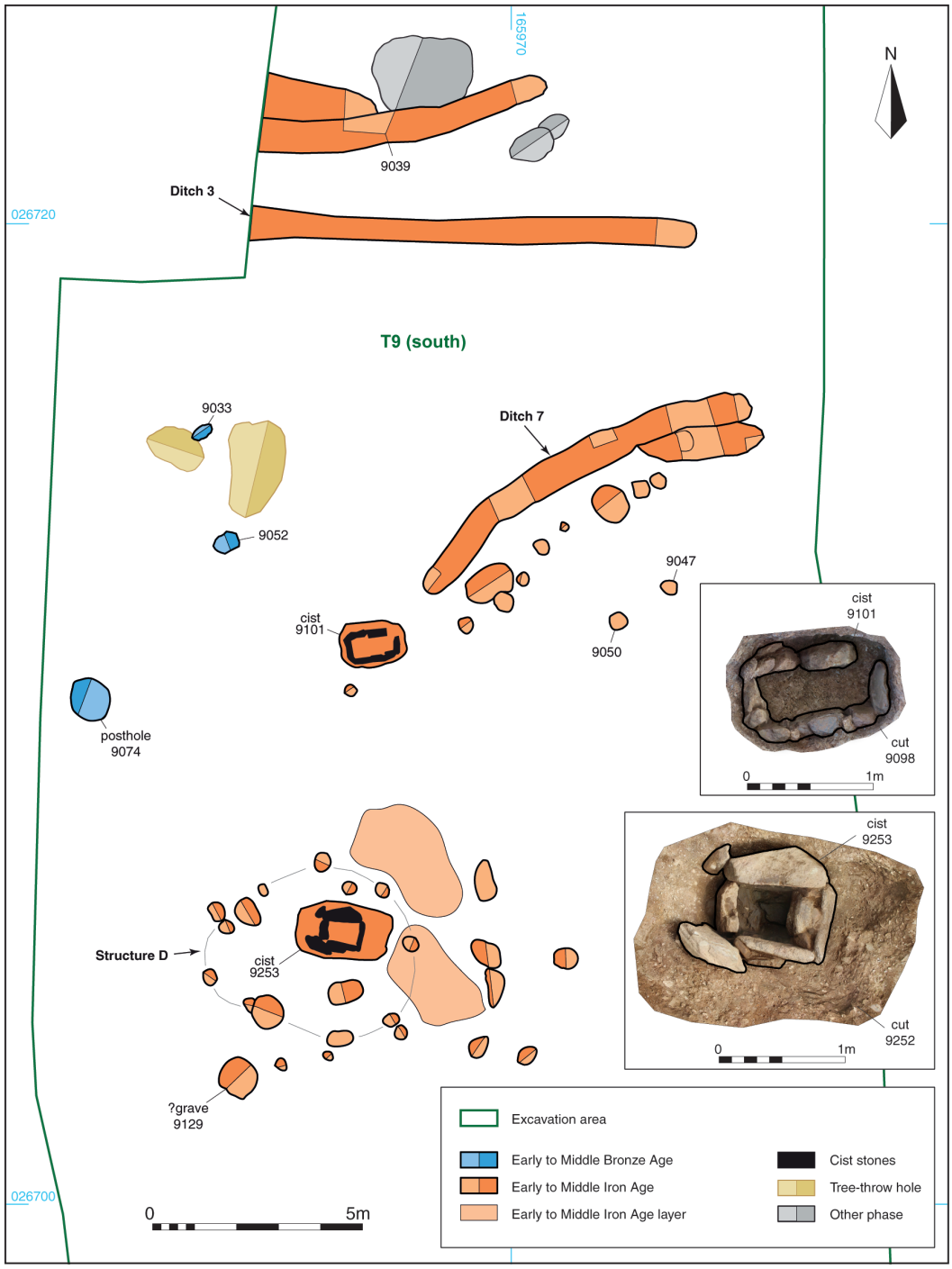

Fig 8 Plan of archaeological features within Trench 9 (south). Cist [9253] is associated with three iron objects (Fig 9, 1–3), and possible grave [9129] contained pieces of copper wire and a large assemblage of Early Iron Age pottery (Fig 10).

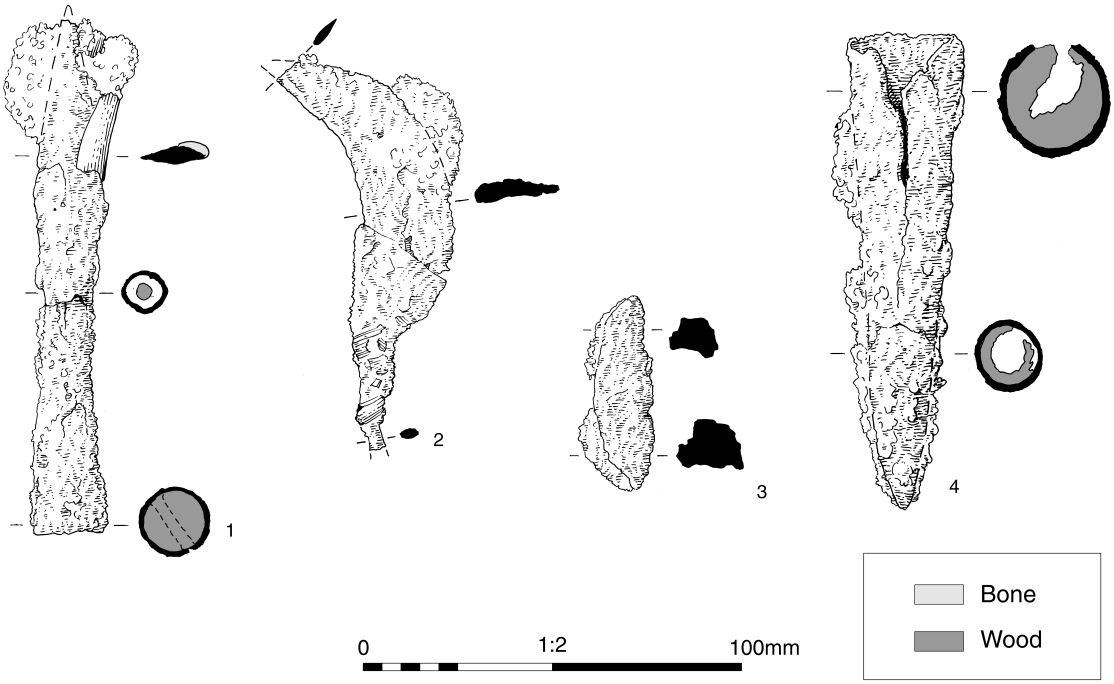

Fig 9 Selected iron objects, 1–3 from cist [9253], 4 from pit [1158], pit group A in Area 1. 1: small-bladed spearhead with conical socket (only the base of the blade remains). 2: curved, bladed tool with tang, probable knife. 3: bar (unidentifiable object). 4: ferrule with rivet hole (possible spear butt). (For full descriptions see G Jones 2020b.)

137 sherds (4375g) of Early Iron Age Plain Jar Group pottery (Fig 10, **P13–21**), the largest such assemblage yet retrieved from a single feature within the south west. Amongst these was a small stamped jar or bowl sherd which Henrietta Quinnell considers to be a precursor to the South Western Decorated ware tradition, datable to around the fourth century BC. These sherds are described in full below and are illustrated on Figure 10.

Early Iron Age Plain Jar Group pottery from grave [9129]

Grace Jones and Henrietta Quinnell

Three fills of possible grave [9129] (fills 9130, 9131 and 9132) produced cross-joining sherds of Early Iron Age Plain Jar Group pottery. The fabric is all gabbroic, predominantly Standard gabbroic (GA1), but also some Well-made gabbroic (GA2) and two sherds of Gabbroic fabric with mudstone or slate inclusions (GA7) (G Jones 2020a, table 5). Twelve vessels were identified, 11 (including **P13–P20**) in the Plain Jar Group tradition of the Early Iron Age (*c* sixth to fourth centuries BC), with a unique stamped, necked bowl or small jar (**P21**).

The complete profile of vessel **P13** was reconstructed, revealing a jar with concave neck, carinated shoulder and plain, flat base. The scar from a handle or lug is present immediately below the carination. The external surface appears to be quite smooth in the areas where it is least abraded. Traces of burnt residue on the internal surface of the vessel suggest it was used to cook food. Two pairs of post-firing perforations had been drilled through the lower wall of the vessel, and a cord passed through them, presumably to repair the vessel. Although nothing survives of the cord itself, it had worn a groove between the holes.

P14 is the same form as **P13**, with rounded, flared rim, concave neck, sharply carinated shoulder with countersunk-lug handle immediately below. Possible black paint was noted on the external

surface of the vessel; burnt residue is present on the internal surface. Although very similar, **P13** and **P14** do appear to represent separate pots. **P15** is also of this type but larger and thicker-walled. A black paint adheres to the upper external surface of the rim.

Sherds from a further four vessels in this tradition (not illustrated) are characterised by flared, rounded rims and concave necks; all are broken at the shoulder but the vessels were presumably carinated at this point. The rim diameters of only two are measurable, at 120mm and 200mm; the walls of each are 6–8mm thick. Two of these vessels are particularly abraded.

Two vessels have similar rounded, flared rims, concave necks and carinated shoulders, but appear to be more open in profile and are probably bowls. **P16** is of this type and has burnished internal and external surfaces. **P17** is similar but smaller, with a flared, rounded rim, concave neck and carinated shoulder. Open, carinated forms have also been recorded from Trevelgue Head, Newquay (Quinnell 2011a, fig 7.5, 27).

Two vessels are represented by their decorated carinated shoulder sherds. **P18** has three irregular tooled horizontal lines above the shoulder. Burnt residue present on the interior and patches of soot on the exterior suggest that this vessel was used for cooking. **P19** has very smooth, probably once burnished, surfaces, with tooled horizontal and diagonal lines just above the shoulder.

The central part of a base (**P20**), found in fill (9131), is decorated with incised lines, irregularly applied in the form of a cross, on its external surface. It may have derived from one of the vessels already described or another vessel.

Two shouldered body sherds, one each from the western terminal of ditch 7 and the topsoil, may also derive from vessels in the Plain Jar tradition.

The Plain Jar Group was first identified and dated to the Early Iron Age (sixth to fourth centuries BC) in the publication of the assemblage from Trevelgue Head, Newquay (Quinnell 2011a, JB2.4, fig 7.4, 74). Parallels were noted from Bodrifty, Madron (Dudley 1956, fig 9, 8), Carn Euny, Sancreed (Elsdon 1978, fig 54, 3, form Po.2), Halligye fogou, Mawgan-in-Meneage (Elsdon and Quinnell 2009–2010, fig 3, P1; fig 6, P18–19; fig 8; fig 14, P98), Boden Vean, St Anthony-in-Meneage (Quinnell 2013, fig 25, 7 and 11, fig 26, 10, 12–14) and Gurnard's Head, Zennor (Patchett and Gordon 1940, fig 8, 2). Although some vessels in the Plain Jar Group are handled (Boden Vean: Quinnell 2013, fig 25, 9, fig 27, 17; Trenowah, St Austell: Quinnell with Taylor 2008, fig 27, 11; and Trevelgue Head: Quinnell 2011a), none are directly comparable to the handles on nos 13 and 14 from Nansloe Farm.

A small necked jar or bowl (**P21**) with an out-turned, rounded rim and rounded body was also recovered from grave [9129], in association with the Plain Jar Group vessels. The area below the neck is decorated with three tooled lines, each 1mm thick, and then a band of stamped triangles, defined above and below with two tooled lines, 3mm apart. They are isosceles triangles but appear slightly variable in size, presumably due to application to a curved surface; each is approximately 7.2mm wide and 9.2mm long. A second band of triangles below is suggested by the presence of one stamp under the lower horizontal bands. The visual effect of the two rows of stamps is of close-set chevrons in relief. The vessel is in a well-made gabbroic fabric (GA2), the surfaces are oxidised to a pale yellowish-brown (10YR 5/6), the core is predominantly oxidised with some unoxidised areas. The external surface is spalled indicating that this may be a firing failure. A body sherd with similar triangular stamps was found at Trevelgue Head with the stamps again located at the widest point of the vessel, but on the Trevelgue vessel the lines within the triangles are vertical, compared to the horizontal lines in the Nansloe stamps (Quinnell 2011, fig 7.10, 131). Quinnell also notes similar triangular stamps on a vessel from Porthmeor (Zennor), placed below dot and circle stamps (Hirst 1937, in Quinnell 2011a, 178). The Trevelgue report contains a full discussion of stamps on Iron Age Cornish pottery, updating that of Elsdon (1978). The Nansloe Farm vessel is smaller than most South Western Decorated vessels, with data published from Trevelgue Head indicating the smallest internal neck diameters of 81–100mm, compared with the 60mm internal neck diameter of the Nansloe vessel, which highlights the unique aspects of the suggested transitional **P21**. The presence of **P21** with stamped decoration in association with forms of the Early Iron Age Plain Jar Group suggests that the group as a whole comes at the end of the use of this ceramic style, probably in the fourth century BC.

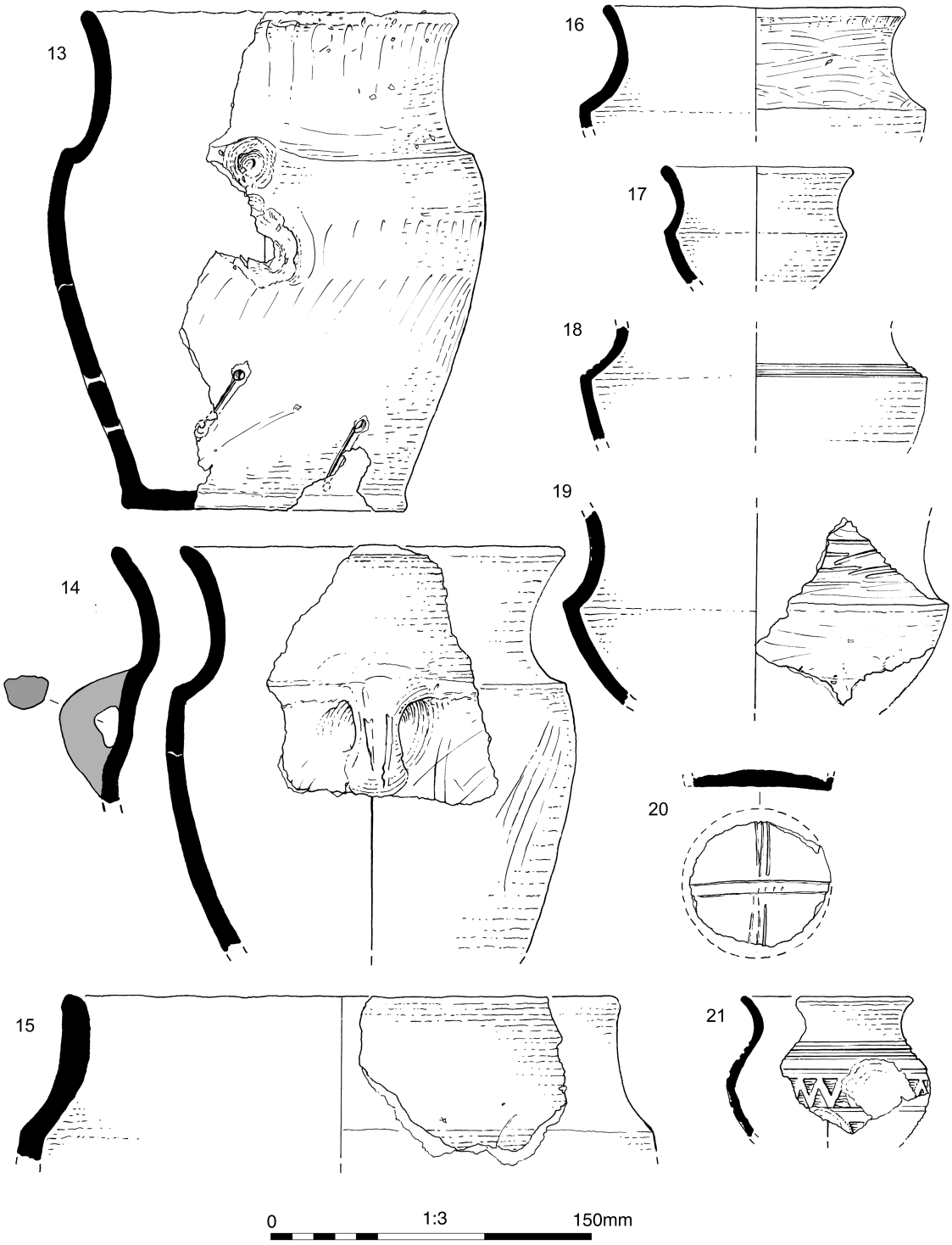

Fig 10 Early Iron Age Plain Jar Group pottery from grave [9129].

Illustrated pottery from grave [9129] (Fig 10)

P13 Plain Jar, handled, rim diameter 190mm, two pairs of post-firing repair holes, fabric GA1, height 250mm, base diameter 140mm, wall thickness 8–9mm. Early Iron Age, fills (9130), (9131) and (9132).

P14 Plain Jar, rim diameter 190mm, with countersunk handle (22mm with an opening of 23mm on one side and 18mm on the other), fabric GA1, possible black paint on external surface, burnt residue on interior, wall thickness 8–9mm. Early Iron Age, fills (9130), (9131) and (9132).

P15 Plain Jar, rim diameter 270mm, fabric GA1, black paint on external surface, wall thickness 10–13mm. Early Iron Age, fill (9131).

P16 Carinated bowl with flared rim and concave neck, rim diameter 150mm, fabric GA7, wall thickness 6mm. Early Iron Age, fill (9131).

P17 Carinated bowl with flared rim and concave neck, rim diameter 90mm, fabric GA1, walls 5–8mm thick. Early Iron Age, fill (9132).

P18 Carinated body sherd with tooled horizontal lines, fabric GA1, burnt residue on interior, patches of soot on exterior, wall thickness 6mm. Early Iron Age, fill (9132).

P19 Carinated body sherd with smoothed surfaces and tooled horizontal and diagonal lines, fabric GA2, wall thickness 5–7mm. Early Iron Age, fill (9132).

P20 Base, decorated with incised lines, fabric GA2, 4–7mm thick. Early Iron Age, fill (9131).

P21 Small jar or bowl, rim diameter 80mm, decorated with stamped triangles and tooled horizontal lines, fabric GA2, height greater than 63mm, walls 5mm thick. Early Iron Age, fills (9130) and (9133) in grave [9129], and the topsoil.

Discussion

The excavation confirmed the results of the geophysical survey and field evaluation, that the remains of an Iron Age field system lay within the site. The excavation also uncovered Iron Age settlement and burial remains, including a notable group of iron objects and the largest assemblage of Early Iron Age Plain Jar Group pottery yet retrieved from a single feature within the south west. Settlement remains of the Early Neolithic, Beaker and Middle and Late Bronze Age periods were also revealed, indicating that this west Cornish site has seen occupation, albeit intermittently, across some four millennia. Roman and later occupation was not evidenced.

Early Neolithic to Beaker period (4000–1800 BC)

Although several of the recovered flints may be Mesolithic in date, no definitively Mesolithic items were recorded and these flints more probably date to the Early Neolithic period, given the presence of pits of that date. The tool types present are those used for plant and hide processing and, along with the debitage produced by knapping, reflect occupation.

Structure A in Area 1 was close to Iron Age features but was undated and, if not Iron Age, could potentially belong to the tradition of square or rectangular Early Neolithic buildings known from the British Isles. An Early Neolithic rectangular structure revealed at Penhale, St Enoder (Nowakowski *et al* 2015, 23), is the only definite example known to date in Cornwall, but was significantly larger than the structure at Nansloe Farm, being at least 25m long and 7m wide. However, smaller rectangular or square structures, more comparable to that at Nansloe Farm, are being revealed occasionally but in increasing numbers as a result of development-led archaeology in other parts of Britain and Ireland (Darvill and Thomas 1996; Smyth 2014); three possible examples were found along the South Wales Natural Gas Pipeline (Darvill 2020), while in the south west there are examples known from earlier excavations at Haldon in Devon (Willock 1936) and Chew Park, Somerset (Rahtz and Greenfield 1977). In Cornwall, ill-defined rectilinear structures have been excavated at the tor enclosures of Carn Brea and Helman Tor (Mercer 1981; 1997).

The Early Neolithic pits are another feature type being recorded in Britain in increasing numbers by development-led archaeology, including in the south-west peninsula (for example, as listed for Cornwall by Jones *et al* 2015, 160–3). The nearest examples to Higher Nansloe are a pair of Early Neolithic pits found at Tremough, Penryn (Jones *et al* 2015, 17; Jones and Gossip 2007), and two further small examples discovered at Bickland, Falmouth (Hart and Tapply 2020 [this volume]). These small pits with variable morphologies, sometimes with handfuls of a range of domestic

debris, seem to reflect episodic occupation. Current interpretations (Carver 2012, 111; Thomas 2012, 2; Jones and Quinnell 2011) have them as specially dug to receive token handfuls of waste to commemorate the end phases of occupation by communities who would have moved periodically to new locations within what was still a largely wooded environment. Although to the south of the site much of the Lizard peninsula may have been open grassland used for grazing (Dudley 2011, 29), this model may still hold true for the pits at Nansloe Farm. Although the overall duration of this seemingly episodic occupation within the site is unknown, similar pits are found in Cornwall in the Middle Neolithic (Jones 2017, table 3) and in the Late Neolithic (for example, at Penryn College and Tremough: Gossip and Jones 2017, 4, 38–9; Jones and Gossip 2007), while the presence of the Beaker period pit [1019] suggests a possible continuation within the site into the mid-third – late second millennium BC.

Pits containing fragments of Beakers, presumably indicating settlement activity, are a relatively frequent find in Cornwall, more so than Beaker-associated burial sites (for example, Jones and Quinnell 2006; 2011, 208–10; Quinnell 2014a; Jones 2019). The few Beaker sherds from this pit are of note in being ornamented with shell-impressed decoration, a feature not previously recorded in the region and perhaps deriving from Neolithic traditions along the western coast of Scotland (see CA 2020 for further details).

Middle Bronze Age (1500–1100 BC)

Roundhouses 1 and 2 are in a form that can now be recognised as belonging to a tradition of vernacular architecture characteristic for the Middle Bronze Age within lowland Cornwall. Jones and Quinnell (2014), discussing a roundhouse found at Trevalga in north Cornwall, present a distribution map of examples known up to 2014 which comprised 13 different sites, the nearest to Helston being at Boden Vean, St Anthony-in-Meneage (Gossip 2013). To these can be added an example found along the Newquay Strategic Road Corridor (Jones 2019), another at Tregunnel, Newquay (Brindle, in preparation), a house at Tremough (Jones *et al* 2015) and the examples at Higher Nansloe Farm. The basic form of these seems to comprise a circular or oval hollow cut into the substrate, its internal face lined with a low wall surrounding a post-ring, with entrances usually to the south east and sometimes aggrandised by larger posts or a porch. At Trethellan Farm (Newquay) the houses were up to 9.5m in diameter (Nowakowski 1991), while those along the Newquay Strategic Road Corridor and at Scarcewater (St Stephen-in-Brannel), were 10m and up to 12m in diameter respectively (Jones 2019; Jones and Taylor 2010).

Nansloe Farm roundhouse 1, at 7.5m in diameter, is therefore a relatively small example, with roundhouse 2, 5.5m wide at most, being smaller again. In other respects however, the Nansloe roundhouses conform to this wider Cornish architectural tradition, each comprising a hollow lined with stone walls and with an inner post-ring; the locations of their entrances are unknown. The posts within the post-rings would have been uprights, taking the weight of conical roofs, thatched or covered with sods. The stone walling may have risen to meet the roof, or might have been dwarf walls supporting wattle and daub above. No flooring survived in either roundhouse, although there were probable central hearths (open fires) or ovens (presumed to have had clay superstructures for baking). Flooring within the roundhouse found along the Newquay Strategic Road Corridor was of redeposited shillet, but hay, bracken or beaten earth might equally have been used at Nansloe Farm. An unusual feature of the Nansloe roundhouses is that the stratigraphic evidence suggested that they were contemporary, rather than sequential, with a short sunken corridor linking the two. It is interesting to note that this corridor was very narrow, but whether this relates to a need for privacy, to screen activities, or to restrict movement, is not known.

The absence of floor surfaces and occupation deposits means that little can be said about the functions and durations of roundhouses 1 and 2, or the uses of the spaces within them. Each seems to have had a central hearth or oven, while some of the internal postholes might relate to internal fittings for furniture or screens. Layers probably derived from the hearths or ovens in each roundhouse produced fuelwood charcoal and a few charred cereals, but these could as easily reflect a final closure firing as everyday use. The size difference between the two roundhouses lends itself to various interpretations. One might have been a living space, the other a work and / or cooking area; alternatively, the larger roundhouse perhaps housed the core of a family, with the smaller roundhouse providing accommodation for

subordinate members such as elderly relatives, a newly married couple or, conceivably, slaves. The small size of roundhouse 2 makes it unlikely that it was used as a byre, particularly given the presence of the hearth-oven, but this cannot be ruled out, and multiple uses over time are possible.

There is evidence for cereal cultivation at the site, in the form of charred grains, but in common with other sites of this period in Cornwall the quantities are small, perhaps suggesting an emphasis on a pastoral economy. As at Trethellan and Tremough, the principal crop appears to have been barley, although there was also wheat (Straker 1991; Carruthers 2007). No traces were found of any fields in the vicinity of the roundhouses, but the limited evidence suggests that field boundaries in Cornwall were not normally ditched at this time (Jones and Quinnell 2011, 220–1).

The large posthole [9074], 20m south west of the roundhouses, is of uncertain function since it is not clear whether it formed part of a wider structure or held an isolated post. The size of the packing stones in relation to the posthole suggests that it supported a post some 0.25m in diameter, and one possibility is that this was a totem or marker pole. A line extending from the intersection between the two roundhouses south westwards across this posthole points towards the Carminowe Creek, although this is not itself visible from the site. The use of monuments to reference natural landscape features is attested in west Cornwall for later Neolithic and Early Bronze Age ceremonial and ritual monuments such as barrows and stone rows (Dudley 2011, 29–30), and it is possible that similar practices were undertaken on other site types, including at Nansloe Farm. This part of the Cornish landscape at this time was largely open (*ibid*, 31), and although the sea itself could not have been seen from eye level, the top of the post might have been visible from the sea or beach, especially if augmented in some way.

The duration of the Middle Bronze Age settlement at Higher Nansloe Farm is uncertain. There was no evidence for rebuilding, but this might reflect the durable nature of the stone walls. Both roundhouses showed evidence for deliberate demolition. Disturbed packing stones in the postholes suggest that the upright posts were removed, while the walls seem to have been slighted and the hearths or ovens scoured out and levelled. The remaining hollows were backfilled with deposits which produced a possible slate vessel lid, a relatively large assemblage of pottery, a stone saddle quern or grinding slab, half of a large stone used as a grain rubber, and a few charred plant remains. While these could be seen simply as domestic waste deposits, the deliberate demolition of Cornish sunken-floored roundhouses seems to have been a widespread practice, identified, for example, at Trethellan Farm (Nowakowski 1991) and Tremough (Jones *et al* 2015). The house found on the Newquay Strategic Road Corridor did not seem to have been dismantled in this way, but it had been memorialised by means of a mound raised above the infilled hollow, a practice that was also seen for Late Iron Age and Roman structures on the same site (Jones 2019, 94, 132–133). In this light, the dismantling and levelling of the Nansloe Farm roundhouses is perhaps best seen as having been part of a formalised process of abandonment.

The post within large posthole [9074] to the south west of the roundhouses also seems to have been intentionally removed. A single rim sherd from a pottery vessel within the backfill of the resulting void may have been deliberately placed as a closure deposit. This perhaps bookends with the rim sherd found within pit [9033] cut into a tree-throw hole: while the relative phasing of these features is unknown, it is tempting to see pit [9033] as a foundation deposit for the settlement, undertaken following tree felling, conceivably for structural timbers for the roundhouses, with the burial of the rim sherd within posthole [9074] one of the final acts to have been undertaken.

The motives behind the abandonment of this settlement and the apparently deliberate dismantling of the two roundhouses are something that the archaeological record cannot tell us. There may have been economic or political factors at play, a calamitous event such as a death in the household, or the nature of the activities undertaken may have been a factor, perhaps having been understood by the inhabitants to have had a lifetime which had come to an end.

Late Bronze Age (1100–700 BC)

Some time after the Middle Bronze Age settlement was dismantled, the site was reoccupied by inhabitants using a later Bronze Age variant of Trevisker ware, thought to date to the eleventh or tenth century BC. This pottery overlaps in date with a style termed Late Bronze Age Plain Ware, found on other sites in Cornwall, but the relationship

between the two traditions is uncertain (Quinnell 2011c, 231–3).

Whether or not there was a significant temporal gap between the settlements at Higher Nansloe is unknown, as is the relationship, if any, between these two groups of people. The form and extent of the Late Bronze Age settlement are uncertain, given that the remains were found close to the excavation edge, and their wider context is therefore unclear. At face value, they comprise a cluster of pits and postholes with a shallow ditch to the south, but it is possible that the pits and postholes represent the remains of a circular structure (structure B) at least 6.5m in diameter, with the ditch having been part of an enclosure. An enclosure at Rodway, Somerset was 38m by 24m in extent and contained two such roundhouses, although of Middle Bronze Age date (Hart and Mudd 2018, 10–13), while at Scarcewater Tip (St Stephen-in-Brannel), a Middle Bronze Age roundhouse settlement was succeeded by a Late Bronze Age roundhouse within an ovoid palisade enclosure, associated with Late Bronze Age Plain Ware and with radiocarbon dates within the late twelfth to tenth centuries cal BC (Jones and Taylor 2013, 118–21). These small enclosures, with the roundhouses themselves often poorly defined, seem to have been fairly well distributed across southern Britain, with other examples including, *inter alia*, Thorny Down, Wiltshire (Ellison 1987), Down Farm, Dorset (Barrett *et al* 1991), and Black Patch, East Sussex (Drewett 1982). Jones and Taylor (2013, 118) suggest that Late Bronze Age lowland settlement in Cornwall may be more widespread than is currently understood, with the form of such settlements making them more difficult to recognise than those of the preceding Middle Bronze Age. At Nansloe Farm, no further extent of the possible enclosure ditch is apparent on the geophysical survey plot (Fig 2), but this may simply reflect the shallow depth of the surviving ditch, with the remainder having been truncated, and the enclosure perhaps originally defined more by a bank than a ditch.

Early to Middle Iron Age (600–100 BC)

The dating evidence provided by the ceramics is not sufficiently refined to indicate whether or not there was a temporal gap between the end of the later Bronze Age settlement and the creation of the field system during the Early to Middle Iron Age. The pottery from the Iron Age features included both Early and Middle Iron Age material while the radiocarbon dates span the Middle to Late Iron Age and perhaps point to some later Iron Age activity, although given the absence of Late Iron Age pottery, overall dating within the Early to Middle Iron Age seems most likely.

The function of the fields is reflected in their layout, which includes trackways and corner entrances, including distinctive funnel-like ditch arrangements. Corner entrances and funnel-shaped ditch layouts are indicators of livestock management (Pryor 1999), with animals being easiest to drive through gaps located at field corners; ditch 4 in Area 1 would have allowed livestock being driven into the field to be sorted and divided, for example during lambing, or, if the fields were held in common (Dudley 2011, 33), to count or separate livestock belonging to different owners as they were driven in from summer grazing.

In response to a need to keep the farming system sustainable, a reorganisation of the landscape around the turn of the first millennium BC is suggested for west Cornwall where, as on Dartmoor, earlier systems of large coaxial fields were replaced by smaller rectangular enclosures associated with nucleated hamlets (Dudley 2011, 32–3; Herring 2008, 87–90). These new fields would have included arable and hay fields; livestock would have had winter grazing there too, at which time they would have added manure, but they would have been sent to upland pastures during the summer (Dudley 2011, 33–4; Herring 2008, 90). It is within this context that the fields and trackways at Nansloe Farm must be seen, and the area around Helston could have provided suitable summer grazing: just to the south east of Nansloe there is a stretch of higher ground formerly known as Helston Downs (now Culdrose Airfield). What livestock were farmed at Nansloe Farm is not apparent from the archaeological evidence, but Dudley (2011, 34) lists cattle, sheep and goat as the main domesticates of this period in west Cornwall. The crops grown are suggested by the range of charred plant remains from the site, these including barley together with emmer and spelt wheat.

No certain houses were identified in association with the Iron Age remains, and the possibility that structure A was Neolithic has been raised above. However, rectilinear Iron Age buildings are attested on a range of other sites, although a recent comparanda of this corpus is lacking and

debate remains about their functions, for which a range of possibilities including dwellings, communal or ritual spaces, or working areas has been suggested; the most recent meta study of such structures was undertaken by Moore who suggested that many may have been dwellings (Moore 2003, 55). A recently excavated example at Kingston Farm, Bradford-on-Avon, Wiltshire, comprised a rectangular structure 7m long and 3.15m wide, based on a ground plan of two cells either side of a corridor (Hart and McSloy 2018); a similar structure at Cleevelands, Bishop's Cleeve, Gloucestershire, was 12.9m long and 5m wide with a similar ground plan (Hart *et al,* forthcoming). The example at Nansloe Farm, if it was a building, was on a square plan (although further postholes from a more rectangular structure may have been lost) measuring 4.5m by 4.5m with a north west-facing entrance.

Pit group A seems to have been associated with heating processes and, in the absence of industrial residues, food preparation may be indicated, perhaps undertaken away from the immediate vicinity of houses in order to reduce the risk of fire. Use for food cooking relating to communal feasting was suggested for Iron Age pits associated with burning found along the Newquay Strategic Road Corridor (Jones 2019, 103). Although no deposits specifically identifiable as feasting remains were found at Nansloe Farm, it is conceivable that these pits reflect feasting associated with seasonal events, such as bringing in livestock at the end of the summer grazing season.

There was at least one high status individual at the Nansloe Farm settlement, this indicated by the grave group, particularly the cist containing the weaponry. Unfortunately, in the absence of identifiable bone within the graves, details of the individuals buried are not known. Iron Age cist graves are well attested in the south west, with most known examples being in coastal areas (Jones and Quinnell 2014, 149–50). For the few examples where bone survived, crouched inhumation seems to have been the dominant burial practice and a few have been accompanied by grave goods such as pottery, brooches and quartz pebbles (*ibid*, 150). Indeed, possible grave [9129] contained fragments of copper wire, possibly from a brooch spring, along with the pottery. Despite the numbers of Iron Age graves recorded in the south west, few individual burial sites of this date have been found within Cornwall itself, and of these only the later Iron Age graves at Trethellan (Nowakowski 1991) and those of the Early Iron Age at Forrabury (Jones and Lawson-Jones 2014, 38–50) have been investigated using modern archaeological methodologies.

Possible grave [9129] is of note in having yielded a large assemblage of Plain Jar Group pottery. Grave 1 at Forrabury was also associated with Early Iron Age pottery, albeit in smaller quantities (Quinnell 2014b, 51). Cist [9253] is remarkable for its three iron objects, including a spearhead, as well as a rubbing stone and charred cereal grains. The discovery of a grave accompanied by weaponry is extremely rare for the region, with the nearest known weapon burial of this period being from the Isles of Scilly (Johns 2002–3). The grave goods can be seen as signifying how the individual within this grave was seen by those performing the burial rite. The weaponry would suggest status and power but possibly also a role as protector, while the rubbing stone might reflect the domestic sphere and the ability to provide food. The charred cereals are typical of a domestic assemblage but in this context possibly represent the remains of foodstuffs burnt to accompany the dead, although this is uncertain as they included weed seeds as well as grains. The stone used to construct the cists was locally collected and included slate, and quartz and granite blocks. The use of quartz is of note since this mineral seems to have been regarded throughout prehistory and beyond as having been endowed with magical qualities, both because of its colours and translucent 'otherness', and because quartz is triboluminescent, generating light when fractured or rubbed together, which resonates with funerary and ritual practices (Jones and Quinnell 2014, 151). It was also used in graves at Harlyn Bay (Jones and Mikulski 2015, 153) and Trethellan (Nowakowski 1991). At Nansloe Farm, cist grave [9253] was seemingly elaborated by having been enclosed within a small enclosure or structure, this suggested by the surrounding postholes. A few pits in its immediate vicinity, some within the structure, conceivably point to further visits to this grave, perhaps commemorating the deceased, although this cannot be demonstrated by the archaeology.

Of note is the fact that a maximum of three graves were identified. A few larger Iron Age cemeteries are recorded within Cornwall, including Forrabury (Jones and Lawson-Jones 2014), where 13 graves were recorded, Trethellan (Nowakowski 1991), which had 21 graves, and, on a far larger scale,

Harlyn Bay, which included 130 cist graves (Jordan 2019). Aside from these larger examples, the small number of graves at Nansloe Farm is entirely in keeping with Iron Age traditions across Britain, where only a few individuals received formal burial within graves, and it must be suspected that, for most settlements, the majority of the population were given funeral rites that have left little or no archaeological trace, such as disposal in wet places like bogs and rivers, or by excarnation. These largely archaeologically invisible practices were the norm for most of the population, and so those buried at Higher Nansloe Farm must be viewed as exceptions, their burial perhaps reflecting their perceived roles as protectors and providers (*cf* Giles 2012).

There is little evidence that the Iron Age settlement continued into the Late Iron Age. Despite the span of the two radiocarbon dates which extend as late as the first century BC, Late Iron Age Cordoned ware pottery and Roman finds were absent, and the only subsequent remains were a few medieval or later field boundaries. A Roman-period presence in the area is possibly suggested by a Roman coin supposed to have been found within Helston, but the provenance of this is uncertain and it is now lost (HER MCO 733). It is likely that occupation shifted to one of the many rounds suggested in the vicinity of Helston, but none of these has been tested by excavation.

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Early Neolithic pits and an Earliest to Early Iron Age pit and hearth at Bickland, Falmouth: excavations in 2018

JONATHAN HART AND CHRISTINA TAPPLY

with contributions from SHEILA BOARDMAN, HENRIETTA QUINNELL, JACKY SOMMERVILLE and IMOGEN WOOD

An excavation was undertaken by Cotswold Archaeology in March and April 2018 at the request of Midas Group Ltd at Bickland Industrial Park, Falmouth. Two small pits produced Early Neolithic pottery as well as small assemblages of flints. A further small pit and a hearth were radiocarbon dated to the Earliest to Early Iron Age. Two small pits remained undated and there was a medieval or later ditch.

In March and April 2018, Cotswold Archaeology (CA) carried out an archaeological watching brief at Bickland Industrial Park, Falmouth (centred at NGR SW 78773 32542; Fig 1). The work was undertaken on behalf of Midas Group Ltd in order to fulfil conditions attached to planning permission granted by Cornwall Council for the industrial development of the site.

The site comprises 1.7 ha of land on the western edge of Falmouth. Bickland Water Road forms the eastern site boundary, an industrial park lies to the north and fields to the south and west. The south Cornish coast lies within 2 km to the south east and the site occupies an elevated position at 80m aOD, with the ground falling away towards stream valleys to the north and west. At the time of the fieldwork, the site was under grass. The underlying geological substrate is mapped as the Devonian Mylor Slate Formation (BGS 2018).

Prior to the results presented here, no archaeological remains had been recorded within or near to the site. It lies within an area characterised by the Cornwall Council Historic Landscape Characterisation Project as Anciently Enclosed Land, where the landscape preserves elements of medieval and earlier settlement and farming (Cornwall County Council 1996). St Budock Church, 140m west of the site, dates to the thirteenth century, although its curved churchyard boundary may indicate early medieval origins. During the Second World War, the eastern side of the site formed part of a defensive line along the western edge of Falmouth, designed to protect the port from landward attack (Kirkham 2011, 24). Type-24 pillboxes, used for infantry sections, are present at the northern and southern site margins (Cornwall Historic Environment Record (HER) MCO 33877 and MCO 42192).

