Mesolithic Miscellany

VOLUME 26: NUMBER 1
June 2018

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Editorial

Greetings MM readers!

This first issue of 2018 presents four papers. In the first, Kenneth Alexandersson and colleagues report on a seated burial from the island of Öland, Sweden. Originally excavated in the 1990s and thought to be Middle Neolithic, it is here shown to be Mesolithic through radiocarbon dating. This once again highlights the importance of direct radiocarbon dating of remains. (Readers may recall that in MM 25:1, the opposite situation occurred, in which fragmentary remains supposedly from underneath the Kilham long barrow in north-east England were shown by direct dating to be Early Bronze Age.) Chris Meiklejohn's series on 'Human bones, burials and cemeteries: new sources', the 6th of which is presented here, is a useful way of keeping up to date on the latest findings dealing with Mesolithic human remains.

The next two papers both deal with sites in Britain yielding abundant struck flints. Andy Jones and colleagues report on the more than 21,000 flints as well as other worked stone pieces collected over more than 50 years, mainly by historian and archaeologist Charles Thomas, from a series of fields overlooking the coast in southwest Cornwall. The second of these two contributions, by Greg Speed and colleagues, reports on their excavations on the Early Mesolithic site at Little Holtby in North Yorkshire. Again, this is a large assemblage, comprising some 10,000 struck flints, though they appear to be the result of multiple, perhaps seasonal, visits by small groups.

We do rely on our readers to send in material, so please send in your contributions for the next issue, due out in December 2018.

The North Cliffs Project

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Abstract

Between 1949 and 2015 Charles Thomas collected lithics from, and fieldwalked the Gwithian / North Cliffs area of west Cornwall, south-west England. Over this period he amassed many 1000s of Mesolithic flints and stone tools, mainly of greywacke, and identified more than 20 scatter sites in the area, which represents one of the densest concentrations in Cornwall. In 2016 Historic England funded the North Cliffs project, which involved the cataloguing and archiving of Mesolithic flints and stonework from four of the most significant scatters, three of which were located in a large field close to the coast path with the fourth situated further inland. The cataloguing was undertaken by trained volunteers and a 20% sample of the flint and stone assemblages was then rapidly assessed by lithic specialists. The study revealed interesting contrasts between the flint scatters and evidence for the collection, working and circulation of Group XIX Greywacke. In light of the very significant results, it is suggested that fuller analyses of the North Cliffs assemblages has the potential to shed more light on the character of Mesolithic occupation at a regional level and also to contribute to national and perhaps European wide debates about contacts between communities and the circulation of artefacts.

Introduction

Mesolithic studies in Cornwall have largely been moribund since the mid 1980s when the last significant period synthesis was written (Berridge and Roberts 1985). This was at a time when various flint scatter projects (Smith and Harris 1982; Johnson and David 1982) led to significant improvements in our understanding of Mesolithic settlement activity in Cornwall. The region is, however, largely covered by acidic soils which have greatly limited the possibility for organic preservation and for the analytical techniques such as isotopic analysis of human remains or radiocarbon dating. Furthermore, the lack of arable ground and the rarity of developer-funded excavation in areas where scatters occur have also meant that new sites are rarely identified.

The North Cliffs area, however, contains a large number of Mesolithic scatter sites in relatively close proximity to one another, not far from the coast, which would have provided a wealth of resources. In particular, it would have yielded flint, which is not found inland, and the source of Group XIX greywacke that was made into a range of tool types and exchanged over long distances. The cataloguing and rapid assessment of four of the lithic assemblages revealed contrasts and similarities between the scatters and has identified an area which it is suggested could have been a place where beach derived greywacke pebbles were taken to, for working into tools, prior to circulation.

Background

The North Cliffs are located on the North Cornish coast, and extend for approximately 9 km from Portreath in the east to Gwithian in the west. The cliffs along this stretch of coast are sheer, with heights averaging 60m to 80m above sea level (Fig. 1). The underlying geology is comprised of Devonian period slates, mudstones and sandstones, which are prone to sudden erosion in stormy weather. There are also outcrops of harder greywacke, a coarse sandstone or gritstone, which was used for a range of stone tools in the Mesolithic and Neolithic periods.

This stretch of coastline is the focus for more than 20 Mesolithic scatters, the majority of which were identified by Charles Thomas from around 1949 until 2015 (Thomas 2005; Jones, forthcoming). In addition to amassing his own collection, Charles obtained flints from others, including those collected by H.J. Berryman. The majority of the scatters were located at the Gwithian end of the North Cliffs (Fig. 2). Many were small and sometimes found during the investigation of other sites. Four of the scatters (HU, HU/NE, HU/SS and CM), however, were larger and located in close proximity to one another in two fields (Hudder Field and Callean Memmoan) and these became the focus for the North Cliffs project.

Figure 1. The North Cliffs looking west towards the Knavocks (Photograph: Andy Jones).

Field Methods

The fields are approximately 500m apart from one another and although all were initially fieldwalked in a non-systematic way, three of the four scatters were subsequently systematically recorded, although in different ways. Hudder Field is approximately 8 hectares in area and situated close to the cliffs, with its northern end abutting the coast path. HU/NE is located at the higher northwest coastal end of Hudder Field (Fig. 3). It was divided into gridded rows which were subdivided into 10m squares (A1-13, B1-6, C1-6, and D1-6). This scatter produced very dense concentrations of flints and pebble tools of Mesolithic date. It represents by far the largest collection of flint and worked stone from the North Cliffs area. HU is the second largest scatter and is located at the south-eastern end of the field near a spring-line. It was walked in eight

transects of which 1 to 6 and 8 were parallel with one another. Transect 7 ran diagonally across 1, 2 and 8. The fieldwalking led to the recovery of large numbers of Mesolithic flints and pebble tools. In addition, some pieces of worked stone of Bronze Age date were found, including a muller, and some of the flints may also prove to be of post-Mesolithic date. HU/SS, the third and final scatter in Hudder Field, was located on a slight rise near the southern field boundary. It has never been gridded out but appears to be a discrete scatter, of a very much smaller scale than the others, with few pebble tools.

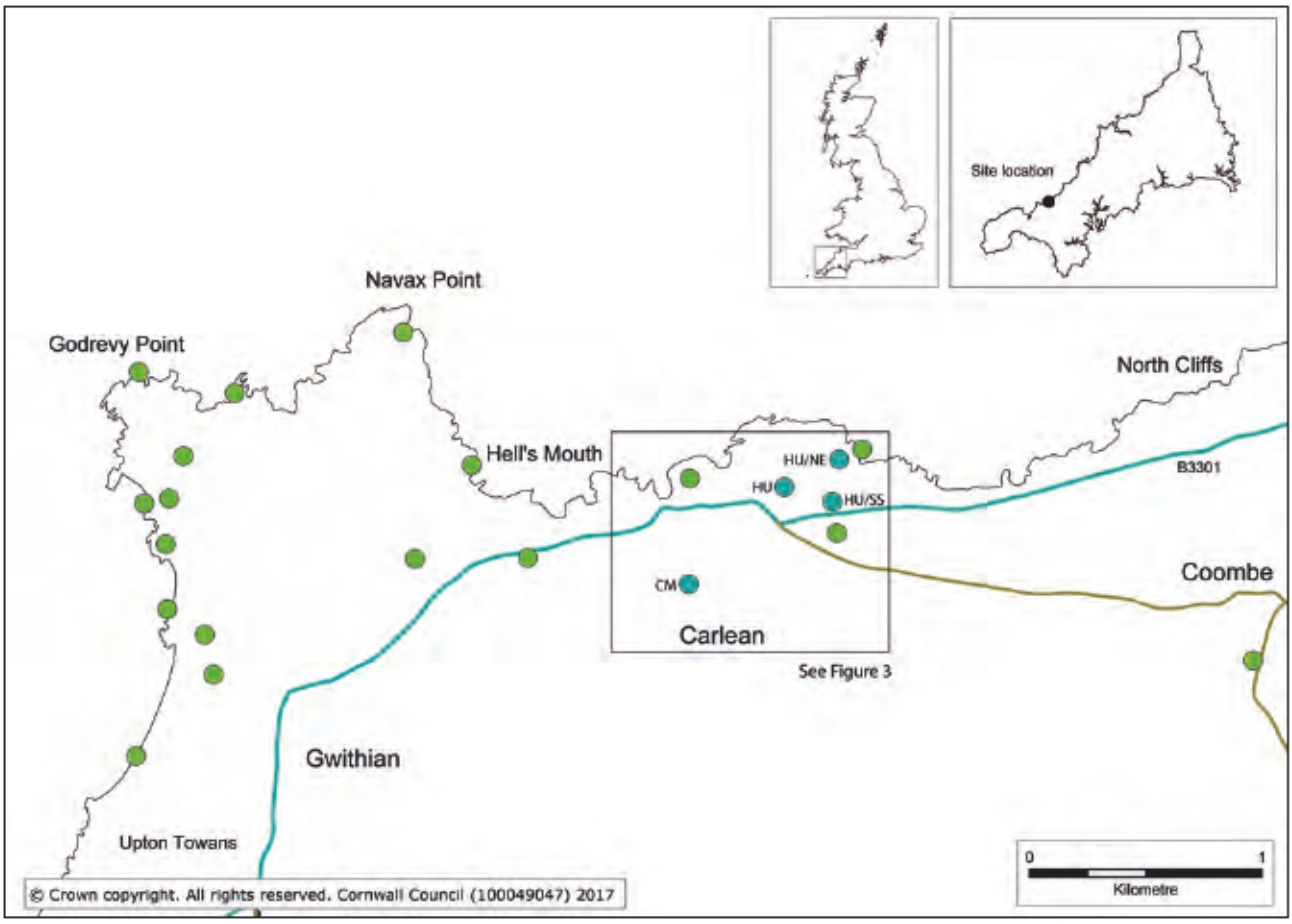

Figure 2. Mesolithic flint scatters in the North Cliffs area, Cornwall.

By contrast, the Callean Memmoan scatter (CM) is situated near a stream in a sheltered shallow valley to the southwest. It is a much smaller area measuring 38m long by 24m wide, although it extends beyond the confines of the gridded box. The area was fieldwalked by quadrant (NW, NE, SW and SE). Large numbers of Mesolithic flints and pebble tools were recovered, as well as diagnostic flints of Middle to Late Neolithic date, which implies that the scatter is associated with two distinct phases.

Although the assemblage had been re-boxed in the early 2000s by the Gwithian project (Nowakowski et al. 2007), there was no funding to fully catalogue or synthesise the Mesolithic assemblages. It was, however, known that the assemblage exceeded 10,000 flints and that there were over 1000, predominantly greywacke, stone tools (Thomas 2007; Jones, forthcoming). In February 2016, the significance of the lithic assemblage was recognized by Historic England, who funded Cornwall Archaeological Unit to oversee an 'archive rescue project'. The first stage comprised the cataloguing of the scatters in Hudder Field and Callean Memmoan and the creation of a project spreadsheet. A second stage was then agreed to rapidly assess the results from the cataloguing project and publish a synthetic overview. The project has not involved detailed study of the artefacts and the results are based on the information provided by the spreadsheet together with an appraisal of a percentage of the stonework and the flint. This report does not therefore constitute full publication but it is hoped that it will stimulate further work.

