MAN AND THE LAND: PHYSICAL ENVIRONMENT AND SETTLEMENT IN THE NORTH-WEST HIGHLANDS

Douglas P. Willis

To leave behind the lowlands of the east and travel across country to the North-West Highlands is to experience one of the most complete contrasts in Scottish geography.

The lowland landscape of the east, with its large farms and fertile farmlands, has been moulded in a kindlier environment. Wide expanses of flat land, floored by younger rock and masked by glacial deposits, are coupled with a climate which, because the area lies in the rain shadow of sheltering high ground to the west, is comparatively dry and sunny. The highland landscape of the west, by complete contrast, is one where human settlement of the land has often struggled to maintain a viable presence against the environmental niggardliness of ancient hard rocks, acid and thin soils, and a climatic pattern that is grudgingly cloudy and wet.

In these circumstances, it is hardly surprising that enormous contrasts should exist between the human landscape of the sparsely peopled upland west and that of the more populous lowland east, although both occur within the context of the Scottish Highlands.

ROCK: THE UNDERLYING RESOURCE

The Highlands of the North-West bear the marks of a land that has been long in the making. Even the most cursory glance at a map suggests the enormous contrasts which exist in the relief pattern. Inland from the coast, steep-sided mountains dominate flat-bottomed straths, while along the Atlantic edge, long fingers of sea lochs indent the land. All have been shaped by the erosive power of time, but within a geological context that is the basis of landscape formation.

To understand the geological history of the North-West Highlands is to embark on a long and complex journey through millennia of time. The earliest foundations of the land lie in the grey and dour rock which is the Lewisian gneiss. Bearing the name of the Long Island whose outline can be seen clearly from the mainland on a clear day, this most ancient of Highland rocks is the hard and unyielding basis of much of the human settlement in the west.

Fig. 1.2 Ben More Coigach mirrored in a lochan near Drumrunie in Wester Ross. The Torridonian Sandstone massifs of Wester Ross and Sutherland rise steeply from peat moor and dubh lochan. 1990.

Fig. 1.3 Stac Pollaidh, perhaps the most spectacular of all the mountains of Wester Ross with its striking Torridonian Sandstone crags and screes. A negative area for human settlement! 1990.

In fact, the landscape of the Lewisian gneiss may be seen as a fossil landscape from the past, for it bears the marks of having been eroded to a low-lying plain millions of years ago. Where later sediments were deposited on top, they were laid down on a surface which had already been reduced to its roots long before. In much more recent times, powerfully moving ice during the last glacial epoch was to strip and scour the surface of the outcropping rock, resulting in today's sombre landscape of dark peat and dubh lochan.

Above this wild and unpromising surface rears the spectacular sugar loaf peak of Suilven and the impressive outlined forms of Canisp, Ben More Assynt, Stac Pollaidh and the rest. These dominating peaks which contribute so much of the distinctiveness of West Sutherland are the surviving remnants of the once more extensive layer of sedimentary rock termed the Torridonian Sandstone [Figs. 1.2-1.4].

Resembling the younger eastern sandstone only in its reddish colouring, the sandstone of the west is a more ancient rock by far. The character of the North-West Highlands owes much to the presence of the Torridonian Sandstone. Often patterned in extensive lichen growth where it outcrops among the peat, the rock has a grey look, though in places where quarrying has exposed open surfaces, the true colour is revealed.

Fig. 1.4 The distinctive peaks of Cùl Mór (left), Stac Pollaidh, Cùl Beag, Beinn an Eoin and Ben More Coigach provide a dramatic backdrop to Loch Vatachan and the extensive and boggy moorlands of the Aird of Coigach. 1972.

Fig. 1.5 The three caves at Craig nan Uamh lie some 30m above the floor of the valley of the Allt nan Uamh, near Inchnadamph.

Excavated in 1889 and 1926-27, an upper layer of cave earth lying on water-laid deposits of clay or gravel contained animal bones from such extinct Arctic fauna as brown bear, lynx and reindeer. For water to have run into the caves, an ice sheet would have had to have filled the valley to a height of 30m, and such an ice sheet is not now thought to have existed in Assynt later than ca. 11,000 BC.