The site's archaeological potential was first assessed in a desk-based assessment (Kirkham 2011), following which a geophysical survey was undertaken (Stratascan 2013). This survey recorded anomalies associated with former field boundaries along the northern and southern edges of the site. Several linear and discrete anomalies in the central part of the site were considered to be of possible

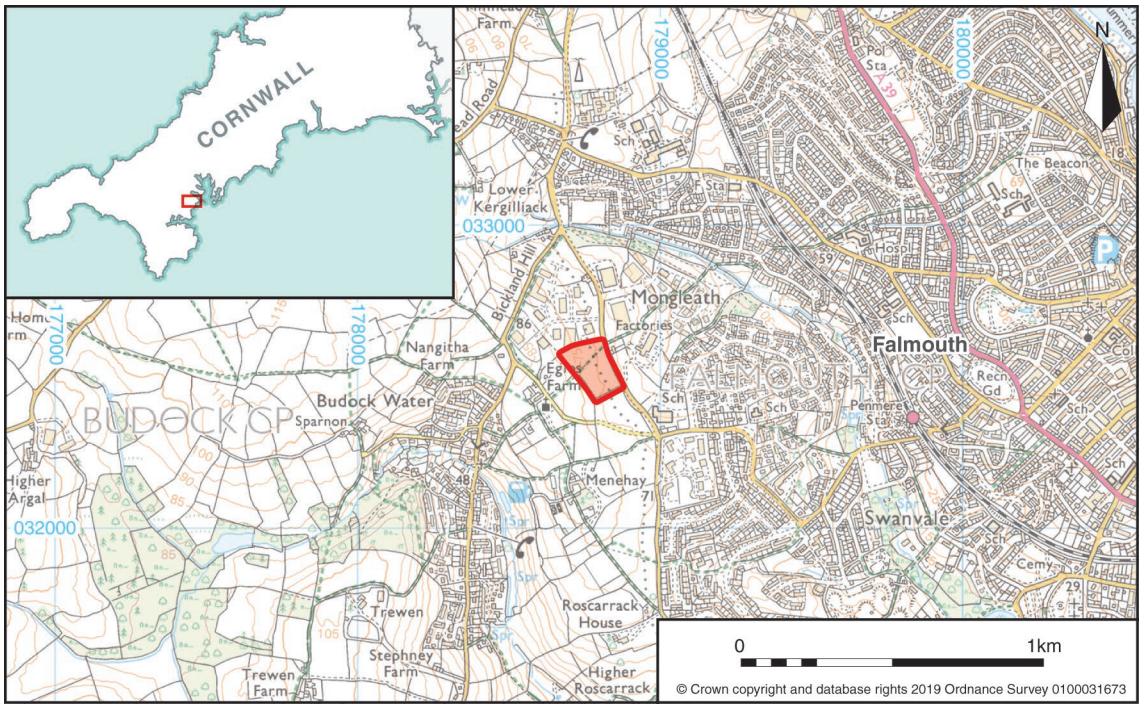

Fig 1 Site location plan.

archaeological origin, although in the event they proved to reflect natural features.

The archaeological work comprised a programme of recording and monitoring during construction groundworks (Fig 2, inset). All groundworks were undertaken by a mechanical excavator equipped with a toothless grading bucket, under archaeological supervision. Features were sampled according to a strategy set out in a written scheme of investigation (CA 2018a) and were hand-excavated to the bottom of the archaeological stratigraphy.

Results

The site contained five dispersed pits, a hearth and two linear features; dense concentrations of remains were absent. Two pits are dated to the Early Neolithic period (4000–3400 BC) on the basis of pottery while one pit and a hearth are dated to the Earliest to Early Iron Age (800–400 BC) on the basis of two radiocarbon determinations (here quoted at 95.4 per cent probability). One of the linear features was a medieval or later ditch while the other was an ephemeral feature, probably relating to medieval or later agriculture, although it lacked finds. Both linear features correspond with anomalies recorded during the geophysical survey but none of the pits had produced geophysical readings. The natural geological substrate comprised pale grey-brown / yellow clay silt with frequent siltstone inclusions. It was generally revealed at 0.45m–0.5m below the pre-development ground level and was sealed directly by the modern topsoil. The prehistoric and undated remains are described below; details of the medieval or later remains are contained in the archive report (CA 2018b) which is available via the Archaeological Reports Online page of the CA website (https://reports.cotswoldarchaeology.co.uk/ – report no **18205**).

Early Neolithic (3800–3400 BC)

Neolithic remains comprised two adjacent pits, [105] and [107], within the southern half of the site (Fig 2). These have been dated by the presence of

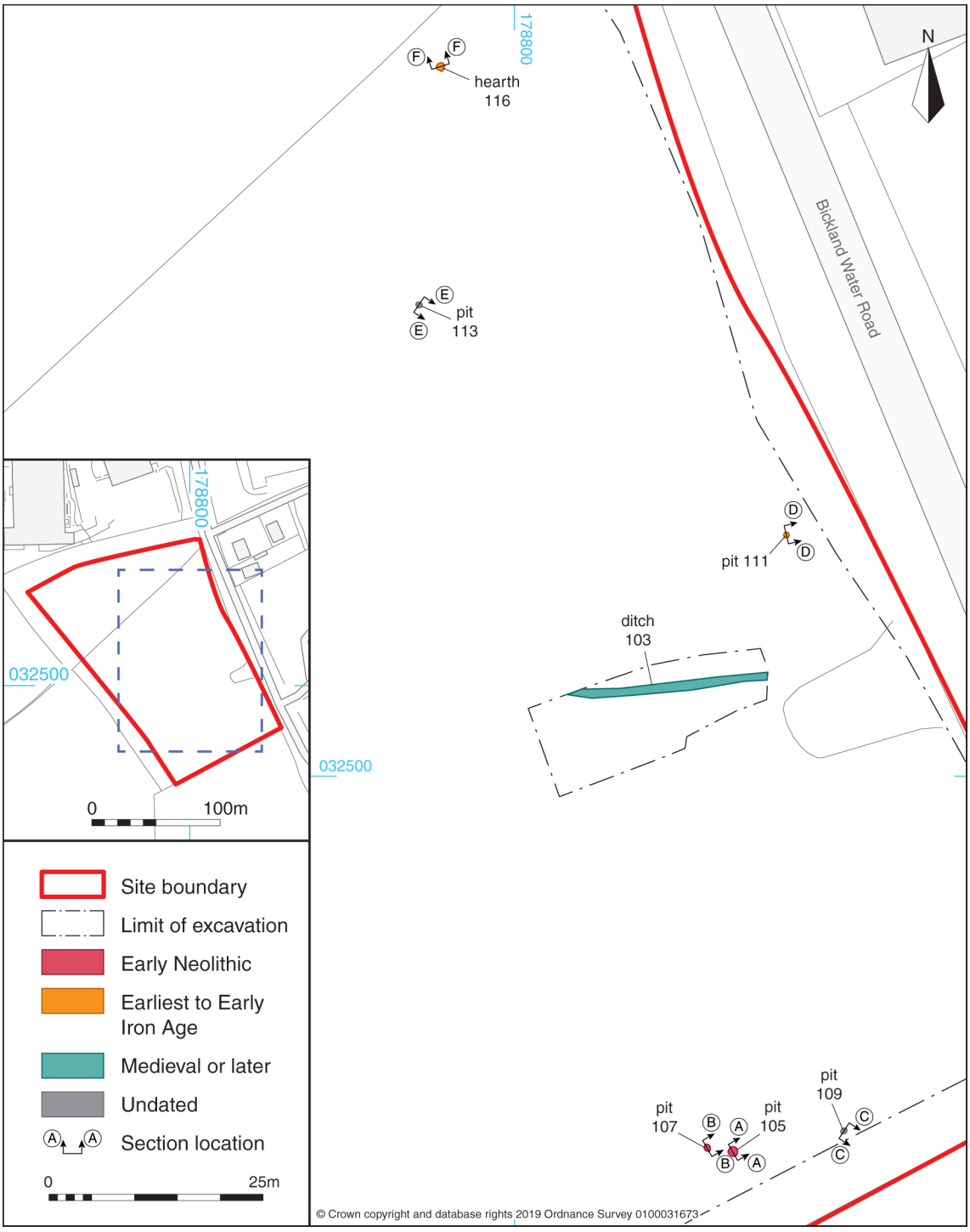

Fig 2 Site plan. [105] and [107], Early Neolithic pits; [111] and [116], Earliest/Early Iron Age pit and hearth; [109] and [113], undated pits.

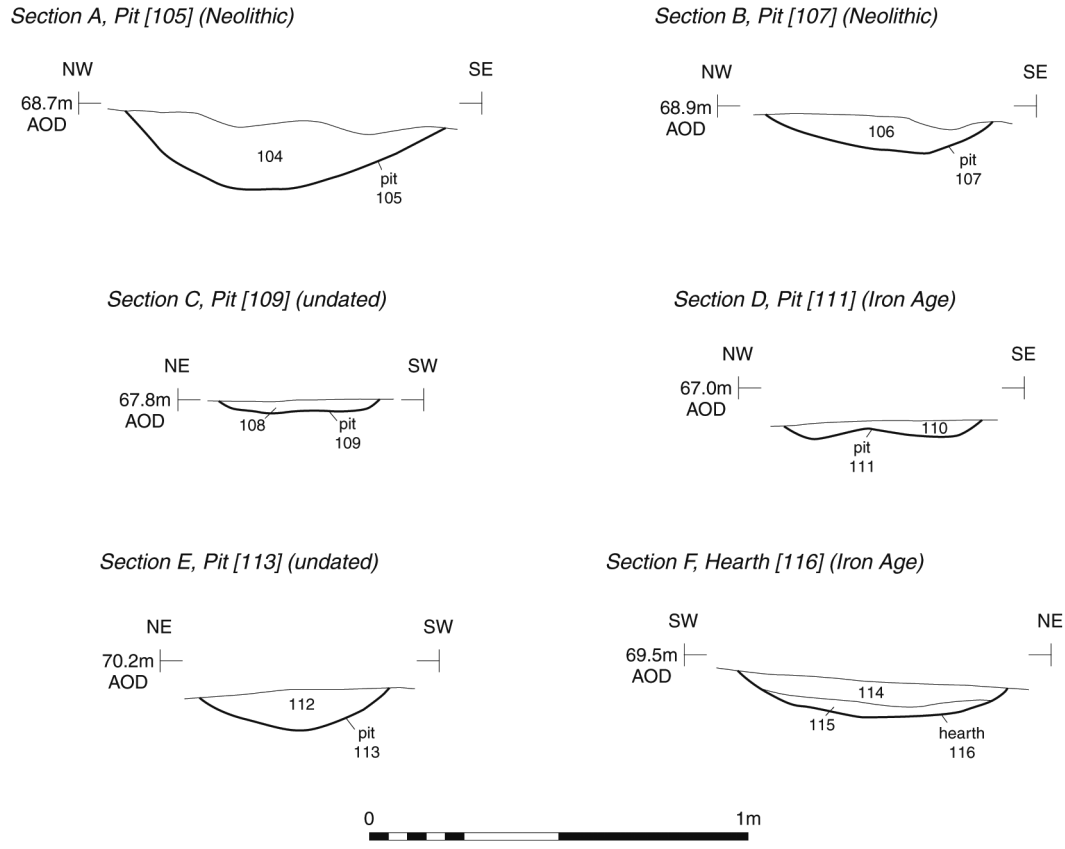

Fig 3 Sections through pits and hearth.

pottery which includes three fabrics, all made using gabbroic clays and showing features characteristic of the Early Neolithic period. The vessel forms recorded were bowls, including one, from pit [107], with a trumpet lug, the smallest Early Neolithic bowl with such a lug yet discovered (Quinnell, below; Fig 4).

The pits were circular with bowl-shaped profiles and were 0.6m to 0.85m wide and up to 0.2m deep (Fig 3, sections A and B). Both contained homogenous clay silt fills; that within pit [105] produced 53 sherds of pottery (389g) from at least three different vessels and including all three of the Early Neolithic fabric types mentioned above. The fill also produced a flint flake and a microdenticulate flint, a tool type thought to have been used for plant processing (Fig 5.1). Pit [107] also produced flints and pottery, the latter with a relatively large sherd size (13 sherds, 189g) and derived from at least three different vessels. The flints from this pit include a blade, a flake and two microdenticulates (Fig 5.2). No biological remains were found within these pits.

Earliest Iron Age to Early Iron Age (800–400 BC)

Two features have been dated to the earlier part of the Iron Age on the basis of radiocarbon determinations. The dates obtained fall within the range of 778–406 cal BC and thus within the Earliest to Early Iron Age period. Both features were located within the northern half of the site but were 75m apart (Fig 2).

Pit [111] was a small irregular-based cut 0.55m wide and 0.05m deep (Fig 3, section D) and contained a charcoal-rich fill (110). A sample from this produced charcoal dominated by oak

heartwood (*Quercus)*, with some blackthorn (*Prunus cf. spinose*), blackthorn / cherry (*Prunus*) and hazel (*Corylus avellana*) roundwood; charred food remains were absent. A blackthorn roundwood fragment from this deposit was radiocarbon dated to 778–490 cal BC (SUERC-87419).

Hearth [116], 75m north west of pit [111], was a circular, bowl-shaped cut and was 0.7m wide and 0.1m deep. The substrate around its base had been scorched and above this was a charcoal-rich lower fill (115) which was overlain by dark clay silt fill (114) (Fig 3, section F). A sample from the lower fill produced oak charcoal, mostly from heartwood, but with sapwood and roundwood also present. The oak sapwood produced a radiocarbon determination of 751–406 cal BC (SUERC-87420).

Undated

Pit [109] (Fig 2; Fig 3, section C) in the southern half of the site and pit [113] (Fig 2; Fig 3, section E) in the northern half remained undated. Both were small bowl-shaped cuts comparable to the Neolithic and Iron Age pits, although neither showed evidence for scorching or contained burnt material and were instead filled with silty clay deposits. The former was located close to the dated Neolithic pits and may have been contemporary while pit [113] was located between the two dated Iron Age features and was perhaps associated with them, but in neither case can this postulated dating be anything more than speculative.

The finds

Prehistoric pottery

Henrietta Quinnell with petrographic comment by Imogen Wood

The assemblage

The assemblage consists of 66 sherds (578 grams) of Early Neolithic gabbroic fabrics.

FABRICS

Fine gabbroic

This corresponds to that described from thin-section study by Taylor (2006, Fabric 1) at Portscatho, Gerrans.

Gabbroic with additions

Fabric 1. Inclusions 20 per cent. Predominant feldspar pieces, off-white sub-angular to sub-rounded between <1mm and 3mm in size. Common angular opaque quartz between 2mm and 11mm. Few black iron rich ilmenite sub-rounded in shape <1mm in size. The feldspar rich clay matrix suggests a gabbroic clay with crushed quartz, possibly locally sourced, added as temper.

Fabric 2. Inclusions 25 per cent. Predominant feldspar, sub-angular between <1mm and 2mm in size; rare examples of feldspar 4mm in size. Very few rock fragments composed of quartz, feldspar and tourmaline, sub-angular 2mm–5mm. Few well-rounded dark red iron rich inclusions 1mm in size. Common tourmaline black single cleavage visible sub-angular <1mm in size. Rare biotite mica cleavage flake <1mm in size. Clay matrix contains fine quartz, biotite mica and feldspar, suggesting a gabbroic clay with the addition of local granitic sand.

Comment. Both fabrics are formed from gabbroic clay with either crushed quartz crystal added as in Fabric 1 or granitic derived sand used as tempering material in Fabric 2. The granitic sand could have derived from the relatively local Carnmenellis granite.

FORMS

Fill (104) of pit [105]: fine gabbroic sherds include a simple rim from an open bowl, probably approximately 200mm diameter, and a sherd with external 'black paint'; other gabbroic sherds come from bowls in two different gabbroic fabrics. Some of these sherds have random pre-firing blocks of lines on parts of their interiors.

Table 1 Details of pottery (sherds/grams). Mean sherd size 8.7g

Context	*Details*	*Fine gabbroic*	*Gabbroic with additions 1*	*Gabbroic with additions 2*	*Total*
(104)	fill of pit [105]	21/153	13/94	19/142	53/389
(106)	fill of pit [107]	12/180		1/9	13/189
Totals		33/333	13/94	20/151	66/578

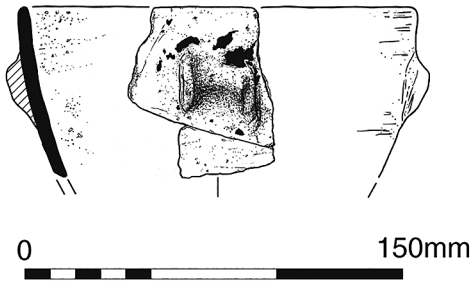

Fig 4 Early Neolithic fine gabbroic vessel from pit [107]: 'black paint' indicated. Scale 1:3. (Drawing: George Scott).

Fill (106) of pit [107] (Fig 4): two conjoining sherds, fine gabbroic fabric, from a small bowl around 160mm diameter with an imperforate trumpet lug set horizontally just below the rim; traces of 'black paint' on exterior. Also rim sherds from two similar open bowls of rather larger diameter, one fine gabbroic and one gabbroic with additions.

Comment

This small assemblage belongs comfortably with Early Neolithic south-western bowl material now known from more than a dozen Cornish locations, mostly from sites with small numbers of pits. The closest of these in location is that at the PAC site at Tremough (Penryn), some 3 km to the north west (Quinnell 2015). There two pits each produced similar dates calibrating to 3604–3378 cal BC. The mean sherd size was 6g and, as at Bickland, this size and the rarity of distinctive pieces argues against special deposition of particular pieces. The PAC assemblage was of mixed gabbroic and granite derived fabrics. Generally in Cornwall, detailed modern analysis demonstrates that assemblages are predominantly of gabbroic fabrics, but often those mixed with other more local components (Quinnell 2006; Quinnell and Taylor 2016, fig 3.1). The Bickland assemblage consists only of simple open bowls but is so small that the absence of other forms, most notably carinated bowls, is not significant.

Imperforate lugs of 'trumpet' shape with expanded ends, considered typical of the south-west or Hembury style, are rare compared to perforate examples, as shown at Carn Brea (Smith 1981, fig 66 P5, P11 and P15). The example from Bickland comes from a vessel which is small for its shape, only a little larger than Smith's 'cups', defined as bowls less than 120mm diameter (*ibid*, 162). The vessel appears to be the smallest recorded with a trumpet lug. The 'black paint' is of regular if not frequent occurrence on gabbroic vessels of this period and is also known from Carn Brea (Helman Tor; Smith 1997, 33–4) and Tregarrick Farm (Roche; Quinnell 2002/3). At Carn Brea, the 'black paint' was analysed and shown to consist largely of carbon (Smith 1981, 170–2) but no subsequent work has been carried out.

Lithics

Jacky Sommerville

The small lithics assemblage consists of six worked flints (9g) from two deposits. From pit [105] are a microdenticulate in two pieces (Fig 5.1) and a burnt medial fragment from a flake or blade. Pit [107] produced two microdenticulates (Fig 5.2) and two flakes, all of which are broken except for one flake. The flakes are not chronologically diagnostic.

Microdenticulates are thought to have been used for the processing of siliceous plants but not for harvesting (Jensen 1994). Although in use throughout the Neolithic and into the Bronze Age (Saville 2002, 96), these tools are particularly common in Mesolithic and Early Neolithic assemblages (Pitts and Jacobi 1979, 173). The use of blade blanks for two of the three microdenticulates makes Mesolithic or Early Neolithic dating most likely for these items. Pottery of Early Neolithic date was also recovered from both of these pits.

Illustration catalogue

1 Pit [105], fill (104). Microdenticulate in two refitting pieces with one fragment missing from the centre. There are quite fine but heavily worn serrations on the right dorsal edge.
2 Pit [107], fill (106). Microdenticulate made on a blade blank with both ends missing, and proximal fragment of a microdenticulate made on a flake blank. Both are serrated bilaterally, worn and display silica 'gloss'.

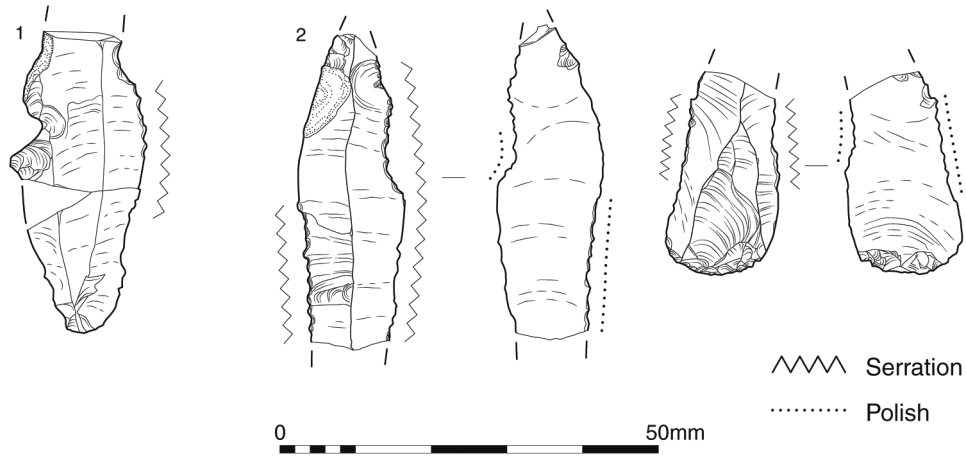

*Fig 5 Selected flints. **1**, microdenticulate from pit [105]. **2**, microdenticulates from pit [107]. (Drawing: Aleksandra Osinska.)*

The biological evidence

Sheila Boardman

Soil samples from a pit and a hearth were assessed; both features are dated to the Earliest to Early Iron Age. There were no deposits suitable for sampling from any of the other pits and neither of the samples produced charred plant remains other than charcoal (Table 2).

Fill (110) of pit [111] produced a mixed deposit, largely of oak (*Quercus*) and probable blackthorn (*Prunus cf. spinosa*). Some blackthorn / cherry (*Prunus*) and hazel (*Corylus avellana*) charcoal was also present. Oak was represented largely by timber heartwood fragments, around 50 per cent of which had very dense, narrow growth rings, which may be indicative of growth in closed forest conditions. The other heartwood fragments had wider growth rings, so probably represent faster grown timbers. One fragment of possible oak root wood was seen. The probable blackthorn, blackthorn / cherry and hazel remains were represented largely by roundwood. Probable blackthorn roundwood fragments had two to eight surviving growth rings, while those of blackthorn / cherry and hazel had three to seven and four to twelve rings respectively.

Fill (115) of hearth [116] produced oak charcoal, again largely from heartwood, although none of the fragments had the very dense growth rings seen on fragments from pit [111]. Around 12 per cent of the oak fragments were from sapwood or roundwood. The roundwood fragments generally had three to six surviving growth rings but no surviving pith or bark.

Radiocarbon dating

Emma Aitkin

Radiocarbon dating was undertaken in order to confirm the date of pit [111] and hearth [116] (Table 3). The samples were analysed during June–July 2019 at Scottish Universities Environmental Research Centre, Glasgow (SUERC). The methodology employed by SUERC Radiocarbon Laboratory is outlined in Dunbar *et al* (2016). The uncalibrated dates are conventional radiocarbon ages. The radiocarbon ages were calibrated using the University of Oxford Radiocarbon Accelerator Unit calibration programme OxCal v4.3.2 (2017) (Bronk Ramsey 2009, updated 2017) using the IntCal13 curve (Reimer *et al* 2013).

Discussion

The project successfully recorded and analysed the archaeological remains within the site, and afforded the opportunity to undertake radiocarbon dating associated with Earliest to Early Iron Age features.

Table 2 Charcoal

	Sample No	*1*	*2*
	Context No	*(110)*	*(115)*
	Feature No.	*[111]*	*[116]*
	Feature type	*Pit*	*Hearth*
	Period	*EIA*	*EIA*
	Soil volume (litres)	*10*	*10*
Rosaceae			
Prunus cf. *spinosa* type	cf. blackthorn type	12r	-
Prunus sp.	blackthorn/cherry	4r	-
*Pomoideae		1	-
Fagaceae			
Quercus	oak	76h(sr)	114hsr
cf. *Quercus*	cf. oak	1rt	
Betulaceae			
Corylus avellana L.	hazel	14r	-
Indeterminate charcoal		1b	
No. of fragments examined		*109*	*114*

Key: Counts include: h – heartwood; s – sapwood; r – roundwood; rt – root wood; b – bark. *Pomoideae may include: *Pyrus* (pear), *Malus* (apple), *Crateaegus* (hawthorn) & *Sorbus* (rowan, service, whitebeam) species.

Table 3 Radiocarbon dating results

Feature	*Lab. no.*	*Material*	*Radiocarbon age BP*	$\delta^{13}C$	*Calibrated radiocarbon age 95.4% confidence, cal BC*	*Calibrated radiocarbon age 68.2% confidence, cal BC*
Fill (110) Pit [111]	SUERC-87419	Charcoal: Blackthorn (roundwood) (*Prunus* cf. *spinosa*)	2487±30	–27.0‰	778–508 (94.6%) 500–490 (0.8%)	761–732 (11.9%) 691–660 (11.5%) 650–544 (44.8%)
Fill (115) Hearth [116]	SUERC-87420	Charcoal: Oak (sapwood) (*Quercus*)	2433±30	–25.0‰	751–683 (20.8%) 669–638 (7.3%) 622–617 (0.4%) 591–406 (66.9%)	727–718 (3.8%) 705–695 (4.5%) 541–415 (59.9%)

Early Neolithic

The earliest remains comprised pits [105] and [107] which produced Early Neolithic pottery as well as flints datable to the Mesolithic to Early Neolithic periods. Among the flints were microdenticulates used for plant processing and these, together with the pottery, point to domestic occupation. While Neolithic Cornish houses have been suggested at Penhale (St Enoder) on the Indian Queens bypass (Nowakowski 1998; Nowakowski and Johns 2015), and at Tregunnel, Newquay (Brindle, in preparation), Early Neolithic settlement is more commonly evidenced only by the presence of pits. These used to be a rare discovery in the region, but are being revealed in increasing numbers by development-led archaeology (listed for example by Jones *et al* 2015, 160–3, fig 11.1, table 11.1; Jones 2017, 191–3, table 3). The nearest examples include a group of three pits with Early Neolithic pottery just 500m to the south at Menehay Farm (South West Archaeology 2016) and a pair of Early

Neolithic pits recorded at Tremough, Penryn (Jones *et al* 2015, 17; Jones and Gossip 2007), 3 km from Bickland, with further examples at Higher Nansloe Farm, Helston (Hart 2020), 13.5 km south west of Bickland. Middle Neolithic pits (*c* 3400–2900 cal BC) are known from Tregurra (Truro), 16 km north east of Bickland, at Metha (Newlyn East), 24 km north east of Bickland, and also at Trenowah, St Austell, 33 km north east of Bickland (Jones 2017, table 3), and at Hendra Road, Stithians (Stansbie *et al* 2018), 7 km north west of Bickland.

Such pits are widely recorded across parts of Britain. Most are small bowl-shaped or irregular cuts, although their morphologies vary greatly. Some produce charcoal and a few finds while others are devoid of finds and are dated by association with other features or by radiocarbon assay on charred remains or bone. Recent interpretations (for example, Carver 2012, 111; Thomas 2012, 2) postulate that such pits were specially excavated to receive token handfuls of household waste, rather than 'special' items, ceremonially deposited to mark episodic periods of occupation. This interpretation has been applied to Cornish examples (Jones and Quinnell 2011, 202) and can stand for the Bickland pits with their ceramic sherds from several different bowls.

Earliest to Early Iron Age

Pit [111] and hearth [116] are dated to the Earliest to Early Iron Age on the basis of radiocarbon assay (Table 3). They are similar in date to a single pit at Hendra Road, Stithians, which had an Earlier–Early Iron Age radiocarbon date of 805–551 cal BC (SUERC-73444) and contained an Early Iron Age rim sherd (Stansbie *et al* 2018). This pit had a scorched base, like hearth [116], but the charcoal was more like that from pit [111], being predominantly oak but also including blackthorn and hawthorn: 'fuel sourced from oaks, supplemented by roundwood from scrub or hedgerow type environments' (Challinor 2018). With its scorched base and oak charcoal, hearth [116] is perhaps more comparable to a scatter of pits at Grampound, two of which were radiocarbon-dated to the Middle Iron Age (Lawson-Jones and Jones 2016).

The specific function and context of the pit and hearth are unknown but the features are significant, in that remains of the Earliest–Early Iron Age are poorly represented to date in Cornwall (Quinnell 2011, 233–5). However, Iron Age pottery types pre-dating *c* 400 cal BC have been identified from a range of sites, including cliff castles (Trevelgue Head, Gurnard's Head and Maen Castle), on multi-phase prehistoric settlement sites (for example, Bodrifty and Nornour) and at sites associated with fogous (Carn Euny, Halligye and Boden) (*ibid*). Earliest Iron Age pottery was found in the ditch terminals of a ritual enclosure at Nansledan, Newquay (Rainbird and Pears 2017), and Hay Close, Newlyn East, another ritual enclosure, is dated to the Earliest–Early Iron Age by a radiocarbon date of 770–410 cal BC (SUERC-17652; Jones 2014).

Other Early Iron Age sites have also been discovered recently in the Budock area. What seems to have been an Early Iron Age ditched enclosure was found during evaluation work at Pen Bethan, Budock, some 850m north east of the current site (AC Archaeology 2019). A further 120m north east of the possible enclosure at Pen Bethan, a possible Iron Age 'round' enclosure has been identified at Kergilliack Corner, Budock, together with a small number of pits, a gully and a ditch which may date to the Early Iron Age (AC Archaeology 2018). That these remains may have lain within what became a managed landscape is suggested by the discovery of late prehistoric or Roman-period sub-rectangular fields 350m south of the current site at Menehay Farm (Bampton 2016), although the interpretation and relative phasing of all of these sites is currently unclear.

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Beneath the sands: a placed Beaker pit deposit at Tyringham Road, Lelant, Cornwall

ANDY M JONES AND ANNA LAWSON-JONES

with contributions from DANA CHALLINOR, HENRIETTA QUINNELL and CLARE RANDALL

Cornwall Archaeological Unit undertook a watching brief at Tyringham Road, Lelant, during groundworks associated with a housing development. The most significant discovery was a pit associated with Beaker pottery and a worked stone assemblage. An initial date on charcoal from the pit produced an Early Neolithic radiocarbon determination, reflecting much earlier activity than the pottery. Interestingly, the pit was overlain by deposits of sandy soils which had preserved a quantity of animal bone. Animal bone rarely survives in Cornwall's harsh acidic soils, so a few fragments were submitted for radiocarbon dating. These produced a later medieval date, with a range from the mid-fifteenth to early sixteenth century AD.

In September 2018 Cornwall Archaeological Unit (CAU) was commissioned by Gilbert and Goode to undertake a watching brief at Tyringham Road, Lelant (SW 5437 3741) in advance of development. The site comprises a 1 ha field to the north of Tyringham Row on the western side of Lelant (Fig 1).

The site drops from 43m above Ordnance Datum in the west to 36m in the north-eastern corner. From the western side there are views out to the north across St Uny's church towards Porth Kidney Sands, Hayle Towans and the sea, which is located approximately 1 km away. The Hayle estuary, historically an important waterway (for example, Hencken 1932, 94), lies approximately 500m to the east. The site lies just beyond the south-western end of the major dune system or towans which extend around the shores of St Ives Bay from Gwithian in the east. The dune systems along the north Cornish coast are important curators of archaeological deposits. They bury sites and their calcareous character preserves certain types of organic material, such as bone, which do not usually survive elsewhere in Cornwall's acidic soils (for example, Nowakowski *et al* 2007; Walker 2018; Straker and Walker 2018). Historic mapping does not indicate that the towans extended into the area of the site, although sandy layers were uncovered across the stripped area and sand continues to blow across the site. Prior to development the field was under pasture and had been used for grazing, although it had been ploughed in the past.

The site is located near to the medieval settlement of Lelant, first recorded as *Lananta* in AD 1170 (Padel 1988, 108). The name is Cornish, containing the element *lann* meaning 'enclosed cemetery', and an early saint's name *Anta* forms the second part. No archaeological remains were known within the boundary of the development; however, the site is situated within an area of

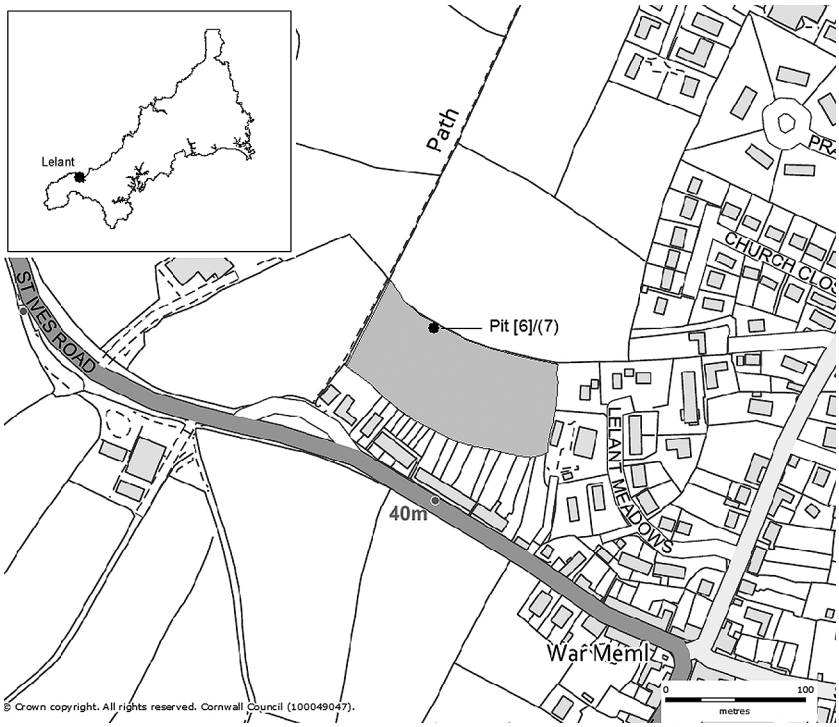

Fig 1 Location map.

significant archaeological potential, lying within Anciently Enclosed Land (Cornwall County Council 1996). This is land that has been settled since at least the medieval period and which often contains buried archaeological remains dating to prehistoric, Roman and medieval times. The site itself is situated within a field system of medieval origin (Cornwall and Isles of Scilly Historic Environment Record (HER) MCO 21163).

Several archaeological sites have been recognised in the surrounding area (Lawson-Jones 2019). These include a lithic scatter in the towans 500m to the north (MCO 6694), a documented probable later Iron Age or Romano-British enclosed settlement or 'round' (MCO 8060) approximately 50m to the south east of the site and a Roman coin, a *statera*, was found roughly 200m to the north west of the development area (MCO 45410). Two sherds of Roman-period pottery were recovered during the watching brief; these were, however, redeposited and associated with post-medieval artefacts (Lawson-Jones 2019) and are not discussed further.

Results from the watching brief

The fieldwork project led to the recording of a range of archaeological features, including several pits and ditches. Most were devoid of finds, however, and so remain undated. All the recorded features are described in the project archive report (Lawson-Jones 2019). This paper discusses a Beaker-associated pit [6] and the overlying sandy deposits (2) / (3) containing animal bone which covered the site.

Windblown sand layers

The depth of topsoil and windblown sand deposits overlying the natural varied considerably across the field, from 0.3m along parts of the northern side of the field, where pit [6] was located, to 1m deep along much of the southern and eastern side.

Four main layers, contexts (1) to (4), were identified overlying the site. At the top of the soil profile was topsoil and turf deposit (1), a dark brown loam ploughsoil which produced occasional mixed post-medieval and modern finds, including glass and china (Lawson-Jones 2019). Beneath

the topsoil was a windblown sandy loam, layer (2). This was patchy in nature, in places forming distinct pockets but in other areas just a thin spread. It was always identifiable as having 70 per cent or more sand content and varied from pale yellowish-grey to pale brownish-grey in colour. Where loamy it often included animal bone and occasionally pottery of medieval and later date, reflecting its alkalinity and the intermixing of midden material with former ploughsoil (3).

The old ploughsoil, layer (3) was a variably sandy mid-brown clay loam. Layers (2) and (3) contained medieval and post-medieval pottery, stone, occasional shells, clay pipe fragments and, significantly, animal bone. They also contained a small number of uniformly heavy, rounded, dark, dense pebbles / cobbles which had been introduced to the site during the medieval period or earlier. These include five greenstone cobbles, a large sandstone-like possible hammerstone and other gritstone pebbles and cobbles. Potential use-wear and damage was noted on nine of these stones but this was not datable. Most were fist sized but their function is uncertain. Few showed concentrated wear or breakage and none were burnt, but their uniformity could suggest deliberate selection. Smaller, more variable pebbles and stones suggest the use of seaweed in manuring. A total of 56 animal bones were recorded, derived from loamy pockets of (2) and sandier pockets of (3) (Randall, below). A radiocarbon determination was obtained on animal bone fragments from layer (2) / (3): 415 ±26 BP, cal AD 1433–1512 (89 per cent probability) (SUERC-90378). This dates the sand inundation layer to the later medieval period.

Below layers (2) and (3) was old land surface (4). This was a compacted, ginger-brown clay loam found across the site. A number of large stones, up to 0.3m in size, were recorded sitting on the natural, within (4) and at the base of (3). These did not appear to be structural or to form obvious alignments, but were sometimes visible as very loose scatters. It is possible that they had been associated with clearance cairns, or remnant ploughed-out boundaries.

Below the old land surface was (5), which represented the natural. Across the site this varied from dense orange clays to shattered blue-grey killas.

Pit [6]

Pit [6] was located on the northern side of the stripped area, sealed beneath the ploughsoil (1) and sandy layers (2) / (3). It was cut into natural geology (5), measured 0.7m in diameter and was 0.16m deep (Fig 2). The base was gently rounded and near flat, and the sides were steeply concave. The pit contained a single fill (7), a mixed, slightly stony, sandy clay-loam, mid-ginger-brown in colour, containing small charcoal lumps and flecks. Around 45 sherds of Beaker pottery were found in a group on the base of the pit. It appeared to be a deliberate deposit (Fig 3), as the sherds probably all derived from the same vessel (Quinnell, below). The flints (**L2**, **L3**, **L5** and **L6**) and stonework finds (**S1**, **S2** and **S3**) also appeared to be arranged around the bottom edge of the pit. It is notable that two of the flints (**L2** and **L5**) are likely to have come from the same core (Lawson-Jones, below). Interestingly, a Middle to Late Neolithic flint end scraper (**L3**) was also recovered from the pit, which might imply that it had been curated (see discussion below). An initial radiocarbon determination obtained on *Corylus* from this deposit, 4963 ±26 BP, 3794–3662 cal BC (SUERC-90379), dated the charcoal in the pit to the first half of the fourth millennium cal BC, the Early Neolithic. This is much too old for the artefacts found within the pit and is likely to be derived from earlier occupation in the area.

Fig 2 Pit [6] after excavation.

Fig 3 Pit [6] showing the location of finds recovered from it.

Prehistoric pottery and worked stone

Henrietta Quinnell

The finds came from single fill (7) within pit [6].

The pottery

This totalled some 45 sherds, including two from the rim of a Beaker vessel, with horizontal lines of square-toothed comb impressions. The initial impression is that they all come from the same vessel with a slightly out-turned rim, a vessel which would more probably date in the earlier part of the Beaker sequence (Needham 2005).

The fabric is similar to other Beaker fabrics, with moderate inclusions <2mm. These include mica and some other material such as feldspar ultimately derived from granite and small shale fragments. The components from granite are not in sufficient quantity to merit the description of 'granite derived' and the fabric may not be immediately local.

Stonework

S1 (Fig 4) Beach cobble 104mm x 76mm x 40mm 643g, of greenstone, possibly volcanic tuff, the rock being sufficiently hard to take a high polish naturally. One flat surface has a scatter of anvil pitting producing a roughened area. Both ends have extensive use from hammering and pestle-type grinding, the latter producing a flattened bevel. The nature of the hammer / pestle use suggests utilisation with a hard material such as rock rather than soft material such as grain.

S2 (Fig 4) Fragment, present dimensions 60mm x 40mm x 17mm, 72g, flat beach cobble, contact metamorphic siltstone which includes veins of tourmaline; these have weakened the stone, causing it to crack. The 'polish' as on **S2** occurs naturally on a hard rock and may not be as a result of use-wear. There are no definite signs of use.

