ART. I – *Coastline and Upland in Cumbrian Prehistory – A Retrospective*

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AT first sight the prehistoric settlement of Cumbria is clearly established. Since the latter part of the eighteenth century funerary monuments have been known and, in some cases, excavated. Stone circles, henge monuments and tumuli have also been recorded and carefully studied for many years (Greenwell, 1877; Burl, 1976; Clare, 1978). The vegetational history of the areas near to the sites, based on pollen analysis, is relatively well known from more recent work (Pennington in Cherry, 1965; Webster, 1969; Bonsall *et al.*, 1989; Chinn and Innes in Cherry, 1995; Hodgkinson *et al.*, 2000) and has produced several examples of pre-Elm Decline clearance episodes. The axe factory sites of the central Lake District have been extensively surveyed and researched (Claris and Quartermaine, 1989; Bradley and Suthren, 1990; Bradley and Edmonds, 1993). However, the location and extent of the occupation sites of prehistoric man still remains largely unresolved.

Over the past 35 years we have been able to conduct two extensive surveys in Cumbria, recording evidence of prehistoric activity in the form of lithic and ceramic scatters. The first of these was concentrated mainly between the 8 and 30 metre contours on the south-west coastal strip between St. Bees and Haverigg, and the second was of the limestone uplands of eastern Cumbria between Shap and Kirkby Stephen, where the majority of sites were clustered around the 270 metre contour (Fig. 1). The former yielded 158 sites ranging (in terms of flintworking technology) from Late Mesolithic to Early Bronze Age. The uplands have yielded, so far, 152 sites with a similar range. In both areas there was a significant scatter of isolated finds. Because diagnostic artefacts of different periods were sometimes found in close proximity to each other, it was not possible to assign non-diagnostic artefacts, such as waste flakes, to a particular culture. Therefore we could not carry out a detailed analysis of the whole assemblage, although we have attempted to do this on specific sites, in our earlier papers, when we considered it to be useful.

The south-west Cumbrian coastal plain is composed of Triassic sandstones mantled with Devensian till, forming a narrow strip of land between the Lake District mountains and the Irish Sea, rarely more than 10 kilometres wide. The terrain is hummocky, with kames and drumlins, and is pockmarked with kettleholes and small tarns; at its western edge the clay is overlain with sand and is consequently fairly well drained, affording a dry environment. In the east of the county, between the village of Shap in the west and the small town of Kirkby Stephen in the east, is a band of limestone lying mainly betwixt the 250 and 350 metre contours, which is largely overlain by a thin layer of soil with the limestone frequently outcropping. The area is used mainly for pastoral farming; ploughing is much less intense than on the coastal strip, and, as with the coastal sites, the land is generally well drained with any overlying peat as a shallow deposit.

Almost all the coastal assemblages were found as a result of ploughing and they were on the exposed gravel beds in the sand-dunes, whereas the finds on the uplands came in a significant proportion from mole-hills and erosion scars. Between the sandy

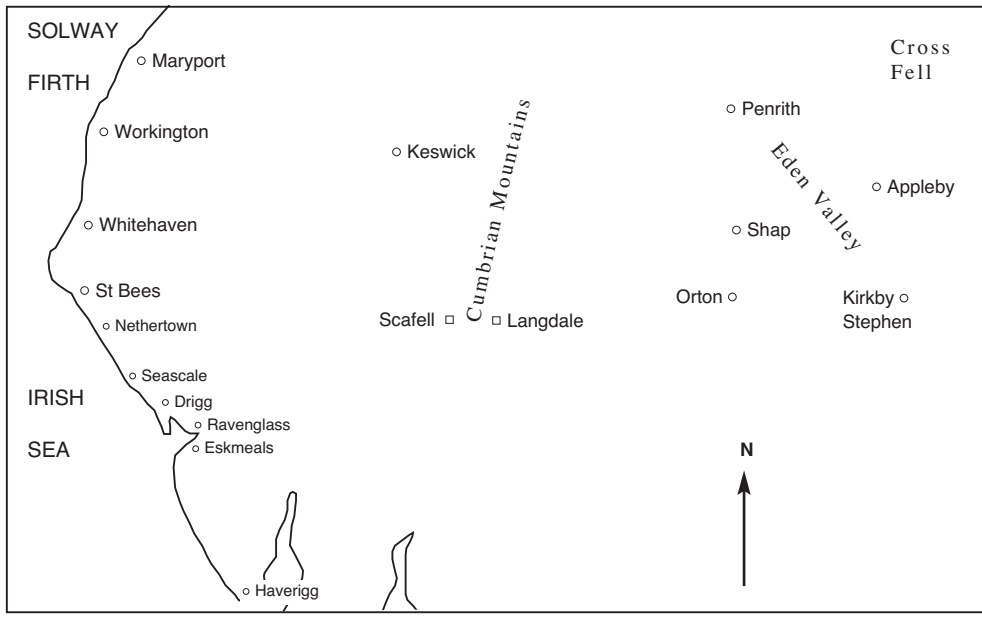

FIG. 1. Map covering most of the area surveyed. It includes the western coastal strip of Cumbria from Whitehaven to Haverigg and the limestone uplands from Shap to Hartley Fell just beyond Kirkby Stephen.

soils of the coast and the limestone uplands lie the grits and volcanic rocks of the Lakeland mountains where the terrain does not appear to have been conducive to large-scale prehistoric settlement.

A. The Mesolithic Period

At present there is better evidence for human activity in Cumbria during the Late Glacial period than during the Early Mesolithic. No Early Mesolithic site has yet been identified on the coastal plain, and there is no unequivocal evidence for Early Mesolithic activity on the limestone uplands of eastern Cumbria (Cherry, 1995). The situation on the coastal plain is readily explicable, because the Early Mesolithic coastline is now submerged. In the limestone uplands, the conditions under which our survey was conducted would make it relatively difficult to detect low levels of activity during the Early Mesolithic. Late Mesolithic sites are abundant on the coastal plain. Their distribution forms a series of clusters, with the largest at Eskmeals (Cherry, 1969, 1986; Bonsall, 1981; Bonsall *et al.*, 1989). North of Eskmeals there are apparently isolated sites at Ravenglass (Cherry, 1985), a small cluster at Drigg (Nickson and Macdonald, 1955; Cherry, 1965), and a microlith is recorded from Seascale 8 (Cherry, 1967, 1984a) from among a small flint scatter which is of Bronze Age appearance. A small group of sites was found at Nethertown, about three miles to the south of St Bees (Cherry, 1984a) and a larger group at St Bees itself (Cherry, 1973, 1983).

