# AN INTERIM REPORT ON THE RESULTS OF THE LAIRG PROJECT 1988 – 1992

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### Abstract

This paper reviews the archaeological fieldwork undertaken at Lairg, Sutherland from 1988 to 1991 and reports on the preliminary results of post-excavation analyses. This programme was established at the instigation of regional and national heritage agencies to advise on a route for a proposed upgraded road. Standard and innovatory techniques of archaeological excavation and survey were combined with various environmental approaches in an attempt to map the evolution of the present-day landscape. In particular, the project has sought to identify and analyse the crucial role of land-use in this evolution.

## Introduction

The recent archaeological work at Lairg, in eastern Sutherland, took place within a corridor of land that straddles the A836. This corridor measures 2.2 miles (3.5km) by a maximum of 330yds (0.3km) and runs north from Achinduich farm to about 0.6 miles (1km) south of the village of Lairg (Fig. 1). The then Highland Regional Roads Authority (HRRA) informed Historic Scotland and sought assistance in achieving a route that would cause the least damage to the archaeological remains in the corridor. The archaeological project that developed from this enquiry has been funded by Highland Regional Council and Historic Scotland. The fieldwork spanned four years:

1988 a topographic survey of upstanding monuments;
1989 a test-pit sampling programme;
1990 a short season of scientific sampling;
1990 an eight week season of excavations;
1991 a further eight week season of excavations.

Further fieldwork directed towards the sampling needs of two associated research studentships (see below) has also been undertaken. It is also likely that additional archaeological fieldwork will be considered once the precise line of the road has met full approval. The project has now entered the post-excavation phase of analysis and is targeted to produce the full report in 1997.



Fig. 1. Location Map.

Two environmental projects were initiated in parallel with the main project. The first of these, a studentship funded by the Science and Engineering Research Council (SERC) and Historic Scotland, has focused on the evidence of farming practice and particularly of soil management in the past. This studentship sought to develop techniques of computer-aided analysis of soil thin-sections. These techniques have been applied to samples of buried soils from within the excavated stratigraphy. The radiocarbon dated chronology offered by the archaeological project has provided the temporal dimension to these analyses and will provide evidence of change in farming practice through time. The second environmental project, also funded by SERC and Historic Scotland, is based on the analysis of pollen from deep peat profiles in the area. The sample sites offer the potential for recognising relatively fine details in the vegetation pattern at close chronological intervals, and the result will be a precisely dated history of vegetation change that spans the period of human settlement in the area. It ought to be possible to discriminate between broad-scale effects, such as those related to climatic change, and local effects, such as woodland clearance, and to correlate these to synchronous changes observed in the archaeological record.

The post-excavation phase of the archaeological programme is aimed at producing a detailed interpretation of the fieldwork record. Supplementary interpretations and enhancements of the excavation record will be drawn from the artefact and environmental analyses (of soils, carbonised plant remains, pollen and geology), the construction of a radiocarbon-based chronology and from the study of estate and court records.

Ultimately, the project will draw together these parallel strands of evidence to elucidate a history of the relationship between human activity and the evolving landscape.

#### **Archaeological Context**

Within northern Scotland the quality of preservation of archaeological sites of almost all types is remarkable. In terms of numbers of sites the region is one of the wealthiest in Europe. This assemblage is dominated by the remains of the pre-Clearance settlement pattern, but within the marginal land of this post-Medieval settlement there is an enormous assemblage of earlier sites.

Compared to the numbers of archaeological sites in northern Scotland, the sites that can be quoted in support of archaeological interpretations are few. The region covers a vast territory (approximately the same size as Wales), and much of this area is not easily accessible because roads are few and the terrain is rough and often masked by peat. With a low population, the range of threats to the archaeology is narrow and historically the number of sites lost to developments has been relatively small. These factors initially concentrated efforts onto prominent and accessible sites (such as the early excavations on coastal brochs (Anderson 1901)). When excavations have occurred, there has been so little contemporary information that the site has become a 'type-site' (e.g. Kilphedir, Strath of Kildonan

(Fairhurst and Taylor 1971)) or it remains unique (e.g. Suisgill, Strath of Kildonan (Barclay 1985)).

