THE NORTH-WEST WALES LITHIC SCATTERS PROJECT

G.H. Smith

ABSTRACT

This paper summarises a project carried out in north-west Wales as part of a wider project in Wales funded by Cadw and designed to assess the resource provided by lithic scatters, and collections deriving from them. The work in north-west Wales also included general assessment of actual lithic scatter sites, some detailed evaluation of individual sites by different methods, including geophysics, soil and palaeo-environmental work, and some trial surface collection. The work provided an up-to-date synthesis of present knowledge, provides new suggestions about depositional environments and about the identification of inland activity areas in the Later Mesolithic period.


Key words: Lithic scatters, Mesolithic, Neolithic, soil analysis, geophysics, pollen analysis, colluvial, coastal environment

INTRODUCTION

A project has recently been taking place in Wales, funded by Cadw, to re-assess all the known lithic scatters and finds. This paper summarises the work in the north-west, carried out by Gwynedd Archaeological Trust. The project had its origins in a paper commissioned by Cadw, which assessed the overall archaeological resource in Wales, as represented by the regional Sites and Monuments Records, and which provided priorities for future conservation and research (Musson & Martin 1998). It identified cultural periods, site types and geographical areas where knowledge was lacking and others where statutory protection was unrepresentative. One of the priorities was the identification of sites of earlier prehistoric settlement, represented mainly by lithic scatters, sites that were poorly represented in terms of research and statutory protection. Similar objectives had previously been identified in England by the Monuments Protection Programme (MPP) of English Heritage, endorsed in 1992 by the Ancient Monuments Advisory Committee, recommending that surface lithic scatters, as manifestations of prehistoric activity, were a neglected aspect of the archaeological resource and in need of assessment and possibly protection. Two papers subsequently proposed further work (Schofield 1994; Schofield & Humble 1995) and a pilot project was carried out in 1993–6, studying four sample areas comprising Buckinghamshire, Cornwall, Oxfordshire and West Yorkshire. This was a major desk-top study, which recorded a total of 3290 scatters, and 1738 stray finds (Schofield & Humble 1997) and led to the production of a published guidance note (Schofield 2000). There are relatively fewer recorded lithic finds in Wales than in England, making it feasible to carry out a country-wide assessment and this was completed between 2000 and 2004 (Cambria 2004; Locock 2000, 2002a & 2002b; Silvester & Owen 2002; Smith 2000).

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The project in north-west Wales was aided by the relatively small number of recorded lithic find spots, of which there are 340 in total, 126 of flint or chert, the remainder being stone axes, axe-hammers or perforated hammers. Records of the latter stone objects were collated as part of the first stage of the present work, but further study was confined to occurrences of flaked flint or chert. Flint and chert both occur as significant proportions of assemblages but are quite rare raw materials here because they mainly derive from secondary contexts in the glacial till or in beach deposits eroded from the till. Other materials were also occasionally used for flaking, including crystal quartz and metamorphically altered shale. The rarity of flint and chert finds means that they have not figured greatly in antiquarian and archaeological work. Finds of non-flint stone tools such as axes and hammers are more frequent and suitable raw material was more readily available, from the Neolithic axe factory sites at Mynydd Rhiw, Aberdaron (Houlder 1961) and Graig Lwyd, Penmaenmawr (Warren 1922), products from the latter being transported widely across Britain. There were only a few recorded finds of flint in the 19th century, one of which was a ‘hoard’ of possibly imported flint flakes from Cors Bodwrog, Anglesey (Lynch 1991: 115–6) and it was only in the 20th century that more widespread finds were recorded. These mainly came from well-frequented coastal areas like Penmon and Newborough, Anglesey. Then and now, finds from within the mountain area are almost absent although one notable discovery was a hoard or cache of large imported, possibly mined flint blades found on a mountain ridge near Penmachno, Conwy (Davies 1939).

Despite the rarity of substantial scatters there has been a growing awareness that flint and chert are fairly ubiquitous in the landscape and typically, wherever excavation has taken place on sites of more recent periods the occasional piece of worked flint is found. The potential for the presence of inland surface scatters was something that the project aimed to study. Recently, extensive archaeological work had taken place in advance of construction of some 20 miles of new road across Anglesey and many of the trial trenches and all the more extensive excavations have produced small amounts of worked flint or chert (Davidson & Hughes forthcoming).

**AIMS AND METHODOLOGY**

1. To create a database of primary records from the HER (Historic Environment Record) and carry out a desktop assessment using discrimination criteria established, tested and refined in the English Heritage Lithic Scatters Project pilot studies (Schofield & Humble 1997), as a useful management tool and as of wider academic value.

