ScARF Scottish Archaeological Research Framework

Regional Archaeological Research Framework for Argyll

Chapter 5. The Early Prehistory of Argyll



Artefacts with Ahrensburgian affinities from Rubha Port an t-Seilich and Tiree © Steven Mithen

Scottish Archaeological Research Framework

5. The Early Prehistory of Argyll: The archaeological record, research themes and future priorities for the Palaeolithic, Mesolithic and Earliest Neolithic periods (12000BP – 6000BP) (10,050BC – 4050BC)

written by Steven Mithen

SCARF Scottish Archaeological Research Framework

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At the end of the last ice age around 11,500 years ago Scotland was slowly colonised by vegetation and animals. Humans followed, hunting, fishing and gathering plants, and utilising a range of resources other resources including stone for making tools and the natural topography for shelter and fish-traps. One of the earliest sites of human occupation in Scotland has been found at Rubha Port an t-Seilich on the Isle of Islay, where 12,000 years ago, people set up a temporary camp, to fish, and hunt, possibly during the summer of a warm period towards the end of the ice age. Archaeologists call this time period Palaeolithic (old stone age).

People continued to come to Argyll, initially for short exploratory visits, and then becoming a resident but mobile population after 10,000 years ago and during the Mesolithic period. Judging by the archaeological record, these people tended to favour island and coastal locations. They moved around, making temporary camps, using the resources of both the land and the sea – and that critical interface, the extraordinary coastal fringe of Argyll. Stone, wood and other natural materials were used to make tools. These hunter-gatherer fisher people did not keep domesticated animals, except possibly dogs (although not direct evidence has been found in Argyll). Around 8,200 years ago, archaeologists detected a decline in the numbers of people living here, which they think was related to a marked drop in temperature. This cold period lasted to around 6,600 years ago, when warming temperatures seem to have enabled population growth and/or resettlement. Argyll has some of the most prolific Mesolithic archaeology of anywhere in Scotland, partly due to the availability of resources here in prehistory, but also because there has been a lot of archaeological work on this time period in Argyll. However, most of the evidence we find is in the form of stone tools, which are only part of the story of the lives of the people who visited Argyll and who lived here between 12,000 and 6,000 years ago.

5.1 Summary

Having reflected on the nature of the early prehistoric archaeological record, research themes are explored relating to five temporal (and overlapping) phases of activity:

1. Exploration and pioneering settlement, up to 9400 cal BP, when issues about responses to climate change at the Pleistocene/Holocene transition and the human drive to explore are prominent.
2. Residential settlement, 9400–7800 cal BP, for which the focus is on Mesolithic mobility and foraging patterns.
3. Population decline, 7800–7000 cal BP, when exploring the potential impact of the abrupt 8.2 Ka cold event and considering the differential survival and recovery of Mesolithic sites are important.
4. Re-colonisation, 7000–5800 cal BP, for which there is a focus on the Oronsay middens and the extent to which there was 'sedentism' on this tiny island or a pattern of regional mobility.
5. Appearance of a new, Neolithic lifestyle from 6300 cal BP-c 5800 cal BP, when the first funerary monuments, pottery and Neolithic style stone artefacts appear. This also covers what might be termed the demise of the Mesolithic, within which period indigenous hunting-fishing-foraging groups reacted to (and eventually adopted) the novel lifestyle based on agro-pastoralism.

Having reviewed these five temporal phases and their research themes, five priorities for future research are identified:

1. Exploring the Late Glacial: by excavations at Rubha Port an t-Seilich, Isle of Islay and research on sea level change, tidal range, and vegetation history.
2. Exploring the earliest Neolithic and the Mesolithic-Neolithic transition: by fieldwork to locate settlement sites, targeted excavations and dating of early funerary monuments,

analysis of artefact assemblages, aDNA analysis of human remains and environmental reconstruction.

3. Refining the early prehistoric chronology: by a programme of radiocarbon dating and Bayesian analysis.
4. Heritage management of early prehistoric sites.
5. Writing the history of archaeology in Argyll.

5.2 Introduction

The borders of Argyll have been demarcated by political events and boundary commissions of various types extending from medieval times until at least 1891 when the Small Isles were transferred out of Argyll into Inverness-shire (Figure 23). As such and with regard to the nature of prehistoric settlement, Argyll is an arbitrary region of western Scotland: its

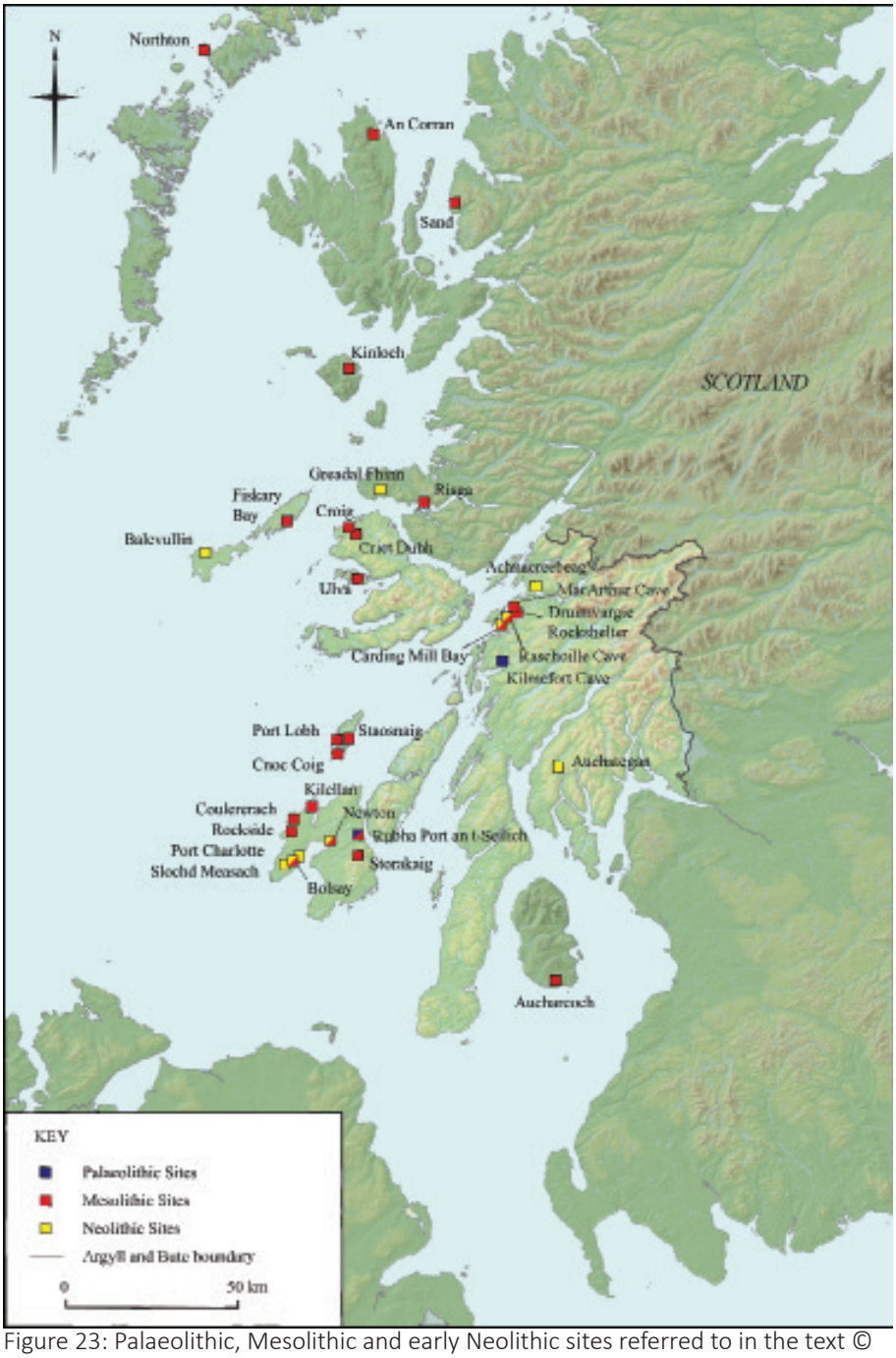

Figure 23: Palaeolithic, Mesolithic and early Neolithic sites referred to in the text © Steven Mithen

spatial extent has no necessary correspondence to the cultural boundaries or the settlement range of early prehistoric communities – the mobile hunter-gatherers of the Palaeolithic and Mesolithic periods, and the communities of the Early Neolithic. These are likely to have extended throughout the west coast of Scotland and beyond. Nevertheless, as illustrated in Figure 24, the majority (75%, 24/32) of radiocarbon dated Mesolithic sites in western Scotland fall into the modern-day boundaries of Argyll, which also contains the only known in situ Palaeolithic site in Scotland, that at Rubha Port an t-Seilich, Isle of Islay (Mithen et al. 2015). A potentially earlier Palaeolithic site has been located at Howburn, South Lanarkshire, but its artefacts are dispersed with material of later periods within a ploughsoil (Ballin et al. 2010).



Figure 24: Radiocarbon dated Mesolithic sites in Western Scotland © Steven Mithen

This concentration of Mesolithic sites in Argyll is likely to be a consequence of both the attractiveness of this region of Scotland for Mesolithic foragers – abundant and diverse terrestrial and coastal resources – and the quantity of fieldwork undertaken in this region. In this contribution we review this archaeological record and its environmental context, identifying important themes for future research relating to both human behaviour and environmental change, these being inextricably linked throughout early prehistory.

5.3 Major Reserach Themes

5.3.1 The chronological pattern of human activity

Establishing the chronology of human activity and an indication of population levels, in either relative or absolute terms, are key research questions for any period of archaeological study. For the Mesolithic of western Scotland, Wicks and Mithen (2014) undertook this task by adopting the activity event approach for all 32 radiocarbon dated Mesolithic sites in western Scotland, as available at the time of study. These had provided 227 radiocarbon dates. When those dates were screened to remove any that appeared unreliable or fell outside the defined chronological range of the Mesolithic the sample was reduced to 137, 69% of which are from Argyll. The activity event analysis identified 74 Mesolithic activity events, occurring at the 32 sites. The majority of sites were characterised by a single activity event, often because there was no more than a single reliable radiocarbon date. Recent fieldwork and dating programmes allows a further 26 radiocarbon dates to be added to the sample used by Wicks and Mithen (2014). Twenty-three of these dates came from Creit Dubh (Isle of Mull) and three from Rubha Port an t-Seilich (Isle of Islay; Mithen et al. 2015), providing an additional four activity events (three and one at the sites respectively). One further activity event located at Rubha Port an t-Seilich can be added. This is represented by a small collection of chipped stone artefacts with technological and typological characteristics of the Late Glacial rather than Mesolithic and dated by association with tephras to c 12,000 BP (Mithen et al. 2015).

The chronological distribution of those 78 activity events by 400-year time steps throughout the Mesolithic period is presented in Figure 31. More than three quarters (77%, n = 16) of these events were located within Argyll. The first activity event is dated to c 12,000 at Rubha Port an t-Seilich, and hence formally placed within the Late Glacial and Palaeolithic period. There is no more evidence of activity within either Argyll or western Scotland in general until c 10,230 cal BP at Creit Dubh on the Isle of Mull. There are no further documented activity events for c 800 years, but as from c 9400 cal BP there is a gradual and then a steep increase in their number. They reach a peak in the time-period between 8600–8200 cal BP with 25 activity events, located between Northton on the Isle of Lewis in the north and Rubha Port an t-Seilich on the Isle of Islay in the south. This is followed by a dramatic decline in the number of activity events, until there are only three activity events in the time period 7800–7400 cal BP, located at Bolsay and Rockside, both on the Isle of Islay, and at McArthurs Cave near Oban. The number of activity events begins to increase again after 7000 cal BP, reaching 10 in the time period 6200–5800 cal BP. Their location is heavily concentrated on the tiny island of Oronsay and adjacent islands of Colonsay and Islay, although there is a single event at An Corran on the Isle of Skye. Activity events then decline in number and then cease at the end of the defined Mesolithic time period.

The 18 non-Argyll activity events within this distribution are spread throughout its geographical range, although having a limited chronological presence (a single activity event) after 7000 cal BP. As such, the pattern for Argyll is not significantly different for western Scotland as whole, other than its apparent locus for settlement towards the end of the

Mesolithic. Figure 32 represents the same data using a summed calibrated probability distribution (SCPD). These are increasingly used in archaeology as a proxy for human population levels (Williams 2012), even though the use of radiocarbon dates in this way has been argued to be problematic (eg Sheridan and Pétrequin 2014). The SCPD for Mesolithic Scotland increases the degree of bimodality of the activity event distribution, making both the rise and fall of human activity/population on either side of 8200 cal BP more intense.

It is not possible to estimate the size of the population directly from the archaeological evidence. Estimates based on ethnographic analogies range from one to nine persons/100Km2 (Smith 1992; Gamble 1999). If we take western Scotland to encompass approximately a third of Scotland's entire landmass of c 79,000 Km, then the Mesolithic population of western Scotland may have varied between c 260 and 2370 people. As indicated in Figure 31, the chronological distribution of Late Glacial and Mesolithic activity can be divided into five temporal phases, each of which pose specific research questions.