It is probable that this distribution is incomplete. There has been significant

coastal erosion in recent years, with Late Mesolithic artefacts being found in the face of eroding, low, boulder clay cliffs at Ravenglass, Drigg and St Bees. Also, although we lack direct evidence for the chronology for Late Mesolithic sites north of Eskmeals, it is possible that most surviving sites date from towards the end of the Late Mesolithic period. This is because they tend to be in close proximity to features associated with the post-Glacial maximum marine transgression, which is dated to around 4000 B.C., and earlier shorelines will have been destroyed by this or the earlier marine transgressions recorded by Tooley (1978).

A convincing case has been put forward to explain the concentration of Late Mesolithic sites at Eskmeals by reference to the availability of food resources throughout the year, in the estuarine conditions which prevailed there in the 5th and 4th millennium B.C. (Bonsall, 1981; Bonsall *et al.*, 1989). The same explanation cannot be applied to the clusters of sites at Nethertown and St Bees, but the existence of these clusters suggests the presence of some attraction, for example, shellfish or nesting birds.

No Late Mesolithic sites have been found on the north-west facing coast between St Bees and the Solway but as this stretch of coastline is more heavily industrialised our search there has been consequently restricted. An isolated find of a microlith at Carlisle has been noted (Caruana and Cherry, 1994). South-west facing coastlines appear to have been favoured for occupation in the Late Mesolithic in southern Scotland (Coles, 1964; Cherry, 1997) but north-west facing coasts may have been less favourable from the point of view of prevailing colder winds and inshore navigation.

There have been no finds of Mesolithic material from the western and central Lake District. To some extent this may simply reflect the absence of exposed ground in these areas but is more likely to reflect the nature of the terrain. The recent surveys of the Great Langdale axe factory sites appear to have revealed no volcanic tuff artefacts unrelated to the manufacture of axes, and the small number of flint artefacts found is undiagnostic (Bradley and Edmonds, 1993).

Raw materials utilised on West Cumbrian coastal sites using Late Mesolithic technologies were predominantly Irish Sea beach pebble flint. There is almost no chert. Volcanic tuff pebbles were also used to produce a range of tool forms comparable to those made of flint. The use of volcanic tuff was greatest at St Bees, where at St Bees 4 (Cherry, 1983) a majority of the artefacts found, including five microliths, were of volcanic tuff. The largest number of tuff artefacts came from Rottington 5 (Cherry, 1973, 1983) including a microlith and a pick (Cherry, 1973, Fig. 4, 35) which is the only large volcanic pebble tuff artefact we have found in our surveys of sites with Late Mesolithic affinities. Based on sites with a strong Mesolithic affinity, 76% of all tuff artefacts (including waste) was found in the St Bees area and 22% in the Eskmeals area. The remaining two per cent was found on the sandhills and other sites with a strong Bronze Age affinities. The difference is even more pronounced if the amount of tuff is compared with the amount of flint picked up. The ratio of tuff to flint artefacts in the St Bees area is 3.8% and only 0.62% at Eskmeals on sites with mainly Mesolithic affinities. So it can be said that much less use of volcanic tuff was made on similar sites further south, suggesting localised use of pebbles from glacial deposits in the St Bees area. The tool making properties of this stone were clearly well known to, and appreciated by, coastal communities using

Late Mesolithic technologies, but there is nothing to suggest exploitation of this material at source.

On the limestone uplands, most sites of Late Mesolithic appearance are found at heights between 275 and 300 metres O.D., again in a series of clusters. In the Shap area, the distribution of sites appears to follow the edge of the limestone, where it abuts onto rocks of the Borrowdale Volcanic Series. There are further clusters of sites in the vicinity of Gamelands stone circle, Tarn Moor and Rayseat Pike long cairn. Distributions of this nature demonstrate repeated use of specific locations, usually near to a convenient water supply. It has been suggested that Mesolithic hunters pitched their camps so as to control the maximum possible local view, which would include the best grazing and sources of water (Jacobi, 1978).

A scatter of isolated finds of microliths has been made across the rest of the limestone uplands. Because sites have largely been identified by artefacts picked up from molehills in these areas, it is difficult to assess, without excavation, whether these finds are simply evidence of "background" activity across the uplands, or come from more substantial lithic scatters which remain unexposed.

Raw materials used are primarily local cherts, which constitute around 60% of the assemblages found. Flint, both chalk and pebble, constitutes most of the remaining artefacts. The pebble flints do not resemble Irish Sea beach pebble flint in colour. They are predominantly grey, as opposed to the mainly yellow Irish Sea beach pebble flint. The pebble cortex of the upland flint is also rolled, but not sandblasted, as tends to be the case with the pebbles from the sandhills and the fields of the coastal strip. It is probable that these flints originate in the gravels of central and eastern Yorkshire. The chalk flints are mainly pale grey with black and white speckled inclusions, together with some brown flint and are probably from the boulder clays of eastern Yorkshire.

The availability of flint to Late Mesolithic communities in the limestone uplands of Eastern Cumbria can be compared with sites in the Craven District of North Yorkshire, around Malham Tarn, where flint appears to have been the preferred raw material for tool making, and the proportion of flint artefacts to chert artefacts is roughly twice as high as in Eastern Cumbria (Williams, Richardson and Richardson, 1987). Thus exchange networks for raw materials between both areas and Eastern Yorkshire existed at a time when Late Mesolithic technologies were in use, but communities in the Craven District, which is nearer to East Yorkshire, appear to have had significantly better access to supplies of flint than the communities of Eastern Cumbria (Cherry, 1998).

