THE AULD ROCK: THE PHYSICAL ENVIRONMENT AS AN ELEMENT IN THE INTERPLAY OF CONTINUITY AND CHANGE IN SHETLAND'S HISTORY

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One of the paradoxes and pleasures of the study of history is that the past is not immutable. Our perceptions of it are always changing. New information comes to light, whether through archive work or archaeology, and seemingly established data are re-evaluated. These re-assessments may reflect either the application of new practical techniques, or changing fashions in philosophy. Often it seems to be a two-way interaction: either may enable or indeed demand the other, and lead to data being approached differently and re-assembled on frameworks which may vary radically from those used by previous scholars. Because of their small scale, and physical though not cultural isolation, the North Atlantic islands offer a particularly interesting theatre to observe the interplay of different schools of thought on basic themes such as the relationship between continuity and change within societies, and between people and their environments.

The nature of the relationship between continuity and change has emerged as a major theme in recent publications on the Northern Isles as well as other areas of Scotland (e.g. Bigelow 1987, 1992; Crawford 1984; Fenton 1984; Fenton and Pálsson [eds.] 1984; Irvine & Morrison 1987; Morris and Rackham 1992; Lynch, Spearman & Stell 1988; Stoklund 1984; Thomson 1987; Whyte 1987). It figured at the 1993 Conference of our Society. The theme had indeed been a leitmotif of the preceding Settlement Conference in Lerwick in 1988, not least in the contributions by William Thomson and John Baldwin, who both gave us particularly vivid views of the evolution of agricultural patterns in Shetland and in the Faroes. They highlighted the way that a propensity for dynamic change has been woven through elements of long-term continuity in the landscape. This pattern is not dissimilar to that found by the present writer in exploring the relationship between traditionalism and innovation in the maritime technology of Shetland and other North Atlantic communities (Morrison 1992).

Professor Bjarne Stoklund (1984), focusing on vernacular building traditions, concluded that most of the earlier studies on the cultural history of the Northern World have been preoccupied by the phenomenon of 'continuity', while 'change' was mostly considered in connection with the process of modernisation beginning in the 19th century and accelerating during the 20th. Because of the apparent 'primitiveness' of the older houses to be found in the Northern Atlantic isles, they were regarded in light of an evolutionistic model of explanation as 'survivals' i.e. representatives of

earlier stages in an unbroken continuity from the Viking age, or even earlier. The Black-House of the Hebrides, for instance, was once widely believed to go back to the Iron Age, but it has now been shown that some of its characteristic features may well be relatively recent (Fenton, 1978). Stoklund talks (1984: 96) of 'evolutionistic thinking in grooves... which has played a dominating role and is very hard to escape'. He emphasises that more recent investigations of vernacular buildings in the North Atlantic isles show that 'primitiveness' is not necessarily a question of age, and that change is not always a more recent phenomenon than continuity. He doubts the value of a mechanistic idea of culture embodying this type of concept of 'survival'.

Stoklund suggests, however, that another meaning of the word 'survival' has real relevance to Northern studies: that of culture as a means of adapting to environment, and surviving harsh conditions. He goes as far as to say that 'it is an aspect that is more distinct here than in any other part of Europe, because these marginal settlements have been most vulnerable in the face of climate as well as economic changes' (1984: 96). One suspects that, *pace* Stoklund, cases could be made that certain southern European areas also display environmental problems which have rendered them equally marginal and vulnerable: for example, those rugged limestone regions which have suffered loss of vegetation and soil erosion through centuries of overgrazing. Uniqueness is not however what is at stake here, and his basic point is surely a valid one, that those concerned with the history of the Northern Atlantic islands can not afford to omit the physical environment from their considerations.

To say this is not however to advocate a return to simplistic environmental determinism. This would be manifestly unprofitable, not to say unattractive. Much of the fascination of the study of these island communities lies in the way that they are small enough for the historian to get to know them sufficiently well to test out hypotheses at a very direct human level. If one is interested in the interplay between, say, social structures and economic systems on the one hand, as against the role of individuals in shaping the development of the community on the other, in island polities of such small scale there is a fair chance of making one's assessment in very specific terms. Sweeping generalisations regarding, say, 'the Effect of Environment on Man' would add little to such debates.