5.3.2 Exploration and pioneer settlement: when, where and how did people arrive in Argyll?

The earliest known human presence in Argyll is at Rubha Port an t-Seilich on the east coast of the Isle of Islay dating to 12,000 BP (Mithen et al. 2015), Figure 33, interpreted as representing a short-term visit (or visits) by Late Glacial hunter-gatherers who were exploring the margins of the known ice age world. We must, however, be open to the possibility of similar visits at least 2000 years earlier in light of the evidence from Howburn, South Lanarkshire suggesting hunter-gatherers of the Hamburgian culture at 14,500 years ago (Ballin et al. 2010) within the Late Glacial (Windermere) interstadial. The possibility of even earlier human activity within Argyll cannot be entirely excluded. Fossil and archaeological evidence for pre-modern human activity is known from Pontnewydd Cave in north Wales dating to 230,000 years ago. If Neanderthal-like humans had expanded their range to northern Wales, there seems no reason why they should not have also done to western Scotland. If any such evidence exists, it is only likely to survive in cave deposits.

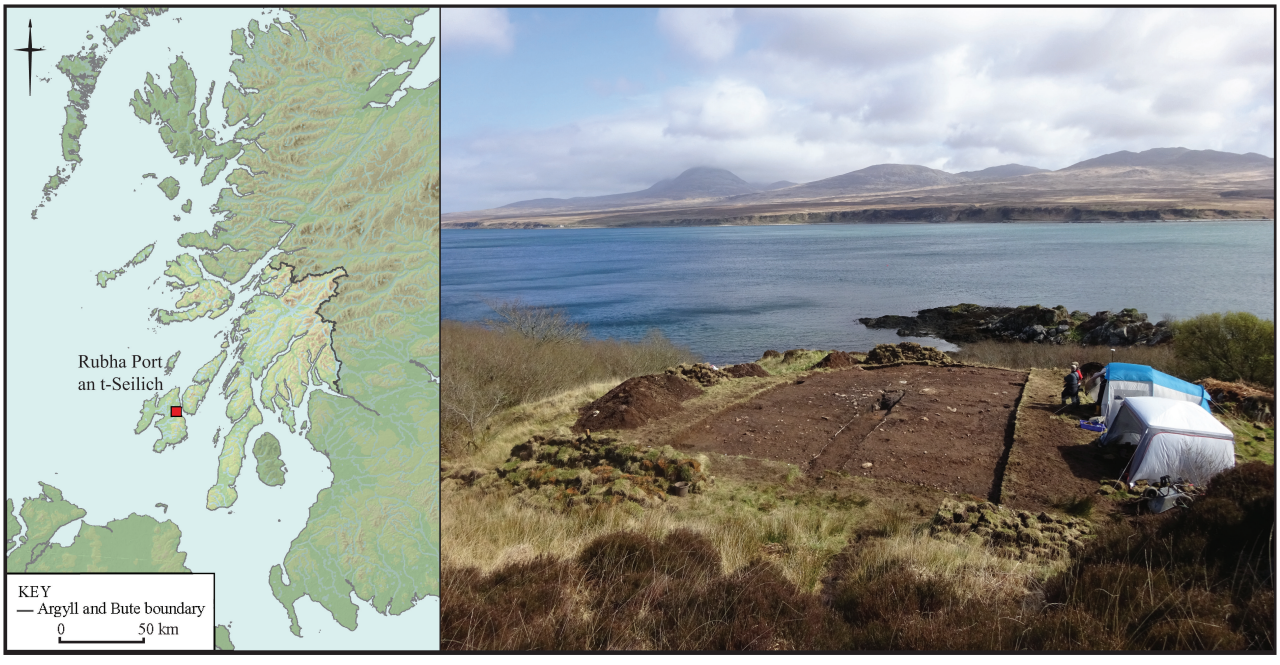

Figure 33: Rubha Port an t-Seilich, on the east coast of Islay © Steven Mithen

Following the Rubha Port an t-Seilich activity, the archaeological record suggests a period of at least 2500 years during which hunter-gatherers were making exploratory visits to what is now Argyll during the Late Glacial and early Holocene. Understanding this critical period of Argyll's prehistory requires not only analysis of the archaeological data but reconstruction of the palaeoenvironmental context, notably changes in sea level, tidal range and vegetation history.

5.3.2.1 The environmental context

The last British-Irish Ice Sheet covered all of Argyll and Bute (Bradwell et al. 2008a; Hubbard et al. 2009), with the possible exception of the Rinns of Islay (Dawson and Dawson 2000) (Figure 34). Current climatic models provided by high-resolution analyses of annual layers of ice in Greenland's ice-sheet (Lowe et al. 2008; Rasmussen et al. 2008, 2014) describe initial warming of the North Atlantic region at c 14,650 BP. Much de-glaciation occurred before this in a cold but dry climate. Chironomid assemblages suggest that mean July temperatures were lower than c 7.5°C before the Late Glacial Interstadial (GI-1), before c 14,300 and reached c 12ºC after this (Turney, Harkness and Lowe 1997); coleopteran data (Coope et al. 1998) suggest temperatures of up to 18°C in GI-1 summers.

With warming, soils began to support vegetation and to store organic matter. Biological productivity increased in lake basins. Late glacial pollen records in Argyll and Bute uniformly record the colonisation of, first, grasses, sedges and herbs of bare- and disturbed-ground character. A closed vegetation cover may have formed but comparative aridity maintained populations of plants we think of as coastal like sea plantain. Heathland developed rich in crowberry, a heather adapted to dry conditions. Juniper and birch migrated but a closed woodland cover probably did not form.

The earliest shorelines to be formed during de-glaciation are found at altitudes of around 40m above mean sea level (Sutherland 1997) because the weight of the last British-Irish Ice Sheet forced the British Isles below contemporary global sea level, which itself reached up to 120m below present. With de-glaciation, the land rose faster than the sea itself rose, leaving elevated shorelines. A calibrated 14C assay on the abandonment by the sea of one coastal basin in Knapdale at 31.3m OD above msl of 17,810–16,770 BP is, if correct, the earliest for de-glaciation in the region (Shennan et al. 2006). At other localities in western Scotland, however, shorelines this high and higher are younger, c 15,000 BP (Shennan et al. 2006).

Temperatures declined during the latter stages of the Late Glacial Interstadial (GI-1a-c/Allerød) to around 11°C. Evidence from chironomids suggests three falls in mean July temperature of between 0.5 and 3°C. Around 13,900 BP mean July temperatures plummeted to below c 7.5°C. Plant communities were destroyed. Periglacial conditions promoted heavy soil erosion and on steep slopes, talus or scree accumulated (Ballantyne and Kirkbride 1987; Dawson, Lowe and Walker 1987).

Sea level fell within the Late Glacial Interstadial. Some areas show the sequential fall over time, as on Oronsay (Jardine 1977), in Kilmartin (Gray and Sutherland 1977) and in the Mhoine Mhor (Peacock et al. 1977). Shorelines eroded by the sea become more coherent and continuous. Contemporary shorelines are seen to fall in altitude from northeast to southwest (see Figure 2.1: Sutherland 1997) because the land around Rannoch Moor rose faster than land on Kintyre. Gray (1974, 1975, 1978) and Dawson (1984) mapped a prominent shoreline, referred to as the Main Rock Platform, falling from around 12m above Mean Sea Level (MSL) in inner Loch Etive to 0m above MSL around Campbeltown. This shoreline is thought to have formed in the periglacial climate of the GS-1 cold stage (equivalent to the European Younger Dryas), referred to in Britain as the Loch Lomond Stadial (Gray 1978).

Marine sediments relating to the higher sea-levels of the Late Glacial Interstadial have been recorded in a number of places, including the central valley of Bute, beneath Campbeltown and from the head of the tidal Loch Gilp at Lochgilphead to the entrance to the lower Add Valley and under the Crinan Canal, and at South Shian (Peacock 1983, 1989; Peacock et al. 1977). These are the Clyde Beds. They contain marine faunas that can define sea surface and deep-water marine temperatures in of the Lateglacial. Peacock (1983) estimated from modern analogues that in the early part of GI-1 summer sea surface temperatures (SST) were close to present but some 3°C at 25m depth: winter SST was near freezing. Later, perhaps around 12,750 BP, summer SST may have exceeded 13°C. An ice sheet centred on Rannoch Moor re-formed towards the end of GI-1 (Golledge, 2006, 2010) or if like ice sheets further north, began to re-advance (Bradwell et al. 2008b). Valley glaciers advanced along Loch Etive to the confluence with Loch Linnhe (Gray 1995), down Loch Awe as far as Ford (Gray and Sutherland 1977; Tipping 1989 b) and to the head of Loch Fyne (Sutherland 1984). A separate ice sheet formed on Mull (Ballantyne 2002) and a rock glacier emerged on Jura (Dawson 1977). Younger Dryas (GS-1) ice incorporating organic mud formed to the east of Loch Lomond at c 12,450 BP (Rose, Lowe and Switsur 1988).

The climatic change that denotes the start of the Holocene at around 11,700 BP occurred in a matter of decades or even a few years (Taylor et al. 1993; Alley 2000; Mayewski et al. 2004; Tipping et al. 2013). Abrupt climatic fluctuations then continued during the Early Holocene creating short 'moments of crisis' separated by longer periods of relative stability. Such events include short-lived deteriorations in climate such as the Pre-Boreal oscillation at c 11,250 BP (Björck et al. 1997) and the 9.2 ka event at c 9250 (Fleitmann et al. 2008). During the Late Glacial the sea level is modelled to have fallen to -5m below present on Skye, to around 0m on Arisaig but to have remained above present tidal limits, around 2m above present in Knapdale (Shennan et al. 2006), although empirical evidence to substantiate this model is currently lacking. On Islay, Dawson, Dawson and Edwards (1998) date the lowest early Holocene RSL at around 0m above msl to c 11,300 BP, as Dawson et al. (2001) do on northern Coll. Dawson et al. (1998) then describe a rapid RSL rise on Islay to 3m above msl by c 9,910 BP, slowing to c 5m above msl by the Neolithic period. On Oronsay, Jardine (1977) thought sea level reached c 7m above msl before this time. Sequences on the Scottish west coast currently lack the chronological precision to test the suggestion (Clarke et al. 2003) that the collapse of the Laurentide ice sheet caused a nearly instantaneous global RSL rise of around 1.4m.

5.3.2.2 The archaeological record

The earliest dated activity event in Argyll is that of Rubha Port an t-Seilich, Isle of Islay, represented by a collection of chipped flint artefacts dated by association with tephra indicating c 12,000 cal BP (Mithen et al. 2015) and hence formally within the Palaeolithic. That date, falling in GS-1 (Younger Dryas), is compatible with the technological and typological characteristics of the stone artefacts, which suggest affinities to the Ahrensburgian culture, which is primarily known from north central Europe. Interestingly, an isolated and un-provenanced artefact find from Tiree has also been categorised as an Ahrensburgian point, as have artefacts from outside of Argyll at Shieldig and Links House on Orkney (Ballin and Saville 2003; Woodward 2008), Figure 35.

Whether or not designation as Ahrensburgian is either correct and/or useful, the Rubha Port an t-Seilich artefacts indicate a Late Glacial activity event, the first in Scotland that is documented and dated in a stratified context with the potential for further excavation. During the GS-1 period, Britain remained attached to continental Europe by the low-lying landscape of Doggerland. One possible scenario is that Late Glacial hunter-gatherers with specialist skills and technology for the exploitation of coastal



Figure 35: Artefacts with Ahrensburgian affinities from Rubha Port an t-Seilich and Tiree © Steven Mithen

and marine resources (travelled from what is now southern Scandinavia along the northern edge of Doggerland and around the northwest of Scotland to reach Rubha Port an t-Seilich. For that they would have required substantial boats; the umiaks used by recent sea-faring foragers in the polar region providing a possible analogy (Fair 2005). In this scenario we would envisage the Late Glacial hunter-gatherers exploring the far northwest fringes of their world, presumably during the warmer summer months. Alternative scenarios are of course possible, such as reaching Argyll by travelling overland from either the south or east, or by sea-faring along the west coast of Britain.

While Rubha Port an t-Seilich is the only directly dated late glacial activity event in Argyll, the possibility for earlier events certainly exists. A chipped stone assemblage from Kilmefort cave has been attributed to the Federmessergruppen culture, which would place it in GI-1c/b (Allerød) of the Late Glacial Interstadial, perhaps c 13,000 BP, but no absolute dates are available (Saville and Ballin 2009)

Until excavation has been undertaken at Rubha Port an t-Seilich, it is impossible to know whether the artefacts present represent a single short term visit or are part of a palimpsest showing a longer-term presence in the region – and even with excavation that might remain unclear. The current assumption is that this was a short-term exploratory visit to the region that did not lead to the establishment of a permanent population with the region.