2. To produce an overall assessment of these sites in the field using pre-defined criteria that will aid understanding and allow the development of appropriate curatorial management policies for this class of site. Sites to be assessed were those where the finds seem to result from more than just isolated examples of casual loss. Field assessment to include such factors as slope, topography, soils and land use and to record condition and threats on defined scales. Criteria used in the field assessment were potential, period, condition, survival, diversity of type, diversity of features and fragility.

3. To test methods of identifying the non-visible archaeological components of surface scatter sites. This was to be carried out by non-invasive evaluation of three sites that suggested particular potential. These would be studied by further collection, if possible, by soil auguring to test soil types and depth, by soil sampling for phosphates and magnetic susceptibility and by geophysical survey. The results would aim to improve the understanding of the processes...
that created the scatters, of what the scatters signify in terms of sub-surface features and of what might be the true potential of such sites.

4. To test the applicability and potential of surface lithic collection in lowland north-west Wales. All existing collections have been casual finds but where collection has been fairly intensive several new sites have been found. It is likely then that present knowledge is quite inadequate about the actual occurrence of lithic material in the landscape. A small sample programme of controlled surface collection will be carried out in Anglesey, of about 10 fields, to encompass a sample area of about 100 acres (40 ha). These will provide a reference point for estimation of occurrence generally.

5. To summarise the results, consider their research implications and produce recommendations for management.

**STAGE 1: DESKTOP ASSESSMENT**

Initial analysis of the HER recorded all lithic artefacts sorted into eight categories, summarised in Table 1.

<table>
<thead>
<tr>
<th>Code</th>
<th>Type</th>
<th>Number</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Flint and chert</td>
<td>126</td>
</tr>
<tr>
<td>2</td>
<td>Stone axes and axe rough-outs</td>
<td>123</td>
</tr>
<tr>
<td>3</td>
<td>Battle axes</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Axe-hammers</td>
<td>34</td>
</tr>
<tr>
<td>5</td>
<td>Grooved maul or waisted pebble</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>Perforated hammers, unclassified</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>Perforated pebble/mace</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>Unknown type</td>
<td>6</td>
</tr>
</tbody>
</table>

*Table 1: Main artefact types of lithic collections*

Descriptive and evaluation criteria were developed, based on those used by the MPP project, taking into account the recommendations resulting from that project (Schofield & Humble 1997). Criteria used in the desktop assessment were integrity, scale of collection, survival, research status, site function, information sources and assemblage size. Definitions can be found in the main report (Smith 2000). In addition, a brief summary of the objects was made together with their present locations. Although about one third are in the National Museum of Wales at Cardiff almost a half are in private ownership or lost and this is problematic for future study.

Most collections are small, under 50 pieces and result from casual collection. 33 resulted from excavation, mainly as residual finds from excavations of other periods such as the Iron Age and Romano-British settlements at Bryn Eryr, Anglesey (Longley 1998) and Graeanog, Caernarfon (Fasham et al. 1999). However, the majority could be placed into period according to diagnostic artefact types (Table 2). Of the unclassified collections some are those with only waste pieces and some are older collections, which are not available for study.

**Period summary**

The scarcity of material means that even today only occasional new flint finds are recorded. Most of the rest come from the coastal fringes of Anglesey and the Llŷn Peninsula but this
may not be properly representative because the inland lowland is now mostly permanent pasture and rarely ploughed, so there are few exposures from which finds could be made. Most surface finds come from persistent searching by those living locally and able to search when soil is exposed in occasional episodes of ploughing for re-seeding of pasture.

<table>
<thead>
<tr>
<th>Code</th>
<th>Period</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upper Palaeolithic</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Mesolithic</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>Neolithic</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>Bronze Age</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Mixed</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Unclassified</td>
<td>43</td>
</tr>
</tbody>
</table>

Table 2: Main archaeological period of collections

Occupation before the Upper Palaeolithic has not been identified in north–west Wales and all the evidence is likely to have been destroyed by the final glaciation although there are early Middle Palaeolithic finds from Pontnewydd Cave, Denbighshire, only 25km to the east, in a limestone area. There are only limited exposures of Carboniferous limestone in the north-west. Those on Anglesey are low-lying but several caves and shelters are known on the Great and Little Orme, Llandudno and two of them, Kendrick’s Cave and Ogo Tan y Bryn have produced Palaeolithic material (Aldhouse-Green 2000: 21). Palaeolithic occupation had been suspected at Kendrick’s Cave, Great Orme, as early as 1881 because of finds of drilled teeth of cave bear. Excavations by local archaeologists T. Stone and M. Davies in the 1960s eventually produced typical Upper and Final Palaeolithic ‘penknife point’ flint artefacts (Davies 1989; Green 1989).

