Little House in the Mountains? A small Mesolithic structure from the Cairngorm Mountains, Scotland

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\textbf{ABSTRACT}

This paper describes a small Mesolithic structure from the Cairngorm Mountains, Scotland. Excavations at Caochanan Ruadha identified a small oval structure (c. 3 m × 2.2 m) with a central fire setting, in an upland valley (c.540 m asl). The site was occupied at c. 8200 cal BP and demonstrates hunter-gatherer use of the uplands during a period of significant climatic deterioration. The interpretation of the structure is primarily based on the distribution of the lithic assemblage, as the heavily podsolised soils have left no trace of light structural features. The lithic assemblage is specialised, dominated by microlith fragments, and functional analysis has identified different uses of different areas inside the structure. The identification of small, specialised Mesolithic sites is unusual and this paper will discuss the evidence for the presence of the structure and its use, compare it to other Mesolithic structures in Britain and highlight some methodological implications.

1. Introduction

This paper presents a small Mesolithic structure from Caochanan Ruadha, in the Geldie Burn valley, southern Cairngorm Mountains, Scotland. Analysis is ongoing, but there is compelling evidence for the presence of a small structure associated with a potentially very short term and quite task-specific set of activities. Such sites are rare and contribute significantly to our understanding of broader patterns of Mesolithic activity (Marchand and Goffic, 2009). We present the background to the project, summarise methods and results of fieldwork at Caochanan Ruadha and detail the interpretation of the structure, before providing a comparative analysis and discussion.

2. The Upper Dee Tributaries Project and the Cairngorm landscape

The increased use of mountain and upland landscapes has been argued to be a ‘defining characteristic’ of the Mesolithic in Europe (Bailey, 2008, 357), but the challenges to systematic archaeological research in upland landscapes are considerable and the record of human exploitation of these areas is variable. The character of human use of uplands and mountain landscapes is unclear in many areas and significant questions remain about the motivations for the presence of hunter-gatherer communities in mountain and upland areas.

This paper presents results of one aspect of the first phase of the Upper Dee Tributaries Project (UDTP, 2012 to present), an interdisciplinary examination of the early prehistory of the National Trust for Scotland’s (NTS) Mar Lodge Estate, an area of c. 29,400 ha within the Cairngorms (Fig. 1). The Cairngorms are the largest area of high ground in Britain, with several summits above 1200 m asl. Conditions on the montane plateau and in the high valleys can be extreme. The plateau is dissected by river valleys, with the River Dee and its major tributaries dominating the Mar Lodge Estate. The larger valleys which are the focus of our project are not high altitude in an absolute sense, but they are remote upland environments. The area is mainly managed for conservation and outdoor recreation. Long-distance routes cross the Cairngorms, including the Lairig Ghru, Scotland’s best-known mountain
pass, which connects the northern and southern flanks.

Nothing was known of the early prehistory of the Cairngorms until the discovery during footpath maintenance between 2003 and 2006 of flint artefacts from Chest of Dee, Caochanan Ruadh and Carn Fiaclach Beag. The need to better understand these assemblages became compelling by 2012 in the context of an extensive nature conservation programme of woodland expansion on the Mar Lodge Estate, including riparian tree-planting. This has significant implications for archaeological conservation, given the fact that all these sites are buried under peat. The UDTP aims to investigate the nature, location and sequence of prehistoric inhabitation in its environmental context, and to address archaeological conservation management. It includes archaeologists, geomorphologists and palaeoenvironmentalists.

The archaeological work has primarily focused on two of the sites originally identified during footpath maintenance (Chest of Dee and Caochanan Ruadh) with further survey work seeking to identify new sites (e.g. Sgòr an Êòin). Work at the Chest of Dee (directed by Gordon Noble) has demonstrated a concentration of activity at c. 415 m asl near prominent waterfalls, immediately above a major river confluence. Pits, hearths and occupation surfaces have been identified, with radiocarbon dates ranging from the Mesolithic to Bronze Age. No clear evidence for structures has been identified to date.