A very few sites now hint at a significant Mesolithic presence in the region. Mesolithic flint tool assemblages are known from Inverness (Wordsworth 1985), Camster Long Cairn, Caithness (Wickham-Jones forthcoming), and at Smoo Cave, Durness, Sutherland (Pollard 1992). Burning of the woodland in the pre-peat landscape in Strath Halladale has been attributed to human activity around 7500 BP (Charman 1992).

The earliest visible indicators of settlement are Neolithic chambered tombs. Henshall has listed 217 sites in the region (Henshall 1963), although more recent survey in Caithness has increased that county's total from 67 to 78 (Davidson and Henshall 1991). Throughout the region there is a clear correlation between tomb distribution and areas of better agricultural potential (Davidson and Henshall 1991, 14), but the link with sedentary settlement is not established and need not be uniform throughout the area (cf. Armit and Finlayson 1992, 669). With only a few sites such as the Ord North, near Lairg (Sharples 1981) and the Grey Cairns at Camster, Caithness (Davidson and Henshall 1991, 96–101) offering dates for use and abandonment there is as yet no basis for any detailed explanation of the profound changes that had occurred in settlement type or pattern, in human society and economy.

For the subsequent periods the most abundant prehistoric monument type throughout the region is the hut-circle or round-house, often listed with an attendant 'field system'. The ubiquity and apparent uniformity of this designation conceal the potential for a wide disparity of interpretation. Even in the first inventory of Sutherland the ambiguities of the classification were recognised by Curle, who identified several distinct types (RCAHMS 1911, xxiv). After eight years of survey in Caithness and Sutherland, Mercer has identified 16 types (Mercer 1985, 65).

In 1911, Curle was able to draw on southern analogies and Scottish ethnography to propose a date range for hut-circles from the early Bronze Age up to the nineteenth century (RCAHMS 1911, xxiv). It was not until the excavations at Kilphedir, Strath of Kildonan, that any better estimate was feasible. These sites produced a small series of radiocarbon dates spanning the 1st millennium BC (Fairhurst and Taylor 1971). The termination of site-use seemed to be intimately related to the onset of peat and to a general decline in soil quality. The Kilphedir dates need to be treated with some caution (due to the evident difficulty of relating the date of the sample to the period of actual site usage) and the potential in the area for earlier sites has been recognised (Jobey 1980, 24). Excavations at the nearby site of Suisgill gave an indication of an invisible, in this case deeply buried, element in the settlement pattern and have provided a somewhat earlier suite of dates (Barclay 1985, 192). Sites outwith the region, such as An Sithean, Islay (Barber and Brown 1984) and Cul a'Bhaile, Jura (Stevenson 1984), suggested that some sites could date from the 2nd millennium BC.

Even on sites which were perceived to have more potential for closer correlations between form, function and date, such as stone-built defensive sites, excavation has not revealed a cohesive pattern of occupation dates and explanations remain at the simplest level or falter at the lack of chronological evidence.

In the prehistoric period to early historical times there are some sites that have been radiocarbon dated, such as Dunrobin Dairy Park cairn (GU-1039 AD 615  $\pm$  40: Close-Brooks 1980) or the vitrified fort at Craig Phadraig, Inverness (Small and Cottam 1972). A longer list of possible sites can be argued from the distribution of 'Dark Age' artefacts, such as those from Ackergill, Caithness (Close-Brooks 1984, 97) and Latheron, Caithness (Stevenson 1959, 40), but these fail to represent more than narrow typological classes and again they are less chronologically distinct than the subject demands.

For much of the historical periods the region fares no better than in the earliest phases of prehistory. Even the dense remains of the lost pre-Clearance society have not, except for Fairhurst's work at Rosal (Fairhurst 1968), attracted the attention of archaeologists and this deep vein of information remains the domain of the historian. Archaeology has yet to define its agenda in this later period.