Human remains, also found in 1926-27, are thought to be of no great age however. No genuine Palaeolithic or Mesolithic flint or stone artefacts were found in the cave earth layers, and the few bone implements and supposed hearths are not closely datable. The case for Palaeolithic man in Scotland remains unproven; the nearest such site is in Cumbria, some 430km to the south (Euan MacKie, 9/4/1988. pers. comm.).

As an enduring building material, the Torridonian Sandstone was once extensively quarried, and until the more recent construction phase, much of Ullapool was fashioned out of small local quarries which today lie disused and overgrown.

The sparkling white quartzite which forms a later geological capping to some of the higher peaks, has been of little significance in the human picture, except as a scenic feature, giving the incongruous impression of a dusting of snow sparkling on the high tops on a fine summer's day.

By contrast, the Cambrian limestone which exists as a narrow band of rock has had considerable impact both in terms of scenery and human value. In a land of acid soils, the presence of outcropping alkaline rock is marked by pockets of better pasture land, such as occur around Elphin. Nearby, at Inchnadamph, solution of the limestone has opened up the rock into caves which have their own attraction these days for visitors keen to have a speleological experience in a Highland setting. But they also once yielded up the bones of an Arctic fauna that included such cold climate beasts as brown bear, lynx and reindeer [Fig. 1.5]. In economic terms, apart from the obvious greater potential for grazing on the limestone-based pastures, the

rock continues to be commercially exploited in a large quarry between Ullapool and Rhidorroch as a useful northern source of agricultural lime. And a substantial marble quarry has now opened near Ledbeg, between Elphin and Inchnadamph.

Though many of the geological events that have helped shape the landscape of the North-West Highlands were long and slow in their occurrence, others were far from being so. Throughout the North-West, faulting has produced stress marks that line the face of the land. The straight edge of Loch Broom, so apparent when seen in aerial view from the top of neighbouring hills, is a good example of a feature whose form is strongly fault-guided. Smaller faults may be seen as minor indentations on many hill slopes, where fast-flowing burns have exploited the weaker rock, but sometimes the effects of earth forces were of cataclysmic proportions that left enormous scars on the landscape.

In the most spectacular tectonic happening of all, metamorphic rocks from further to the east were pushed bodily westwards along what geologists term a thrust plane, over-riding the existing rock formations. It was an event whose visible effects were to perplex the generation of early geologists who struggled to interpret them. The view of Murchison of Tarradale, doyen of early British geologists, that the rocks formed a perfectly normal series was strongly challenged by the counter view that earth movements had indeed complicated the sequence.

But, as far as the people who had to gain a living from the land were concerned, such matters were purely academic. In down-to-earth practical terms, the Moine Thrust had been the means of providing a rock type of considerable value. This, the Moine schist, has the distinct value of splitting into layers that may at times resemble thick slate. The potential of such a material as a building medium is obvious, providing a source of well-shaped building stone which could be more easily manipulated than the uneven stones which land or seashore provided. That the value of the schist has long been recognised in this way is apparent in its use for structures as far removed in time as the vitrified Iron Age fortification of Dun Lagaidh in Upper Loch Broom [Figs. 1.6, 1.7], or the walls of recent croft houses and outbuildings with their inset cruck beams [Figs. 1.8]. Indeed, such is the tendency of this rock to split quite naturally into layers and slabs, that its use as doorway and window lintels, and even as stall divisions in old byres, strongly resembles that of the heavy flagstones of Caithness and Orkney (see MacKie, Beaton, this volume).

LANDFORM, SETTLEMENT AND COMMUNICATIONS

Although the landscape continues to be shaped by the powers of weathering and erosion, as the scree-covered slopes of Ben More Coigach or An Teallach amply confirm, it is to the powerful effect of moving ice that so much of the land surface owes its present character. As the climate deteriorated and snowfall accumulated over the higher ground, the great ice

Fig. 1.6 The fort and dun at Dun Lagaidh, looking north to Ullapool, inner Loch Broom. 1984.