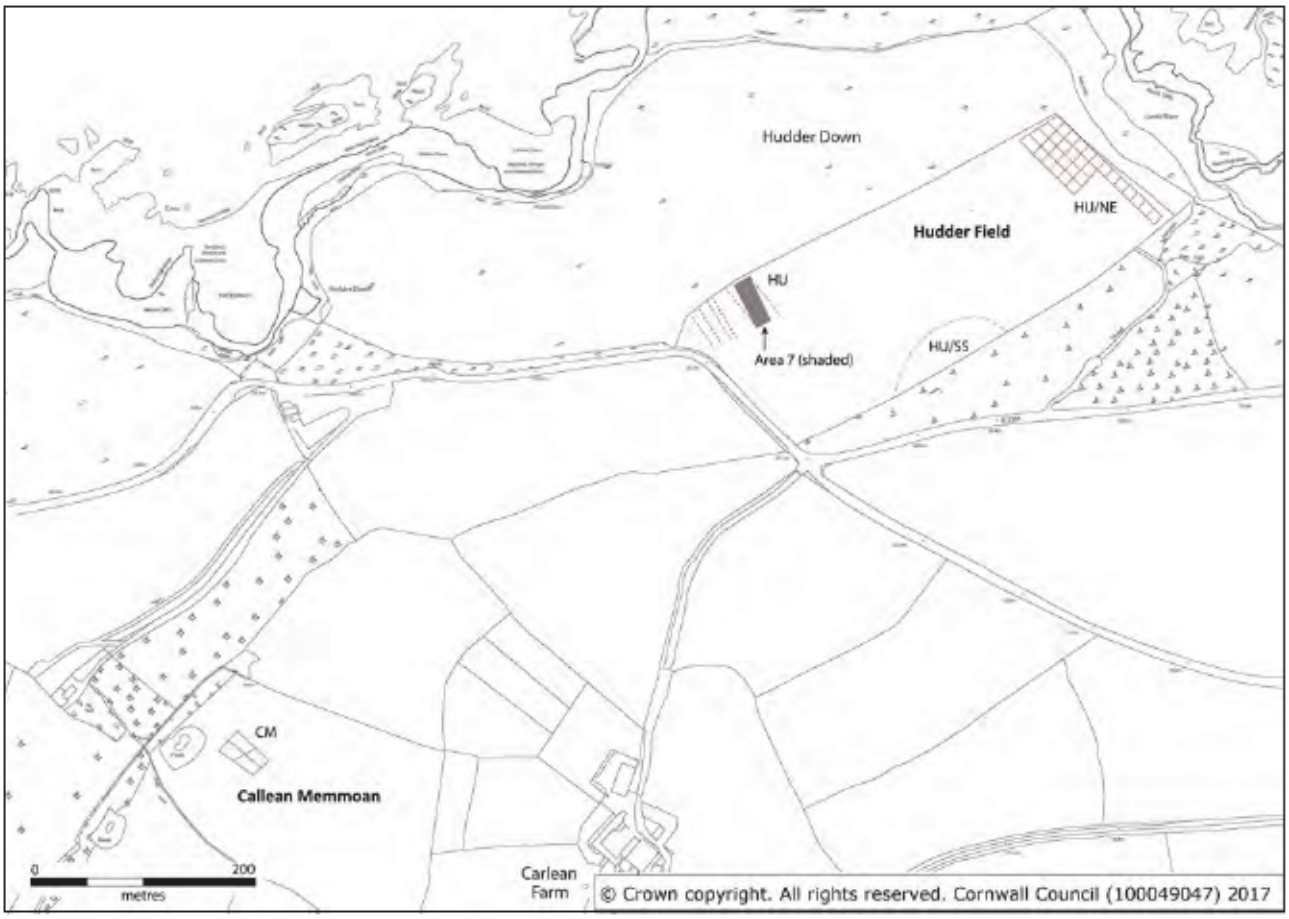

Figure 3. Map showing Hudder Field (HU/NE, HU/SS and HU) and Callean Memmoan (CM).

Cataloguing

In advance of the cataloguing, recording sheets for the flint and worked stone and two searchable spreadsheets, one for flint and a second for the stone, were designed. A team of nine volunteers were then recruited through the Cornwall Archaeological Society who, after receiving training, worked until the end of July 2016 at the Royal Cornwall Museum, where every find was catalogued. For the flint, different categories and sub-categories were recorded (see below). For the stonework, the different types of stone were sub-divided, firstly according to their shape and then how or whether they appeared to have been modified and whether this was by flaking, abrasion or percussion. Evidence for decoration was also looked for and recorded. For both datasets the details of where the objects were found, including National Grid References of up to 10 figures, were recorded. Most boxes contained several bags of flints, and a recording sheet was required for each bag.

A sample of the worked stone artefacts was also thin-sectioned to establish their petrology and to see if there was a match with the locally outcropping Group XIX greywacke.

A master list quantifying all the finds held in the North Cliffs archive was produced and an electronic file produced which was added to the PAS database and exported to the Cornwall Historic Environment Record. At the end of the project, the finds were all packaged and boxed to museum standards, and the archive accessioned into the Royal Institution of Cornwall's collections.

Flint

The four scatters comprised very different sized assemblages: HU/NE produced 13,544, HU 3702, HU/SS 228 and CM 3929 flints. A rapid assessment of the catalogued database was followed by a more detailed study of 3915 flints from five selected boxes from HU/NE and CM representing approximately 20% of the

assemblage. Of these, 2428 were from HU/NE and 1487 from CM, representing 18% and 37% of each assemblage respectively.

Database assessment

Ten basic forms were selected for identification (Table 1), with additional subdivisions (including burning, the use of chert and retouch) which make up the detail of the data.

Microcore (pyramid, opposed platform, single platform)
Microlith (oblique, triangular including scalene, retouched bladelet including rod)
Microburin
Microflakes / blades (small flakes or blades)
Blades (broken, complete, plunging)
Flakes (broken, complete, plunging)
Cores (flake core, blade core, mixed flake / blade core or core tool)
Scrapers (blade end, flake end, flake side, flake side and end)
Arrowheads (leaf, transverse, tranchet)
Pebbles (broken, complete)

Table 1: Forms selected for identification.

These criteria were selected to attain the maximum amount of information in the simplest way within the project timeframe (Table 2). Inevitably the assemblages contained more than 10 forms, and the chosen criteria are not all strikingly diagnostic or easily separable.

Tools / sites	CM	%	HU	%	HU/NE	%	HU/SS	%		Total No.	Total %
Arrow-head	1	0.03	0	0	2	0.01	0	0		**3**	**0.01%**
Blade	269	6.8	300	8.1	557	4.1	12	5.2		**1138**	**5.3%**
Core	366	9.3	319	8.6	985	7.2	9	3.9		**1679**	**7.8%**
Flakes	1471	37.4	2013	54.3	5665	41.8	65	28.5		**9214**	**43.0%**
Micro-burin	6	0.15	3	0.08	27	0.2	0	0		**36**	**0.1%**
Microcore	175	4.4	264	7.1	555	4.1	10	4.3		**1004**	**4.6%**
Microflake / blade	1411	35.9	662	17.8	5248	38.7	118	51.7		**7439**	**34.7%**
Microlith	17	0.4	8	0.2	129	0.9	1	0.4		**155**	**0.7%**
Pebble	145	3.6	103	2.7	246	1.8	0	0		**494**	**2.3%**
Scraper	68	1.7	30	0.8	130	0.9	13	5.7		**241**	**1.1%**
TOTAL NO.	**3929**	-	**3702**	-	**13544**	-	**228**	-			
TOTAL %	18.3	-	17.2	-	63.2	-	1.0	-		**TOTAL 21403**	
Burnt total	**93+**	-	**82+**	-	**568+**	-	**0**	-			
Burnt %	**2.3**	-	**2.2**	-	**4.1**	-	**0**	-			

Table 2: Total number of flints by scatter.

All four scatters produced diagnostic Mesolithic microliths, but always at a ratio of less than 0.5% of the total assemblage. HU/NE, significantly, has proportionately more than twice as many microliths than HU/SS and CM and more than four times as many as HU, suggesting either that HU/NE is significantly 'more Mesolithic' than the other sites or that it had a different function.

However, when looking at all four potential Mesolithic markers (the microliths, microburins, microcores and (initially considered) the microflakes / blades), HU/SS appears the 'most Mesolithic' at 56.4% followed by HU/NE, CM and HU at 25.1%. The microflakes and blades are responsible for this discrepancy and should be used with care as Mesolithic identifiers. Many of the microblades and an unquantified number of the

microflakes are certainly Mesolithic, but a proportion of the other microflakes may well simply be a reflection of the small size of the available pebble flint, and as such are not datable.

Table 2 highlights a number of other largely subtle differences. The most pronounced are found at HU and HU/SS, suggestive of definite differences in character and / or date.

HU has 13% more larger flakes and 3% more microcores than the next highest site, but surprisingly 18% fewer microflakes. It also has a small number of distinctive large, heavily patinated blades reminiscent of the Early Mesolithic.

HU/SS has no microburins or pebbles, and 4% less large cores than the next lowest site ratio, but nearly 13% more microflakes / blades and 4% more scrapers.

In terms of CM to HU/NE comparison, the differences are very subtle: CM has 3% more blades, 2% more large cores, 1.5% more pebbles (mostly tested) and 1% more scrapers. HU/NE has 4% larger flakes and 3% more microflakes / blades than CM.

Realistically the inter-site variation recorded in the database reflects a range of factors, including differences in actual site dating / phasing and onsite activities, probably linked to specific locations. In addition, the differing collection strategies will have affected apparent variations between sites.

At HU/NE the gridded assemblage shows some clear patterning. For the main rectangle (A, B, C, D, 1-6) there is a decline in flint density towards the southwest. Row D only accounts for 14% of the total 9029 grid located pieces. By contrast, row A produced 23%, row B 33% and row C 28%. An even more marked decline is seen extending southeast of the site in squares A7 to A13, which together only produced 406 pieces (Fig. 4).

In terms of distinct clusters it is clear that square B4 contained the largest number of flints (1035), followed by B3 (764), A4 (688) and B5 (593) (Table 3). It is possible that these reflect a group of convergent hotspots, related to different seasonal occupations and / or activities. This is supported by the distribution of tool types (cores, micro-cores, microliths and scrapers), which have overlapping but slightly differing distributions (Figs. 4-8). Squares C1-C5 each produced in excess of 400 pieces, suggesting a southwestern extension from the main concentration. All other squares produced less than 300 pieces. It is possible that A1, which contains a higher amount of material than the adjacent squares, marks the start of another cluster to the north.

The CM quadrant recorded material (Table 4) accounts for 71% of the entire scatter and reflects a genuine, simple pattern. Numerically there is a heavier western concentration of material. In order of density quadrant NW produced 977 pieces (35%) and SW 869 pieces (31%), while on the eastern side of the scatter, quadrant SE produced 597 pieces (21%) and NE produced just 357 pieces (13%). Other patterns too are evident; there is a bias towards scrapers and microcores in the SE and SW quadrants, and proportionately more microliths in the NW.