This rather dismissive account of the archaeology in the region is not intended to disparage the results of previous workers. Instead, it is meant to demonstrate the limited extent of our understanding of the past in the region. Crucially, this ignorance lies not in the explanation of why certain developments or changes occurred. Rather it lies at the simpler level of what did occur and when. The aim of our work at Lairg is to identify the basic elements of the sequence, to map contemporary events, to determine the duration of such events and finally to propose cause and effect relationships between contemporary and successive events.

## **Preliminary Results of the Lairg Project**

The survey of the road corridor, in 1988, produced a list of 653 sites. These range from hut-circles and later dwellings to clearance cairns, field banks and terraces. This surface survey also identified many sites where there was a clear succession of features and the over-riding impression was that a sequence of distinct agricultural landscapes had developed over a long period of time. The 1989 trial trenching season established the likely extent of that sequence with over forty radiocarbon dates ranging from *circa* 2500 Cal BC to Cal AD 1600.

Some of the effects of such a prolonged history of land-use were also apparent in 1989. Soil accumulations had masked some sites while others had their forms accentuated by erosion. This insight does not encourage confidence in interpretations based solely on surface survey.

During 1990 and 1991 eighteen sites were excavated (Table 1). Full open-area excavation was not applied to all classes of monument. One of the results of the surveys of 1988 and 1989 had been an assessment of relative archaeological potential of all identified monuments (McCullagh and Dalland 1988). This assessment highlighted those site types and locations where the high costs of excavation would be matched by the quality of information retrieved. Sites were selected as typical, well preserved examples of their type and the choice of excavation mode was then influenced by the estimated potential. Partial excavation or sampling was considered adequate for the various land-use monuments (cairns, dykes, lynchets, etc.). Open area excavation was applied only to high potential sites (such as the burial cairn and hut-circles).

Site Type	1989 Total	Excavated in 1990–91	
Burial Cairns	1	0020	
Burnt Mounds	6	0765, 1079	
Dykes	180	0658	
Field Cairns	290	0655,0657	
Hut Circles	54	0504,0650,0659,0660,0667	
Lynchets	21	1072	
Terraces	15	7000, 8000, 9000	
Rectilinear sites	32	1101, 1103	
Miscellaneous sites	54	1092	
Totals 653		18	

#### **Table 1: List of Sites Dug**

The major part of the fieldwork centred on the quarry located between two small tributaries to the Shin (the *Allt na Fearna Mor* and the *Allt na Fearna Beg*) (Fig. 1), where a cluster of hut-circles and related field remains was extensively excavated (Fig. 2). Excavation sites were also located at the south end of the survey, where a possible burial cairn was fully excavated and just to the north of the Allt na Fearna quarry, where one of the two excavated burnt mounds was located. At the northern end of the survey, a group of probable pre-Clearance structures was identified (Fig. 3). From this group Site 1099 and Site 1103 (refer to the accompanying illustrations for the location of numbered sites, in this case Fig. 3) were chosen for excavation as examples of this later settlement period. Other excavated sites in this locality include another burnt mound (site 1079) and a large enclosed, and possibly fortified, site (Site 1092).

#### **Settlement Sites**

The fieldwork of 1989–1991 produced seventy-five radiocarbon date determinations from sixteen hut-circle sites. They range from approximately 4500 Cal BC to Cal AD 450. The distribution of the dates (Table 2) clearly shows that most sites date from the second half of the second millennium BC, with a further 18% of the dates spread over the ensuing 1500 years.





Fig. 3. 1103 site plan.

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Date Range	% hut-circles	% other types
Cal AD 1950–Cal AD 1500	0	0
Cal AD 1500–Cal AD 1000	0	5
Cal AD 100–Cal AD 500	0	3
Cal AD 500-0	3	5
0–500 Cal BC	8	13
500 Cal BC-1000 Cal BC	7	11
1000 Cal BC-1500 Cal BC	64	38
1500 Cal BC-2000 Cal BC	7	16
2000 Cal BC-2500 Cal BC	0	8
2500 Cal BC-3000 Cal BC	0	0
3000 Cal BC-3500 Cal BC	1	0
3500 Cal BC-4000 Cal BC	1	0
4000 Cal BC-4500 Cal BC	3	0

### Table 2: Distribution of Dates amongst the Hut-Circles and amongst other Site Types

(The remaining 6% of sites are represented by AMS dates which are not available at the time of writing.)