Fig. 1.7 Excavation at Dun Lagaidh revealed a fine flight of intra-mural stone steps. 1984.

Fig. 1.8 Cruck-framed house at Cuaig, Applecross. 1972.

Fig. 1.9 The deep U-shaped valley of Strath Broom. Shaped by a glacier during the Ice Age, the valley bottom provides potential for farming in an environment of limited agricultural opportunity. 1990.

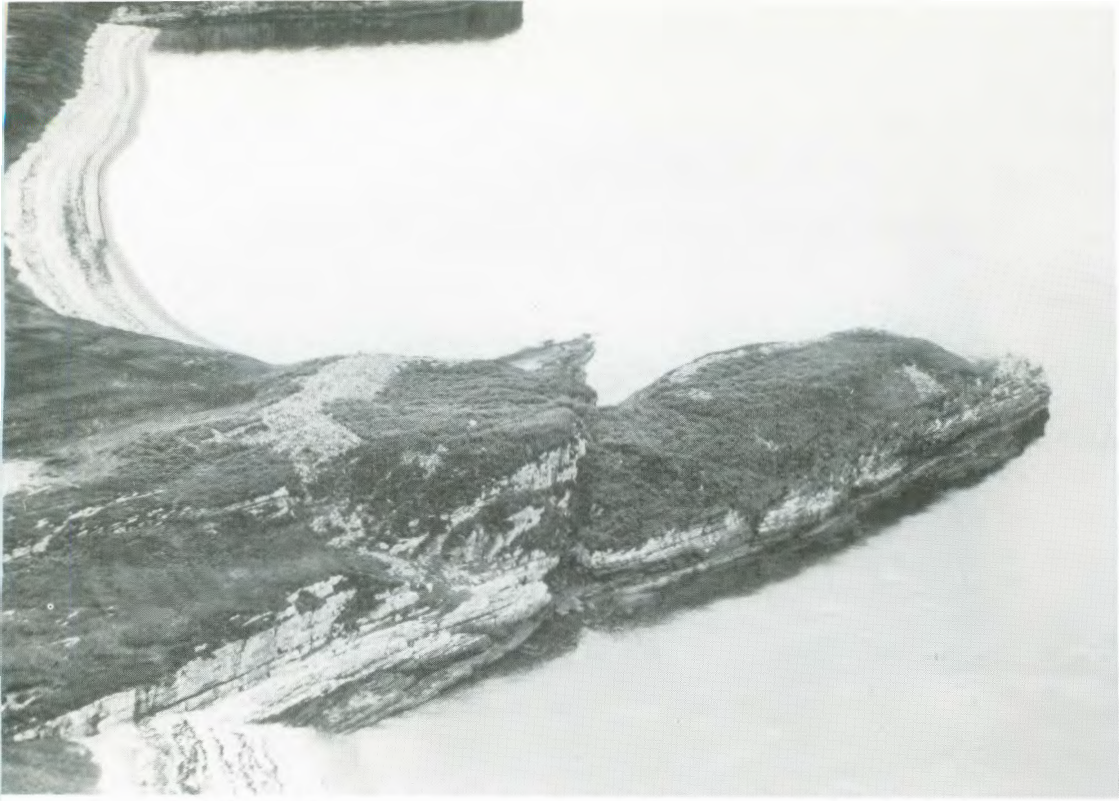

Fig. 1.10 Dun Canna on a peninsula at the mouth of Strath Kanaird, Loch Broom. 1974.

tongues of outflowing valley glaciers moved inexorably seawards. On the west side, their erosive power was the greater because of the short distance to be covered by the ice on its powerful downhill journey. The result in today's landscape is the presence of some spectacular scenic features, notably the long and deep sea lochs which parallel the Norwegian fiords in their mode of formation, and the wide glaciated valleys such as Glen Torridon or Strath Broom [Fig. 1.9].

In the human geography of the area, each of these glaciation features has had its own significance throughout time. The wide valley floors have provided flat land in an area where farming has always been influenced by severe relief constraints; and they have given more fertile, alluvial deposits where poor, thin soils have also imposed their limitations upon agriculture.