Caochanan Ruadh lies further into the Cairngorms, with radiocarbon dates focusing on c. 8200 cal BP, contemporary with one phase of activity at Chest of Dee. Caochanan Ruadh lies within a wide and shallow upland valley on the south-facing flank of the Cairngorm plateau, at c. 540 m asl. The Geldie Burn is a low-gradient gravel-rich river which meanders through an incised valley cut into superficial deposits and peat, but which is prone to snow-melt floods. To the east of the site is a prominent north-south morainic ridge running down to the valley floor, forming the eastern limit of a notable basin (Fig. 2). To the west a large, multi-phase alluvial fan, last active after c. 500 CE, may have truncated some archaeological features. Today the site overlooks the Geldie Burn (Fig. 3) but there may have been no substantial water-course present in the Early Holocene, the site instead overlooking a peaty wetland. This is a remote and cold place today, which is routinely covered by snow in winter until at least March.

The first stage of this project was the completion of a geomorphological survey to provide overall landscape context and guide archaeological investigations by identifying land surfaces that would have formed part of the Mesolithic landscape. The Geldie valley is a well-known example of river capture, with much of the upper catchment now part of the River Feshie to the west; this probably occurred during deglaciation of the last ice sheet but may have occurred much earlier (Sissons, 1967). Evidence of former glaciers is testified by numerous mounds and channels found in the vicinity of the site (Fig. 2) reflecting the retreat of a diminishing glacier in the lower part of the valley during deglaciation with the landscape being ice-free before 15,000 years ago. Valley glaciers appear to have continued to exist in some of the higher Cairngorm valleys at this time (Everest and Kubik, 2006). Following deglaciation, restricted valley glaciers became re-established in the high Cairngorms: a more extensive plateau icecap covered the high Gaick Plateau to the south, with a major outlet glacier occupying the upper Geldie catchment. During deglaciation and the subsequent cold stage, non-glaciated surfaces were subjected to intense periglacial processes (Sugden, 1971). This had a major impact on slopes and fluvial systems leading to the formation of thick drift sequences associated with solifluction on slopes and alluvial fans (Ballantyne and Whittington, 1999).

The periglacial environment influenced the river regime, with a distinct flow associated with seasonal snow and ice melt from Younger Dryas glaciers in the upper Geldie catchment. The disappearance of ice in the upper catchment appears to have had a major impact on the Geldie in the early Holocene – a major reduction in discharge and stream power allowed thick peat (3 m) to form over the floodplain from at least c. 10,000 cal BP. Gravel-rich bars and floodplains have only partly removed this peat cover within the last c. 2000 years.

The closest pollen record is c. 1 km downstream at Geldie Lodge (510 m asl) (Paterson, 2011). This peat stratigraphy commences at c. 7550 cal BP, and is thus slightly younger than the archaeological evidence. The earliest evidence at Geldie Lodge is for a semi-open pine woodland with birch. Heather (Calluna) and grasses were also important on the valley side mineral soils. Evidence of disturbance and
elevated microscopic charcoal values in this woodland may indicate deliberate human modification during the later Mesolithic (Paterson, 2011, 214). Over the following millennia the wood fluctuated in density. The implications for Caochanan Ruadha are that the site was likely located in semi-open woodland, towards the tree line. Pine and probably birch were present, along with open ground on slopes and the valley floor.

Full analysis of the results of the first phase of UDTP work is ongoing, and the remainder of this paper focuses specifically on the fieldwork conducted at Caochanan Ruadha.

3. Fieldwork at Caochanan Ruadha

Fieldwork took place from 2013 to 2015 and included geophysical survey, test- and shovel-pit survey, walkover survey and targeted excavation. This uncovered a very low-density scatter of worked flint covering an area c. 50 × 25 m. Artefacts were identified by surface survey in erosive contexts up to 380 m upstream. Identifying concentrations of activity is difficult in such a low density scatter, but two have been excavated. Trench Four (2014–2015) focused on the area of a 1.0 × 0.5 m test-pit that returned four artefacts in 2013 (no other test-pit identified more than one artefact). Some 50 m downslope of Trench Four, Trench Five (2015) targeted the area of the original surface finds discovered eroding from a footpath in 2005.