This pattern might be interpreted as meaning that settlement sites in this area rapidly increased in number between 1500 and 1000 Cal BC and thereafter declined to a low level. Following this logic it might appear reasonable to equate settlement site numbers to human population and to seek causes for this apparent sudden rise and subsequent, catastrophic collapse. This interpretation must first be tempered with a note of caution concerning the selection of material for submission as date sources. In 1989, most of the secure contexts were early in the stratigraphic sequence and represent site inception and not any subsequent phases of use. The excavation of five sites at the Allt na Fearna quarry (Fig. 2) provided dates from a wide spectrum of stratigraphic locations but the date pattern persisted. Although this appears to return the argument to its initial form, excavation revealed a situation in which the expected, uniform, processes of accumulating stratigraphy could not be demonstrated and complex and ill-balanced processes of deposition and erosion were recognised.

The excavation demonstrated that each of the upstanding sites had been built upon a ground surface that had once been tilled farm land. On two sites (0650 and 0660), beneath this old agricultural horizon, the truncated remains of yet earlier structures were revealed. These, in turn, overlay a sub-soil surface scarred with ard-marks which represented the last vestiges of the earliest surviving evidence of tillage.

Evidence of a similar succession was recovered under a massive field bank (Sites

0655, 0657 and 0658) (Fig. 2). The earliest element of the stratigraphy was an agricultural soil profile. This was succeeded by a low rubble-built enclosure dyke and the succession was interpreted as evidence of a change from open tilled land to smaller enclosed units. This field boundary had become accentuated by later deposits of field clearance rubble and of slope-washed soil.

Although excavation revealed evidence of relatively early land-use, this has only survived as isolated fragments beneath the accumulations of later settlement, enclosure and field edge deposits. This partial protection only persists in areas where subsequent land-use tolerated these impediments.

Even within such protective sites the level of preservation is not uniform. The interior floor surfaces of the larger hut-circles (Sites 0650 and 0659) (Fig. 2) were worn down within the entrance ways and around the central hearth area. Interpreted as the product of every-day use by generations of occupants, this erosion matched the effect of tillage with much of the interior space becoming an area of nett loss of the archaeological sediments and features of preceding occupations. Only beneath areas such as banks, which would have impeded this occupation-related erosion, is there any likelihood of good preservation of earlier sediments.

The general effect of successive episodes of both tillage and settlement is to impose a finite time limit on the survival of the evidence of preceding occupants and landusers. The apparent scale of the increase in settlement sites may thus be a product of poor survival of earlier material rather than a subsequent increase.

Similar caution must be applied in the interpretation of the apparent reduction in settlement sites in the later periods. Excavated evidence offers two related alternatives, both of which reflect the possible difficulties in distinguishing later sites.

The largest settlement site, in terms of area and depth of stratigraphy, Site 0650/2 (Fig. 2), persists into the 1st millennium Cal BC. By this date it had been transformed from a simple, large hut-circle into a raised platform with an impressive dry-stone facade. The entrance-way projected some 13ft (4m) from the facade. Access to the interior was gained via a ramp, which may have been roofed. A similar elaborated entrance way was recognised in the later form of Hut-circle V at Kilphedir (Fairhurst and Taylor 1971, 84).

Two other excavated settlement sites (Sites 0660 and 0667) (Fig. 2) appear to be broadly contemporary with this elaborated form. These are smaller in diameter and seem to have few 'domestic' attributes (e.g. artefacts, hearths, and accumulated midden material). The occupants or users of these two sites appear not to have undertaken the full range of domestic activities that are evident on adjacent sites. In both cases, there is some evidence to suggest that a different set of priorities influenced location and design. Site 0660 appears to be built in conjunction to the re-use of the adjacent Site 0659 as a stock-yard. The entrance to Site 0667 opens, almost immediately, upon an extensive area of what was probably very marshy ground. The apparent inconvenience of this arrangement may indicate that not all of the normal range of activities were undertaken within this structure.