They have had their value, too, for communications, the flat-bottomed valleys allowing a passage through difficult upland terrain, especially important in providing connecting routes from the east. The sheltered arms of the sea lochs were also a means of communication in an era when travel by sea was easier than by the road transport of the time. However, in this present age, the sea lochs now exist more as a barrier to rapid movement, imposing long detours on communication among lochside communities, a fact which raises its own complications for service provision, such as schooling. On the other hand, the sheltered conditions and previously

unspoiled waters of the sea lochs have provided the basis of the sometimes controversial fish farming industry that now has its power base in the west.

Communication up or down the west coast has always been frustrated by the problems of physical geography. Only at Kylesku does a bridge expedite north-south travel across the broken terrain of the North-West; elsewhere, isolation rather than communication has been a recurring feature of west coast communities. In the unsettled times of the past, however, isolation on a local scale could be a positive advantage in strategic terms. Peninsular positions, virtually surrounded by water, assumed a value as defensive sites, as in the Bronze Age fortifications of An Dun at Gairloch and Dun Canna at the mouth of Strath Kanaird [Fig. 1.10], or in later times in the stark fortress of Ardvreck Castle in Loch Assynt [Fig. 1.11]. Sometimes there could be a defensive value also in the kind of rocky outcrop on which the crumbled ruins of Dun Lagaidh now overlook the multinational klondyker invasion of Loch Broom [see Fig. 1.6].

It might be argued that in this most recent economic phase of the North-West Highlands, the very things that frustrated life in the past, such as wild and difficult terrain and isolation (see e.g. Baldwin, Caird, Richards, this volume), have now assumed a positive value in an age when mass communication and a desire to escape into unspoiled, unurbanised areas, have helped consolidate an enormous tourist trade for the area.

For the human generations whose lot it has been to coax a living out of this ungenerous land, nature has both given and taken away. Lack of flat land, paucity of soils and difficulty for communication and social contact present enormous difficulties along the coastal edge. These have been the limiting legacy of the Ice Age.

Fig. 1.11 Ardvreck Castle at the upper end of Loch Assynt. Pen and ink sketch. 1884.