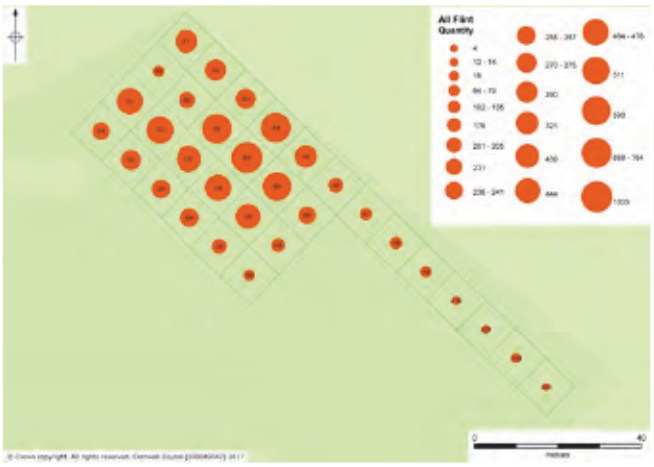

Figure 4. Distribution of flint within HU/NE (spot sizes range 4-1035)

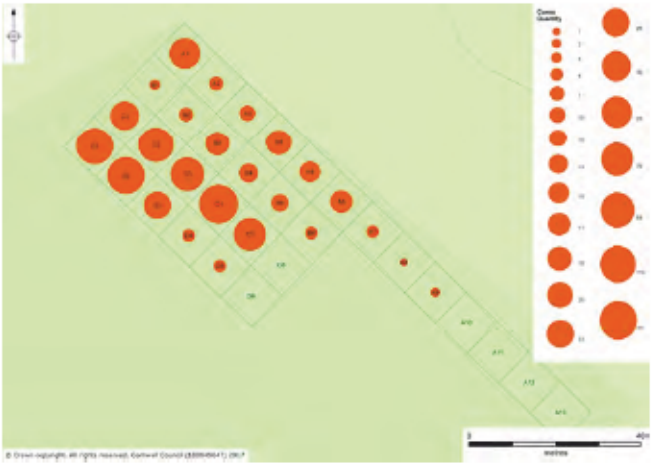

Figure 5. Distribution of cores within HU/NE. (spot sizes range 1-111)

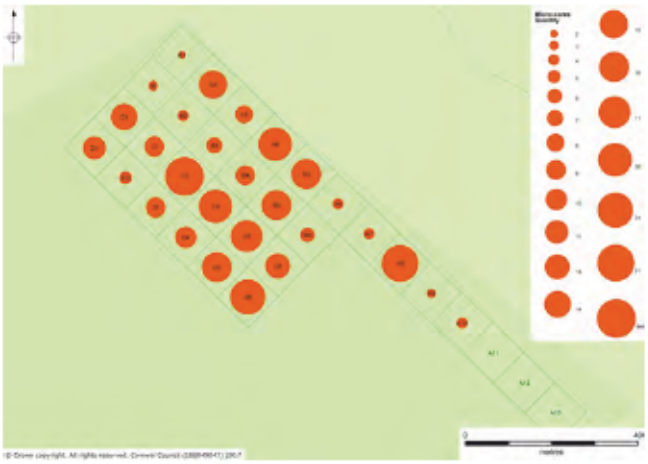

Figure 6. Distribution of micro-cores within HU/NE (spot sizes range 2-94).

Figure 7. Distribution of microliths within HU/NE (spot sizes range 1-11).

Row A	Totals	Row B	Totals	Row C	Totals	Row D	Totals		Other / grid not specified	Totals
A1	363	B1	176	C1	462	D1	236		Area W of gate	27
A2	290	B2	231	C2	513	D2	270		NE	7
A3	275	B3	764	C3	476	D3	255		NE corner	36
A4	688	B4	1035	C4	475	D4	257		HU/NE 3	31
A5	321	B5	593	C5	444	D5	205		HU/NE/O	15
A6	201	B6	241	C6	179	D6	79		Coast path	15
A7	135									
A8	102								Main scatter	3344
A9	64									
A10	73									
A11	13									
A12	15									
A13	4									
A1-10	167	B1-5	407							
A	17	B	13	C	17	D	11			
Total	**2728**		**3460**		**2566**		**1313**			**3475**

Table 3: HU/NE flint counts by grid square.

Form		Non-quadrant		NE		NW		SE		SW	
Arrowheads		1		0		0		0		0	
Blades		92		29		59		47		42	
Cores		122		41		80		64		59	
Flakes		421		165		345		246		294	
Microburins		5		0		0		0		1	
Microcores		59		24		19		38		35	
Microflakes / blades		362		81		422		162		384	
Microliths		6		0		7		3		1	
Pebbles		26		14		40		26		39	
Scrapers		35		3		5		11		14	
Totals		**1129**		**357**		**977**		**597**		**869**	

Table 4: CM flint tool type counts (non-quadrant and quadrant collected pieces).

Figure 8. Distribution of scrapers within HU/NE.

Sample study

Box 1a (specially selected material)

Charles Thomas identified 230 flints from HU/NE and five from CM as either markedly different or notably fine pieces (Figs. 9 and 10). The 'markedly different' pieces comprised large, long flakes / blades and some retouched material (sometimes reflecting more heavily retouched Neolithic technologies). The 'fine' pieces included well-worked distinctive cores, microliths, and retouched fine end and / or side scrapers.

The selected pieces from HU/NE (Table 5) included 80 microliths (Fig. 9, **L1-9**), 46.25% of these came from row B, which also produced occasional fine single platform bladelet cores. 50 of the microliths (62.5%) were steeply retouched bladelet forms. At least one was a rod, and a small later Mesolithic scalene triangle form. The focus of microliths in row B correlates with the higher flint density squares B3, B4 and B5.

HU/NE Row	Triangular Microlith	Bladelet Microlith	Oblique Microlith	Total Number
A	2	13	3	**18**
B	0	20	17	**37**
C	1	12	4	**17**
D	1	5	2	**8**
TOTALS	**4**	**50**	**26**	**80**

Table 5: Box 1a microliths from HU/NE rows A to D.

A large retouched bladelet microlith was also identified within the non-gridded material. The vast majority of the microliths are very small, narrow and patinated.

Other notable pieces included a large, long chert blade / point (**L10**) from row A, a flint pebble with a natural hole on one side with small removals around its periphery, a large patinated flake and a patinated cherty / quartzite long-flake end scraper from row B. The latter also produced a small number of cores (**L12** and **L13**). Row C produced a large 'glittery' pale grey flake core, a thick long flake knife, a small number of flake end scrapers and heavily patinated blades (**L11**). Evidence for reuse and post-patina modification was seen, plus occasional finely retouched scrapers including a ripple-flaked example, and a large heat-treated piercer. Row D produced a core tool point or piercer, a large piercer on a plunging blade, a large heavily patinated long flake / blade with later end scraper reuse and a small transverse arrowhead. A number of the HU/NE pieces display a distinctive patchy staining.

The notable pieces from CM comprised five pieces: a large, complete bifacially worked later Neolithic transverse arrowhead (**L16**), possibly of imported flint; part of an end scraper / probable broken knife of

Portland chert or possibly heated black flint; a later Neolithic triangular projectile (**L15**), of dark treacle-brown, possibly imported flint, with one side formed by snapping; a complete soft-hammered used blade with minor distal retouch; and a fine Mesolithic single platform narrow blade core. Other cores show bladelet removal, including **L14**, which has reuse at its tapered end.

The CM pieces reflect a multi-phased assemblage. At least three are post-Mesolithic, two suggesting the use of imported raw material. Given their size and lack of damage it is possible that some of this scatter is the result of recent ploughing out of subsurface archaeological features. However, only archaeological excavation can determine this.

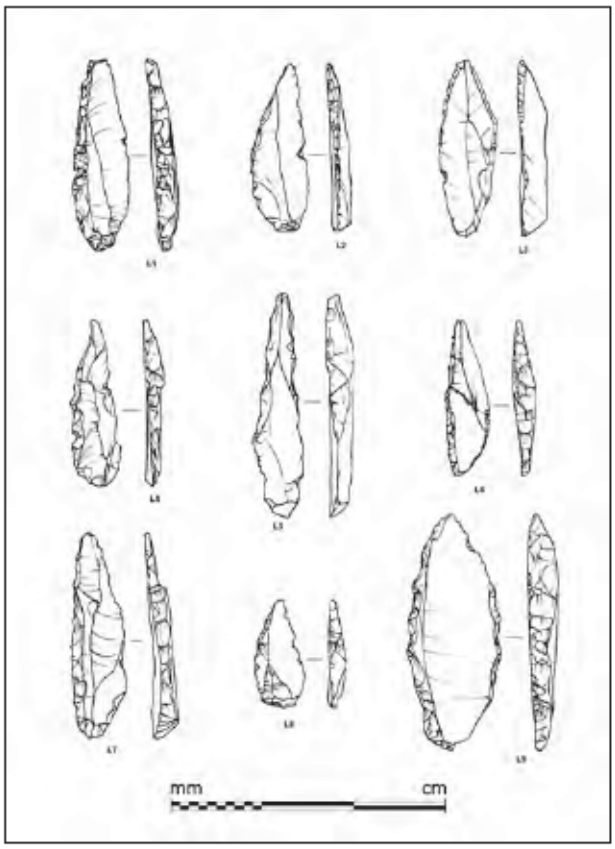

Figure 9. Selected microliths from HU/NE. L1, L2, L3, L4 and L5 (row C), L6 and L7 (row D), L8 (row A) and L9 (row B) (Drawn by George Scott).

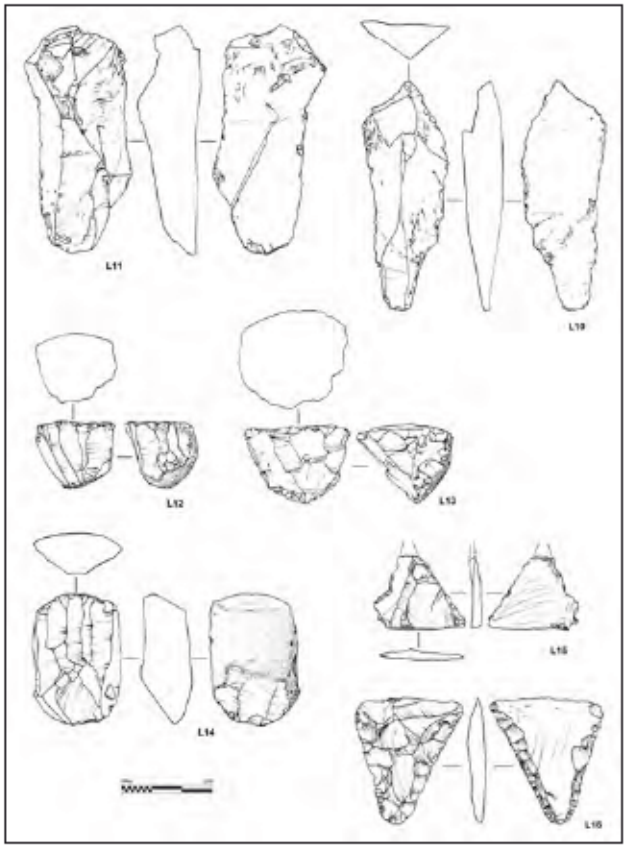

Figure 10. Selected larger pieces from HU/NE and CM. Large utilized blades L10 and L11 (HU/NE rows A and C), cores L12, L13 (HU/NE row B), bladelet core L14 (CM), arrowheads L15 and L16 (CM) (Drawn by George Scott).

Berryman Collection (Box 51)

HU/NE comprises 68 pieces, largely patinated flakes and blades of various sizes, some showing evidence of reuse. A number of fine long blades are included, a probable large microlith and occasional notched pieces. Some large side and side / end flake scrapers span the Mesolithic and possibly Neolithic period.