The Late Mesolithic assemblage from Levens (Cherry and Cherry, 2000) is of interest in this context, because although it is a coastal site, the raw materials used differ from other coastal sites in West Cumbria. There is significant use of chert, and chalk flint of probable Yorkshire origin was available in addition to the beach pebble flint used. A small amount of volcanic tuff was also used. The raw materials on this site demonstrate the presence of different exchange networks within Cumbria during the Late Mesolithic.

Volcanic tuff pebbles were used for tool making on upland sites in Cumbria, but generally to a lesser extent than on coastal sites. They were used to produce a range of tool forms analogous to flint and chert, and finds include a microlith from Shap 2 and a microburin from Shap 4 (Cherry, 1987c). Recent reports of finds of volcanic

tuff artefacts with lithic scatters of Late Mesolithic appearance in the Northern Pennines at Birkside Fell are of interest (Tolan-Smith, 1997).

On both coastal and upland sites, microliths occur in a range of types, mainly scalene triangles and rods, but with simple obliquely blunted points and crescents present. Quadrangular and trapeze forms are rare. The upland sites do not resemble those Late Mesolithic sites in the Central Pennines where one geometric form of microlith or another dominates (see e.g. Barnes, 1982). We can see no obvious difference in the typology of microliths between the upland and coastal assemblages, so that there is no evidence to suggest any difference in the function of microliths between the two areas. Microburins are rare on coastal sites and virtually absent on the upland sites. The preferred method of removal of the bulb of percussion was by direct snapping. The small size of the raw material involved made this practicable.

At present there is no chronology at all for the upland sites. All that can be said is that, in terms of stone working technology, the majority are conventional Late Mesolithic sites, which in terms of tool form appear closer to the Cumbrian coastal sites than to Pennines upland sites. A small group of sites where Neolithic type artefacts are also found is discussed below. For the coastal sites at Eskmeals, there are radiocarbon dates in the early 5th millennium B.C. for Monk Moors 1 (Bonsall, 1981) and in the mid-4th millennium B.C. for Williamson's Moss (Bonsall *et al.*, 1989), and a relatively late date is postulated for most other coastal sites because evidence of earlier sites is likely to have been destroyed by post-Glacial marine transgressions.

No detailed analysis of the excavated assemblages from Monk Moors and Williamson's Moss has yet been published. From available surface finds, we can discern no obvious typological differences between the two sites. It is possible to demonstrate variations in flint working style between the coastal sites of Nethertown 4 and 5 (Cherry, 1984) and differences in raw materials used between the upland sites Shap 2 and 3, and the Tarn Moor sites (Cherry, 1987b) – all groups of sites in close proximity to each other. Similar conclusions can be shown for the coastal assemblage at Levens Park (Cherry and Cherry, 2000). These differences suggest activity by different groups separated by an undefinable period of time.

B. The Neolithic Period

In identifying specifically Neolithic sites, the position is not straightforward. To begin with, arrowheads of any kind are comparatively rare in the coastal assemblages. Out of over 60,000 artefacts collected, only 45 arrowheads and fragments of arrowheads were found. Leaf arrowheads – the simplest diagnostic artefact of the Neolithic – number only 12, of which six were found in the higher part of the Drigg sand dunes associated with Mesolithic and a little Bronze Age material; two have been found at the western end of Rottington five at St Bees (Cherry, 1973, 1983; Austen *pers. comm.*), and two at Williamson's Moss, Eskmeals (Cherry, 1986).

Finds of Neolithic artefacts on the western hills have been rare; the only finds made during the period of our survey from the western uplands are a few flakes of flint and a leaf arrowhead found together with a blade of volcanic tuff struck from a polished implement at Waberthwaite 5 (Cherry, 1985) and a long narrow blade from Hurlbarrow (Cherry, 1984a). Polished stone axes are reported from the Gosforth

district, Drigg, Holmrook, Corney, Waberthwaite and Seascale (M. C. Fair, 1943; Cherry, 1966, 1967, 1976, 1983; Fell, 1967). Four axe roughouts have also been found during the coastal survey (Cherry, 1969, 1984).

If we define an Early Neolithic assemblage as one based on a blade technology with leaf arrowheads and polished stone implements, excluding earlier and later tool forms, then it would appear that none of the 158 sites in our coastal survey can safely be ascribed to the Early Neolithic.

It was originally thought that the sites at Williamson's Moss would be Early Neolithic in type because of their position on the remains of an old raised beach (Cherry, 1969). However, pottery finds have been minimal and in the form of small, mainly nondescript, sherds of thick heavily grit-tempered pot, so that they cannot assist in the identification of Early Neolithic material. Apart from the pottery from Ehenside Tarn (Darbishire, 1874) and Brougham (Fell, 1972) there are only a few sherds from the excavations at Williamson's Moss, Eskmeals, and these are considered to be of Middle Neolithic type (Bonsall *pers. com.*). Much of the land around Williamson's Moss was rough heathland before ploughing in 1965. It is thought that any pottery that may have been on this and other coastal sites is likely to have been destroyed by intensive modern ploughing.

This shortage of ostensibly Early Neolithic finds gives rise to a number of alternative hypotheses:

1. That the area was effectively unoccupied during the Early Neolithic. It seems intuitively unlikely that an area so attractive to Late Mesolithic settlement should cease to be attractive in the Early Neolithic. Moreover, the palynological evidence shows, with early clearance episodes at Ehenside Tarn, Williamson's Moss and Barfield Tarn, that the Neolithic in this region was positively precocious.
2. That Early Neolithic sites exist but are to be found outside the areas we were able to survey. We were constrained in our searches by the patterns of modern ploughing, which was concentrated close to the coast. The distribution of stone axe finds extends somewhat further inland, particularly round Waberthwaite and Gosforth, above which lies the long cairn of Sampson's Bratful (Masters, 1984). However, our survey of such ground as was ploughed in these areas tended to show sites becoming smaller and less frequent away from the coast. Some probably Late Neolithic material has been found away from the coast, e.g. Gosforth 1 (Cherry, 1984a) and Waberthwaite 5 (Cherry, 1985). Having said that, the evidence for early clearance comes from coastal locations well within the area of our survey.
3. That Early Neolithic sites exist within the area we surveyed but left such ephemeral traces that they have not been identified. It is worth bearing in mind that the report of excavations at Ehenside Tarn makes no mention of flint artefacts among the finds (Darbishire, 1874) and our surveys of most of the adjoining fields have produced virtually no evidence of Neolithic flintwork (Cherry, 1984a, 1987c). Also, the limited excavations of the crop mark enclosure at Plasketlands near Maryport have produced Early Neolithic dates, but no associated artefacts at all (Bewley, 1993).
4. That Early Neolithic sites cannot be recognised by applying conventional typologies because they still retain Late Mesolithic characteristics. There is a virtual overlapping of radiocarbon dates in the 4th millennium B.C. between sites

