THE ISLE OF PORTLAND, PORTLAND ChERT AND NEOLITHIC ARROWHEADS: QUALITIES AND CONNECTIONS

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ABSTRACT

Portland chert occurs in a restricted geological setting and is known to have been selected for manufacturing stone tools in prehistory, particularly arrowheads. This paper investigates the physical properties of this type of chert that made it an excellent material for making arrowheads. Replication experiments were undertaken, which revealed the qualities of Portland chert that made it suitable for arrowhead fabrication are enhanced by heat-treatment. These experiments also explored the reason for the associated distinctive chert debitage that has been observed in archaeological assemblages. This research highlights that arrowheads fabricated with heat-treated chert display a characteristic lustrous appearance also observed in archaeological material. In addition, it considers the selection of this material for use in stone tool production. As Portland chert occurs alongside flint, its use implies choice. Considerable effort would have been expended in the collection, transportation, and exchange of materials with particular physical and aesthetic qualities in prehistory. In addition, other factors may have been important, such as raw material location and place within the landscape. The results of this study suggest that Portland chert was selected for both pragmatic reasons and perhaps because the main source of this material was from a remarkable location.


Keywords: Portland chert, Neolithic arrowheads, heat treatment, experimental knapping, Isle of Portland

INTRODUCTION

Portland chert outcrops occur in the Upper Jurassic limestone of the Portland Stone Formation. These strata are seen in Dorset on the Isle of Portland, along the Purbeck coast and on the northern edge of the Weymouth Anticline (Arkell 1978). Secondary deposits also occur alongside flint on the land surface of Wiltshire and Dorset (Stewart 2012).

Rankine first noticed and recorded Portland chert during an archaeological investigation at the Farnham Mesolithic site in Surrey in the 1930s. He compiled a short schedule of Portland chert artefacts, which included leaf-shaped, transverse, and barbed and tanged arrowheads, and illustrated the wide geographical distribution of this material in prehistory (Rankine 1951). Excavations at Hembury Hillfort, in Devon, also revealed the utilisation of Portland chert in both Mesolithic and Neolithic contexts (Liddell 1931, 1932, 1935). Palmer (1970) subsequently compiled an extensive catalogue of Portland chert artefacts that included more of the arrowhead types noted by Rankine. She later excavated the Mesolithic site at Culverwell on the Isle of Portland where Portland chert was used in abundance (Palmer 1976).

Portland chert was utilised as an expedient raw material in prehistory alongside flint for stone tool fabrication on the Isle of Portland and elsewhere in both Dorset and Wiltshire, where it was easily obtainable (Palmer 1976; Green 1980; Gingell & Harding 1983). Further away, however, it is represented in archaeological assemblages across southern Britain almost ubiquitously in tiny quantities as flakes, tools and in particular, arrowheads. Often only a few flakes are present in an assemblage of thousands of flint pieces (Stewart 2015). For example, artefacts have been recorded in South Wales (David 2007), at Silbury Hill and Stonehenge to the north, sites in Surrey to the east (Rankine 1951), and the Isle of Wight, Bournemouth, the Mendips, and western Cornwall (Palmer 1970). The presence of Portland chert in lithic assemblages in Devon and Cornwall has been noted by a number of researchers including Smith and Harris (1980), Tingle (1998), Bayer (2011), and others (see Appendix). At Plymouth Museum there is a piece of Portland chert from an archaeological site in Kent, unfortunately without provenance (pers. obs.).

Neolithic people chose Portland chert in particular for fabricating arrowheads. Many have been recorded in gazetteers of...
arrowheads (e.g. Green 1980; Keene 1999). Most abundant were the earlier leaf-shaped arrowheads (Figure 1), but some of the rarer, later, oblique forms and chisel-shaped arrowheads were also fabricated using the same material (Figure 2).

Care (1982) suggests that Portland chert is in no way superior to flint and Sharples (1991) states that, in raw material terms, there is little evidence that Portland chert was regarded as intrinsically important, citing the low frequency of it at the Maiden Castle excavations. Nevertheless, the wide distribution of this chert away from its geological source must indicate some special reason for its use, despite it being recorded in relatively small quantities from excavations and in minute quantities from field walking and find spots.