There is an elapse of almost 2000 years prior to the next known activity event in Argyll, or indeed western Scotland in general. This is located at Creit Dhu in NW Mull at c 10,230 cal BP, represented by two statistically consistent radiocarbon dates both from charred hazelnut shell fragments excavated from adjacent and heavily truncated pits (Wicks and Mithen, forthcoming). It is not possible to associate specific artefacts with this activity event at Creit Dubh, but the assemblage at the site is entirely narrow blade in technology and hence we assume this was in use at Creit Dubh at 10,230 cal BP. This activity event is one of the earliest in Scotland, statistically equivalent to that of Daer 1, but c 200 years younger than Cramond, near Edinburgh. The route by which the west coast was reached remains entirely unknown: perhaps across the interior of Scotland, by boat around the north or from the south?

The event at Creit Dubh is followed after a further c 800 years by an event at Kinloch on the Isle of Rum. Both Creit Dubh and Kinloch are notable for having extensive Mesolithic deposits that primarily accumulated several hundred years after these first and presumably exploratory visits. Creit Dubh was visited again in the time period 9400–9000 cal BP, as were at least four other locations within Argyll: Staosnaig (Isle of Colonsay), Fiskary (Isle of Coll), Rubha Port an t-Seilich (Isle of Islay) and Druimvargie Cave (Oban). These earliest activity events in Argyll, especially those at Rubha Port an t-Seilich and Creit Dubh raises one of the perennial questions about colonisation: why do people explore? Even more pertinent is why do people make

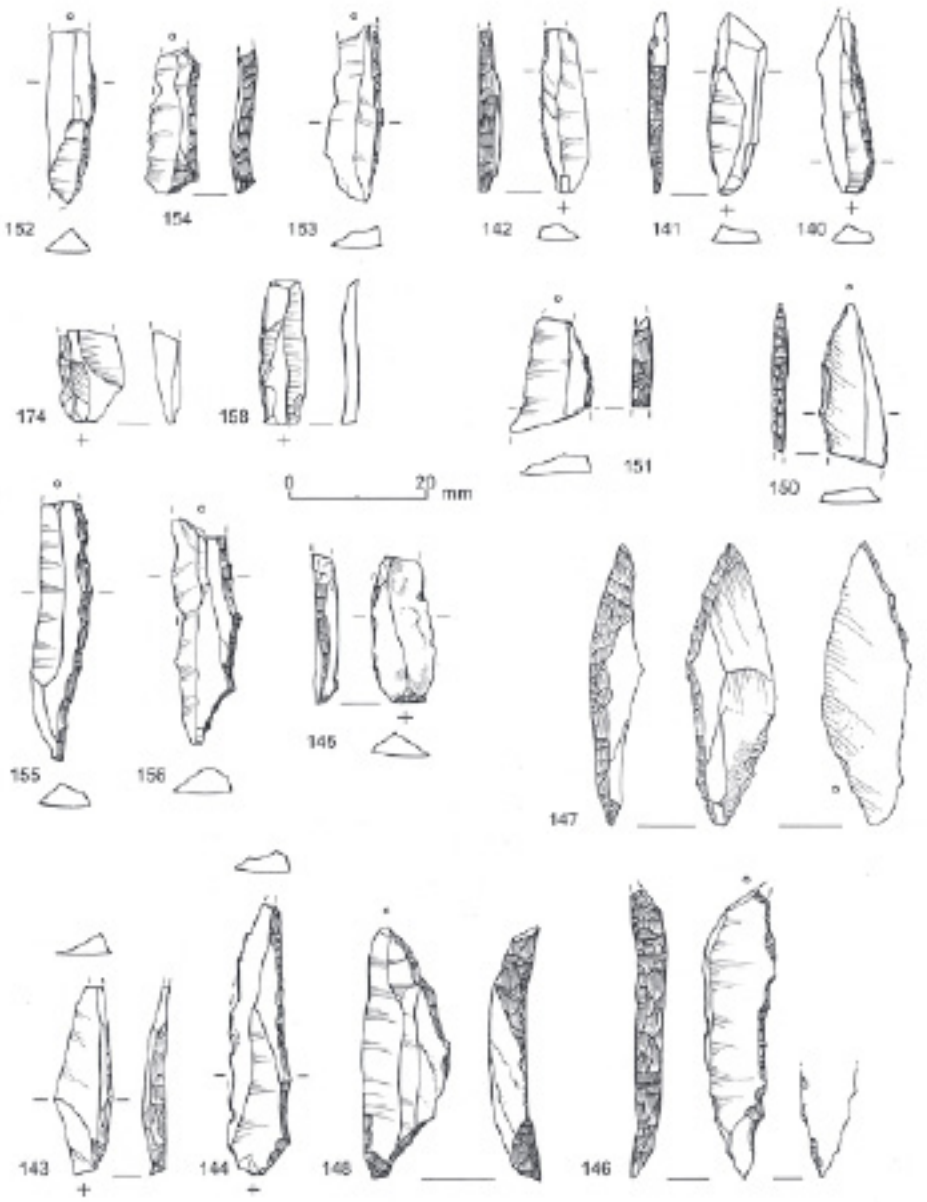

Figure 36: Stone artefacts from Kilmefort cave attributed to the Late Glacial Federmessergruppen culture © Marion O'Neil

journeys into the unknown to visit small islands that would have involved substantial effort and risk? One answer is that, on the first visit at least, they would not have known that the land sighted on the horizon across the sea was necessarily an island – it may have been the edge of a new landmass. Another answer is that of human curiosity: even since the dispersal of Homo sapiens from Africa around 70,000 years ago, our species appears to have had an unquenchable thirst to explore all corners of the world at the first opportunity, including those presenting hostile conditions.

Whether or not these exploratory visits were undertaken by members of a single population-line and hence resulted in the gradual accumulation of geographical knowledge about the region is, of course, unclear. But as they increased in frequency after 9400 cal BP and led to a resident population within the region, such geographical knowledge – that about the topography, resource availability, climate and weather – would have developed and been passed from generation to generation, no doubt largely by stories and song. The dilemma, of course, was that the environment was in

a state of dramatic flux, with rising sea level, changes in tidal range and colonisation followed by succession of flora and fauna. As such the hunter-gatherers were constantly required to revise their knowledge and expectations about the region

5.3.3 Residential settlement: reconstructing mobility patterns, c 9400–7800 cal BP

The period between c 9400 and 7800 cal BP can be described as that of residential settlement within Argyll and western Scotland in general – residential referring to a permanent presence in the region despite what was probably a highly mobile lifestyle. Mesolithic communities – or perhaps a single community – were exploiting the whole region, with activity events distributed from Northton on the Isle of Harris in the north

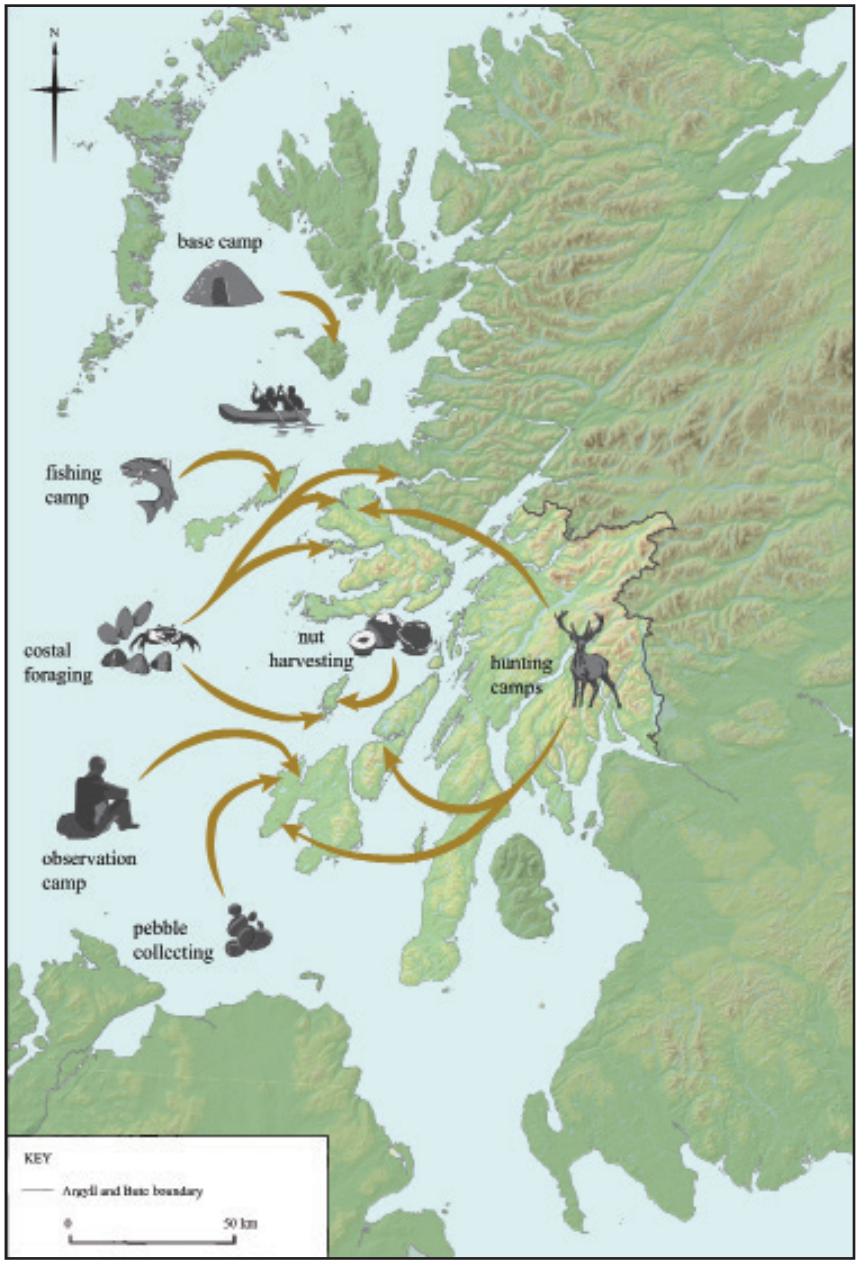

Figure 37: Schematic diagram for Mesolithic hunting and gathering activities during the residential phase of settlement © Steven Mithen

to Auchareoch on the Isle of Arran in the south, and hence encompassing the whole of Argyll. Although there are only 45 dated activity events within this 600 year period, it seems likely that many of the undated Mesolithic sites would date to this period. It was a period of on-going environmental change, with the likelihood that people were now having an influence on vegetation history through deliberate clearance and intensive harvesting of woodland.

The increasing number of activity events up to c 8200 cal BP can be interpreted as an increase in population numbers, although factors relating to preservation and discovery may also be significant. As argued elsewhere (Mithen 2015) and illustrated in Figure 37, the archaeological record suggests a mobile settlement pattern based around exploiting specific types of resources at specific location, most likely at specific times of the year – unfortunately seasonality data is especially sparse.

Several sites have multiple activity events throughout the period of residential settlement indicating repeated visits to key localities, either as a regular seasonal round or simply responding to particular weather conditions and other contingent factors. The latter seems more likely because the Mesolithic hunter-gatherers would have been in a state of constant uncertainty about environmental conditions, these being in flux because of both weather and climatic change. As such, constant information gathering, processing and decision making by the Mesolithic hunter-gatherers would have been required: by necessity they would have been 'Thoughtful Foragers' (Mithen 1990).

5.3.3.1 Mesolithic activities

At Staosnaig, Isle of Colonsay, there is evidence for intensive processing of hazelnuts and other plant types, suggesting the harvesting of the woodland (Mithen et al. 2001), Figure 38. Colonsay is unlikely to have supported large game and hence visits may have been specifically directed towards the exploitation of the hazel-rich woodland. Likewise, Fiskary on the Isle of Coll can be interpreted as a fishing camp, visited on at least three occasions providing discretely dated activity events, centred on c 9070, 8520 and 8280 cal BP (Mithen et al. 2007a; Wicks and Mithen, forthcoming). The fish bones from Fiskary indicate inshore fishing, possibly using fish traps not unlike the cairidh