conventionally considered Neolithic, such as Ehenside Tarn and Plasketlands, and sites of Late Mesolithic type such as Williamson's Moss, Eskmeals (Bonsall *et al.*, 1989). The coincidence of the late survival of Late Mesolithic technologies and the early appearance of "Neolithic" clearance may be of significance here. Bradley and Edmonds (1993) have noted the similarity between the description of the structural evidence reported from Ehenside, and that found at Eskmeals (Bonsall *et al.*, 1989).

A number of sites in our survey tend to support this last hypothesis. At St Bees, Rottington 5 (Cherry, 1973, 1983) has produced a large Late Mesolithic assemblage. Towards the seaward end of the flint scatter, we found that the flint artefacts tended to be less heavily patinated. The industry was still dominated by blades, but they were larger than those found a short distance further inland. Microliths tended to be fewer, larger and less neatly geometric. Finally, finds include two leaf arrowheads. At St Bees 8 (Cherry, 1983), adjacent to a boggy hollow which may have preserved environmental evidence, we found a blade industry with a fine series of end scrapers on short, ridged blades together with a large isosceles triangular microlith and a chisel arrowhead. The flints were only slightly patinated, in contrast with a conventional Late Mesolithic site elsewhere in the same field.

Unusually, the raw material utilised was a grey chalk flint with large creamy inclusions. Although this flint probably originated in eastern Yorkshire, the possibility of an Antrim origin cannot be excluded. We found more chalk flint around St Bees than elsewhere on the coastal plain, and this is not the most obvious distribution to expect if flint was coming from the east. Seaborne links – at least in the Late Neolithic – are shown by the discovery of a Ronaldsway Neolithic stone axe at Seascale (Cherry, 1967).

The sites on the gravel ridge bordering the western edge of Williamson's Moss, Eskmeals, also show similar features (Cherry, 1969, 1986). This gravel ridge was formed relatively recently, certainly after 6,000 BP (Bonsall *et al.*, 1989). Occupation of this ridge can reasonably be expected to postdate the occupation of the site east of Williamson's Moss, excavated by Bonsall *et al.* (1989), which has produced a series of radiocarbon dates in the mid-fourth millennium B.C. Nevertheless, we found unequivocally on the ridge, a conventional Late Mesolithic site. Overlapping this to the south was a substantial scatter of flints with larger, less patinated blades, with a smaller number of larger microliths and with two leaf arrowheads. A small sherd of undiagnostic plain heavily grit-tempered pot also came from this area.

We should mention that another microlithic site at Eskmeals, Monk Moors 2, has produced a large chalk flint blade and a fragment of volcanic tuff with its flake scars partially ground out over a convex surface. However, the flint industry from this site was, in other respects, entirely Late Mesolithic in character (Cherry, 1986). Also, a leaf arrowhead was found during excavation of the Late Mesolithic site east of Williamson's Moss by Bonsall *et al.* (1989). This arrowhead was not stratigraphically separated from the Late Mesolithic material found.

The remaining location to produce evidence of pre-Elm Decline clearance is Barfield Tarn to the south of Eskmeals. No ploughing took place in the vicinity of the tarn during our survey and we have therefore had no opportunity to look for artefacts and see whether a similar pattern might emerge. The sites found south of Eskmeals recorded in our survey all appear to be of Bronze Age type (Cherry, 1987a).

Sites with Late Neolithic affinities are somewhat easier to identify, but still relatively uncommon. Very little Late Neolithic material has been found north of Seascale. At Seascale itself, Seascale 1 has produced a substantial assemblage including a leaf arrowhead (Cherry, 1984a). The finding of a Ronaldsway Neolithic axe at Seascale 3 has been mentioned above. Seascale 7 (Cherry, 1967, 1984a) is a small assemblage but one in which the flint artefacts are of chalk flint, and there was a large flake of volcanic tuff. Sites in the Seascale area have produced a number of well made blade knives, often on what appears to be chalk flint. South of Seascale, the Drigg sand dunes have produced a series of leaf, chisel and oblique arrowheads (Cherry, 1965). At Drigg, leaf and chisel arrowheads are found mainly on the low boulder clay ridge in the northern part of the dunes. Arrowheads found on the gravel beds of the coastal foreland in the southern part of the dunes are mainly of oblique or barbed and tanged type. At the northern end of the dunes, the remains of a possible wooden structure, and of a substantial hearth dated to around 2000 B.C., were found in a peat bed exposed by coastal erosion (Cherry, 1982).

Neither leaf nor chisel arrowheads have been found in the Eskmeals sand dunes, which overlie a series of gravel ridges, the formation of which has been dated to between 4400 and 3600 BP (Bonsall *et al.*, 1989). It is likely that the gravel beds at Drigg were forming at the same time.

Inland, the sites of Gosforth 1 and Waberthwaite 5 have been mentioned as possible Late Neolithic sites. Further sites can be found on the gravel ridge to the west of Williamson's Moss, Eskmeals. Finds there include a large unfinished chisel arrowhead in pale grey chalk flint and a hollow-based arrowhead (Cherry, 1986), together with a small undiagnostic plain sherd of heavily grit-tempered pottery. South of Eskmeals, there is little that can be considered Late Neolithic in character.