As R. G. Collingwood put it in 'The Idea of History':

> . . . when people speak (as Montesquieu, for example, did) of the influence of geography or climate on history, they are mistaking the effect of a certain person's or people's conception of nature on their actions for an effect of nature itself. The fact that certain people live, for example, on an island has in itself no effect on their history; what has an effect is the way they conceive that insular position; whether for example they regard the sea as a barrier or as a highway to traffic. Had it been otherwise, their insular position, being a constant fact, would have produced a constant effect on their historical life;

> whereas it will produce one effect if they have not mastered the art of navigation, a different effect if they have mastered it better than their neighbours, a third if they have mastered it worse than their neighbours, and a fourth if everyone uses aeroplanes... In itself, it is merely a raw material for historical activity, and the character of historical life depends on how this raw material is used (Collingwood 1946: 200).

The views of Stocklund and Collingwood accord well with the findings of James J.A. Irvine and the present writer, regarding historical and geographical aspects of the fishing activities of the Shetland community (Irvine and Morrison 1987). We concluded that popular stereotypes of 'traditional folk life' are often more hide-bound and less flexible than those ways of life themselves ever were in actuality. As in the case of vernacular architecture, so too with fishing technology: the stereotypes tend to assume to be 'continuity from an immemorial past' what is frequently no more than an eclectic recollection of elements from the experience of relatively recent generations. Thus, rather than perpetuating the practices of Viking times, the Far Haaf fishery and the particular form of sixareen used to pursue it appear to have been essentially 18th century developments. It would seem that in much of the past as at the present day, the story of fishing in Shetland has essentially been one of change. What is more, these changes have arisen as much through responses to conditions created elsewhere as to local environmental factors within the islands. They have involved a complex multi-way interplay of social, economic, technological and indeed psychological elements. We concluded that things as tangible as not only boat types but the geographical location of fishing stations might be viewed as the varying resultants of these interacting forces. Through time, their patterns have altered markedly, and sometimes very rapidly. The potentials and problems of the physical environment have been re-evaluated periodically as perceptions and aims have changed.

Nonetheless, just as one must reject simplistic environmental determinism, so too is untrammelled 'possibilism' an unrealistic framework for research. Subconscious acceptance of this is however, perhaps a more subtle and insidious danger than that of embracing discredited determinism. Few people in these allegedly ecologically-conscious days would overtly deny that economic, social and political acts have their environmental constraints and consequences. But in practice it seems all too easy to disregard or under-rate the importance of the physical environment in historical studies, for three reasons.

Firstly, there is the seductive convenience of interpreting history as if the stage upon which it is played out were some featureless isotropic plane, which refrained from adding geographical complications to socially or economically based conceptual models. Secondly, attempts to take account of the physical environment can run up against the problem of divergences in interests and training: specialists in the natural sciences and in historical

studies do not necessarily have either the background or the inclination to work together. Thirdly, it takes a determined historian of the particular turn of mind of an Emmanuel Le Roy Ladurie (e.g. 1972) to identify and extract information on the physical environment from historical documents. In terms of environmental data, little short of a catastrophe tends to 'hit the headlines' in the types of records with which historians normally deal. Conditions which are constant, or which are changing so slowly that trends are imperceptible to those living through them, are unlikely to be forced on the historian's consciousness by contemporary comments, however important those continuities or changes may be in the long term.

This is an extreme case of what Fernand Braudel (1972: 16) identifies as:

> . . . the basic problem confronting every historical undertaking. Is it possible somehow to convey simultaneously both that conspicuous history which holds our attention by its continual and dramatic changes [conjuncture, denoting short-term realities] - and that other, submerged, history [structure, denoting long-term realities] almost silent and always discreet, virtually unsuspected either by its observers or by its participants, which is little touched by the obstinate erosion of time?

Braudel's own solution for his classic and immense analysis of Mediterranean history was to adopt as his starting point an in-depth consideration of 'the role of the environment':

> The resulting picture is one in which all the evidence combines across time and space, to give us a history in slow motion from which permanent values can be detected. Geography in this context is no longer an end in itself but a means to an end. It helps us to rediscover the slow unfolding of structural realities, to see things in the perspective of the very long term. Geography, like history, can answer many questions (Braudel 1972: 23; also 1958).