To add further complexity to the interpretation of the survey, excavation also revealed a structure (Site 0650/3) (Fig. 2) that survived only as a ring of post-holes.

As such it would be invisible within the normal process of survey. The site is as yet undated, but it is very late in the stratigraphic sequence. The remains of the building were separated stratigraphically from a mass of earlier features by a thin cultivated soil through which the post-holes had penetrated. With the soil removed, the components of this late site became indistinguishable amongst the unpatterned scatter of truncated features.

Further typological problems were demonstrated by the excavations of Site 1092 (Fig. 3) and Site 0504 (Fig. 2). At the northern end of the survey, Site 1092 was partially excavated (in 1989 and 1991). The site was shown to be a ditched and palisaded enclosure (diameter: *circa* 56ft (17m)) dating to the second half of the 1st millennium Cal BC. This site represents the first appearance in the chronological sequence of what appear to be defensive features. Prior to excavation, Site 0504 appeared little different from the general appearance of the hut-circles within the surveyed transect. With excavation, the scale of the difference between the physical traits of Site 0504 and those of the other excavated habitation sites was insufficient to merit a reclassification. Yet the radiocarbon determinations demonstrate that the building was virtually synchronous to Site 1092 and some 600 years later than all the other excavated hut-circles.

The final form of domestic site to be excavated was Site 1103 (Fig. 3) at the northern end of the survey. This rectangular structure (some 79ft (24m) long by 14ft (4m) wide) resembles the domestic structures excavated at Rosal, Sutherland (Fairhurst 1968) and at Lix, Perthshire (Fairhurst 1969) which have terminal dates in the Clearance of the early nineteenth century. Site 1103 probably represents a creel built structure, which, in various forms, typified the rural architecture in northern Scotland (Fenton and Walker 1981, 101).

#### Land-Use Sites

In the course of fieldwork in 1989, 1990 and 1991, various forms of non-domestic monument were examined. The types of site range from field clearance cairns, stone dykes and field-edge banks to terraced fields and buried land-surfaces.

Test trenching in 1989 had shown that very few topographic features could be ascribed to non-human processes. There was clear evidence for superimposed land-use or land-tenure regimes, with the relics of field banks or field-edge cairns preserving old field alignments into later systems. It was also clear that the homogeneity of form implied by the term 'field system' could not be sustained. These features were shown to be the products of many generations and were palimpsests of numerous fragments of successive systems.

Open excavation has added a clearer chronological identity to the palimpsest. Ard-marks in the sub-soil, found below the earliest settlement deposits, strongly suggest that the land prior to *circa* 2000 BC was already a mature archaeological environment. In the succeeding levels on each of the Allt na Fearna quarry sites, settlement was abandoned and the land returned to tillage with the virtual loss of all trace of the former buildings. In time, the tillage ceased and buildings were, once again, erected on the abandoned field surface. The fieldwork at Lairg has not established whether this sequence of episodes of tillage and settlement represents widescale clearance followed by recolonisation or merely elements of a rotating system of residence location.

In the final phase of land-use almost all of the area around the quarry, measuring about 5 acres (2ha), was covered in narrow rig. The rigs were set at a spacing of *circa* 4ft (1.2m), and seemed to have been the end product of a process that involved cross-ploughing with ards. This technique has been recognised in many sites in upland areas (e.g. the Borders (Topping 1989)) and probably has its origins in the need to enhance shallow, poorly drained soils.

The dating programme for this broad group of sites has produced a total of 34 radiocarbon determinations. The resulting calibrated dates are distributed through time in a similar pattern to settlement site dates (see Table 2), though the late 2nd millennium BC predominance is less marked.

After the land was abandoned, blanket peat developed over the Allt na Fearna quarry sites. Radiocarbon dating obtained from the base of this peat has now shown that the inception of the final encroachment of peat seems to have occurred in the latter half of the 1st millennium AD.

There is as yet no evidence to explain the nature of this final abandonment nor for the length of time between the cessation of land-use and the start of peat growth, although it seems probable that the two events are intimately related. It is also unclear whether the cause of the abandonment should be sought in some form of environmental degradation or in the contemporary economic or political situations.