Our tentative conclusion from our coastal survey is that there was a considerable degree of continuity between the Late Mesolithic and Early Neolithic in south-west Cumbria. It is possible that a microlithic technology continued in use until the end of the 4th millennium B.C., if not beyond. A conventional division between the Mesolithic and Neolithic periods is very difficult to apply to the lithic scatters we have found. A resolution of this question must await the establishment of a better chronology for the coastal sites, and a more comprehensive range of associated pottery finds.

Some 80 kilometres to the east, the limestone uplands of eastern Cumbria offer a marked contrast in terrain. They consist of a long plateau at heights ranging between 250 and 400 metres O.D., with patchy till cover. There are substantial areas of exposed limestone pavement, interspersed with areas of good pasture, and of moorland with coarse grasses and blanket peat. Below about 275 metres O.D., the land tends to be enclosed pasture, with only occasional ploughing. The area includes a number of probably Neolithic monuments, including Shap stone avenue (Clare, 1978), large stone circles at Shap South and Gamelands (Burl, 1976), a timber circle at Oddendale (Turnbull and Walsh, 1997) and long or oval cairns at Rayseat Pike (Greenwell, 1877; Clare, 1979) and Crosby Garrett (Greenwell, 1877). Our survey has produced over 12,000 artefacts of flint, chert and volcanic tuff, from molehills, rabbit scrapes, erosion scars and ploughed fields (Cherry, 1987b, 1995).

The upland sites appear to be concentrated along the northern side of the limestone plateau, particularly round the heads of the rivers Lowther and Lyvennet,

and also in the vicinity of Gamelands stone circle and Rayseat Pike long cairn. The distribution of known sites is incomplete, but suggests use of the uplands by peoples originating in the Eden valley to the north.

In upland sites with Late Neolithic or Early Bronze Age affinities, raw material usage is significantly different from that evident on Late Mesolithic sites. Chalk flint becomes the predominant raw material for toolmaking, comprising around 75% of total artefacts. There is virtually no pebble flint or pebble tuff. The balance of artefacts is made from local cherts.

Arrowheads are, in relative terms, about fifteen times more frequent than in the coastal assemblages. Also, we have found pottery on 40 of the upland sites, which was probably made locally (Cherry, 1992). Nevertheless, we have encountered the same difficulty in identifying "classic" Early Neolithic assemblages in the uplands as on the coast.

As yet, there is no evidence for pre-Elm Decline clearance in the area. Only two pollen diagrams exist. The first is for Sunbiggin Tarn, near Rayseat Pike (Webster, 1969). This was intended to support research on the environmental impact of Romano-British occupation, and the Elm Decline is used as a starting point for the diagram, so that no information prior to the Elm Decline is available. The second is from Wet Sleddale near Shap (Chinn and Innes in Cherry, 1995). This covers periods before the Elm Decline but identifies no interference with the vegetation cover until the Elm Decline itself, notwithstanding that there is a significant concentration of Late Mesolithic sites within two kilometres to the east, at Shap.

We have identified a number of sites where Late Mesolithic artefacts occur together with Neolithic artefacts. As with coastal assemblages, there is no way of demonstrating whether these occurrences are the result of coincidence or genuine association. Sites (reported in Cherry, 1987c) include Shap 5 (microlith, leaf arrowhead, probable Grimston ware), Shap 6 (microliths, fragment of polished stone axe), Gaythorn 3 (microlith, stone axe fragment, chert leaf arrowhead, and a crumb of heavily grit-tempered pot), Tarn Moor 4 (microlith, chert leaf arrowhead), Gamelands 1 (microlith, leaf arrowheads) and Rayseat 7 (microliths and leaf arrowheads). However, we have not observed any obvious variation in blade size, degree of patination or microlith size or type which would distinguish these sites from other Late Mesolithic sites, as in the case of the coastal assemblages at St Bees and Eskmeals.

It may be worth noting that Neolithic monuments tend to occur in the vicinity of clusters of sites with Late Mesolithic affinities, particularly at the Shap South and Gamelands stone circles and Rayseat Pike long cairn. The lithic scatters may well be earlier than the monuments, but there are hints of continuity in patterns of activity here.

Late Neolithic sites on the limestone uplands are numerous and recognisable not only by finds of leaf, chisel and oblique arrowheads, but by the presence of Peterborough Ware (15 sites) and Grooved Ware (5 sites), (Cherry, 1987c, 1992 and 1995). The presence of pottery of probably local manufacture on these sites implies that the uplands were occupied for significant periods, not just by transient hunting parties.

Fragments of polished stone axes, from use or reworking, are frequently found, and although most are derived from the axe factory sites of the central Lake District,