S3 (Fig 4) Tabular beach cobble of fine-grained siltstone, 72mm x 40mm x 11mm, 53g. Scatter of small anvil marks on narrower part of one flat face and a wear facet across part of one end.

*Fig 4 Stone objects. **S1** greenstone cobble, with hammerstone and pestle use; **S2** beach cobble; **S3** cobble, with anvil marks.*

Flint

Anna Lawson-Jones

A very small assemblage of five worked flints was recovered during the fieldwork. Four were stratified and came from pit [6], fill (7); the fifth, **L1**, was unstratified and recovered during the wider watching brief. All are shown on Figure 5, together with **L4**, one of two unstratified chert pebbles, which could have been introduced to the site as raw material, as a sling stone or by accident with seaweed during soil improvement.

Pit [6]

Pit [6] / fill (7) produced four worked flints (**L2, L3, L5** and **L6**). Three of these (**L2**, **L5**, **L6**) appear fresh and unabraded with no cortex and are dark mottled grey in colour. **L2** and **L5** are likely to have come from the same pebble core. The larger piece (**L6**) is a uniform milky grey with a distinctive pale inclusion visible on both faces.

L2 – Small, complete end scraper with one partial denticulated edge (31mm by 19mm by 6mm; 3.8g). This piece is short, thin and will not have been suitable for heavy use. Slight abrasion of the distal 45 degree scraper edge and one lateral projection indicates at least short-term usage.

L5 – Sharp, angular, minimally worked possible point (40mm by 29mm by 8mm; 7g). This piece has irregular, jagged edges and has been removed by hard hammer from a multi-platform flake core. The point itself is missing but is suggested by the remaining associated retouch.

L6 – Multi-purpose knife and end scraper (41mm by 28mm by 8mm; 8.6g). The rounded scraper end shows limited but controlled 45 degree retouch. There is no clear evidence for use, despite

the break or snap on its right dorsal edge. The complete convex side of the tool is a knife with uneven patchy retouch and minimal use-wear. The ventral face was formed by a large hard hammer flake removal.

The fourth piece, **L3**, is much paler, thicker, largely cortical, and shows incipient repatination.

L3 – Thick, simple, complete, comfortable to hold end scraper (49mm by 25mm by 18mm; 23.3g). Very steep, near 90 degree retouch at its distal end. Removals along the working face are limited and functional, forming a slightly denticulated working edge. Tiny, probable use-associated removals or wear suggest plane-like use.

Unstratified piece

This unstratified worked flint is made on a thick, cherty, pebble flint flake. It came from the southern half of the field and was probably associated with plough horizon (3).

L1 – Complete, cortical end and side scraper with distal and lateral retouch (35mm by 28mm by 12mm; 14.9g). The long, worked edge has 60 degree retouch and the slightly denticulated distal end has steeper 85 degree retouch. The whole piece is abraded but not broken, suggesting long-term exposure and / or disturbance from ploughing associated with layer (3). It is likely to be of Neolithic date.

Discussion

The three grey pieces of flint (**L2**, **L5** and **L6**) are all considered to be contemporary with pit [6] and fill (7). All are Early Bronze Age in character and three of the four were used as scrapers. Scrapers are associated with a range of functions (for example, Butler 2005), including wood, bone and leather working as well as food preparation.

The larger piece (**L3**) is different, despite coming from the same fill. It pre-dates the other flints from the pit and is of broadly Middle to

*Fig 5 Flints **L1**, **L2** and **L3** (top row, left to right), **L4**, **L5** and **L6** (bottom row). **L1** was unstratified, **L2**, **L3**, **L5** and **L6** came from pit [6]; **L4** is one of two unstratified chert pebbles.*

Late Neolithic date. Its inclusion within the fill is suggestive of curation. It may have been found in the immediately surrounding area, given the presence of **L1** (and perhaps **L4**, as well as other undated stone within the unstratified assemblage).

Other unstratified stone in the wider assemblage includes quartz, quartzite, chert and other pebbles and cobbles. Some may represent raw material for modification and subsequent use, for example as smoothers, polishers, game pieces or slingshot. Pebbles interpreted as slingshot have been found in association with a number of prehistoric sites, but particularly hillforts such as Danebury and Maiden Castle (Finney 2006, appendix 1.1; Cunliffe 2005; Brown 1984). In addition, at least some of the pebbles are likely to have been brought in during the medieval and later periods with seaweed, which was historically used to improve and fertilize soils.

Animal bone

Clare Randall

The small animal bone assemblage from Lelant was recovered from a number of locations within the sandy contexts (2) / (3).

Methods

Each bone fragment was identified where possible to element and species, and, where this was not possible, to Large Mammal (for example, cattle sized), Medium Mammal (for example, sheep sized, but potentially pig) and Unidentified mammal categories. All data were recorded in an Access relational database. Identification was carried out using comparative collections and with reference to Hillson (1992) Schmid (1972) and Hillson (2005) for domestic mammals. Zones were recorded where possible for each anatomical element using the Maltby / Hambleton method (nd).

Where available, the sheep / goat tooth wear was assessed using Grant (1982), and Payne (1973; 1982). Hambleton (1999) was also used in assigning these to a category. Bone porosity was recorded for all fragments and each fragment examined for fusion information. Fusion was examined for each fragment and assigned to age ranges (Silver 1969). The percentage of the element present was estimated and recorded to the nearest 10 per cent for all identified fragments. Each fragment was also examined for pathological changes, breakage patterns, gnawing and weathering indicators. The condition of all fragments was assessed on a five-point scale through poor, poor–average, average, average–good and good. No metrical information could be recorded.

Results

The assemblage from Lelant comprised a total of 56 fragments of disarticulated and commingled animal bone (Table 1) from layers (2) / (3), albeit from different locations.

Preservation and taphonomy

The condition of the bone was consistently poor–average with fragmented remains. No associated bone groups were noted. In total 18 per cent of the material was identified to species, which is understandable given the condition of the material. There were two loose teeth. A single helical break associated with breakage of the bone when fresh was noted and there were five examples of butchery (Table 2). These, notably, were all related to sawing through fragments, mainly the shafts of long bones of larger mammals / cattle, although this also included a sheep tibia and a fragment of deer antler. Representation of less obvious butchery may well have been affected by the surface condition of the bone. Fifty-one fragments (96 per cent of the total assemblage) demonstrated taphonomic change with all fragments root etched.

Table 1 Species representation

Species	*NISP /No*	*MNI*
Cattle	5	1
Sheep / goat	4	1
Main total	***9***	
Large mammal	14	-
Unidentified mammal	32	-
Unidentified total	***46***	
Shell	*1*	
Total	56	

NISP (number of identified specimens) and MNI (minimum number of individuals).

Table 2 Butchery

Species	*Element*	*Cut type*	*No of cuts*	*Direction**	*Comment*
Cattle-sized mammal	Tibia	Saw	1	---	Through shaft
Cattle-sized mammal	Ulna	Saw	1	---	Through shaft
Cattle-sized mammal	Long bone	Saw	1	---	Through shaft
Cattle	Ulna	Saw	1	---	Through articulation
Sheep	Tibia	Saw	1	---	Through shaft

*Direction in relation to normal anatomical position

Species representation

The assemblage comprised five fragments of cattle bone and four fragments of sheep / goat (neither sheep nor goats were positively identified). Fourteen further fragments related to a cattle-sized mammal.

Element representation and distribution, age, metrics, and pathology

The range of elements represented is limited and comprises limb bones and teeth. All of the fragments are from the most robust and larger elements of the skeleton. The element distribution is therefore entirely related to the preservation conditions. No measurements could be taken and no pathology was noted.

CATTLE

Five fragments of cattle bone were recovered. A single radius fragment was fused proximally, and therefore came from an animal of at least 12 to 18 months. Two mandibular teeth could be assessed for wear, with a first molar at wear stage 'l' and second molar at wear stage 'k', both consistent with an adult but not elderly animal. A cattle ulna had been sawn through at the articulation. In addition, 14 cattle-sized mammal fragments were recovered. Three of these fragments had been sawn through, one a tibia fragment, one a fragment of pelvis, and one a long bone. A single fragment of long bone displayed a break which probably occurred when the bone was fresh.

SHEEP / GOAT

Sheep / goat were represented by four fragments, all of them tibiae. None of the sheep / goat elements could be positively identified as either sheep or goat. No ageing information was available. One left tibia had been sawn through.

SHELL

A partial shell of a bivalve was noted, possibly a cockle.

Comment

This is a small assemblage of material which is in poor condition, fragmented and heavily affected by root etching. The material which has survived is entirely related to larger or more robust bones. However, despite the condition of the bone, a small amount of cattle and sheep / goat was represented and butchery was noted in five cases. In each case this was where a bone had been sawn through. This might have implied a relatively recent date for the material and deposit. However, saws have been used in butchery from the Roman period onward and the radiocarbon determination produced a later medieval date.

Charcoal

Dana Challinor

A single sample from Beaker pit [6] was examined for the characterisation of the charcoal and selection of suitable material for radiocarbon dating. Standard procedures for identification were followed, with the charcoal placed in a sand bath for examination at high magnification. The flot was small, with some modern roots, pupa cases and land molluscs. Charcoal was sparse, with only a few identifiable fragments, all of which were identified (Table 3). No stems or roundwood were observed, although the fragments were generally rather small. The largest fragments were of *Taxus baccata* (yew), which can be significantly long-lived and is therefore not suitable for dating purposes. Some of the species of the *Maloideae* (particularly hawthorn) can also be quite long-

Table 3 Charcoal from pit [6]

Charcoal	*Fill (7), sample 1*
Taxus baccata yew	4
Alnus/Corylus alder/hazel	2
Maloideae hawthorn, apple, whitebeams, etc.	1

lived, so the *Alnus* / *Corylus* was deemed the most appropriate material for radiocarbon dating. Since the individual fragments were quite small, both were selected and placed in a tube together. Although no confirmed differentiation between alder and hazel was made, the stubs of perforation plates observed in longitudinal section suggest that hazel may have been represented.

An additional bag (labelled slag) from the same context was examined. This contained a single fragment of charred, vesicular material; probably organic in origin, but unidentifiable.

The paucity of identifiable material in the sample limits interpretation, especially since there was a certain amount of intrusive material. Yew is an uncommon find in charcoal assemblages, presumably because the wood was not generally favoured for burning. In later periods, at least, the tree had a particular association with death, but it was also prized for making long-bows, with evidence from the Neolithic period (Gale and Cutler 2000). The presence of hazel and *Maloideae* type is typical for fuel residues and does not offer any indication of date.

Radiocarbon dating

The key aim was to obtain secure dating evidence from pit [6] and the sandy layers (2) / (3). The charcoal sample from fill (7) was a piece of *Corylus* (hazel) roundwood, which is a short-lived species. Three fragments of bone were also selected from sand-rich layers (2) / (3). The samples were submitted for accelerator mass spectrometry dating (AMS) at the Scottish Universities Environmental Research Centre (SUERC) (Table 4). The probability distribution has been calculated using OxCal (v4.3) and all radiocarbon determinations are quoted at 95.4 per cent probability throughout this paper unless otherwise stated.

Results

The radiocarbon determination SUERC-90379 from pit [6] fell in the first half of the fourth millennium cal BC. This is in the middle of the Early Neolithic and is similar to dates from other pit sites in Cornwall and tor enclosures (for example, Cole and Jones 2002–3; Whittle *et al* 2011). The date on the charcoal is interesting as it demonstrates a human presence on the site during the Early Neolithic; it is, however, much too early for the contents of the pit and must therefore be residual. An attempt was made to get a second date on the Beaker pottery through lipid dating. A sample number of Beaker sherds were submitted to Dr Julie Dunn at the University of Bristol. Analysis of these sherds, however, revealed that there was no evidence for the presence of lipids associated with use of the vessel.

The determination SUERC-90378 on the animal bone fragments fell in the later medieval period, with the weight dating to cal AD 1433–1512 (89 per cent probability). This is significant as there are few medieval faunal assemblages from Cornwall and it helps to date one of the periods of sand inundation or possibly soil enrichment which have occurred across the project area.

Discussion

The archaeological watching brief at Tyringham Road produced some very interesting results, most notably a Beaker-associated pit, which also contained an 'odd' or structured deposit of worked

Table 4 Radiocarbon dating from pit [6] and sand layer (2) / (3).

Feature	*Lab. no.*	*Age BP*	*Material*	*Calendrical years 95.4%*
Pit [6], fill (7)	SUERC-90379	4963 ±26	Charcoal: *Corylus* Hazel	3794–3662 cal BC
Layers (2) / (3)	SUERC-90378	415 ±26	Animal bone fragments	Cal AD 1433–1512 (89%) 1601–1616 (6.4%)

and visually distinctive stones and flints, which form the focus for this discussion. The Beaker is undated but is likely to belong to the earlier part of the period, *c* 2400–2100 cal BC (Jones and Quinnell 2011).

Pits dating from the Neolithic period onward have, since the advent of widespread developer funding in the 1990s, become a frequently uncovered site type, and consequently one of the main proxies for prehistoric settlement and ritualised activity (for example, Garrow 2012a; Noble *et al* 2016). Pits of the Neolithic period have attracted much discussion both within Cornwall and beyond, where their contents have often been discussed in detail in relation to the intentional placing of deposits (for example, Baczkowski 2019; Cole and Jones 2002–3; Taylor, forthcoming).

By comparison, Beaker period and Bronze Age pits, outside of those associated with metalwork (for example, Bradley 1990; Fontijn 2019), have seen less discussion, especially in terms of ritualised behaviour; although in Cornwall it is interesting to note that there is an abundant number of Beaker-associated pits; in the last review of the corpus of Cornish Beakers they were identified as being more commonly found in pits than, for example, in burial-related contexts (for example, Jones and Quinnell 2006; 2011). Indeed, the number of pits associated with usually incomplete Beaker vessels (Quinnell 2014; Jones 2019; 2021, 333) has grown exponentially since the last survey of Cornish Beakers, and there are also a far greater number of associated radiocarbon dates (for example, Taylor, forthcoming).

There are, however, notable differences in the way that artefactual assemblages came together within the pits. Some Beakers appear to have been deposited quite casually into the open pit cut, without much regard for how the sherds ended up in the pit. Examples of this type of casual discard can be found at, for example, Nancemere, Truro, or St Stephen-in-Brannel, where small pits containing jumbled sherds of Beaker were recovered (Gossip 2021; Quinnell 2014). Often these types of deposits are associated with charcoal and hazelnut shells that are likely to have been associated with the cooking of food and the charred remnants of a meal (Jones 2019). This type of deposit may therefore be regarded as what has been termed an 'average practice' (Garrow 2012b), produced by the clearing away of food waste in a particular ritualised manner. Indeed, several writers have drawn attention to the links between ritualised domestic practices and more formal structured ritual activity (Brück 1999; Bradley 2005), and they are probably best considered as being part of a sliding scale (Thomas 2012), ranging from casual discard to formal deposition.

In fact, comparatively few Beaker pits in Cornwall, beyond those associated with cists and barrows, exhibit definite signs of formal ritual or a large amount of deliberation over their infilling. Nonetheless, there are a few clear instances where this does seem to have occurred. One good example was found along the route of the Sennen to Porthcurno pipeline at Trebehor (Jones *et al* 2012). Here, a stone-lined pit [261] was found to contain sherds of Beaker pottery from several different vessels, assorted worked stone artefacts, flint and a visually distinctive jasper pebble. The pottery and flint were noticeably 'fresh' and unabraded. The stone lining of the pit suggested deliberation and the character of the artefacts from within it is significant because the unabraded nature of the pottery and flint assemblage suggested that they not been lying around in the open for long before they were incorporated within the pit. The flints might have been manufactured for a particular, task-specific activity. The jasper pebble, by contrast, may have been a treasured item or a family heirloom. The lack of silting within pit [261] suggested that it had been backfilled quickly and had not been left as an open feature (Jones 2013). As such, the deposit can be argued to be an intentional 'structured deposit' possibly associated with a small-scale event.

Pit [6] reconsidered

One approach to understanding where pit [6] falls in relation to intentionality is to consider the tasks and temporality involved in the digging of the pit, the choice of artefacts and the way they were placed inside it (*cf* Ingold 1993). By examining the form of the cut and its contents more closely, pit [6] can be argued to fall into the category of formalised deposition. Although the pit was shallow, it was well cut and appeared to have been carefully excavated. Arguably, it provided a frame for the deposits which were then placed into it (Fig 2). The selected objects were clearly placed into it in a non-random way (Fig 3).

The sherds of Beaker pottery, which were probably derived from a single vessel that may not have been locally made (Quinnell, above), were clustered together in the southern part of the cut, and extended up its side. Given their poor condition, it is likely that they belonged to an old, already broken vessel, fragments of which had been gathered together for burial. The flints (**L2**, **L3**, **L5** and **L6**) and other lithic artefacts (**S1**, **S2** and **S3**) formed a less obviously structured cluster than the Beaker pottery but these artefacts did appear to be arranged around the bottom edge of the pit. It is noticeable that three of the four flints (**L2**, **L5** and **L6**) were located close together in the north-east quadrant of the pit; two of them (**L2** and **L5**) are likely to have come from the same core (Lawson-Jones, above). It is also the case that three of the four pieces are scrapers, which, like the Beaker, may be making reference to particular tasks or the persons associated with them. Interestingly, the Middle to Late Neolithic flint end scraper (**L3**) was also recovered from the pit, which might imply it had been curated. Comparable finds have been made elsewhere: recent work at Colinhill, Strathaven (South Lanarkshire), for example, led to the discovery of an Early Neolithic leaf-shaped arrowhead which was deposited as an offering in a much later Bronze Age structure (Ballin 2019). Clearly this much earlier artefact was significant in some way and its deposition was deemed appropriate and beneficial, perhaps as a commemorative act. In common with the flint arrowhead from Colinhill, **L3** may have been recognised as belonging to an 'older time' or a 'forebear' and therefore suitable as a deposit within pit [6].

Moving to the stonework assemblage, the flat beach cobble **S3**, which showed some signs of anvil use, was potentially associated with the knapping of lithics, and was situated beside the flints with which it could have been associated. However, the visually distinctive greenstone hammerstone **S1** was deposited beside a striking 'polished' looking beach cobble **S2**, close to the western side of the pit cut. The 'polished cobble' **S2** may not be worked and it may have been chosen because of its appearance. Distinctive pebbles are certainly found in a variety of ritualised contexts during the Bronze Age (for example, Tilley 2017) and its colour and texture may have made it worthy of inclusion within the pit. The greenstone hammerstone **S1** is also highly distinctive, but by contrast had been worked. The hammer / pestle wear which is evident on this stone is indicative of use on a hard material (Quinnell, above). It is possible that, in common with the Beaker stonework assemblage from Sennen, this use could have been consistent with the crushing of cassiterite (Carey *et al* 2019). In common with the Beaker pottery and the flint scrapers and potentially the anvil stone, there may have been a deliberate connection being made between tasks, people and conceivably the places these artefacts came from (for example, Baczkowski 2019), which were brought together as a formal deposit before being buried. The yew charcoal within the pit was unusual. Yew has been found within a Beaker pit at Treyarnon, St Merryn (Jones and Taylor 2009–10); however, in the case of pit [6] the date of the charcoal is uncertain, and it may be residual and of Neolithic date.

Overall, consideration of the arrangement of artefacts found in pit [6] suggests that the contents lie at the formalised end of the spectrum of pit deposition and represent more than just the routine clearing away of occupation deposits. Instead, it can be argued that the assemblage represents both a deliberate clustering and separation of different types of artefacts into distinct groups potentially associated with different people and contrasting tasks. The reasons for this deposit are lost; it is possible that, as is known to have occurred elsewhere, they were of an offertory nature, to spirits, ancestors or other beings (for example, Äikäs 2017). It is, however, possible that when the different objects are considered together they could be taken to be linked with a formalised marking of place, and it may be significant that the pit was located not far from the sea and close to the Hayle estuary, an important historic waterway which itself is likely to have created links between people and places.

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Analysis of a probable Middle Bronze Age boundary and pre-enclosure palaeosol at West Northwood Farm, Bodmin Moor: occupation and continuity in the Cornish Bronze Age?

CHRISTOPHER CAREY, ANDY M JONES, RICHARD MACPHAIL, JENNY HART AND NICK HART

The 2017 excavations at West Northwood Farm, St Neot, Bodmin Moor, afforded the opportunity to investigate a palaeosol preserved beneath a probable Middle Bronze Age enclosure bank. The analysis of the palaeosol identified a brown earth soil which prior to burial had not undergone sustained waterlogging or been subject to the start of podzolisation. The palaeosol revealed evidence for a long period of activity at this locale prior to construction of the enclosure bank. This interpretation is consistent with the limited excavation evidence, which recorded some Late Neolithic or Early Bronze Age flint work in the excavation of a later roundhouse. This suggests some degree of continuity in the use of this locale from the Early Bronze Age through the Middle Bronze Age, evidence that is often lacking in archaeological sites due to the differences in the monuments, and hence archaeological records, created during these two periods.

During the summer of 2017 a series of excavations were undertaken by Cornwall Archaeological Unit and volunteers on a presumed Middle Bronze Age enclosure at West Northwood Farm, St Neot, Bodmin Moor (NGR: SX 2016 6977; Fig 1), as part of the community project 'Dig, Eat and Sing'. The site lies on Granitic bedrock of the Bodmin intrusion, at a height of 245–250m OD, on the north side of an east–west orientated valley. The enclosure is situated at the present-day boundary between southern lower lying slopes containing enclosed fields on a free draining acid loamy soil, and the higher moorland to the north, now covered by a stagnogley podzol, an acidic loamy soil with a peaty surface. The D-shaped enclosure contains three definite roundhouses and another three or four possible roundhouses or ancillary structures and, based on its form, is suggestive of a Middle Bronze Age date (*c* 1500–1100 cal BC) (Fig 2). Excavations of the enclosure bank failed to provide a date of construction of the enclosure, while excavations at roundhouse 1 identified evidence of activity in the area of the roundhouse stretching from the Late Neolithic through to the Roman period and beyond (Jones 2017). This contribution details the investigation of the palaeosol and subsequent bank deposits at the West Northwood enclosure, placing the enclosure and its construction within its wider environmental context.

The enclosure at West Northwood Farm: summary of the 2017 excavations

It is necessary to provide a brief summary of the outcomes from the 2017 excavation to contextualise this analysis, although the reader is referred to Jones (2017) for a full description. The enclosure is D-shaped, 37m east–west and 43m north–south. The bank is relatively low, 0.3–0.5m high, about 3m wide, and in places has internal and sometimes outer facing stones. The southern course of the enclosure is eroded and incomplete, while the northern edge has a shallow external ditch. The original entranceway into the enclosure is uncertain, although one now exists on the eastern side. The earthwork survey revealed three definite roundhouses within the enclosure, with a further three or four possible roundhouses / structures. A further circular structure, outside the enclosure and a little downslope to the south east, is either a ring cairn or another roundhouse.

The excavations focused on roundhouse 1 but a trench was also cut through the enclosure bank. Roundhouse 1 showed an extended period of use from possibly the Middle Bronze Age through to the early medieval period. It is 7.5m in diameter with double-skin stone walls, infilled with rubble and soil. Although no definitive dating evidence for construction was retrieved, a Middle Bronze Age date is suggested by three sherds of pottery, found in later contexts, and by the form of the roundhouse, including a south-facing entrance and a threshold stone. However, the roundhouse also revealed evidence of extensive later use in the Iron Age and Roman periods, with the pottery collection being the largest single assemblage of Iron Age and Roman pottery recovered from an excavation on Bodmin Moor.

Radiocarbon dating produced evidence for a further phase of use in the early medieval period,

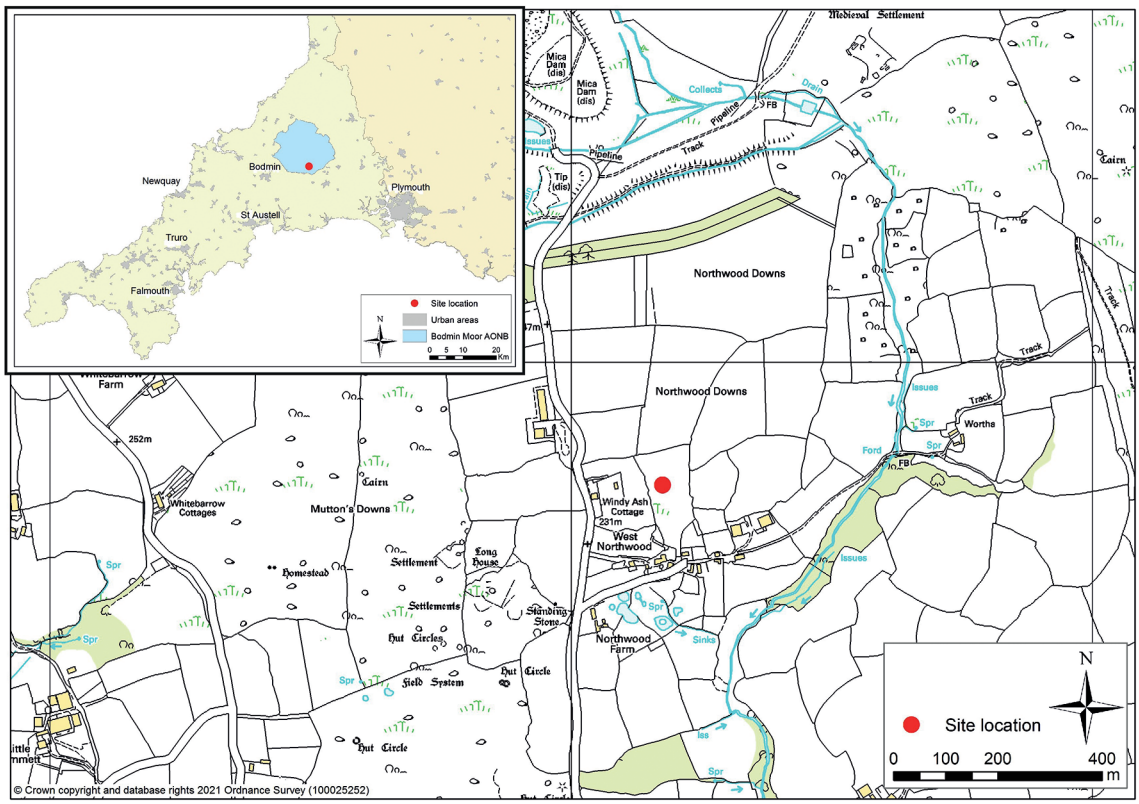

Fig 1 The location of the West Northwood enclosure.

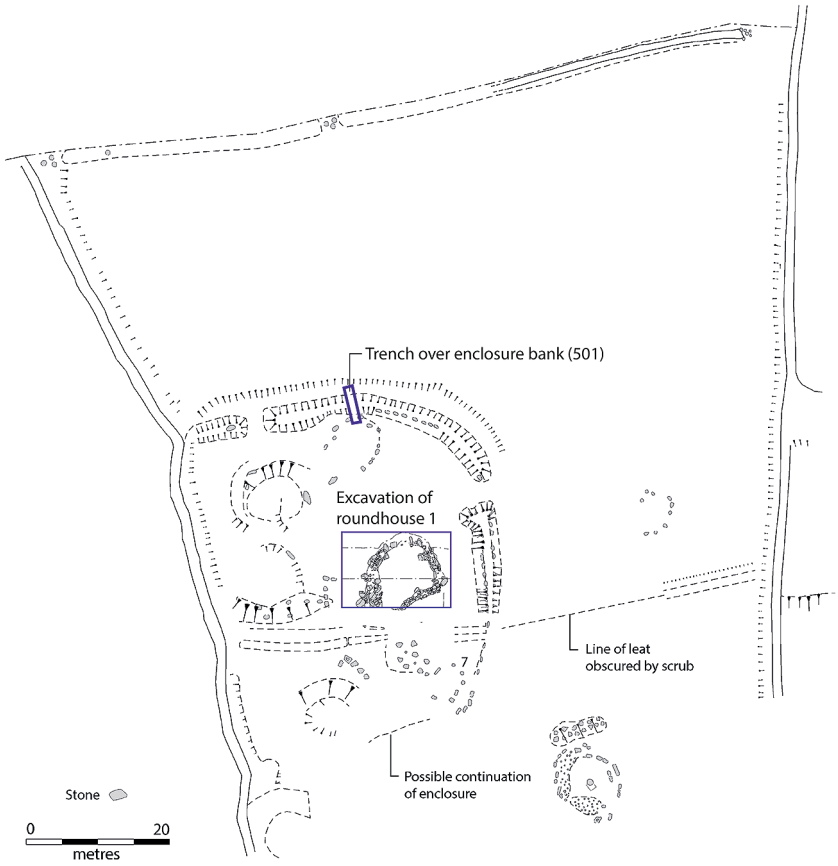

Fig 2 The earthwork survey of the West Northwood enclosure, which on morphological grounds is likely to date from the Middle Bronze Age (c 1500–1100BC). (Source: Jones 2017, fig 2.)

around the ninth century AD. It may have been during this later reuse that a new entrance was placed in the north of the roundhouse and the floor of the roundhouse was heavily disturbed by later activity, possibly through use as a livestock byre. No internal features such as postholes or pits were identified, although this is not entirely unusual, as other roundhouses in upland areas have been found to lack cut features (Jones 2004–5; Quinnell 1991). No hearth was identified, although later activity could have destroyed this feature. The lack of secure contexts and cut features made dating problematic but, if it was indeed constructed in the Middle Bronze Age, then the roundhouse was used episodically over a period of at least 2000 years. Earlier activity on the site is indicated by three pieces of finely worked Late Neolithic or Early Bronze Age flint.

DigVentures undertook further excavations at the enclosure in 2018 (Forster *et al* 2018), excavating trenches across two roundhouses. The finds were broadly in line with the 2017 excavations, including relatively abundant Iron Age and Romano-British pottery, although there is also a single piece of non-gabbroic Middle Bronze Age pottery with incised decoration (Quinnell 2018). Earlier activity at the site was again evidenced through a Late Neolithic – Early Bronze Age chisel arrowhead and thumbnail (also known as button) scraper, datable to the Early Bronze Age.

During the 2017 excavation, the enclosure bank was excavated with a 5m by 1m trench which ended to the south against the north wall of roundhouse 2 (Figs 2 and 3). Enclosure bank (501) was covered by the current peaty soil (100), overlying two further dark peaty layers (500) and (504). These can all be taken as the current soil deposits of the stagnogley podzol soil formation, which occurs to the north of the enclosure and stratigraphically overlies the enclosure bank. The bank layer (501) was relatively shallow (about 0.3m thick at its maximum excavated state, although not all of the

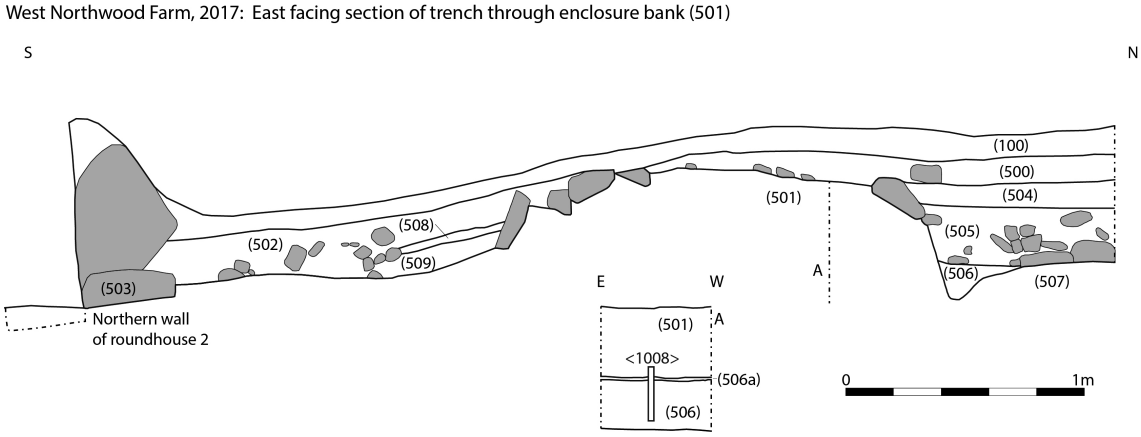

Fig 3 East-facing section through the enclosure bank (redrawn from Jones 2017, fig 15).

bank section was excavated). Beneath this was (506), a greyish-black deposit, which under bank (501) had an evident turf line (506a) and was a preserved palaeosol. On the north edge of the bank outside the enclosure, layer (504) sat directly above (506), with no preservation of a turf line on (506) under the podzolic peat. Context (506) represents a land surface buried by the bank and then, outside the bank, buried by the peat; it is reasonable to presume that context (506) is diachronous (that is, it was buried at different times), although the date of peat formation has not been established at West Northwood. Therefore, the date of (506) under the bank is older than the date of (506) outside the bank under peat, as no peat was visible above (506) beneath the bank, but is clearly present above (506) outside the bank. A small section of the bank was excavated perpendicular to the displayed section (Fig 4, A–B) to recover sample <1008> for the analysis of the preserved palaeosol and bank deposits (Fig 5).

Environmental context and the aims of the study

The modern ground to the north of the enclosure is currently covered by a podzolic peat soil. However, the soils of the upland areas of the south west were originally loess-derived argillic brown soils, supporting deciduous woodland, which during the mid- to later Holocene, have transitioned into podzolic peat soils (Roberts 2008, 228). This transition is the product of acidification and waterlogging, although a variety of local factors will have contributed, including topography, contemporary land use, geology and climatic variability (Moore 1993). Acidification and waterlogging were exacerbated by tree cover removal, with grasses and herbs like heather reducing the rate of evapotranspiration and plant litter accumulation at the soil surface increasing localized anaerobism. This facilitated clay breakdown and mobilization of sesquioxides, causing brown earth soils to degrade into stagnogley podzols and peats on the higher moors (Dimbleby 1962; Duchaufour, 1982, 112–21; Macphail and Goldberg 2018, 122–34).

This process of deterioration of the original brown earth soils seems to be coupled with prehistoric societies in these upland systems, with woodland clearance during the Neolithic and Bronze Ages either driving or facilitating podzolisation (Amesbury *et al* 2008). Deforestation is recognisable on Bodmin Moor, with palaeoenvironmental research indicating a pre-Neolithic woodland of oak-hazel with the presence of some alder, elm, lime and birch. There is evidence for some limited woodland clearance in the Early Neolithic, which became more widespread during the Bronze Age (Gearey *et al* 2000a; 2000b). The removal of tree cover exposed the underlying soils to erosion, coupled with further human agency through activities such as livestock grazing and possible tilling / cultivation during the Bronze Age, which exacerbated the processes of

Fig 4 Excavation photographs of the enclosure bank: (A) from east, after topsoil removal, showing internal and outer facing stones, with dumped material forming the bank, and (B) working shot of the sampling of <1008> during excavation, showing a lighter brown colour towards the bottom of the sequence, defining the palaeosol. Sample length is 21.5cm. (Photographs: Cornwall Archaeological Unit.)

soil degradation and the subsequent change into acid, waterlogged podzolic soils (Carey *et al* 2020).

However, the date of transition of these soils from brown earth to podzols seems to vary. On Exmoor, an area of uplifted semi-metamorphosed sedimentary bedrock (Edmonds *et al* 1975), a brown earth palaeosol recently dated to the Early Bronze Age at Farley Water burnt mound showed significant evidence of colluviation through soil erosion but no evidence of podzolisation prior to burial (Carey *et al* 2021). Likewise, at Holwell, Dartmoor, a presumed Middle Bronze Age reave also sealed evidence for soil erosion prior to reave construction, with no evidence of podzolisation (K L Hunnisett, pers comm). The seminal excavations at Shaugh Moor, Dartmoor, analysed the pre-reave sediments at Saddlesborough Reave, which demonstrated that some of the pre-reave soils had already undergone severe degradation prior to reave construction, with a peaty topsoil, Eag horizon and iron pan over a podzolic B horizon present (Balaam *et al* 1982). Rather than being a reason to abandon the uplands, land divisions at Shaugh Moor were being constructed within an already partly podzolised area.

At Chysauster, Gulval, an early Holocene brown earth palaeosol formed on weathered granite regolith (growan) with a suspected loess component was buried under a cairn. This soil had been affected by some acidification prior to burial and contained evidence of tilling, demonstrating that soil degradation prior to podzolisation was occurring in the Early Bronze Age, with colluviation during the Bronze Age / Iron Age (Smith 1996; Macphail 1987). At Carn Brea, Illogan, a palaeosol beneath the bank of an Early Neolithic enclosure (*c* 3600BC) was an acid brown earth that had undergone podzolisation, with leached iron and clay microfabrics in the upper Ah/Ea horizons containing significant amounts of charcoal, indicating pre-enclosure human activity (Macphail 1989). Maltby and Caseldine (1982; 1984) analysed palaeosols sealed beneath two Early Bronze Age barrows (CRIV and CRII) on Bodmin Moor at Colliford, St Neot, approximately 3 km north west of the current study area. Under the CRIV barrow, two palaeosol samples were both iron pan stagnogley podzols, demonstrating podzolisation had occurred prior to barrow construction. Contrastingly, on the opposing,

west-facing, side of the valley at CRII, a largely minerogenic palaeosol was present beneath the barrow, with evidence of earthworm (lumbricid) burrows, demonstrating the presence of pre-barrow brown earth soils prior to podzolisation of the surrounding landscape. However, at the time of burial of this landsurface by barrow CRII, some waterlogging of this soil profile had occurred and podzolisation had started, leading the authors to refer to the palaeosol as a brown podzol. At East Moor, Altarnun, which lies to the north of West Northwood, Brisbane and Clews (1979) suggested the presence of a poorly-preserved brown earth palaeosol that had undergone some podzolisation prior to burial by the construction of a Bronze Age cairn. However, the cairn was situated close to, if not within, a Bronze Age field system, and neither was securely dated.

However, while the wider south-west region has several analyses of prehistoric soils prior to monument construction, Bodmin Moor specifically has seen relatively little recent research. Therefore, given the location of the enclosure at West Northwood Farm, at the boundary between the modern podzol, which overlies the enclosure bank, and the non-podzolised soils to the south of the site, there was a significant opportunity to investigate the soil conditions at the enclosure prior to the construction of the monument. It was possible that the north side of the enclosure marked not only a transition between enclosed space and open ground, but also that between an encroaching, agriculturally unproductive peat land and the still fertile soils on the south slope, not only a conceptual threshold in the Middle Bronze Age, but an actual threshold between two different ecotones and landscapes.

Sample <1008> was collected from the palaeosol underneath the enclosure bank deposit (501) with the following aims:

1. To define the palaeosol prior to bank construction.
2. Identify whether the palaeosol had suffered waterlogging, soil erosion or the process of podzolisation prior to burial and fossilisation.
3. Identify any evidence for pre-enclosure bank activity at this site preserved within the palaeosol.

Methods

Field sampling

Samples were collected from the excavation using a drainpipe inserted into a section (Fig 4). Although numerous samples were taken, there were only resources to fully analyse sample <1008>, which sampled the enclosure bank and the preserved palaeosol. A square plastic drainpipe, with one edge cut off, was placed over the section and labelled, photographed and recorded on the section drawing, before sample removal. The sample was wrapped in cling film and black plastic, before being placed in cold storage.

Laboratory methods

Within the laboratory, the sample was cleaned, photographed and logged, before being continuously subsampled on 1cm intervals, removing about 10g of sediment per sample. The 1cm subsamples allowed sediment variation both within and between contexts to be analysed, integrating the laboratory analysis with the field excavation data. The remaining undisturbed sediment in the sample tin was retained for soil micromorphology. The 1cm subsamples were oven-dried at 40^{O} C; when dry, each subsample was homogenized in a ceramic pestle and mortar and fractionated using a 2mm sieve. The <2mm fraction was weighed and discarded, with the ≤2mm fraction retained for analysis.

The analyses

Four types of analysis were undertaken for characterisation of the deposit sequence.

Analysis of fine sediment fraction

The fine sediment fraction was analysed to determine sediment composition using a Malvern Mastersizer 2000 laser analyser. The analysis of the fine sediment fraction (<2mm) can be used to define transportation and depositional processes – for example, colluvium – alongside identification of the origin of the sediment material; for instance, brown earth soil (*cf* Carey *et al* 2021).