The number of finds of Mesolithic material (Figure 1) is small compared to south–west Wales and Cornwall, despite their topographic similarities. There are six occurrences of Earlier Mesolithic material and ten certain and five probable occurrences of Later Mesolithic material. The only excavated Earlier Mesolithic site is that of Trwyn Du, Aberffraw, Anglesey (White 1978). This was an extensive working floor that had first been discovered during the excavation of a Bronze Age cairn (Houlder 1957). The flint assemblage was dominated by large obliquely-blunted pieces made from poor quality local glacial flint pebbles and was accompanied by two tranchet axes, one flint and one stone, and a number of elongated pebble tools. It produced radiocarbon dates centring around 6500 BC, uncalibrated, similar to those from Rhuddlan, Flintshire in north–east Wales (Berridge 1994). Both Trwyn Du and Rhuddlan lay on promontories overlooking estuaries, which would have been just valleys at the time of occupation with a much lower sea–level (Figure 1). There is an obvious coastal bias to the overall distribution, but the coast edge is well–walked, while most of the inland area is permanent pasture and largely unknown so this could be just a collection bias. However, most occurrences are where deeper water comes close to the present land edge. The identification of extensive Later Mesolithic material on the island of Bardsey, separated from the mainland by deep water and very difficult tidal currents shows the capability for coastal movement and exploitation (Edmonds et al. 2003).

The lack of inland sites has recently been answered in part by the discovery of Later Mesolithic activity in the Lledr valley, a tributary of the River Conwy, in the heart of the mountains near Dolwyddelan, Conwy (Figure 1). Despite the lack of ploughing, the repeated collection over several years, mainly from mole hills, by Judy and Robin Robbins has
produced a large collection of material, which includes Later Mesolithic objects from at least three separate locations around the valley. One of these was chosen for study and is discussed further below.

Figure 1: Mesolithic flint and chert finds in Gwynedd. Submarine contours at -20m and -10m OD indicate the changing position of the coastline during this period

Of all recorded flint or chert finds in north-west Wales a good number are only of undiagnostic waste pieces (Figure 1) although most are likely to be of broadly Neolithic date. The number of identifiably Neolithic finds is small and the distribution of activity is better represented by finds of stone axes and of chambered tombs (Figure 2). There are several finds of lithics from the excavation of chambered tombs such as Bryn yr Hen Bobl, Plas Newydd, Anglesey (Hemp 1935) or the smaller assemblages from the Pant y Saer chambered tomb (Scott 1933) and Bryn Celli Ddu (Hemp 1930 & 1931). The more recent excavations at
Dyffryn Ardudwy (Powell 1973), Trefignath and Din Dryfòl (Smith & Lynch 1987) have produced some of the best-documented lithics in the region. Trefignath also produced evidence of domestic activity prior to its construction. Evidence of Earlier Neolithic domestic activity was also found at the Llandygai henge excavation, Bangor (Houlder 1968; Lynch & Musson 2004) and at Capel Eithin, Gaerwen, Anglesey (White & Smith 1999). The Neolithic landscape around the chambered tomb of Bryn Celli Ddu, Anglesey has also been the subject of extensive gridded test-pit sampling in an area of permanent pasture and this produced a light but widespread lithic scatter (Edmonds & Thomas 1991).

Figure 2: Neolithic flint collections, stone axes and chambered tombs. Submarine contour at -5m OD indicates the coastline close to the present sea-level.
There are only a handful of lithic finds attributable to the second millennium BC, mainly isolated finds of arrow-heads or finds close to known monuments such as standing stones, as at Cremlyn, Anglesey or Tir Gwyn, Llanfor, Llyn or in burial contexts. There are far more stone finds of this period comprising widespread individual chance finds of axe-hammers and mace-heads. Worked flint has been found to be very sparse in the two cases where occupation areas of this period have been excavated. At Cefn Caer Eini, in inland Meirionnydd, an Early Bronze Age burial cairn overlay domestic activity with sherd’s of ‘Domestic Beaker’ or possibly Peterborough character, one flint convex scraper and 47 waste flakes associated with a radiocarbon date in the early to mid-third millennium cal BC (Lynch 1986). At Meyllteyrn Uchaf the excavation by Richard Kelly of a complete small settlement of the Middle Bronze Age comprising three round houses and their enclosure, produced only 19 pieces of flint or chert of which the worked pieces comprised two ‘thumbnail’ convex scrapers and a serrated flake associated with radiocarbon dates between c. 1400–950 cal BC (Ward & Smith 2001).