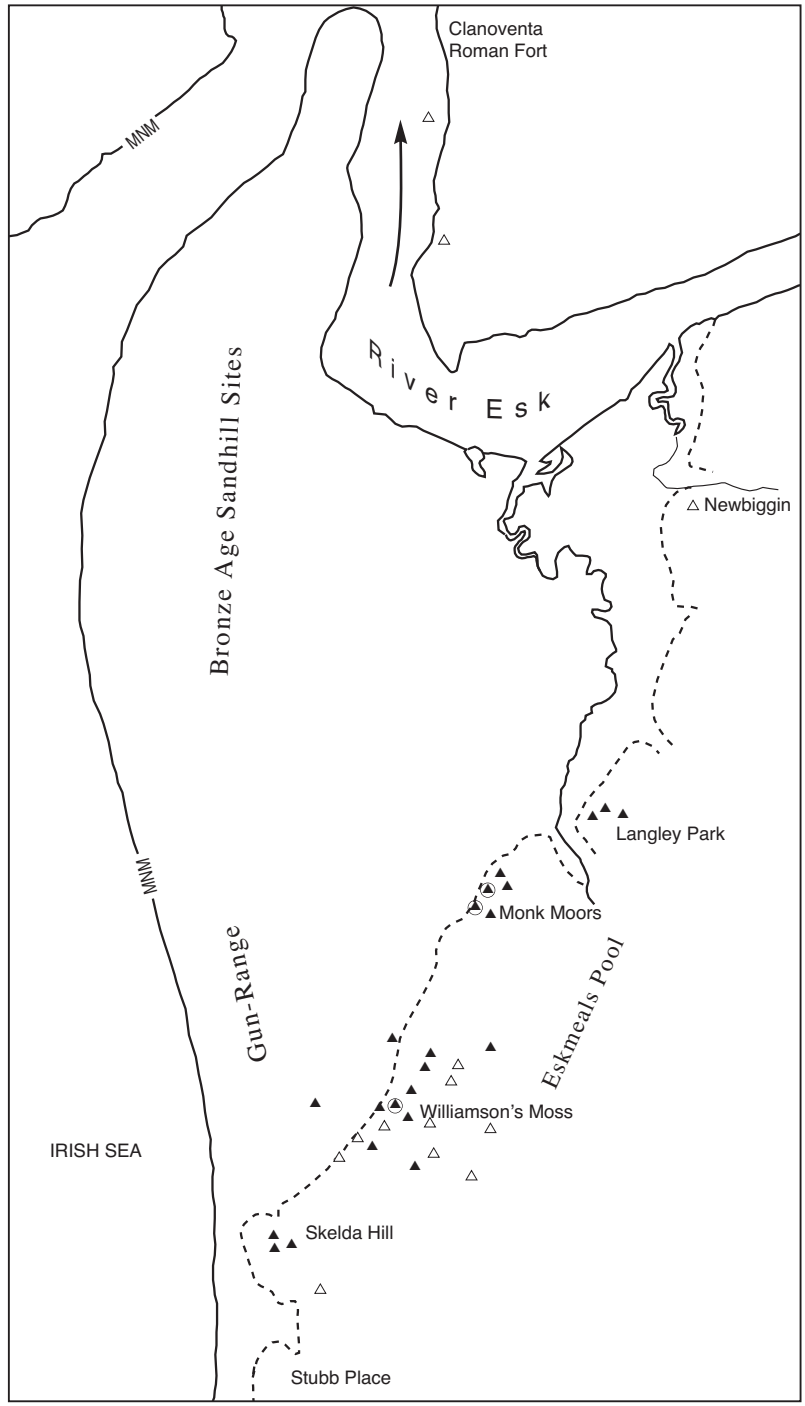

FIG. 2. Eskmeals Sites showing how the clusters lie mainly along the 25 foot contour (shown as a dotted line). ▲ are the sites excavated, ▲ are the sites with definite Mesolithic component and △ indicates a scatter of material with at least some Mesolithic component.

a small proportion may have come from the tuffs which outcrop in the vicinity of Ullswater and Haweswater, both easily accessible from the Shap area (Davis in Cherry, 1987c and 1995). A similar conclusion has been reached for a group of finds from the Craven District of Yorkshire, which are macroscopically indistinguishable from the Eastern Cumbrian finds (Davis in Cherry, 1998). Curiously, although fragments of polished stone axes are common in the limestone uplands, they are extremely rare in coastal assemblages. Finds of complete or substantially complete axes are relatively common on the coast and include a number of roughout axes (e.g. Cherry, 1969, 1984b).

Davis (in Cherry, 1987c and 1995) has identified fragments of axes, adzes and chisels. From wear patterns he has deduced that implements were used in both ground and partially ground condition. Fracture and wear patterns suggest that a significant number of fragments derive from the use of such implements as hoes in cultivation and clearance.

Other differences can be found when comparing artefact types between coastal and upland assemblages. For example, serrated blades and flakes are commonly found on upland sites but are extremely rare on coastal sites. The ratio between knives and scrapers – a subjective distinction but consistently applied – is twice as high on upland sites as on coastal sites. Finally, as previously mentioned, arrowheads of all types are found some fifteen times more frequently on the uplands than on the coast. This indicates a different way of life where seafood and fishing were the main sources of protein and where the post-Mesolithic settlers found the warmer, well drained land more suitable for the growing of crops.

The two areas of survey are neatly bisected by the extensive workings of the Great Langdale axe factory complex (Claris and Quartermaine, 1989). In their recent investigations into the production and dissemination of stone axes from these sources, Bradley and Edmonds (1993) have considered the evidence of vegetational history and monuments in Cumbria, and have concluded that prehistoric communities in the Eden Valley and Eastern Cumbria may have developed in a different way from their coastal counterparts. The view that there may have been two distinct social groups in Neolithic Cumbria is also supported by the evidence of petrology and distribution of hammerstones excavated recently from the Great Langdale axe factory sites (Bradley and Suthren, 1990).

Our surveys show a clear distinction between the coastal and upland settlement in the raw materials used for toolmaking. Significant amounts of good quality flint from Yorkshire were available to the upland communities. Direct evidence of the importation of good quality flint can be shown from the hoard reported at Auchenhoan, Kintyre (Saville, 1999). The amount of this superior material reaching the coast was negligible. Arguably, therefore, the coastal groups were not in the same exchange networks as the upland communities. Moreover this distinction was evident during, or had its roots in, the Late Mesolithic. The evidence from the uplands cannot be regarded as the activity of an intrusive immigrant Neolithic population derived from Yorkshire. On the contrary, exchange networks with eastern Yorkshire are clearly demonstrated by the presence of significant amounts of Yorkshire flint on Late Mesolithic sites in eastern (but not western) Cumbria.

The key to these issues, in our view, lies in the Eden Valley, particularly in the area round the Penrith henges (Topping, 1992) and Long Meg stone circle (Burl, 1994).

Very little fieldwork has been carried out in the Eden Valley to date, but probable chalk flint artefacts are recorded from Brougham, with Peterborough Ware (Fell, 1972), Murton (Fell, 1991) and Skirwith (Cherry, 1993). Connections with Yorkshire are highlighted by the finding of a "Seamer" type flint axe at Ainstable (Richardson, 1990). A systematic programme of fieldwork will be needed to establish the detailed nature and chronology of Neolithic settlement in this area, to ascertain whether the tentative arguments advanced here can be supported. The use of the limestone uplands can be explained either by communities in the Eden Valley using these well drained lands with their open grassy clearings for grazing which would be available for most of the year, or groups of herdsmen making the journey over Stainmore for the same purpose. One thing that is common to sites of all periods, is that they are usually situated on naturally well drained land with a preference for south to west facing aspects.