Most Portland chert artefacts in the spread across southern Britain are of Mesolithic and Early Neolithic date. This may reflect the mobility of human populations in these periods. Mesolithic populations are known to have moved around the landscape exploiting seasonal resources, while Early Neolithic people were more mobile in comparison with the relatively sedentary lives led by those later in the Neolithic (Care 1982). The use and transport of Portland chert has resonances with that of Arran pitchstone across Scotland (Ballin 2009) and into Cumbria (Hamilton-Gibney pers. comm.).

This study aims to investigate why Portland chert was utilised in prehistory, what made it an attractive raw material for arrowheads and what the distinctive chert debitage in archaeological assemblages may signify. The reasons why Portland chert was regarded as a special material are also explored.

METHODS AND RESULTS
Observations of archaeological material
A detailed study of museum collections was undertaken. The occurrences of pieces of worked chert in archaeological assemblages, from excavated and field-walked sites in Devon and Cornwall were investigated. Six assemblages from causewayed/tor enclosures were studied, together with those from excavations along the pipeline between Porthcurno and Sennen. In addition, three major field-walked sites, four smaller field-walked collections, and sixteen small collections were also examined. Both chert implements and debitage were recorded from the following museums and archaeological unit:
• Alexander Keiller Museum, Avebury;
• Cornwall Archaeological Unit;
• Plymouth Museum;
• Royal Albert Memorial Museum, Exeter;
• Royal Cornwall Museum, Truro; and
• Torquay Museum.

A list of assemblages and finds that included Portland chert from this study is recorded in the Appendix.

Notes on assemblages studied

The sparse nature of Portland chert in archaeological contexts means that, when it is found without chronological signifiers, flakes and general tools are difficult to date. In addition, lithic material from Cornish sites is particularly mixed (Smith & Harris 1980). The presence of Neolithic Portland chert artefacts associated with Mesolithic assemblages at Rame Head and the Trevose and Constantine area illustrate this point. Sites with predominantly Mesolithic artefacts of Portland chert are not included in this paper.

Assemblage study results

Three main observations were made concerning the material studied:

1) examination revealed that the artefacts have different surface characteristics compared to freshly broken raw material. Usually, Portland chert has a matt, even rough texture that contrasts with the smooth, waxy surface, worn edges and sheen displayed by archaeological material (Figures 1 & 2);

2) the size, shape, and nature of much of the debitage studied were found to be surprisingly similar (Figures 3–5); and

3) a noticeable feature of the debitage and tools observed is that only a tiny amount display primary cortex and most occur as tertiary debitage flakes (Figure 6). The high abundance of tertiary flakes indicates that knapping was taking place away from the procurement site while the low numbers of cores suggests re-shaping of artefacts, or alternatively the use of blanks or roughouts.

Replication research method and questions

Samples from a number of different types of chert, including Portland chert, were provided to expert flint knapper John Lord to explore their knapping qualities. John also fashioned a laurel leaf and four leaf-shaped arrowheads using Portland chert, as well as producing arrowhead roughouts for heat-treatment experiments. These roughouts were then heat treated and used to fabricate two arrowheads in order to make comparisons between the treated and untreated materials. John’s comments and observations were noted throughout these experiments.

Four questions in particular were posed:

1) what are the reasons Portland chert was chosen to make arrowheads?;

2) what do the predominant shape, size and form of the debitage flakes represent?;

3) does heat-treatment improve the knapping qualities of Portland chert?; and

4) could the lustrous appearance of Portland chert in archaeological assemblages indicate heat-treatment?

Heat-treatment experiments

A small pit was dug and filled with sand to a level approximately 0.2 m below the ground surface. Flakes were placed on the surface of the sand (Figure 7) and covered by a further layer of sand. A small bonfire was then lit above the pit and kept burning for twenty-four hours. The sand was employed to buffer the intense heat produced by the bonfire, to spread the heat evenly and to avoid temperature fluctuations (Waldorf 2010). After heating had taken place the flakes were left undisturbed in the pit for a further twenty-four hours to allow slow cooling and thus prevent fracturing of the chert due to thermal shock. Waldorf (2010) advises a heat increment of 10°C per hour and according to the stone type, an optimum temperature range between 150 and 430°C. However, the less scientific bonfire method was very efficient, and no fractures occurred.
Figure 3. Maximum dimensions of Portland chert debitage, illustrating the predominance of flakes between 10–35 mm.