In adopting this approach, Braudel specifically rejects 'the doubtful pursuit of a determinist explanation' (loc.cit.). His interest is focused on distinguishing between long-term and more changeable factors in the lives of those who lived in his area of interest. It is in this spirit that the present writer offers the remainder of this paper. The nature of the interplay between factors inducing continuity and change is likely to be subtly different in every period, so the objective here is not to provide 'the solution'. Instead, the aim is to offer those interested in particular periods an overview of the physical environment of Shetland, indicating some of the problems of the information available. The Conference made it clear that we are at an interesting phase in the development of settlement studies in the North Atlantic isles. With new concepts being applied and primary archive work and fieldwork going forward afresh, it would seem a shame if the excitement of these developments distracted us from giving due weight to those basic realities of life in the islands arising from their location and configuration. The aim here is therefore to review characteristic elements of the physical environment of

Shetland, to encourage us to keep these factors in mind while carrying on our main-line historical studies in whatever period we may specialise.

In embarking on this, it is necessary to reiterate that we must beware of too simple an approach in which we equate long-term continuity with 'constant' factors from the world of nature, and change with 'recent human activity'. This can certainly sometimes be the case. However as we saw, for example, in our study of fishing (Irvine & Morrison 1987), human factors (political, economic, social, psychological) can sometimes conspire to delay change. When such a situation occurs, the appearance of long-term continuity may create an erroneous impression, in which undue importance may be attributed to the constraints set by the physical environment as the context within which the society is operating. But then quite suddenly the nature of the multi-dimensional interaction between people and their habitat can alter, weaving a new pattern across those warp threads of continuity which do come running through from the islands' past and off into its future.

We have to keep in mind also that some of the elements in the environmental equation have themselves changed through time due to natural processes. Furthermore, in as fragile an environment as Shetland, aspects of the habitat will inevitably have been modified (directly and indirectly, intentionally and inadvertently) by people and their animals.

Environmental implications of Shetland's location and configuration

One inescapable fact of Shetland's physical geography is the high latitude of the archipelago. While London lies at 51 degrees North, Shetland is mostly between 60 and 61. The Arctic Circle is as near to Shetland as Shetland is to Newcastle or Belfast. The islands thus lie north of Stockholm, and share the same latitude not only with Bergen and Oslo but Helsinki, Leningrad and much of Siberia. Moscow is far to the south. Indeed Shetland is well north of such snow-bound places as Churchill on Hudson's Bay, Juneau in Alaska, the Aleutians and most of the Bering Sea. It is indeed on the same latitude as Cape Farewell at the tip of Greenland.

Because of the obliquity of the sun's rays in these latitudes and the amount of cloud cover sweeping in off the Atlantic, the total insolation received at the surface in Shetland each year averages less than 80 g.cal. per square cm, i.e. less than half that characteristic of much of the Mediterranean (data from I. Budyko, in Fisher 1978). This is less disadvantageous for agriculture than it perhaps sounds however, because of the marked seasonality which the high latitude also brings. Certainly, at mid-winter, the sun is below the horizon for eighteen of the twenty-four hours. In compensation, however, during the latter part of the growing season leading up to Hairst, the land is virtually without night. Though not quite far enough north to qualify for the Midnight Sun, instead of any real darkness Shetland enjoys the bright twilight of 'da Simmer Dim', giving crops a better chance to ripen than farmers used to the less extreme daylight regimes farther south

tend to assume. Nonetheless, with this low basic level of solar input, conditions for reliable cropping have always been marginal, and the possibility of crop failures due to both short and long-term climatic variations can never be left out of the reckoning in considering the history of Shetland.

Because of their clearer skies, inland parts of southern Greenland in fact receive more insolation than cloudier Shetland. Their great contrast in climatic harshness, despite this, emphasises the fact that climatic zones are not simply latitudinal. The effects of continental masses and oceanic circulation have to be taken into account. Most of the other northerly places noted in the latitude comparison above are subject either to continental effects or to cold ocean currents, and have severe winters. Shetland lies however in the track of moderating westerly winds coming in across the ocean, which is warmed here by the North Atlantic Drift, the continuation of the Gulf Stream. The result is an equable climate, with winter temperatures almost the same as those of London, ten degrees of latitude farther south but more susceptible to the winter cooling of the landmass of continental Europe. Indeed, winters in New York (twenty degrees farther south but subject to harsh continental effects) are often much more bitter than in Shetland.