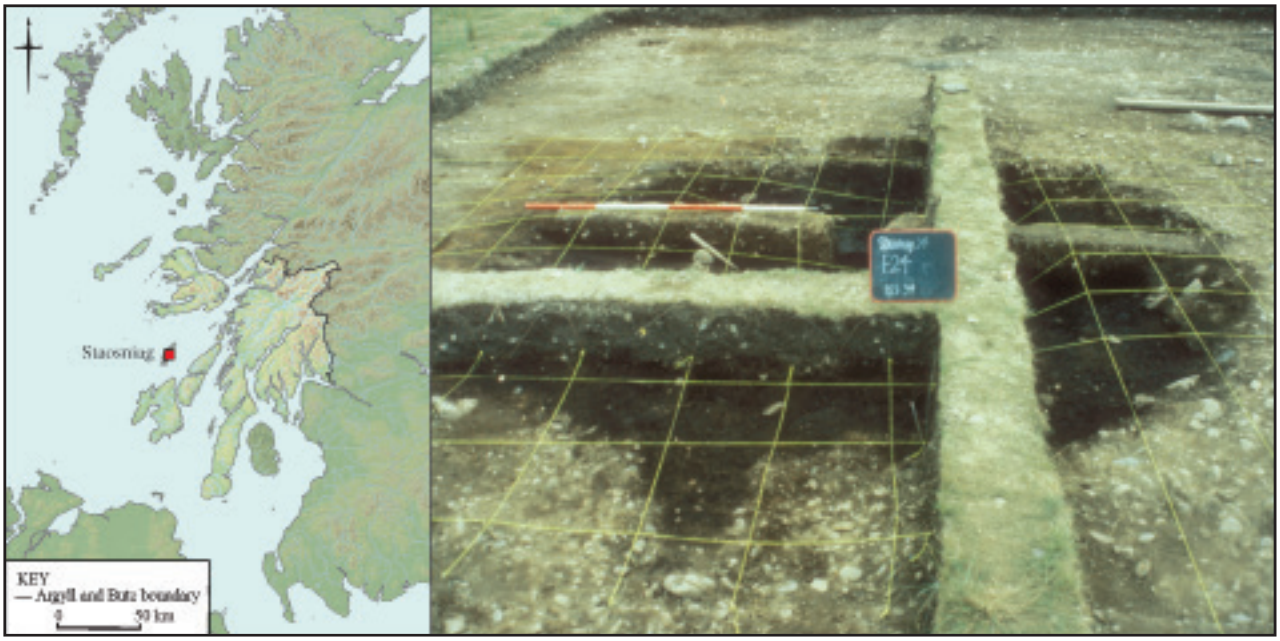

Figure 38: Feature 14 at Staosnaig, isle of Colonsay, show dense concentration of charred hazelnut shell fragments © Steven Mithen

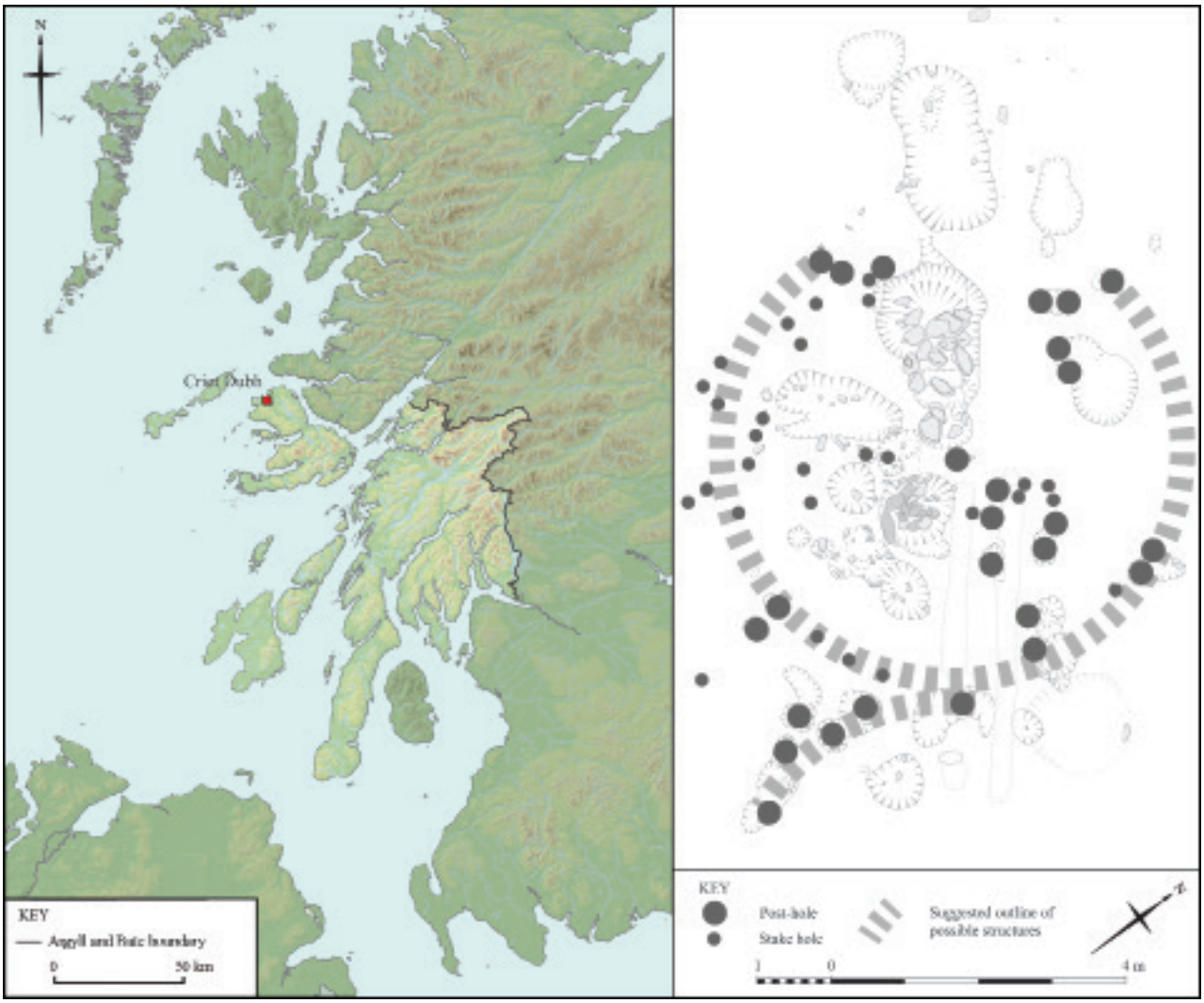

Figure 39: Features at Creit Dubh, isle of Mull, suggestive of a structure © Steven Mithen

that survives at Fiskary Bay today. The quantities of charred hazelnut shell and wood charcoal at Fiskary suggest that activities other than fishing were also undertaken. Unfortunately, the debris at Fiskary is an unstratified palimpsest and cannot be divided into the three (or more) activity events. As such, although one might assume the same range of activities were undertaken at Fiskary during each visit, we cannot exclude the possibility that one visit involved fishing, another involved hazelnut collecting, and a third might have involved neither or both.

The Mesolithic deposits at Rubha Port an t-Seilich on the Isle of Islay provides evidence for another form of activity: big game hunting (Mithen and Wicks 2010a, 2011b; Mithen et al. 2015). Although heavily fragmented, the faunal remains include those from red deer, roe deer and wild boar, as well as from fish and birds. Rubha Port an t-Seilich is one of only two non-shell midden sites where faunal remains have survived, the other being the much later dated Storakaig, also on Islay. It seems likely, however, that other microlithic-chipped stone scatters on the larger islands, such as Bolsay (Isle of Islay, Mithen, Lake and Finlay 2000), Kinloch (Isle of Rum, Wickham Jones 1990) and Creit Dubh (Isle of Mull, Wicks and Mithen 2010c, forthcoming) were also related to large game hunting.

One further specialised activity location appears to be Coulererach on the west coast of Islay (Mithen and Finlay 2000). Excavation revealed

evidence for a predominance of the early stages of core preparation, with large numbers of split pebbles and primary flakes. The location is close to beaches that today have relatively large numbers of flint pebbles. Assuming this was also the case in the Mesolithic, Coulererach appears to have been a raw material acquisition site, from which partially prepared cores were taken to other destinations, especially on islands lacking in flint raw material. Comparative analysis of chipped stone assemblages from the region has yet to be undertaken in an attempt to trace such raw material movements, although evidence for this is already apparent from the presence of bloodstone from Rum and pitchstone from Arran at sites such as Staosnaig on Colonsay (Mithen, Finlay, Carruthers et al. 2000).

The rarity of evidence for structural remains implies a high level of Mesolithic mobility with limited investment in 'place'. This might, of course, reflect no more than the limited area of excavation at any one site, the predominance of small trenches being unable to expose structural evidence other than isolated pits and postholes. But when relatively large areas have been exposed at Kinloch (Wickham-Jones 1990) and at Bolsay and Staosnaig (Mithen et al. 2000) the number of substantial features in patterned arrangements has also been limited. Although these sites lack evidence for major structures, they have arrays of postholes, stake-holes and pits that suggest windbreaks and shelters, most likely erected for short periods of activity. More substantial structures are currently known from just two sites, Staosnaig and Creit Dubh. The large shallow pit containing charred hazelnut shells at Staosnaig has been interpreted as a secondary use of a hut floor (Mithen et al. 2001), while a dense concentration of postholes and stake-holes at Creit Dubh, some providing well-formed arcs and associated with large fire pits, suggests they may have been one or more structures erected (Mithen, Wicks, Pirie and Mariecevic, forthcoming).

In summary, the residential period, 9400–7800 cal BP, appears to have been one of mobile foraging, with visits to specific locations to exploit specific resources most likely at specific times of the year. The archaeological sites provide an insight into some of the specific activities undertaken in the residential phase of Mesolithic settlement. These must be seen in the context of a constantly changing environment, the evidence for which might provide further signs of Mesolithic activity.

5.3.3.2 Environmental context

While annual temperatures within this period would have fluctuated, towards its end there was a major climatic reversal centered on 8200 BP (Alley et al. 1997; Alley and ágústdóttir 2005). This had widespread, hemispheric impacts, felt intensely at the latitude of Argyll (Seppa et al. 2007) and involved a temperature depression in parts of the North Atlantic of up to 4°C. North-west Europe was markedly more arid. This 8.2 ka event is attributed to the abrupt collapse of the North American or Laurentide ice sheet, which through its effect on North Atlantic Ocean circulation, probably shutting down the gulf stream, altered global atmospheric circulation. Stager and Mayewski (1997) and Debret et al. (2009) suggested that the present atmospheric circulation system only emerged with the collapse of this huge ice sheet.

Throughout this period sea level continued to rise, as described above and perhaps accelerated by the 8200 BP event. But sea level change was not the only alteration to the Early Holocene coastline of significance to early prehistoric communities. The availability of resources and the pattern of settlement would have also been influenced by the erosion and deposition of sediment, changes in sea temperature and salinity, the extent of storminess and of tidal extremes. While we can be confident such changes would have occurred, direct evidence is regrettably sparse.

Bond et al. (1997) has identified the transport from the Arctic Ocean of "armadas" of icebergs as far south as the Irish west coast periodically

in the Holocene at c 11,150, 10,250, 9350, 8200, 5900, 4200 BP and c 1350 BP. Thornalley, Elderfield and McCave (2009) analysed fluctuating surface and deep-water temperature and salinity south of Iceland. Changes in either will have affected the abundance and locations of spawning and feeding grounds for fish populations. They recognise falling salinity from the start of the Holocene to c 8000 BP: the 8200 BP event freshened by 0.4psu the North Atlantic. Seawater was well mixed and fresh after this event for c 1000 cal years until c 7000 BP. Salinity then increased to its present day values at c 5000 BP.

Sediment-stratigraphic and biological RSL indicators tend to describe mean sea levels, not tidal or wave extremes. Jardine (1987) mapped a series of storm-beach gravel ridges on Oronsay, thought to be of mid-Holocene age, one at least perhaps 10m above contemporary mean sea level. Smith et al. (2007) surveyed storm beach ridges probably dating to the mid-Holocene on the west and east coasts of Bute, which reached up to 3m higher than contemporary mean sea level, even though such early Holocene storm beaches had been deposited from a significantly lower sea level. The systematic mapping and dating of further storm beaches would provide data, though biased to Devensian Lateglacial and post-6000 BP events, to infer past periods of increased storminess, the degree of exposure of particular parts of the coast and the modelling of wave extremes that may have been critical to travel by sea.

Other than the on-going changes in sea level, tidal range, salinity and storminess, the major on-going environment change throughout this period was that of vegetation. This influenced the availability and type of animal resources for hunting, of plant foods, raw materials, and of materials used for medicines. Vegetation cover also influenced visibility across and the ease of movement through the landscape. Moreover, human impacts on the landscape are likely to be most evident on vegetation cover and potentially detectable via the palynological record, while microscopic charcoal within sediment cores might provide evidence for human activity in the absence of archaeological sites. Fortunately, in contrast to other aspects of environmental change we have considered, the evidence for vegetation change within Argyll is relatively abundant.

Palynological records have been derived from numerous sediment cores distributed throughout Argyll, probably the densest array in Scotland (Figure 25). Those by Durno with Mercer on Jura and are of historical interest only (Edwards 2000) but many analyses are cutting-edge. Most of these are uniformly of high quality with regard to pollen taxonomy and temporal resolution, though in many there was no recording of microscopic charcoal. Most are 'sensitive' sites, describing plant communities and their changes at spatial scales small enough to identify and be supportive of archaeological evidence for similarly small-scale human activities. For those pollen sites lacking 14C-derived chronologies their attribution to the Mesolithic is based on the rise of Alnus (alder) pollen after c 7000 cal BP and the absence of a mid-Holocene Ulmus (elm) decline, known from elsewhere in southern Britain. In general, birch and hazel trees were the predominant trees within the early Holocene woodland. These were subsequently out-competed by the broad-leaf taxa such as oak and elm after c 9000 BP; one must note, however, considerable degrees of local variability reflecting variations in topography, aspect, exposure, soils and so forth.