Each subsample was disaggregated through adding 5ml of sodium hexametaphosphate (Calgon) to a heaped spatula of sediment (about

Table 1 The Wentworth scale used in the analysis of the fine sediment (≤2mm fraction).

Size (mm)	*Wentworth scale*
0.0039	Clay
0.0078	Very fine silt
0.0156	Fine silt
0.031	Medium silt
0.063	Coarse silt
0.125	Very fine sand
0.25	Fine sand
0.5	Medium sand
1.0	Coarse sand
2.0	Very coarse sand

1g), which was agitated on a platform rotary shaker at 175 rpm for a minimum of one hour. Each subsample was analysed using Basic Ultrasonic Method, making three measurements, with a mean value calculated. All data was exported from the Malvern Mastersizer using the Wentworth scale, a Phi classification of sediment sizes range (Table 1), and this nomenclature is used throughout. (Figure 5 and Table 2.)

Organic content

Loss on ignition was used to measure the organic content, which is a useful proxy for the identification of palaeosols (Canti 2015).

Ceramic crucibles were oven-dried at 100^{O}C for 24 hours before weighing, to remove any water. A spatula of subsample was added to each crucible before drying for a further 24 hours at 100^{O}C. The crucibles were then removed from the oven and placed in a desiccator before reweighing, and were then fired at 450^{O}C for four hours, before being placed in a desiccator and reweighed. This firing process burns off the organic matter within the sample and allows a percentage calculation of organic content to be made. (Figure 5 and Table 2.)

Magnetic susceptibility

Magnetic susceptibility was used to identify evidence of heating, as well as topsoil inwashing, with both processes enhancing magnetic susceptibility values (Goldberg and Macphail 2006, 350–2).

The magnetic susceptibility of each subsample was measured using a Bartington MS2B magnetic susceptibility meter with the reading calibrated to the mass of the sample, using 10ml pots. The sample sequence required a blank zero measurement, before the sample was added to the meter and the magnetic susceptibility measured for five seconds, before removal and a further blank zero measurement, to calibrate for drift. The sample measurement was mass specific. (Figure 5 and Table 2.)

Soil micromorphology

One thin section was taken from sample <1008> in order to identify soil fabrics, for example, podzolic peats or brown earth material; to identify any pedogenic features in the sediment, for example, earthworm burrows; and to identify any inclusions within the sediments, for example, charcoal (Stoops *et al* 2018).

The thin section sample was impregnated with a clear polyester resin-acetone mixture; the sample was then topped up with resin, ahead of curing and slabbing for 75x50mm-size thin section. The thin section was further polished with 1,000 grit papers and analysed using a petrological microscope under plane polarized light (PPL), crossed polarized light (XPL), oblique incident light (OIL) and using fluorescent microscopy (blue light – BL), at magnifications ranging from x1 to x200/400. The thin section was described, ascribed soil microfabric types (SMTs) and microfacies types (MFTs), and counted accordingly (Goldberg and Macphail 2006). An SMT type is a specific type of fine fabric or groundmass as defined by three to four optical tests (Macphail and Goldberg 2018, table 3.3, 89-90, after Bullock *et al* 1985, 88–94), while a MFT type includes all micromorphological and bulk analytical data, associated with a defined site formation process. Key information derived from the soil micromorphology is included in the context descriptions, with a full micromorphological description given in the tabulated data for each context. (Figure 6 and Tables 3 and 4.)

Presentation of data

With the analyses completed the data were entered into an Excel spreadsheet before exporting to SPSS (statistics software) for the drawing of line graphs. Graphs drawn in SPSS were exported in Adobe

Table 2 West Northwood Farm 2017. The sediment data for sample <1008> by context

Context		*Clay (%)*	*Very fine silt (%)*	*Fine silt (%)*	*Medium silt (%)*	*Coarse silt (%)*	*Very fine sand (%)*	*Fine sand (%)*	*Medium sand (%)*	*Coarse sand (%)*	*Very coarse sand (%)*	*Organic content (%)*	*Magnetic susceptibility (SI)*
(501)	Mean	14.22	15.14	18.08	20.61	19.07	7.37	1.04	0.99	2.01	1.48	8.02	1.222 E^{-07}
	Minimum	11.98	12.20	15.27	18.15	16.70	3.66	0.00	0.00	0.00	0.00	6.30	8.05 E^{-08}
	Maximum	16.25	18.67	22.13	22.59	21.12	13.57	2.57	4.98	7.43	7.25	10.08	1.551 E^{-07}
(506a)	Mean	13.80	16.49	19.68	20.53	18.03	7.91	0.32	0.24	1.61	1.43	9.78	1.39 E^{-07}
	Minimum	13.12	15.84	18.66	18.76	18.02	7.00	0.22	0.00	0.00	0.00	8.26	1.283 E^{-07}
	Maximum	14.47	17.07	20.70	22.30	18.03	8.82	0.43	0.48	3.22	2.86	11.30	1.496 E^{-07}
(506b)	Mean	15.12	16.22	19.52	22.01	18.13	6.00	0.97	1.11	0.81	0.12	5.88	7.728 E^{-08}
	Minimum	12.47	12.41	14.66	18.83	13.30	.04	0.00	0.00	0.00	0.00	4.29	4.97 E^{-08}
	Maximum	19.39	20.74	23.93	24.81	20.25	9.88	3.97	4.61	3.66	0.74	8.95	1.129 E^{-07}

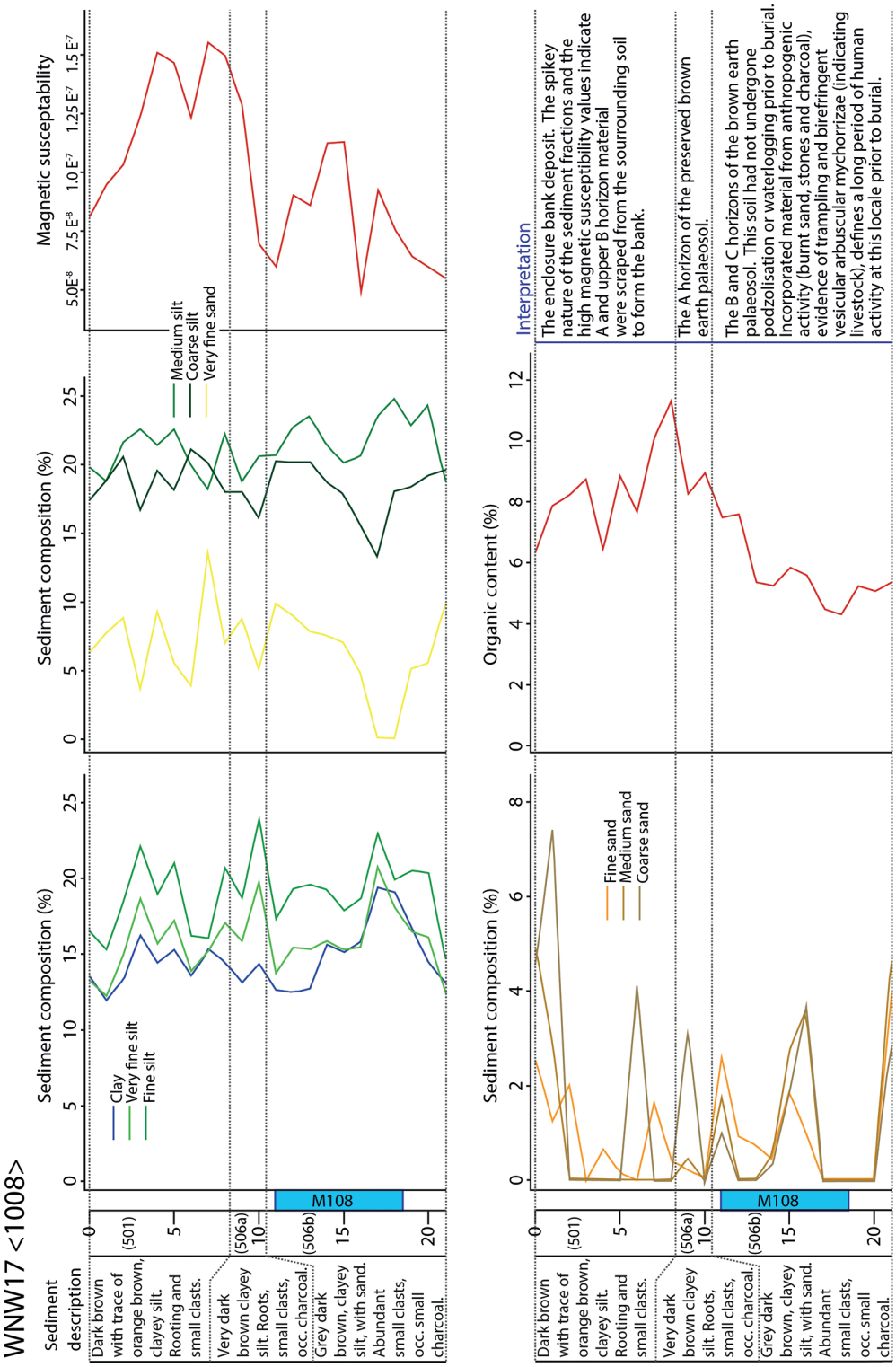

Fig 5 The sediment data for WNW17 Sample <1008>.

Illustrator and added to the sample logging sheet, with the context boundaries drawn over the graphs. Each context was then described and the data from the soil micromorphology were integrated.

Results

The results from each context are displayed individually, with an initial interpretation of each context, before an overall synthesis of the sample. The percentage values displayed in brackets are rounded up mean values, with the precise values displayed in Table 2. The soil micromorphology counts (Table 3) and descriptions and interpretations (Table 4) are summarised in the context descriptions.

During the laboratory processing of the sample it became apparent that context (506) was composed of two different sub-units, and so these were used for the analysis: (506b), the lower part (10.2–21cm); and (506a), the upper part (8.1–10.2cm).

Context (506b)

Unit (506b) is described as a grey dark-brown clayey silt with sand (Fig 5). Clay (15 per cent), very fine silt (16 per cent) and fine silt (20 per cent) are high, initially increasing at the base of the unit, then showing a slight decrease. Medium silt (22 per cent) is also high and has an initial increase, before a slight decrease. Coarse silt (18 per cent) is high, with very fine sand (6 per cent) moderate, with both showing an initial decrease before a slight increase. Fine sand (1 per cent), medium sand (1 per cent) and coarse sand (1 per cent) are all low, being higher at the base of the unit, with a spike at 15–16cm. The organic content (6 per cent) is high showing a slight increase through the unit, with magnetic susceptibility showing a general increase, with a spike at 14–16cm and a slight decrease at the top of the unit.

The soil micromorphology (Fig 6; Tables 3 and 4) records this context to be diffusely layered and finely mixed dark brown to very dark brown silt loam, with occasional to abundant fine charcoal embedded in the soil matrix. There are channel-associated blackish-brown humic silts to silty organic matter present. The unit is poorly sorted, with silts and fine sands, and with frequent fine gravel (max 4mm) at 15–18.5cm, and common fine and coarse gravel (max 8mm) at 11–15cm. It is characterised by examples of birefringent fungal bodies (probable vesicular arbuscular mychorrizae; *cf* Brady and Weil, 474–5). Vesicular arbuscular mychorrizae are types of phycomycetous fungi that have a symbiotic relationship with angiosperm (plant) roots. Birefringence is recorded as developing after some 800 years (Romans and Robertson 1983), with examples of vesicular arbuscular mychorrizae birefringence development in buried soils recorded at Romano-British Chysauster, Gulval, and in upland grazed areas of Powys, Wales (below early-medieval dated dykes; *cf* Offa's Dyke) (Macphail and Goldberg 2018, 441; Smith 1996; A Caseldine, pers comm).

The micromorphology also recorded possible occasional heated rock fragments, many fine charcoal (<0.5mm), and occasional sometimes ferruginised fine roots (1.0–1.5mm). There are occasional matrix intercalations and pans and many examples of iron staining of organic soils in channels and some ferruginised roots and channel hypocoatings. Evidence for soil fauna activity is through occasional thin and broad burrows, becoming abundant thin and occasional broad burrows upwards, and occasional broad, many thin and rare very thin organo-mineral excrements,

Table 3 Thin section M108 soil micromorphology samples and counts.

MFT	*SMT*	*Voids*	*Gravel*	*Roots*	*Charcoal*	*Burnt mineral*	*Arbusc mychor*
A1	1a(2a)	25%,40%	fff/ff	aa	aaa	aa	a*/a
Matrix intercal	*Secondary Fe*	*Thin burrows*	*Broad burrows*	*V. thin org. excrement*	*V. thin O-M excrement*	*Thin O-M excrement*	*Broad O-M excrement*
aa	aaa	aaaa/aa	aa/aa	aa/00	aaaa/a	aaa/aaa	a/aa

* – very few 0-5%, f – few 5-15%, ff – frequent 15-30%, fff – common 30-50%, ffff – dominant 50-70%, fffff – very dominant >70%; a – rare <2% (a*1%; a-1, single occurrence), aa – occasional 2-5%, aaa – many 5-10%, aaaa – abundant 10-20%, aaaaa – very abundant >20%

MFT = microfacies types, SMT = soil microfabric types, O-M = organo-mineral

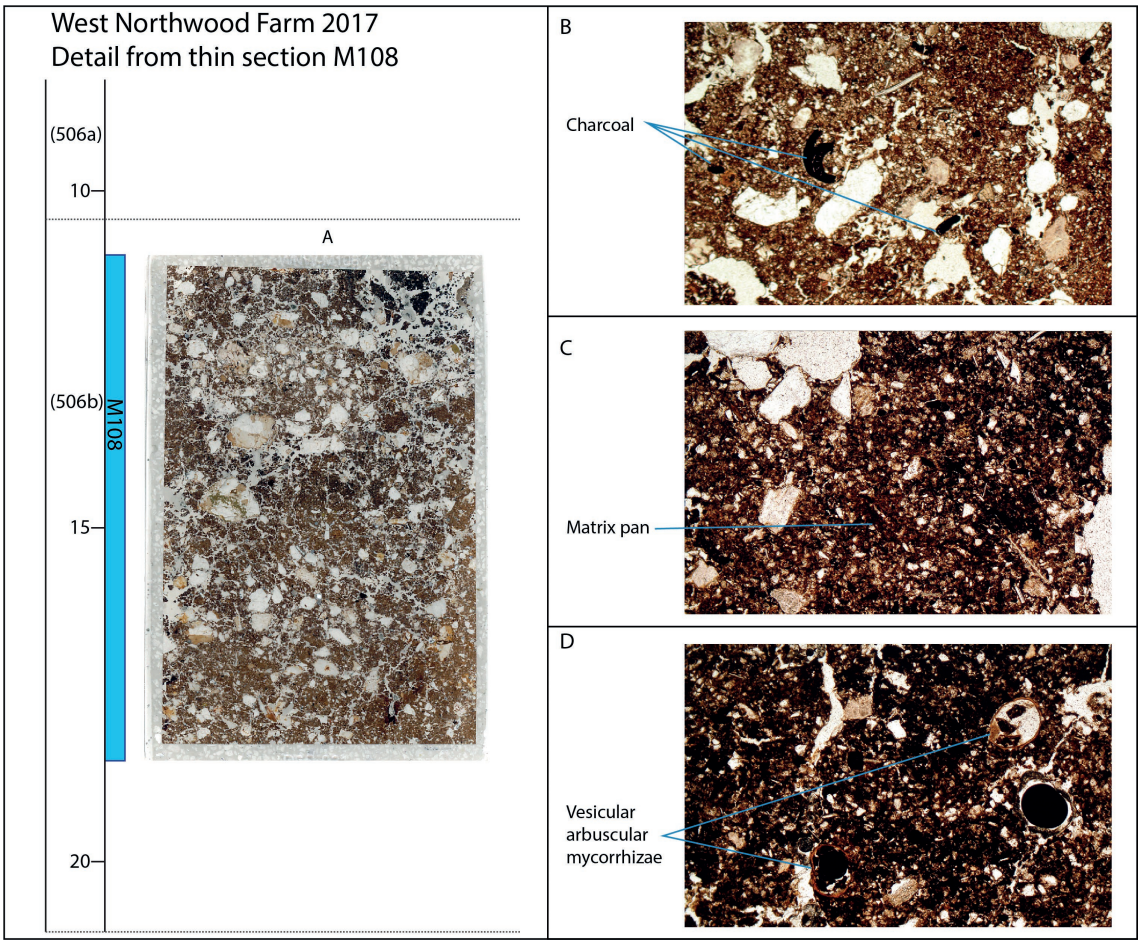

Fig 6 The thin section and soil micrographs of key features from the analysis of WNW17 <1008>
A: Scan of M108 (506b), showing the complete thin section. A compact, diffusely layered anthropogenic deposit, with stony layer (top middle), and post-depositional iron staining.
B: Photomicrograph of M108 (506b). Compact anthropogenic deposit containing charcoal (black), and with matrix intercalations. Plane polarised light (PPL). Frame width is ~4.62mm.
C: Photomicrograph of M108 (Layer 506b). Compact layers, with high concentrations of very fine charcoal (upper layer, darker areas) and matrix pan likely resulting from muddy trample. PPL, frame width is ~2.38mm.
D: Photomicrograph of M108 (506b, 11–11.5cm); two 'large' vesicular arbuscular mycorrhizae fungal bodies in upper part of (506b) these are also birefringent. PPL, frame width is ~2.38mm.

becoming rare broad, many thin and abundant very thin organo-mineral excrements, with occasional very thin organic excrements, upwards.

Context (506b) interpretation: This unit has a moderate to high organic content, coupled with high clay and finer silt fractions, indicating a loessic derived brown earth soil, specifically the C and then B horizons. However, this soil is also diffusely and gravelly layered, with abundant fine charcoal, and was once a humic, anthropogenic soil. The presence of heated sands and gravel, identifiable in the soil micromorphology, the sand fractions and magnetic susceptibility (between 14cm and 16cm) with charcoal, and the relict humic staining and

Table 4 West Northwood Farm 2017 thin section M108 soil micromorphology descriptions and interpretations.

Soil Micromorphology (SM)	*Summary and interpretation of MFT A1*
SM: diffusely layered and finely mixed dark brown to very dark brown, with occasional to abundant fine charcoal embedded silt loam (SMT 1a), with channel-associated blackish brown humic silts/silty organic matter (SMT 2a); ***Microstructure***: massive-compact fine blocky and pellety, 25% intrapedal voids (vughs and fine channels), 40% interpedal voids (channels, chambers, complex packing voids; ***Coarse Mineral***: poorly sorted silts and fine sands, with frequent fine gravel (max 4mm) at 15–18.5cm and common fine and coarse gravel (max 8mm) at 11–15cm; quartz, feldspars, micas and granitic rock fragments; ***Organic and Anthropogenic***: e.g. of x2 ~375–400 μm at 11–11.5cm and eight ~250μm at 11–11.5cm, birefringent vesicular arbuscular mychorrizae, possible occasional heated rock fragments, many fine charcoal (<0.5mm), and occasional sometimes ferruginised fine roots (1.0–1.5mm); ***Fine Fabric***: **SMT 1a**: dotted and speckled dark brown to very dark brown (low interference colours to isotropic close porphyric, stipple speckled to undifferentiated b-fabric, XPL), dark brown (OIL), once often humic stained with occasional to abundant very fine charcoal, spores present; **SMT 2a**: blackish brown (PPL), isotropic (open porphyric, intergrain aggregate, undifferentiated b-fabric, XPL), black (OIL), organic; ***Pedofeatures*****:** *Textural*: occasional matrix intercalations and pans; *Amorphous*: many examples of iron staining of organic soils in channels and some ferruginised roots and channel hypocoatings; *Fabric*: occasional thin and broad burrows, becoming abundant thin and occasional broad burrows upwards; *Excrements*: occasional broad, many thin and rare very thin organo-mineral excrements, becoming rare broad, many thin and abundant very thin organo-mineral excrements, with occasional very thin organic excrements, upwards.	Diffusely layered and finely mixed dark brown to very dark brown, with occasional to abundant fine charcoal-embedded silt loam, with channel-associated blackish-brown humic silts/silty organic matter. The soil is poorly sorted silts and fine sands, with frequent fine gravel (max 4mm) at 15-18.5cm, and common fine and coarse gravel (max 8mm) at 11–15cm. It is characterised by examples of x2 ~375–400 μm at 11–11.5cm and eight ~250μm at 11–11.5cm, birefringent vesicular arbuscular mychorrizae, possible occasional heated rock fragments, many fine charcoal (<0.5mm), and occasional sometimes ferruginised fine roots (1.0–1.5mm). Occasional matrix intercalations and pans, many examples of iron staining of organic soils in channels and some ferruginised roots and channel hypocoatings, occasional thin and broad burrows, becoming abundant thin and occasional broad burrows upwards, and occasional broad, many thin and rare very thin organo-mineral excrements, becoming rare broad, many thin and abundant very thin organo-mineral excrements, with occasional very thin organic excrements, upwards, were recorded. Diffusely (gravelly) layered, fine charcoal-rich, probably once humic, cultivation soil. The possible presence of heated sands and gravel, with charcoal, and the relict humic staining and organic inclusions, suggest inputs of both organic and settlement waste manure. The relative concentrations of small (~250 μm) and large (~400 μm) birefringent vesicular arbuscular mychorrizae, may also link the soil to sheep and cattle husbandry, respectively – and moreover indicate a soil >800 years old.

organic inclusions, suggest inputs of both organic and settlement fire installation waste.

In addition, the presence of small (~250 μm) and large (~400 μm) birefringent vesicular arbuscular mychorrizae, may link the soil to animal husbandry, possibly sheep and cattle indicators, respectively (as suggested by Romans and Robertson (1983) in their synthesis of UK sites). Vesicular arbuscular mychorrizae can be linked to plants under stress (Wilshire, Southampton University, pers comm), and although there is no direct link to grazing pressure effects and coprophilous fungi (Cugny *et al* 2010; van Geel *et al* 2003), possible dung remains and fungal dung indicators were found in grazed upland Powys buried soils where such birefringent vesicular arbuscular mychorrizae were particularly concentrated (A Caseldine, pers comm). Its layered character, compactness and the presence of matrix intercalations could further suggest that it was a sometimes muddy trampled anthropogenic soil accumulation, possibly associated with animal husbandry / enclosure use (Macphail *et al* 2017; Macphail and Goldberg 2018, 412–35; Rentzel *et al* 2017). An alternative interpretation is that this is a cultivation soil manured with settlement waste and dung, although this is interpreted as less likely. The buried soil has been affected by post-depositional rooting and ferruginisation of these roots and root channels, due to waterlogging associated with the development of the overlying stagnogley podzol (Lindbo *et al* 2018).

Context (506a)

This unit is described as a very dark brown clayey silt, with roots, small clasts and occasional visible charcoal. Clay (14 per cent), very fine silt (17 per cent) and fine silt (20 per cent) are all high and show a slight increase in this unit, compared to (506b). Medium silt (21 per cent) and coarse silt (18 per cent) are both high and show a slight decrease in this unit. Very fine sand (8 per cent) is moderate

and also shows a slight decrease. Fine sand (0.3 per cent), medium sand (0.2 per cent) and coarse sand (2 per cent) are all low and show a slight increase in this unit. The organic content is high (10 per cent) and increases in this unit. Likewise, magnetic susceptibility is elevated in this unit. No soil micromorphology was undertaken on this unit.

Context (506a) interpretation: The increase in organic matter coupled with the increase in magnetic susceptibility, and high clay and finer silt fractions, is consistent with this being the buried A horizon of the original brown earth soil. Like the preceding context, this A horizon is likely to show extensive evidence of human activity at this site at a microscopic level.

Context (501)

This unit is described as a dark brown with a trace of orange-brown clayey silt. Clay (14 per cent), very fine silt (15 per cent) and fine silt (18 per cent) are all high, although the data are more spikey than in the preceding contexts (506a) and (506b). Medium silt (21 per cent) and coarse silt (19 per cent) remain high and also have a more variable distribution than in the preceding contexts. Very fine sand (7 per cent) is moderate, with fine sand (1 per cent), medium sand (1 per cent) and coarse sand (2 per cent) all low, with all the sand fractions displaying several peaks in this context. The organic content (8 per cent) decreases slightly across this unit, with the magnetic susceptibility being initially high and then decreasing. No soil morphology was undertaken on this context.

Context (501) interpretation: This deposit is the dumped deposit of the bank, which preserved the palaeosol beneath it. The sediment fractions and organic content, which in percentage terms, are barely different to the soil they preserve, indicate that soil stripping was undertaken to build the bank. The high magnetic susceptibility values indicates this could have been just A/B horizon stripping. The spikey nature of the data is consistent with multiple small scrapes of sediments being piled up, creating the spikey distribution in particle sizes.

Sample <1008> summary

This sample records the C and B horizons (506b) and A horizon (506a) of a preserved brown earth palaeosol (respectively the weathered parent rock, subsoil and topsoil). The palaeosol records evidence of substantive activity at this locality prior to construction of the enclosure bank. The presence of charcoal, burnt sands and stone, and anthropogenically derived humic material, worked into the B horizon of the palaeosol, suggests a considerable period of time (>800 years) between these activities and the enclosure bank construction. The presence of the birefringent vesicular arbuscular mychorrizae and layering within the palaeosol strongly suggest the presence of livestock at this location prior to the construction of the bank. Taken as a sum total, this indicates considerable human presence at this locality prior to the bank being constructed on the north side of the enclosure. The bank deposit (501) is poorly sorted, with spikey sediment data indicating shovel scrapes of the upper soil horizons were used.

Discussion

Given the morphology of the enclosure and the roundhouses, with features such as the south-facing doorway and threshold stone revealed in roundhouse 1, the date for the formation of the roundhouses is interpreted as Middle Bronze Age (1500–1100 BC), although it must be caveated that no absolute radiocarbon dates confirm this. The following discussion uses this assumption for a Middle Bronze Age date for the enclosure, with analogous examples in the south west such as Bodrifty in Penwith, and Shaugh Moor, Dartmoor, providing Middle Bronze Age dates (Dudley 1956; Wainwright and Smith 1980). From the analysis of the palaeosol underneath the enclosure boundary at West Northwood (contexts (506b) and (506a)) it is clear there is no pre-burial evidence for either waterlogging or podzolisation. This then removes the idea of the enclosure being a boundary between two ecotonal areas, during the Middle Bronze Age. The deposit contains abundant evidence of anthropogenically derived inclusions, but it is contained within a brown earth soil. This brown earth soil would have been capable of supporting pastoral grazing or possibly tilling during prehistory. The advent of podzolisation to the north of the enclosure is undated, although it is now known for certain it postdates the enclosure construction, with any anthropogenic contribution to this process of podzolisation undefined. On the slope to the south, it can be suggested that free draining soils, alongside land use, have maintained

its nutrient status and associated elevated levels of biological activity / soil mixing, perhaps through stocking or use as an infield, inhibiting the podzolisation process.

Furthermore, the palaeosol also revealed extensive evidence for human activity at this locale prior to construction of the enclosure bank. Inclusions such as burnt sands and stones, and charcoal, worked into the B horizon of the soil, indicates a relatively long-lived utilisation of this area for human activities. The presence of the birefringent vesicular arbuscular mychorrizae and layering within the soil indicating trampling, are strongly suggestive that livestock were present here prior to construction of the enclosure bank. Taken as a whole, if the estimate of an extant soil with evidence of human activity >800 years is anywhere near correct, then evidence for human use of the site is conservatively pushed back into the Early Bronze Age (2150–1500 cal BC), on the presumption of a Middle Bronze Age date for the enclosure bank construction.

This, then, is significant. The Bronze Age is characterised by an Earlier Bronze Age, dominated by large numbers of burial mounds and cairns, which on Bodmin Moor are often associated with cremation practices (Johnson and Rose 1994; Jones 2004–5). Sometimes burials are interred with grave goods such as Beaker pots, Collared Urns, Food Vessels and especially Trevisker vessels in Cornwall, and very rarely prestige items (for example, bronze daggers, amber beads and faience) (Carey and Higham 2020; Brück 2019; Woodward and Hunter 2015). However, the archaeological record changes from the Middle Bronze Age, with settlements and roundhouses dominating the archaeological record, which have been more extensively studied in southern Britain, for example in Wessex and the Thames region (Brück 2000). It is likely that the shift between these two phases in some regions is not so clear cut, with similar styles of pits and deposits visible in different types of sites (for instance, both 'domestic' and 'funerary') (Jones 2013), with the transition from the Early to Middle Bronze Age likely to show regional variation both in archaeological form and also chronology.

The south-west uplands have a rich archaeological record of Middle Bronze Age field divisions (including reaves), pounds (enclosures) and hut circles although these are for the most part only loosely dated (Newman 2016; Johnson and Rose 1994). On Bodmin Moor excavations at Stannon Down and Leskernick have confirmed Middle Bronze Age occupation of roundhouses on the moor, with the latter being supported by radiocarbon determinations (Mercer 1970; Jones 2004–5; Bender *et al* 2007). In the lowlands archaeological investigations since the 1990s have revealed widespread evidence for the construction of Middle Bronze Age hollow-set roundhouses, although contemporary fields are rare and there is no evidence for settlement enclosures off the moors (Jones and Taylor 2010; Jones and Quinnell 2011; Jones *et al* 2015). The environmental context within which upland roundhouses were constructed and what preceded them is not clearly understood; does the Early Bronze Age have an equally rich settlement history, but of an architectural form that leaves little archaeological trace? If so, the junction between the predominantly funerary landscapes of the Early Bronze Age and the domestic landscapes of the Middle Bronze, might not be as drastic as it now appears.

In this context, the enclosure at West Northwood could indicate some form of continuity of activity, or at least episodic re-inscription of a significant locale, in both the Early and Middle Bronze Age. The identification of older inclusions within the palaeosol is consistent with the excavated archaeological record, with Late Neolithic – Early Bronze Age flint being recovered during the excavation and a possible ring cairn just downslope and to the south east of the enclosure (although this feature was not excavated and could also possibly be a roundhouse). This suggests that West Northwood was a 'place' in the Early Bronze Age, with human activities such as fires (cooking?) and the management of livestock. In the Middle Bronze Age these activities appear to have been formalised and possibly intensified through the construction of the enclosure, indicating some form of continuity in the occupation and use of this 'place' between the Early and Middle Bronze Age.

Evidence of Early Bronze Age 'settlement' and 'occupation' across Britain and Cornwall is generally slight. The evidence for Beaker period – Early Bronze Age settlement is often ambiguous, recorded through stakeholes, scattered postholes and pits containing domestic deposits ('refuse') (Brück 1999; Gibson 2019). Within Cornwall, a very early Beaker structure is recorded at Sennen, which showed a lightly built structure with stakeholes (Jones *et al* 2012), and a few poorly

preserved stake and posthole built structures have been uncovered across the county (Jones and Kirkham 2021). At West Northwood, given the strong indications of pre-Middle Bronze Age activity on this site, it is certainly worth prospecting for earlier features, such as pits, within the site environs, to see if earlier deposits can be identified. Of course, there is a clear need to apply some absolute dating methods to the enclosure at West Northwood, dating the palaeosol through a combination of Optically Stimulated Luminescence on the sand component and radiocarbon dating any charcoal within the palaeosol. This would give an absolute date for the establishment of the enclosure and the activity at this locale pre-enclosure, which was beyond the financial means of the original project.

Conclusion

This sample has demonstrated the potential of utilising geoarchaeological methods for the analysis of sediments within prehistoric site environments in the uplands of the south-west peninsula. There is a lot more research to be done, linking the narrative of human land use and exploitation with soils, environments and changing landscapes. This is particularly pertinent for Bodmin Moor, where a podzol peat system now covers large areas of the moor. There is a need to accurately analyse the pre-monument environments across Bodmin Moor to understand the 'soilscape' and its relationship to prehistoric human activities (for example, tilling) and environmental change (podzolisation) and to investigate the nature of the 'abandonment' of the uplands.

However, as this analysis shows, one of very few undertaken on Bodmin Moor, the Bronze Age environment at this locale supported human activity for a millennium or more. The soils that were buried and enclosed were a brown earth soil, albeit one that had been altered by the effects of human activity. Subsequently, in the case of West Northwood, the inhabitants of the enclosure during the Middle Bronze Age were living in a productive ecotone, on the side of the valley, an area that during the Middle Bronze Age was still capable of supporting rich pastoral grazing and was possibly suitable for tilling.

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Archaeological investigations at Tower Meadows, St Buryan, 2019–2020

MICHAEL J ALLEN, ALAN J CLAPHAM, PETER DUDLEY AND ANDY M JONES

with a contribution from IMOGEN WOOD

An archaeological watching brief was carried out in advance of a housing development in two fields to the north west of Tower Meadows, St Buryan. A burnt spread containing Bronze Age Trevisker ware pottery, cereal grains and the seed of a Celtic / field bean was recorded, in possible association with three pits or postholes. A radiocarbon determination from the Celtic bean produced a Middle Bronze Age date. A single pit in a neighbouring field was undated but fragments of early medieval Grass-marked pottery including part of a bar-lug were found in close proximity to it.

Cornwall Archaeological Unit was commissioned by Classic Builders (South West) Ltd to undertake an archaeological watching brief in advance of the construction of a new housing development within two fields to the north west of Tower Meadows, St Buryan, West Penwith (centred SW 40696 25781; Fig 1). The gently sloping fields stand at 116m to 122m OD, increasing in height towards St Buryan churchtown, to the south east. The site is on granite bedrock of the Land's End Intrusion (British Geological Survey 2021).

The area has a high archaeological potential: St Buryan church, 170m to the east, was the site of an early medieval monastery and the churchyard is a possible *lann*, or early Christian enclosure, although it may have originated as an Iron Age or Romano-British 'round' (Preston-Jones 1987). The wider area includes considerable evidence for prehistoric activity including, most famously, the stone circles of Boscawen-Un (1.6 km to the north east) and the Merry Maidens (2.6 km to the south east).

Within the development site a spread of burnt material associated with Trevisker ware was uncovered and sherds of Grass-marked pottery were found. This short report outlines the key results from the project. Full details are given in Thorpe (2020).

Radiocarbon dating cited below is calibrated to OxCal 4.3.2 (Bronk Ramsey 2009) and the date range calibrated using the IntCal13 atmospheric calibration curve (Reimer *et al* 2013).

Results

The watching brief recorded a small pit in field 1 and, in field 2, a spread of burnt material and a roughly linear arrangement of three pits or postholes. Evidence for more recent ground

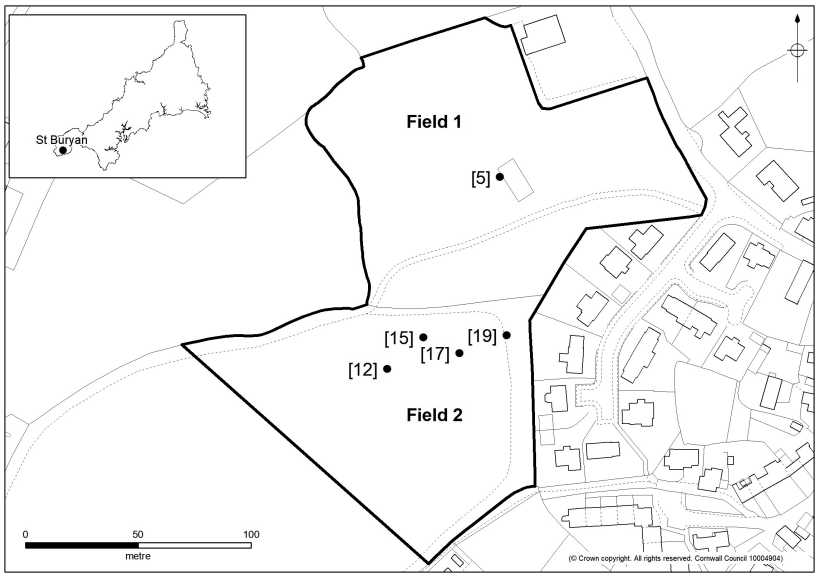

Fig 1 Location of the fields covered and features revealed by an archaeological watching brief at Tower Meadows, St Buryan.

disturbance included land drains in both fields and, in field 1, two electrical cables to serve a sewage pumping station located within the site (Thorpe 2020) (Figs 1 and 2).

Field 1

In field 1 a shallow pit [5] was recorded, measuring 1.4m by 1.2m and 0.2m deep, with the long axis orientated north west to south east. It had a shallow U-shaped profile with an irregular base and was infilled with a black-brown clay containing numerous charcoal fragments (6). Cut into the natural, the southern side of the pit was red in colour, suggesting that it had been heat affected, presumably the result of burning within the pit. No artefacts were retrieved from the pit but the charcoal-rich fill was sampled.

Approximately 1m to the north of pit [5] five fragments of Grass-marked pottery of early-medieval date were recovered from the subsoil (3), the pottery assemblage including a fragment of a bar-lug.

Field 2

The principal feature located in field 2 was a large burnt spread of charcoal-rich fill (13) measuring roughly 6m by 3m interleaved with burnt red-brown clay (14), both contained within a very shallow cut [12] which was no more than 0.05m deep (Fig 2). From the charcoal-rich infill (13), three conjoining sherds forming part of the rim of a Middle Bronze Age Trevisker ware vessel were found (Table 2; Fig 2). Another body sherd of the same pottery type (but from a different vessel) was also recovered from the same context. A Middle Bronze Age radiocarbon determination of 3018 ±24 BP, 1390–1140 cal BC (SUERC-96627) was obtained on charcoal from layer (13).

To the east of the burnt spread was a roughly linear arrangement of three small pits or postholes [15], [17] and [19], each filled with a black-brown clay containing charcoal fragments (16), (18), (20). No artefacts were recovered from the postholes but the charcoal-rich fills (16) and (18) were sampled.

From the base of the subsoil (10) within field 2, three abraded body sherds of Bronze Age pottery were also recorded.

Palaeoenvironmental evidence

Alan J Clapham

Soil samples were taken from the fill of burnt spread [12] and the fills of pits or postholes [5] and [15] and [17] were sorted and analysed. Full details are given in Clapham (2020) and are summarised here.

Charred plant remains

While low numbers of charred plant remains were recovered from all four samples, the preservation was good enough to enable the identification of

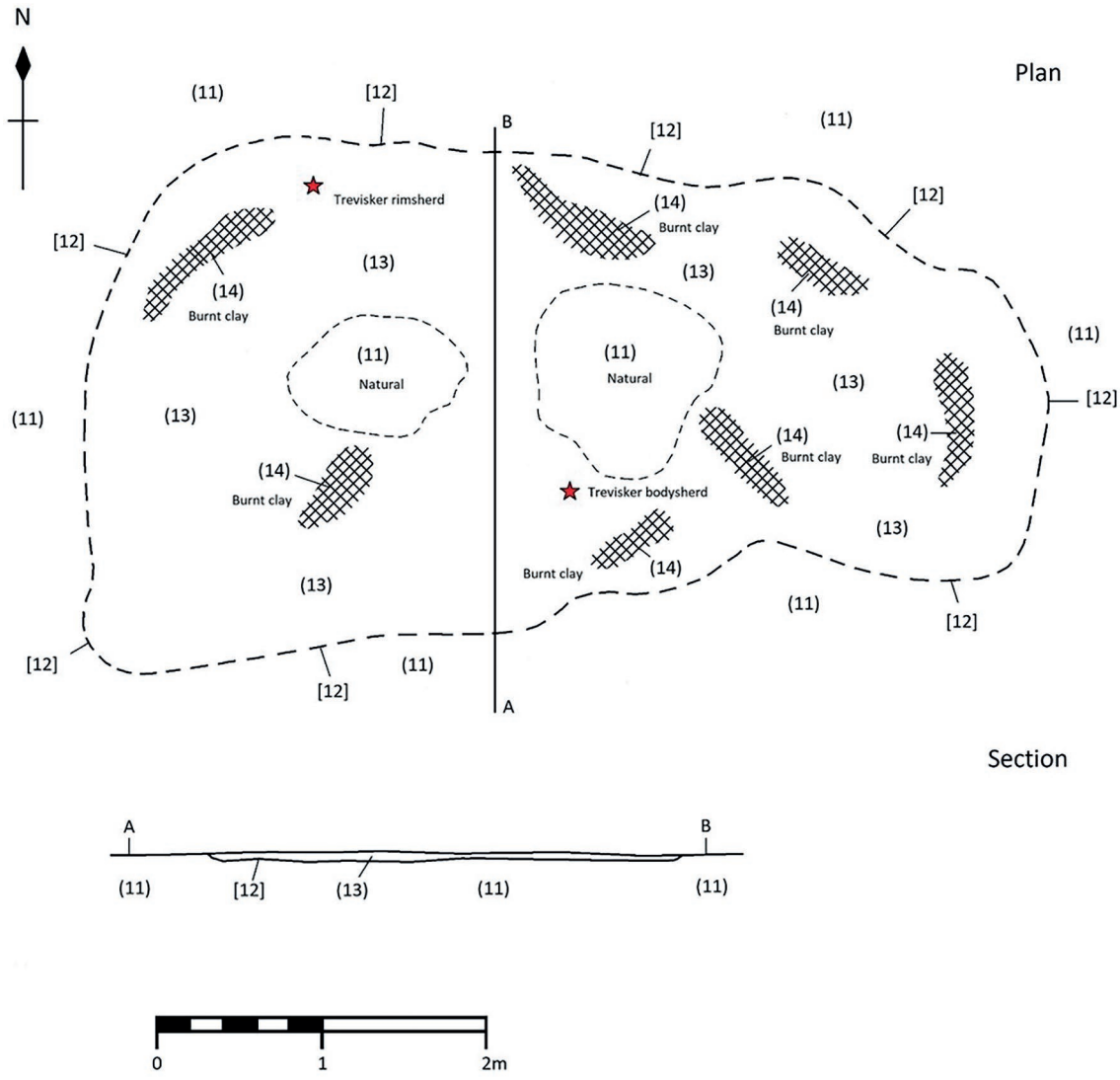

Fig 2 Plan and excavated section of the burnt spread [12] recorded in field 2.

most species; however, it was only the results from fill (13) of burnt spread [12] that were significant.