In Shetland, the average number of mornings with snow cover tends to be 15 or less (Chandler and Gregory 1976), whereas for substantial inland areas of mainland Scotland, both in the Highlands and Southern Uplands, it is often over 50. The average dates of the first air frost of the year tend to be as late as November in Shetland, compared to September in much of Highland Scotland, and October in many of the mainland Scottish lowland areas. The last frosts of the spring are more important for agriculture, and again the beneficial effect of the North Atlantic Drift is apparent, with Shetland tending to have had its last air frosts before April is out, whereas much of mainland Scotland has to wait until June is in (Burnett [ed.] 1964).

These figures for snow cover and incidence of frost are based on runs of statistics gathered in the earlier part of the present century, yet their relevance to our immediate future is in dispute. The present preoccupation with the possibility of anthropogenic 'Global Warming' emphasises the difficulty of evaluating trends even in this heavily instrumented age. Some historians may accordingly feel that it is injudicious to involve themselves with the possibility of climatic variations in periods before scientific meteorological records were kept. There are however many indirect lines of evidence which suggest, for example, that the efficacy of the ocean currents for warming the North Atlantic has varied significantly through the centuries. These include the positions where pack-ice was logged by the 17th and 18th century whaling ships, and a wide range of other indirect documentary and natural science data from Iceland, the Faroes and Norway as well as the British Isles (e.g. inter al.: Grove 1988; Lamb 1982; Gissel & Jutikkala 1981; Parry 1978).

The importance of climatic change to a community set at so high a latitude as Shetland is such that the probability of significant variations ought

not to be discounted, despite the need for much further research. Happily, the prospects for this going forward seem positive. Not least because of the topical interest in using historical data to evaluate the current concern over 'Global Warming', it seems likely that there will continue to be inputs of funds for researching the climatic changes of recent centuries. Results from this may offer routes by which some of the basic problems of the history of Shetland may be approached. For example, Dr Hance Smith has drawn attention to the dearth of reliable direct data on the varying population levels of Shetland, right up until the 18th century. He casts doubt on estimates for the Viking era and notes that 'there is practically no information for the intervening period' (Smith 1984: 6). An assessment of the changes in the subsistence base available in the islands in earlier centuries would at least help to provide a framework for conjecture on demography, and the climatic research now proceeding offers one route towards this. While data on the sequence of climatic changes derived from Shetland itself remain scanty, recent reviews of results from Iceland and Norway suggest that a sufficiently consistent picture is emerging to justify some interpolation to our intervening islands (e.g. Teitsson 1981; Grove 1988; Ogilvie 1984). Since the area of ground in Shetland with any potential for arable land-use is of such limited extent (see Fenton 1978, and below), it is practicable to consider surveying its viability under specific conditions, and apportioning confidence limits for its possible productivity under different climatic regimes (cf Parry 1978).

The North Atlantic Drift has clearly been crucial in saving Shetland from the frigid winters commonly characteristic even of latitudes much farther to the south. In summer however, while the temperature curve can rise quite steeply in continental areas protected from the influence of a major ocean, the great mass of sea water works as a heat-sink and inhibits the rise of summer temperatures in the islands. At 12 degrees Celsius, Shetland in July is about three degrees cooler than Edinburgh and six degrees cooler than London. This may not seem much, but this flattening of the curve relative to more continentally-influenced areas means that relatively few day-degrees of energy are available above the threshold temperatures for plant growth and ripening. The relative mildness of Shetland's winters certainly makes the islands a more convenient place to live than Greenland or Labrador, but this is of scant advantage for arable farming, since little crop growth occurs in the gloom of winter. The importance of this factor of 'oceanicity' relative to 'continentality' in the summer growth season is brought out by the fact that in a European perspective, all Scotland has been mapped (Parry 1978: 85) as having a more marginal climate for cereal cropping than part of Finland, despite the marked contrast in the severity of their winters.