Figure 4. Length/width ratio of debitage in mm showing a predominance of sub-circular to slightly elliptical shapes.
Figure 5. Debitage types, indicating the predominance of flakes.

Figure 6. Cortex presence/absence on tools and debitage.
Knapping experiments

John found that Portland chert was ‘a joy to work with!’ He made the following comments about its knapping qualities:

1) straight away it lends itself to arrowhead making;

2) it is bit a more resistant than flint, but it presents fewer problems with end shock and is better for thinning than flint which splits more easily;

3) there is an increased success rate when making arrowheads which is a major bonus;

4) it is perfect for projectile making; and

5) it is easy to make Portland chert arrowhead roughouts, which is normally the difficult part.

As John was working the arrowheads it was interesting to see that the debitage produced was very similar to that noted in the archaeological assemblages (Figure 8). However, although many flakes were similar, most of the pressure flakes produced were consistently smaller than those observed in collections.

Heat treatment changed the quality of the Portland chert. The change in lustre and texture between heat-treated and untreated Portland chert was striking, although this is difficult to photograph (Figure 9). The sheen on the heat-treated samples appears similar to that seen in the archaeological assemblages studied. John also found that the heat-treated Portland chert was easier to use and noticeably more responsive for producing good invasive pressure flaking (Figure 10).

DISCUSSION

Heat treatment

Andrefsky (2005) defines heat-treating as ‘the heating of lithic material to change its structure in an effort to make it more effective for chipping or knapping’. In her experiments, Coles (2009) observes that heat treatment on tough flint is extremely effective. The treatment of Portland chert by slow, deliberate heating significantly improved its invasive knapping qualities. Crabtree (1972) states that evidence of the heat treatment of lithic raw materials appears simultaneously with the...
advent of pressure flaking, and the process certainly facilitates knapping, allowing the fracture front to pass more easily through the stone (Waldorf 2010). The visual evidence of heat treatment is seen as an increase in lustre as noted by Price et al. (1982), which has been described by Domanski and Webb (2007) as a ‘greasy shine’. Heat treatment also seems to make Portland chert softer, and therefore more susceptible to wear and rounding of artefact edges. Ethnographic studies describe the heat treatment of blanks to improve raw materials for the pressure flaking of bifacial points (Domanski & Webb 2007). Could the features of Portland chert noticed in archaeological assemblages be due to heat treatment in prehistory? A study of Neolithic flint procurement in southern France indicates that special raw materials were prepared either as blades or heat-treated preforms (Léa 2005). These were then distributed over a wide area of France and beyond. The working areas exhibit abundant scatters of mixed debitage that share affinities with those seen on Portland. Léa suggests that specialist craftspeople were employed in the preparation of such material.

Geological outcrops of Portland chert do vary but the good quality chert used for stone tool production in prehistory was remarkably similar. However, some strata are particularly glossy, more so than others. Therefore, one must be cautious in assuming that the sheen is solely the result of heat treatment. Taphonomic processes may have also affected the surface of worked Portland chert. Despite these reservations, the difference between treated and untreated Portland chert is clearly noticeable.

**Distinctive debitage flakes**

Experiments by Darmark and Apel (2008) show micro-flakes along with small flakes produced in knappers’ waste during the fabrication of bifacial arrowheads. The appearance of these small flakes is very similar to those observed in this study. The concentration of the small flakes in assemblages may be due to differential recording, the micro-flakes being rarely collected because of their diminutive size. However, this changes when lithic material is sieved at excavation sites. Sieving was used at Carn Brea (Mercer 1981) and numerous tiny Portland chert flakes were recorded in the residue. The differentiation of Portland chert from flint becomes more difficult with tiny flakes.
**Arrowheads**

Jacobi *et al.* (2007) noted that people in the Upper Palaeolithic used better quality raw material for their projectile points than other tools. This indicates that choices were made about the type of stone used for specific tool types as far back as the Palaeolithic. The knapping characteristics of Portland chert make it an excellent material for arrowhead making. This chert is characteristically softer, lighter and more elastic than flint, which makes it ideal for single use objects or for objects that exhibited fine working and were perhaps meant for display rather than practical use. The ease of pressure flaking may have been important because this allows arrowheads to be made thinner and thus more effective for hunting. However, there are suggestions that leaf shaped arrowheads were particularly connected to warfare and death (Sharples 1991).