CM consists of 376 pieces. The Mesolithic material includes a number of heavily patinated flakes and blades (many with platform preparation), approximately half of which are micro forms, along with an associated range of mixed cores, some with partial blade / bladelet scarring. Associated with much of the smaller patinated waste are three microliths (one bladelet, one triangular, one obliquely blunted), four microburins, a pyramid core and one platform bladelet core. These pieces typify later Mesolithic activity, and are identical to some of those from HU/NE. The microburins demonstrate onsite microlith manufacture. One of the heavily patinated, tapered bladelets showed tiny patinated opposing notches suggesting binding. Given its tiny proportions, plant fibre or hair would seem an obvious binding material. The vast majority are patinated and distinct from the pieces of Middle to Late Neolithic date.

There is also a notable proportion of well-formed flakes, some with slight cutting use-wear, well-prepared but often minimally reduced multiplatform flake cores, occasional nodular material and a small number of large distinctively coloured golden brown sometimes cherty pieces, and fine-quality retouched tools including a number of scrapers, a transverse arrowhead, occasional large points / piercers, a thumbnail scraper and long-flakes / broad blades ideal for use as knives / knife blanks. Much of this is later, potentially spanning the Middle Neolithic to Early Bronze Age periods. Several large pieces are near pristine and finely retouched, with little or no macroscopically visible evidence for use, despite some being apparently deliberately snapped.

Despite the significant post-Mesolithic activity at CM, the number of reused pieces was not significantly higher than HU/NE. One piece, however, appeared to show three phases of use on the basis of breaches of differing patination.

HU/NE (Box 46)

1066 flints were recorded from squares A3, B3, C3 and D3 (approximately 7% of the HU/NE assemblage). Some were used and many were stained.

A3: 149 pieces including a mixed range of occasional tried pebbles, patinated mostly multiplatform flake and blade cores, Late Mesolithic single platform and pyramid forms; occasional side scrapers, minimally retouched pieces – some used but unretouched. The flakes are often primary and occasionally large, including rejuvenation pieces. There are many mostly patinated microflakes and blades. Several flints bear a dark mottled staining which occasionally suggests the use of mastic that left the 'tool end' unstained. However, many show all-over patchy staining. Occasional post-patination damage and possible reuse was noted.

B3: 495 pieces including a number of patinated blades, two later Mesolithic pyramid cores, single platform blade cores and several larger patinated flake and blade cores. Some of the cores are quite big and were abandoned after testing. Several of the larger, often thicker flakes have patchy discontinuous retouch and some show unretouched use-wear underlying the patination. Rarely, pieces show subsequent reuse, others possible plough-damage. There are many thin, often narrow, patinated debitage-related microflakes / blades.

C3: 220 pieces including a microlith, a notched bladelet, an opposed platform blade core and other patinated variable flake and blade cores, some of which are burnt (although there is no clear pattern to the distribution of burnt pieces). There are several moderately long narrow blades and many other microflakes and blades (many are thin, patinated, tertiary, broken or occasionally burnt). A number of the cores are minimally reduced and little more than tried pebbles. Many of the true cores are multiplatform flake and occasionally flake and blade producing forms. Some of the pebbles are markedly large, reflecting preferential beach collection or access to larger pebbles and cobbles exposed in nearby raised beaches. There is one good end scraper on a long plunging flake, and a number of used, unretouched flakes. Occasional post-patination damage and possible reuse were noted.

D3: 202 pieces including many thin, patinated, often broken microflakes and blades. There are occasional Mesolithic narrow blade cores including pyramid-like types. The larger cores are predominantly multiplatform and flake producing; however, there are occasional rejuvenation flakes with fine single platform blade scarring. Some of the larger flake material comprises used and occasionally minimally retouched tools including a simple large piercer and a well-formed, patinated, plunging long flake.

HU/NE (Box 48)

1064 flints from squares A5, B5, C5 and D5 (approximately 7% of the HU/NE assemblage).

A5: 187 pieces including a notched bladelet, occasional scrapers and at least one made on a core rejuvenation piece. The cores are variable, producing flakes and blades. They are patinated, sometimes burnt or stained and occasionally narrow-blade producing examples, including a pyramid and a single platform type. Many of the microflakes and blades are primary corticated pieces; although there are secondary and tertiary examples.

B5: 382 pieces including two microliths, a pyramid core, occasional well-formed patinated blades and some broader blades. There are lots of thin, patinated microflakes and blades, including occasionally burnt pieces, and patinated multiplatform flake and blade cores, some of which are burnt. A number of core rejuvenation pieces were noted, often displaying blade scarring. Larger flakes and blades included a broken knife and

some well-formed miscellaneously used flakes. Most pieces were patinated, and few showed post-Mesolithic reuse or damage.

C5: 292 pieces including a notched bladelet, a large heavily patinated concave end scraper on a flake, plus another scraper. The microflakes and blades were thin, patinated and sometimes heavily blade scarred. Some were burins; others showed unretouched use, snapping or staining with about half being tertiary. There were several well-formed bladelet cores of pyramid, single and opposed platform type. Occasional split and tested pebbles included one probable hammerstone. Larger cores included a long narrow blade core. Larger flakes varied considerably, with some showing use-wear or occasionally minimal retouch. Reuse and post-patination damage was negligible.

D5: 203 pieces including one round end scraper on a primary flake, a large triangular or nosed, retouched probable end scraper, and a large patinated side scraper with neat shallow, parallel retouch. Occasional split or tested pebbles and a variety of cores were noted. There was some core rejuvenation waste, and a large multiplatform flake core. Flakes included occasional burins and miscellaneously retouched pieces, and a near black non-patinated, possibly imported nodular Neolithic thinning flake (probably associated with production of a biface tool). There were many microflakes and blades, most of which were patinated and thin, sometimes burnt, quite often broken, and occasionally snapped. At least half were tertiary.

CM (Box 20)

1106 flints (28% of the CM assemblage). Of these, 106 were from NE, 201 from NW, 298 from SE, and 203 from the SW quadrants.

SE and NE: Some well-formed, often patinated broad and narrow blades; a number of large flake producing, often patinated cores; a range of flakes including large often well-formed and / or distinctively dark golden brown, occasional chert, mostly patinated examples; and several microflakes and blades, less than half of which were patinated. There were a few miscellaneous, steeply-retouched scrapers with patchy discontinuous retouch, some with possible cutting / scraping use; a few large split or tested flint pebbles, most of which appear to have been abandoned despite the apparently good-quality flint; a number of flake cores, blade cores and core tools, a good proportion of which were multiplatform and unpatinated. Occasional bladelet cores with classic parallel bladelet scarring were present. Both quadrants may be biased towards larger, later tools, cores and flakes.

SW and NW: A similar range of pebbles and cores but slightly more in the way of fine, heavily-patinated Mesolithic blades, and some notable microcores for narrow blade production. A significant number of the microflakes and, particularly, microblades were tertiary, including unpatinated thinning flakes of post-Mesolithic date. More markedly burnt pieces were found in quadrant NW (suggesting a real patterning in the data, and hinting at underlying buried archaeology).

No microliths were identified in Box 20; however, the focus of Mesolithic activity in the western half of the site is notable. Quadrants NW and SW contained 10 of the 16 database listed microliths from CM, while only three came from quadrant SE. The three remaining microliths are not located by quadrant. This again suggests real patterning.

Flintwork character and chronology

Nearly all the flint was collected from nearby beaches, largely consisting of mottled, sometimes faulted, grey pebbles, probably derived from the off-shore Haig Frais Cretaceous chalk deposits (Berridge and Roberts 1986). Very occasional Cretaceous greensand chert was identified, representing approximately 1% of the assemblage. The examined pieces demonstrated evidence for onsite testing and knapping. A combination of hard-hammer direct percussion, sometimes alongside anvil use (particularly for smaller pebbles) during initial reduction, was followed by hard and / or soft-hammer working and more rarely retouch modification.

Cores

HU/NE included later Mesolithic narrow blade-producing single platform and pyramid cores, a variety of multiplatform flake cores and, less frequently, opposed platform types (Butler 2005, 83-88). This range is typical of later Mesolithic Cornish sites (Jones et al. 2013) and elsewhere, including Caldey Island, Nab Head and Burry Holmes in Wales (David 2007; Walker 2016) and Ferriter's Cove in Ireland (Woodman et al. 1999). Larger cores are often indicative of earlier Mesolithic activity (David 2007), while smaller cores

are frequently of Late Mesolithic date. Although, large good-quality flint is available from nearby raised beach deposits today (and was possibly more easily available in the past), it does not seem to have been preferentially used. The small HU/NE cores largely reflect the use of easily obtainable beach pebble flint. It may be that larger cores had no major advantage, given the small-blade-based focus of technology at the time.

Mesolithic bladelet cores, and a range of less specialized, predominantly multiplatform cores, similar to those at HU/NE, were found at CM. The Mesolithic cores from both sites are almost identical, comprising predominantly small, multiplatform flake or narrow blade types. Most are heavily patinated and sometimes burnt, their presence reflecting onsite knapping. CM also produced a number of large later Neolithic flake producing cores, with little or no patination. A small, but notable number of these were cherty and golden brown, distinct from the mottled grey pebble flint of Mesolithic date.

Flakes and blades

There were vast numbers of variably sized flakes and narrow blades. Relatively few broader (>10mm) blades were recorded. Occasional thick long flakes were present, often with minimal modification and / or use-related cutting and sawing wear. All the largest examples were heavily patinated and sometimes cherty. Some of these are Early Mesolithic in date. Honey-coloured greensand chert has been recorded on many sites around Cornwall, including Poldowrian where, in common with HU/NE and CM, it was used for larger picks and chopping tools (Smith and Harris 1982).

Retouched pieces

In common with several nearby Mesolithic sites (Roberts 1987), the Mesolithic assemblages from HU/NE and CM included only a small portion of retouched material. Mesolithic retouch was mostly associated with steeply-retouched microliths. In addition, there was a wide range of miscellaneous flakes showing patchy, discontinuous retouch. Many were used as scrapers and knives. Denticulated edges, particularly on larger primary pieces or thick long flakes show the retention of cortex as backing to facilitate hand-held grip. Occasional burins were noted, but were not always obvious, and notched retouch was almost non-existent. The scrapers (and perhaps the burins) suggest the processing of organic materials such as wood, hide and bone (David 2007, 113).

Scrapers

The larger retouched Mesolithic HU/NE tools included scrapers, simple knives, and knife / scrapers. Side or combined side and end scrapers were the most frequent. Scrapers included concave, convex, tapered, nosed and fine end forms. At CM there is evidence for the production and use of hand-held, often minimally retouched scrapers, knives, burins and core tools, and hafted composite pieces. A small number of probable Late Neolithic scrapers were identified at CM, some of which appeared unused and deliberately snapped in half.

Microliths

These are almost invariably small, obliquely retouched forms of narrow blade geometric type (Butler 2005, 96), including convex-backed and lanceolate forms from HU (Jacobi 1979). In addition to the simple obliquely retouched and triangular (including scalene) forms, a lunate and a rod microlith were identified at HU/NE. Small scalene triangles and rods represent part of a widely dispersed pattern which made a relatively sudden appearance from about 7000 BP (Barton and Roberts 2004), and have been identified at several Cornish scatters, including Trevose Head, Poldowrian and Windmill Farm (Johnson and David 1982; Smith and Harris 1982; Smith 1984). Compared with other Cornish sites, there appears to be a disproportionately small number of scalene triangles. Detailed analysis, however, would identify a wider range of microlith forms.