The effects of these millennia of agriculture were demonstrated in long profiles excavated across the contours in the Allt na Fearna quarry sites. On flat ground or on slopes, the thin soil lay directly on glacial drift. At the field edges, especially on slopes, large amounts of stone rubble and redeposited topsoil had accumulated forming linear cairns and giving the landscape the stepped appearance of terracing.

The excavation of these field-edge sites presented considerable difficulties of interpretation and it remains far from clear how or when they originated. In several cases, a line of large boulders was revealed, which may have represented the very first acts of clearance or of apportionment. It is likely that in some cases, a long phase of tillage preceded the linear accumulation, for example, the field clearance cairn (Site 0658) was already established before the large field bank (Site 0657) began to accumulate (Fig. 2). In another example, at the south end of the survey, a sequence of cross-cutting prehistoric dykes suggest that the field layout had been re-arranged at various times. One intermediary position in this sequence of dykes was dated to *circa* 700 Cal BC.

## **Other Archaeological Features**

Amongst the surveyed land forms, excavation has revealed three types of site that are distinct from dwelling or land-use sites.

At the southern end of the surveyed area, excavation of a vacuous stone cairn

confirmed its survey interpretation as a burial site. This cairn infilled a circular area delineated by a kerb of upright boulders measuring 26ft (8m) in diameter. The original land surface beyond the kerb had long been lost to erosion but collapsed elements of the cairn sealed an accumulated soil containing medieval sherds. Within the kerb, a series of deposits of cremated bone and a small, apparently disrupted, cist suggest that the cairn was built over the site of some, presumably sepulchral, ritual. This site produced fragments of a Beaker, a complete Food Vessel, eleven shale discoidal beads and a small, flint, tanged and barbed arrowhead. The ground surface beneath the cairn and these 'ritual deposits' consisted of the partially ploughed remains of midden deposits. These midden deposits are likely to have been associated with a settlement site, although no candidate source site was recognised in the near vicinity.

The second type of site refers to a group of three pits containing cremated human bone which were found beneath Site 660/2 (Fig. 2). Here again the classification may express only a state of preservation and as both the radiocarbon dates and the pottery are broadly contemporary to the southern cairn, these pits may represent the last vestiges of a burial cairn. However, no evidence for this putative cairn was observed and it remains possible that these burials were not marked with a cairn.

The third type of monument, the burnt mound, is well known from prehistoric landscapes and has been variously interpreted as a ritual, or domestic, feasting or bathing site (cf. Buckley 1990 and Hodder and Barfield 1991). In 1988, the survey identified three burnt mounds. In 1989 trial excavation dismissed one of these but identified two additional burnt mounds. In 1990 two burnt mounds, representing either end of the range of typical forms, were examined.

The larger burnt mound was located in what has probably always been extremely poorly drained land and consisted of a kidney-shaped mound which partially encircled a possible setting for a wooden trough. The second site was much less substantial, being merely a shallow (*circa* 1ft (0.35m) deep, spread of laminated burnt stone and charcoal. Neither site contained much information on function, but both produced radiocarbon date sequences ranging from 1500 Cal BC to 800 Cal BC. In the case of the larger site, this sequence parallels that on the quarry sites some 600yds (500m) to the south and may indicate how parts of the subsistence activity could be located beyond the edges of the useful farming land.

#### **Summary of Fieldwork Results**

The main impact of the fieldwork has been a recognition of the omnipresence of the remains and effects of prehistoric tillage. While logic might argue that the effects of perhaps three millennia of tillage would be great, the full extent of those effects had not been anticipated. The remodelling of much of the landscape over this time has produced sites whose apparent uniformity belied a considerable archaeological complexity.

The interdigitation of phases of settlement and agriculture on the same location has offered three valuable insights into the prehistory of the region. This stacked stratigraphy offers a sequence of dates that will greatly lengthen the general chronology for land-use in this area. It also offers the possibility of establishing the date and duration of individual phases. The third benefit has been the possibility of recognising elements of rotational or cyclical systems of settlement location. The excavation of the rectangular structure offers an important link between the recorded, historical patterns and methods of land-use and settlement and those observed in prehistory. This site may also offer some means of testing the interpretations of purely documentary analyses.