Some of the sediment cores located on Figure 25 were taken to understand the dynamics of de-glaciation of ice sheets and valley glaciers of GS-1 (the Younger Dryas or Loch Lomond Stadial). Those along Loch Awe at Ford, Inverliever and Barachander (Tipping 1987, 1988, 1989a) and in Cowal at Na Lona Min (Tipping 1986) do not extend to sediments younger than c 11,000 BP. However, those on Rannoch Moor at Clashgour, Corrour, Kingshouse and Rannoch Station (Walker and Lowe 1977, 1979, 1981, 1985, 1987), on Loch Linnhe at Lairigmor (Walker

and Lowe 1981) and on Mull at Coire Clachach, Fhuaran, Gribun and Torness (Lowe and Walker 1986) also describe plant communities for the bulk of the Mesolithic period. None of these sites have records of microscopic charcoal.

A cluster of pollen sites on Islay were analysed to understand Mesolithic vegetation history and human disturbance to plant communities including Coulerach (Bunting et al. 2000), Bealach Froige, Cultoon, Gruinart, Loch Gorm and Sorn Valley (Edwards 2000) and Loch a'Bhogaidh (Edwards and Berridge 1994; Edwards and Mithen 1995). Analyses at Loch Cholla, Colonsay were intended to understand the Oronsay shell middens excavated by Mellars (Andrews et al. 1987). On Coll, the site of Loch an-t Sagairt remains to be fully published (Wicks and Mithen 2013). Edwards, Langdon and Sugden (2007) tried to disentangle anthropogenic from climatic effects on the vegetation at Loch an't Suidhe on Mull around c 8200 BP. The site of Rhoin Farm, west of Campbeltown, was analysed by Edwards and Mackintosh (1988; Edwards 1990) to explore pre-elm decline agricultural activity.

The difficulties of defining an unambiguous hunter-gatherer signal in pollen records are many, not least because new data on the intensity of abrupt climate change introduce mechanisms by which vegetation can be naturally disturbed. Tipping (1996) argued, for instance, that relative drought increased the likelihood of wildfires in northern Scotland, although this has been contested by Bishop et al. (2015). Random events such as lightning-strike fires and tree-felling in storms (eg Tipping (2008) at Clashgour on Rannoch Moor) are feasible sources of woodland change. Edwards et al. (2007) elegantly evaluated human-climate agencies at Loch an't Suidhe on Mull across the major early Holocene abrupt climate change event at c 8200 cal BP. Losses of deciduous woodland around 8300 BP are accompanied by increases in microscopic charcoal, which were argued to have been anthropogenic in origin because climatic deterioration was recorded from chironomid analyses after, not during woodland loss. Errors in 14C dating may explain why the climatic deterioration appears not to be that at c 8200 cal BP (though see Edwards et al. 2007 for other interpretations) but do not detract from their more general conclusions.

On Islay, Mesolithic anthropogenic activity has been suggested from closely spaced pollen analyses seeming to describe short-lived vegetation disturbance, accompanied by burning (Edwards 2000). Events are diachronous across the island, which Edwards (2000) uses to dismiss climatic causation. Disturbance was particularly widespread in the 8th millennium BP. The astonishing find of burnt hazel nuts – the product of perhaps some 15000 trees – at Staosnaig on Colonsay (Mithen et al. 2001) excited much interest, with the suggestion that the pollen record should be able to detect this event (Edwards 2000), although Andrews et al. (1987a) had not reported Mesolithic-age anthropogenic impacts on Colonsay. Andrews (in McCullagh 1989) also identified possible anthropogenic woodland disturbance on Islay, around the Sorn Valley, around 7900 BP. In the Oban area significant woodland loss, associated with burning, is also recorded for short time intervals throughout the Mesolithic.

Lowe and Walker (1986; Walker and Lowe 1977, 1979, 1981, 1985, 1987) were unable to detect Mesolithic period anthropogenic signals in any of their fourteen sites they examined in Argyll. This may in part be because microscopic charcoal had not been recorded, or because the time interval between pollen samples was too coarse, but this is an intriguing if negative result. Trees may have also been at a low density which impedes detecting an anthropogenic impact: on Colonsay, for instance, Andrews et al. (1987a) reported that tree pollen rarely exceeds 20% total pollen and spores concluding that the landscape must have been quite open, maintained by a high degree of exposure to winds. Walker and Lowe (1985) also infer a high degree of exposure to wind from the low representation of trees at sites on Mull, and around Iona Loch the dominant vegetation in

the Mesolithic is a grass-heath with few trees (Scaife and Dimbleby 1990). It is difficult to see in these open settings why people would have needed to disturb woodland: models for anthropogenic interference derived from the closed deciduous woodlands of eastern England (Simmons 1996) need not have applied to the Scottish west coast. Other landscapes appear more wooded, but nevertheless the precise 'ecology' of these disturbances in western Scotland, and if purposeful what they achieved, needs to be explored much more fully. This is now a pressing need because if anthropogenic signals in Mesolithic-age pollen records along the Scottish west coast can be demonstrated, the technique is one of the few that could test Wicks and Mithen's (2014) suggestion of population collapse in and after the 8200 BP abrupt climate change.

5.3.4 Population decline: the impact of climate change?

Following c 8200 cal BP the archaeological record shows a dramatic decline in the number of activity events (Figure 31), a decline that appears even more dramatic in the summed calibrated probability distribution (Figure 32). Wicks and Mithen (2014) proposed that this was a consequence of the environmental impacts of the abrupt 8.2 ka cold event, which is synchronous with the decline of activity events and even more so with the summed probability calibration distribution (Figure 32). This event is well documented within the ice cores and a range of terrestrial indicators as a c 200-year climate anomaly creating cooler, drier and perhaps windier conditions in the North Atlantic regions (Thomas et al. 2007). Its impact appears evident in pollen records from the region, such as at Loch an t-Sagairt on the Isle of Coll (Figure 23; Wicks and Mithen 2014).

Wicks and Mithen (2014) argued that the 8.2 ka event reduced the biomass and productivity of the region while increasing the risks associated with sea-travel and coastal foraging. This either resulted in landscape abandonment or a demographic collapse. Wicks and Mithen preferred the latter, arguing that even slight reductions in birth rates and increase in mortality are likely to have significantly reduced the population levels. The continuing presence of activity events and technological continuity throughout the residential, decline and re-colonisation phase suggests the population did not become locally extinct.

One must, of course, be cautious of this interpretation because the decline in the number of activity events might be an artefact of the archaeological record rather than population density. Acknowledging this, Wicks and Mithen (2014) considered a range of alternative explanations including:

1. Might there have been a change in technology or settlement size immediately after 8.2 Ka that made Mesolithic sites in the period 8200–6600 more difficult to find?
2. Might there have been a differential rate of destruction or burial of Mesolithic sites resulting in their relative rarity in the period 8200–6600?
3. Might the 8.2 ka event have caused a change in the spatial distribution of Mesolithic activity within the study region to locations that are no longer archaeologically visible or have received less intensive fieldwork?

None of these possibilities were found to be compelling. As such a demographic collapse arising from the environmental impact of the 8.2 Ka event appears most plausible to explain the decline in activity events. If that is indeed the case, one might reasonably ask why the Mesolithic hunter-gatherers did not adapt their technology, subsistence and social systems to be more appropriate for the new environmental conditions. Many hunter-gatherers have lived, if not flourished, within far harsher environmental conditions than those likely to have been induced in western Scotland by the 8.2Ka event. The most likely explanation for a failure to adapt is a

combination of the abruptness of the 8.2 Ka event and low population densities that inhibited the capacity for innovation. A demographic impact would only have been avoided if new patterns of mobility, subsistence and social behaviour could have been required within a generation. That rate of cultural change appears unfeasible within groups of low-density hunter-gatherers (Shennan 2001). A limited capacity for innovation is indeed evident in the c 4500 years of the Mesolithic record of western Scotland. There is, for instance, a striking similarity in the stone tool technology from the earliest activity events, such as at Kinloch, Creit Dubh and Fiskary (events before 9000 cal BP), to those at the latest, such as Storakaig (events after 6000 cal BP).

In summary, the period between 8200 and 6600 cal BP is interpreted as one of population decline to low, but still viable, population levels throughout the region – towards the c 260 rather than the 2370 of the potential population range. Activity events are known in the relative south, such as at Bolsay, Isle of Islay, and in the relative north, such as at An Corran, Isle of Skye. It is also within this period that the first activity event becomes apparent on the Isle of Oronsay.

5.3.5 Re-colonisation: was there Mesolithic 'sedentism' on Oronsay?

As from 7000 cal BP the number of activity events increases in number, reaching a peak at between 6200–5800 cal BP, but at only half the level attained prior to 8200 cal BP. The location of these events is almost entirely in the southern area of Argyll, notably on the Isle of Oronsay (Figure 29). This increase in activity events might be explained either by the growth of what had been the residual population by enhancing fertility and/or reduced mortality, or by re-colonisation with people returning to what had been a largely abandoned landscape. As noted, above, however, one must remain aware of the possibility of differential survival of archaeological sites in different phases of the Mesolithic past arising from environmental events.

It is indeed during this temporal phase that the post-glacial transgression reaches it maximum extent. This rise in sea level is likely to have destroyed a number of sites by coastal inundation. An example comes from Fiskary Bay, Isle of Coll (Mithen et al. 2007a; Wicks and Mithen, forthcoming). Here a raised beach that

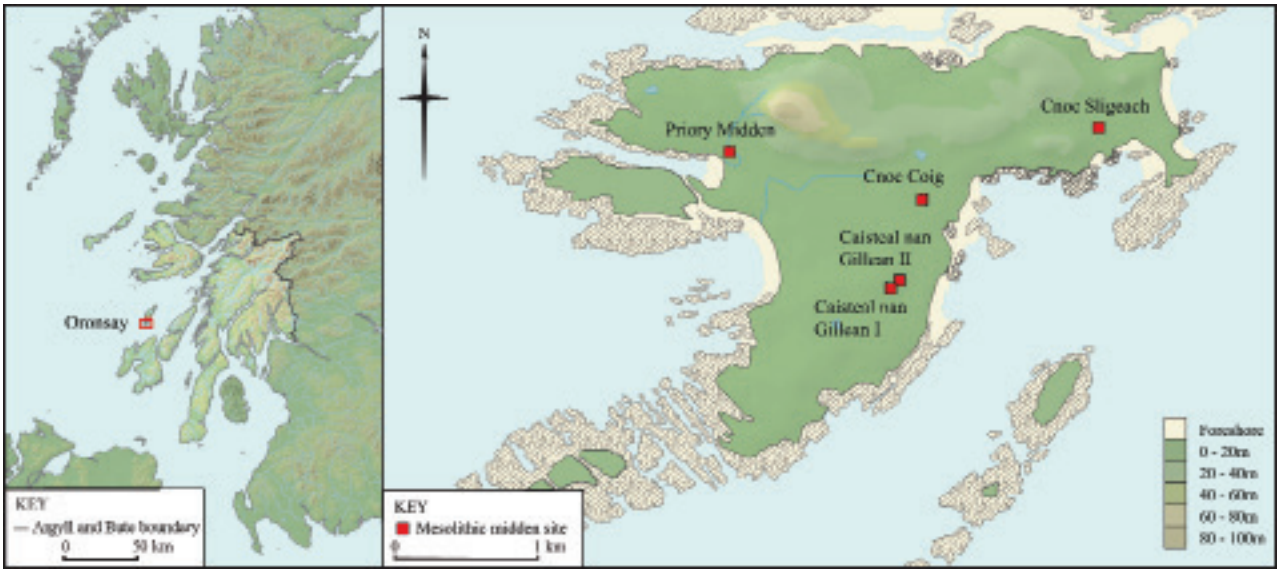

Figure 40: Map of the Oronsay middens © Steven Mithen

contained abraded stone artefacts sealed the in situ Mesolithic deposits: the lower-lying part of a single activity location appears to have been swept over that at a higher level. Mesolithic chipped stone artefacts within a storm beach dating to the maximum transgression also been recorded at Croig, Isle of Mull (Mithen et al., forthcoming). While such coastal inundation might have destroyed some Mesolithic sites and made others harder to discover, Wicks and Mithen (2014) discount this as explaining the temporal pattern of activity events illustrated in Figure 31, primarily because of the chronological evidence was primarily derived from inland Mesolithic sites.

The Oronsay middens are some of the most intensively studied and discussed Mesolithic sites in Britain, Figure 40. These have provided data for the application of numerous scientific methods including the analysis of fish bones for seasonality (Mellars and Wilkinson 1980), human bone for isotopes indicative of diet (Richards and Mellars 1998), and Bayesian statistics for establishing chronology (Wicks et al. 2014). It is nevertheless regrettable that much of the data excavated by Mellars during the 1970s remains unpublished, including the human bones, bird bones, fish bones, stone artefacts, bone artefacts, features and so forth. Moreover the frequent characterisation of Cnoc Coig, as a 'shell midden' does little justice to the complexity of its archaeological remains evident from unpublished plans because a range of features indicative of substantial structures are present.

The studies of the Oronsay material and ensuring debates have contributed to wider discussions about settlement patterns and diet in the Late Mesolithic and potential contrasts with that of the Neolithic (Schulting and Richards 2002; Richards et al. 2003). As such, the key themes of the re-colonisation phase are Mesolithic sedentism and diet.