This deposit contained charred cereal grains: three grains of hulled wheat (*Triticum* sp.; probably emmer) and four grains of hulled barley (*Hordeum vulgare*). Some of the grain exhibited signs of sprouting although this is not thought to represent evidence for malting but rather spoilt grain. No cereal chaff was recorded apart from a single fragment of a barley rachis (its main axial structure).

A whole seed of Celtic / field bean (or horsebean) (*Vicia faba*) was identified from this sample. The weed assemblage includes taxa that are usually associated with crop husbandry, the commonest being that of fat hen (*Chenopodium album*), pale persicaria (*Persicaria lapathifolia*), black bindweed (*Fallopia convolvulus*), ribwort plantain

(*Plantago lanceolata*) and heath grass (*Danthonia decumbens*). These and the majority of the other weed taxa in this assemblage are most probably associated with crop cultivation. The remains of bracken (*Pteridium aquilinum*) suggests that an open heathy element was exploited, although to what extent is difficult to say due to the paucity of remains. The presence of lesser celandine (*Ficaria verna*) tubers may suggest the presence of damp grassland.

Charcoal

Charcoal was the dominant form of plant remain in all the samples analysed. Four taxa were identified from the features in field 2 and two from pit [5] in field 1.

The charcoal from burnt spread [12] was dominated by oak (*Quercus* sp.) heartwood fragments. A single piece of gorse (*Ulex* sp.) roundwood and four heartwood fragments of possible beech (*cf Fagus* sp.) were also recorded.

The samples from the series of small pits or postholes in field 2 yielded several fragments of wood. Fill (16) of [15] was dominated by roundwood fragments of *Maloideae* (apple / pear / whitebeam / hawthorn), with a small proportion of oak heartwood. It is unlikely that the *Maloideae* fragments are the remains of the possible post whereas fill (18) of [17] contained nothing but heartwood fragments of oak, most probably the traces of the original post. In field 1, fill (6) of pit [5] consisted of heartwood and knotwood fragments of oak and a piece of hazel (*Corylus avellana*).

Radiocarbon dating

Michael J Allen

The whole charred seed of Celtic / field bean (or horsebean) (*Vicia faba*) was submitted for AMS radiocarbon dating at the Scottish Universities Environmental Research Centre, and a date of 1390–1140 cal BC returned (Table 1), falling within the range of the Middle Bronze Age (Allen 2021).

Pottery analysis

Imogen Wood

Twelve sherds of pottery weighing 221g were recovered from the watching brief (Table 2).

Middle Bronze Age

The conjoining decorated rim sherds from context (13) have a rim diameter of 340mm, suggesting a large vessel falling into the Quinnell class of style 3 and 4 (Quinnell 2013, 150). There are

Table 1 Radiocarbon result of the *Vicia faba* from burnt spread [12].

Feature	*Context*	*Material*	*Lab no*	*Result BP*	□C^{13} ‰	*Cal BC*
Burnt spread [12]	(13)	*Vicia Faba*	SUERC-96627	3018±24	-23.4	1390–1140

Table 2 Quantification, fabrics, dates and description of the pottery assemblage.

Context	*Feature*	*Weight (g)*	*Count*	*Abrasion*	*Fabric*	*Date*	*Description*
(13)	Fill of spread [12]	74	3	2	Granitic 1	MBA	3 conjoining rim sherds with incised horizontal and diagonal decoration typical of Trevisker ware. Reduced fabric.
(13)	Fill of spread [12]	20	1	3	Gabbroic Admixture	MBA	1 body sherd slightly more abraded, variably oxidised and reduced fabric.
(10) (base of)	Subsoil (Field 2)	28	3	3	Gabbroic Admixture	BA	3 body sherds, oxidised and abraded
(3) (base of)	Subsoil (Field 1)	99	5	2	Granitic 2	EMC	1 Grass-marked bar-lug strap handle. 2 conjoining upright flat-topped rim sherds. 1 springing sherd for handle, external sooting. 1 body sherd with external sooting.

Fig 3 Bronze Age Trevisker ware rimsherd from context (13) within spread [12]. (Photograph: Cornwall Archaeological Unit.)

two horizontal incised lines with diagonal incised lines below (Fig 3), which could have formed a bordered zone similar to sherds from Guisseny Place, Porthleven, dated to 2840 ±35 BP, 1114–910 cal BC (SUERC-30658), which has been interpreted by Quinnell (2011, 34, fig 17) as a late Trevisker style. A similar incised geometric pattern is also found at Bosiliack, Madron, which also has later Trevisker style radiocarbon dates: 2900 ±30 BP, 1200–1005 cal BC (SUERC-29274 and SUERC-29279) (Quinnell 2013, 150; Jones and Quinnell 2011). However, the everted rim with internal bevel and the neatness of the decoration are more characteristic of the typical Middle Bronze Age Trevisker style, which is also consistent with the radiocarbon determination. The highly abraded oxidised sherds from the base of context (10) are not decorated and are broadly assigned to the Bronze Age. The single sherd of Gabbroic Admixture fabric (Gad) retrieved from (13) is a finer vessel with smaller inclusions. The use of both Gabbroic Admixture and Granitic fabrics is also seen in the assemblage at Bosiliack.

Early medieval

The bar-lug cauldron sherds from the base of context (3) are typical of Grass-marked ware and are comparable to those found throughout Cornwall from the seventh to eleventh century AD (Thorpe and Wood 2011, 278). The bar sherd and flat upright rim, with an estimated 340mm rim diameter, both have grass impressions on the interior and exterior. Analysis of rim diameters spanning the occupation of the house excavated at Gunwalloe suggested rim diameters increased over time, with sizes between 260mm–360mm dating to cal AD 1030–1210, although the sample size was small and further dated sequences are needed (Wood 2015). The general lack of dating and more importantly the static form of this ware sadly make precise dating problematic.

The nearest comparable examples are from Sennen (Guthrie 1962, 119) and Hellesvean, St Ives (Guthrie 1954, 73), both of which are undated. The vessels from these sites were also in a Granitic fabric with large inclusions. The use of crushed Biotite Granite 2, as opposed to the rounded Tourmaline Granite 1 temper used in the Middle Bronze Age, suggests a different source of tempering material while still both using essentially local clay sources rather than Gabbroic clay.

The significance of the results

These small archaeological features provide further evidence for past activity in West Penwith. Although undated, the small pit [5] could be of early medieval date, as it was found in close proximity to the Grass-marked ware; however, due to the limited evidence this remains conjecture. St Buryan was an important monastery in the tenth and eleventh centuries (Preston-Jones 1987; Olson 1989) so activity in the surrounding area is to be expected.

We have a fuller understanding of the burnt spread [12] due to the good preservation of charred plant remains, charcoal and pottery and the supporting radiocarbon date with a range within the Middle Bronze Age. Due to their close proximity to the burnt spread it could be inferred that the three pits or postholes are broadly contemporary, but they have not been dated. It is possible that the heartwood recorded in [17] represents a standing post.

The absence of documented settlement activity in the immediate area makes the context of the burnt spread uncertain. In isolation, it is possible that the spread either represents vegetation clearance for cultivation, is linked with a celebratory event of some kind, or was perhaps residues that had been generated by settlement activity. The presence of

unburnt Trevisker ware sherds within the area of the spread and the lack of evidence for *in situ* burning beneath it might suggest the latter scenarios are more likely, and the presence of charred cereals and crop weeds may indicate the processing and consumption of food. The burnt spread therefore has two areas of archaeological significance, one as an indicator of settlement activity of some form and the second in terms of the environmental information that it contains.

Middle Bronze Age spreads and mounds

The burnt spread is difficult to interpret; however, it is possible that it represents a deposit which had been used to seal a shallow cut feature. The charcoal, which was interleaved with burnt clay, does not appear to have been burnt *in situ*, and the unburnt but abraded nature of some of the pottery might at least suggest that the deposit was not in its original context. It is therefore possible that the deposit was derived from an event or activities which had occurred elsewhere, possibly on a settlement.

Spreads of material dating to the Middle Bronze are known from elsewhere in West Penwith and Cornwall, although the context for most of these deposits is ambiguous. At Tredarvah, Penzance (Pearce and Padley 1977), a spread of occupation material, which included Trevisker pottery, worked stone artefacts, charcoal and metalwork was uncovered and was initially thought to be associated with a roundhouse. Salvage investigation suggested that although the layer was occupation-derived it was not directly associated with a structure and it is possible that it represented a heap of material into which the metalwork had been deposited (Jones and Knight, forthcoming). At Bussow, St Ives, Noall (1971) reported on an early discovery of Trevisker pottery from what he thought might have been a barrow. However, no burial was identified and instead only 'ashes', more pottery and grinding stones were recorded, which had possibly covered a large stone. The site was already disturbed when Noall visited but it is evident that it was not far from a roundhouse settlement, and the large deposit of charcoal might have been generated by settlement activity.

On the Lizard peninsula, at Higher Polcoverack, St Keverne, a low mound covering an area containing Bronze Age pottery was found to cover a series of pits and postholes (Harris and Smyth 1983). The features did not form a structure and the mound did not appear to be a barrow but did appear to have been deliberately deposited. Another potentially comparable example was uncovered at Trenowah, St Austell (Johns 2008). Here a shallow hollow measuring approximately 6.2m by 5m had been infilled with charcoal-rich layers containing sherds of Trevisker pottery. Two postholes and a pit were sealed by the deposit but these did not form a structure and no roundhouses were uncovered in the immediate vicinity. Two radiocarbon determinations were obtained from the hollow, 3112 ±42 BP, 1495–1264 cal BC (Wk-11930) and 3155 ±50 BP, 1512–1290 cal BC (Wk-11932), which places it in the Middle Bronze Age. In the case of Trenowah it seems that occupation deposits had been deliberately used to seal a hollow and, in common with Higher Polcoverack, earlier non-structural features.

The lowland Middle Bronze Age settlement at Trethellan, Newquay, also produced evidence for the intentional infilling of hollows (Nowakowski 1991). Here, three 'ritual' hollows had been deliberately infilled with layers which included charcoal-rich deposits, pottery and organic-rich remains. Although dating to the end of the Middle Bronze Age, and therefore a little later in date, a large shallow pit at Trevassack Hill, Hayle (Brown *et al* 2016), has similarities with burnt spread [12]. It was filled by a charcoal-rich deposit which contained sherds of Bronze Age pottery, an amber bead and charred food remains, which included cereals. The cereals had not been burnt in the pit and the fill was interpreted as being deliberately placed into the cut.

Lowland Middle Bronze Age settlements across Cornwall have produced a significant amount of evidence for midden deposits containing pottery, charcoal and charred plant remains being used to infill roundhouse sites as part of rites of abandonment (for example, Jones *et al* 2015).

Although it is not possible to determine where the deposit formed or what the events were that led to its deposition, it is possible that the burnt material covering cut [12] was part of a spectrum of practices involving the deliberate deposition of accumulated occupation-related material to seal features.

Agricultural activity in the Bronze Age

The second area of significance from Tower Meadows lies in the proxy indicators for the surrounding environment of the Middle Bronze Age, which suggest agriculture and woodland management in the Middle Bronze Age of west Cornwall, together with the secure dating of the Celtic bean in association with fragments of Trevisker ware.

The material retrieved from burnt spread [12] demonstrates that hulled wheat, most likely emmer (*Triticum turgidum* ssp. *dicoccum*), and hulled barley (*Hordeum vulgare*) were grown, with further signs of cultivation nearby provided by the identified weed seeds.

The Celtic / field bean (*Vicia faba*), securely dated to the Middle Bronze Age, is an unusual and important find, as it did not become a significant crop until the Iron Age. Previous work in Cornwall, however, has recorded a small number of beans in features dated to the Middle and Late Bronze Age (Treasure and Church 2017; Table 3). The bean from Tower Meadows, however, is potentially the most south-westerly Bronze Age example found yet.

The presence of lesser celandine tubers (*Ficaria verna*), grass and bracken remains suggests that other habitats such as damp grassland and heathland were exploited in the Middle Bronze Age in the area of St Buryan. The exploitation of heathland is supported by the presence of gorse (*Ulex* sp.) charcoal identified from the burnt spread.

The charcoal from the Bronze Age contexts – (13), and possibly (16) and (18) – suggests that wood or fuel for domestic fires was collected from various habitats, such as heathland (as mentioned above) and scrubland, as indicated by the presence of *Maloideae* charcoal, most likely to be that of hawthorn rather than apple / pear or whitebeam, although blackthorn (*Prunus spinosa*) cannot be ruled out. Taxa more associated with woodland included oak (*Quercus* sp.), which was the commonest find and perhaps formed the original post in posthole [17]. The remains of oak consisted of heartwood which exhibited close grown annual growth rings, suggesting that perhaps that there was some stress in the environment inhibiting growth. In other oak charcoal fragments the late summer vessels were very small and infrequent suggesting that the stress may be in the form of the occasional summer drought or some other physiological means which would restrict the late growth of the oak (perhaps use as fodder for grazing animals?).

The burnt spread also produced an interesting find in the presence of a few pieces of possible beech (*Fagus* sp.). It used to be thought that beech was a post-Roman introduction into the British Isles, given its requirements for warmer weather, but beech wood and charcoal remains have been found in Neolithic to Roman contexts in southern Britain (for example, Godwin 1975; Clapham 1988).

The presence of beech in Cornwall may be considered part of its expansion throughout southern Britain. It is possible that beech formed only a small proportion of the wooded landscape but it may have formed pure stands in favourable conditions where, due to the dense shade cast by its canopy, all other woodland species were excluded. The presence of the scrubby *Maloideae* and heathland gorse suggests that the woodland was managed to some degree, although there is no evidence from the site for coppicing.

Table 3 Occurrence of *Vicia faba* in Bronze Age contexts in Cornwall (from Treasure and Church 2017, appendix 1).

Site	*No of beans*	*Reference*
Trethellan Farm	14	Straker 1991
Scarcewater	5	Jones 2010
Tremough	2	Jones 2015
Trevilson	V abundant frags	Jones 2004
Callestick	1	Gilbert and Straker 1999

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New Close and Kestle, near Roundwood, Feock, Cornwall: a note on non-invasive investigation of two newly discovered enclosures

ANDY M JONES AND ANNA LAWSON-JONES

Following the discovery of a possible hillfort on the ridge to the west of Roundwood promontory fort, Cornwall Archaeological Unit undertook a programme of fieldwalking and geophysical survey across two fields named Kestle and New Close. Fieldwalking led to the identification of a concentration of artefacts in New Close which included worked stone, flint and abraded unglazed pottery, some of which is of prehistoric and Roman-period date. Although Lidar appeared to confirm the presence of the large enclosure in Kestle field, the geophysical survey did not support this, leaving its identification unresolved. However, a second and previously unsuspected sub-rectangular enclosure was located in New Close.

This note presents a summary of results of the non-invasive surveys which have revealed new information about the use of a previously apparently blank area in the later prehistoric and Roman periods.

Between 2017 and 2019, Cornwall Archaeological Unit (CAU) was commissioned by the National Trust to organise fieldwalking by volunteers of two fields, Kestle and New Close, followed by a 9 ha geophysical survey. The two fields are located close to a scheduled promontory enclosure of probable Iron Age date which projects into the River Fal at Roundwood (Figs 1 and 3).

A summary of the results of the fieldwalking and the geophysical survey are presented here alongside other information from non-invasive archaeological investigation and Lidar data. Combined, these different strands provide a multi-faceted glimpse of past activity across the two fields which will feed into future National Trust management of the area.

Location and background

The two fields (centred on SW 83125 40411) are located on the western side of the River Fal in the parish of Feock and are separated by the lane to Roundwood Quay. They lie within land characterised as Anciently Enclosed Land; that is, land where the pattern of settlements and fields has origins in the medieval period (Cornwall County Council 1996; Herring 1998, 77–82). Such land has undergone generations of ploughing and changing patterns of enclosure; long-term cultivation has resulted in the production of a well-mixed ploughsoil, blending topsoil with underlying disturbed natural geology, killas and quartz.

The fields, named Kestle and New Close in the 1845 tithe apportionment for Feock, are positioned centrally on a distinctive broad east–

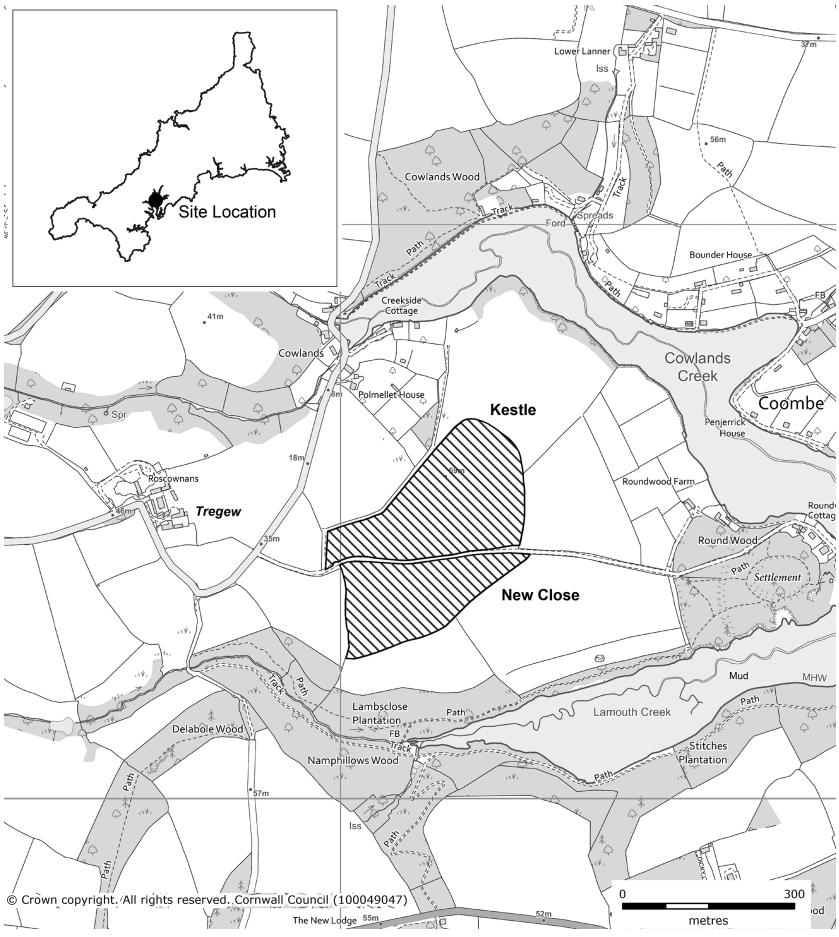

Fig 1 Location of the project area: Kestle Field to the north of the lane to Roundwood and New Close to the south.

west ridge, defined by Lamouth Creek to the south and Cowlands Creek to the north. The ridge tapers and slopes to the east. At its eastern end, approximately 340m away, is Roundwood, a late prehistoric multivallate promontory enclosure (scheduled monument: National Heritage List for England 1019847). Historically the fields were part of Tregew, a farming settlement of early medieval origin 500m to the west, first recorded in 1208. By the eighteenth century Tregew had become a seat of gentry (as shown on Martyn's map of 1748). The field pattern is essentially unchanged from that shown on an estate map of 1821 (Parkes 2015, 47, fig 52), the series of large enclosures being characteristic of a barton farm; that is to say, a higher status single dwelling with the home farm land held in hand (*ibid*, 2015, 31, 32). It is likely that at some time much of the promontory had been an area of rough ground, associated with Tregew: the tithe apportionment described North Kestle as rough pasture and the late seventeenth-century Lanhydrock Atlas, which shows some of the fields at Tregew, recorded South Kestle as furze (gorse) (Holden *et al* 2010, 94, 97). The locations of North Kestle and South Kestle are shown on Figure 4. At that time, South Kestle was considerably larger and included Lambs Close to the west. Perhaps South Kestle had originally covered all the ground south of the lane, in which case that might explain the name 'New Close' if this had been enclosed from South Kestle. Alternatively New Close might refer to the clearance and reorganisation of an earlier field pattern.

The lane to Roundwood Quay is likely to have had a long history (Parkes 2015). In part it may follow the original approach to the Roundwood fort, and then in the medieval period and later it linked Tregew with a potential landing place at

Fig 2 The south-east corner of the potential hillfort on the ridge above Roundwood. The hedge, the platform in the field in front, and the low rise outside it, appear to represent the remains of an enclosing rampart, ditch and counterscarp bank. (Photograph from Parkes 2015, fig 46.)

Roundwood. In the later eighteenth century this was developed as a quay, initially associated with a short-lived copper smelter (Kirkham 2005).

Kestle field encloses the highest point of the promontory at 58m OD. It has broad northern views down towards Coombe, Cowlands Creek and beyond, east to Roundwood and the Fal River valley, west towards Tregew, and south across the extensive south-facing slope which drops down to Lamouth Creek. New Close lies below Kestle on land that slopes to the south.

A possible hilltop enclosure

In 2015 archaeological recording carried out by CAU in connection with works to the Roundwood lane identified a possible hilltop enclosure. The curving form of the existing field boundaries, together with the character of the boundaries, were suggestive of a large univallate enclosure, roughly pear-shaped in plan and about 4.9 ha in area (Parkes 2015). Examination of the tithe apportionment schedule revealed that the field-name was Kestle, derived from the Cornish word *castell* meaning 'castle, village, tor', which can denote an early settlement (Padel 1985, 42). The fact that the name Kestle is shared by the adjacent fields of North Kestle and South Kestle implies that the term Kestle referred to a pre-existing dominant landscape feature.

The northern and north-eastern sides of Kestle field are defined by a distinctive curved boundary, which largely follows the top of a markedly steep scarp and is likely to contain the fossilised remains of the enclosure bank, recorded as being up to about 4m wide and 2m high (Cornwall Historic Environment Record MCO 58148). On the eastern side, Cathy Parkes (2015) also tentatively identified the remains of a ditch, visible as a platform or depression immediately beyond the hedge, with hints of a counterscarp bank beyond it (Fig 2). This platform is a subtle but clear feature, which significantly increases the visual impact of the Kestle enclosure when viewed from the east. The ditch can be seen on the Lidar survey (Fig 3), although the hedge does not appear to be more substantial than other field boundaries. On the north-west side of the enclosure a later trackway may mark the line of the ditch. The possible enclosure bank does not survive in the south-west section and no boundary is shown here on any of the historic maps, the earliest being the 1821 estate map; however, Parkes noted a marked break in slope here on the suspected line of the bank, suggesting that at some time before 1821 the enclosure bank had been levelled to amalgamate Kestle and a smaller field to the west. This line can be seen on the Lidar survey. The southern side of the enclosure is uncertain; the lane may mark the line of the ditch.

No archaeological features were visible within Kestle field, although the National Mapping Programme identified three potential round barrows within the enclosure, showing as soilmarks (Cornwall Historic Environment Record MCO 3434, MCO 3436 and MCO 3435). None are upstanding earthworks or were detected by Lidar or the geophysical survey. It is, however, possible that MCO 3435 lies in a rough uncultivated patch of ground centred on the highest point of the field which had been left as an area for planting and could not be surveyed.

No earthworks were visible in New Close although close, retrospective inspection of the Lidar survey (Fig 3), does show low banks in the

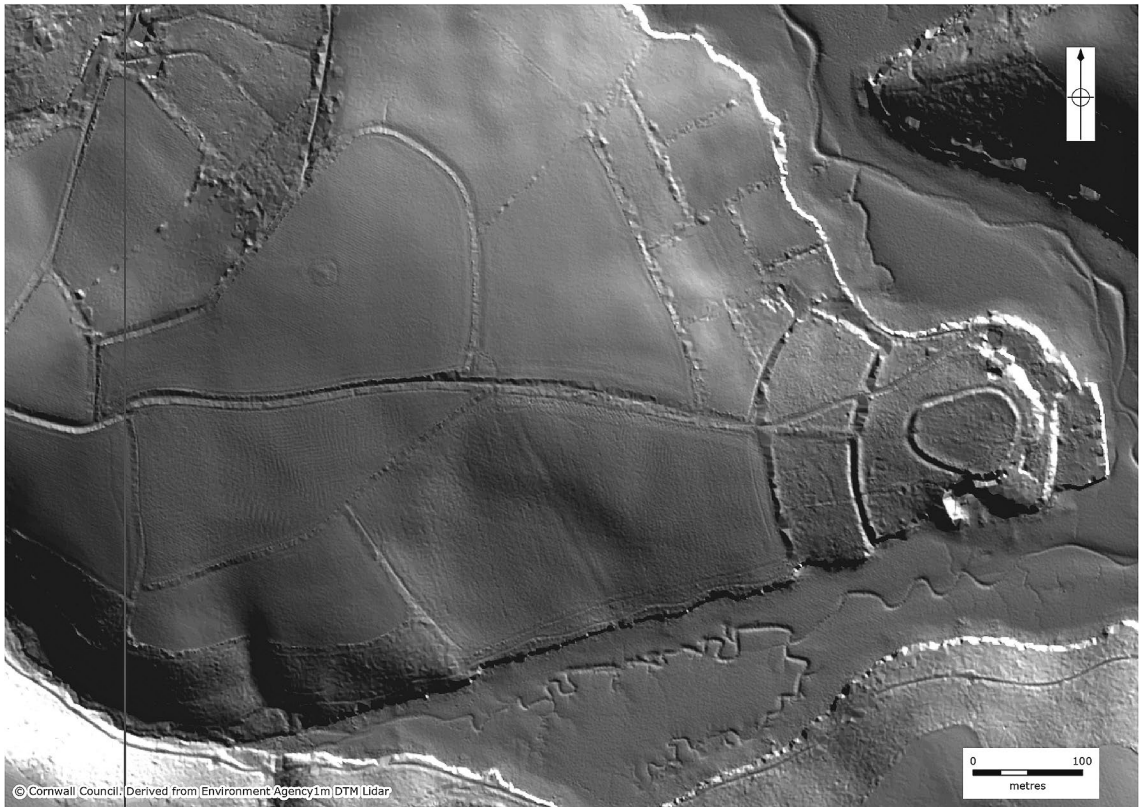

Fig 3 Lidar showing the earthworks at Kestle and the promontory enclosure at Roundwood to the east. (Source: Environment Agency.)

area which was subsequently found by geophysical survey to contain an enclosure comparable in size to a later prehistoric or Romano-British 'round' (below).

Long-term ploughing over generations in both fields will have truncated archaeological remains, indeed recent horse ploughing still allowed the ploughman to report hard stony patches and softer areas.

Fieldwalking

As a result of the hilltop enclosure's identification, CAU was commissioned to arrange two days of volunteer fieldwalking, across Kestle in 2017 and New Close in 2018, after horse-drawn ploughing had taken place. Both days resulted in a large number of finds of all periods being collected (Fig 4). Later finds were recorded by broad zones but the earliest, including flint, unglazed pottery and other worked stone, were plotted using a hand-held GPS unit. It was hoped that this might help date the enclosure and highlight other prehistoric and later activity. Fieldwalking demonstrated the long-term use of the site through the collection of Mesolithic to Bronze Age flintwork, but also drew attention to the effects of long-term ploughing on less resilient artefacts such as abraded sherds of unglazed pottery. The results from the fieldwalking are recorded in two archive level reports (Lawson-Jones 2017; 2018).

Kestle

Fieldwalking in Kestle produced 570 finds (Lawson-Jones 2017). The overwhelming majority were post-medieval or later in date, but there were also around 35 sherds of medieval pottery, suggesting that the field was being cultivated at this

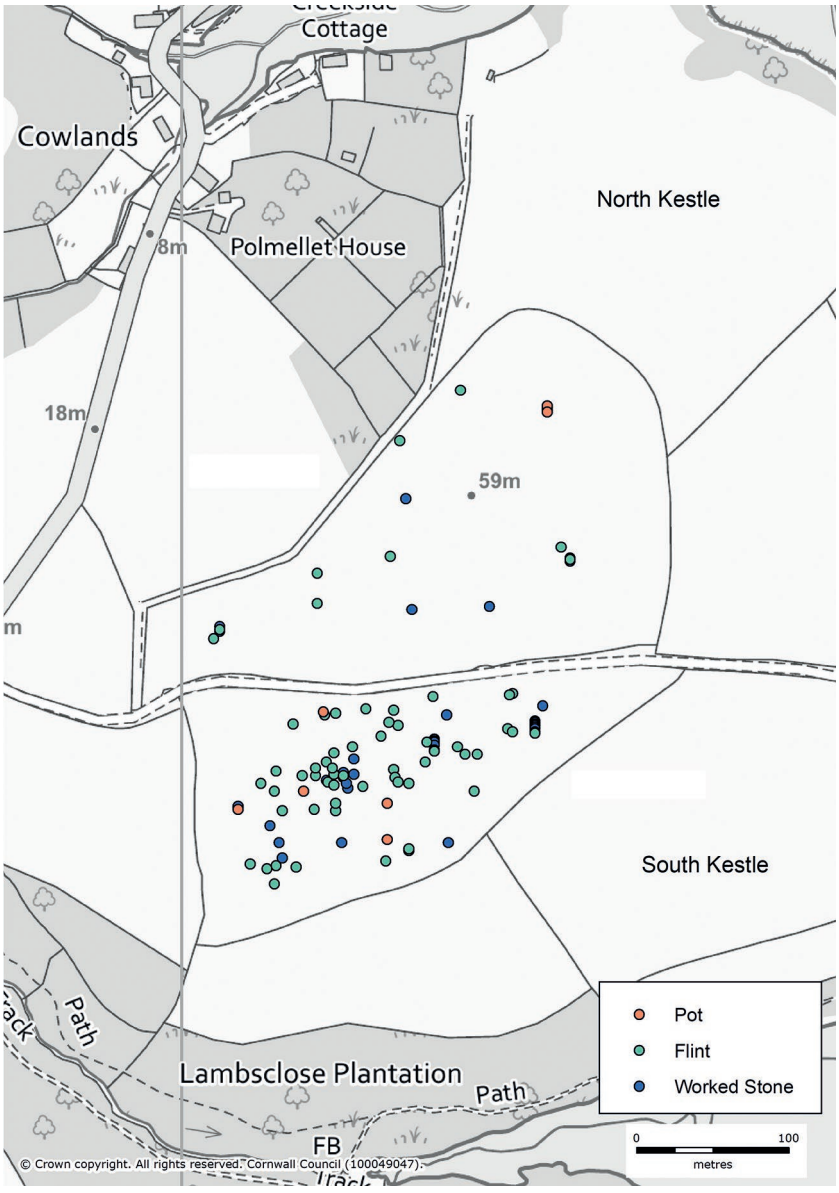

Fig 4 Results from the walkover surveys, showing the locations of finds in Kestle Field and New Close. A marked concentration of finds is noticeable over the area of the New Close enclosure.

period. Moreover, the assemblage also included 33 Mesolithic, Neolithic and Bronze Age worked flints and a range of smooth, often symmetrical, complete and broken flint / chert and quartz pebbles, possibly representing late prehistoric slingshot (for example, Robertson 2016; Nowakowski and Quinnell 2011, 261). Alternatively, the pebbles may have been introduced with seaweed or sea-sand manuring, although local River Fal seaweed is likely to have been associated with water-worn shillet and quite often misshapen quartz rather than the more symmetrical flint, chert and quartz pebbles. Prehistoric pottery was absent although two probable Romano-British sherds were collected from this field.

New Close

Fieldwalking across New Close produced an overall assemblage of 1011 items (Lawson-

Jones 2018). This included a larger range of late prehistoric to Roman-period artefacts than Kestle field. There were 67 Neolithic and Bronze Age worked flints and a worked quartz piece, as well as miscellaneous selected, half and quartered discoidal pebbles, which possibly represent gaming counters. A single cassiterite pebble may have been collected in prehistory from a watercourse for the purpose of metalworking. Worked stone artefacts included four hammerstones, two whetstones, holed and notched slates, and two slate pot-lids. These artefacts are likely to be of Iron Age or Roman date (for example, Quinnell 2004, 142; Jones and Taylor 2015, fig 30). Three muller fragments are likely to be of Bronze Age or Iron Age date (for example, Jones and Taylor 2010, fig 59). More closely diagnostic was a fragment of Trethurgy type bowl (Quinnell 2004, 135) of second to third-century AD date. Pre-medieval ceramics were also found in New Close, including three sherds of Bronze Age pottery, two of possible Roman date and two potential amphora sherds. These items were abraded but are unlikely to have travelled far from their original context. This is significant as along with the muller, hammerstone and stone bowl fragments this suggests later prehistoric and Roman-period occupation was focused in New Close. Indeed, many of these finds were concentrated over the area where subsequent geophysical survey identified an enclosure. Around 50 sherds of medieval pottery were also found; however, the majority of artefacts were of post-medieval date.

Geophysical survey

On the basis of the fieldwalking results it became clear that there might be surviving below-ground remains. A 9 ha geophysical survey was commissioned (Fig 5), which was undertaken by Sumo Geophysics (Davies 2019). The survey was divided into four areas (Area 1, Kestle; Area 2, New Close; Area 3, Lambs Close; Area 4, South Kestle) and revealed an unexpected range of results.

Kestle

Comparatively little was uncovered in this area, and with the exception of a removed boundary, the few anomalies within the enclosure are of uncertain archaeological origin or date.

In the eastern part of Kestle the geophysical survey identified two linear anomalies, forming a ninety-degree angle, suggestive of a remnant field system. The date of any such field system is uncertain, although a prehistoric or Roman origin is possible.

In addition, towards the western end of the survey area a straight anomaly runs from a kink in Kestle's northern perimeter south to Roundwood lane. This may be a post-medieval boundary removed prior to the earliest map evidence of 1821. Alternatively, the boundary may be of later prehistoric or Romano-British date, as its line appears to continue south beyond the lane, ending on the enclosure in New Close. In either case, this feature does not appear to mark the south-west perimeter of Kestle's potential hilltop enclosure. The southern edge of the enclosure was also not identified, either in Kestle field or in New Close, suggesting that if there was an earthwork here, the lane is likely to mark its southern perimeter.

New Close

By contrast with Kestle, several significant anomalies were uncovered in this area, the major one being a well-defined, single-ditched sub-rectangular enclosure measuring approximately 95m by 85m. The ditch varies in width and has irregular edges. There are two distinct approximately 2m wide breaks in the ditches, potentially associated with entrances. One is located on the northern side and the other is in the south-eastern corner. The northern entrance may have been the more substantial and shows a distinct broadening of the ditch on either side. The south-eastern entrance also shows a broadening of the ditch to either side, plus a short projection east from the northern side.

There are numerous internal anomalies within the enclosure, including circular, sub-circular, curvilinear and linear arrangements some of which may be buildings, pens or fenced spaces (Davies 2019). These are found mostly in the northern (uphill) part of the enclosure, but also in the south east and south west. In the centre there is a north–south ditch, on the same alignment as features located to the north of the enclosure, which could represent an internal division within the enclosure, or, as it follows the gentle slope down to the south, a possible drain.

Fig 5 Geophysical survey results, showing the enclosure in New Close. (Source: Davies 2019.)

To the north of the enclosure there are two linear anomalies immediately south of and parallel with Roundwood lane. These may have formed a track or droveway, given its width of approximate 7m which widens to 12m as it becomes level with the northern entrance of the enclosure. It is likely that the track is contemporary with the enclosure since it appears to make use of the northern edge of the enclosure for the last part of its approach, and does not extend beyond the northern entrance, seeming to end on the north–south ditch which runs from Kestle field to a point immediately east of the enclosure entrance. It is tempting to see this approach as a precursor to Roundwood lane. At the

eastern end of the track there is a semi-circle with a southern entrance and internal pit-type feature and beyond this to the east there are further linear and pit-like anomalies. To the east of the enclosure is a group of discrete pit-like anomalies. These have strong responses, but their date and function is uncertain.

To the south and west of the enclosure are two east to west linear anomalies which could be associated with early fields. The northern one is relatively straight and appears to run up to the south-western corner of the enclosure. It is uncertain whether it is contemporary with the enclosure or if it was aligned on the enclosure, thereby post-dating it.

A linear anomaly running east from the enclosure is thought to be a natural geological feature (Davies 2019), as is a broader, less well defined feature running north–south through the southern part of the enclosure and beyond.

Lambs Close

Several potential linear, pit type and curvilinear anomalies which may be associated with archaeological features were identified in this area. In particular, a string of pit-type features is located at the western end of the area and at the eastern end is a potential curvilinear anomaly which might be associated with a cluster of pits immediately to the south.

South Kestle

At the southern end of the survey area is an irregular linear together with a semi-circular anomaly with an internal small pit-like anomaly which is potentially archaeological in nature.

Discussion

Kestle

Initial observation in the field, together with historic mapping and place-name evidence, were strong indicators of a potential new hilltop enclosure at Kestle, appearing to be a roughly pear-shaped univallate enclosure of about 4.9 ha. Geophysics, fieldwalking, and Lidar have shed further light on it.

The fieldwalking in Kestle field produced comparatively few prehistoric artefacts, although flints indicate at least an intermittent human presence from the Mesolithic period onwards. Similarly, the geophysics did not identify any unequivocal prehistoric archaeological features, such as roundhouses. This is possibly due to plough damage removing structures. As finds and internal features are few, this does not help with interpretation of the site as a prehistoric enclosure; however, it does not rule out this possibility as investigations elsewhere in Cornwall have revealed that not all hilltop enclosures contained domestic structures (Lewis and Frieman 2018; Lewis *et al*, in preparation; Jones 2018). Likewise, there was no evidence for the three round barrows previously identified as soil-marks. However, many Cornish barrows are not surrounded by ditches (Miles 1975; Johns and Herring 1994), and when reduced by intensive ploughing would leave few traces for a geophysical survey or Lidar to detect. Their potential presence is of interest as many later prehistoric hilltop enclosures across Britain and Cornwall enclose Early Bronze Age round barrows and cairns, which may have been associated with the assertion of connections with a distant past by the builders of the enclosure (for example Sharples 2010, 31–4; Jones 2018).