Two distinct forms of largely oblique bladelets / straight-backed microliths were recorded at HU/NE: a squat geometric type with a short parallel body and one diagonal / obliquely retouched edge; and the more numerous, longer slightly tapered oblique, straight and convex backed pieces found at both HU/NE and CM. The longer microliths were variable and often blunter than the squat forms. As noted by Palmer (1977, 172), who examined a sample of the material, the majority showed retouch along one complete or nearly complete edge. Both types are found elsewhere, including Trevose Head, Poldowrian, and Windmill Farm in Cornwall, and Nab Head in Pembrokeshire (David 2007; Walker 2016; Jacobi 1979).

Staining

Slight tar-like mottled staining was present on many of the Mesolithic HU/NE flints (Fig. 11). On the basis of positioning, it occasionally appears that this could relate to a mastic associated with the production of composite tools (Aveling and Heron 2000, 47-52), but it is more frequent as intermittment staining on both faces. The cause is uncertain, but it is confined to the HU/NE Mesolithic assemblage and is possibly a contemporary residue, or a post-depositional reaction to an organic substance. If related to Mesolithic activity, it would be extremely significant.

Figure 11. Photograph of selected pieces from HU/NE illustrating the range of colour, size and degree of working. Note the patchy staining and discolouration on some of the microliths (Photograph: Anna Lawson-Jones).

Greywacke and other stone

A total of 2095 pieces were recorded. HU/NE had 1434, HU 354, HU/SS 18 and CM 231. Three boxes were selected for detailed study, two from HU/NE, and one from CM. Boxes 25 and 38 HU/NE contain 335 pieces, Box 26 CM 109 pieces, totalling a sample of 444 and providing a 21% sample of the assemblage. Thirty-eight items from this sample have been catalogued, with full descriptions including petrology (and given 'S' numbers). The catalogue includes another 40 items with S100 numbers, selected by Charles Thomas as of probable interest (Box 32) or identified during the cataloguing stage, including pieces from HU and one from HU/SS. Descriptions from the catalogue are only included here for illustrated items. Roger Taylor's petrological comments are given in italics.

The standard geological division between pebbles <64mm and cobbles >64mm maximum dimension is used except where 'pebble' has become accepted usage.

Materials and tool categories

About 75% of all pieces were initially recorded as greywacke, some with quartz veins, slate, siltstone, vein quartz, and igneous rock making up most of the remainder. Almost all was local beach pebble / cobble, with the occasional exception of non-local material such as S107 a calc-silicate hornfels axe (Jones, forthcoming) likely to post-date the Mesolithic assemblage. The initial geological record was broadly confirmed by the petrological study, with the exception that siltstones had sometimes not been distinguished. A large proportion of the assemblage was broken or damaged to various extents. Study of the greywacke items indicated that surfaces had been softened by weathering, which accords with earlier work (Mitchell 1988, 45). Many of the tools have possible hammerstone marks or incised lines, in addition to modification or main use-wear.

There is no standardized terminology for prehistoric stone tools, and some of the categories used here such as 'pieces with anvil pitting' are used descriptively where there is no accepted term. Tool use may be inferred either by modification or traces of usage. However, both these indicators can be indeterminate. All pieces had some human factor in their presence, involving transport up from a local beach for possible use, and can be regarded as 'potential tools'.

Using probable modification and use-wear as diagnostic criteria, some 85 or 25% of the HU/NE sample and 39 or 35% of that from CM may be regarded as tools. This would indicate that the HU/NE assemblage contains some 360 tools. The distribution of stonework at HU/NE with a concentration centring on squares B3 and B4 reflects that of the flint (Fig. 12) which strongly supports its association with Mesolithic flint.

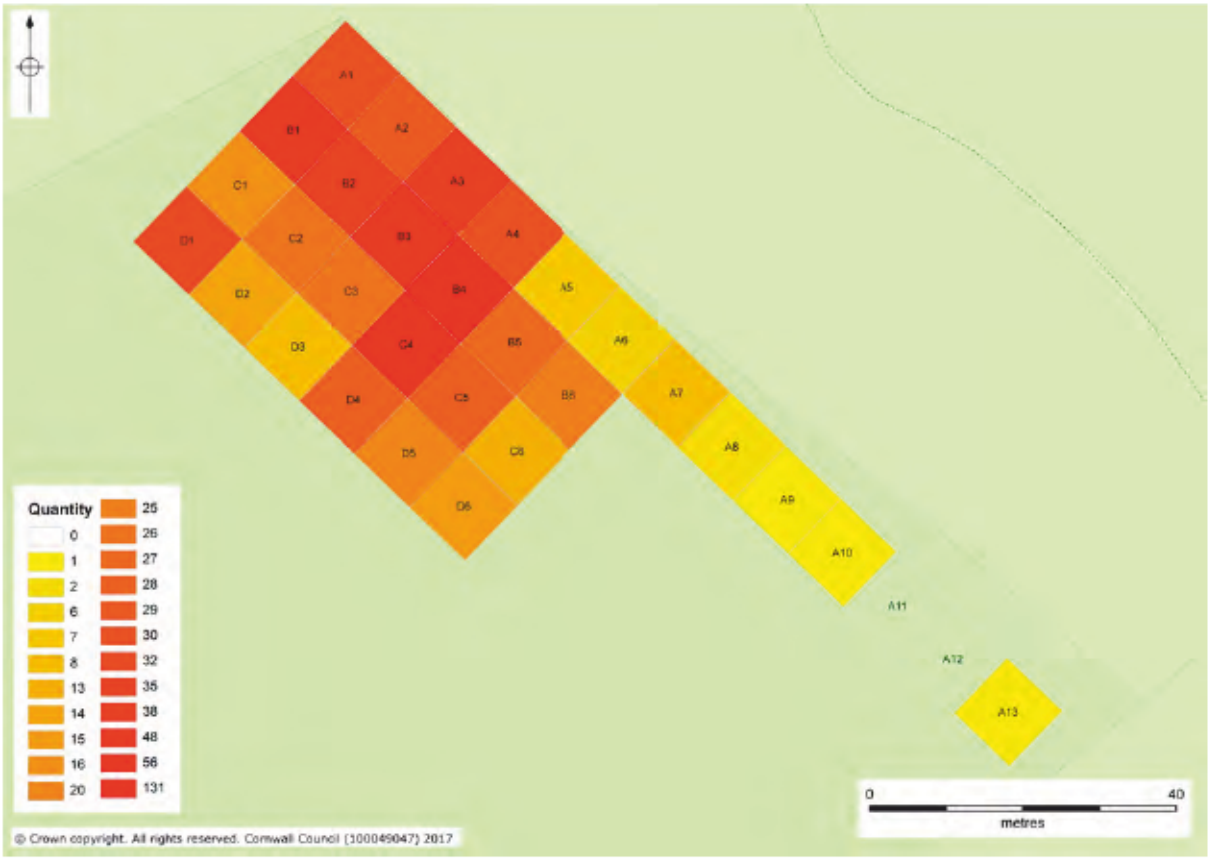

Figure 12. Distribution of stonework within HU/NE.

Bevelled pebbles

Bevelled pebbles generally are within the size range recorded by Fletcher (2005) in a small sample: length between 64 and 128mm, width between 27 and 49mm, thickness between 12 and 18mm although a few are several mm thicker. The general character of bevelled pebbles is well-known, and an example, S108 (CO204) from the assemblages has previously been published (Berridge and Roberts 1986, fig. 6, no. 5). They predominate in coastal Late Mesolithic tool assemblages from Cornwall, notably those from Poldowrian and Trevose Head (Smith and Harris 1982; Johnson and David 1982). Their use remains uncertain, although the former interpretation as 'limpet scoops' is now generally discounted (Roberts 1987, 135). Experimental work by Fletcher (2005, 30) indicates that bevels were formed by abrasive action. She also found that an abraded bevel was far more effective in working hides than unmodified cobble ends, which is supported by work on the bevelled pebbles from Howick, Northumberland (Waddington 2007, 193-6).

From the HU/NE sample there are 36 complete bevelled pebbles, of which four are slate and the remainder greywacke, a few of the latter with quartz veins. Seven are double-ended: five have single bevels at both ends (S43): two have a single bevel at one end, the other double (S41). None have double bevels at both ends. 29 are single ended, with 23 a single bevel and six a double bevel. 14 have damage on the bevels at one or both ends. There are 31 broken bevelled pebbles, of which three are slate. 23 of these have single bevels, nine double. 27 have some chipping or other damage on one or both bevels. A few of both complete and broken bevelled pebbles, generally at the wider side of the size range, have a marked curve to one or both bevels. A few have incised marks which might be intentional (S43). Extrapolating the sample, there may be 145 bevelled tools in the overall assemblage.

From CM there are 17 complete bevelled pebbles, of which two are slate. Two, S108 and S109, were established as Group XIX greywacke (Clough and Cummins 1988, 145, CO204 and CO205). Three are double-ended, of which two have single bevels at both ends and one a single and a double bevelled end. 14 are single ended, of which 11 have single bevels and three double. Four have some chipping or damage. There are 12 broken bevelled pebbles, of which three are slate. 11 have single bevels, one double. Three have some chipping or other damage on one or both bevels. On these figures, the CM assemblage may comprise 50 bevelled tools.

S41 (Fig. 13) HU/NE Bevelled pebble, double end, one end double, the other single, 109 x 38 x 16mm. *Greywacke. Good double ended example with regular shape.*

S43 (Fig. 13) Bevelled pebble, double end, single facets both ends but on opposite surfaces, fine incised marks / grooves, 119 x 34 x 16mm. *Greywacke. Example with less regular shape and possible incised marks.*

Pieces with specialized hammer use

Specialized use of the end of some elongated cobbles as hammers is indicated on a number of examples such as S123 HU/-: sometimes the end is further flattened by intensive impact/use, S112 HU/NE. A large number of other broken elongated cobbles with some damage or spalling may have some use as end-hammers. Some specialized task is indicated. A tiny hammerstone <37mm S14 CM indicates some other specialized use. Fletcher (2005, 31) suggested that greywacke was not suited as a knapping tool. The durability of this rock is, however, very variable depending upon minor variations in texture and component size, and some other specialized hammer activity may be involved (R Taylor, pers ob). This type of hammer use can be seen in examples from Poldowrian (Smith and Harris 1982, fig. 61, nos. 80 and 82) and Trevose Head (Johnson and David 1982, fig. 7, nos. 2, 5 and 6). Further afield they bear comparison with the pebbles with spalled ends from Ferriter's Cove in County Kerry (Woodman et al. 1999, 58-9).

S112 (Fig. 14) HU/NE Rod shaped cobble, 61+ x 32 x 29mm, end flaked both sides, hammerstone detachments forming chisel-like end, abraded on one side. *Greywacke fragment.*

S123 (Fig. 14) HU/- Thick elongated cobble, truncated by detachments from either side forming a 'chisel' end; worn with some grooves and scratches, 92 x 32 x 23mm. *Prolate siltstone cobble, with flaking at one end due to use as a hammerstone. Grooves/scratches relatively recent; one cuts through flaked surface.*

Pieces with pitting

Several pieces have small areas of pitting which appear to have been made either directly by a small pointed hammer or indirectly from use as an anvil. One S2 (HU/NE is greywacke, the others, S6, S17, S30 and S31 are slate, and all but S17 (CM) from HU/NE. These pieces show the pitting clearly but occasional possible pits or pitting is found on a number of pieces. This type of use was noted at Poldowrian (Smith and Harris 1982, 45, fig. 17, no. 82a) where it is described as 'light pecking'.