## **Post-Excavation Research**

Since 1991, the project has been engaged in the 'post-excavation' phase of the programme. These post-excavation analyses involve inputs from specialists in palynology, soil science, conservation science, botany, osteology, geology, statistics and artefact studies. The final stage will focus on the integration of the analysed site data and the results of the parallel, SERC- and Historic Scotland-funded studies into a unified description and explanation of the archaeology within the road transect. At the time of writing, interim interpretations are available from the dating programme, from some environmental studies and from artefact studies.

### Chronology

At the end of the financial year 1992–1993, the site chronology is represented by 132 radiocarbon dates. These are based on 108 samples from as many phases of site activity as possible, and by 25 samples taken from 10 locations around the Allt na Fearna quarry representing the final encroachment of peat over the land surface.

The chronology will be analysed by statistically integrating the dates with the site stratigraphy (Dalland 1993). When each phase of each site is dated, it should be possible, within the limitations of precision inherent in radiocarbon dating, to produce a chronological framework in which contemporary phases in various sites can be recognised (such as those in a burnt mound and an adjacent hut-circle). The duration of a phase of site use or abandonment (such as the phases of tillage in Sites 0650, 0660 and 0667) and the chronological extent of human impacts on landscape may also be estimated.

This date-rich chronology has important implications for the artefact studies because it will provide well-defined dates for use or disposal of tools or pottery.

When, eventually, the palynological analyses are complete (see below) there will be a parallel radiocarbon chronology which will map changes in the vegetation through time. Integrating these two radiocarbon date assemblages will go some way towards providing synchronous or sequential cause and effect relationships between events or practices on the settlement sites and events or changes in the environment.

# Artefacts

The range of artefacts recovered from excavation was typically small. None of the sites preserved uncarbonised organic materials and only ceramic and various stone

artefacts have survived. Each of the types has been analysed for provenance of the raw material(s) and to elucidate information on manufacture and use. The various studies are incomplete but several have already produced interesting results.

Most of the post-Medieval material comes from one site, the rectangular house at the north end of the study area: Site 1103 (Fig. 3). This assemblage consists of metal, glass and ceramic objects. The pottery and glass support the documentary evidence in placing the use of this building towards the end of the eighteenth century and to the first two decades of the nineteenth. The pottery assemblage is mostly Scottish in origin, and contains some fine wares.

The size of the prehistoric assemblage is small, with the remains of one almost complete vessel representing 20% of the total number of sherds. The typology of the vessels generally matches the site chronology. Decorated pottery only occurred in the earliest parts of the assemblage and these are all associated with the 'ritual' contexts in the southern burial cairn (a near complete Food Vessel and fragments of Beaker type) and under the hut-circle on Site 0660/2 (Beaker sherds). The cairn also produced a small assemblage of shale discoidal beads from the same context as the Food Vessel.

Thin section analysis of the prehistoric pottery will be undertaken to identify the sources of clays and coarse fraction material within the fabric. Initial results suggest that the clays are mostly local with the possible exception of the fine wares. Throughout the local assemblage a talc-like rock has been used as a temper. The sources of this material within the region are rare. Two possible locations have been identified: a small outcrop 12 miles (20km) north-west of Lairg and an equally small outcrop in Strathnaver some 30 miles (48km) north of Lairg.

Flint tools were scarce in all excavated areas except for the southern burial cairn although several fine arrow-heads were discovered from tilled, and thereby, disturbed contexts. Flint working debris was only recognised in the midden material which preceded the cremation layers in Site 0020.

Flaked quartz tools were recognised at most levels in the excavation, but were only abundant in late levels in Site 0650. The raw material was mostly very poor quality vein quartz, which would have presented considerable difficulties in the production of useable tools. The manufacturing technique is crude and tool production seems to have been directed at acquiring rough blade forms. There is as yet no explanation for this late reliance on quartz as a tool source.

Excavation also recovered various hammer and rubber stones and several forms of crude saddle quern. Analyses of form and geological provenance are now under way.