All trenches and test pits had very similar soil profiles: peat-rich A horizons overlying fine silt-sands and/or glacial diamict. The peats varied considerably in depth and could be as thin as 0.02 m. These peats overlie heavily podsolised fine sands varying from c. 0.01–0.15 m depth (C.402, C.502), mainly very dark greyish brown (10YR3/2) in colour. This overlies a variable diamict of abundant sub-rounded and sub-angular clasts of local lithologies, from < 0.05 m to > 1 m in maximum dimension (C.414, C.503). Preliminary analyses by Clare Wilson suggest that the fine sands are an eluviated E horizon of a classic peaty podsol with illuviated Bh and Bs horizons below. These have formed through the removal of organic material, Fe and Al oxides from the E horizon and their deposition within the upper layers of the diamict. The profiles are best interpreted as in situ soils developed through pedogenesis and with no evidence of truncation. The extent of podsolization meant that identification of archaeological features could be very challenging. Artefacts were found throughout the sands, especially at the upper levels; in places artefacts were recovered immediately beneath the root mat and lying on top of large boulders. Although re-fitting has not yet been undertaken, the spatial patterning identified in the lithic assemblage strongly suggests that the assemblages are largely in situ.

Excavations at Caochanan Ruadha were carried out entirely by hand. Trenches were divided into 1.0 m squares and excavated in c.0.05 m spits. Control samples were recovered for flotation processing from all squares/spits with targeted sampling of features. All spoil on site was dry sieved to 5 mm, but the vast majority of artefacts were recovered by hand not in the sieve and were located in three dimensions (103 of 109 from Trench 4, not including those sieved in laboratory conditions). The average size of these artefacts was 8.7 mm × 4.8 mm (n = 109). All artefacts are flint, which is non-local. Quartz was present on site, and due to the complexities of identifying worked quartz all natural and potentially worked quartz was retained. This was assessed by Killian Driscoll using an analytical framework developed for quartz (Driscoll, 2011): of the c. 4000 pieces assessed only c. 50 are possible flakes or cores with no certain flakes/blades or retouched pieces. The discussion here therefore focuses on flint. The primary focus here is Trench Four, but brief comparative data on Trench Five are presented first to facilitate comparison.

3.1. Trench Five

Trench Five was 2.0 × 2.0 m, bisected by a heavily eroded footpath, which cut through peat (C.501) and sands (C.502) onto diamict (C.503). A total of 16 flint artefacts were recovered, mainly from C.502. Three were identified on the surface prior to excavation and four/five of the thirteen from the trench are a single burnt artefact that can be
refitted. Three irregular charcoal spreads were identified at the base of C.502 and within those deposits (Fig. 4). C.504 is the largest of these, covering a sub-circular area of c. 0.80 × 0.80 m and c 4-20 mm in maximum depth.

Two radiocarbon dates were obtained on short-lived material from C.504 (Table 1) Paterson thinks that Alnus (alder) was unlikely to have been common in upper Geldie Burn. The two dates from Trench Five combine to 8023–7958 cal BP (95% confidence; \( \chi^2 \) test: df = 1; \( T = 2.0(5\% 3.8) \)), using the R_combine function in OxCal 4.2 (https://c14.arch.ox.ac.uk/oxcal/).

4. A Mesolithic structure in Trench Four

Trench Four examined a 7.0 × 7.0 m area immediately northeast of an eroded footpath, and with a small extension to the southwest of that footpath (Fig. 5). No artefacts were recovered from the extension.

 Artefacts were recovered throughout a heavily podsolised fine silt-sand. Only one archaeological feature was identified, an irregular pit/hollow associated with a concentration of charcoal and many burnt lithics (C.406) (Fig. 6), interpreted as a fire setting. Two radiocarbon dates have been obtained from this feature (Table 1), both on twigs of yew (Taxus). The presence of yew is interesting, given ambiguity over its natural presence in Scotland (Dickson, 1993). It may be that this was carried to the site. The two dates from Trench Four combine to 8161–8011 cal BP (\( \chi^2 \) test: df = 1; \( T = 0.0(5\% 3.8) \)).

Attempts to combine all four dates in Table 1 fail (\( \chi^2 \) test: df = 3; \( T = 8.3(5\% 7.8) \)). Modelling of interval between the combined dates for Trenches Four and Five (see Supplementary information) indicates that, while there is a small probability that they were partly contemporaneous, it is much more probable that the activities represented were separated by at least some decades, possibly by as much as c. 165 years (−8 to 164 years, 95.4% confidence), though more likely no more than a century or so (−4 to 87 years, 68.2% confidence) (Fig. S2).