Portland chert was transported or exchanged over many kilometres (Stewart 2015). The carrying of unmodified raw material would have been bulky and awkward. Untested material might be found to be of poor quality or even useless when eventually needed. Completed arrowheads would have been easily broken during transport. Considering these factors, therefore, the preparation of roughouts would seem the best method for transporting stone for projectile points, and thinner blanks or roughouts would have been more effective to prepare with heat treatment. John noted that heat-treated Portland chert is better than untreated chert to fabricate roughouts.

Causewayed enclosure/tor enclosure sites seem to have acted as assembly nodes in the landscape to which lithic raw material were brought. These sites are also often associated with numerous arrowheads (Coles 2008) while Anderson-Whymark and Price (2011) noted evidence of Late Neolithic arrowhead fabrication at the causewayed enclosure at Barrington in Somerset. Flint arrowhead roughouts have been found in a number of the assemblages considered in this study. In the collection from Hazard Hill, three Portland chert roughouts were noted (Figure 11). After these roughouts were obtained by direct procurement or trading, arrowheads appear to have been made where they were required, producing the distinctive debitage flakes observed.

The quality of invasive retouch on flint arrowheads is normally highly variable. Some flint arrowheads observed from archaeological collections show quite basic retouch but all those made from Portland chert show excellent, careful, and invasive working indicating that this material was considered worth special effort.

**Portland as a special place**

The geomorphology of the Isle of Portland is unusual and intriguing (Figure 12). The tombolo landform of Chesil Beach extends as a shingle ridge for 13 km from Abbotsbury to the Isle of Portland and in modern times this attaches the island to the mainland. The shingle has moved shoreward since the end of the last Ice Age and estimations are that it was accumulating around 7000 years ago, and the island was linked to the mainland by about 5000BP (Bray 2007). The steep shingle bank is difficult to walk along. Therefore, even after the Isle of Portland was attached to the mainland, it was effectively an island. Bradley and Edmonds (1993) suggest that liminal, inaccessible locations with outcrops of unusual rock types attracted the attention of people in the Neolithic period.

Palmer (1970) states that Portland chert was exploited on the Isle of Portland in the Palaeolithic and it is possible that people utilising the chert in later times were aware of the presence of ancestral procurement. Other
islands seem to have been connected with death or the ancestors, for example: the Isles of Scilly (Sawyer 2015); the Isle of Thanet in Kent (Moody 2008); Bardsey Island off the Lleyn Peninsula (Palmer & Palmer 1997); and Herm in the Channel Islands (Scarre 2011). Would these connections to Portland as a place of the ancestors have been important? Tilley (1999) suggests that, morphologically, Neolithic Bincombe Long Barrow and Broadmayne Bank Barrow are mimetic to the sight of Portland, marking the first glimpses of the Isle of Portland along routeways towards the coast (Figure 13). Objects from special places may have had a connection to mythical ancestors or deities (Bradley 1990; Pétrequin
et al. 2012) and there is a possible connection of leaf-shaped arrowheads to warfare and death (Sharples 1991).

**The occurrence of Portland chert away from the Isle of Portland**

Despite the obvious attraction and mystery of Portland, worked Portland chert is also found on the land surface where the Portland Beds crop out on the northern side of the Weymouth Anticline (pers. obs.), forming the end of the Ridgeway ancient route. There is some over-estimation of the geological occurrence of the bedrock and drift deposits of Portland chert in archaeological reports (discussed in Stewart 2015) but assemblages curated by Martin Green, observed in this study, include worked Portland chert from residual deposits on the downs north of his farm on Cranbourne Chase.

**Prehistoric activity on the Isle of Portland**

Frequent struck pieces of Portland chert are found on the old land surface of the Isle of Portland (pers. obs.). Mark Godden, quarryman and Portland resident, reports that worked Portland chert is found in soils all over the Island. Many of the pieces I have seen seem to have the shine of heat treatment but many also have primary cortex and some are without sheen. Could it be that Portland chert was quarried, fashioned into roughouts and treated with heat on the Isle of Portland and transported away from the area in this prepared form? Much of the old land surface of Portland has been affected or obliterated by centuries of quarrying activity. However, the fields around and above the Culverwell are full of Portland chert debitage. This prolific scatter is very mixed in size and shape, and cortex is present on many of the pieces. This is very close to the Mesolithic site excavated by Palmer (1970, 1976) but the scatter of worked Portland chert over an area of at least a kilometre is remarkable and may indicate use over a long period. Green (1980) showed that Portland chert was exploited on the Isle of Portland in the Neolithic period.