STAGE 2: FIELD VISITS AND MONUMENT EVALUATION

Evaluation was carried out on the basis of the desktop study, using the four criteria that were regarded as most useful in the MPP studies, these were Integrity (the extent to which a scatter has discrete boundaries), Scale, Survival and Archaeological Record. It was found that the scores did not provide a useful discrimination of value that could be used to select sites for the second stage of the project. The main reasons were that few of the collections here are typical ‘surface scatters’ and a low score in another criteria often cancelled out a high score in one criterion. A further discrimination criterion of Potential was therefore used, based on a simple continuum from a Low value for a single isolated find to a Very High value for a large collection with some identified stratigraphy or a high or in progress threat. This was supplemented by a category of ‘needing further assessment’ particularly where the findspot needs to be properly identified or where there is a possibility of association with an existing monument such as a standing stone. Collections from scheduled ancient monuments were excluded from the assessment. The recorded potential gave a useful classification but one that did not correlate with the values recorded by the sum of the other criteria values (Table 3). 36 locations were eventually chosen for field visits, comprising those of Medium, High or Very High potential plus those needing assessment but excluding some sites, for instance those derived from excavations, and old collection sites that could not be located. Some collection sites whose general topographic position had been identified were included and some were relocated. Those find sites on Bardsey and St Tudwal’s islands were also left out for reasons of inaccessibility.

<table>
<thead>
<tr>
<th>Potential</th>
<th>Number</th>
<th>Mean sum of other criteria values of these collections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Low</td>
<td>42</td>
<td>7</td>
</tr>
<tr>
<td>Medium</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>High</td>
<td>35</td>
<td>7</td>
</tr>
<tr>
<td>Very High</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Scheduled site</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Further evaluation needed</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 3: Lithic collection sites classified according to the criterion of Potential compared to the mean sum of monument evaluation criteria values for Integrity, Scale, Survival, and Archaeological record (excluding values for excavated sites). Range of possible mean sum values: 4–12.
The field visits were very useful because, unlike many standing monuments, most of these sites had never been assessed in any way and many had not been visited since they were first discovered, some over 60 years previously. Even those discovered in quite recent years often had no information about context and only a general description of location. In several cases, new in situ material was found that allowed the find spots to be identified exactly. In other cases it was possible to identify the locations by visiting the site and comparing the descriptions with the local topography or by contacting the original collectors for further information. It was the availability of soil exposures that largely determined the ability to understand each site. The least productive locations were actually those that best fitted the expectation of a ‘surface scatter’, that is from a ploughed field and all these were invisible under grass pasture when visited.

The field survey recorded descriptive items about location as well as land use threats. It also carried out a further monument evaluation based on criteria of condition, vulnerability and potential. This identified all but three of the sites as of medium or higher potential, four sites as of particular value and four sites as at significant risk.

A ‘Colluvial value’ was also assigned, which recorded whether a site was depleting, stable or aggrading. Most were found to be slightly depleting with only four aggrading. In terms of topography 23 out of 36 were located in the coastal fringe. In nine of these cases the identification of the exact origin of material during the visits by the collection of new in situ pieces showed that lithic material was not eroding out of the surface at the coast edge but from buried levels of colluvium on slopes. Interest in these sites was first raised by the identification of an undated flint site at Trefor, Clynnog Fawr during a previous coastal survey for Cadw (see Trial Site Evaluation, below). This observed that a significant amount of lithic material was eroding out of a quite steeply sloping face in an exposed edge of an old mining trial level. The steepness of slope of the layer and the varied angle of the flints within it showed that they must have moved down slope, presumably from a working area on more level ground on a ridge further uphill. The occurrence of the flints in this colluvial layer was taken to be the result of a localised environmental erosion event such as might occur due to winter storms close to the sea edge. However, similar situations were discovered at eight other sites both in Llŷn and Anglesey of sites that have produced Later Mesolithic material and in one case Early Neolithic material. The implication is that all these sites, which are now well grassed over, apart from occasional terracettes, have, at some time in the past, suffered from a period of major vegetation and soil denudation. It means that the original location of activity should be sought further inland than the coast edge location of the artefacts.

This can be illustrated by one example, Pared Llechymenyn, Aberdaron, Llŷn, a small, exposed rocky cove backed by high, sheer cliffs on the south-west facing coast of the Llŷn peninsula. The sea-bed shelves quite steeply here compared to much of north-west Wales so the coastline would have been quite similar even with lower sea-levels. Several small collections have been made here in the past (Maltby et al. 1938; M. Griffith pers. comm.). The latter finds have been identified by Dr Stephen Aldhouse-Green and include pieces of Later Mesolithic type. Most of the material is patinated to a light creamy grey. There are overall about 100 pieces including a narrow-blade scalene triangle microlith, two notched distal blade segments, a microburin and a notched flake (Figure 3). The finds come from the exposed faces of terracettes amongst stony colluvium on steep, sloping coast edge above cliffs at the south-east side of the cove (Figure 4). They are likely to have originated further up the slope where there is a more level area from which a separate small collection has been made, although with no diagnostic pieces. The same situation is likely for other small coast edge
collections and has been demonstrated by recent work on Bardsey Island. There have been several small casual collections of lithics from the coast edge on Bardsey including one from colluvium, which contained several blades, a denticulate scraper and a narrow-blade scalene triangle microlith. By chance a pasture field nearby was ploughed and observed, revealing a considerable collection of lithic material, which was then collected in a formal manner and has subsequently been test-pitted. It already comprises several thousand pieces and includes similar narrow-blade microlithic material to the previous casual finds and is now the subject of an ongoing research project (Edmonds et al. 2003).