4.1. Distribution

A total of 109 flint artefacts were recovered by hand from the excavations and 23 from samples of the fire setting. All distribution maps that follow include only those with individual locations plotted by dGPS or total station and thus minimise the density of the centre of the concentration, but given that these samples include many very small artefacts, the focus on hand recovered material means that comparable recovery techniques are being represented. The distribution of all flint has a notable concentration in the centre associated with the fire-setting C.406 (Fig. 7). There is a sudden fall off in lithic density demarcating an oval area c 3 × 2.2 m with the long axis running approximately east-west (Fig. 8); this shape does not correspond to the alignment of grid squares and is not an artefact of excavation methodologies. Indeed, in some places, especially to the north, it appears that the artefact distribution is defining a coherent oval edge. Burnt artefacts are very common (74% of flint where it could be determined). Their distribution is similar to the overall pattern although they are less common outside the possible structure. Experimental work has shown that burnt flint is associated with high degrees of fragmentation (Sergant et al., 2006) and that heavily burnt artefacts are found within the hearth and smaller chips and ‘pot lid’ thermally fractured material expelled c. 2.5–3 m

Table 1

<table>
<thead>
<tr>
<th>Laboratory Code</th>
<th>Trench</th>
<th>Context</th>
<th>Sample</th>
<th>Material</th>
<th>bp uncal</th>
<th>±</th>
<th>cal BP (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUERC-58040 (GU36381)</td>
<td>4</td>
<td>C.406</td>
<td>S.590</td>
<td>Taxus</td>
<td>7252</td>
<td>30</td>
<td>8164-8002</td>
</tr>
<tr>
<td>SUERC-58041 (GU36382)</td>
<td>4</td>
<td>C.406</td>
<td>S.590</td>
<td>Taxus</td>
<td>7259</td>
<td>30</td>
<td>8164-8008</td>
</tr>
<tr>
<td>SUERC-67810 (GU41145)</td>
<td>5</td>
<td>C.504</td>
<td>S.904</td>
<td>Pinus</td>
<td>7150</td>
<td>30</td>
<td>8017-7935</td>
</tr>
<tr>
<td>SUERC-67814 (GU41146)</td>
<td>5</td>
<td>C.504</td>
<td>S.905</td>
<td>Alnus</td>
<td>7210</td>
<td>30</td>
<td>8154-7958</td>
</tr>
</tbody>
</table>

Fig. 4. GLD15, Tr. 5. Mid Excavation, showing C.504, 505 & 506. C. 503 underlying. Cross-hatching indicates main concentrations of charcoal. Red diamonds are flint artefacts. Refitting cluster SF507–510 in SW corner. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Fig. 5. GLD15, Tr.4 & Tr. 4 ext. Post excavation plan. C.414 visible throughout trench. Fire setting C406/407 highlighted in tan. Test pits in pink. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)
from the hearth. This does not correspond to the distribution identified at Caochanan Ruadha, especially in terms of the comparatively coherent and sudden limit to the distribution.

Considerable attention was paid in the field to the possibility of tent rings and/or areas cleared of stone, but no certain instances of either were identified. Given the location of the artefacts at the upper levels of C.402 any such evidence may have lain very close to the surface.

The overall distribution of artefacts therefore strongly suggests the presence of an oval structure. This is most likely to have been some kind of tent or other comparatively light structure: perhaps covered in skin, bark or vegetation. This is likely to have been comparatively light weight in terms of structural framework – the only structural features that may have left archaeological traces may have been stake holes or stones used to weigh it down. Given the extent of podsolization and the highly irregular till, it is very unlikely that such ephemeral archaeological features would be identified. We therefore think it most likely that the three dimensional recording of hand recovered artefacts, including those of very small size, provides robust evidence for the presence of a small Mesolithic structure at Caochanan Ruadha. Analysis of the lithic assemblage sheds further light on the function of this building and the character of the associated activity.
4.2. Lithic assemblage: technology

A total of 132 flint artefacts were recovered from Trench Four by hand and from samples of the central fire setting. Much of the assemblage is very small: 52 artefacts are < 5 mm in maximum dimension and 30 only 1 mm. Full analysis is ongoing. 130 are blades or flakes and two are debris or indeterminate forms. No cores or core fragments are present but a core rejuvenation flake suggests some in situ use of cores (GLD15-SF-0419). Breakages are present on 72 of the 94 artefacts where it could be assessed (76.5%). Blades and blade fragments are very frequent (43.8% of debitage) with many fragments being too small to securely identify as either blades or flakes (46.9% of debitage). Blade widths are generally narrow, although only four complete, unmodified blades are present. The assemblage is dominated by tertiary (94%) and secondary (6%) pieces: cortex is very rare. The nearest blades are present. The assemblage is dominated by tertiary (94%) and possible microlith fragments, are retouched: eight complete microliths, 22 microlith fragments, two possible microlith fragments, five microburins and one edge retouched blade. No scrapers are present but a possible scraper rejuvenation flake is. Microlith types are classic later Mesolithic ‘narrow blade’ forms (Fig. 9), including scalene triangles, backed bladelets and crescents, with many being too small to closely classify. The three microliths found outside of the structure were all indeterminate forms, with all of the others clustering in the structure and in the central fire setting.