**Later use**

The fascination with Portland chert seems to have declined as the Bronze Age progressed (Green 1980). A few, rare Portland chert Bronze Age barbed and tanged arrowheads have been recovered. Significantly, people in the period of transition between the Late Neolithic and the Early Bronze Age, deliberately placed small pieces of Portland chert into pits with other exotic materials and objects (Stewart 2013).

**CONCLUSION**

Neolithic people chose to give special attention to Portland chert for its particular knapping qualities that lent themselves to the fabrication of arrowheads. These qualities were improved by the use of heat-treatment. Van Gijn (2010) suggests that lithic artefacts made from exotic raw materials may have been deemed particularly appropriate for ceremonies, rites and celebrating special events. She suggests that unusual raw materials and the skills of the craftspeople that utilised them may have been thought to be supernatural. The small but significant amounts of this Portland chert across Southern Britain from a relatively limited source implies that it held some kind of importance to the people who used it, beyond simply utilitarian reasons.

**ACKNOWLEDGEMENTS**

Particular thanks go to John and the late Val Lord for their hospitality and assistance. Thanks to my supervisor Professor Richard Bradley; the curators of Plymouth Museum, The Royal Albert Memorial Museum, The Royal Cornwall Museum, Torquay Museum and to Martin Green for access to his lithic collection. I am also grateful to Mark Godden for sharing his knowledge of the Isle of Portland with me.

**REFERENCES**


Ballin, T.B. 2009. *Archaeological pitchstone in northern Britain. Characterisation and interpretation of an important*