Evidence for the perimeter of the enclosure could not be confirmed by the geophysical survey, partly because the survey was focused upon the interior of the field inside the northern and eastern banks. Its southern side was not identified in either field, suggesting that it must have run along the lane. The best opportunity to confirm the existence of the enclosure was on the south west, where a substantial, probably curving, ditch might have been expected. However, the straight and relatively slight feature found here is more likely to be either a removed post-medieval field boundary or a boundary associated with the enclosure in New Close. If Kestle is not a prehistoric enclosure, the other possibility is that the prominent curving boundary on the north and east sides could instead be a medieval or post-medieval boundary running between Roundwood lane in the south to another curving boundary to the north, enclosing an area that had perhaps been part of rough ground on the promontory. In that case, the name ‘Kestle’ (together with North Kestle and South Kestle) may have referred to the promontory fort just to the east, or perhaps to the enclosure in New Close, as

this could have survived as a prominent feature for many centuries after it was abandoned. However, another possibility is that the hilltop was never entirely encircled by an earthwork and that the ramparts were either unfinished or intended to be seen from one direction, namely from the low-lying ground to the east occupied by the Roundwood promontory enclosure and the river.

Given the uncertainty of its form and paucity of associated artefacts, the date of the Kestle earthworks remains to be established. If Iron Age in origin, based on current understanding it may have been constructed in the earlier Iron Age and abandoned by the later Iron Age (Pope and Haselgrove 2007; Sharples 2010, 55–7; Pope *et al* 2020). However, although few artefacts were recovered from within Kestle field, sherds of Bronze Age pottery and stone muller fragments that could date to the same period were recovered from New Close. These artefacts have no direct association with Kestle field; however, in other parts of Britain and Ireland some hilltop enclosures have been found to be of later Bronze Age date (Bradley and Ellison 1975; Bradley *et al* 2015, 22–30; Ellis 1989; O'Brien 2016; O'Brien *et al* 2014-2015). It may also be noteworthy that in Cornwall enclosures of Bronze Age date have also been identified at Liskeard and Tregurra, Truro (Jones 1998-9; Taylor, forthcoming), and in neither of these cases was a complete ditch circuit established.

New Close

The walkover and geophysical survey in New Close produced a larger artefactual assemblage, including 67 flints of predominately Neolithic to Bronze Age date and a small worked stone and ceramic assemblage dating to the Bronze Age. The majority of the finds were located in the area of the enclosure, a south-facing, well-drained location. The character of the occupation is difficult to determine and is likely to have shifted over time but it is possible that Bronze Age occupation was linked with visits to nearby barrows, use of the waterways or use of the enclosure in Kestle field.

The geophysical survey revealed the presence of significant sub-surface remains. Here, to the immediate south of the possible hilltop enclosure in Kestle field, the survey identified a smaller, 'round'-size enclosure with entrances in the north and south east. The chronology of the New Close enclosure is uncertain but its size and position on a south-facing slope, as opposed to the summit of the hill, is indicative of a Late Iron Age or Roman date as rounds tend to be sited on sloping ground (Quinnell 2004). A Roman-period date is also suggested by the artefacts which were recovered from the fieldwalking in New Close. These include sherds of amphora and Roman pottery and part of a Trethurgy type stone bowl, all of which demonstrate occupation in the Roman period, when the majority of rounds were occupied (Quinnell 2019). It is therefore possible that the New Close enclosure post-dates the possible Kestle enclosure and, like other sites in Cornwall, was associated with a reformulation of the landscape in the post-conquest period (Jones and Kirkham 2021).

By contrast with Kestle, the geophysical survey of the New Close enclosure revealed that it contained a large number of internal features which, as at Trethurgy and Penhale rounds, were concentrated around the perimeter of the enclosure (Quinnell 2004; Nowakowski and Johns 2015). Based on our knowledge of other comparable enclosures, the anomalies are likely to represent houses, pens and other structures, which were probably associated with a wide range of activities including domestic occupation, agriculture and small-scale industry (Appleton-Fox 1992; Quinnell 2004). The concentration of features in some parts of the enclosure may also be indicative of the renewal of structures and of a long occupation. Although the range of activities and length of occupation within the New Close enclosure cannot be determined without excavation, intensive occupation is supported by the finds from the fieldwalking which were concentrated in the area of the enclosure. The enclosure appears to have been associated with a rectilinear field system formed by ditched (and presumably banked) boundaries, including a trackway leading to the enclosure's north entrance.

Final thoughts

The different investigative techniques reported on in this paper have greatly increased understanding of this area's landscape history. Fieldwalking (Fig 6) revealed episodic occupation stretching from the Mesolithic through to the post-medieval period, and Lidar and geophysics provided evidence for enclosure.

Fig 6 Fieldwalking in New Close 2018, with the hedge of the Roundwood lane in the background. (Photograph: Cornwall Archaeological Unit.)

The full range of activity and indeed the construction and end dates for occupation at New Close, and Kestle, however, remain to be established, as does their relationship with the promontory enclosure at Roundwood. It is tempting to see a link between the possible hilltop enclosure and the promontory enclosure on the river to the east. Paired enclosures are found elsewhere in Cornwall, as for example can be seen with the enclosures of Gear and Caervallack, St Martin-in-Meneage (Edwards and Kirkham 2008). Kestle, which overlooks the river, could have restricted access inland from visitors or traders arriving at Roundwood. However, Roundwood has no documented excavation and the chronology and character of its occupation is also uncertain (Kirkham 2005). The potential chronologies and relationships between all three enclosures can only be demonstrated through excavation. Nonetheless, the current project has revealed the value of using a combination of non-invasive techniques to greatly increase knowledge of an area which was previously considered to be devoid of archaeology.

Acknowledgements

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Archaeological investigations at Godrevy, Gwithian 2019: implications from geophysical survey and auger coring

MICHAEL J ALLEN, ANDY M JONES AND THOMAS WALKER

In 2019 Cornwall Archaeological Unit was commissioned by the National Trust to organise geophysical and auger surveys at Godrevy, in west Cornwall. The surveys produced a significant and complementary set of results which have shed light on the occupation of the headland prior to the current farm and field system, which is itself of medieval origin. The geophysical survey of approximately 25 hectares within the fields around the farmhouse revealed that the area had been enclosed by at least one earlier north–south aligned field system, which appeared to be coaxial in nature. Auger coring was predominantly undertaken to the south of the farmhouse in the fields and dunes. Little in the way of environmental evidence was found within the fields; however, the results from the towans were significant as they suggested that, by contrast with previous coring sampling, the dunes in this area had formed since the medieval period.

As part of the assessment stage, three radiocarbon determinations were obtained on snail shells from an existing core. These produced two dates which fell in the Early to Middle Iron Age and a third in the medieval period, adding further detail to the existing dated sequence of sand blows. The determinations cannot be directly related to the field system detected by the geophysical survey but they are associated with significant changes to the landscape.

In July 2019 Cornwall Archaeological Unit was commissioned by the National Trust to organise a programme of archaeological recording at Godrevy Farm, Gwithian (centred at SW 58555 42885) in advance of a possible realignment of the coast road and relocation of car parking spaces. The recording was undertaken to assess the archaeological potential of the area and was largely non-invasive. It comprised building recording of the historic farm complex (Motley and Thomas 2020), geophysical survey of the fields surrounding the farm buildings to identify buried archaeological features (Davies 2019) and auger coring (Allen 2020) to recover evidence of buried soils and deposits, especially to the south where dune formation had the potential to seal very significant palaeoenvironmental and geoarchaeological remains (Fig 1).

This short paper describes the results from the geophysical survey, which identified an extensive field system, the assessment of the coring samples, and radiocarbon dating of shell samples, which have produced a significant and complementary set of results.

Location and background

Godrevy Farm is located on a north-coast headland in western Cornwall, approximately 5.5 km to the north west of Camborne (Fig 1). The underlying geology is composed of the Mylor slate formations. The current farming settlement is of medieval origin, first recorded in 1297 (Padel 1988, 88). On its north-west side the farm is sheltered by a low north–south ridge, beyond which is the more exposed Godrevy Point (Fig 2). In the fields around the farmhouse, the soils are fertile and were in cultivation at the time of the surveys. Further to the south, the land becomes sandier and as the ground slopes to the west and south there are large dunes, Godrevy Towans, which reach several metres in height. The eastern edge of the survey area is marked by a steep slope up to slightly more elevated ground.

The sandy, calcareous quality of the soils and the surrounding dunes means that it is one of the most important areas in Cornwall for the survival of palaeoenvironmental remains, including snails, animal bone and potential evidence for past manuring (for example, Walker 2018; Straker and Walker 2018; Dev 2018). This range of organic remains does not normally survive the acidic conditions which prevail inland beyond the dunes and across most of the rest of the county, and are therefore of huge significance.

In addition to the excellent preservation of palaeoenvironmental material, the Gwithian area is exceptionally rich in archaeological sites, ranging from dense concentrations of Mesolithic artefact scatters (Roberts 1987; Thomas 2005; Jones *et al* 2018; 2019) to major Bronze Age, post-Roman and early medieval settlement sites (for example, Thomas 1958; Fowler 1962; Nowakowski *et al* 2007). In particular, highly significant evidence for prehistoric to earlier medieval enclosure and traces of cultivation have been revealed beneath the sands, which have included spade and ard marks as well as ploughsoils and lynchets (Fowler and Thomas 1962; Megaw 1976; Nowakowski *et al* 2007).

There are a number of important sites in the immediate vicinity of the project area which may be relevant to the current study (Fig 2). On higher ground immediately to the south east is Crane Godrevy, a Romano-British 'round' reused as a medieval and post-medieval settlement, excavated in the 1950s and 1960s (Thomas 1969). On the low cliff 175m south west of Godrevy Farm there is a small Roman-period settlement site excavated in 1956–1962, known as Porth Godrevy (Fowler 1962); this may be associated with a few small fields identified on Godrevy headland (Fowler 1962, 21; Thomas 1964, 43–4, fig 14). Immediately south east of the Porth Godrevy site, Fowler refers to 'ruinous 17th–18th century farm remains, predecessors of the present Godrevy Farm' (Fowler 1962, 19); Nigel Thomas includes a sketch of this site in his assessment of the area (1995, fig 10) but there has been no further work on it, and its date and character are uncertain.

The whole of the headland north west of Godrevy Farm was recorded in a detailed measured survey in 2002–3 (Craze 2003). Among other things, this included a medieval field system of about 5.5 ha on Godrevy Green, consisting of a number of fields defined by banks and lynchets, some of them quite substantial, suggesting prolonged cultivation. Groups of strips within the fields, marked by very low banks, are a good indication that the fields were farmed by a hamlet rather than by a single farmstead, although it is uncertain whether this settlement was on the same site as the present Godrevy Farm or elsewhere (such as the clifftop site next to Porth Godrevy). Part of this area was enclosed again in the nineteenth century, the walls and Cornish hedges sometimes cutting across the earlier boundaries and in other cases reusing them (Craze 2003).

The current field pattern in the project area is associated with Godrevy Farm, an eighteenth- to nineteenth-century farmstead. The fields are largely unchanged since the 1840 tithe map and although post-medieval in its current form, the layout is likely to be medieval in origin, resulting from the enclosure of former strip fields (as seen to the north west of Godrevy Farm). It has been suggested that these may have formed very long north–south strips (Fowler and Thomas 1962, 81–2, fig 21; Thomas 1995, 71, fig 10), but perhaps it is more likely that much shorter north–south strips were contained within a series of east–west 'cropping units' formed respectively by Areas 1 to 3, Areas 6–7, Areas 11–12, and Areas 8–10 (Fig 3).

Other than these elements, the archaeological potential of the project area was essentially unknown, and it fell outside the parts of the Gwithian–Godrevy landscape which had been investigated by Charles Thomas's campaigns of fieldwork throughout the 1950s and 1960s.

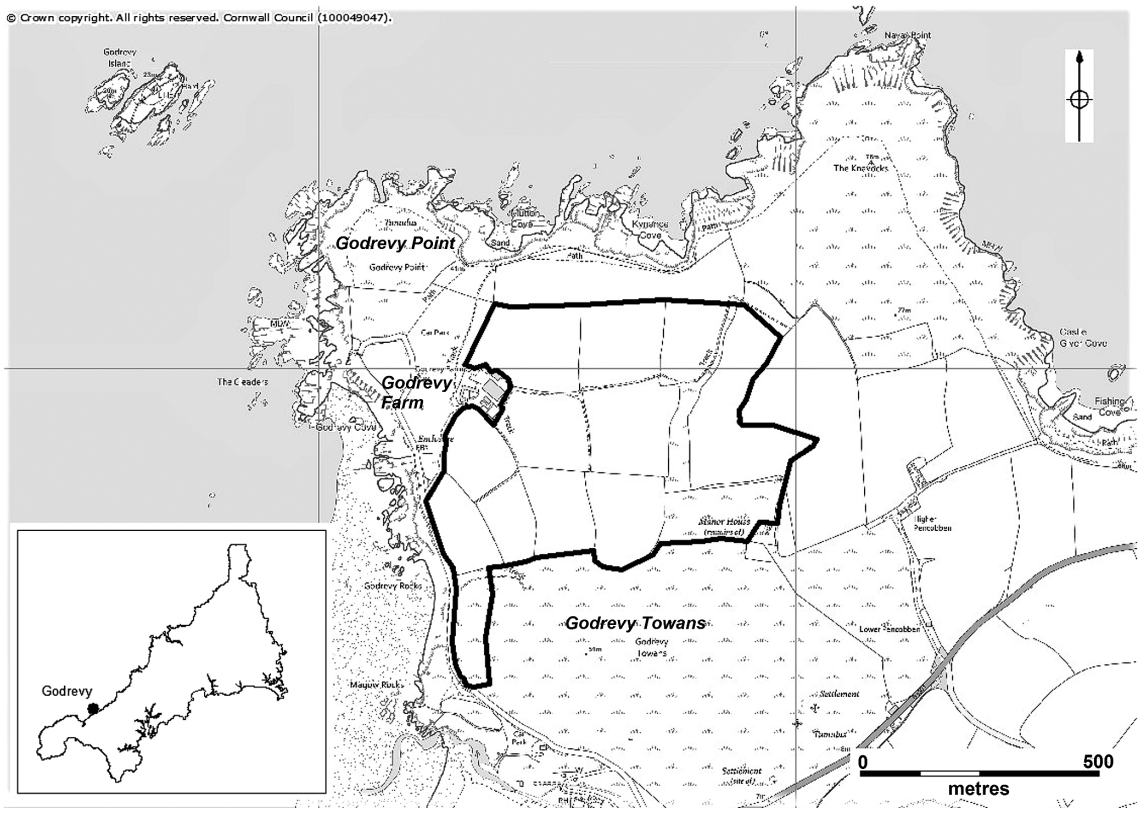

Fig 1 Location of the Godrevy geophysical survey and auger coring project.

Inspection of recent lidar data and aerial photographic mapping undertaken by the National Mapping Project revealed that, by contrast with adjacent areas of the Godrevy headland (especially to the east and west), there was a distinct paucity of archaeological features, and cultivation across most of the project area since the 1950s may well have reduced any earthworks to the point where they were no longer visible on the ground. In particular, study of the lidar data revealed areas of deep, closely set parallel furrows in several of the fields, consistent with modern deep ploughing. This meant that the combination of geophysical survey and auger coring provided the best opportunity to investigate an important part of the Gwithian landscape.

The archaeological investigations

Geophysical survey

A magnetometer survey of approximately 25 ha was undertaken in the ploughed fields around Godrevy Farm (Davies 2019). The survey identified a large number of anomalies, which very probably relate to pre-medieval episodes of settlement and enclosure (Fig 3).

A few features relate to the present field layout. Areas 1 and 6 both have evidence for removed double-ditched boundaries running north–south. A ditched feature running west-south-west to east-north-east through Areas 9 and 10 appears not to extend beyond Area 10, suggesting perhaps that the area covered by Areas 8, 9 and 10 had previously been divided into two rather than three fields. The survey also shows two lines of strong magnetic disturbance which are thought to be service

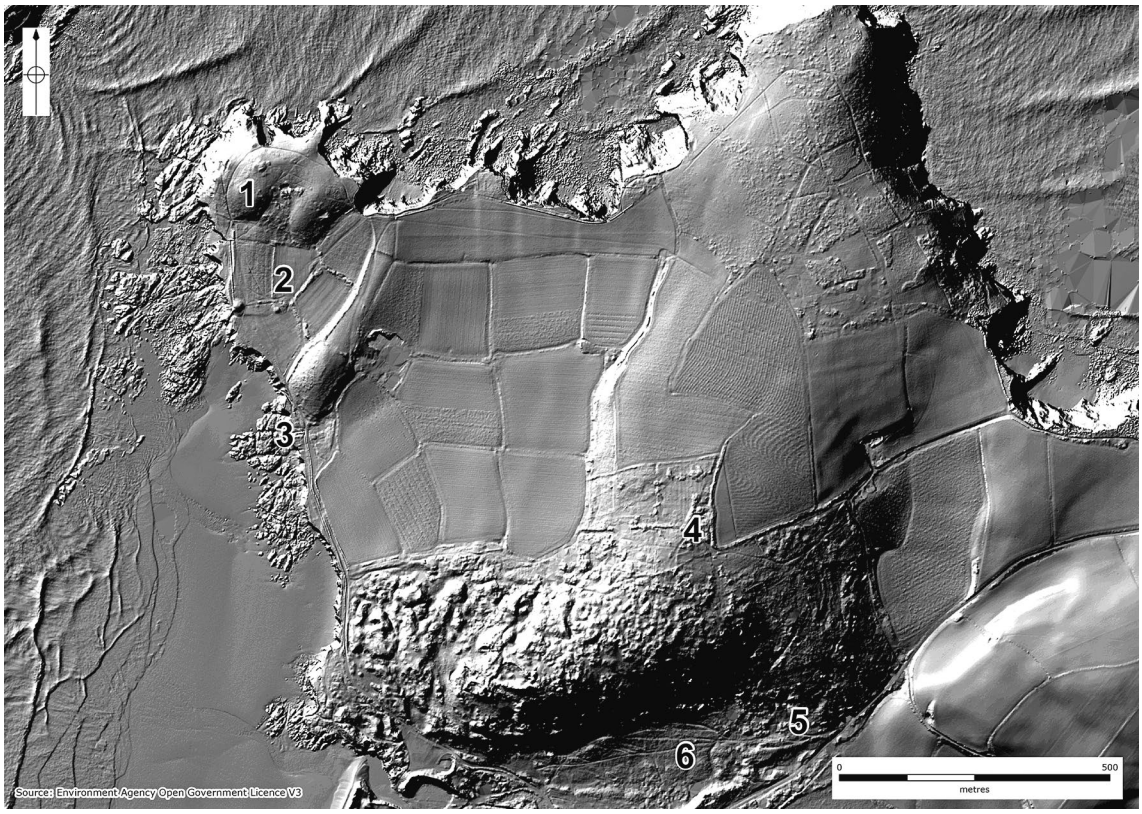

*Fig 2 Lidar showing the Godrevy area. (**1**: Godrevy Point, Bronze Age barrow. **2**: Godrevy Green, medieval strip fields and enclosures. **3**: Porth Godrevy, Roman-period settlement. **4**: Crane Godrevy, round and medieval settlement. **5**: Gwithian, Bronze Age settlement. **6**: Gwithian, early medieval settlement.)*

trenches running to Godrevy Farm (one east–west, the other south–north).

The majority of anomalies are linear ditched features associated with a field system underlying, and on a different axis from, the current field system, which has largely remained unchanged since the 1840 tithe map and is itself of medieval origin. These appear to be mostly part of a single field system with a predominantly north-north-east to south-south-west alignment. However, the field system is not uniform in character across its extent. Strip-like fields, 30–50m wide, are prominent across the central area; an east–west boundary may divide these into shorter bundles. South west of these there are traces of simpler, rectangular fields, although they have a similar alignment to the strip-like fields. A boundary running through Areas 6 and 12 roughly parallel to the alignment of the fields to the west has a number of east–west ditches attached to its east side; this boundary can also be seen on the lidar survey, suggesting that it survives as a slight earthwork. It appears to end on the southern side of a group of more irregular enclosures to the north east (Areas 2 and 3); a prominent north–south feature on the east side of Area 3 can similarly also be seen on the lidar survey (Fig 2). Also in the northern part of the field system, there appear to be well-defined east–west fields across Area 1, but the survey report suggests that these anomalies may instead be caused by geological features such as localised variations in the underlying superficial deposits or possible striations in the slate and siltstone bedrock (Davies 2019). Interpretation of the lidar data suggests

Fig 3 Geophysical survey results, showing the field system which pre-dates the present-day layout. (Source: Davies 2019.)

the field system may extend further to the north, beyond the project area (Fiona Fleming, pers comm), although alternatively this may reflect medieval or later enclosure of the coastal strip. There is also an indication of time depth, as some of the linear anomalies seem to fit into neither the current field system, nor within the overall pattern of the fields identified by the geophysical survey.

Beyond the fact that they are earlier than the current field system, the geophysical survey could not demonstrate the age of the linear features. As the field system has a single predominant axis, it may be related to coaxial field systems which in the south-west region have been dated to the middle centuries of the second millennium cal BC (for example, Fleming 1988; Vervust *et al* 2020), although it is equally possible that they could date to any time from the earlier Bronze Age to the Roman period (below). Alternatively, the strip-like character of some of the fields suggests the possibility of a medieval date.

In addition to the field system, the geophysical survey identified a number of anomalies in the northern part of the survey (Areas 1, 2 and 3), where features circular or sub-oval in plan and approximately 5m–6m in diameter, were detected. These are of potential archaeological interest and may represent shallow backfilled pits. Some may be associated with the field system and it is possible that some of the larger sub-circular anomalies could represent hollow-set Middle Bronze Age roundhouses, which have been found to be associated with this kind of signature (for example, Jones 1998–9; Gossip 2013). It is, however, equally feasible that they are of natural origin (Davies 2019). In the south-east corner of Area 2 there is a possible ring-ditch that may be associated with a structure which may itself be related to the field system. At the southern end of Area 12 there appear to be a small rectangular enclosure and curving boundaries suggestive of a focus of settlement to the south of the survey area.

Geoarchaeological and palaeoenvironmental overview

The sand dunes at Gwithian–Godrevy are a well-known and well-studied archaeological resource,

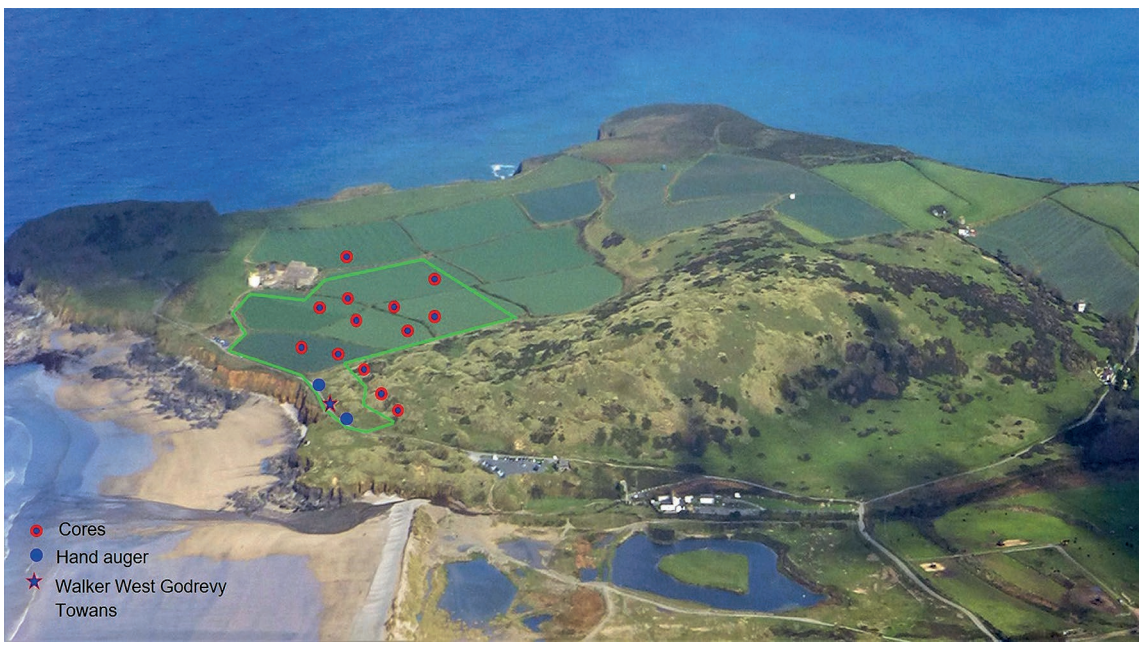

Fig 4 Aerial photograph of Godrevy Point and Towans showing the study area and approximate location of the auger points. (Photograph by kind permission of T Walker, modified from Walker 2018, fig 5: © Walker 2018.)

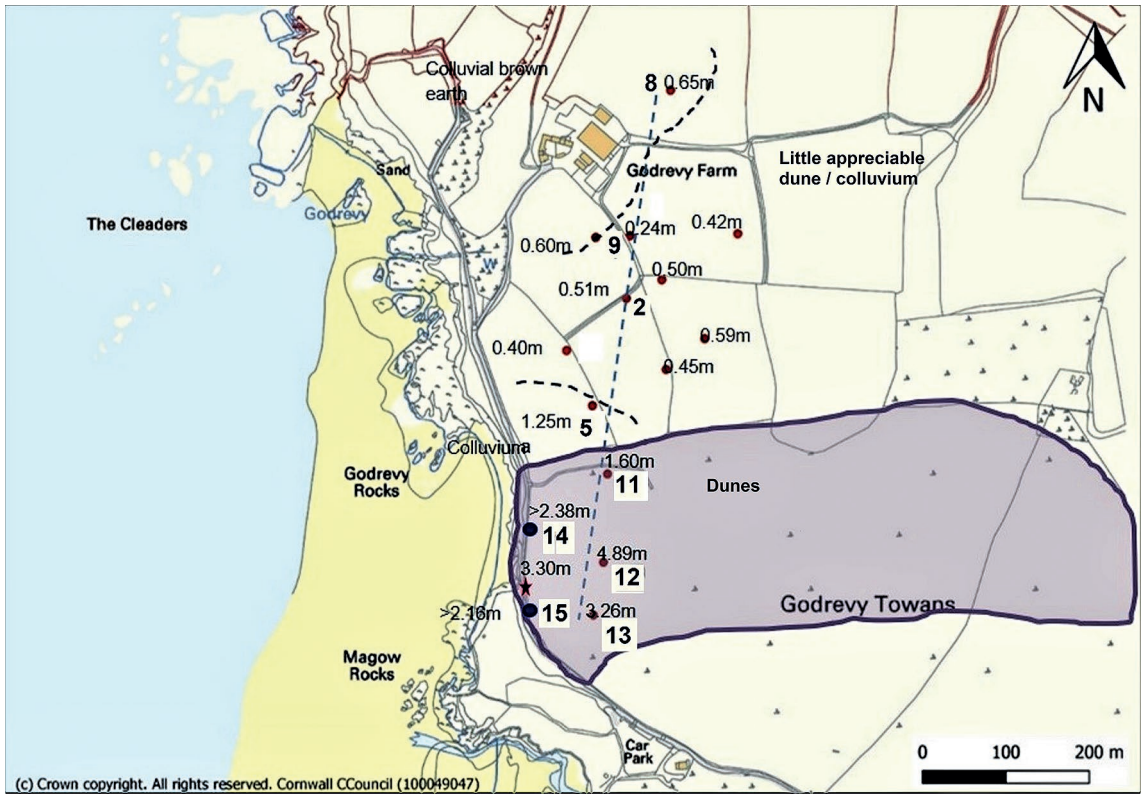

Fig 5 Location of the mechanical cores (red dots) and approximate location of the hand augers (blue dots) and Walker's West Godrevy Towans study (star). The area of Godrevy Towans is shaded.

with remains from the Late Neolithic to the later medieval period variously encapsulated within them, much of which was studied and reported upon by the late Charles Thomas (papers in Jones and Quinnell 2018). However, the farmland of Godrevy Farm had seen little previous examination.

A series of 13 power-driven mechanical cores and two hand auger points were bored from the high land around Godrevy Farm in the north across the dunes to the south-western edge of Godrevy Towans (Figs 4 and 5). The boreholes would enable the mapping of the extent of any obvious dune beyond the towans, define any colluvial deposits and characterise the geoarchaeological potential between Godrevy Farm and the dunes. Machine coring and recovery of large diameter cores also provided the opportunity to obtain material for palaeoenvironmental enquiry and samples for radiocarbon dating (Allen 2020). This work also sought to shed light on any land use change between the underlying prehistoric field system and the superimposed medieval field system.

Most of the coring was done using a tracked terrier percussion rig (Fig 6), which enabled the recovery of sediment cores to 5.9m depth, supplemented by hand coring to 2.5m. The 15 recorded profiles have enabled the deposits to be identified, modelled and profiled. Off the dunes, the soils and sediments in the fields of Godrevy Farm were surprisingly sand free, especially in view of the proximity to the towans. Behind Godrevy Point the topography of Godrevy Farm was high ground with gently undulating cliffs to the west with the land falling away to the south. Generally, only shallow rendzina soils and brown earths (about 0.2–0.4m thick) were present; however, north east of Godrevy Farm (core 8) a shallow colluvium (a colluvial brown earth) only 0.65m thick existed and at the location cored there was a hint of possible buried soil. Deeper and localised colluvium was

Fig 6 The percussion coring rig at T1/1 (Photograph: © M J Allen 2019).

also present on the north-western end of the towans ridge (for example, core 5; Figs 5 and 7). Both of these locations are relatively discrete areas and both foot-slope locations where buried archaeology may occur, which may not be reflected in any surface morphology or surface artefacts. The brown earths and colluvium were almost sand free.

The dunes of the towans tower above the landscape to north and south and are in excess of 9m thick, burying archaeology from the Neolithic to medieval periods and including stacked stratified sequences of up to six separate clear stabilisation horizons (for example, Thomas 1958; Walker 2018) and buried settlement, occupation and fields. The sands have been shown to contain an important 4500 years-long stratified palaeoenvironmental (land snail) record (Walker 2018). Coring in the interior of the towans was undertaken in a gap between two high upstanding dunes, where up to 5.6m of stratified sand was cored (cores 11, 12 and 13). These were almost devoid of any visibly recognisable stasis horizons, stabilisations, or buried soils, whereas those on the western end of the dune (cores 14 and 15) recorded several stabilisation horizons and essentially replicated sequences studied previously by Walker (2017; 2018). Notably, the dune sand is known to exist south of the towans in the Red River valley, but this survey clearly showed that it does not extend to the north.

Palaeoenvironmental and dating evidence

The opportunity was taken to sample selected cores from the interior of the dunes for palaeoenvironmental data, and this included testing for pollen but also looking at land snails; these have been studied previously from numerous locations by at least four previous analysts. Pollen had rarely previously been examined from these deposits and is not always readily preserved in sandy contexts. Larger than normal samples were processed by the analyst but despite this, pollen numbers were low, preservation poor, and little could be inferred. Land snails, on the other hand, are known to be well-preserved in the towans and in places there are extraordinarily high numbers of shells. Important sequences have been published from the dunes since 1975 (for example, Spencer 1975; Milles 1991; Davies 2006; Walker 2018). Only one of our cores (core 12) contained a possible weak stasis or buried surface at 3.5m and at 4.3m depth, but land snail preservation through this was, disappointingly, only poor to moderate. Although land snails principally provide information about the environment and vegetation structure, some have chronological implications, based on their arrival in Britain. Fragments of several of these species were found throughout the 4.85m of sequence assessed in core 12. One was a Roman-period introduction – the 'Roman' snail (*Cornu (Helix) asperum*) – suggesting our sequence

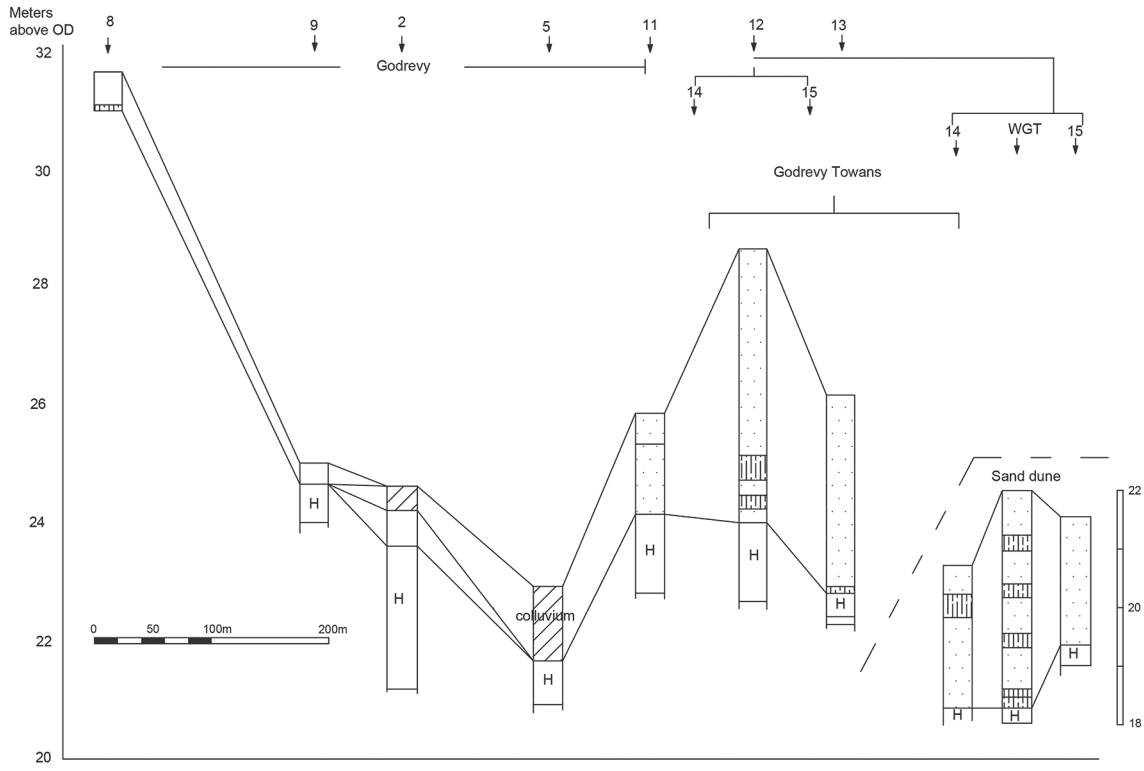

Fig 7 North–south profile from Godrevy Farm to Godrevy Towans. H = head.

as probably post-Roman; however the others, occurring consistently and in relatively moderate numbers, were medieval introductions (*Cernuella virgata* and *Candidula* spp.). On this basis it looks like the entire 5m sequence in this part of the dune is medieval or later in date. Detailed costly analysis would add little to what we already know, especially as a lack of archaeological finds and organic material meant that more detailed dating of the sequence would be a challenge. Although this work did not provide new palaeoenvironmental data, it did indicate the spatial variability and complexity of the dune system.

Failing to provide good new long palaeoenvironmental sequences, we turned to increasing the chronological resolution of Dr Tom Walker's sequence at West Godrevy Towans (shown as WGT on Fig 7 and indicated by a star on Fig 5). Radiocarbon dating on the long spiral land snail shells *Cochlicella acuta* found in the upper part of his sequences added three new late prehistoric Iron Age to medieval dates (below) on a shell historically thought to be a medieval introduction to Britain, but proved by Tom Walker (2018) to have been around since at least the Neolithic period (below).

Radiocarbon dating

Three new radiocarbon determinations were obtained on long spiral land snail shells *Cochlicella acuta*, which were extracted from Tom Walker's West Godrevy Towans sequence of 31 contiguous samples covering 3.5m, which was already accompanied by five radiocarbon dates (Table 1). The new dates were taken from the upper part of the sequence. In order to attempt to examine chronology of clear fluctuations in the mollusc palaeo-fauna (*C. acuta*), shells of *C. acuta* were provided by Tom Walker from the peaks in the stabilisation at 68–75cm and in the blown sand at 110–123cm. Additionally, there was a millennium of blown sand between 255 and 190cm with increases in *H. itala, C. acuta and P.*

Table 1 Radiocarbon dates from West Godrevy Towans (new dates, this project, in bold).

Depth (cm)	*Stratigraphy/ environment*	*Material*	*Calibrated results*	*Result BP*	δC^{13}	*Lab number*
68–75	**Stabilisation *C. acuta* peak**	***C. acuta* shell**	**cal AD 1130–1160**	**933±26**	**–7.0**	**SUERC-93891**
110–123	**Blown sand *C. acuta* peak**	***C. acuta* shell**	**480–360 cal BC**	**2331±26**	**–7.6**	**SUERC-93892**
170–180	Stabilisation *C. acuta* peak	*C. acuta* shell	cal AD 90–230	1833±26		OxA-28969
210–223	**Blown sand**	***C. acuta* shell**	**490-370 cal BC**	**2346±26**	**–7.1**	**SUERC-93893**
225–265	Stabilisation *C. acuta* peak	*C. acuta* shell	910-810 cal BC	2718±27		OxA-28968
288–300	Stabilisation *C. acuta* peak	*C. acuta* shell	1500–1420 cal BC	3957±27		OxA-28967
310–332	Neolithic ols	*C. acuta* shell	2570–2350 cal BC	3957±27		OxA-28966
332	Neolithic ols	*Prunus* charcoal	2570–2310 cal BC	3590±40		Beta-280906

muscorum from 223cm. This point was also dated via a specimen of *C. actuta* provided by Dr Walker.

It was hoped that the increased chronological resolution would, combined with re-examination of the palaeo-fauna, enable us to tease out subtle but vitally significant changes in the land use record. The results of the three new radiocarbon assays are given in Table 1. The radiocarbon dating probability distributions have been calculated using OxCal (v4.3).

Consideration of the new radiocarbon results

The results from the stabilisation at 68–75cm (933 ±26 BP, cal AD 1130–1160; SUERC-93891) and the lower sample from the blown sand at 210–226cm (2346 ±26 BP, 490–370 cal BC; SUERC-93893), fit well with the stratigraphic location of the dates obtained previously. These date a notable change in the mollusc fauna (and numbers) within the blown sand phase during the Early to Middle Iron Age and again during a phase of local dune stabilisation in the medieval period. These two results may date important changes not just in shell numbers but also possibly in the local and wider palaeoenvironment, land use and fieldscapes. However, when the molluscs are examined using relative abundance (that is to say, proportional representation) rather than absolute numbers, these horizons seem palaeoecologically less significant.

The radiocarbon date within the blown sand at 110–123cm of 2331 ±26 BP, 480–360 cal BC (SUERC-93892) is clearly anomalous and much too early to fit the existing dated sequence. Although this could indicate a single intrusive shell (or shells), it is more probable that some, or all, of the blown sand from 83cm to 160cm was reworked and represents aeolian deflation of pre-existing dunes formed in the Iron Age. Tom Walker comments that this may also account for the very high number of molluscs within the blown sand, but with no evidence of buried soil at this level.

Discussion

A major aim of the Godrevy survey project was to better characterise the buried archaeological potential through a combination of geophysical survey and coring. The results from these two mostly non-invasive techniques have revealed a previously unknown buried landscape of fields and have shed further light on past human impacts upon it.

Although exceptionally well-preserved field systems and evidence for agricultural practices and settlements of Bronze Age date have long been known in the wider Gwithian area (Thomas 1958; Nowakowski *et al* 2007), past excavations have only given a small window into the character and layout of these early fields. By contrast, the geophysical survey has made a major contribution to studies in the Gwithian–Godrevy area by, for the first time, revealing the much more extensive early field system which covered most of the project area.

The field system clearly pre-dates the upstanding field pattern which is of medieval derivation, but typological layout alone was not enough to be confident of its origin. The strip-like character of parts of the field system could point to a medieval date. The widths of the strips would be within what can be expected for Cornish medieval strip fields (for example, Johnson and Rose 1994, 106–11; Herring 2006a; 2006b), and the geophysical survey

identified some possible ridge and furrow in the eastern part of Area 12 (Davies 2019, fig 4). If the underlying fields are at least partly medieval and the overlying fields are also medieval (in origin), then this would be very interesting, suggesting two separate phases of medieval fields with different layouts. A major disruption and reorganisation of this sort would perhaps not be out of the question in this landscape, although it may be noted that the coring did not find evidence for an episode of sand blow affecting these fields.

