Birsay Bay, Orkney: Human exploitation of natural and agricultural resources

By Christopher D. Morris and D. James Rackham

1. Introduction

The Bay of Birsay (fig. 1) has been the focus of archaeological interest since the mid 19th Century, and in particular a number of campaigns took place on the Brough of Birsay, in the 1930s, 1950s and 1960s. From 1973 to 1982, renewed excavations took place on various sites around the Bay, including the Brough of Birsay (1). As might be expected, until this recent work, little attention had been paid to the recovery and analysis af ecofactual, as opposed to artefactual and structural data. Work on the excavation of Room 5 on the Brough of Birsay introduced sieving techniques, which produced some interesting indications in analyses by specialists of what might be expected with more rigorous attention to economic and environmental data (2). Shortly before this excavation, Dr Anna Ritchie undertook an important "rescue" excavation on the site of a mound on the Point of Buckquoy, and in 1977, Mr John Hedges undertook a preliminary "rescue" excavation at Saevar Hove, on the Mainland side of the Bay. These are now published, and have included important analyses of the ecofactual data by relevant specialists (3). Similar analyses are in train for the material recovered from both the recent excavations on the Brough of Birsay (4), and those from the various excavations along the Brough Road (5) and in Birsay Village (6).

The paper that follows is not an attempt to summarise the results of these recent excavations and their accompanying analyses (for much of the ecofactual data is still under study), but to point forward to that. It summarises the situation, as we presently understand it, for the human exploitation of natural and agricultural resources in the Birsay Bay area, against a consideration of the natural features of the Bay. While some of the factors mentioned may be specifically related to the Pictish and Viking periods, others are more general and would also relate to both earlier and later periods than those which are the primary focus of archaeological investigation in the Birsay Bay Project.

2. Topography and Geology of Birsay Bay

The Orkney Isles, off the N coast of Scotland (fig. 2), with the exception of Hoy, have a similar low-lying gently rolling topography. The major hills are present in W Mainland, Rousay and Westray, reaching a maximum height of 275 m. Most hills in the Orkneys have small escarpments or terrace features on their sides due to differential erosion of hard and soft alternating beds within the deposits of Old Red Sandstone flags. The same process also produces differential sea cliffs with similar features.

The Bay of Birsay is a marked indentation on the N W coast of Mainland Orkney (fig. 2). It is, in fact, two bays, divided by a small promontory of land called the Point of Snusan or Snushan. The northernmost is the

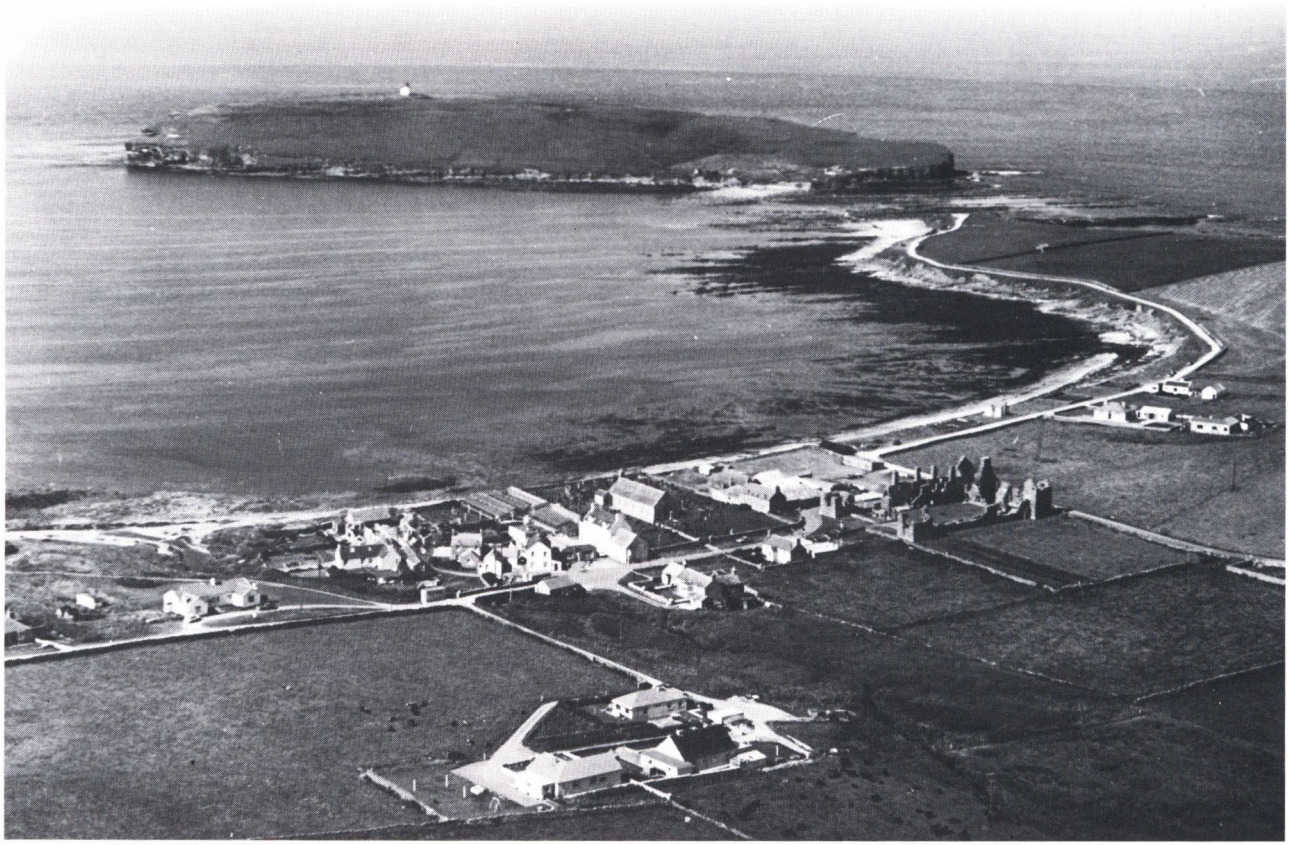

Fig. 1. Aerial view of Bay of Birsay from SE, showing, from L foreground to R background, Beachview, Church, Palace, Brough Road and Brough of Birsay in background (copyright Gunnie Moberg).