It is noteworthy that no evidence of metal-working has so far been recovered from any of the prehistoric sites.

## **Environmental Analyses**

The analyses of the environmental data represent the area of the greatest investment within the post-excavation programme. The first of these studies (the joint SERC- and Historic Scotland-funded studentship analysing soil management regimes) has resulted in the awarding of a doctorate and an abstract from this thesis will appear in the final report. The second and similarly funded doctoral studentship has begun the analysis of the pollen evidence and will conclude with a written report in 1995. Analyses of the samples retrieved during excavation are also under way and will lead to reports on the identification of the wood charcoal and carbonised plant remains, on the analyses of buried soils for evidence of agricultural practices, on the identification of local geology and soil types and on the pollen-based analyses of the burial deposits for evidence of floral tributes.

From the preliminary identification of charcoal and carbonised plant remains there appears to be a fairly consistent pattern of exploitation of the vegetation. Agriculture throughout the prehistoric periods seems to have been centred on the exploitation of barley, although several minor grasses and weed species have also been identified. The local woodland, which was presumably the source of much of the fuel preserved as charcoal, appears to consist of birch, alder and willow with oak as a minor component. With both materials, caution must temper the interpretation as the samples are biased by the circumstances of preservation; only those remains that were burnt now survive. Analysis of some of the ash deposits strongly suggest peat was not a major fuel source in the prehistoric periods, and that most ash represents burnt turf.

The analysis of soil management regimes has been used as a case study in the course of developing computer-enhanced video techniques for automatic soil thinsection analysis. The initial results suggest that there are distinct differences between prehistoric buried soils and later, possibly medieval, buried soils. The difference centres on the much greater evidence for organic activity in later soils. It seems likely that in prehistory a soil management regime developed which failed to control erosion and maintained fertility only by regular, but barely sufficient, applications of organic material. The source of this material seems to have been settlement waste or midden material. This regime may account for the episodic ploughing flat of dwellings, and the implied rotation of settlement, evidenced in the excavated sites. The medieval soils, in contrast, seem to have been less prone to erosion and to have been richer in nutrients. Initial results suggest that these later soils may have resulted from managed pasture, but it is, as yet, unclear whether this indicates a change in the orientation of farming towards greater stock raising in the later periods or whether arable soils of this date have escaped detection within the road corridor.

The evidence of the origins of the prehistoric system is probably lost. On-site observations of buried soils suggest that the conditions that promote the development of podsols and, ultimately, blanket peat were already established prior to the time of the earliest surviving archaeological deposits. It is probable that much of the basic agricultural technology was already developed prior to the surviving phase of excavated settlements.

Some changes in agricultural technique can be recognised during the span of the excavated sites. The total levelling of pre-existing structures occurs only in the earlier phases of the surviving sites and suggests a systematic approach to land preparation; later practice seems to have tolerated ploughed land dotted with the stony mounds of

abandoned buildings. In contrast, the creation of long field boundaries, which ultimately gave rise to a terraced landscape, seem to have been contemporary with the upstanding buildings (i.e. within the 2nd millennium BC). Regular cross ardploughing seems to be a late development, perhaps not before the 1st millennium BC. Elsewhere within the surveyed area there is also evidence for the use of narrow, parallel, enclosed fields from this later period.

The final encroachment of blanket peat over the ploughed and rigged fields now appears to be intimately related to the cessation of the practice of cultivation. Peat development should not be seen as the cause of this cessation but is merely a consequence of it.

## Conclusions

The project was initiated to meet the planning advice needs of Historic Scotland and Highland Regional Council. The initial investment was directed at establishing what might be the effects of the road construction through this archaeologically rich landscape. All the subsequent work has, despite being targeted at explaining the archaeology, remained ultimately targeted at assessing the value of this particular landscape. It is hoped that once complete, this study will be both useful in providing models for explanations in similar contexts and tools for site and landscape evaluation.

The combined chronologies from the archaeological and environmental stratigraphies will provide a comprehensive framework for the identification of synchronous events. This is the first stage of the progress towards recognising genuine processes of human technological and social adaptations and identifying possible cause-and-effect relationships between these human activities and the environment.

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