S2 (Fig. 13) HU/NE Bladed cobble with pitting on one face, 61+ x 40 x 17mm, broken across pitting. *Weathered greywacke cobble with pit marks on flatter surface, one transverse scratch probably plough-damage or similar.*

S31 (Fig. 13) HU/NE Fragment of bladed cobble, some detachments taken off from break, very clear pitting on one side, also scratches, 61+ x 34 x 13mm. *Broken oblate slate cobble, with two clusters of pitting: scratches naturally formed.*

Edge damaged tools

A number of bladed cobbles of greywacke or slate have damage to their sides and some have additional marks such as pitting. Three of the most distinct examples, S4, S5 and S7 were described from HU/NE. S5 in particular has a number of additional small incised lines and other marks which may be considered too regular to be incidental.

S5 (Fig. 14) HU/NE Bladed cobble with abraded sides, 143 x 25 x 17mm. *Siltstone cobble, possible battering at one end, shallow notched wear on one edge, but otherwise surface marking incidental.*

Flaked knives

Three pieces, two from HU/NE S1 and S119 and one from CM S118, are bifacially worked slates or greywacke probably functioning as knives. Although greywacke should flake adequately, no similar pieces

are recorded from other sites in South West Britain. The general working is similar to that on potential greywacke axes S101 and S106.

S1 (Fig 14) HU/NE Small biface, probable knife, 53 x 37 x 17mm. *Discoidal concretion within local slate with a little of the concretion surface surviving.*

S119 (Fig. 14) HU/NE Roughly flaked discoidal knife, 77 x 67 x 19mm. *Flake detached from large fine greywacke cobble.*

Rubbers

Three small quartz or jasper rubbers come from HU/NE S12, S13 and S128, none more than 78mm across. An apparently unused cobble S129 of reddened quartzite from HU/NE may form part of this group. These are characterized by small size, generally circular form and hard material and appear clearly different from those from CM S19, S20, S116 (non-local elvan), and S130 from HU/NE, complete or fragmentary mullers of Bronze Age type. These are the first tools of this type and date identified from South West Britain.

S128 (Fig. 14) HU/NE A.5 Waterworn pentangular lump, 78 x 62 x 40mm, small patches of gloss suggest rubber wear on one surface. *Jasper cobble, small patches of gloss suggest rubber wear on one surface. Jasper as a form of quartz can be found on local beaches and is a very hard rock.*

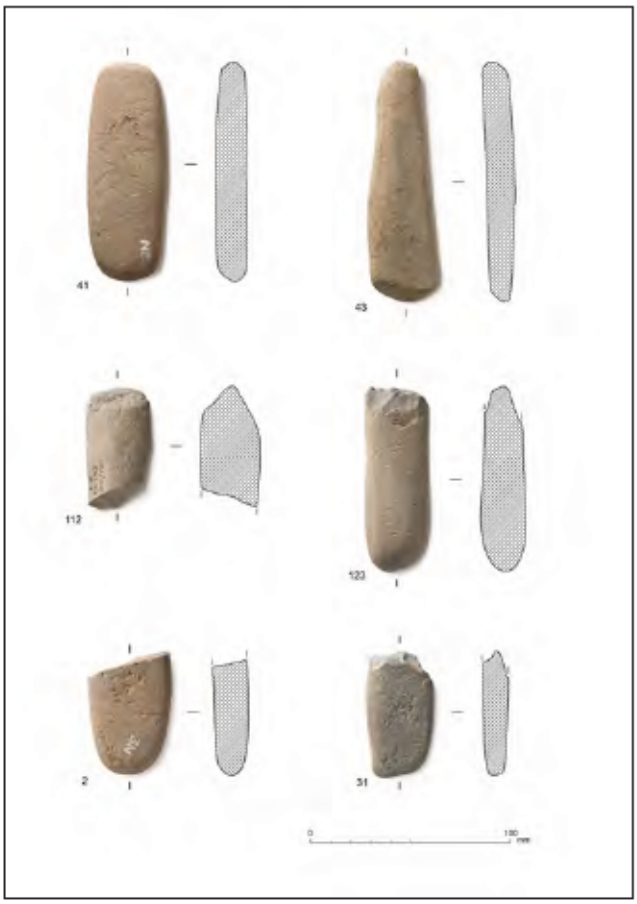

Figure 13. S41, S43 bevelled pebbles, S112, S112 specialized hammerstones, 2, S31 pieces with pitting (Photographs: Gary Young).

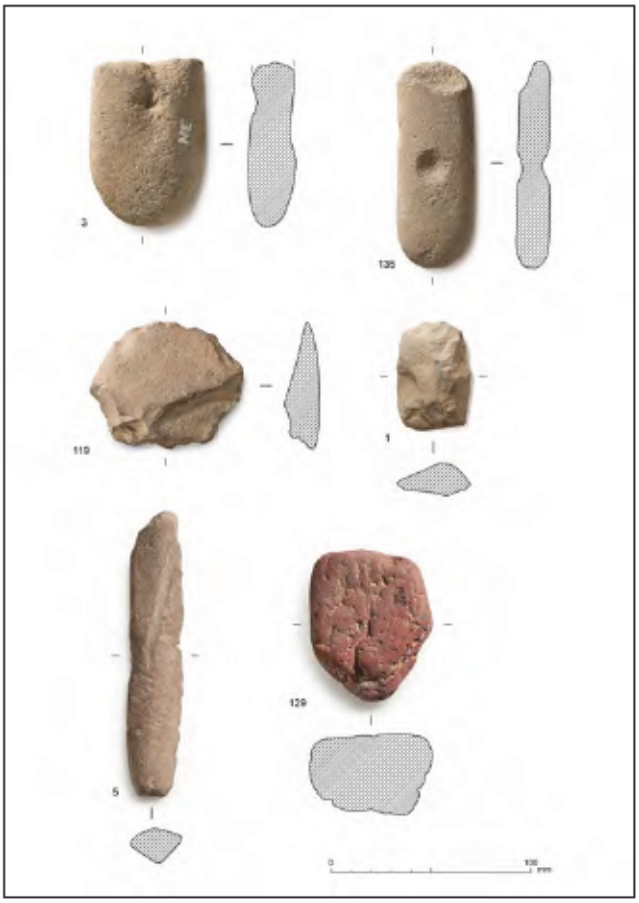

Figure 14. S3, S135 cupped pebbles, S119, S1 flaked knives, S5 edge damaged piece, S128 rubber (Photographs: Gary Young).

Pebble hammers and cupped pebbles

Pebble hammers, which have hourglass perforations and cupped pebbles, which have two usually circular depressions on opposite faces (Roe 1979; 1985), are closely linked typologically as the latter can be viewed as unfinished versions of the former. The two linked types have a long potential date range, from the Late

Mesolithic until the Early Bronze Age (*ibid*). One complete cupped pebble from HU, S127, is previously published (Berridge and Roberts 1986, fig. 6, no. 4; Palmer 1977, 174) and is of fine-grained elvan with some hammerstone use on one end. A single broken cupped pebble S3 has been identified from HU/NE. A complete cupped pebble, S135, comes from HU/SS, and a complete example on an irregular cobble from Hudder Field, S124. Another broken irregular cobble with opposed cup-marks comes from HU/SS S134, and a more regular example from CM S137. A piece of weathered slate, levered off, has broken across the start of a single slightly worked depression, S24 HU/NE. The only pebble hammer, of a broken pointed shape, S136, comes from CM. All depressions show signs of pecking and gouging rather than drilling and all but S127 use greywacke cobbles. These eight examples form the largest and densest concentration of the types in South West Britain and the only ones with good association with Mesolithic material. The strong predominance of cupped pebbles over pebble hammers might support their onsite manufacture.

S3 (Fig. 14) HU/NE Broken cobble with pecked depressions on each face, dissimilar in plan, hammerstone use on end, 82+ x 57 x 25mm. *Greywacke cobble with oval anvil / cupped depressions on both faces, subsequently damaged.*

S135 (Fig. 14) HU/SS Cobble, one end damaged with possible single bevel from bevelled pebble, 102 x 38 x 16mm. Abraded circular cupped depression in same position on each face *c*.15mm across. Both sides show possible radial gouging marks in the depressions. *Bladed greywacke cobble.*

Decorated pieces

Many pieces have scratches or short lengths of incised lines which can seem deliberate but which are probably accidental. Four which have intentional patterning are described and illustrated: another two, S131 HU/NE greywacke, S42 CM slate, have similar incisions that are probably intentional. The method by which the incised lines were produced is uncertain. The incised pebble from Trevose Head (Jones 2015) has lines with a slightly squared profile suggesting the use of flint. By contrast, under magnification the lines on the North Cliffs pieces appear to have a more rounded profile than a flint point would produce.

S133 (Fig. 15) HU/NE Broken bladed cobble, surviving end has one damaged bevel, 84 x 37 x 15mm. Both faces have incised lines, some apparently parallel, some crossing each other, and some damage. *Fine greywacke. Side A has several fine scratched lines sub-parallel to and also at right angles to the length of the blade. Side B has area of pitting, and impact has caused edge to break away on a joint.*

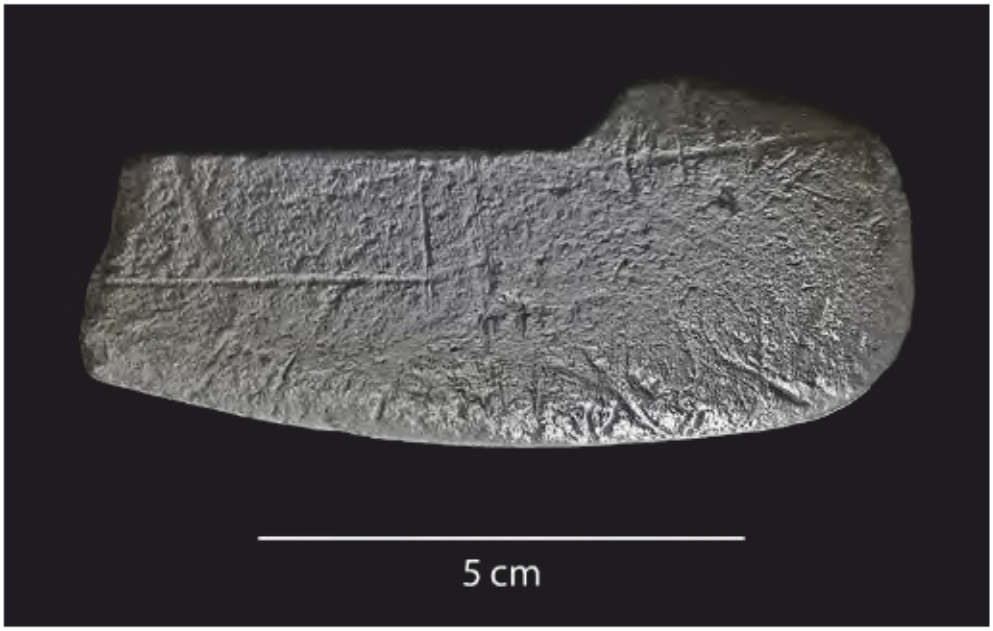

Figure 15. Photograph of the incised lines on decorated piece S133 (RTI image: Ryan Smith).

S139 (Fig. 16) HU/NE Cobble broken before use, 110 x 53 x 24mm. Side A has incised lines forming geometric pattern, Side B has some incised lines. Sides and edges have some peck marks, one edge very noticeably. Arguably, the incisions may be representational. *Greywacke, surface weathering producing a browner tinge than pieces brought directly from the beach. Broken before marking, scratch marks with some*

degree of patterning. Sides and edges have traces of more recent cultivation related damage which in places obliterates scratches.