The high degree of fragmentation, high numbers of microliths, presence of microburins and evidence for burning is coherent with ‘retooling’: removing microlithic components of compound artefacts and replacing them, potentially using light heat to release resins. A small black patch of possible resin is present on microlith fragment SF0306 (Fig. 10). The presence of core rejuvenation evidence, but not cores, demonstrates the importance of curation of artefacts in whatever strategy of landscape use is represented at Caochanan Ruadh.

Although the assemblage from Trench Five is small, which makes robust comparisons difficult, it is notable that it appears to be different in character to that from Trench Four. Trench Five’s 16 artefacts include seven flakes/fragments of flakes, five blades/fragments of blades. Retouched pieces comprise one microlith, one fragmented scraper, a possible edge retouched flake and a possible microburin.

4.3. Lithic assemblage: functional analysis

Following an initial technical analysis by Graeme Warren the flint artefacts from Trench Four were sent to Annemieke Verbaas (Leiden Laboratory for Material Culture Studies) to assess their potential for use-wear analysis (for full report, see Supplementary information 3). This identified thirty two artefacts as having good potential, based on surface preservation, with many of the other artefacts having been altered by light surface abrasion, probably caused by the sandy sediments in which they were deposited. The extent of burning also limited inferences in some cases. Following the identification of high potential artefacts the sample for analysis was refined to 28 pieces by consultation.

Of the selection for analysis, twelve artefacts show traces of wear, with one (SF0210) showing two different areas of wear (Table 2). The functions include use as projectiles, the processing of animal materials, plants and further uncertain attributions. Evidence for the use of projectiles is provided by the presence of Multi Linear Impact TraceS (MLITs) on SF0031 & 0059 (Fig. 11). A small flake (SF0202) was used for scraping hide, this was probably a scraper edge rejuvenation, indicating on-site tool maintenance. Another flake (SF0445) and a blade/microlith fragment (SF0428) were used for cutting an unknown animal material, and a final flake (SF0388) for cutting soft animal material. Three artefacts were used for working plants: one blade (SF0210) being used to scrape a siliceous plant and the opposite side used for another plant material. A crescent and a blade (SF0067 and SF0343) were used to cut an unknown plant material. For the remainder of the pieces with wear the contact material could not be inferred.

Spatial analysis of this functional data suggests some possible patterning to activity. The dangers of over-interpreting such a small number of artefacts are clear, but it is interesting that activities involving animal materials mainly took place to the south of the fire setting, most plant working (including SF0210 which was used on both edges) to the north (Fig. 12).

4.4. Trench Four – a synthesis

Combining these strands of evidence suggests that at some stage in the period 8161–8011 cal BP a small structure surrounding a fire setting was built on a gentle slope in a high valley, overlooking a waterlogged basin. Given its position on a prominent ridge, the location chosen is
Table 2
Summary of functional analysis.