Figure 3: Pared Llechymenyn. 1–2: Notched blades; 3: Microlith, scalene triangle; 4: Proximal microburin; 5: Notched flake. Scale 1:1.

Figure 4: Pared Llechymenyn. Location of flint finds in relation to topography. Based on Ordnance Survey 1:10,000 maps © Crown copyright. All rights reserved. Licence number AL 100020895.
STAGE 3: TRIAL SITE EVALUATION

Fieldwork design

This aimed to evaluate a selection of three sites identified as of particular potential from the desktop study and field visits. The sites chosen were Boncyn Ddol, Dolwyddelan, Conwy, which had produced Early and Later Mesolithic and Early Neolithic material (Figures 5–6), Trefor, Gwynedd, which had produced an undiagnostic assemblage and Trefarthen, Brynsiencyn, Anglesey, which has produced undiagnostic waste flakes closely associated with a polished stone axe and a flaked stone pick (Figure 7). Boncyn Ddol is small knoll in a deep inland valley now under permanent pasture although it has been ploughed as a hay meadow in the past. Trefor is a small grassy and rocky ridge at the edge of coastal cliffs. Trefarthen is a lowland field that is regularly ploughed.

Figure 5: Location of Boncyn Ddol, Dolwyddelan. Possible edge of former lake Llyn Dolwyddelan shown at 181m OD contour. Based on Ordnance Survey 1:10,000 maps © Crown copyright. All rights reserved. Licence number AL 100020895.

The Boncyn Ddol site is the only one that will be discussed in detail here. It is one of three sites identified in the upper Lledr Valley, all in partly improved pasture and the finds have been made piecemeal over several years by collections from molehills, river banks, ditch cuts and other minor exposures. Boncyn Ddol appears to be the most extensive area of activity, on a low knoll of better-drained land within the marshy floor of the valley. The other two are Ty’n Ddol quarry, another knoll and Ty’n Ddol meadow, by a small stream.

The mound of Boncyn Ddol (‘Meadow of the little cliff’) lies at 185m OD and provides a small promontory of relatively level land, raised above the peaty valley floor. This peat, about 0.80m deep, overlies preserved woody remains and it has been suggested that it occupies the area of a former lake, Llyn Dolwyddelan, shown on Saxton’s map of Caernarvonshire of 1578.
and Speed’s of 1610 but not on any subsequent maps (Figure 5). The valley was probably drained in the 18th or early 19th century.

The Boncyn Ddol collection includes about 500 pieces of flint, three pieces of banded chert, and one piece of black chert, all from glacial pebbles. There are also 15 pieces of worked crystal quartz. The waste pieces are dominated by small blades or blade segments, which form about a quarter of the total of waste flakes. There are very few irregular fragments despite the poor material and eight of the 10 cores are conical, single platform. There are 17 retouched pieces including three scrapers, a spurred piece, two broad-blade microliths, eight narrow-blade microliths and part of a possible edge-worked leaf-shaped arrow-head (Figure 6). There are also two microburins and several casually retouched pieces.

![Figure 6: Boncyn Ddol, surface collection. 1: Possible arrow-head fragment; 2–3: Broad blade microliths; 4–10: Narrow blade microliths; +: Bulb of percussion present; ●: Direction of missing bulb; ○: Probable direction of missing bulb. Scale 1:1.](image)

**Summary results**

It is only possible to provide a summary of the results of the three site studies here. At each site a contour survey and geophysical survey by gradiometer were carried out. A gridded pattern of soil pits was dug to record soil depth and to collect samples, which were analysed for magnetic susceptibility and phosphates by Dr John Crowther of the University of Wales, Lampeter. The previous lithic collections were also studied. In addition, at Boncyn Ddol, nearby peat deposits were sampled for pollen analysis and a limited grid of test trenches were dug. At Trefarthen a gridded surface collection was also made after the field was ploughed.

**Soil depth study**

This showed that there were no stratified layers at Boncyn Ddol or Trefor with only thin topsoil over the subsoil. At Trefarthen, however, in the lowland of Anglesey, there was a considerable depth of material, deepest in a low valley where colluvium must have collected, and this would have an effect on both the interpretation of the surface collection and on the geophysical results.
Soil analysis
At Boncyn Ddol there were significantly higher magnetic susceptibility readings in the lithics area than in controls and there was also enhancement of the phosphate readings. These all suggested potential for further work, needing surface collection or test-pitting. At Trefor the results were all very variable, suggested to result from soil movement and it was suggested that further work would be more productive on the summit of the ridge, where the material was thought to have originated. At Trefarthen the results were very even and uninformative, probably because of the depth of soil and prolonged mixing by cultivation.