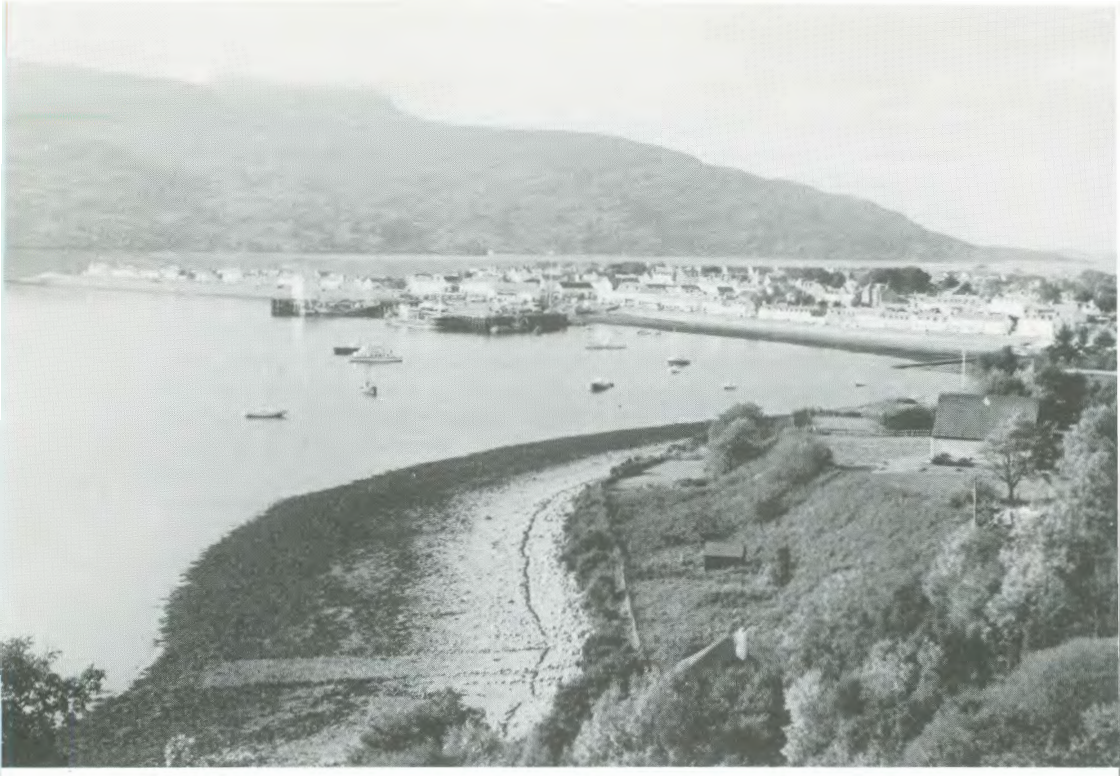

Fig. 1.12 Ullapool, established by the British Fisheries Society in 1788, occupies a flat, well-drained site on the raised beach at the mouth of the Ullapool River. Note also the *port* or slipway cleared through the rocky shore, where small boats would be hauled up to safety. 1990.

On the positive side, however, the amelioration of climate and the melting of the ice were to result in the formation of a feature of inestimable value to west coast communities. The immediate effect of the massive return of meltwater was to raise the level of the sea. In time, however, the upward recovery of the land from its depressing cover of ice resulted in the formation of raised beaches; narrow fringes of flat green land to soften the abrupt junction of sea and backing hill slope [Fig 1.12].

All around the western fringe of the land, crofting communities have moulded themselves to fit the physical form of this narrow band of land which has had a value both for farming and settlement. On one side the sea provided a source of food and of fertilising seaware, laboriously hauled up from the shore in creels and dumped in the scattered places where the *cas chrom* and human effort together turned the soil. On the other side was the rising hill slope where stock could be grazed and winter fuel cut in the deep beds of peat. But between these two lay the narrow focus of human settlement, a natural flat site where crofters might construct their homes and grow their rigs of food crops as part of a subsistence economy whose character was fashioned by the contours of the land.

Even the grouped settlements, such as Shieldaig village, sometimes

assume a linear form, their houses strung out along the line of the raised beach. Communications could also benefit from this feature, roads and sometimes railway following the flat land of the coastal edge.

Where burns and rivers have deposited their loads of alluvial sediments carried down from the mountains, flat spreads of green croft land stand in striking contrast to the dark colours of the poor grazing land around. The effect in a landscape poor in cultivation potential was strongly to concentrate human activity on such scattered gifts of nature.

The junction of alluvial fan or delta with the hill land behind is made the more noticeable by the presence of the stone dyke dividing the productive land from the grazing land above. This, the head dyke, has been termed a fundamental line in Scottish geography, and in this western context the aptness of that description is often startlingly demonstrated.

The green fan of croftland at Ardmair just to the north of Ullapool, for example, well illustrates this, with its cluster of crofts crowded on to the better land [Fig. 1.13, 1.14]. Ardmair is one of very few townships around Loch Broom where the later, 19th century houses and outbuildings have remained clustered on the site of the earlier multiple-tenant farm buildings,

Fig. 1.13 Crofts once crowded around the head of the alluvial fan at Ardmair in Wester Ross. The unpromising environment of peat-covered moorland behind provided little potential for cultivation and settlement, making the more fertile deposits a focus of human interest. 1990.