<table>
<thead>
<tr>
<th>SF number</th>
<th>Type</th>
<th>Degree of wear</th>
<th>Motion</th>
<th>Contact material</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Microlith fragment tip</td>
<td>Probably used</td>
<td>Shooting</td>
<td>Unsure</td>
</tr>
<tr>
<td>59</td>
<td>Microlith fragment tip</td>
<td>Probably used</td>
<td>Shooting</td>
<td>Unsure</td>
</tr>
<tr>
<td>64</td>
<td>Microlith scalene</td>
<td>Light</td>
<td>Boring</td>
<td>Unsure</td>
</tr>
<tr>
<td>67</td>
<td>Microlith crescent</td>
<td>Light</td>
<td>Diagonal cutting</td>
<td>Plant</td>
</tr>
<tr>
<td>202</td>
<td>Debitage indet</td>
<td>Medium</td>
<td>Scraping</td>
<td>Hide</td>
</tr>
<tr>
<td>210</td>
<td>Blade</td>
<td>Light</td>
<td>Unsure</td>
<td>Plant</td>
</tr>
<tr>
<td>210</td>
<td>Blade</td>
<td>Medium</td>
<td>Scraping</td>
<td>Silicious plant</td>
</tr>
<tr>
<td>305</td>
<td>Blade</td>
<td>Probably used</td>
<td>Hafting</td>
<td>Unsure</td>
</tr>
<tr>
<td>343</td>
<td>Blade</td>
<td>Light</td>
<td>Longitudinal</td>
<td>Plant</td>
</tr>
<tr>
<td>388</td>
<td>Blade edge retouched</td>
<td>Medium</td>
<td>Cutting</td>
<td>Soft animal</td>
</tr>
<tr>
<td>428</td>
<td>Microlith fragment indet</td>
<td>Light</td>
<td>Unsure</td>
<td>Medium animal</td>
</tr>
<tr>
<td>430</td>
<td>Microlith fragment indet</td>
<td>Medium</td>
<td>Unsure</td>
<td>Unsure</td>
</tr>
<tr>
<td>445</td>
<td>Flake</td>
<td>Medium</td>
<td>Longitudinal</td>
<td>Animal</td>
</tr>
</tbody>
</table>

Fig. 11. A MLITS as seen on SF0031; B Group of MLITS as seen of SF0059; C Traces interpreted as those being the result of scraping hide on SF0202; D Traces interpreted as those being the result of cutting an unknown animal material on SF0445; E Traces interpreted as those being the result of scraping siliceous plants on SF0210.
5. Mesolithic structures in upland Britain

Mesolithic structural evidence in Scotland is varied in character (Wickham-Jones, 2004). Most structures have been identified by the presence of stake or postholes, artificial or natural depressions, fire settings, stone settings or (more ambiguously) flattened areas within middens. Structures vary from the substantial (c. 5 m in diameter) to much smaller (c. 0.5 m diameter). Rare evidence for structures in the uplands includes poorly understood stake holes and occupation soils at Starr, Loch Doon (Edwards, 1996) and a possible post-built hut (c. 1.5 × 2 m) at Daer, Lanarkshire. Evidence for Mesolithic use of high mountain areas at Ben Lawers, Perthshire, has been disturbed by more recent activity and is not possible to interpret in terms of any structural features (Atkinson, 2016).

Of the upland Mesolithic sites in Northern England, some in the Pennines are associated with evidence of structures (Spikins, 2002) sometimes interpreted on the basis of artefact halos in association with varied structural evidence (Preston, 2011/12, 2009). Stone settings associated with the edges of an oval hollow (c. 3.3 × 2.1 m at its widest) at Deep Carr, Yorkshire are interpreted as a structure, possibly opening to the South (Radley and Mellars, 1964). Areas of cleared stone, stone settings and stake holes indicate a burnt-down structure c. 5 × 3.3 m in dimension at Broomhead More Site 5 (Radley et al., 1974). At Dunford Bridge Site A the “abruptly-defined limits of the stones and the flint distribution is suggestive” (Radley et al., 1974, 7) of a c. 2.6 m diameter structure.

Setting aside comparative evidence for structures, to find microlith-dominated artefact scatters in the uplands of Britain is not unusual – indeed it has been the basis of a long standing model of upland small group hunting (Mellars, 1976; Jacobi, 1978). At Pule Bents in the Pennines a small scatter comprising 93 microliths (mainly rods and scalene triangles) and ten other lithics is argued to have been a location where stone tools were used but not manufactured (Stonehouse, 1997): either a kill location (possibly used over some time) from which dead animals were removed or a cache of artefacts (as seen elsewhere in the Pennine uplands (Preston, 2009). Other Mesolithic sites in lowland Scotland suggest very short lived, specialised activity, including a crescent dominated microlith assemblage from Fife Ness, associated with a small structure (Wickham-Jones and Dalland, 1998).

6. Methodological implications for fieldwork

The interpretation of the presence of this structure is based solely on the distribution of artefacts, and in particular on their precise 3D location. This is not an unusual approach (Stapert, 1989) but the
precision with which we have identified the edge of the structure solely on the basis of artefact distribution is unusual, although, of course, artefact distributions have been used to identify different activity areas within and outside of structures (Connell er et al., 2012; Waddington, 2007). Given the low numbers of artefacts, and the importance of the very sharp drop-off in lithic numbers in building the argument for the presence of a barrier, it is unlikely that gridded excavation would have provided the spatial resolution to identify this pattern.