C. Bronze Age

There is a significant contrast between the widespread distribution of small lithic scatters of Bronze Age type and the strongly clustered distribution of (large) Late Mesolithic and (presumed) Neolithic sites. This suggests firstly that, by the Bronze Age, the landscape was sufficiently cleared to allow the exploitation of larger areas of land. Certainly the pollen evidence indicates the presence of cereal cultivation during this period. Secondly, Bronze Age patterns of activity did not, otherwise than in relation to the sand-dune sites at Drigg and Eskmeals, involve a focus of activity in specific locations.

The nature of the Bronze Age activity in the Drigg and Eskmeals sand-dunes is difficult to categorise. Within Eskmeals, activity was focussed on the extensive gravel beds of the coastal foreland. The formation of this feature is discussed in detail by Bonsall *et al.* (1989) and is considered to have taken place between 4400 and 3600 BP, in other words, during the Early Bronze Age. In the case of Drigg, whilst the most extensive sites are to be found in the gravel beds at the southern end of the dunes, there are a number of sites on the low boulder clay ridge in the northern area of the dunes. It is likely that the gravel beds at the southern end of the dunes were forming at the same time as the Eskmeals coastal foreland.

The identification of a possible wooden structure, struck flints and a hearth dated to around 2000 B.C. at the northern end of the Drigg dunes (Cherry, 1982; Howard, Davis and Town, 2001) does not shed any light on the nature of prehistoric activity in the sand-dune belt itself. In a marked contrast to the sand-dune sites at Glenluce and Walney Island, no prehistoric pottery or other occupation debris has been found at Drigg or Eskmeals. Although saddle querns are reported from both Eskmeals (Cherry, 1963) and Drigg (Cherry, 1988) these were found in areas peripheral to the main flint scatters. However, pollen evidence from the Drigg hearth site demonstrated that there was forest clearance in the general area, which would account for the presence of the querns, although there is a possibility that these are of a later prehistoric date.

There are a number of possible explanations for the extensive evidence of Bronze Age activity in the sand-dunes:

1. Harvesting of the naturally occurring food resources – until very recently there

were large colonies of breeding seabirds nesting in the dunes. The birds and their eggs would have represented a substantial and reliable food source. The sites are also close to the estuaries of the rivers Irt, Mite and Esk, providing year-round food resources (Bonsall, 1981). However, these subsistence activities do not require the large-scale production of flint implements.

2. Salt production – Although there is some slight evidence for the production of salt in the Roman period in the dunes to the south of the road which goes from Drigg to the shore, we have found no evidence of substantial hearths associated with Bronze Age material, within the dune belts, and lack of evidence for the use of pottery makes salt production unlikely.
3. Utilisation of the gravel beds as a source of flint pebbles for tool making. There is no evidence of quarrying or excavation of the gravel, but we have noted a "cache" of flint pebbles in the Drigg sand-dunes which might be prehistoric (Cherry, 1965). Evidence of flint working along the coastal strip has already been reported in the *Transactions* of the Society.

We consider that the extensive flint scatters on the gravel beds at Drigg and Eskmeals probably derive from frequent visits by an otherwise dispersed population, to obtain supplies of flint and to utilise the available naturally occurring food resources. It is, however, unclear why the Bronze Age activity in the sand-dunes at Drigg and Eskmeals should have differed from contemporaneous activity at Glenluce and Walney Island, as is implied by the finds of pottery and other occupation debris in the latter areas. The dunes at Drigg and Eskmeals seem to be still building, so that it is just possible that any evidence there might be is now buried under the encroaching sand.

Although chalk flint continues to appear sporadically in Bronze Age assemblages on the coast, flint pebbles are overwhelmingly the most common raw material used in tool making. The finds from Mecklin Park, Santon Bridge (Fletcher, 1985), only ten kilometres from the coast, offer a sharp contrast. Artefacts of chalk flint of Yorkshire origin, beads apparently of Yorkshire jet and fragments of Yorkshire Vase Food Vessel distinguish this site as unusual and show that the distinctions in raw material use we have identified between eastern uplands and the western coastal region of Cumbria during the Late Mesolithic and Neolithic persisted into the second millennium B.C.

Coastal assemblages are dominated by small scrapers. Other tool forms, particularly arrowheads, are rare. Having said that, arrowheads of barbed and tanged and oblique PTD type, are considerably more common than leaf shaped or chisel arrowheads. Hunting appears to have assumed greater importance in the Early Bronze Age than in the Neolithic, but it remains reasonable to infer heavy reliance on seafood as a source of protein throughout.

On the limestone uplands, we have identified two features in sites categorised as Early Bronze Age, by the presence of barbed and tanged arrowheads and Beaker pottery (Cherry, 1987c). Firstly, they tend to occupy the higher ground in the area surveyed. Secondly, a high proportion of arrowhead types unassociated with other occupation debris is of barbed and tanged type. These probably represent casual hunting losses, and show that (as in the case of coastal sites), hunting was increasing in importance during the Early Bronze Age. Beaker pottery is much less common in the limestone uplands than Peterborough ware and Grooved ware, occurring at only

four sites.

In contrast with the coastal sites, scrapers are relatively less common on upland sites in comparison with other tool types. Knife forms occur more frequently in the uplands, serrated blades and flakes are common on the uplands but very rare in coastal assemblages. Another distinction can be drawn between finds of flakes of volcanic tuff deriving from the use or reworking of polished axes or similar implements.

Although these uplands reveal widespread evidence in the form of structural remains of stone (cairns and field systems), there is nothing in the distribution of the lithic scatters to hint at any connection between them and any of the structural remains. There are no lithic scatters comparable with those we have identified in the Craven District of Yorkshire, as being likely to postdate the Early Bronze Age (Cherry, 1998). There, a small number of sites revealed a crude flake industry, dominated by local chert, suggesting that exchange networks for supplies of flint had ceased to operate effectively.