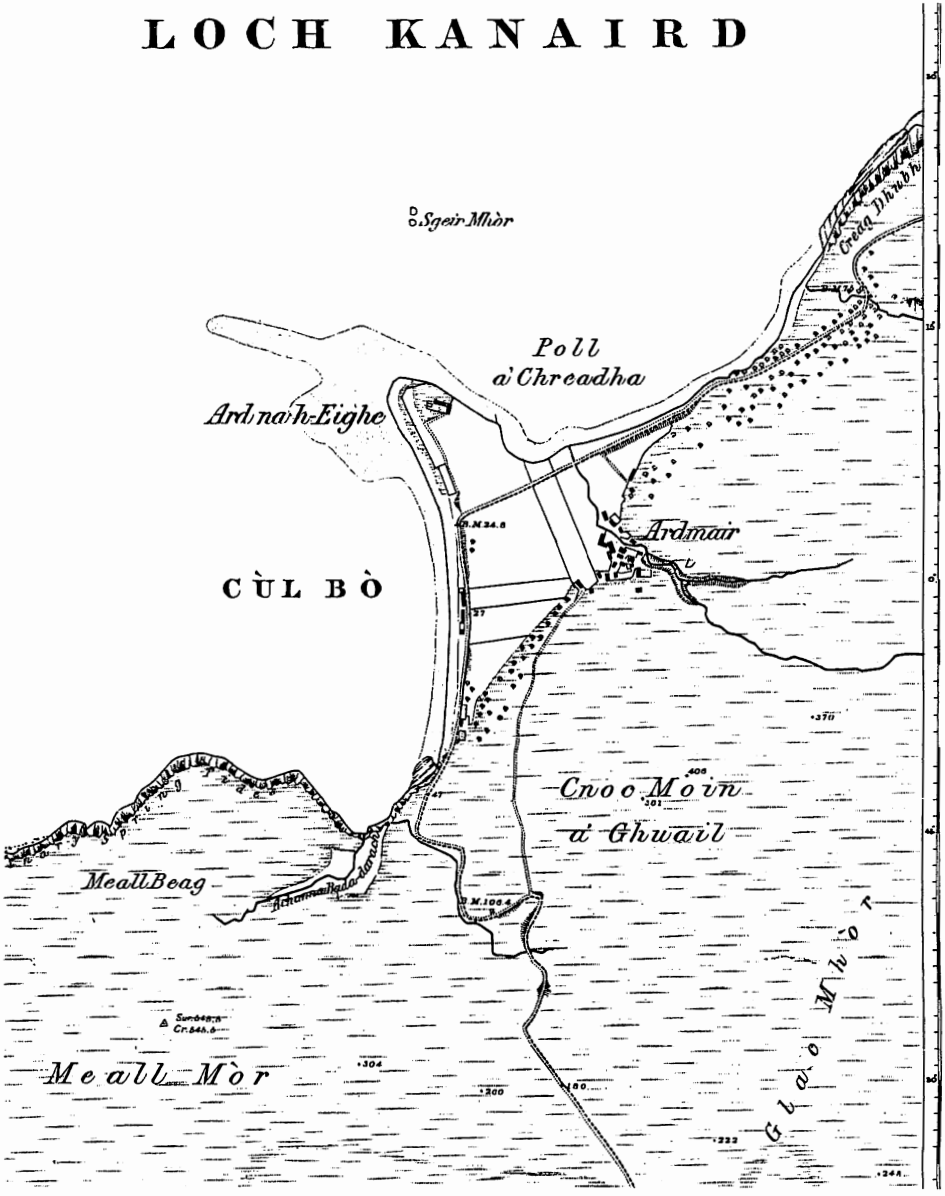

Fig. 1.14 The clustered croft buildings of Ardmair are on the site of the earlier multiple-tenant township. O.S. 6 inch Sheet XIII, 1st. edition, surveyed 1875.

rather than re-located, linear fashion, each on its own rectangular allocation of croft land. Yet in that place, as so often elsewhere in the west, the once widespread theme of shortage of suitable land to support a large population is etched still into the face of the land. Among the bracken and heather, outlines of long-abandoned cultivation rigs appear in the most unpromising situations on rocky hill slopes where cultivation would never be countenanced today.

The problem of shortage of cultivable land in the past, and a need to maximise the production from what was available, is also echoed in the presence of shieling remains high above the valleys and coastlands. Such transhumance took the pressure off the better lands by removing the livestock to areas where summer growth was adequate to support them (see Baldwin, this volume).