Given the importance of individual artefact location to our interpretation it is important to recognise the very small size of many of the artefacts. As noted above, the average maximum dimension is only 8.7 mm. Only 30 artefacts from the site are > 10 mm in size. Recovering such small artefacts in difficult montane conditions is not straightforward, but has provided rich rewards. Fieldwork at Caochanan Ruadh had little logistical support in terms of facilities, not least because of the remote location. The excavation area was not covered, and there was little shelter from the elements. Many of the excavators were comparatively inexperienced students: many of them had limited experience of mountain environments and conditions. The significance of the spatial information recovered in these conditions suggests that further work in the uplands should seek to provide the best possible conditions for the conduct of excavation to maximise visibility of artefacts and recovery of spatial information.

7. Conclusion

Fieldwork at Caochanan Ruadh adds considerably to our understanding of the kinds of structures that remain to be found in upland and mountainous areas of Britain and of the various tasks that were carried out within or in association with them. As noted above, the use of upland and mountainous environments is a key aspect of Mesolithic activity in Europe, with recent overviews of Alpine settlement emphasising the “extremely high technical dynamism of the last hunter-gatherer-fishers and the variability of the adopted exploitation strategies” (Fontana et al., 2016, 3, and see other papers in this thematic issue of Quaternary International). Further, inter-regional comparative analysis of the use of the various uplands of Europe are required.

The structure appears to have been comparatively light and the limited range of tasks suggests that occupation was short term – perhaps little more than one night. The internal area of the structure is c. 5.2m² with a central fire. Comparative models suggest hunter-gatherer buildings have an average area of c. 5–7 m² per person (Belfer-Cohen and Goring-Morris, 2013, 553), perhaps only one or two people were present.

The structure is but one focus of activity within a broader, low density scatter of worked stone and the full extent of the site has yet to be defined. Only one other concentration of activity has been dated, and although not contemporary it may not have been separated by any substantial period of time: initial analysis suggests that the activities that took place there may have been different. The Mesolithic use of the uplands of Britain in some places is characterised by the use of ‘persist ent places’ (Barton et al., 1995), locales that see consistent patterns of activity over the long term. It is not clear yet whether Caochanan Ruadh is best interpreted in this light: the activities identified so far may have fallen within one human generation, and they may have varied over time.

The focus of activity in Trench Four shows that a small number of people were engaged in a limited range of tasks: processing animal carcasses, working plant materials, and, seemingly, repairing compound tools. They had carried materials with them to undertake these tasks: small flint cores to remove blades from and to manufacture microliths; a scraper; possibly twigs of yew for reasons we do not fully understand. It would be tempting to try and fit this into a simple model – to search for the ‘reason’ that Mesolithic hunter-gatherers were in this broad upland valley. Too often, models of the use of the landscape in the British Mesolithic have become narratives set around a pervasive lowland/upland divide, in which the motivation for activity in the latter is dominated by hunting large ungulates (Clark, 1954; Mellars, 1976). These models have been robustly critiqued (Spikins, 2000; Finlay, 2000) but should not be completely dismissed. Indeed, much of the evidence for activity at Caochanan would be coherent with a ‘logistically’ organised strategy of upland hunting with resources being taken back into lower lying areas of the landscape.

But this is not the only possible explanation. Even after detailed spatial, technological and functional analysis, it is difficult to identify the motivations of the people whose fleeting traces we have examined at Caochanan Ruadh. Yes, they hunted. But, they may have been journeying around the southern flanks of the Cairngorm massif because the Geldie Burn connects via Glen Feshie to the hills west of the Cairngorms; or they may have been seeking resources. More comparative data are needed to assess these questions, though the difficulties of site prospection in this region are substantial. Nevertheless, Caochanan Ruadh is one of a growing number of sites that provide significant evidence relating to the exploration of Mesolithic lives in the uplands of Europe.

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References

Dickson, J.H., 1993. The yew tree (Taxus baccata L.) in Scotland - native or early introduction or both? Dissertationes Botanicae 196, 293–304.
Dickson, J.H., 1993. The yew tree (Taxus baccata L.) in Scotland - native or early introduction or both? Dissertationes Botanicae 196, 293–304.