However, given that the fields do not appear to be related to the current system and were not on the tithe map it seems most probable that they are pre-medieval and are likely to be multi-phased. Those in the southern part of the survey area (Areas 6, 7 8, 9, 10, 11, 12 and 13) share an axis and can be considered to be coaxial, a term widely adopted to describe systems where a cardinal alignment structures the field layout (Johnston 2013, 314). That is to say, they are characterised by uniformly conjoined, rectangular, field plots following a dominant axis. It is of course true that coaxial and axial field systems in the south-west region and elsewhere in southern Britain have been dated to the middle centuries of the second millennium cal BC, the Middle to later Bronze Age (Pryor 2001, 408–13; Yates 2007; Bradley 2007, 196; Vervust *et al* 2020), with the most famous example of coaxial fields being the extensive 'reaves' found on Dartmoor (Fleming 1988), as can be seen around Corndon Tor, where 'strip-like' reaves are found (Newman 2011, fig 3.15). However, even on Dartmoor, precise dating for the origins and use of coaxial fields is lacking (Johnston 2020, 314–23). In Cornwall coaxial fields are less common than other forms of prehistoric field system but have been identified on, for example, East Moor, Altarnun (Brisbane and Clews 1979; Johnson and Rose 1994, 62–5). However, the chronologies of most Cornish field systems are relative and imprecise, and the only direct dating is from the coaxial field system at Bosigran, Zennor, in West Penwith, which has been dated by Optically Stimulated Luminescence (OSL) to 1690 ±180 cal BC (CERSA 285) with a *terminus ante quem* of 1120 ±230 cal BC (CERSA 286) (Vervust *et al* 2020).

Elsewhere in Britain, however, some coaxial field systems have been found to post-date the Middle Bronze Age (for example, Higham 1986, 204; Williamson 1987). In Cornwall, excavated ditched field boundaries, as opposed to stone walls, are more typically found to be of Iron Age or Roman date (for example, Johns 2008; Jones 2019, chapter 12). The excavations of the Bronze Age settlement at Gwithian also revealed banks, walls and fences as opposed to ditches (Thomas 1978; Nowakowski *et al* 2007). Given that pre-Norman adjacent settlements at Gwithian and Godrevy have been found to be very wide ranging in date (Fowler 1962; Nowakowski *et al* 2007) and the potential for some anomalies within the field system to be Bronze Age roundhouses or later structures, it is possible that the newly identified fields at Godrevy could date to anywhere from the earlier Bronze Age to the Roman period. Only excavation and targeted sampling of the ditches will enable material to be securely dated or material recovered suitable for OSL dating (*cf* Vervust *et al* 2020).

Returning to an original aim of looking for differences in land use between coaxial and post-Roman – medieval field systems, was there anything we could tease out from examining either our data, or by re-examining published data with this in mind, and with the new radiocarbon dating? Land snails have potential for defining differences between broken soil, arable land and short grazed, trampled and longer grassland, which might indicate different farming practices used in the respective field systems. However, differentiating between arable, pasture and short-sward grassland is notoriously difficult, and whether this is actually possible is debatable. Nevertheless, previous palaeoenvironmental research has never attempted to address this. Although any palaeoenvironmental interrogation of the land snail data, and of the windblown sand facies has yet to be done, preliminary examination in assessment does suggest that there are subtle but potentially significant changes in the open country molluscan assemblages between the Iron Age and Roman – earlier medieval periods which might relate to changing farming regimes, and provide a more nuanced land use history for the later prehistoric and medieval Godrevy–Gwithian landscape and be a new chapter in understanding its fascinating archaeological history.

In conclusion, a Bronze Age origin for the underlying field system may therefore be suspected; however, given that it could alternatively be Iron Age or even possibly medieval in date, this could not be proven without targeted investigation and dating of the boundary ditches. Although

not directly linked with the geophysical survey results, the three new radiocarbon determinations reveal impacts in the landscape in the Iron Age and medieval periods, and detailed analysis of the land snail assemblage might reveal much more detail of changing land use over time.

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Recent work in Cornwall

This summary does not necessarily include all work carried out in Cornwall during a particular year. Some archaeological work is deemed commercially sensitive and the resulting client reports are not made publicly accessible for a period after the work is complete. In normal circumstances these reports should be lodged with the Cornwall and Scilly Historic Environment Record via OASIS (Online AccesS to the Index of archaeological investigationS: online at https://oasis.ac.uk) and will become available at some future date via the grey literature library provided by the Archaeology Data Service (https://archaeologydataservice.ac.uk/archives/view/greylit/).

In some instances work included here may have been carried out at an earlier date but the resulting report was only completed in the specified year.

AC archaeology

2019

Church of St Mary, Sheviock (SX 37018 55094)

An archaeological watching brief was undertaken in February and March 2019 during internal re-ordering and external excavations at the Church of St Mary, Sheviock. The works exposed a small number of graves, present under two pathways. One pathway is interpreted as a relatively recent feature but the other may have earlier origins. Cartographic evidence indicates that the churchyard was extended to the west in the late nineteenth or early twentieth century, and evidence for this was uncovered in the form of part of the earlier boundary wall, a metalled surface associated with a former external road, and associated landscaping deposits raising the level of the new ground to that of the existing graveyard. The works within the church exposed service ducts which were probably inserted during late nineteenth-century restorations.

- Project Officer: Stella De-Villiers.

Land off High Lanes, Hayle (SW 5675 3760 and SW 5699 3750)

An archaeological trench evaluation was undertaken during November 2019 on two areas of land off High Lanes, Hayle. The evaluation comprised the machine excavation of 15 trenches totalling 406m in length, each between 1.6m and 1.8m wide. The trenches were positioned in areas to be impacted by development, as well as targeting geophysical survey anomalies and 'blank' areas. The results of the evaluation were generally low level with only a few archaeological features identified. These were all ditches and are largely undated. A small assemblage of post-medieval finds was recovered from overlying deposits.

- Project Officer: Christopher Caine.

Land at Doublebois Holiday Park, Doublebois (SX 1999 6520)

Archaeological monitoring and recording were undertaken during November and December 2019 on land at Doublebois Holiday Park, Doublebois. The work comprised the monitoring of groundworks associated with the creation of foundation platforms for new holiday lodges and associated infrastructure. The site of the new lodges covered parts of a golf course and land formerly associated with Doublebois House. This is a Grade II Listed Victorian Gothic mansion and the monitored groundworks were located within its historic grounds. Groundworks comprised the machine-stripping of soils from three areas. The investigations exposed only limited results, with one undated small pit, a demolished structure representing a probable nineteenth-century or later outbuilding, and three former field boundary ditches. No finds were recovered from the ditches, but they pre-dated historic mapping dated 1842.

- Project Supervisor: Naomi Kysh.

Land at Pen Bethan, Hillhead Road, Budock (SW 7828 3338)

An archaeological trench evaluation was undertaken during December 2019 on land at Pen Bethan, Hillhead Road, Budock. The evaluation comprised the machine excavation of 14 trenches totalling 331m in length, each 2m wide. The trenches were positioned to target the main anomalies identified by geophysics, as well as blank areas to confirm the effectiveness of the survey. The results from the trench evaluation largely support the geophysical survey interpretation, in that three enclosures were confirmed, one in the north-west corner and the other two in the south-east corner of the site; one of these is dated by Early Iron Age pottery. Other significant features included a possible working hollow in the centre of the site which contained pottery of Bronze Age date and a pit in the south of the site which contained undated evidence for possible metalworking. Other linear anomalies were mainly found to be features that related to an agricultural landscape of field boundary ditches; although these are undated they may pre-date the historic pattern.

- Project Officer: Stuart Randall.

Hensbarrow Dry, Porth Farm, Par Moor Road, Par (SX 07318 52928)

In December 2019 an historic building record of a pair of china clay kilns was prepared at Hensbarrow Dry, Porth Farm, Par Moor Road, Par. The investigation was required in advance of their demolition and redevelopment of the site. Both structures originally comprised pan kilns with associated settling tanks. Building 1 was constructed in 1910, building 2 in 1911. The kiln of building 1 was rebuilt and extended in the 1960s and demolished in the early 2000s; there is no above-ground evidence of the building. Its associated settling tanks survived, although they had again been altered in the 1960s and partially demolished in the early 2000s. The kiln and linhay of building 2 were partially rebuilt in the 1980s when the building was converted into a storage facility. Some of the settling tanks were also altered and partially demolished to allow the construction of a hopper and a conveyor belt. Part of an original railway siding serving the building also survived. Some minor late twentieth-century alterations were identified.

- Project Manager: Andrew Passmore; Project Officer: Stella De-Villiers.

2020

Old Coastguard Lookout, New Road, Port Isaac (SW 99764 81040)

An historic building record of the Old Coastguard Lookout at Port Isaac was prepared in January 2020 in advance of demolition and redevelopment of the site. The Coastguard had a presence in Port Isaac from the 1830s, and in the mid-1920s moved to its third location, a hilltop site above the village. This new station consisted of a terrace of three cottages with a detached lookout to the west, a flagstaff to the north, and a signal room to the east. The lookout as recorded had been heavily altered, and only room 2, and possibly room 3, formed part of the 1920s building. In the late twentieth century the lookout was renewed as a result of rot to the timber structure. One part was demolished and a new lookout room constructed. A garage, latterly used as a store, was subsequently added to the south end of the building. Original finishes and fittings partially survived within room 1, but the majority of the fabric and fittings dated to the later

twentieth century. The Coastguard station at Port Isaac closed in 2017.
- Project Officer: Stella De-Villiers.

St Neot Church, St Neot (SX 18604 67858)

An archaeological watching brief was carried out in July 2020 during works to alleviate water penetration through the north wall of the north aisle at St Neot church, St Neot. The groundworks involved the excavation of a trench along the external line of the north wall to a depth of approximately 1.5m. The excavations exposed a slate drain feature of uncertain date. The presence of the feature indicates that water ingress into the church has been a problem for some time and that previous attempts have been made to alleviate the problem. A second slate drain, probably nineteenth century, was also recorded.
- Project Manager: Andrew Passmore, Project Officer: Stella De-Villiers.

Bodwannick Manor Farm, Nanstallon (SX 03690 65622)

An archaeological excavation at Bodwannick Manor Farm, Nanstallon, was undertaken between July and August 2020. The main archaeological interest in the site was that Bodwannick is considered likely to be the site of a medieval manor house. It sits within Anciently Enclosed Land as defined in the Cornwall Historic Landscape Characterisation. The investigation uncovered evidence for archaeological features dating from the Middle Bronze Age in the form of part of an enclosed settlement, with the enclosure ditch, if circular, having an estimated internal diameter of 42m. Square terminals defined an entrance which faced east. There was no evidence for a bank and the whole area had undoubtedly suffered from plough truncation. Within the enclosure a cluster of postholes and pits almost certainly mark the position of a timber building, but the form of this is not possible to discern. The finds include an assemblage of Middle Bronze Age Trevisker pottery, some fired clay fragments and four worked stone mullers.
- Project Officer: Abigail Brown.

Land off Quintrell Road, Nansledan, Newquay (SW 8350 6126)

An archaeological watching brief was undertaken during August and September 2020 on land off Quintrell Road, Nansledan, Newquay. A small number of features were exposed. Two were natural in origin: one of these was a shallow natural hollow containing prehistoric worked flint and the other a drainage gully which appears to have been filled in the late post-medieval period. The remaining features were ditches for former field boundaries and relating to the extant field system. A small collection of finds comprised two prehistoric worked flints, an eighteenth- or nineteenth-century iron wall anchor, two fragments of ceramic roof tile and five pieces of ironworking slag, with these finds also of eighteenth- or nineteenth-century date.
- Project Officer: Abigail Brown.

Land at Penhale Farm, St Cleer (SX 2499 6853)

An archaeological watching brief was undertaken during November and December 2020 on land at Penhale Farm, St Cleer. The main archaeological and historic interest of the site is that the western portion of it is crossed by the former course of the Liskeard and Caradon Railway, which itself forms part of the Caradon Mining District World Heritage Site. The watching brief exposed a small number of archaeological features, comprising pits, ditches and a gully. These were located to the north of the former line of the railway. Although undated, none of them were obviously associated with the construction or use of the railway and are probably related to the agricultural history of the site. There were no finds from the features.
- Project Supervisor: Tom Etheridge.

Land forming Phase 5.1, Nansledan, Newquay (SW 8418 6115)

An archaeological trench evaluation was undertaken during December 2020 on land forming Phase 5.1, Nansledan, Newquay. The evaluation comprised the machine excavation of 15 trenches totalling 416m in length, each 1.5m wide. These were located in areas to be affected by development as well as to target anomalies identified by a previous geophysical survey. The archaeological investigations exposed evidence for probable late prehistoric or Romano-British occupation on the site. The focus for this appears to be in the

south-east part where a probable roundhouse and associated features were present; these are likely to have been located within a contemporary pattern of fields, as identified by probable field boundary ditches. However, no finds were recovered to confirm the dates of these.

- Project Officer: Abigail Brown.

Land south west of Saputo Dairy UK, Davidstow (SX 13660 86327)

Archaeological investigations were undertaken by during August and December 2020 on land south west of Saputo Dairy UK, Davidstow. Work comprised the machine excavation of six trenches totalling 300m in length, each 1.6m wide, and the monitoring of the excavation of geotechnical trial pits. The trenching and watching brief established that the area has been subject to quarrying with no evidence to indicate that the buried remains of Bronze Age barrows were present in the area. The quarry pits contained no finds and might be expected to belong to the medieval or post-medieval periods. Two shallow ditches are probably parts of the same feature and roughly correspond to the orientation of the former post-medieval field enclosures in the area.

- Project Officer: Abigail Brown.

Cornwall Archaeological Unit (CAU)

2015–16

Mount Edgcumbe Country Park, Maker-with-Rame (SX 452 526)

Archaeological survey, recording and a watching brief were carried out during a programme of conservation work at Mount Edgcumbe Country Park, as part of a Higher Level Stewardship agreement. The work focused on a selection of significant historic parkland and garden features, many of which were in urgent need of repair and consolidation. Included in the work were clearance and excavation of the late eighteenth- or early nineteenth-century ornamental structures known as the Stone Seat and the Moss Seat, and the Upper Deer House, a regionally rare example of a nineteenth-century fodder house. The work was carried out with the assistance of a team of Cornwall Archaeological Society volunteers and Truro College students.

- Project Manager: James Gossip. Volunteers: Charlotte Barley, Stuart Dow, Lisa Gibb, Roy Goutte, Colin Green, Tom Harvey-James, Richard Hoskins, Christine Wilson, Chris Mace, Jo May, Heather Munro, Lizi Price, Katie Smith, Roger Smith, Emma Stockley and Pat Tremain.

2019

Wheal Martyn, Carthew (SX 00354 55489)

Archaeological monitoring and recording were carried out during preliminary investigative groundworks as part of the *Clay Works!* project at Wheal Martyn. The site encompasses parts of a pair of china clay works established during the nineteenth century, adapted as a heritage centre and museum for the china clay industry. Much of the site is scheduled and is on the Heritage at Risk Register.

Archaeological work was undertaken in three phases between January 2017 and June 2019, in tandem with ground investigations within the mica dry and pan kiln and service trenching in the linhay and transport yard. The monitoring revealed episodes of activity reflecting use of the mica dry following the abandonment of its primary function in 1933. Evidence of former surfaces was recorded within the transport yard. It was concluded that the interventions proposed for the mica dry would have no significant negative impacts on the structure of the building or on buried archaeological deposits below its floor level.

- Project Manager: Sean Taylor. Fieldwork: Ryan Smith, John Gould and Fuller Hughes. Report author: Adam Sharpe.

2020

Landscape of the ancestors: community documentary research project on Bronze Age barrows along the A30

The *Landscape of the Ancestors* project aimed to enhance and expand knowledge and appreciation of four groups of Bronze Age barrows along a 10.5 km stretch of the A30 trunk road north of Truro, currently being re-routed as a dual carriageway. The area contains one of the densest concentrations of barrows in central Cornwall and the research

focused on those at (from west to east) Four Burrows (SW 7616 4823), Allet (SW 7953 4853, Carland Cross (SW 8445 5379) and Hendra (SW 8585 5365). Despite their visual prominence very little is known about them. Only one barrow in the area has been excavated to broadly modern standards, that which formerly stood at Carvinack, near Chybucca, which was investigated by Dorothy Dudley in the 1950s. All except the Carvinack site are scheduled.

The project was led by CAU, with volunteers from Cornwall Archaeological Society undertaking research at the Courtney Library in the Royal Institution of Cornwall in Truro. The object was to provide information, images and interpretative material for use in presenting the barrow landscape to the wider public. The documentary sources included manuscript transcriptions in the Charles Henderson archive at the Courtney Library, historic maps, newspaper sources, published accounts and a recent geophysical survey of an area near Carland Cross. Among other outcomes, the work generated insights into the landscape contexts of the barrows and the complex social and funerary practices revealed by the Carvinack excavation; it also revealed elements of the 'afterlives' of barrows in the historic period as boundary markers and landmarks.

The project was commissioned by the Arup Group and formed part of a wider initiative, with funding from the Highways Agency, to enhance and present the historic environment of the A30 in this area.

- Project manager: Andy Jones. Project Officer: Cathy Parkes.

Trevenson Road, Pool (SW 66703 41629)

A watching brief was undertaken during ground disturbance carried out as part of the phase II development of the former Camborne School of Mines campus. An earlier assessment noted eighteenth- and nineteenth-century mining activity in the vicinity associated with Pool Adit mine, East Wheal Crofty and later North Wheal Crofty. The area had been stripped prior to an archaeological presence on site but a walk-over revealed no archaeological features or finds. A further six trenches were monitored but no archaeological finds or features were revealed.

- Project Manager: Peter Dudley. Fieldwork: Antony Angove, Fuller Hughes and Ryan Smith.

Lower Tregerthen, Zennor (SW 46582 39161 – SW 46530 39264)

A watching brief was carried out on groundworks for replacement sewage arrangements. Tregerthen is one of the elongated Zennor tenements, extending south from the coastal cliffs across the coastal plateau and onto the moors. The coastal plateau portion of the farm incorporates the remains of two later prehistoric – Romano-British field systems, surviving as a mix of Cornish hedges and stone walls following the lines of early field boundaries, combined with ploughed-out contour lynchets, recorded by survey in the late 1980s. The field through which the drain was to be dug was located in this area, with the trench for the drain intersecting a lynchet.

Small-scale trenching in and adjacent to the former farmyard revealed no traces of the agricultural buildings shown on historic maps, nor of artefacts or features indicating pre-modern occupation. Excavation of a long outfall trench similarly produced no artefactual material. It had been anticipated that the trench would encounter remnant stonework of a revetment on the downslope face of the lynchet, but this proved not to be the case and it was concluded that a combination of twentieth-century removal of boulders from the fields and ploughing have removed all traces of the former boundary within the area traversed by the trench.

- Project Officer: Adam Sharpe.

Carruan, St Minver (SW 95238 79194)

A small-scale evaluation of three trenches was carried out in advance of the proposed development of agricultural buildings and a slurry lagoon. A previous assessment had identified the cropmark of a rectilinear enclosure at the eastern edge of the proposed site and a number of sub-circular cropmark and earthwork features within the site area and adjacent fields. Local academic archaeologists Mark Borlase and Malcolm Wright had previously carried out a geophysical survey and limited test pitting and confirmed the existence of a large number of sub-circular anomalies extending over four or five fields.

The evaluation identified ditches and pits and confirmed that the geophysical anomalies represented archaeological features. Areas shown as blank by the geophysics were found to be largely

devoid of archaeological features apart from one linear ditch, perhaps representing a field boundary.

The enclosure ditch was found to be large and had been re-cut, suggesting at least two phases of use. The relationship between it and ring-ditched features adjacent and crossing it remains untested but they are likely to be broadly contemporary, given that some of the anomalies appear to respect the enclosure. Five ring-ditched features, probably representing roundhouses, were identified. Only one contained internal features within the narrow extents of the evaluation trenches. Some artefacts were recovered, predominantly worked stone and water-worn pebbles. One piece of gabbroic pottery, tentatively identified as of Iron Age or Romano-British date, was recovered from a ring-ditch section. Several sherds of similar material, including one resembling South Devon ware of Roman date, were recovered from spoilheaps.

The evaluation confirmed that the geophysical anomalies represent archaeological features likely to represent a large roundhouse settlement of Iron Age – Romano-British date. A local comparison would be the settlement at Lellizzick on the west bank of the Camel north of Padstow.

- Project Manager: Sean Taylor. Project Officer: Ryan Smith. Fieldwork assistance: Mark Borlase, Phil Kent, Richard Mikulski, Roger Smith and Malcolm Wright.

Penadlake and Trewindle barrows, near West Taphouse, Braddock (SX 14095 63330)

Historic England commissioned a programme of Heritage at Risk works on a Bronze Age barrow group at Braddock Down, west of West Taphouse, sited on a ridge enclosed from rough ground in the nineteenth century. The group includes one undesignated and three scheduled Trewindle barrows and five scheduled Penadlake barrows, some of which survive to 4.6m high.

Planned volunteer vegetation clearance and small-scale reprofiling of barrow damage had to be postponed, but two other key elements of the project, a badger survey and a geophysical survey, went ahead between December 2019 and March 2020. The badger survey found evidence for considerable badger activity across the wider site. A magnetometer survey by James Lewis and Dr Catherine Frieman identified 15 discrete anomalies, two of which are barrows (one scheduled but heavily ploughed, the other suspected from historic mapping and ploughed but not scheduled). A resistance survey undertaken by Malcolm Wright identified a further three anomalies focused on the westernmost scheduled barrow, including a ditch, a mound and a central cavity. A further 12 potential barrows, identified from air photographs, are recorded in the Historic Environment Record. Only one of these, the undesignated barrow, was confirmed by the geophysical survey.

This project represents initial information-gathering in advance of a planned future project to preserve, repair and improve management

The most westerly of the five barrows in the Penadlake group. Some of the other barrows are visible over the hedge to the right. (Photograph: Cornwall Archaeological Unit.)

of this visually striking cluster of barrows. Recommendations include a comprehensive badger survey over the wider area to inform acquisition of licences for future management work, and a volunteer programme of vegetation clearance alongside small-scale reprofiling and recording of visible components such as quartz stone facings.

- Project Manager: Anna Lawson-Jones.

Lappa Valley Railway, St Newlyn East (SW 83749 55917)

A watching brief was carried out during groundworks in advance of a proposed development at the Lappa Valley Railway, close to the site of the former East Wheal Rose. The only archaeological feature recorded was a substantial layer of mine waste across the site.

- Project Manager: Sean Taylor. Fieldwork: Richard Mikulski.

Two Burrows, Allet, Kenwyn (SW 79533 48533)

Small-scale initial evaluation and subsequent monitoring were carried out for a project to remove a 5m wide modern earth bank carrying mature pine trees which divided the scheduled area drawn around two barrows. The works formed part of the wider *Landscape of the Ancestors* programme, commissioned by the Arup Group and funded by Highways England, to enhance the condition and presentation of barrows in the wider landscape around current road improvements along the A30. The archaeological work was required as a condition of Scheduled Monument Consent (SMC), to guide and mitigate the groundworks and ensure protection of the barrows.

An assessment and geophysical survey carried out in advance informed the work, the geophysics indicating that the mound to the north east had an external ditch; the other barrow did not appear to have a ditch but contained several anomalies with high magnetic responses. The main aims of the archaeological work were to ascertain whether any remains of the barrows, or material derived from them, had been overlain by or incorporated into the bank during its construction, and to ensure appropriate protection and recording.

Two evaluation trenches and subsequent monitoring revealed that the bank was made up of earth not resembling the local topsoil and there was no evidence that barrow material had been reused in its construction. There were, however, indications of the preparation of the old land surface, probably prior to or associated with the original construction of the barrows: the former topsoil appeared to have been stripped and covered by a deposit probably representing either spread mound material or possibly turves. No other significant archaeological results were revealed during the work and the contractor's careful working arrangements meant that the barrows suffered no damage.

- Project Managers: Anna Lawson-Jones and Cathy Parkes. Fieldwork: Ryan Smith, Jack Smith and Graham Britton.

Tintagel Castle Visitor Centre, Tintagel (SX 05210 88980)

A watching brief was carried out during ground disturbance for upgrading the water supply at Tintagel Castle Visitor Centre. No archaeological features or artefacts were revealed.

- Project Manager: James Gossip. Fieldwork: Antony Angove.

Molesworth Street, Trevena, Tintagel (SX 05683 88345)

A watching brief was undertaken during the removal of the topsoil from the site of a housing development covering approximately 0.75 ha to the west of Molesworth Street, Trevena, adjacent to the core of the historic settlement of Tintagel and immediately south of the site of the medieval chapel of St Denys. The work indicated that only modern features were affected and no significant archaeological remains were revealed.

- Project Manager: Andy Jones. Fieldwork: Carl Thorpe.

Brew Farm, Sennen (SW 37454 25047)

An archaeological watching brief was undertaken at a British Telecom 'remote site' at Brew Farm, Sennen, near Land's End, which has a history of communications use extending from being part of an early warning radar system during World War II to the modern installation of three satellite dishes. The archaeological work included monitoring excavation of geotechnical test pits and topsoil stripping, ground reduction and levelling of a new compound area, trench digging and extension of the access track.

A single Mesolithic flint and a probable prehistoric hammerstone were found; a potential medieval (or earlier) gully was seen and recorded close to the compound and part of the remains of a wartime building (the probable Operations Room) with blastproof walling were recorded, together with numerous communications-related power and service features.

- Project Manager: Anna Lawson-Jones. Fieldwork: Ryan Smith and Richard Mikulski.

17 New Street, Penryn (SW 78629 34458)

A historic building record was made prior to conversion of an outbuilding located to the rear of 17 New Street, Penryn, and forming part of the Grade II Listed Building. The single-storey structure had a granite plinth and was otherwise of painted brick with a scantle slate roof; it had undergone two principal phases of construction and remodelling. A fireplace and chimney with associated remains of a probable wash copper suggest that it was used as a washhouse. It is likely to date to the late eighteenth or early nineteenth century.

- Project Manager: Andy Jones. Project Officer: Connor Motley.

Tower Meadows, St Buryan (SW 40696 25781).

An archaeological watching brief was carried out in advance of a housing development in two fields to the north west of Tower Meadows, St Buryan. The development is sited on land characterised as Anciently Enclosed Land, regarded as of significant archaeological potential.

The earliest archaeological features recorded were a spread of burnt material and clay associated with Bronze Age Trevisker ware pottery; three pits or postholes with charcoal-rich fills were located nearby. A single pit was recorded within the other field; no direct dating evidence was obtained for this but early medieval grass-marked pottery, including part of a bar-lug, was found about 1m to the north. [A full report appears in this volume: M J Allen *et al*, Archaeological investigations at Tower Meadows, St Buryan, 2019–2020.]

- Project Manager: Peter Dudley. Fieldwork: Carl Thorpe.

Lanydrock House, Lanhydrock (SX 0880 6360)

CAU was commissioned by the National Trust to carry out a historic building survey of the house, gatehouse, coach house, harness block, accumulator block and the garden and yard walls at Lanhydrock House, near Bodmin. The work was undertaken to provide a better understanding of the buildings and inform future management and conservation. A total of 11 construction phases were identified.

Lanhydrock is the former country residence of the Robartes family. The house and gatehouse are Listed Grade I and the coach house, harness block and garden walls are all Grade II*. The accumulator block lies within the curtilage of the Grade I Listed house.

There has been a settlement associated with the manor of Lanhydrock since the medieval period, and it seems likely that a substantial manor house has existed here since at least the 1530s. Although much of the present house was rebuilt

Lanhydrock: east elevation of the west range. (Photograph: Cornwall Archaeological Unit.)

after a devastating fire in 1881, surviving parts of the old house date mainly to the seventeenth century; however, there are a few elements that may pre-date this. The gatehouse was added in the mid-seventeenth century and the coach house and harness block appear to have seventeenth-century or earlier origins, although both underwent major remodelling in the nineteenth century and late twentieth century. The garden and yard walls were added in the mid-nineteenth century, altering an early retaining wall at the rear of the house which underwent alteration again after the fire in 1881. The accumulator block was added as a fuel store and general outhouse in the 1880s.

- Project Manager: Jo Sturgess. Project Officer: Connor Motley.

Plain-an-Gwary, St Just-in-Penwith (SW 37018 31421)

In May 2020 archaeological recording was carried out on part of the scheduled *Plain-an-Gwary* at St Just-in-Penwith, known locally as the 'Plen'. The exposed section was at a location where a bounding wall had been removed during building works to the adjacent Co-op store.

The investigation found that while most of the material formerly banked against the wall dated from a reconstruction of the monument during the late 1870s, this overlaid a buried soil deposit which in turn covered the edge of what was identified as the site's documented infilled ditch. At this point on the circuit of the Plen, the backfilled ditch lies immediately to the east of the monument beneath the surfaces of yards associated with adjoining dwellings and businesses. In one area of the section a deeply-buried stony layer was tentatively identified as the foundations for a section of the stone seating described in 1754 by the Cornish antiquary William Borlase but wholly lost to sight by 1780.

A soil column was retrieved from the section, sampling all significant material above the natural subsoil. This sample is intended for appropriate specialist micro-excavation, assessment and analysis. A condition report on the column by geoarchaeologist Dr Michael Allen notes that the profile contains the lower bank deposit, which is possibly medieval soil material, which itself may contain unstratified but useful pollen assemblages. A possible truncated buried soil may exist at the base of the monolith, which, if confirmed, may contain a stratified medieval and earlier land-use and environmental history. The sampled column is currently in cool storage pending further work.

- Project Manager: Cathy Parkes. Fieldwork: Ryan Smith and Adam Sharpe.

Tresooth Cottage, Lamanva, Mawnan Smith (SW 76624 31891)

A watching brief was carried out during topsoil stripping of six 1.9m wide trenches and complete topsoil stripping of the northern part of the site. The area is known to have undergone some recent topsoil stripping and to have been used as a training ground for mechanical trench digging in the past. However, given its well-drained, south-facing setting and proximity to three prehistoric barrows, a potential Iron Age – Roman period round, early medieval, medieval and post-medieval settlements and sites, there was significant potential for survival of archaeological remains beneath the modern disturbance. In the event, no features of archaeological significance were found and no diagnostically early artefacts recovered. Scattered pebbles could potentially relate to activity at any period from the prehistoric through to the medieval or later, potentially indicating past manuring with sand or seaweed.

- Project Manager: Anna Lawson-Jones.

Lantoom Quarry, Dobwalls (SX 22651 64753)

A watching brief was carried out on topsoil stripping for part 2 of the phase 2 quarry extension on the eastern side of the existing Lantoom Quarry. A length of removed field boundary was recorded and its ditches partially excavated. The boundary was shown on the 1840s tithe map of the area and it was still a functioning division on 1940s RAF air photographs, but has been removed subsequently. Other potential archaeological features suggested by geophysical anomalies were not found, but two pieces of probable Early Neolithic worked flint recovered as unstratified finds suggest activity in the area at that period.

- Project Manager: Anna Lawson-Jones. Fieldwork: Carl Thorpe.

Tregarthen: the inner and outer enclosure ditches. Note the higher top of the natural on the left and markedly lower internal surface level of the interior of the enclosure. The paler material of the former banks is visible between the ditches and less clearly on the inner edge of the internal ditch. (Photograph: Cornwall Archaeological Unit.)

Tregarthen Cottage, Long Rock, Ludgvan (SW 50015 32322)

An archaeological watching brief was carried out during groundworks for a proposed extension at Tregarthen Cottage, Long Rock. The work revealed the north-western edge of a previously suspected but unlocated enclosure, interpreted as a 'round' of Iron Age – Romano-British date. It is probable that this was the feature referred to in 1644 as 'The Kelgier' and subsequently noted in 1770 by the Reverend William Borlase. Significant features identified during the work included two strongly curved concentric enclosure ditches, two remnant banks (one internal and one between the ditches) and a number of finds of pebbles and cobbles, some of which appear selected, recovered from well-sealed ditch contexts which are likely to pre-date subsequent medieval and later infilling and levelling.

- Project Manager: Anna Lawson-Jones.

Godrevy Farm, Gwithian (SW 58346 42959)

A historic building record was undertaken for the National Trust on all the pre-1950 buildings of the farmstead at Godrevy, Gwithian, to inform their renovation and future uses. A total of seven phases of construction and alteration were identified, with the earliest surviving building, a two-storey structure originally with a stable on the ground floor and lofts above, probably dating to the later eighteenth century. The other farm buildings, including a cow house and calf house range, a newer stable / cart house and another separate curved calf house were all built in the nineteenth century and were mapped by the Ordnance Survey in 1876. The original farmhouse on the site was destroyed by fire in 1874 and its replacement also mapped in 1876.

Most of the older farm buildings at Godrevy retain their cobbled floors and only the rear extension to the barn, one of the cow houses and part of the curved calf house have modern floors

of concrete or cement screed. The farmstead developed in the mid-twentieth century and later by expansion into newer larger buildings constructed outside the older farmyard.

Godrevy was not a 'planned' farmstead; instead, buildings were added as demand and budgets allowed. Significant surviving features include the very well preserved later nineteenth-century stable and cart house, complete with all its original fittings. It is now very rare to find a complete stable within the context of a small to medium-sized farmstead; surviving examples in Cornwall are usually associated with much grander country houses.

- Project Manager: Jo Sturgess. Fieldwork: Nigel Thomas, Connor Motley and Antony Angove.

Nansledan, St Columb Minor (SW 8424 6168)

Evaluation trenching was carried out in advance of phase 6 of development on land off Nansledan, St Columb Minor. The area under investigation had been subject to a geophysical survey, which identified a large number of anomalies suggesting possible buried archaeology. Sixteen trenches were laid out and a variety of features investigated, including various field boundaries, predominantly of the post-medieval period. Two unstratified flints were recovered, including a small, retouched scraper.

- Project Manager: James Gossip. Fieldwork: Antony Angove, Ryan Gilkes and Joel Smith.

A391 – A30 Link Road, Stenalees – Victoria (SX 011 566 – SW 985 613)

A programme of archaeological evaluation was carried out to inform further mitigation that might be required for construction of a new link road running to the west of Roche between the present A391 and the A30. Trial trenching targeted geophysical anomalies identified by an earlier survey.

Significant features identified by the work include a probable Roman military marching camp at Trerank extending over approximately 5 ha. This corresponds to a large rectilinear geophysical anomaly with rounded corners, the characteristic 'playing card' shape for such features. The ditch profile in parts of enclosure circuit had a characteristic vertical 'ankle breaker' in its base. No finds were directly associated with the ditch but small sherds of possible amphora and samian ware were found in a residual context.

Another significant group of features was identified close to Pentivale. Circular ditched anomalies were revealed as ring-ditched features. Although little in the way of dating evidence was produced and few contained any internal features, they are likely to represent Iron Age or Romano-British structures, some possibly roundhouses,

Section through the Roman marching camp ditch at Trerank, showing the 'ankle breaker' slot in the base. (Photograph: Cornwall Archaeological Unit.)

others perhaps ritual enclosures. At least two field systems underlying the extant field system were also identified. The earlier of these is likely to be Iron Age or Romano-British in date, the later perhaps Romano-British or early medieval. A group of features, ditches and pits, containing medieval pottery was identified immediately to the west of Trerank.

The identification of a Roman camp is very significant, given the previous absence of comparable features in Cornwall and their sparsity in southern Britain as a whole. The ring-ditches, early field systems and medieval features are of more minor significance but nonetheless have the potential to provide data on poorly understood periods in Cornish history.

- Project Manager: Sean Taylor. Fieldwork: Carolyn Royall, Sean Taylor, Graham Britton, Chris Chappell, Eustace Long, Richard Mikulski, Jack Smith and Ryan Smith.

Polglaze Farm, Hewas Water, St Mewan (SW 96410 49840)

A historic building record was carried out on a farm building at Polglaze Farm, Hewas Water, in advance of conversion and extension to form a new dwelling. The building appears to have been first constructed in the late nineteenth century following demolition of a former dwelling and outbuilding on the same site, with the earliest construction phase *c* 1880 reusing building stone from the demolished structure to construct a new stable with a hayloft over and a cart house to the east. Three further phases were identified, including conversion to a milking parlour in the 1930–40s.

- Project Manager: Jo Sturgess

82–83 Lemon Street, Truro (SW 82632 44789)

A watching brief was carried out on an opening being made in the internal ground floor boundary wall between 82 Lemon Street, Truro (formerly Pearce's Hotel), and the adjoining no 83. The work revealed a blocked former window opening with splayed reveals; the random hand-made bricks bonded with earth used for the blocking suggested that the window may have been blocked when Lemon Street was constructed in the late eighteenth century. A brick-lined flue had been inserted into the former window space.

- Project Officer: Connor Motley.

Stowe's Hill, Linkinhorne (SX 25720 72732)

Historic England commissioned a comprehensive record of the current condition of the scheduled area of Stowe's Hill, Linkinhorne, currently listed on the Heritage at Risk register. The site comprises an enclosed hilltop settlement (Neolithic tor enclosure) with associated field systems, building platforms, roundhouses, cairns and transhumance huts.

A significant issue at Stowe's Hill in recent years has been the construction of stone stacks – 'Fairy Castles' – using stones taken from the ramparts, particularly in the southern enclosure. Sections of surviving original rampart face and core have been robbed to create these stacks, and the shifting of collapsed or loosened stones reveals more *in situ* rampart which is then accessible to further robbing. Although such vandalism is unlikely to be malicious in intent, it is classed as a heritage crime and these actions, whether carried out wilfully or not, affect the significance of the monument. The project aimed to make a record of the current condition and preservation of the site, in the light of the recent damage, and to work with established volunteer groups in recording damage and dismantling stone stacks. It is hoped that providing new information, interpretation and education will help prevent future vandalism.

In addition to the ground recording undertaken by volunteers during the project, material was also captured by drone, producing aerial stills and video together with data for a 3D model. These additional resources provide an insight into the overall form and layout of the monument, its current condition and state of repair, and detail on features such as the ramparts, house stances and other features, which is not available to visitors on the ground. It also provides a record of vegetation cover and footfall erosion. This visual, digital data is ideally suited to presentation online, providing detailed information but reducing or eliminating the need for physical on-site interpretation boards.

- Project Manager: James Gossip. Fieldwork: James Gossip and Anthony Angove. Aerial survey: 3DeepAerial.

Old Bridge Street, Truro (SW 82742 44902)

A watching brief, commissioned by Cormac Solutions Ltd, was undertaken during repair works to a revetment wall on the north side of the River Allen at Old Bridge Street in Truro. The site lies

within the Truro Conservation Area and forms part of the curtilage of an early nineteenth-century Grade II Listed Building, comprising the premises of 'Guild of Ten' and the 'Kathmandu Palace'. Old Bridge, also Listed Grade II, formerly known as East Bridge, is medieval in origin and partially underlies Guild of Ten. The site is close to that of the eighteenth-century *Star and Garter* inn, the stables for which probably backed on to the river at or close to the site of the repairs. At an earlier period a medieval quay is likely to have stood there.

The watching brief took place in the spring of 2020, initially amid storm surges and towards its end under Covid 19 working restrictions. As a strongly tidal river, the repair works were from the start designed to be intermittent. The watching brief involved monitoring during the removal of iron railings, recording collapsed riverside wall material on the riverbed and remnant unstable walling, and monitoring removal of a limited amount of soil and rubble from behind the area of collapse, together with observation of reconstruction work.

The revetment wall, likely to be eighteenth century in origin, consisted of horizontally laid, uncut stone blocks of various sizes, the largest measuring approximately 0.5m long. The base of the wall was not exposed. Behind the revetment was a stony, gritty deposit which also included two large, shaped slate slabs; one of these had fallen into the river prior to the repair, the other fell during works from approximately 1.3m below ground level, where it had appeared to be horizontal. It is unclear whether it had been i*n situ*. The slab was approximately 0.12m thick, 0.45m wide and more than 0.7m long. Given its depth it may represent the remains of former quayside surfacing.

All suitable stone recovered during the works was retained for reuse during reconstruction of the wall, while the railings were carefully removed and then reinstated. The repaired wall section spanned an approximate 4m length and although it was initially an obvious and pale repair, it will blend in quickly with the Listed historic wall to the west. A maximum 3m height of walling was affected by the works.

- Project Officer: Anna Lawson-Jones.