At the heads of the sea lochs, spreads of alluvial material have long been extending seawards, slowly creating new areas of saltmarsh and increasing the grazing area. But, in human terms, the most striking legacy of this deltaic deposition from the past can be seen at Ullapool itself [Figs. 1.12, 12.1, 12.4]. Today's moderate flow of water down the Ullapool River gives little clue to the vast outpourings which once charged seawards into Loch Broom. Thus the founding fathers of the British Fisheries Society had the fluctuations of post-glacial seas to thank for what was to prove to be a superb site for settlement growth, offering a well-drained area where relief presented no obstacle to the layout of the original settlement and to its more recent expansion (see J. Munro, this volume).

CLIMATE AND CULTIVATION

In climatic, just as in relief terms, nature has provided the North-West Highlands with an environmental mixture of mercies. Incoming Atlantic air, heavily charged with water vapour, loses much of its moisture as rain on meeting the high ground. As a result, rainfall levels are high and sunshine amounts correspondingly reduced by the greater incidence of cloud cover. In the present age this can be an irritation to the tourist on a limited stay, but in times past, an unrelenting wet summer could spell disaster for the harvest of the land and hence for the communities which depended on it.

The waving heads of barley which now so dominate the farmlands of the east find no place in this western environment. Oats, potatoes and hay continue to form the basis of the limited cultivation of the croftlands. Production of the latter crop is not without its difficulties in such a wet climate, requiring a special response to ensure more speedy drying, such as spreading the cut grass over fences to allow the wind to blow through it and hasten both drying and maturation. It is a type of response common along what Professor Estyn Evans succinctly termed 'the Atlantic Ends of Europe.' Sometimes the hay might be heaped up over upturned tree branches for a temporary support, and only when it was reasonably dry could this fodder harvest be safely gathered in.

Although high rainfall may cause problems for drainage, a fact marked everywhere by the ubiquitous sprouting of rushes among the croft lands, in times past it did have the advantage of providing an assured flow down the burns to power the water wheels of mills, as at the mouth of the River Kirkaig at Lochinver and of the Ullapool River.

A positive feature of the climatic environment, however, is the ameliorating influence of the North Atlantic Drift. Since the prevailing winds blow from a south-westerly quarter, they pass over a sea area that is at a higher temperature than it would otherwise be for its northerly latitude, as a result of the constant current of water which has its origins as the Gulf Stream. Although it has lost some of the considerable warmth of its source region, the North Atlantic Drift is nevertheless warm enough to create a situation where the coastal areas of the North-West Highlands enjoy considerably milder temperatures in winter than, say, the exposed landscape of East Anglia which receives the full force of bitter continental air. The result is an extended growing season for pasture, and these generally frost-free conditions were exploited to the full by Osgood Mackenzie when he laid out his gardens on the exposed Inverewe peninsula last century. The secret of success at Inverewe has certainly not been a sub-tropical climate, as so many writers have erroneously suggested, but a combination of shelter from the wind and the critical factor of absence of biting frosts. It is therefore to the generally frost-free conditions of the area that Ullapool and Plockton owe the presence of the cordyline palm trees which lend a slightly exotic air to the villages.

Along this western fringe of our Scottish Highlands, then, the human impress on the land may frequently seem slight and discontinuous compared with that of the lowland east. But where the record of human presence and activity in the past is tangibly expressed in the landscape of the present, the area offers a fascinating commentary on man-land relationships through time.

Acknowledgement

Sincere thanks are due to Dr. J. Close-Brooks for Figs. 1.6, 1.7. These prints, along with Figs. 1.5, 1.9, 1.11 have been kindly provided by the Royal Commission on the Ancient and Historical Monuments of Scotland. Fig. 1.4 is reproduced by permission of the Trustees of the National Library of Scotland; Figs. 1.4, 1.8 were taken by John Baldwin, the latter courtesy of the Scottish Ethnological Archive, National Museums of Scotland. All other photographs are by the author.

References

Evans, E. E. The Atlantic Ends of Europe, in *Advancement of Science.* 1958-59. No. 15: 54-64.

Robertson, I. M. L. The Head Dyke: A Fundamental Line in Scottish Geography, in *Scottish Geographical Magazine.* 1949. Vol. 65 (1): 6-19.