The oceanic inhibition of the rise of summer temperatures makes everything more marginal: not only is there less scope for evaporating excess soil moisture, but the cooling effect of increasing height above sea level becomes critical at a much lower altitude than in regimes where summer

temperatures show a higher peak. Crops ripen reliably in the Alps and other inland continental locations (including parts of eastern Scandinavia) at considerably greater heights than the practical limits of arable farming in Shetland. Thus, just as we have to qualify our interpretation of Shetland's latitude in terms of the 'oceanicity/continentality' axis, this in turn leads us to take on board the concept of 'vertical norths'. This term was coined by Strzgowski (and adopted by Braudel 1972: 27) as shorthand to indicate the way in which vertical movement up a hillside at a single locality can lead through a succession of ecological zones, equivalent to those which would be encountered in a considerable horizontal traverse northwards. The oceanicity of the climate in the Northern Isles has compressed these zones dramatically, so that despite the low amplitude of relief in the islands, viable agricultural land is soon supplanted by habitats that are technically sub-Arctic, as one ventures up hill.

Thus, Shetland's growing-season at sea level is no more than that at Dalwhinnie at 1150ft (350m) in Scotland's central Highlands, while by the time that 1000ft (305m) above sea level is reached in Shetland, the mean summer temperature is the same as at 2500ft (762m) in the central Highlands (Spence 1979). Because of exposure, one does not have far to climb to encounter 'patterned ground' features. These are stripes and other shapes sorted in loose stones by frost-heaving on bare, wind blasted ground. They are characteristic of periglacial conditions, and though found down to sea level in the Arctic and Antarctic, they tend to develop only at relatively high altitudes elsewhere. On the Keen of Hamar on Unst, however, they may be seen on slopes of serpentine gravel at only 200ft (60m) above sea level: the lowest post-glacial, frost-patterned ground recorded anywhere in Britain. Ronas Hill, though the highest point in Shetland at 1486ft (453m), is hardly a notable peak in European terms. Yet a whole range of periglacial phenomena are to be seen 'more clearly here than on any other British site' (Ball & Goodier 1974), and because of this and its Arctic-Alpine flora it has been designated a Site of Special Scientific Interest. It is a measure of the marginality of conditions in all the Northern Isles that despite the advantages of lowland Orkney for agriculture (see below), Ward Hill on Hoy, which at 1565ft (477m) just tops Ronas Hill, also has widespread examples of patterned ground.

Although the patterned ground emphasises how closely the isles come to the Arctic in terms of their 'vertical norths', as noted earlier the buffering effect of the surrounding ocean both limits the time in which snow lies and in which killing frosts may affect agriculture, at least at sea level. However, exposure to the wind is a factor which has to be taken into account throughout the year in the isles. There is no shelter as far as Greenland or Newfoundland to the west, or the Pole to the north. Scotland as a whole ranks as:

> . . . one of the most exposed countries in the world, with wind forces and frequencies greater than elsewhere in Western Europe and comparable only to

the coasts of NW America, Tierra del Fuego, the Falkland Islands, and other high latitude islands (Tivy 1983: 79).

Shetland is among the windiest parts of Scotland. There are no records for Ronas Hill, but Sandness Hill at just 817ft (249m) registers 80% of the mean annual windspeed of the summit of Ben Nevis itself (4406ft; 1343m). For eight months of the year, the average windspeed in much of Shetland does not drop below 15mph, and through December, January and February it stays over 20mph. There are between 200 and 250 hours of full gales per year, and some of the highest windspeeds known anywhere in Britain have been recorded in Shetland. A gust registered 177 knots at RAF Saxa Vord, Unst, but as it took the head of the anemometer off downwind with it, nobody is quite sure what speed it actually reached! (Morrison 1974).