### APPENDIX: LIST OF ASSEMBLAGES HIGHLIGHTED IN THIS STUDY

#### Excavated sites

<table>
<thead>
<tr>
<th>Site</th>
<th>County</th>
<th>Museum</th>
<th>Reference</th>
<th>Site type</th>
<th>Chronology</th>
<th>Total lithic assemblage</th>
<th>Portland chert artefacts</th>
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<tbody>
<tr>
<td>Helman Tor</td>
<td>Cornwall</td>
<td>RCM</td>
<td>Mercer (1987)</td>
<td>Neolithic enclosure</td>
<td>Ceramics &amp; radiocarbon = c.3970-2700 BC</td>
<td>1201</td>
<td>6 small flakes 1 broken leaf-shaped arrowhead</td>
</tr>
<tr>
<td>Carn Brea, Illogen</td>
<td>Cornwall</td>
<td>RCM</td>
<td>Mercer (1981)</td>
<td>Neolithic enclosure</td>
<td>3240 ± 150 BC 3330 ± 150 BC 3150 ± 150 BC</td>
<td>26,382</td>
<td>40 pieces, including small flakes &amp; microdebitage 6 leaf-shaped arrowheads 1 scraper</td>
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<tr>
<td>Raddon Hill</td>
<td>Devon</td>
<td>RAMM</td>
<td>Gent &amp; Quinnell (1999)</td>
<td>Neolithic causewayed enclosure</td>
<td>3370 – 3020 cal BC</td>
<td>1080</td>
<td>4 flakes 1 broken fabricator</td>
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<td>Hazard Hill</td>
<td>Devon</td>
<td>Torquay RAMM</td>
<td>Houlder (1963)</td>
<td>Neolithic enclosure</td>
<td>4920±150BP/4700±150BP (Gent &amp; Quinell 1999)</td>
<td>2638</td>
<td>57 pieces of debitage 6 scrapers 2 knives 9 leaf-shaped arrowheads 3 arrowhead roughouts 1 core</td>
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<td>Porthcurno to Sennen pipeline</td>
<td>Cornwall</td>
<td>Cornwall Archaeological Unit</td>
<td>Jones et al. (2013)</td>
<td>Beaker structure/pits and Bronze Age pit complex.</td>
<td>2470-2270 cal BC Early to middle second millennium BC</td>
<td>502</td>
<td>6 pieces of debitage</td>
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<td>Hembury Hill Fort</td>
<td>Devon</td>
<td>RAMM</td>
<td>Liddell (1931, 1932, 1935)</td>
<td>Neolithic causewayed enclosure</td>
<td>3330 ± 150 BC (Brown 1991) 3240 ± 150 BC 3150 ± 150 BC</td>
<td>c. 26,500</td>
<td>253 pieces of debitage 1 core 12 scrapers 1 laurel leaf 4 non-standard tools 11 leaf-shaped arrowheads</td>
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<td>Collector(s)/reference</td>
<td>Site type</td>
<td>Chronology</td>
<td>Total lithic assemblage</td>
<td>Portland chert</td>
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<tr>
<td>Dozmare Pool</td>
<td>Cornwall</td>
<td>RCM Plymouth</td>
<td>Brent c1920; also, Maynard and Dickinson, Wainright (1960)</td>
<td>Lithic scatters around an upland lake</td>
<td>Mixed period</td>
<td>Approximately 2500</td>
<td>1 blade 8 flakes 1 scraper 1 knife 1 transverse arrowhead</td>
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<td>Crandons Cross</td>
<td>Devon</td>
<td>RAMM</td>
<td>Pierce Berridge (1985)</td>
<td>Chert procurement site</td>
<td>c.7000 BC onwards</td>
<td>c.11,700</td>
<td>3 small flakes 10 blades</td>
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<td>Sticklepath to Cranmere, Dartmoor</td>
<td>Devon</td>
<td>Plymouth</td>
<td>Trickman</td>
<td>Upland moor</td>
<td>Mesolithic but also mixed</td>
<td>214</td>
<td>1 small scraper 1 broken fabricator 2 flakes 1 blade</td>
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<td>Batworthy Common, Dartmoor.</td>
<td>Devon</td>
<td>Plymouth</td>
<td>Hansford Worth</td>
<td>Upland moor</td>
<td>Neolithic</td>
<td>140</td>
<td>1 small knife 1 arrowhead fragment 1 bifacial piece 1 chisel arrowhead 5 flakes</td>
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<tr>
<td>Rame Head</td>
<td>Cornwall</td>
<td>Plymouth</td>
<td>Brent &amp; Grimes</td>
<td>Cliff top site</td>
<td>Mesolithic</td>
<td>500+</td>
<td>1 broken arrowhead fragment 1 scraper</td>
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<td>Constantine Bay, Booby’s Bay &amp; Trevose Bay &amp; Head</td>
<td>Cornwall</td>
<td>RCM Plymouth</td>
<td>Dobson-Hinton, Norman, Buckingham, Irwin, Hathaway and Dudley</td>
<td>Beach and cliff top site</td>
<td>Mesolithic</td>
<td>5000+</td>
<td>1 leaf-shaped arrowhead</td>
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### Small finds

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<td>RCM</td>
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<td>1 scraper</td>
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<td>Halammaning</td>
<td>Cornwall</td>
<td>RCM</td>
<td>1 blade</td>
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<td></td>
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<td></td>
<td>1 flake</td>
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<tr>
<td>Men-an-Tol</td>
<td>Cornwall</td>
<td>RCM</td>
<td>1 blade</td>
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<td></td>
<td></td>
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<td>1 transverse arrowhead</td>
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<td></td>
<td></td>
<td>1 scraper</td>
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<td>North Cliffs</td>
<td>Cornwall</td>
<td>RCM</td>
<td>1 blade</td>
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<td></td>
<td></td>
<td></td>
<td>1 flake</td>
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<td>RCM</td>
<td>1 flake</td>
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<td>RCM</td>
<td>1 fragment leaf shaped arrowhead</td>
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<td>Bude</td>
<td>Cornwall</td>
<td>Plymouth</td>
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<td>Colliton Farm, Dartmoor</td>
<td>Devon</td>
<td>Plymouth</td>
<td>1 small blades</td>
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<td>Vixen Tor</td>
<td>Devon</td>
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<td>1 flake</td>
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<td>Huccaby to Swincombe, Dartmoor</td>
<td>Devon</td>
<td>Plymouth</td>
<td>1 broken scraper</td>
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<tr>
<td>Huccaby</td>
<td>Devon</td>
<td>Plymouth</td>
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<td>Dunnabridge to Brownberry, Dartmoor</td>
<td>Devon</td>
<td>Plymouth</td>
<td>2 flakes</td>
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### Abbreviations

AK – Alexander Keiller Museum, Avebury.
RAMM – Royal Albert Memorial Museum, Exeter.
RCM – Royal Cornwall Museum, Truro.