There are two conflicting interpretations of the Oronsay middens. To quote Mellars (2004, 177);

"That the occupation and use of the different shell middens on Oronsay was essentially the product of a single social group, which remained on the island throughout most if not all of each year, but moving seasonally between the different sites (Richard and Mellars 1998)";

"That the occupation documented in the different middens represent much more sporadic and intermittent visits to the sites by a range of different social groups, who spent the remainder of each year on some of the larger adjacent islands, such as Jura, Islay or Colonsay, or possibly the Scottish mainland, most probably practising economies in these other locations dependent largely on the hunting of red deer and other land mammals (Mithen 2000: 623; Mithen and Finlayson 1991)".

Wicks et al. (2014) provided new evidence to support the second of these interpretations. Their excavations at Storakaig, a non-coastal, upland site on Islay, had produced not only a Mesolithic site with a narrow blade assemblage but also, and uniquely for an inland site, preserved animal bones. Although highly fragmented, these represent red deer, roe deer, wild boar, fox and badger. They were preserved by having become heavily calcined from being burned at high temperatures. The location of the Storakaig, its artefacts and fauna suggests a small Mesolithic hunting camp, Figure 41. When its eight AMS 14C dates (all on single fragments of charred hazel nut shell) were analysed these indicated a minimum number of four activity events, centered on c 6320, 6070, 5840 and 5810 cal BP. As such, a strong overlap with the chronology of activity events on Oronsay was demonstrated, which is illustrated most effectively by the overlap in the summed calibrated probability distributions for Cnoc Coig and Storakaig (Wicks et al. 2014), Figure 42.

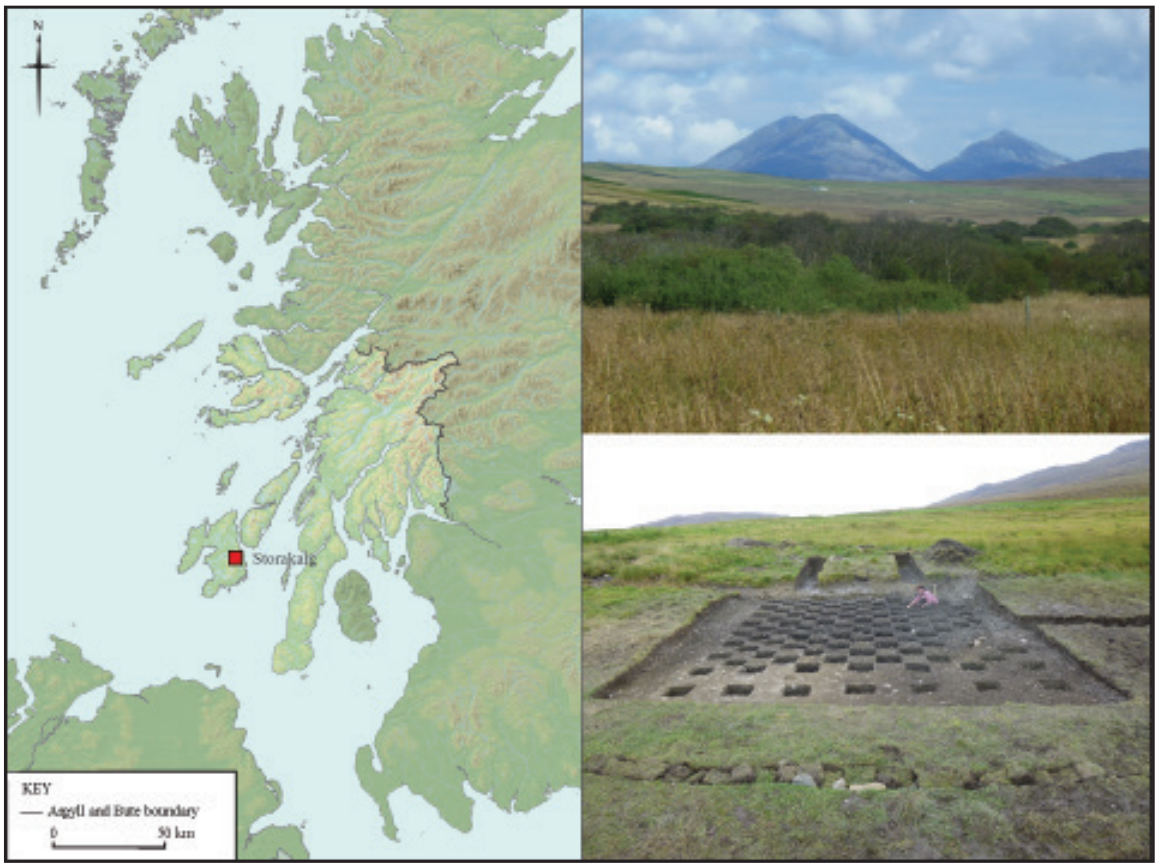

Figure 41: Storakaig, Isle of Islay © Steven Mithen

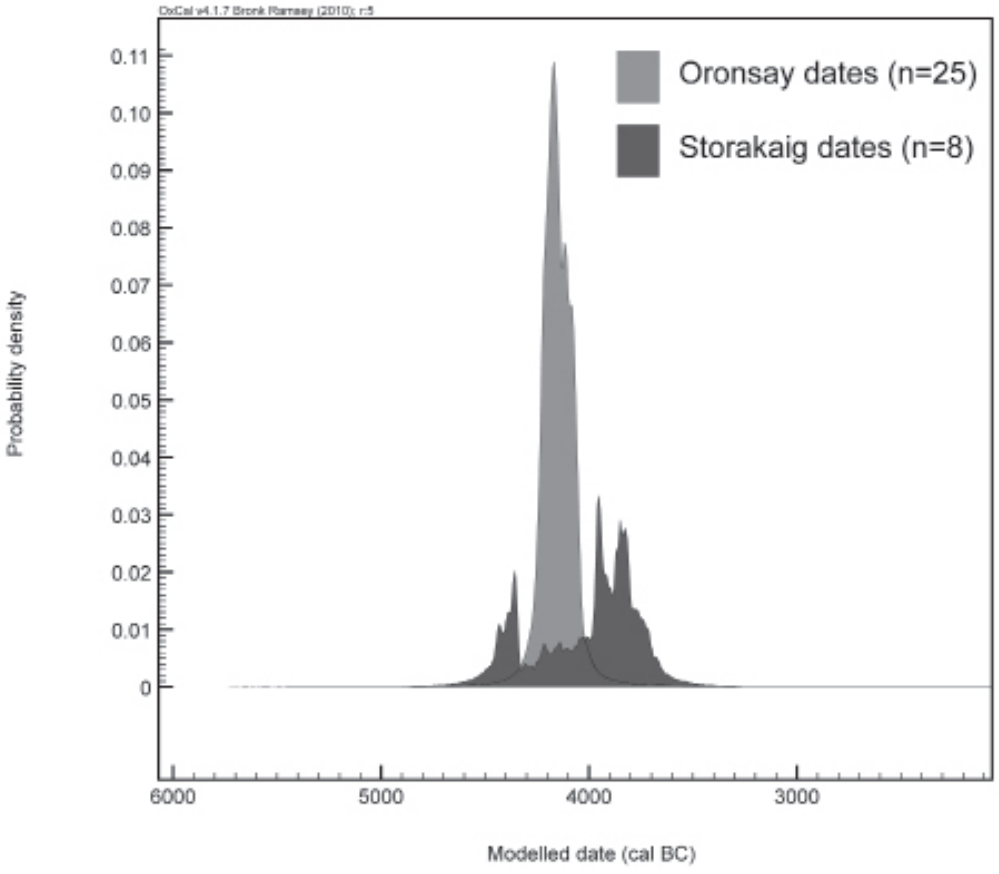

Figure 42: Overlap of the SCPD for Storakaig and the Oronsay middens © Steven Mithen

Although it cannot be demonstrated formally that the same group of Mesolithic foragers were moving between Oronsay, where they were predominately fishing and collecting shell fish, and Islay, to hunt big game, that would appear to be the most reasonable interpretation, lending support to the second of Mellars' hypotheses listed above – although this might reflect the movement of a single social group rather than the 'range' of social groups that Mellars' proposes (whatever 'range' might mean in this context). In this regard the differences between the chipped stone assemblages from Cnoc Coig and Storakaig, the former predominately bipolar the latter predominately platform core technology, should be interpreted as responses to available raw materials, types of activities undertaken, anticipation of future needs and the social context of tool manufacture, rather than distinct cultural traditions of separate populations.

If one does indeed favour the second of Mellars' (2004) hypotheses, then the behaviour of the Mesolithic foragers within this period appears similar to that with the residential period: 'thoughtful foragers' moving to different locations to exploit different types of resource at different times of the year, always in a state of uncertainty because on-going change in their environment. While one might perceive an increased focus on coastal foraging, perhaps relating to the marine transgression, shell middens had also been created during the residential period, notably at Sand, Northton and An Corran.

5.3.6 Appearance of the Neolithic

At some point between 6300 cal BP and 5800 cal BP a wholly novel lifestyle based on agro-pastoral farming, and featuring a new technology (pottery) and many other novelties in material culture, belief and practices, appeared in Argyll. Sheridan (2010) interprets the evidence as the arrival of small groups of farmers ultimately from continental Europe. She argues that the alternative interpretation – that indigenous hunter-gatherers adopted a Neolithic lifestyle as a result of long-standing, long-distance and regular contacts with the Continent (eg Thomas 2013) – lacks any credible supporting evidence.

According to Sheridan (2010), Argyll has evidence for two strands of Neolithisation The first relates to a northward movement up the Atlantic façade of small groups of settlers from the Morbihan region of Brittany, as attested by the Morbihan-style closed megalithic chamber and simple passage tomb, with Morbihan-style pottery (including a Late Castellic bowl), at Achnacreebeag (Figure 49; Ritchie 1970; Sheridan 2010). Similar monuments are known elsewhere in western Scotland, such as the north-west chamber at Greadal Fhinn in Ardnamurchan (Ritchie 1970, 37), at the north-west and south-west tips of Wales, and around the northern half of Ireland, these always being in coastal (or near-coastal) locations. No settlements or other evidence relating to the builders of these monuments have yet been found in Britain and Ireland. Similarly, there is no radiocarbon date for the construction of the Achnacreebeag monument (and no chance of obtaining such a date), while radiocarbon dates obtained for similar monuments at Carrowmore in County Sligo, Ireland, have been subject to trenchant (and justified) critique (Bergh and Hensey 2013). At present their dating, and that of Late Castellic pottery, is based on dates from Brittany and Normandy, where they fall between 6300 BP and c 5900 BP. The British and Irish monuments and pottery are also likely to fall within this date bracket, and could lie towards its end.

The second strand of Neolithisation in Argyll is argued to derive from a different northward movement, again of small numbers of immigrant farmers, this time from the Nord-Pas de Calais; this has been named the 'Carinated Bowl [or 'CB'] Neolithic' (Sheridan 2007). Its appearance in Argyll – extending as far north as Islay and the Cowal peninsula, as excavations at Newton and Port Charlotte on Islay, and at Auchategan,

Glendaruel make clear (McCullagh 1989; Harrington and Pierpoint 1980; Marshall 1978, and see Sheridan 2012 on the 'CB Neolithic' presence in Kilmartin Glen; Figure 26) – is likely to relate to a rapid south-westerly spread of settlers from eastern Scotland, moving along major river valleys and the Great Glen, rather than to direct movement from northern France. More is known about these people than the first Neolithic arrivals. In addition to their distinctive pottery style (Carinated Bowl pottery – one of several variants of Chasseo-Michelsberg pottery that developed around the end of the fifth millennium in northern France and Belgium), we know that:

- In some parts of Scotland the first arrivals built large rectangular communal timber houses (halls), staying there until people felt sufficiently well established to 'bud off' into individual households;
- They initially used non-megalithic communal funerary monuments, usually involving rectangular timber mortuary structures that were usually burnt down and covered by long or round mounds; importantly, however, we know that they also buried their dead in the cave at Raschoille near Oban (Connock 1986 ; Bonsall et al. 2012), and elsewhere in Scotland (and Ireland) they also cremated people on open pyres, covering them with round mounds (as at Boghead, Aberdeenshire: Sheridan 2010);
- They brought with them their sacred and ancient axeheads made of jadeitite and other Alpine rocks, as precious and talismanic heirlooms (rather than as workaday axeheads);
- They introduced to Scotland the practice of using ground stone axeheads – necessary for clearing the forest and working timber for their houses, tools and monuments – and they sought out good sources of stone for making them;
- They also introduced new styles of small lithic artefact (eg leaf-shaped arrowheads) and a new style of knapping flint (Warren 2005), and they also sought good-quality flint and other types of stone; furthermore, they introduced technology relating to the processing of cereals (i.e. saddle querns and rubbers);
- They rapidly established networks of contact over which they exchanged objects (such as pitchstone artefacts and stone axeheads), ideas and probably people;
- They grew cereals (wheat and barley) and flax in small plots on good agricultural land that they had sought out, and kept domesticated cattle, sheep/goats and pigs. They also hunted wild animals (as is clear from the yew bow found at Rotten Bottom, Dumfries and Galloway: Sheridan 2007) but they did not consume marine foods (Schulting and Richards 2002). The site at Auchategan (Marshall 1978) suggests that they practised transhumance, this being a probable summer camp.