Besides causing direct mechanical damage to crops, high wind forces tend to curtail productivity by increasing evapo-transpiration and lowering temperatures by wind-chill. Furthermore, since none of Shetland is more than three miles (under 5km) from the sea, the turbulent air off the ocean is often heavily salt laden, and can damage plants throughout the year. Taking these features into account, Dr David Spence (1979) has classified the upland part of Shetland as subarctic oceanic, in terms of climate and vegetation. He puts the lower limits today of this inhospitable environment at around 200m in sheltered valleys, but at no more than 100m (c330ft) on summit ridges, since exposure depends on relief as well as altitude. This is the situation in the relatively bland climate of the late 20th century. We must assume that in many of the phases of the Little Ice Age which are now being identified (as reviewed for example by Grove 1988), the constraints on subsistence agriculture in Shetland and the other Atlantic Islands were even more severe. Indeed, recent work in Norway suggests that some phases characterised by milder winters, which favoured inland parts of that country, were marked by increased storminess which actually restricted vegetation growth on the exposed western Norwegian seaboard (Teitsson 1981). Complications such as these may well have to be taken into account in our Isles, because of their degree of exposure.

Most of the terrain with which the climate interacts in Shetland has never favoured agriculture. Although absolute heights are not great, the narrowness of the islands and the degree of coastal indentation is such that steep slopes from ridge to shore are common. Glaciation has worked over the very ancient and often highly contorted bedrock to produce landscapes of erosion, with many bare rock outcrops and characteristically shallow soils. In some areas, as we shall see, the soils appear to have been further attenuated by the activities of people and their animals. Where recent deposits of any depth have formed, these are generally of blanket peat, capable only of supporting low-intensity grazing. The extensive peats (covering, for example, two thirds of Yell) reflect the combination of the cool wet climate with bedrock which is often acidic, rather than base rich.

There are relatively few areas where geology has favoured agricultural activity. The Old Red Sandstones of Dunrossness resemble those of Orkney in their gentler topography and sweeter soils, and give some of the best farming land in Shetland. Narrow bands of limestone, outcropping from Scalloway to Nesting, make part of the Tingwall area more productive than the acidic soils on the surrounding schist and gneiss. In Unst and Fetlar, basic gabbro and serpentine offset the acidity, so that Fetlar has sometimes been called 'the Garden of Shetland' (Whittow 1977).

These exceptions however emphasise the limited agricultural potential of the greater part of the archipelago. When considering this in terms of traditional economies, it is perhaps more realistic to avoid figures from the current EC and Oil era, and join Fenton (1978) in looking to those from the pre-war period. Thus, even in 1931 just 3.4% of Shetland's total land area was classified as Arable: less than a tenth of the corresponding figure for Orkney (37.3%). As we have seen, climatic variations must certainly have reduced the amount and productivity of Shetland's limited stock of arable land, particularly in phases of lower summer temperatures, and greater storminess. As Goodlad (1971: 2) puts it:

> . . . with Shetland close to the limits of tolerance of many crops... a small annual fluctuation in the amount of sunshine, or strength of wind or occurrence of frost... on occasions in history caused famine, and even today they can severely strain the resources of a small farmer.

Just as human factors may sustain long-term continuity as well as precipitate change, so too can quite evanescent short-term physical events like some of the great storms which Shetland has experienced change the fortunes of communities, through losses of crops on land, and crews at sea.

Although the present climatic phase is relatively bland compared with many in previous centuries, it can not be assumed that this 3.4% figure represents the maximum, from which subtractions for negative climatic phases should be made. The reservoir of land of arable potential may have been slightly greater in the past. It is not merely the prospect of some periods of better climate which needs to be taken into account. As suggested above, allowance must be made for the deleterious impact of people and their animals, in over five millennia of occupation of this fragile habitat.

The limitations of Shetland for cropping have led to a traditional emphasis on livestock, with the hill land being used to feed cattle, ponies, swine and particularly sheep (Fenton 1978). Even in recent years Shetland has carried more sheep than the much larger county of Caithness and as Spence has pointed out, these have degraded the upland vegetation and soil significantly by trampling, as well as reducing its nutrient status with the removal of their wool and carcasses for consumption elsewhere (Spence 1979). The burning-over of the pastures has contributed to erosion. The hill land has also served at least since the Iron Age as a source of peat for fuel. According to Spence, failure in the past to follow the practice of replacing the

top sod on the bare peat surface may account for the stoney areas so common in areas of cut-over blanket bog, as at Staneydale in West Mainland. Turf scalping may account for the bareness of upland Papa Stour, and for the thin soil cover on the areas around many townships, as at Muness in Unst. Overall, the extent to which potentially productive land has been lost is difficult to assess, and it may be that the impact has been more on the uplands and rough grazings than on patches of better arable land, cherished because of their very rarity. Certainly, until the last century peat used to be brought off the hill to be mixed with manure to supplement the topsoil of infields.