Geophysics
This was carried out by David Hopewell of Gwynedd Archaeological Trust. At Boncyn Ddol and Trefor there were no significant anomalies. At Trefarthen, however, a probable sub-circular enclosure was identified, c. 30m diameter, in the area where the original surface finds had been made (Figure 7).

Contour surveying
This was mainly of use in defining the areas of study, but at Boncyn Ddol the topography was of particular interest because of the possibility that the valley had once held a lake. Peat beds in the valley bottom could be shown to lie below a break of slope, presumed to mark the possible lake edge. This could have a direct bearing on the location of the lithics site, occupying a low promontory extending into the lake (Figure 5).

Palaeo-environmental analysis (carried out by Astrid Caseldine and Kate Griffiths of the University of Wales, Lampeter)
There were only suitable deposits at Boncyn Ddol. Here three columns were cut into the valley peat adjacent to the area where the majority of casual surface finds had previously been made and two of these were studied for their pollen record (Caseldine & Griffiths 2004), summarised here. The peat was up to about 85cm deep and sampling was restricted to the lower half of the columns. Radiocarbon dates show that the peat deposits from these levels span the period between the mid fifth to mid third millennia cal BC and the analysis supports the archaeological evidence that there was activity here, perhaps intermittently, over a long period. The earliest evidence shows alder well established with mixed woodland, including pine, elm and oak in the vicinity and the presence of some charcoal might suggest human activity. Plantago appears first soon after the mid fourth millennium coinciding with a slight peak in charcoal. Subsequently a fall in elm is accompanied by the occurrence of a flint flake and more charcoal and occurrence of open ground taxa suggesting small-scale opening of the woodland canopy. After about the mid-third millennium there are fluctuations in the arboreal record and increased representation of herbaceous taxa, especially Rumex, accompanied by increased values for charcoal suggesting increased activity in the area or activity close to the site.

Surface collection
Surface collection in a controlled manner was only possible at Trefarthen. Conditions were not ideal because the surface had to be walked before the soil had weathered so the resulting collection was smaller than it could have been. Relatively few worked pieces of flint were found but they showed a distinct pattern, with a concentration in the area of the probable enclosure (Figure 7). Observation of the soil exposed after ploughing also showed a stonier area where the enclosure bank should be and this showed as a slightly raised area on the contour survey.
Summary

The approach was quite experimental in this region and each site was quite different in character. It was not known whether the techniques would be productive. The various techniques have been only partially successful in defining, or understanding the activity and
all need following up by actual excavation, not just to understand the sites but also to help interpret and evaluate the techniques themselves.

So far only Boncyn Ddol has had the benefit of limited excavation of eight metre square test pits at the east end of the knoll, where the greatest concentration of surface finds had come. These trenches produced surprising results, with about 80 pieces of worked flint and 6 pieces of crystal quartz. The waste pieces were dominated by flakes not blades and the only formally retouched pieces were three thumbnail scrapers. One of the trenches revealed three small pits, one of which was excavated and produced some burnt stone, burnt clay and charcoal. The latter produced a date of 3340+/-70 BP (Beta-128500), 1765 to 1450 cal BC at 2 sigma, representing a period of activity that had not been identified from the previous surface collections. This indicates that not only were there various periods of activity on the knoll and around the valley, but that they might be present in quite well-defined areas. Future work should comprise a more widespread programme of test-pitting to produce a general distribution plan of the lithic scatters. This is the first place where any widespread activity of these periods has been identified within the whole of the north Wales mountain region. Its identification is due to intensive and repeated collection over a number of years. It indicates that similar activity should be found at other similar locations among the numerous river valleys. Such sites will not be in cultivated areas and will not be available for formal surface collection. They might be identified initially by casual collection but will need test-pitting.

Trefor was a coast-edge site on a slope beneath a rocky ridge. None of the techniques used were really successful but do suggest that the lithic material originates from activity on top of the ridge. The trial work should really have included more of this area and further work needs to be done there. The lithic collection comprises over 300 pieces, characterised by flakes, not blades. It includes several small single platform cores, probably dependent on the pebble flint available but the only retouched piece is a small spurred piece on a thick flake and the date of the assemblage remains uncertain.

Trefarthen was more like the lowland lithic scatters typical of England. The results show that such scatters can be usefully evaluated by most of these techniques. However, some excavation is needed to provide a firm understanding of the site and the context of the lithics.