The date of the arrival of the CB Neolithic in Argyll is likely to fall within the first two centuries of the sixth millennium cal BP (see Sheridan 2012b for a critique of Whittle et al.'s (2011) Bayesian-modelled dates for its appearance in different parts of Scotland). It may therefore have been roughly contemporary with the Breton strand of Neolithisation, or may have post-dated it by several generations.

5.3.7 The demise of the Mesolithic

There is much that we do not know about these putative immigrant farmers and about their relationship with the indigenous Mesolithic communities. There is evidence that the Mesolithic lifestyle continued at least until the opening centuries of the sixth millennium BP, and this is confirmed by recently obtained radiocarbon dates on human and boar remains from the Cnoc Coig shell midden, which lie within the first quarter of that millennium (Charlton et al. 2016, and see also Milner 2010). The radiocarbon dates from Carding Mill Bay midden start from 6180–5740 cal BP (4230–

3790 cal BC) and continue through the entire 6th millennium BP (4th millennium BC; Connock et al. 1992), while human bones of 'Neolithic' date were deposited in the Mesolithic midden at Raschoille cave (Milner and Craig 2009, Bonsall et al. 2012).

The chronological analysis undertaken by Wicks et al. (2014) support the notion of Mesolithic-Neolithic overlap, most starkly illustrated at the Mesolithic site of Storakaig on the Isle of Islay (Figure 39) that has dates that overlap with both the latest dates from the Oronsay middens and the earliest Neolithic in this part of Argyll. Potential chronological overlap or, at least, close temporal succession of the events taking place in these locations is especially interesting because Storakaig is a 'classic' Mesolithic site and would have sat comfortably within the residential period of settlement. Its chipped stone assemblage contains some large blades and retouched artefacts that are generally considered diagnostic of Neolithic assemblages but which are scarce in Argyll (Wicks et al. 2014). At Storakaig, these Neolithic-like artefacts are scattered across the site and are indistinguishable from the diagnostically Mesolithic artefacts in their condition and patination within a tightly clustered set of radiocarbon dates (Wicks et al. 2014).

The radiocarbon dates from both the Oronsay sites and Storakaig have a significant overlap with the dates of the Clyde cairns, including Port Charlotte chambered cairn on Islay (Henshall 1972: ILY 1, Harrington and Pierpoint 1980), which yielded three preconstruction dates from the occupation layer under the cairn 5930–5590 cal BP, 5900–5580 cal BP and 5590–5050 cal BP (3980–3640 cal BC, 3950–3630 calBC and 3640 – 3100 cal BC. Two dates from inside the chamber of the cairn were 5460–4960 cal BP (3510–3010 calBC) and 5590–5310 cal BP (3640–3360 calBC). Very similar dates come from Newton, c.5km northwest from Storakaig, where two pits containing Neolithic pottery produced dates of 5890–5590 cal BP (3940–3640 cal BC) and 5750–5470 cal BP (3800–3520 cal BC) (McCullagh 1989). Although we are dealing with overlaps between substantial date ranges, which by no means prove overlap in the activities at these Mesolithic and Neolithic sites, these nevertheless provide a significant cluster of dates spanning the transition in a narrow geographic proximity.

Neolithic activity is also evident at Bolsay, one of the most extensive Mesolithic sites on Islay. This is situated 2km to the northwest from Port Charlotte chambered cairn and an equidistance from the chambered cairn of Slochd Measach (the 'Giant's Grave'), located to the west of Bolsay (Henshall 1972), Figure 45. The excavation at Bolsay recovered 329,667 pieces of chipped stone, including 7000 microliths, and was interpreted as a frequently visited hunting camp, providing a significant 'place' for Mesolithic people who returned to it repeatedly for over millennia. Mesolithic occupation is represented by an in situ horizon sealed by colluvium, which was disturbed by ploughing. This colluvium contained a huge number of artefacts of narrow blade technology, which is conventionally entirely associated with the Mesolithic period, along with small numbers of Neolithic and Bronze Age artefacts, including the fragment of a polished stone axehead.

From ten Bolsay C14 dates only three belong to the Mesolithic, providing two activity events centred on 8155 cal BP and 7650 cal BP (6205 cal BC and 5700 cal BC) and thus predating the activities at Storakaig and Oronsay. However, renewed activity at the site in the Early to Middle Neolithic is evident by three C14 dates with ranges between 5590–5320 cal BP (3640–3370 cal BC), 5580–5070 cal BP (3630–3120 cal BC) and 5300–4880 cal BP (3350–2930 cal BC) (Mithen, Lake and Finlay 2000), even though the diagnostic Neolithic artefacts are a tiny proportion of the whole. The Bolsay site in unquestionably a palimpsest of activity from an extensive chronological range, but whether this is one of clearly differentiated events separated by extensive periods of time, or a continuous flow of similar types of activity that nevertheless falls

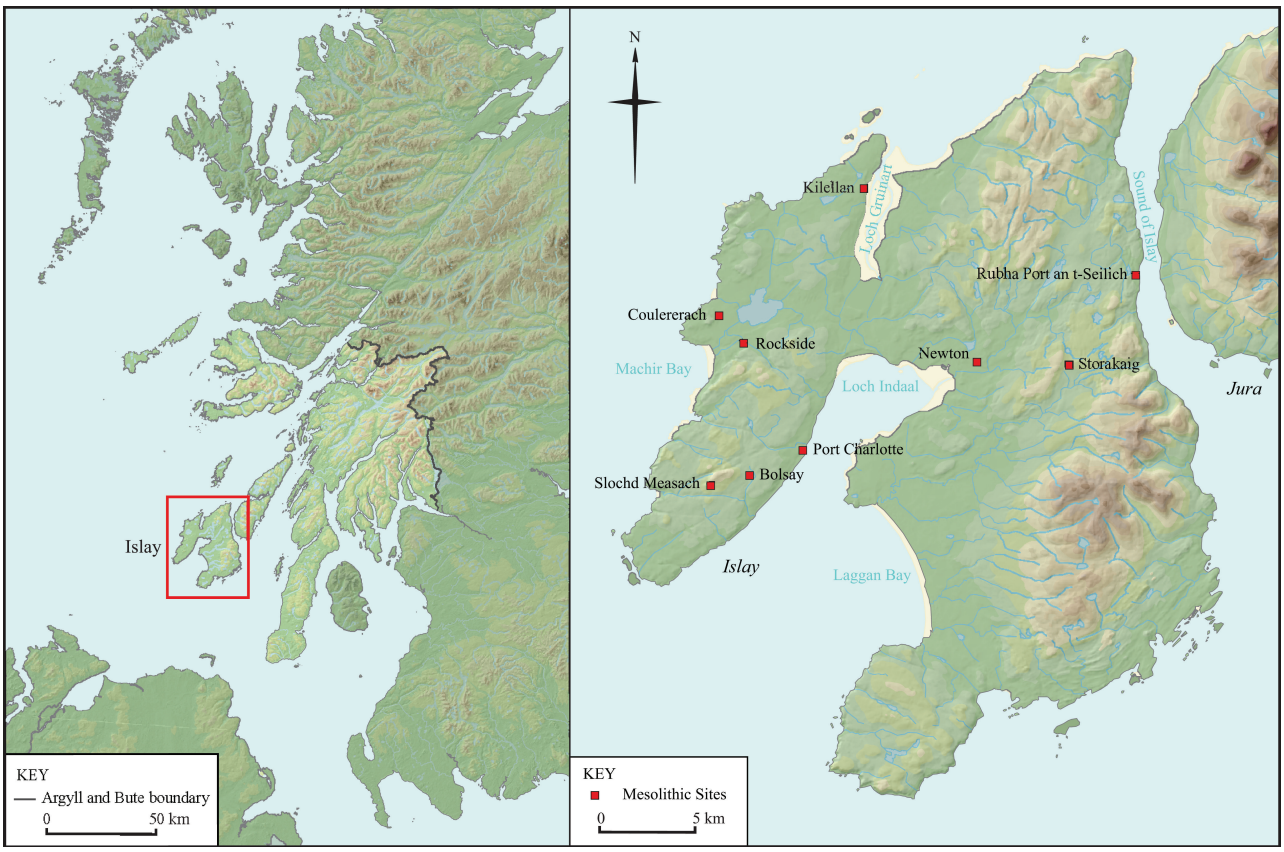

Figure 45: Mesolithic and Neolithic sites on Islay referred to in the text © Steven Mithen

into different cultural periods as conventionally defined remains unclear. The fact that Neolithic lithic material is not only found on a site that had been frequented during the Mesolithic, and within the same archaeological contexts raises the question of what exactly constitutes 'Mesolithic' and 'Neolithic' settlement remains in western Scotland (Armit and Finlayson 1992).

The population density for both indigenous and putative immigrant groups might have been sufficiently low that it is possible that they had successfully co-existed in relative proximity of each other for several generations, no doubt being aware of each other. The fragmented nature of the west coast of Scotland and the adjacent islands offered such diverse subsistence opportunities for the hunter-gatherer groups that the introduction of the initial small scale farming in this landscape may not have imposed any immediate threat to their way of life (Milner 2010). Nevertheless, a process of acculturation – or simply Mesolithic extinction – took place, perhaps swiftly, with the demise of the purely hunting and gathering way of life. This is starkly illustrated in the isotopic and lipid evidence relating to human diet, with no individuals having a 'Mesolithic' dietary signature being known to post-date the aforementioned Oronsay shell midden individuals. The interpretation of such dietary data remains in contention, with an invaluable review by Sheridan and Pétrequin (2014).

5.3.7.1 Environmental evidence for the Mesolithic-Neolithic transition

The environmental context for the transition from the Mesolithic to the Neolithic has not received sufficient attention. Abrupt climatic fluctuations appear broadly coincident with the transition, from c 6350 BP until c 5750 BP (Bonsall et al. 2002; Tipping 2010 but see Schulting 2012), although whether these had any causal influence on human activities – that is the eventual decision to abandon a lifestyle based purely on exploiting wild resources – remains unknown.

Increased storminess may have been a significant environmental characteristic during the period of the transition. This is evident from patterns of sand dune accumulation that are interpreted as a consequence of abrupt climate change and storminess in Sweden (Bjorck and Clemmensen 2004; De Jong et al. 2006), Portugal (Clarke and Rendell 2006) and Wales (Orme, Davies and Duller 2015). Dunes on the Outer Isles (Gilbertson et al. 1999; Dawson et al. 2004), in Wester Ross (Wilson 2002) and along the north Irish coast (Wilson, McGourty and Bateman 2004) suggest periodicity rather than continuity in dune and machair accumulation, this appearing to start towards the end of the Mesolithic and during the early Neolithic c 6300–5200 BP. Again, whether increased storminess had a causal influence on the process of transition from the Mesolithic to the Neolithic, remains to be explored.

Whilst the dating of the archaeological record of the Late Mesolithic and the Early Neolithic remains poorly resolved, and the economic activities of these communities remains ill-defined by archaeological evidence, the environmental record might provide insights into the economies of these periods and the chronology for the development of farming as the predominant way of life. The possibility that Mesolithic people might have planted cereal crops was once an intriguing idea (Edwards 1989; Edwards and Hirons 1984). Macklin et al. (2000) report cereal-type pollen as early as c 11,200 BP at Gallanach Beg but interprets this as deriving from wild grasses. Cereal-type pollen was found in pre-elm decline sediments at Rhoin Farm (Edwards and Mackintosh 1988) but could not be shown to be unambiguously from cereal grasses: almost all the pollen grains were of Hordeum type (barley type), which includes many wild grasses known to produce cereal-size pollen in habitats such as the sand dunes that surround Rhoin Farm today, and probably did so in prehistory.

Around Coire Clachach in central Mull (Walker and Lowe 1985), Plantago lanceolata appears in the early Neolithic at c 5800 BP, and some dryland trees such as hazel and oak decline. This pattern is also described from Loch a'Bhogaidh on Islay from a similar date (Edwards and Berridge 1994) and from the Sorn Valley (Andrews in McCullagh 1989) from c 5700 BP, though at the latter site by a single pollen grain only. At Gribun on the exposed west coast of Mull, a plant community with wild grasses was established before the elm decline, further increasing from c 4800 BP as the birch population fell (Walker and Lowe 1987). A decline in hazel and an expansion of grassland with P. lanceolata occurred prior to the elm decline around Iona Loch, and cereal type pollen is recorded from the elm decline (Scaife and Dimbleby 1990). Bohncke (in Barber 1981) suggested that Neolithic farming on Iona had included cereal crops. Near Kilmartin, valley-floor woods at Torbhlaren were partly cleared from as early as c 6300 BP (Tipping et al. 2011), with cereal cultivation introduced at c 5300 cal BP, and arboreal regeneration between c 5200 and c 4900 BP. Tipping et al. (2011) suggested that at c 4900 BP oak woodland began to be conserved, or perhaps planted, and grown on for some 800 years until the woodland was abruptly felled at c 4100 BP. This activity may have coincided with the creation of rock art on the valley floor. At Lochan Taynish, Rymer (1974) reported only limited woodland disturbance in the Neolithic, after c 5400 BP. Close by at Loch Cill an Aonghais (Peglar 1980), whilst P. lanceolata appeared at the elm decline, grassland expanded only from c 5400 BP. In the Sorn Valley, grassland with P. lanceolata was established around 5100 BP (Andrews in McCullagh 1991).