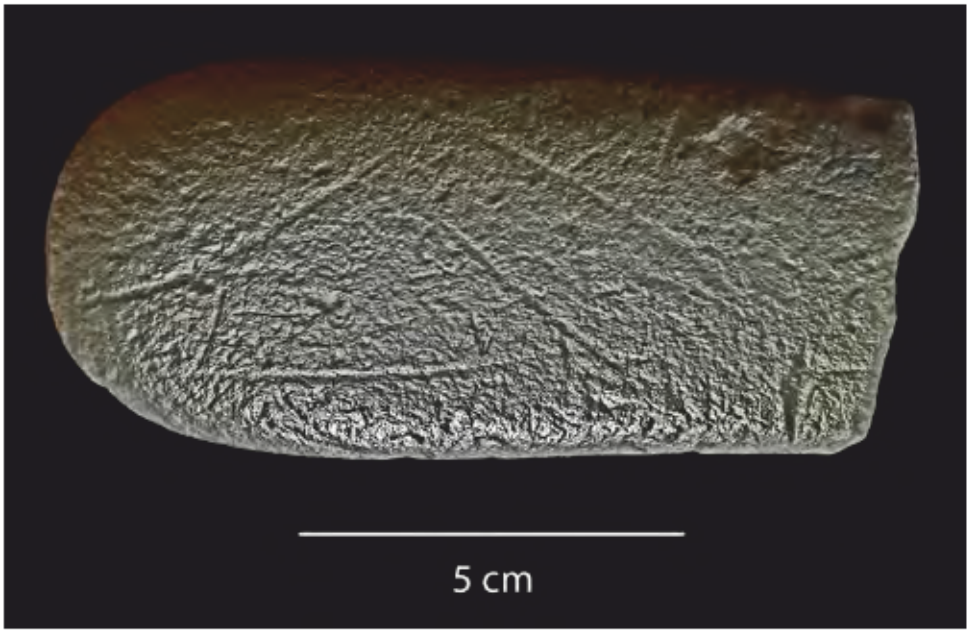

Figure 16. Photograph of the decorated piece S139. The chevrons may form a 'structure' (RTI image: Ryan Smith).

S138 (Fig. 17) HU/NE Bladed cobble, 128 x 39 x 18mm, one end double bevel. One side has three sharply incised lines, the other an area of noticeable pecking. *Laminated siltstone, one side with two scratched lines: more recent cultivation related damage. Area of pitting on other side.*

Figure 17. Photograph of the incised lines on decorated piece S138 (RTI image: Ryan Smith).

S132 (Fig. 18) HU/NE B3 (Box 39) Large broken bladed cobble, 117 x 52 x 17mm. One face has grooves, two at least parallel, and some in different directions, second face also with grooves. Break abraded and damage to surviving cobble end. *Greywacke weathered as S139, with battering of hammerstone at one end, four faint straight scratched lines on one surface, three parallel and one oblique, method of production uncertain. Cultivation damage on both faces.*

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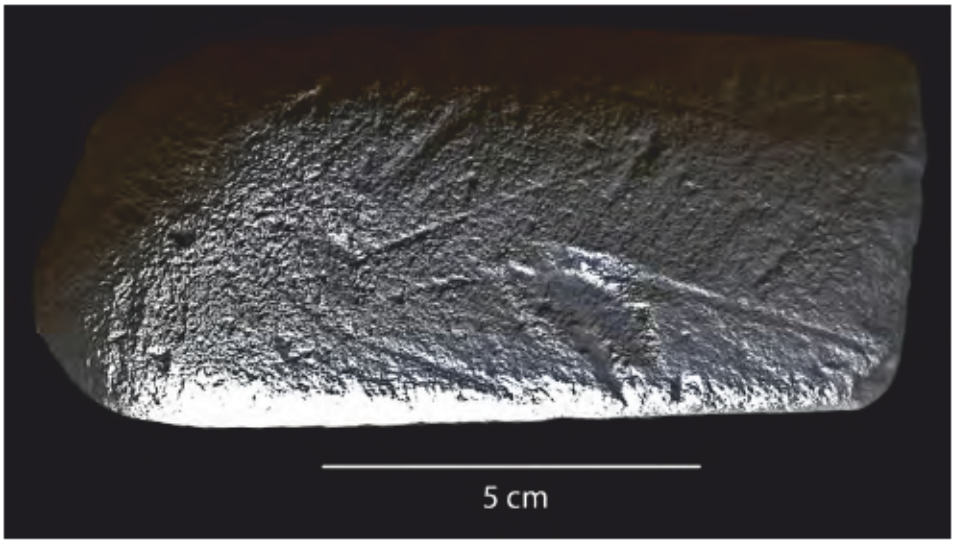

Figure 18. Photograph of the incised lines on decorated piece S132 (RTI image: Ryan Smith)

Axes and 'potential axes'

From North Cliffs

Recent work on rough-outs or potential axes of Group I and Group XVI has demonstrated that in West Cornwall many axes were worked up from cobbles (Jones et al. 2013; 2015). Group XIX axes are made from greywacke thought also to originate in West Cornwall: the Group was defined in 1962 and suggested to be Cornish (Evens et al. 1962, 226-7). Subsequent work by Mitchell (1988, 52) confirmed the general location as the North Cliffs and commented that all the pieces viewed by him appeared to be pebble. Consequently the South West Implement Petrology Group funded the thin-sectioning of five potential axes from HU/NE and HU for which preliminary results are now available.

Figure 19. Micro-photograph of thin section through Group XIX greywacke potential axe S101 CO479 (Photograph: Jens Andersen).

Of the potential axes thin-sectioned, S101 113 x 51 x 25mm and S106 80+ x 47 x 19mm (CO479, CO483), both from HU/NE, are greywacke cobbles (Fig. 19) flaked around the perimeters to provide 'axe' shapes: S106 has broken. Both of these are thin for axes and could perhaps be better interpreted as 'choppers' or knives. S102 (CO480) 100+ x 59 x 30mm, HU/NE is a tapering greywacke cobble broken across both ends, with possible abrasion across one break, the other break recent, possibly a potential axe. S103 (CO481) 177+ x 53 x 26mm, HU, is a broken greywacke cobble with a damaged end is more appropriate as a large little used hammerstone. S104 (CO482) now 68 x 59 x 37mm, HU/NE, is a broken greenstone cobble with part of a possible groove pecked across it; and difficult to see as a potential axe.

All other pieces either specified as possible axes in the records or of probable greenstone were examined. From HU/NE S8, S9, S10, S11 and S113 were confirmed as coarse greenstone but only S9 and S11 had possible worn or abraded facets. S105, CM NW, was a weathered greenstone fragment. S18 from CM NW, suggested as a greenstone flake (Thomas 2005, 43) is a recently fractured greywacke. S21-23, CM NE, are all slightly burnt sedimentary surface fragments. S110 and S111 from HU/NE and S120, S121, S125 and S126 from HU are all concretions from within local slate which have 'axe-like' shapes. The evidence for the production of axes on the North Cliff sites is therefore fairly slight.

Group XIX in Britain

Twenty-eight Group XIX artefacts are recorded in the most recent published list (Clough and Cummins 1988, 141-264). None of the 91 items thin-sectioned by SWIPG since 1988 are Group XIX, according to the last updated records. Basic typological and geographical data on the 28 Group XIX artefacts are summarized in Table 6. The term 'bevelled pebble', was not used in the published lists, however, examination of examples (CO204, CO205) and illustrations (Mitchell 1988, CO6, CO50, CO57, CO171) shows that this is appropriate for items initially classified as 'hone?' or 'rubber'. No complete and undisputed axes occur either in Cornwall or Devon, and items further afield include shaft-hole adzes and axe-hammers which should not date before the third millennium BC. The data may indicate a little use of Group XIX material continuing on from the Mesolithic, with only three greywacke items but not specified as Group XIX found among the artefacts from the neighbouring Carn Brea tor enclosure (Mercer 1981, 160: Clough and Cummins 1988, 147). However, given the wide geographical spread of the artefacts, the presence in the records (Clough and Cummins 1988) of ungrouped greywacke artefacts, as well as those of Group XIX across Southern England, and the presence of greywacke outcrops elsewhere, in North Wales, Southern Scotland and the Lake District (Toghill 2000, 37, 59, 79), the use of greywacke may be rather more extensive than Group XIX artefacts alone indicate.

	Cornwall	Devon	Dorset	Wilts	Hants	Kent	Sussex	Cambs	Norfolk
Bevelled pebble	7								
Pounder	1								
Pestle?	1								
Axe				1	1		1		1?
Axe, pt or??	4	1							
Cupped pebble, pt	1								
Pebble hammer	1							1	
Mace-head					1				
Shaft-hole adze			1 pt	1			1		
Axe-hammer						1?			1 near
Totals	15	1	1	2	2	1	2	1	2

Table 6: Details of Group XIX artefacts by type and county (After Evens et al. 1962; Mitchell 1988; Clough and Cummins 1988).

Discussion

The North Cliffs project provides a significant step forward in our understanding of the complex nature of Mesolithic activity in Cornwall. It highlights what can be achieved with a relatively simple level of recording and has shown that well-organized cataloguing projects can make large assemblages easily accessible for future detailed analysis.

The initial analysis undertaken by this project allowed a moderately detailed comparison to be made between sites in terms of density and clustering of activity within the HU/NE and CM scatters, which can perhaps be linked with the character of occupation.

In the Mesolithic, the beaches below the North Cliffs potentially offered a wealth of seasonal foods ranging from fish, shellfish, and the occasional beached whale, to seabird eggs, seaweed and seal pupping grounds (Waddington 2007, 198). These resources would have made the coastal littoral attractive and it is

unsurprising that so many scatters are found in the Gwithian area, as well as more widely around coasts and river estuaries (Barton and Roberts 2004; Roberts 1999, map 4.1). Clearly HU/NE, HU/SS, HU, CM and all the other assorted coastal Mesolithic sites focussed around the Gwithian area and beyond along the northern and the southern coasts of Cornwall and western Britain reflect part of a much wider pattern of coastal and riverine resource exploitation, involving different types of settlement in terms of scale, date and character (Bell 2007, 327-334).

In terms of the character of the lithic scatters, it is important to remember that in common with much of western Britain, the North Cliffs have been eroding and truly coastal sites have doubtless been lost (Stanton 1984). Elsewhere, archaeological recording has produced evidence for the close association of Mesolithic activity to now lost prehistoric coastlines and estuaries. Along the Severn estuary, for example, human footprints have been found in several locations (Aldhouse-Green et al. 1992; Bell 2007) and at the submerged Bouldner Cliff site off the Isle of Wight, Mesolithic flintwork has been retrieved in association with former woodland (Tomalin 2011). In addition, recent stable isotope analysis of human remains from Caldey Island and the Gower peninsula have demonstrated the importance of marine foods to Mesolithic communities, although terrestrial results from elsewhere in Britain have revealed that this can be variable (Schulting 2009; Schulting and Richards 2002; Schulting et al. 2013).

It is also the case that in Cornwall flint is only available from coastal sources, often only at low tide. At North Cliffs flint could be found both as beach pebbles and as larger pieces within raised beach deposits. Importantly, there was also an abundance of other stone resources, most notably Group XIX greywacke. This outcrops in the cliffs but unlike the Carn Menyn meta-mudstones in west Wales, which were quarried in the Mesolithic (Darvill and Wainwright 2014), the greywacke is readily collectable from the beaches; often in the form of near perfect pebble tool shapes (Jones, forthcoming). Access to flint and especially stone resources may have affected the use of the sites, and in turn influenced the make-up of their lithic assemblages.