Six Chimneys, Bolenowe, Troon, Camborne (SW 67348 37599)

A watching brief was carried out during groundworks for the erection of an agricultural building at Six Chimneys, Bolenowe, Troon. The site was found to be largely covered with a thick deposit of redeposited stony material. No other archaeological features or deposits were identified.

- Project Manager: Sean Taylor. Fieldwork: Michael Castle.

Kenython (new site), near Church Quay, Bryher, Isles of Scilly (SV 87960 14980)

Archaeological monitoring was undertaken during groundworks for construction of a new dwelling near the east coast of Bryher, Isles of Scilly. The location was at the upper, north-west end of one of a series of strip-like flower fields close to the shore; a lynchet in the next field to the south may indicate that these strips were adapted from earlier fields.

Topsoil stripping showed no stratified deposits and the only cut feature was a modern service trench. Unstratified finds included pottery, with three of the recovered sherds in a plain granitic ware, possibly Bronze Age in date (Carl Thorpe, pers comm). There was also a small stone assemblage, including eight knapped grey flints. The flints were worked from locally derived beach pebbles, three with distinctive pale swirling colouration suggesting that they had come from the same pebble (Anna Lawson-Jones, pers comm). Knapped flint from the same core suggests an intact knapping site. At least two pieces had been re-worked from larger knapped pieces, and three show use as tools; two of these have been used for cutting or slicing and are probably better termed 'cutting flakes' rather than knives. The third tool had very steep, minimal focused damage, probably resulting from working a hard material such as bone. All of the flint pieces are Bronze Age in character. They appear functional and rapidly made.

- Project Officer: Cathy Parkes.

Chapelfield, St Mabyn (SX 04281 73383)

A programme of archaeological excavation was carried out over approximately 1 ha at Chapelfield, St Mabyn, following archaeological assessment, geophysical survey and evaluation trenching which had identified two closely adjoining enclosures.

Topsoil stripping revealed a large portion of two markedly different enclosures of Romano-British date, although much of the southern sides of both, and their main entrances, lay beyond the excavated area.

The lower-lying western enclosure was angular and contained most of the features identified, including a well, a circular post-built structure, pits, ditches (with two rich midden deposits) and an oven. Finds included a large range of local and imported pottery, glass, occasional metalwork, part of a shale bracelet and stonework including rotary querns, a large circular worked stone (possible millstone), a stone mortar and part of a Trethurgy-type stone bowl. A late Roman copper-alloy coin dating to AD 333–337 was recovered from the western enclosure; a near complete copper-alloy penannular brooch was found in the eastern enclosure during the earlier evaluation.

The curvilinear eastern enclosure contained four structures: two ditch-defined buildings with central pits, a truncated posthole arc and part of another structure defined by slate walls with occasional postholes. Some intercutting of features and ditch recuts in both enclosures indicate multi-phased use.

Post-excavation work will include selection of environmental material for analysis and dating, specialist assessment of significant artefacts, including pottery, worked stone, glass, metalwork and shale, and production of a paper reporting the results.

- Project Manager: Anna Lawson-Jones. Fieldwork: Ryan Smith, Jack Smith, Oscar Lawson-Jones, Chris Chappell, Dave Morris-King and Connor Motley.

Pendennis, Falmouth (SW 825 317)

A watching brief was carried out during footpath improvement works within the scheduled area on Pendennis headland, Falmouth. Groundworks at nine different locations were carried out with an archaeologist in attendance. No archaeological features or artefacts were revealed.

- Project Manager: Antony Angove. Fieldwork: Carl Thorpe.

Marazion Marsh, Ludgvan (SW 50541 31345)

Archaeological recording, including a watching brief and auger coring, was undertaken at Marazion Marsh, near Penzance, in late 2019. The marsh is associated with significant archaeological finds and deposits, including buried peats, which have been forming since the Mesolithic period, and a Roman

Chapelfield, St Mabyn: the Roman-period well during excavation. (Photograph: Cornwall Archaeological Unit.)

urn containing a hoard of 1000 coins. A number of significant later prehistoric finds, including Bronze Age hoards, metalworking deposits and records of finds of furnaces, have come from the area around the marsh. A Bronze Age barrow has recently been excavated to the west and further environmental coring undertaken, the results from which are of relevance to this project.

No features or artefacts were identified by the watching brief but the environmental coring revealed a long peat sequence. The 8.95m deep stratigraphy was recorded in detail and a suite of 212 samples removed for assessment of pollen, diatoms and shells, examination of the presence of contemporaneous waterlogged plant remains and radiocarbon dating. The results from the latter show that human activity in the vicinity started in the Mesolithic and continued to the end of the Roman period.

The work recovered a relatively long and interesting pollen record, with the peats providing the most comprehensive picture of vegetation change and past land use. The evidence indicates an early wooded landscape dominated by alder, birch and hazel, with rising water levels leading to local peat formation. Rising water tables and increased marine influence led to a considerably more open environment and the development of a backwater fen with willow and a very strong pastoral element. In the later prehistoric period there was a change from saline to freshwater conditions, with evidence for formation of the marsh and lake, removal of open alder, birch and hazel woodland, and establishment of dry ground and extensive pasture. The results are valuable and will tie into other palaeoenvironmental work undertaken in the area.

There is clear potential for more detailed analysis, including work on the pollen, diatoms, geoarchaeology and the plant macrofossils, which may add significant value to older studies undertaken in this area. The results of the work will be published in due course.

- Project Managers: Anna Lawson-Jones and Andy Jones. Fieldwork: Ryan Smith.

Cotswold Archaeology

Cotswold Archaeology project reports are available online, using the report numbers cited, at https://reports.cotswoldarchaeology.co.uk/ Where no report number is cited the report was not yet available.

Land at Quenchwell Road, Carnon Downs, Feock (SW 80068 40734)

An evaluation identified six ditches, probably former field boundaries shown on the tithe map of *c* 1840, together with other boundaries on similar alignments. Report EX0131_1

- Project Officer: Simon Sworn.

Helston Flood Alleviation Scheme (SW 65450 27930 to SW 65550 27390)

A watching brief recovered a spherical worked stone object of possible Late Neolithic – Early Bronze Age or Roman date as a residual find in a later deposit. It also recorded two upstanding post-

A working shot of the 'stone ball' recovered during the Helston flood alleviation works. (Photograph: Cotswold Archaeology.)

medieval structures: a Cornish hedge and a historic garden wall. Report EX0114_1
- Project Supervisor: Sara-Jayne Boughton.

Land at Trethorne, Kennards House, St Thomas the Apostle Rural (SX 28502 83428)

A watching brief identified no features or deposits of archaeological significance.
- Project Manager: Derek Evans.

Land off Porcupine Lane, Par (SX 07853 55697)

A watching brief identified redeposited natural sands and clays. Cartographic sources indicate that the site was utilised for the disposal of mining waste during the late nineteenth century and this is probably the source of the clays and sands. The remains of a possible nineteenth-century cobbled granite surface, perhaps associated with mining activity, were also identified.
- Project Officer: Jonathan Orellana.

Land to the rear of Miners Court, Redruth (SW 70195 42285)

A watching brief recorded a substantial pit-like feature at the location of a former shaft associated with a mine which closed prior to 1854. A late post-medieval – modern culvert and an adjoining soakaway were also present, together with undated ditches and pits. Report 880343_1
- Project Supervisor: Paul Clarke.

Treloyhan Manor, St Ives (SW 52320 39550)

A watching brief noted deep deposits of mine waste, probably originating from Trelyon Consols copper mine. Two sub-circular structures may represent shafts. A small number of stone structures, an isolated posthole and a substantial late post-medieval – modern cut may relate to late nineteenth- or twentieth-century buildings or garden features associated with the manor house. Report 18095b
- Project Supervisor: Paul Clarke.

Tregantle Fort, Torpoint (SX 38648 53296)

A watching brief at Tregantle Fort (National Heritage List for England no 1004346) identified no features or remains of archaeological significance. Report EX0113_1
- Project Officer: Simon Sworn.

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Reviews

Ancient and high crosses of Cornwall. Cornwall's earliest, tallest and finest medieval stone crosses, by A Preston-Jones, A Langdon and E Okasha, 2021. University of Exeter Press. ISBN 9781905816613. Pb £19.99; EPUB (9781905816620) £19.99.

Two of the authors of *Ancient and High Crosses of Cornwall* will be very well known to Cornwall Archaeological Society members: Andrew Langdon and Ann Preston-Jones. Their expertise, not only in the area of crosses and stone sculpture, but also in the general history and archaeology of Cornwall, makes them ideal guides for the reader. The third author, Elisabeth Okasha, Professor Emerita of the University of Cork, is an internationally renowned expert on early medieval inscriptions. Andrew's series of books on Cornish stone crosses is a very well-known and much-used reference, while *Early Stone Sculpture* (volume XI of the British Academy's *Corpus of Anglo-Saxon Stone Sculpture*) by Ann and Elisabeth was published in 2014 to great academic acclaim. The authors felt that there was a place for a single-volume, affordable book on the subject of Cornwall's crosses, incorporating the latest thinking. There can be no doubt that they have succeeded brilliantly. In a beautifully produced, handily sized volume (credit here to the University of Exeter Press), they give an historical overview, as well as explanations of inscriptions, types of crosses and their functions.

If you have ever been puzzled about how crosses can be dated, you will find the answer here. There is a widely-held assumption that crosses are older than is the case. The authors explain that the term *Celtic,* when applied to crosses, has led to the view that the majority were produced in the immediate post-Roman era, whereas their research shows that the earliest is likely to date from the late ninth century AD (St Cleer 1, better known as the Doniert Stone). They are not contemporary with another type of Christian stone carving, inscribed memorial stones, which are generally thought to date from the late fifth to the seventh centuries. The heyday of crosses appears to stretch from the late ninth to the early thirteenth centuries. The authors readily concede that dating cannot be an exact science but, in the absence of documentary evidence, it is possible to suggest dates according to the decorative styles used, such as bosses, foliage scrolls and rows of dots. By such detective work it has been possible to trace not only the evolution of crosses but also to show if they were the work of monastic workshops, skilled carvers directed by high-status patrons, or more rustic efforts that sought to imitate more complex designs. The glossary is especially welcome, while the chapter on the work carried out in the past by antiquarians shows how thinking on the subject has evolved.

Not every Cornish cross is mentioned. To have done that would have required readers to have strong arms and quite possibly a wheelbarrow to

carry such a detailed volume! Instead, the authors have picked their top 100, nearly all of which are accessible to the public. Presumably the process of deciding which crosses were in, and which out, was fraught and it is hoped that the debates were calm and forgiving! The photographs deserve special mention. How often have you visited a cross but struggled to make out the features? It's so frustrating to know that inches from your face there is a carved figure or design, quite possibly the crowning achievement of the carver's career, but all you can see is lichen or stone crystals. The authors have used ingenious lighting to reveal all. For example, the photographs of the early medieval Biscovey cross-shaft at St Blazey, the scratch-dial of which was the subject of a paper in *Cornish Archaeology* 58 (2019), reveal extraordinary and fascinating detail – a revelation to those who have visited it in sub-optimal light.

As the authors demonstrate, crosses are not just works of art; they were meeting places and boundary markers, as well as sources of inspiration, revelation and reassurance. By learning more about them we take one more step into understanding our history.

Roger Smith

Later prehistoric settlement in Cornwall and the Isles of Scilly: evidence from five excavations, edited by Andy M Jones and Graeme Kirkham, 2021. Archaeopress, Oxford. ISBN 9781789699579. E-publication ISBN 9781789699586. Pb £52.00; e-publication £16.00. xii + 363 pages.

This welcome publication presents the results of five archaeological investigations of settlement sites, three in central Cornwall, at Killigrew, Nancemere and Higher Besore, one at Porthleven on the south coast and the other at Porth Killier, St Agnes, on Scilly. These important sites, all excavated by Cornwall Archaeological Unit between 1996 and 2014, had, for one reason or another (not actually stated by the editors), not made it to publication despite manuscripts being prepared along with the post-excavation analyses and specialist reports. The editors have presented the reports in separate sections which are book-ended by an introduction and a very useful final chapter, which brings out the significant themes, both by Andy Jones.

The volume title is a tad misleading, in that many of the sites also have Roman-period phases, but Andy Jones explains that in a Cornish context there is much continuity from later prehistory through to the Roman period in sites of the type described here and therefore the 'prehistoric' nature of the settlements should be forefronted.

The authors of each section will be familiar to readers of this journal, as will the contributors of the specialist reports, with Henrietta Quinnell's authoritative finds reports being particularly prominent. The volume presents the sites by year excavated, with the earliest first, and in the introductory chapter it is suggested that reading the papers in order illustrates the context current when the reports were prepared; however, few people are likely to read the volume sequentially, cover to cover, and each section can be read as stand-alone reports, although the bibliography has been combined at the end of the volume to avoid what would have been considerable repetition. It is also stated in the introductory chapter that changes to the discussion for each report have been limited to updating references where they had been 'forthcoming' and the standardisation of radiocarbon dates to a more recent calibration dataset; however, there does appear to have been rather more updating, especially in regard to relevant comparanda, and this is certainly to be welcomed.

The 1996 archaeological recording during the building of a sea wall at Porth Killier, St Agnes, Isles of Scilly, by Charles Johns, Jeanette Ratcliffe and Andrew Young, is the first report. Here there was limited exposure of Bronze Age buildings, pits, midden and a possible cairn or entrance grave. Although the exposed archaeology was of limited extent the importance of this site lies in relation to the relatively rare opportunity to investigate a small part of the rich prehistoric settlement remains present on the islands. The midden contained good evidence for the Bronze Age economy, which appears to have had a significant contribution from hunting, trapping, fishing and shellfish, alongside domesticated cattle and sheep.

The next three sections report on sites located close to Truro. Dick Cole and Jacqueline Nowakowski report on excavations at Killigrew, St Erme, in 1996. Here were found parts of a Beaker vessel in a pit, and a Late Iron Age furnace, but more extensively part of a double-ditched sub-circular round (a small enclosure

typical of Cornwall and not always circular as the name implies). This was found to be of Romano-British date and contained evidence for industrial ironworking. Notable among the finds was part of a unique tin dish found in a pit.

For Nancemere (Truro) James Gossip reports on archaeological investigations undertaken in 2003. Most significant was the excavation of an entrance way for a round, which revealed several phases of Late Iron Age and Romano-British use of the site. Evidence for earlier activity was derived from pits containing Beaker sherds and later use of the enclosure was indicated by sherds of Grass-marked post-Roman pottery.

The most extensive excavations presented in the volume are in the much-anticipated report by Gossip on work at Higher Besore and Truro College, in 2004–5. The importance of the findings from this investigation is highlighted by part of George Scott's reconstruction painting of the Iron Age settlement phase being used to provide an attractive cover to the volume (the image is also presented in full in the final chapter). A rare possible Beaker-period structure is at the beginning of the sequence and is followed by a settlement of Late Bronze Age post-built roundhouses, the best evidence for settlement of this period in Cornwall, and an 'open-settlement' of 12 structures represented by ring-gullies dating to the later Iron Age. 'Open-settlement' means unenclosed, contrasting with the nearby and probably contemporary settlement within the previously excavated Threemilestone Round, and highlighted by the section's title 'Life outside the round'. A key find was part of a Late Bronze Age sword mould and, in the Iron Age, large amounts of smelting waste indicated that iron working was taking place nearby.

The final report section is by Andy Jones on the excavation of an Iron Age settlement and Romano-British round at Porthleven in 2014. The Iron Age phase comprised possibly four post-built structures arranged in two pairs. The round (which was single-ditched and rectilinear in this case), had the soil stripped fully from the interior with no houses found and evidence for industrial use, probably metalworking, present. Of particular note was a stone-lined hearth with a clay base decorated by circles.

The concluding chapter by Andy Jones draws out some of the themes arising from the volume, but also in relation to his extensive understanding of later prehistoric and regional Romano-British contexts. Of particular note is his discussion of changes to Cornish lowland house types from the Middle Bronze Age hollow-floored types, through Late Bronze Age post-ring types and later Iron Age ring gully forms, which continue into the Romano-British period when oval rather than circular forms become more prominent. The ring gullies are also included in a discussion of the apparently greater importance given to enclosure moving from the Iron Age through to the Romano-British period, with it becoming more apparent that rounds proliferate in Cornwall during the Roman period and that many may be used not for settlement but as specialised sites, particularly in relation to industrial use. Jones usefully reflects on what this apparent importance given to enclosure – and the diversity of specialised uses rounds are put to – means in regard to changes in social organisation from later prehistory through to the Romano-British period.

One note on presentation is that the page headers could have provided the site name, which would have made it easier to navigate the volume. An index would also have been helpful. A final thought, especially given the prohibitive price of the print version, is that these important reports could have at a much earlier date been made available for free through the Archaeology Data Service. Although this is not always ideal, as the scrutiny of such publication through editing and peer review is less exacting, the results of these important investigations would have been available more swiftly. This said, the volume is an important contribution to the literature on the archaeology of the later prehistoric and Romano-British periods of south-west England.

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Obituaries

NICHOLAS JOSEPH CAHILL MA IHBC

29 March 1959 – 11 March 2020

Nick Cahill, historic settlements and buildings expert and most recently Historic Environment Strategy Officer with Cornwall Council's Strategic Historic Environment team, died suddenly on 11 March 2020, aged 61.

Nick was born and grew up in Southampton. He studied Modern History at New College, Oxford, where he continued an involvement in rowing – he told a number of stories about the picaresque exploits of himself and his fellow oars – and after Oxford took a postgraduate degree in English Local History at Leicester. There he studied with the late Harold Fox and produced an MA dissertation (Cahill 1980) on the Isle of Wight in the early medieval period, including novel comparisons of early medieval settlement foci on the island with potentially similar forms elsewhere.

(Photograph: Ann Preston-Jones.)

In 1983 Nick was involved in excavations on the medieval settlement of Popham in Hampshire; he contributed the historical background section of the published report on the site (Fasham 1987) and is also listed as having been one of the excavation supervisors. His portion of the report offers another early foray into analysis of settlement topography and development and using this as a window on other factors, in this instance the ambitions of the landholding family. The following year he produced a report for Isle of Wight County Council on the historic environment represented by the island's downlands (1984).

Later in the 1980s Nick worked on the national Accelerated Listing Survey – he had good memories of a period reviewing timbered buildings in the Weald of Kent – and also produced Vernacular Building Survey reports for the National Trust. In 1991 he came to work in Cornwall as a Conservation Officer for the former Carrick District Council, before moving to London to join his wife-to-be Mary, where he worked in the London Borough of Wandsworth on

the planning side of heritage management. In 1998 they moved back to Mary's native Cornwall where he established himself as a historic environment consultant, and then, with Mary, set up The Cahill Partnership.

One of his early commissions was the *Hayle Historical Assessment* (2000), funded by English Heritage and Cornwall County Council with the aim of ensuring that Hayle's rich historic environment could make a full contribution to regeneration. Nick's summary to the report emphasised that what was revealed by the work was 'a settlement of unique character and great historical significance, contained within a landscape of equal merit. The historic environment is already serving as the catalyst for major investment in Hayle and should continue to underpin initiatives for the regeneration of the town.'

This coupling of the character and significance of the historic environment with the potential for guiding sensitive future development and improved 'place-making' was a key element of Nick's work over the next few years. Commissioned by Cornwall Archaeological Unit (CAU), in a partnership which also included English Heritage, Cornwall County Council and the various District Councils, he undertook a large portion of the detailed work involved in the Cornwall Industrial Settlements Initiative, which between 1998 and 2004 produced reports on villages and towns shaped by mining, quarrying and china-clay extraction across the county, from St Just in the west to Kelly Bray, Gunnislake and Calstock in the east (Ratcliffe 2000–1). Many of these settlements, because of their industrial character, had previously been little regarded in terms of their historical and architectural significance; a major strand of Nick's approach was to identify and encourage appreciation of the many 'gems' he found in these places and to promote appropriate acknowledgment of their heritage value through Listing or the creation or expansion of Conservation Areas. (These reports, and others noted below, can be viewed online and downloaded via the 'Events' layer on Cornwall Council's Historic Environment mapping.)

With CISI studies ongoing, Nick also worked with Jeanette Ratcliffe and Nick Johnson of CAU in developing what became the ground-breaking Cornwall and Scilly Urban Survey (CSUS) project, uniquely supported by English Heritage, the Objective One Partnership for Cornwall and the Isles of Scilly (European Regional Development Fund) and the South West of England Regional Development Agency. Between 2001 and 2005 the CSUS team produced detailed 'historic environment for regeneration' studies for 19 settlements which it was believed would become the focus for development through European Objective 1 funding to Cornwall. Nick advised on each of the detailed settlement studies, adapting for urban use the 'Historic Landscape Characterisation' methodology developed by CAU: the 'character areas' identified within each town were the key elements of the analyses, regeneration recommendations and project reporting. He also authored the Penzance report (Cahill 2003). Separately, Nick was a member of the specialist teams which produced characterisation-based assessments of Tintagel (Berry *et al* 2003) and Lostwithiel (Berry *et al* 2008).

Fieldwork expeditions with Nick for these studies were always a pleasure, marked by his huge enthusiasm for understanding 'places' – how they had developed, the architectural and townscape treasures they contained, what constituted the key elements of their character and what marked each of them out as distinctive and 'special' – and his encyclopaedic knowledge. One of Nick's favourite observations, adapted from Kipling, was 'What do they know of Cornwall, who only Cornwall know?', highlighting the value of bringing wider knowledge to bear and perceiving and evaluating the gems which Cornwall's settlements have to offer within a much broader framework than the simply local. But he was also remarkable in his knowledge of the local and the significance of details: the Pavilion amusement arcade on Penzance Promenade took on a new aspect after Nick pointed out that it was the venue in 1934 for the first performance of the St Ives-born composer George Lloyd's opera *Iernin,* inspired by the Nine Maidens stone circle.

Classical music and opera, of which he had an extensive knowledge, were notable passions, as was the need for good coffee, always a priority to start the day. Churches were also a major interest. Nick tweeted in February 2020, only a month before his death, 'Went to Hereford today. Did the cathedral. First time. At last, after some 45 years, I've ticked off all English mediaeval cathedrals. Just the rest of Britain and Europe to go now . . .'

But Nick's greatest passion was always his beloved family: his wife Mary and son Joe. He lit up when he spoke about them and no trip out with

Nick was complete without at least one and usually several mobile conversations with home!

As part of the Victoria County History (VCH) 'England's past for everyone' initiative, Nick collaborated with Eric Berry in carrying out a detailed building survey and historical assessment of the early post-medieval buildings which make up Keigwin, Mousehole – the report (2007) is available through the Victoria County History website. Nick and Eric then contributed text panels on quay building, surveying Keigwin and identifying older buildings to Joanna Mattingly's 2009 VCH volume *Cornwall and the coast: Mousehole and Newlyn*.

After more than a decade in Cornwall as an independent consultant, Nick joined Cornwall Council in 2010 as Acting Historic Environment Advice and Policy Manager, with responsibility for a large team of Conservation Officers, planning advice archaeologists and other colleagues. He always felt at home in both the worlds of conservation and archaeology and this holistic approach to the historic environment ran through much of his work. Serial reorganisations moved him through a number of Cornwall Council roles, ending as Historic Environment Strategy Officer. In all of those posts Nick brought his knowledge and passion to bear in persuading planners, developers, managers and the wider public to care about Cornwall's built environment, building their commitment and action and improving their understanding of stories and significance. One of the many legacies of his work will be his *Understanding Cornwall's Historic Environment, a guide to Heritage Statements*, a gathering together in one place of the principal sources and techniques required to investigate an historic place in Cornwall. This had reached an advanced draft when he passed away in 2020. He was also preparing an overview of the state of Cornwall's conservation areas and identifying building types for which 'assessment frameworks' could be developed, to sit alongside those he had contributed to on farmsteads and nonconformist chapels.

He was an indomitable character and an inevitable focus of attention, and it was good for Cornwall's historic built environment that he was: no one left a meeting unaware of the views of Nick and the Strategic Historic Environment service! He developed close relationships with other professionals in Cornwall Council, including planning, natural environment, coast and catchment, World Heritage Site and Area of Outstanding Natural Beauty teams; his was a phone that regularly buzzed and his was a desk that colleagues regularly sidled up to for a word of advice. Archaeology and the historic environment need people like Nick explaining and championing them and Nick represented them well on boards and panels, including the Truro Diocesan Advisory Committee, Truro Cathedral Fabric Advisory Committee (Nick served as vice-chair) and the Cornwall Design Review Panel. He was also the Cornwall representative for the south-west branch of the Institute of Historic Building Conservation (IHBC).

Nick was chair of the Cornish Buildings Group in 2009–10, relinquishing the role because of the

(Photograph: Mary Cahill.)

potential for a clash of interests with his Cornwall Council role. Paul Holden, Nick's successor as chair, recalled in his obituary for the Group's newsletter Nick's Twitter profile description of himself – 'mediaeval historian manqué, lapsed architectural historian, really appallingly bad local authority operative . . .' – pointing out how perfectly it summed up Nick's modesty and self-deprecatory humour.

During his period with Cornwall Council most of Nick's writing was in the form of formal reports for the authority. He did contribute to the urban sections of the reviews of later medieval and post-medieval Cornwall in the fiftieth anniversary volume of *Cornish Archaeology* in 2011 (Kirkham and Cahill 2011a; 2011b). The significant ideas in these were almost entirely the legacy of Nick's mentoring to the CSUS team. He had also spoken about updating – with a more modern understanding of urban topography – Peter Sheppard's *The historic towns of Cornwall* (1980), an ambition that others may take forward, inevitably drawing on Nick's interpretations as they do so. Nick's paper on work in Cornwall by the eighteenth-century architect John Wood the Younger is to appear in the *Cornish Buildings Group Conference Proceedings,* to be published in 2021.

One of the many tributes after Nick's death came from Chris Hibbert of the Borlase Smart John Wells Trust, which owns Porthmeor Studios in St Ives:

> 'We first met when we asked him and Eric Berry to prepare the historic building report for Porthmeor Studios. This was an epic document, which English Heritage Historic Buildings Architect Rebecca Child considered one of the best she had seen. It also established Porthmeor as an important building in its own right, whereas previously it had only been noted for containing the remains of the pilchard industry. This new research was used by English Heritage to reassess its significance, it was upgraded to II*, which in turn helped to secure the necessary funding.'

After the Porthmeor renovations were completed in 2012, Nick gave a talk and guided tour during the St Ives September Festival, which became an annual event. This presentation became the short film 'Fish, Tin and Light' [available online]. Chris added, 'During filming Nick would think for a minute, take a breath, and then deliver his piece word-perfect. It was awesome.'

Subsequently, the Trust started planning for the renovation of Anchor Studio in Newlyn, formerly used by Stanhope Forbes and John Wells. 'Again, we needed an historic building report to better understand the building and help build the case to upgrade to II*. Nick was now working for Cornwall Council and didn't feel able to directly contribute in the same way, but still put in just as much time and effort. He put a team together of Eric Berry, Dan Ratcliffe and Jo Mattingly, who unearthed a considerable amount of new material, which in turn was used by Historic England to upgrade the building to II*. As at Porthmeor, this helped to unlock the additional funding needed.'

A further tribute came from Alyson Cooper, Principal Historic Environment Officer at Cornwall Council until 2014 and also a friend and former colleague of Nick's at Carrick District Council. She describes him as a

> 'wordsmith: eloquent, cultured, intelligent, perceptive. He crafted and polished his meticulous research and observations and presented them in a manner accessible to all. He was a polymath with the ability to join up strands: art, architecture, literature, poetry, music, political, social and economic history, and to share his ideas with a contagious enthusiasm that none of us will forget. As a colleague he was generous with his advice, diplomatic, professional and wholly reliable, keen to build the confidence of others, mentoring, encouraging and supporting.'

Many other past colleagues recalled the sheer pleasure of working with Nick, not just for his knowledge and expertise – and his willingness to share them – but also for his enthusiasm, kindness and the wit and humour he brought to professional life: 'He set a brilliant example of being professional whilst not taking yourself too seriously and remembering the important things', recalls Nick's Historic Environment Record (HER) colleague Hannah Curnow. Francis Shepherd, HER Officer, adds that the 'important things' for Nick were often cheesy chips and a pint of Guinness!

Ann Reynolds, Cornwall Council's Historic Environment Countryside Advice Service (HECAS), worked 'just across the desk' from Nick in the Strategic Historic Environment team and recalls dreading Nick's eventual retirement,

> 'because that would mean losing our day to day banter, the excitement of discovering and sharing a new map or print (Nick always physically swivelling his screen round to share the joy), that inevitable reply to my morning query of 'cup of tea?' with 'Well I was

> just thinking of getting a coffee; any phrase leading him to burst into song, being silenced by one of my special looks over the screen and his mischievous grin in reply, the jaunty scarf . . . our epic team outings where he knew about everything even if it was somewhere he had never been before . . . I did the green stuff, he did the brown and grey stuff (but he also did the green, blue and yellow stuff, having more knowledge in his little finger than the rest of us can ever dream about). We were a team. The best team possible.'

From a heritage perspective, we may fear that walking Cornwall's towns and streets will never be quite the same again now Nick has gone. But our understanding of them is immeasurably improved because he passed their way. On a personal level, few of us can aspire to be as widely acknowledged, respected and loved by those we have worked with as was Nick. He was, in a phrase from the Irish forebears in which he took such pride, 'a mighty man'.

Graeme Kirkham and Peter Herring

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ANDREW ROBERT YOUNG MCIFA

28 February 1958 – 3 June 2021

Andrew Young, a long-time member of Cornwall Archaeological Unit and manager of its field operations and other projects from 2011 until his early retirement in 2019, has died at the tragically early age of 63.

He was born and grew up in Lancaster, attending Lancaster Royal Grammar School where he shone academically – he took his A-Levels a year early and was top of his class in Latin – and also learned to play the violin. At 17, before going to study archaeology at the University of Manchester, he worked on his first excavation, the rich multi-period site at Mucking in Essex. He dropped out of his university course after the first year (it had been a memorable period for making friends and enjoying life!), initially working for British Rail – he famously derailed a train in a shunting yard – before joining 'the circuit' as an itinerant digger, working on excavations all over Britain.

Andrew first came to Cornwall in the summer of 1983 to dig with the Department of the Environment's Central Excavation Unit team led by George Smith on the flint working and Iron Age cliff castle site at Penhale (Perranzabuloe), the largest excavation to have taken place on a Cornish promontory fort. He was one of the excavators singled out for particular thanks in the published report (Smith 1988). He returned to Cornwall in 1987 to work as one of the supervisors on the Cornwall Archaeological Unit (CAU) excavation of the Romano-British round at Reawla, Gwinear (Appleton-Fox 1992).

While working on the Royal Mint site in London, Andrew met his future partner, Jeanette Ratcliffe.

(Photograph: Jeanette Ratcliffe.)

By late 1989 he was married and the father of twin sons, Frazer and Hamish. For the next few years he was a full-time father and 'house-husband' while Jeanette followed her career with CAU. This was, at the time, an unconventional arrangement: Andrew's daily two-mile walks with the two babies in a pram to and from the local shop were a novel sight in St Buryan and he was the subject of a feature in *Woman's Own!*

Once his sons had started school Andrew joined CAU, remaining there for the next 26 years. For a substantial part of this he led the Unit's participation in one of the four pilots for English Heritage's National Mapping Programme (NMP), now renamed Air Investigation and Mapping (AIM). During the period 1994–2006 the Unit's NMP team examined more than 50,000 air photographs and recorded from them around 30,000 archaeological features across the whole of Cornwall and Scilly, in the process creating some 24,000 new Historic Environment Record (HER) entries (Young 2006; 2007). Andrew outlined the pre-digital methodology used in the early stages of mapping in a contribution to the CAU *West Penwith surveys* volume (Young 2016). Approaching 12,000 of the new records were generated from mid-twentieth century Royal Air Force vertical photographs alone, including much relating to otherwise poorly recorded World War II features (Young 2006, 114, fig 5; 2013).

At the end of the NMP project, which was one of the largest in the country, Andrew urged the creation of a website rather than a publication (although he also produced a comprehensive report). This was an unusual and quite bold move, but it made the results very much more accessible and within weeks after it went 'live' had been viewed by people all over the world. The results of the project can now be viewed on Cornwall Council's online HER mapping.

During this period Andrew produced the publication report on the 1995 *Time Team* investigations at the Iron Age enclosure and fogou at Boleigh (St Buryan) (Young 2000–1). His 2012 paper in *Cornish Archaeology* examining the detailed results of the NMP mapping in the wider hinterland of the Camel estuary, particularly the large numbers of prehistoric and Roman-period enclosures and associated features recorded, casts new light on what Henrietta Quinnell has called the 'active landscapes' of fields and unenclosed settlements which provided the wider setting for the enclosed settlements (Young 2012; Quinnell 2019).

In addition to carrying out a substantial part of the plotting from photographs for the project, Andrew also produced regular comprehensive reports detailing progress. The expertise of Andrew and the NMP team at CAU was also put to good use more widely, mapping, for example, west Devon, Hampshire's aggregate areas, the South Downs, the South Dorset Ridgeway, the Isle of Wight and the Hampshire Downland. The latter project was notable for having identified the first possible cursus monument in Hampshire (Young and Jones 2019).

After the completion of the NMP for Cornwall, Andrew took on another substantial project, again funded by English Heritage (latterly Historic England). This was 'Lowland Cornwall: the hidden landscape', an ambitious attempt to use the large dataset provided by the Cornwall and Scilly Historic Environment Record, in combination with a detailed update of Cornwall's Historic Landscape Characterisation, to develop a method for predictive modelling of the prehistoric and Romano-British landscape across a large part of Cornwall, predominantly the portion which is actively farmed in the modern era and in which few archaeological features of these periods survive as standing earthworks (*Cornish Archaeology,* **56** (2017), 274–7). Working closely with Peter Dudley at CAU, Andrew undertook advanced statistical techniques to establish the degree of correlation between data on the locations of a variety of monument forms and the various Historic Landscape Character types. The models which emerged were further tested against the large quantities of information held by the Cornwall and Isles of Scilly Events Record, the database of past archaeological interventions and investigations, and data from the HER on find-spots. Detailed case studies were conducted on four areas: Probus, Pelynt, Poundstock and portions of West Penwith. The results of the project were brought together in five substantial reports (Young 2013–15), together totalling more than 800 A4 pages. (The reports are available online via the Events layer of Cornwall Council's Historic Environment mapping or through the Archaeology Data Service.)

Nick Johnson, Andrew's boss during much of his time with CAU, comments that he was

> 'known and valued across Scilly and Cornwall and further afield. Always reserved and modest, [he] was a delight to work with . . . conscientious,

> thoughtful, dedicated and insightful. He could always be depended upon to offer a well-considered strategy, delivered in clear prose, a modest voice or through an amusing presentation. He rarely pushed himself forward and yet by the time I left CAU in 2010 he was clearly heading further up the tree and deserved to do so.'

In 2011 Andrew became manager of CAU Projects team, which carries out commissioned work for external clients, continuing in the role after a restructuring of Cornwall Council historic environment functions in 2014. In these posts Andrew had responsibility for a team of 20 or so people and the projects with which they were all involved. He initiated an Innovation Team to encourage new ideas and approaches, and this reported to him on issues ranging from report presentation and digital archiving to staffing needs for future development of the Unit. 'It was to his credit that he acted on most, if not all, of the recommendations', commented one of his former colleagues. Additionally, and very importantly, Andrew negotiated new arrangements with Cornwall Council planners for increasing the level of provision of detailed archaeological advice on development proposals. This achieved major benefits in terms of both additional protection for the historic environment and for investigating and recording those elements of it to be unavoidably destroyed or otherwise affected by change.

When Andrew left CAU, Sara Homes, the Unit's Business Systems and Development Officer, thanked him particularly for being 'supportive, knowledgeable, approachable and *sensible* (which is possibly the most important thing of all!),' and pointed out the respect and appreciation his colleagues had for him. This is evident in tributes from other former CAU colleagues. Peter Dudley remembers Andrew as

> 'a lovely, gentle and witty man – intelligent, understated and warm hearted . . . . He put so much into steering the Unit through the worst of times, often at his personal cost, putting a huge strain on his well-being and health . . . He was a good archaeologist, a great writer, erudite and sharp, a breath of fresh air in the office.'

Emma Trevarthen, now an Aerial Investigation and Mapping Investigator in the north of England with Historic England, recalls him as having been as colleague and manager

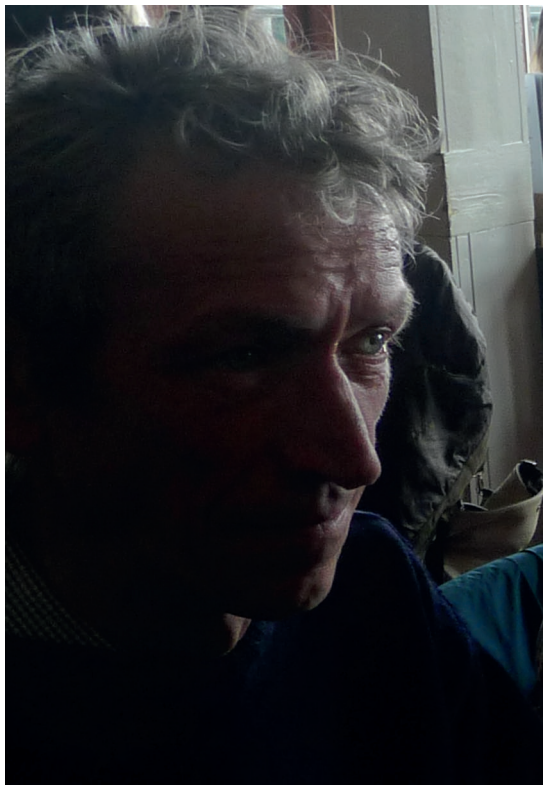
> 'astonishingly fair, thoughtful and modest. His knowledge of Cornish archaeology was meticulous and wide-ranging, and he could talk easily and at length about any aspect of it with co-workers or visiting dignitaries. I don't believe he ever realised how impressive, and unusual, that was. He was the first person I met at CAU, and he came to say goodbye on my last day in the office. I will forever associate the archaeology of Cornwall with him.'

Others remember Andrew for his wry and dry sense of humour. At a time when news stories about the 'Beast of Bodmin Moor' were prevalent, he produced a set of spoof health and safety guidelines on 'Fieldworkers and Big Cats' for colleagues carrying out work on the Moor. He quietly pinned them to the office noticeboard where they remained for several years.

Away from work, Andrew had a deep interest in music. He had sold his original violin while a student in Manchester but rediscovered the instrument in his late thirties. He had a great love of classical works and, after passing his Grade 8 exam, became lead violin for the West Cornwall Strings Orchestra, also playing occasionally in Penzance's festive street ensemble, the Golowan Band.

He also pursued a passion for botany, first developed in childhood and his teenage years. Later in life he spent considerable amounts of his spare time recording plants in the field; the recently updated *Flora of Cornwall* (French 2020) includes numerous entries bearing his name. This aspect of his interests was unknown to most of his work colleagues but Sean Taylor of CAU recalls 'bumping into him unexpectedly on the marshy ground behind Par Beach and wondering what he was doing so far from home. It turned out that he was counting the orchids, among other things, making a record for the Wildlife Trust. It was an interest of his that I had no idea about until that chance encounter.'

Some searches took him further from home, including to Leicestershire and around Morecambe Bay in his native Lancashire. Andrew said of these trips, 'There are always consolations to unsuccessful searches. Just being outdoors walking can be a joy. Many times, wandering through country lanes on the way home, I have felt like bursting into song. The wind and the sun, the brother and sister of life.' During the last couple of years of his life, Andrew wrote his memoirs: 'Shaggy Dog Stories – my search for the



(Photograph: Graeme Kirkham.)

understanding of the meaning of life', described by friends as being 'as peculiar and wry as the man himself.'

Andrew spent more than half of his life in Cornwall and will be remembered for the very substantial and significant contribution he made to the understanding of its past. He always saw himself as a Lancashire man, however, and asked that his ashes should be scattered at Arnside, on the shore of Morecambe Bay, to be carried away by its famous tidal bore.

Graeme Kirkham

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An obituary for the late Nigel Thomas, formerly of Cornwall Archaeological Unit, will appear in the next volume of *Cornish Archaeology.*