Another environmental signal that might reflect Late Mesolithic and Early Neolithic economic activity is changing sedimentation patterns in terrestrial locations, both colluviation (slope and soil erosion and subsequent re-deposition) and alluviation (fluvial erosion and deposition). Again, the available evidence is sparse.

Tipping et al. (2011) obtained a securely dated record of slope and soil erosion in Scotland at Torbhlaren in the lower Add valley. Peat

forming on the valley-side above the floodplain received varying amounts of soil eroded from sandy glacio-marine terraces above. An alluvial fan on the slope began to form from c 9500 BP and in one colluvial record, colluviation also commenced within the Mesolithic period, at c 7060 BP. Despite being only a couple of hundred metres apart, three dated sediment cores suggest diachronous phases of the most intense soil erosion. Sediment delivered at high energies to one borehole between c 6800 and c 6200 BP has no counterpart in an adjacent borehole, though comparable high-energy events might be recorded in both at c 5800-c. 5200 cal BC and c 5550 and c 5400 BP.

In the Oban region, Rhodes, Rumsby and Macklin (1992) and Macklin et al. (2000) analysed soil erosion from geochemical signals. Rhodes et al. (1992) investigated a range of elements at Gallanech Beg but with no discussion of the data while Macklin et al. (2000) report only potassium (K) in three additional peat sequences at Lon Mor, Bhuilgh bhith and Cnoc Philip. They argue that soil erosion was greatest between c 5500 and c 4000 BP, when they claim the first evidence for farming appears in the sequences, although in the same paragraph they also argue for soil stability between c 5600 and c 4000 BP.

With regard to fluvial activity, Carter and Tipping (1991–2; Tipping, Carter and Haggart (1994) mapped the terrace surfaces along the lower Carra Water on Kintyre. Most are related to glacial or relative sea level stages but the extensive Rhonadale Wood Terrace is fluvial. It began to accumulate between 6500 and 5500 BP when sufficient sediment from earlier-formed terrace fills or soils on slopes filled the river enough to promote frequent flooding and the creation of a floodplain.

While these isolated reports are insufficient to provide an informed history of landscape, they suggest that colluviation and alluviation were significant in the Early Neolithic, implying significant landscape change. But whether this should be attributed to economic activity of climate changes remains unclear. It is likely that geomorphic changes in the highlands and on steep slopes were climatic in origin (Ballantyne 2004) because pastoralism is likely to have made few impacts, but colluviation in lowland valleys as at Torbhlaren need not have been. Yet here Mesolithic and Neolithic colluviation occurred in the absence of evidence for major human activities in the pollen record (Tipping et al. 2011). As such, a climatic causation for Holocene alluviation remains plausible, as it do so elsewhere in Britain (Macklin, Johnstone and Lewin 2005).

5.4 Key Priorities for Future Research

As this overview of the early prehistory of Argyll and its environmental context has indicated there are a large number of research themes that require on-going exploration, being of relevance not only to Argyll but also to national and international debates about early prehistoric settlement and society. While on-going fieldwork to simply discover and excavate further Mesolithic and ideally Palaeolithic sites along with palaeoenvironmental research is desirable, the following can be identified as the five priorities for the region, three concerning fieldwork, one desk-based research and one heritage management.

5.4.1 The Late Glacial: excavation at Rubha Port an t-Seilich and its environmental context

Argyll now has the only known in situ Late Glacial site in Scotland, located at Rubha Port an t-Seilich (Mithen et al. 2015) – the site of Howburn in South Lanarkshire being a scatter of probably Late Glacial artefacts in a plough soil, intermingled with those from later periods (Ballin et al 2010). In light of stone artefacts at Rubha Port an t-Seilich having Ahrensburgian affinities, and its most likely date being in the latter part of the Younger Dryas, this site has significance for the Late Glacial of NW Europe in general, notably the extent to which maritime adaptations were

developed. At present, however, all that we know about Rubha Port an t-Seilich (other than its Mesolithic archaeology) is from a small collection of chipped stone artefacts and preliminary studies of tephra, pollen, phytoliths and the geochemistry of a sediment monolith. Whether the site contains a substantial number of artefacts, structural features, and preserved faunal material remains unknown. As such, this site should be the research priority for early prehistory in Argyll. As a hugely valuable by-product of this research priority, the Mesolithic deposits at Rubha Port a t-Seilich would also be excavated, these containing abundant artefacts, charred plant material, faunal remains and features indicative of significant structures.

The value of further evidence about the Late Glacial activities at Rubha Port an t-Seilich would be significantly enhanced if this could be placed within an improved understanding of the environmental context of Late Glacial and early Holocene exploration and settlement. Of particular importance is securing a better data and models for sea level change and tidal range between the Younger Dryas and the mid-Holocene. Exploring the extent – if any – of correlations between abrupt climatic fluctuations in the Late Glacial and early Holocene and the presence/absence of archaeological sites within the region should also be a key priority.

5.4.2 The appearance of the Neolithic and the demise of the Mesolithic: targeted excavation, dating and environmental reconstruction

A second priority is a programme of fieldwork, dating and analysis to explore the nature of the earliest Neolithic and the demise of the Mesolithic, focusing on the following questions:

1. At what date were the Breton-style closed chambers and simple passage tombs first constructed?
2. Where did the builders of the funerary monuments live, and what was their lifestyle and subsistence practice? And when, precisely, did these putative Breton immigrants – if indeed that is who they were – arrive?
3. Where (in addition to the sites we already know) did the Carinated Bowl (CB) Neolithic settlers live, and what precisely was their subsistence strategy? Is their settlement organisation the same as elsewhere in Scotland (as reviewed, for example, in Sheridan 2007)? And are there any non-megalithic CB funerary monuments in Argyll and Bute, such as those at Lochhill and Slewcairn in Dumfries and Galloway (Masters 1973; 1975; Millican 2012)?
4. Why were some of the early Neolithic inhabitants buried in a cave (Raschoille cave) as opposed to a built funerary monument?
5. What exactly was the process, timing and tempo of the demise of the Mesolithic? Did the Mesolithic communities become culturally and biologically extinct or did they become acculturated into the Neolithic? How late did a lifestyle based solely on the exploitation of wild resources continue? Is there any reason to accept Bonsall et al.'s (2002) argument for environmental change having an impact on the Mesolithic-Neolithic transition?

A regional, problem-oriented fieldwork strategy is required to address such questions, most likely involving extensive field-walking, test-pitting and excavation in the quest to locate Neolithic domestic settlements and to date the earliest construction of funerary monuments. A critical element of this fieldwork will need to be directed towards securing datable evidence to enhance our understanding of the chronology of the Early Neolithic. That will need to be fully integrated with that for Mesolithic to create a single model for the early prehistory of Argyll. In addition, obtaining ancient DNA from the Mesolithic individuals buried on Oronsay and the earliest Neolithic individuals, such as those from Raschoille cave, might help to identify places of human origin – local or external to the region – and patterns of life-history mobility;

this work is currently underway and the results are expected in 2017.

The fieldwork programme should include targeted excavation of the megalithic monuments suspected to be of Breton type. Although the later dated Clyde cairns do not represent the first wave of the Neolithic in the west of Scotland, they become the predominant monument form in Argyll from about 5800 cal BP (3800 BC) and in many areas they are the earliest known evidence of the Neolithic way of life, Figure 46. They have been in several cases proven to be later developments from simpler closed chamber round cairns, such as Mid Gleniron I and II in Wigtownshire (Corcoran 1969), Glenvoidean on Bute (Marshall and Taylor 1977), Blasthill on the Mull of Kintyre (Cummings and Robinson 2015) and Cladh Aindreis in Ardnamurchan (Cobb et al. 2008). In some cases they sealed earlier archaeological deposits, such as at Port Charlotte, Islay (Harrington and Pierpoint 1980) and at Glacknabae (Bryce 1904). As such the Clyde Cairns carry possibility for building longer stratigraphic and chronological sequences which may reflect the importance of these places in the landscape prior to the monument construction, as well as their construction histories, the histories of their use, re-use and even robbing (see also Case Study 5: Jack Scott's excavations at Ardnacross II chambered tomb and later associated structures, near Peninver, Kintyre). The on-going excavation at Slochd Measach (Giant's Grave) on Islay may further contribute to this cause (Mithen et al. 2015).

As with the case of Late Glacial settlement, understanding the environmental context of the Mesolithic–Neolithic transition is as important as enhancing our knowledge of the archaeological record itself. The proposition that this was a period of increased storminess and climatic fluctuation requires further consideration, both to verify this proposition and to explore its environmental impacts. Did this change encourage indigenous groups to adopt the novel, exotic Neolithic lifestyle of their farming neighbours? Fine-grained records of both terrestrial and marine environmental change are required, along with models for Mesolithic economies and their resilience to such change. Further investigation should be undertaken at those sites that contain both Mesolithic and Neolithic artefacts, such as at Newton and Bolsay on Islay, and/or have dates that span the critical period for transition, such as Storakaig, on Islay. Survey and targeted excavation of the Neolithic chambered cairns located those parts



Figure 47: Excavations at the Slochd Measach (Giant's Grave) Neolithic Cambered cairn, Isle of Islay © Steven Mithen

of the landscape that had been repeatedly visited by the Mesolithic hunter-gatherers, is another important line of enquiry, especially in the absence of the early farming settlement sites.

5.4.3 Establishing the Mesolithic chronology: A programme of radiocarbon dating and Bayesian analysis: testing the 8.2 Ka model and reaching out to the Neolithic

The chronological development of the Mesolithic as described in this contribution is based on a sample of a mere 163 radiocarbon dates (selected as those considered reliable from a total sample available of 253 dates). This is far too small a number with which to confidently establish the chronology of settlement over a period of at least 6000 years. As such, the pattern identified by Wicks and Mithen (2014), and especially their proposal of the impact of the 8.2 Ka event, should be considered as hypotheses requiring further testing. There is already a large quantity of well-sourced material suitable for radiocarbon dating from Mesolithic sites, while small scale targeted excavation could produce further samples from localities, especially those that appear under-represented. Securing an additional 100 AMS dates, subjecting these to Bayesian analysis and establishing activity event on a site-by-site base and for the region as a whole will enable the 8.2 Ka hypothesis to be tested and provide a secure chronological foundation for the earliest prehistory of Argyll. As noted above, it is perhaps even more important to develop an enhanced understanding of the Early Neolithic chronology, and to create a single integrated model for the Early Prehistory of Argyll.

5.4.4 Heritage management of early prehistoric sites

Argyll has some of the most important Mesolithic sites in Scotland, and indeed the UK. Yet there is no heritage management of these sites. In one regard the required management is limited: with the exception of middens, Mesolithic sites are predominately buried below ground in areas unlikely to be disturbed or developed. This is not always the case: numerous Mesolithic have been found by ditch digging and other farming activities and remain subject to further risks of this nature; others are in fields that are regularly ploughed or coastal areas subject to erosion, especially with anticipated rise in sea level. Our understanding is that none of the Mesolithic sites have been scheduled to ensure they are protected. Another dimension of heritage management is public engagement. Our experience is that the public have a huge interest in the Mesolithic and would enjoy visiting Mesolithic sites, even if these are only points on the landscape with no visible archaeology. As such a programme of marking sites with suitable display boards, producing walking trails, guide-books and related exhibitions within the local museums should be a priority. This must also apply to the Neolithic. The chambered cairns on Islay, for instance, are largely buried by vegetation, with no markers for visitors or walking trails.

5.4.5 Writing the history of archaeology in Argyll

Finally, it would be of considerable value to have a systematic study and interpretation of the history of archaeological research in Argyll. Our impression is that this is important to the history of archaeological thought in general in the late 19th and early 20th century. Why were the tiny islands of Oronsay, Coll and Tiree so attractive to the likes of A. Henderson Bishop and William Galloway? What were their intellectual networks? This project would also help recognise the contribution of amateur collectors such as George Holleyman, stationed on Tiree during the war, and indeed those who continue to contribute to archaeological knowledge today.

5.5 Summary

The prior knowledge and particular interests of the authors will inevitably bias any overview of the archaeology within a specific region. We are conscious that we might be guilty of a biased focus on those areas of Argyll where we have undertaken fieldwork ourselves, while it is always difficult to fully escape from one's own interpretations of the data to provide an objective account. Similarly we have stressed certain research themes while neglecting others that are nevertheless of considerable importance, such as the analysis of lithic assemblages to exploring technological and typological change through time. We have also avoided the more speculative matters, such as relating to the social organisation and ideology of the Mesolithic and Late Glacial hunter-gatherers. What we have attempted, however, is to provide a chronologically driven overview of the early prehistoric period within its environmental context, highlighting what we believe to be the most important topics for future research. The Palaeolithic, Mesolithic and earliest Neolithic periods in Argyll are of national importance with considerable potential for contributing to international debates about the human-environment relationships within early prehistory.

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