**STAGE 4: SURFACE COLLECTION TRIAL**

This was designed to provide a small sample of the Anglesey landscape to give some idea of the general occurrence of lithic material rather than to try to locate new sites or produce any kind of distribution map. Anglesey is a lowland landscape, much of which has been used for arable farming since prehistoric times but which is now largely semi-permanent pasture. There are many Neolithic monuments and many casual finds of axes but very few finds of worked flint apart from those from excavations of funerary sites or secondarily in later settlements. This part of the project could only be carried out thanks to help from students of the Department of History, University of Wales, Bangor and from members of the Friends of Gwynedd Archaeological Trust. It was hampered by a very wet season and by a lack of ploughed fields at the times available for work. In total only six fields were walked, comprising 58 acres (23ha), whereas it had been hoped to survey 100 acres. Gridded collection was tried first but was found to be impractical because the amount of surface lithics was found to be very slight and because each field had to be completed in one day. Subsequently survey was by line walking with plotting of individual finds. This might
identify concentrations of finds that might be further defined by gridded collection at a later date.

The six fields were in four areas, all in south Anglesey, an area where the concentration of chambered tombs and finds of stone axes suggest extensive Neolithic land use. Cefn Poeth was on the north slope and foot of a ridge and produced a very light scatter of undiagnostic pieces of flint concentrated towards the foot of the slope. The only retouched piece was a thumbnail scraper. Llanedwen was a field on a gentle slope above the Menai Straits, just south of the Neolithic chambered tomb of Bryn yr Hen Bobl. It produced no struck flint but a scatter of flint and chert pebbles, natural flint and chert fragments and a flake of Graig Lwyd stone. Rhuddgaer is a prominent low hill overlooking the Menai Straits and is the site of a probable high status Romano-British enclosed settlement and a suitable site for earlier prehistoric settlement. Three fields here were walked where the land sloped down towards a small river. Between them they produced only three flint flake fragments, one irregular fragment and two flint pebbles. Trefarthen was the site of previous casual finds and has been discussed above. In general the total area walked was too small to provide a useful sample but does show that lithic objects are present at low levels in the landscape and that actual areas of activity such as settlement should be recognisable from surface scatters although the density will be low.

**DISCUSSION**

The primary aim of the project was fulfilled in simply identifying what was there and providing an up-to-date overview. The number of finds has increased greatly since the production of the Gazetteer of Mesolithic Sites (Wymer & Bonsall 1977) and Jacobi’s synthesis of 1980. Most of the finds are already recorded on the Gwynedd HER with a few additional finds listed in the collections of the National Museum of Wales (Burrow 2003). The work has also been of benefit to management in assessing the value and vulnerability of each lithic find location as described above. Generally the condition of the majority of sites was seen as good or stable but four locations were identified as at risk and deserving some attention. Four other locations were also identified as of highest potential although the lack of known structural remains means they fall outside the scope of statutory protection. There are, however, a few collections from excavations of monuments that are already protected, such as the chambered tombs of Trefignath and Dyffryn Ardudwy and the buried land surfaces beneath such monuments is an especially useful resource for the future.

The varied origin and small size of most of the collections and the lack of controlled recovery makes it impossible to carry out any general analysis or say a great deal about distribution. It also means that there can be no in-depth analysis which might distinguish between sites or areas of industrial or domestic activity as carried out by Entwhistle and Richards (1987) and Bradley (1987).

The coast edge sites of most of the Mesolithic finds are probably best viewed as spring and summer campsites. All are in positions exposed to prevailing winds but the headland positions are close to deep water and strong tidal flows and are favoured for modern shore-fishing. Mackerel shoals come close to these points in the summer months. The high cliffs of these promontories are also favoured sea-bird nesting sites and egg collecting could have been an important spring food source. The coast edges were also places where flint and chert would be collected, either from eroding edges of the glacial drift or from beaches. There may have been places where flint pebbles could have been found in large sizes, in particular glacial deposits or due to tidal action. The inland sites might be transitory hunting or collecting sites, of which
Penbol Uchaf may be one such, or autumn and winter base camps of which only Dolwyddelan is representative at present. There, salmon and sea-trout may have been an important food source, moving up the rivers in the summer and autumn.

The distribution of sites of the Mesolithic period is also affected by sea-level changes. The known coast-edge sites happen to be close to deeper water where the coast edge now may not be greatly different from the past. There may have been equally as many sites in lower-lying areas where the coastline was several miles beyond the present and is now submerged (Figure 1). On the coast of Cumbria, where the land has risen, preserving the earlier coastline, concentrations of Late Mesolithic sites were found close to the level of the maximum marine transgression at +8m OD, and close to resource-rich estuarine areas (Cherry & Cherry 1996).

Another factor contributing to the distribution pattern is the masking of early land surfaces by peat development. Study of intertidal peats in this area shows that most are actually coastal exposures of low-lying terrestrial valley or coastal plain peats that developed as a rising sea-level impeded drainage (Dorning 1999; Smith 2002). There are also inland peats in valleys, as at Dolwyddelan and on upland plateaux and in lowland and upland basins. Sites buried by peat will only occasionally be revealed, as at Penbol Uchaf, Anglesey (Figure 1), exposed at the eroding edge of a reservoir.