Wherever Mesolithic scatter sites of any size have been identified, differences have been seen between function, size, phasing and perceived clustering, usually in terms of lithic density. These differences have typically led to sites being designated 'base camps', as at Poldowrian and Windmill Farm, or temporary 'hunting camps', such as Croft Pascoe or those around Trevose Head (Berridge and Roberts 1986), although as Spikens (1999, 126) has argued, such terms are problematic, especially where there is a lack of environmental evidence.

Possible links between the two studied sites HU/NE and CM were certainly evident in terms of the make-up of the flint assemblages, both of which comprised beach flint and included similar microliths and core types. The presence of the cores and the range of knapped and burnt material are suggestive of intensive occupation on both sites. It is possible that the two scatters may have been broadly contemporary, although not necessarily occupied at the same time of year. The microlith associations found at both HU/NE and CM may also shed light on function. Finlay (2000, 23-31) looks at this with particular reference to the manufacture and use of the scalene microliths, and places these within a wide range of composite tool forms including knives, saws, arrows and harpoons, which required the mounting of microliths within bone or wood.

Despite these similarities, contrasts between the scatters were also found. In part this may be due to environmental factors, as although topographic and environmental conditions have altered, the catalogued sites clearly always occupied different landscape settings. HU/NE would have been higher, drier and closer to the coast with views out to sea and closer access to sources of flint and greywacke stone. This would have made the scatter site more visible in the landscape and more exposed. By contrast, CM is lower-lying, less exposed and close to freshwater. The locale was more hidden, further away from the coastal resources. Each site therefore would have had distinct character.

Differences were especially evident in scatter size; HU/NE stands out as a site of mostly Mesolithic date, whereas the CM and HU assemblages are multi-phase. The former revealed a later Neolithic presence with contrasting uses of flint sources and the latter worked stone of Bronze Age date. At CM there is clear evidence for later Neolithic activity to one side of the probable main Mesolithic focus, while at HU/NE occasional flint reuse and a small transverse arrowhead indicates only small-scale post-Mesolithic activity.

On current understanding, the flint scatter evidence suggests that HU/NE and possibly HU would comfortably sit within a long-term Mesolithic site profile. However, the perceived clustering and contrasts in the distribution of flint tool types at HU/NE could reflect seasonal shifts of activity, the repeated return of

small groups over a prolonged period, or the focusing of particular activities or settlement over different periods of time, not as an unbroken seasonal pattern, but rather as part of a sporadic pattern of movement with perhaps years between each visit.

By contrast, the concentrated nature of CM and especially the low density of HU/SS would more comfortably sit within a smaller, short-term site set-up. The presence of Neolithic flints at CM, however, might indicate that, as at Clodgy Moor (Jones et al. 2013), there was some form of continuing use of the site. This is of interest given the lack of apparent Neolithic use of the much larger HU/NE site. Unlike Clodgy Moor, there does not appear to have been widespread occupation of the scatter sites in the Neolithic, and currently there seems to be little evidence for continuity in the collection or use of the Group XIX stone for tools in the Early Neolithic period.

The stonework assemblage which comprises complete and broken tools, as well as tested pebbles, also revealed significant contrasts at an intra- and inter-site level. HU/NE produced nearly 1500 pieces of mostly Greywacke Group XIX stone. Greywacke pebbles do not occur naturally in the field and they must have been collected and taken to the site; however, it is possible that a few may derive from residual drift deposits (Roger Taylor, pers comm). This is far in excess of the quantity produced by any other Mesolithic site in western Britain (Palmer 1999; David 2007; Gardiner 2011; Walker 2016, 41-4). Indeed even within Cornwall, comparable quantities of unworked or worked pebbles have not been found at the other coastal scatters, for example the much larger scatter at Poldowrian produced 370 pebble tools (Smith and Harris 1982), and at inland sites there is also a marked drop off in the ratio of pebble tools to flints (Wainwright 1960; Jacobi 1979; Lawson-Jones 2013). Interestingly, this pattern can be seen in the wider Gwithian environs, and even within the North Cliffs project area itself, where the proportion of pebble tools declines markedly as one moves away from HU/NE.

Study of the selected North Cliffs stonework assemblage from HU/NE revealed that much of the collected material was unused or minimally so (as far as is ascertainable without microscopic analysis). This pattern stood out from CM where the proportion of stone to flint is still high but crucially the amount of unworked stone is far lower. The resulting implication is that greywacke pebbles were bought to HU/NE from the beaches in large numbers, where they were tested / made into tools and then circulated into the wider landscape.

The range of greywacke tools is exceptionally wide. In addition to the more commonly found 'bevelled' pebbles (cf Clarke 2009), the assemblage includes hammers, flaked knives and anvils. The eight perforated 'pebble hammers' and cupped pebbles are of particular importance as they form the largest and densest concentration of the types in South West Britain and the only ones with a clear association with Mesolithic material. The cupped pebbles may have been unfinished pebble hammers and arguably these 'specialized' forms of stone tool could have been made on the site and exchanged further afield. Indeed, many of the identified Group XIX implements found across Britain may be of Mesolithic date. If this were the case, it would represent an exceptional occurrence given the generally limited evidence for the long distance circulation of lithics in the Mesolithic (Thomas 2013, 210).

Taken together the lithics and worked stone suggest that site HU/NE may, like sites such as Howick and Star Carr (Waddington 2007, 196; Milner et al. 2013, 86), have become a persistent place in the Mesolithic landscape (Thomas 2013, 202). HU/NE may, especially when the small probable Early Mesolithic component of the flint assemblage is considered, have been a long-term aggregation point for the collection of greywacke pebbles, which were worked up and then circulated across the wider landscape. This is highly significant for developing a more nuanced site interpretation which moves beyond 'base camp'.

Lastly, the significance of the decorated pebbles should not be overlooked. Mesolithic 'art' is uncommon at a national level, and in a region without surviving organic materials, such as bone or antler which was sometimes decorated (for example, Mannermaa 2016), its identification is of exceptional importance.

Decorated stonework is nationally scarce (Clarke et al. 2012), although the recent find of a decorated stone pendant at Star Carr (Milner et al. 2016) suggests that modern techniques would identify more than had been generally supposed. Mesolithic incised or scratched pebbles are slightly more common and decorated examples have been recorded, as at Rhuddlan in north Wales and at Hengistbury Head and Culver Well on Portland, both in Dorset (Berridge and Roberts 1994; Palmer 1977, 132; 1984). These examples are quite decorative and possibly representational and could be considered to be pieces of 'art' in their own right. There are no unequivocal examples of Mesolithic 'art' from the South west peninsula. Nonetheless, there are

other examples of Cornish pebbles with incised and grooved lines on them (Jones 2015). An unstratified broken bevelled pebble from Davidstow Moor barrow XXVI (Christie 1984) displays incised lines on both sides. Although it was not in a secure context, the stone was interpreted as being of Mesolithic date and comparable to an incised pebble from the Late Mesolithic site at Poldowrian (Smith and Harris 1982). This pebble has incised lines along one edge and at right angles to it. The majority of the identified 'decoration' on the pebbles from the North Cliffs project also bear this kind of incised marking. One piece, however, stands out. The incisions on S139 can be argued to be representational, and perhaps be interpreted as a 'structure' (Jones, forthcoming), as such they are potentially the first example of Mesolithic 'art' in South West Britain.

Opportunities for further analysis

The results from the project are highly significant, although the level of study undertaken so far is of a cursory nature. Inevitably there was a range of experience between the volunteers, and an element of subjectivity crept in. Despite this, the invaluable initial process of counting and sorting has made the assemblages accessible for future work and at a basic level, comparable with other sites.

A number of avenues for further research have been identified as a result of the current project. Test pitting was carried out in Hudder Field by the Cornwall Archaeological Society in 2016 and test pits are planned for Callean Memmoan. The ongoing work has already confirmed the richness of the Mesolithic record at HU/NE.

The Mesolithic sites at Hudder Field and Callean Memmoan represent a small sample of the scatter sites in this part of Cornwall and there is a need for the continuation of the cataloguing process for other Mesolithic sites in the wider North Cliffs archive. This would enable a greater understanding of the contrasting character of the scatters, and the use of the wider landscape. They reflect part of a much wider picture applicable to Mesolithic Cornwall, and have relevance for adjacent areas of western Britain, including Devon, south Wales, and the Isles of Scilly. Furthermore, the remarkable discovery of a Mesolithic flint assemblage with northern French / Belgium affinities at Old Quay, St Martins on the Isles of Scilly (Anderson-Whymark et al. 2015; Garrow and Sturt 2017, 129-131) has revealed evidence for long-distance contacts in the Late Mesolithic and raises the possibility that comparable pieces may be present in the understudied mainland Cornish flint assemblages as well.

Fuller analysis of the catalogued CM and HU/NE assemblages should be undertaken. For the worked stone assemblage, greater analysis of the stone tools is required. In most cases the function of tool groups awaits future research, especially study by SEM and a programme of comparison with the results of experimental work to aid the understanding of the function. Initial study has shown that their numbers and variety, especially on HU/NE, far exceed any other site in western Britain and that they were being used for a much greater range of activities than the generic term 'bevelled pebble' suggests. The wider use of thin-sectioning would also be useful to answer questions related to the wider distribution of Group XIX. Long distance exchange of worked stone is unusual in the British Mesolithic and it would therefore be interesting to establish whether Group XIX was being circulated. Decorated artefacts of Mesolithic date are also very uncommon in Britain and following the identification of decoration upon a small number of pieces, it is recommended that a detailed inspection of the worked stone assemblage and reflectance transformation imaging (RTI) be undertaken.

Further work on the flint is required so that intra-site comparisons can be made. Detailed study should include: blade-width measurement to quantify the narrow-blade assemblage component and look for patterning, primary/secondary/tertiary quantification to identify cross-site patterning, detailed microlith classification and macroscopic use-wear, and detailed tool identification to examine site division by function. There is also scope for refitting, for example, the distinctive 'glittery' core from HU/NE. Finally, the staining found on a significant amount of the Mesolithic HU/NE assemblage should be analysed, with a view to understanding its origin.

This suggested programme could guide a Cornwall-wide cataloguing project of other unpublished Mesolithic scatters. This would result in a very significant and important body of information, greatly enhancing our understanding of life in western Britain and potentially beyond (cf. Garrow and Sturt 2017, 130) prior to the onset of the Neolithic.

Acknowledgments

We are very grateful to the volunteers who catalogued the North Cliffs archive: Richard Hoskins, Steve Northcott, Ian Blackmore, Steve Hartgroves, Jack Smith, Adrian Rodda, Kathryn Conder, John Prela and Jo May. Comments on the petrology of the greywacke and other stone assemblages were provided by Dr Roger Taylor and we are very grateful for his observations. We would like to thank Ryan Smith for the RTI images of the decorated stones, Gary Young, Jane Read and George Scott for the artefact illustrations, Francis Shepherd for the site maps. Thanks also to the journal's editors and reviewers for their comments on this paper. We are grateful to Historic England, The Royal Cornwall Museum, the Portable Antiquities Scheme and the Cornwall Archaeological Society for supporting the North Cliffs Project and to the South West Implement Petrology Group for funding the thin-sectioning.

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