Whatever detailed variations there may have been in the area of ground capable of supporting cultivation in Shetland, it has certainly been one of the factors of long-term continuity in the human geography of the islands that this area has only been of the order of one twenty-fifth of the total extent of the archipelago. This underlies the stereotyping of the Shetlander as 'a fisherman with a croft', i.e. one who turned for subsistence from the limited potential of the land to the relative fertility of the surrounding seas, despite the difficulties and dangers of working these far northerly waters.

Since Orkney and Shetland both lie in the same broad climatic regime, the contrasting stereotype of the Orcadian as 'a farmer with a boat' requires consideration. We have already noted that the proportion of arable land in Orkney is ten times that in Shetland. Underlying the rich complexity of the history (e.g. Thomson 1987), there is a bold geological contrast between the island groups (Whittow 1992). Except for areas such as Dunrossness mentioned above and part of western Mainland, most of Shetland is essentially a geological stepping stone between the Grampian Highlands and the equally ancient rocks of the western Norwegian mountains. It is akin to them in structural complexity, with many contorted and metamorphosed beds set on edge, their differences in hardness picked out by glacial erosion. Orkney, however, is primarily an extension of the sandstones characteristic of Caithness. Their almost horizontal strata give broader islands, with more extensive plains in the crucial climatic zone close to sea level. The sandier soils tend to be less acid, to drain better and to warm earlier in the spring. At the same time as it has fostered agriculture, this geology has given Orkney a coastline which is very different from the point of view of traditional small-boat fishing. Though there are great roadsteads such as Scapa Flow, and fine sandy beaches, the erosion of the sandstone strata has often created wide shallow rock shelves which make approach difficult in heavy weather (Goodlad 1971). These shelves are frequently backed by unbroken clifflines. Shetland on the other hand, though certainly beset by complex stretches of skerries and iron-bound coastlines, is penetrated by many narrow arms of the sea which offer sheltered havens.

Shetland's physical geography can also be set in perspective by comparison with the Faroes (Jackson 1991). Lying around two hundred miles to the northwest, conditions there tend to be more extreme versions of those

encountered in Shetland. There is less insolation, due not only to the even higher latitude, but to more persistent cloud cover and fogginess. The terrain is yet more dissected. Agriculture is thus even more difficult. The surrounding fishing grounds are at least as fecund as those around Shetland, so it is hardly surprising that in the Faroes, fishing has traditionally been of far greater importance than farming. However, as Goodlad notes (1971: 8) 'this is not entirely due to the attractiveness of the marine environment.' Factors such as the nature of the historical relationship to Denmark and changing access to European markets can not be left out of account.

Conclusion

As suggested above, Shetland and the other North Atlantic isles have an especial attractiveness as a theatre for re-assessing one's ideas on the processes of history. They have advantages for evaluating the extent to which the interplay between elements sustaining continuity and those promoting change has varied from period to period, and for investigating the ways in which human and environmental factors each have the potential to influence the development of a community and its landscape in both long-term and short-term ways. Thus, all these island communities are sufficiently small and relatively well documented for their internal dynamics to be accessible, and there is a rich legacy of previous scholarly study to provide starting points. The very fact that they are islands also tends to make the evolution of their relationships (for good or for ill) with other societies elsewhere more explicit and visible than is necessarily the case for inland communities set amidst the artificial political boundaries of a continent. The northerly and oceanic habitats which they offer are also sufficiently exacting to make the nature of relationships between the environment and the social or economic organisation of the communities rather more direct and clearer than in many parts of the world which are climatically blander.

In this paper, both the obsolescence of traditional determinism and problems involved in evaluating aspects of the physical environment have been stressed. It is nonetheless difficult to escape the conclusion that this high-latitude North Atlantic oceanic realm provides an environment of sufficiently pronounced characteristics to deserve serious attention by historians concerned with most aspects of life in these islands.

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