Finds of Neolithic material are sparse but are likely to include most of the unclassified collections (Figure 1). In Cumbria it was found that coastal Neolithic sites were difficult to identify because of a lack of diagnostic artefacts (Cherry & Cherry 1996). There, as in northwest Wales this was partly because the raw material was small glacial pebbles, which led to a restricted range of products. This was demonstrated in a domestic assemblage buried under the Trefignath chambered tomb, associated with a radiocarbon date of 5050+/-70 uncal. BC (HAR-3932). There the pebbles had been generally split on an anvil and the main tools were small convex scrapers plus a range of small and irregular versions of other tool types including knives and piercers (Healey 1987: 50–1). Some better quality flint from elsewhere in Britain was being introduced by this time and used for artefacts such as knives and arrow-heads, recognised here at Trefignath, Llandygai and Capel Eithin and at Brenig, Denbighshire (Lynch 1993).

Lithic finds of the second millennium are even sparser, with only 14 collections, these mainly single arrow-heads or finds in funerary contexts, although there are over 80 finds of stone axe-hammers and mace-heads and over 500 round barrows or cairns are known. The very sparse finds from the Meyllteyrn Uchaf settlement already mentioned, which was discovered by aerial photography followed up by geophysics, suggests that without these, surface collection alone may have been unable to locate the site.

Further sample surface collection is needed in different regional and topographic areas before there can be any better understanding. However, the low density of artefacts and the lack of cultivated land mean that the usual type of surface collection design is inapplicable. A wide range of approaches is needed and collection needs to be able to exploit occasional cultivation episodes and to make best use of these by rapid overview survey with detailed collection from specific sub-areas. More detailed study may need to use test or shovel pitting, and targeting of particular topographic locations such as near springs, on coastal or riverine promontories, in the vicinity of stone axe finds, of extant funerary monuments or of cropmark evidence, as demonstrated by the work at Bryn Celli Ddu (Edmonds & Thomas 1991).
The study has emphasised that it is important to look at the exact context of lithic finds, as well as their overall distribution and local topographic location. This has been demonstrated by Waddington (1999) in the Milfield Basin, Northumbria. Lithic artefacts in the topsoil are exposed to a greater extent on cultivated slopes and so their apparent density is increased. The same must be the case on slopes where colluvial movement has occurred and then been eroded on the coast edge of Llŷn and Bardsey Island. The distribution of finds here then represents exposures rather than the actual sites of activity. On the other hand, where colluvium or ploughsoil collects, as in a lynchet, there may be a greater number of lithic artefacts present in the soil as a whole, but these will be represented by a lower surface density (*ibid*). This factor must be taken into account in all inland collections where cultivation has taken place, as at Trefarthen (Figure 7).

Geophysics and geochemical study of surface scatter sites elsewhere has been shown to be useful but of diffuse effectiveness, for example in Bradley’s work on the Dorset Cursus (Bradley 1987) and the same has been the case here. However, every possibility needs to be explored, depending on the exact local conditions. Soil studies have indicated possibilities for future work at Dolwyddelan but geophysics was unproductive. The opposite was the case at Trefarthen where the soil chemistry had been affected by very prolonged cultivation, but geophysics revealed an enclosure, which may be of Neolithic date. However, in both cases actual excavation is needed to validate the results. At Dolwyddelan, limited test-pitting demonstrated the presence of some sub-soil features, too small for geophysics to identify whereas at Trefarthen the nature of the features that created the distinct anomalies and the extent of their survival is still unknown.

As a further stage all the existing collections need proper study and recording with identification of raw materials, technology and typology. Unfortunately, the survey showed that many lithic finds are in private ownership and may be difficult to gain access to, because of the popularity of flint collecting. The raw material sources themselves should also be studied to add depth to the picture, even though glacial pebbles account for most. Controlled sampling of beaches and eroding coast-edge drift could show if material is well distributed or clumped. It could also show whether there is any variability in the drift or beach raw material, whether in size, colour or quality. Chert was the dominant material at Trefignath chambered tomb, for instance but was thought to derive from glacial deposits (Healey 1987: 50), which are widespread. However, some tabular black chert does occur in the carboniferous limestone of Anglesey, but is generally of irregular fracture although some better material may exist. The *in situ* chert needs to be scientifically compared to the chert in recorded assemblages. More in-depth study is therefore needed to properly characterise lithic materials and to identify areas from where lithic material was introduced, for instance in relation to the movement of Graig Lwyd axes or to links with Ireland and England in the second millennium BC demonstrated by pottery styles and gold, amber and jet artefacts.

**BIBLIOGRAPHY**