It has been suggested that some or all of the cairnfields which are to be found on the higher ground in the hinterland of the West Cumbrian coastal plain, are of Early Bronze Age date (e.g. Richardson, 1982). In our view, this must be treated as unproven. Sites such as Stephenson's Ground, Scale, in the Lickle Valley, are more likely to show the nature of occupation sites in the uplands of Western Cumbria during the Second Millennium B.C.

Conclusions

We should not overlook the limitations of evidence derived from surface collections of artefacts. Nevertheless, we consider that there is evidence from which the following conclusions can be drawn.

1. Activity in the areas we have surveyed, during the Early Mesolithic, was at too low a level to be demonstrated with any certainty. It remains to be seen whether evidence for Early Mesolithic occupation emerges in the Eden Valley.
2. Significant concentrations of activity began during the Late Mesolithic. The existence at this stage of different exchange networks can be shown from the use of different raw materials for toolmaking. However, all Late Mesolithic communities in Cumbria appear to have been familiar with the use of volcanic tuff for toolmaking.
3. Such dating evidence as exists, shows that Late Mesolithic technologies continued in use well into the 4th millennium B.C., so that in chronological if not cultural terms, Late Mesolithic communities in Cumbria were contemporaneous with Early Neolithic communities in East Yorkshire.
4. We cannot identify any Early Neolithic toolmaking tradition in Cumbria which lacks Late Mesolithic features. There is evidence, on both coastal and upland sites, for coincidence of Late Mesolithic and Neolithic artefacts, which again suggests the continuation of Late Mesolithic traditions throughout the Early Neolithic period in Cumbria.
5. The importation of significant quantities of flint originating in East Yorkshire began at a time when Cumbrian communities still used Late Mesolithic technologies, but cannot be shown to pre-date the inception of the Early Neolithic

in East Yorkshire. The importation of this flint increased in quantity over the Neolithic period, so that during the Late Neolithic and Early Bronze Age, it became the dominant raw material for toolmaking in East Cumbria. As is well known, over the same period, significant numbers of stone axes deriving from the axe factories of the Central Lake District found their way to East Yorkshire.

6. Pottery finds of any significance are limited to East Cumbria. Pottery from this area appears to be of local manufacture. What few observations can be made of form of decoration of vessels do not show any close similarity with finds from East Yorkshire. This suggests that groups of people were not moving between the two areas during the Neolithic, but were in contact, as the movement of stone axes to the east, and flint to the west, demonstrates.
7. Communities in West Cumbria retain their distinctive development throughout the Neolithic period and into the Early Bronze Age. If those communities had obtained access to good quality chalk flint during the 3rd Millennium B.C., it is impossible to believe that they would not have made use of it.
8. Late Mesolithic – and probably Early Neolithic – activity, both on the coast and in the uplands, created concentrations of dense lithic scatters in areas which were favoured. In contrast, Late Neolithic and Early Bronze Age activity in both these areas resulted in a diffuse scatter of smaller sites, widely spread across the landscape.

Much more work remains to be done. In particular, the establishment of a chronology for Late Mesolithic activity in the limestone uplands of East Cumbria, will demonstrate whether it is in fact contemporary with the Yorkshire Neolithic. If that can be shown, it will have significance for our study of the axe factories of the Central Lake District, and the distribution of their products. Also, the extent and distribution of prehistoric activity in the Eden Valley needs to be investigated. Our expectation that there will be Early Mesolithic material in the Eden Valley may not be fulfilled. The "boundary" between communities reliant on Yorkshire flint, and those dependant on local lithic resources, may be demonstrable on the ground. If our conclusions are correct, that "boundary" will be sharp rather then gradual. The Penrith henges and the great stone circle at Long Meg, need to be set among the remains of the people who built them. If our surveys continue to provoke more questions than they have so far answered they will have been worthwhile.

ARTEFACT TOTALS

Flint	**Total Coastal**	**Total Uplands**	**Total All Sites**
Waste Flakes (including burnt)	49,089	4,915	54,004
Cores	4,058	243	4,301
Core Trimmings	263	114	377
Bulbar Rejects	1,144	126	1,270
Blades	2,088	601	2,689
Microliths	449	62	511
Microburins	96	2	98
Retouched/Utilised Blades	454	232	686
Retouched/Utilised Pieces	1,572	459	2,031

Flint		**Total Coastal**	**Total Uplands**	**Total All Sites**
Scrapers (including Core-scrapers)		1,204	276	1,480
Knife-forms		137	190	327
Fabricators		8	10	18
Awls		94	19	113
Arrowheads	Tanged & Barbed	22	16	38
	Tranchet	9	33	42
	Leaf	7	37	44
Chalk flint (including retouched)		20		20
TOTAL		60,714	7,335	68,049
Chert				
Waste				6,545
Cores				650
Core Trimmings				106
Blades				624
Retouched/Utilised Blades				55
Bulbar Rejects				170
Microliths				44
Scrapers				114
Knife-forms				33
Miscellaneous Retouched Pieces				221
Arrowheads	Tanged & Barbed			1
	Tranchet			0
	Leaf			3
Awls				7
Fabricators				8
TOTAL				8,581
Volcanic Tuff				
Waste Flakes (including lumps)		464	197	661
Cores		39	3	42
Blades		108	0	108
Microliths		9	0	9
Microburins		1	1	2
Bulbar Rejects		44	0	44
Scrapers		11	0	11
Core Trimmings		6	2	8
Retouched Pieces & Blades		26	6	32
Axes		6	2	8
TOTAL		714	211	925
Potsherds (including small crumbs)		2	255	257

The overall total, including the finds from Levens are as follows:
Flint 69,568: **Chert** 9,023: **Volcanic Tuff** 936 and **Potsherds** 257 (including two Beakers from Levens). The small numbers of identifiable chert artefacts from the coastal sites were insignificant and have not been included. It must be emphasised that the totals given here represent only the surface finds, repeated visits to sites after further ploughing have always produced another crop of artefacts (e.g. the total number of flints from Eskmeals including those from the excavations is more than 100,000).

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