larger, bounded on the N by the Point of Buckquoy, originally attached to the Brough of Birsay, itself projecting out into the Atlantic. This tidal island is separated by the 778 ft (238 m) wide Brough Sound from the Point, although connected at low tide by a modern concrete track across the natural causeway of exposed rocks. The Brough of Birsay has attained its shape and status as a tidal island due to faulting and the erosion of joints (fig. 4a). It is also due to the tilting of the flagstones, which produce wedge-shaped headlands. The sea erodes from both sides behind the headland at the low end of the wedge, thus isolating the head as an island. Faults and joints produce areas of low erosional resitance forming 'Geos'. This is the manner in which,

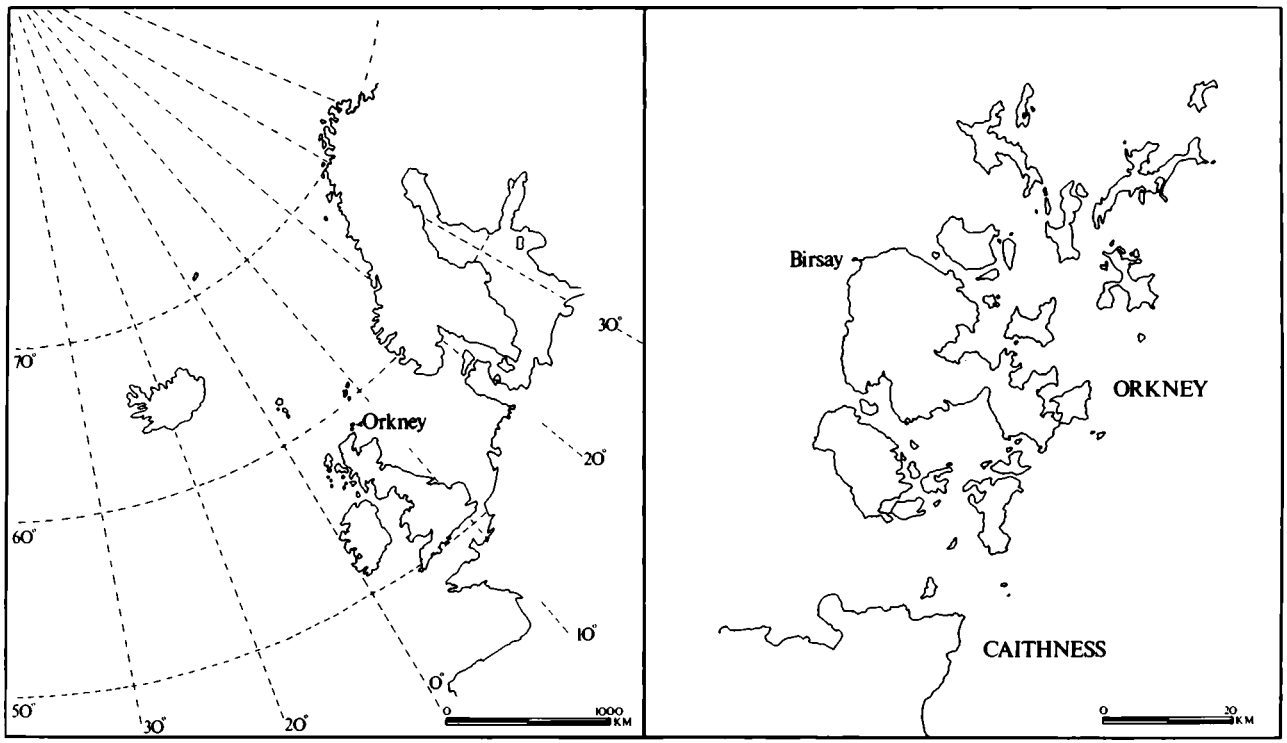

Fig. 2. Location of Orkney & Birsay (Norman Emery).

in its turn, the Peerie Brough has been virtually separated from the Brough of Birsay.

The Orcadian landscape has resulted from geological deposition, folding and glaciation. It is, therefore, in part shaped by gently inclined Devonian, Middle Old Red Sandstone flagstones, sandstones, lavas and tuffs dipping to the N and the E (fig. 3). The four major rocks outcropping around the Bay of Birsay are the Upper and Lower Stromness Flags, the Sandwick Fish Beds and igneous, intrusive Camptonite dykes – all of which are faulted, jointed and tilted.

The Upper and Lower Stromness Flags consist of light grey and black, very thinly bedded, sometimes laminated dolomitic siltstones, shales and occasionally sandstones. Due to the dolomitization of minerals, which have undergone partial recrystalization, very hard, brittle and thinly-bedded rocks are produced, known as flags of flagstones. Extensive coastal exposure and differential weathering has isolated individual beds, which may easily be broken off due to their brittle nature. Flagstones have been a major building commodity on the islands since Neolithic times.

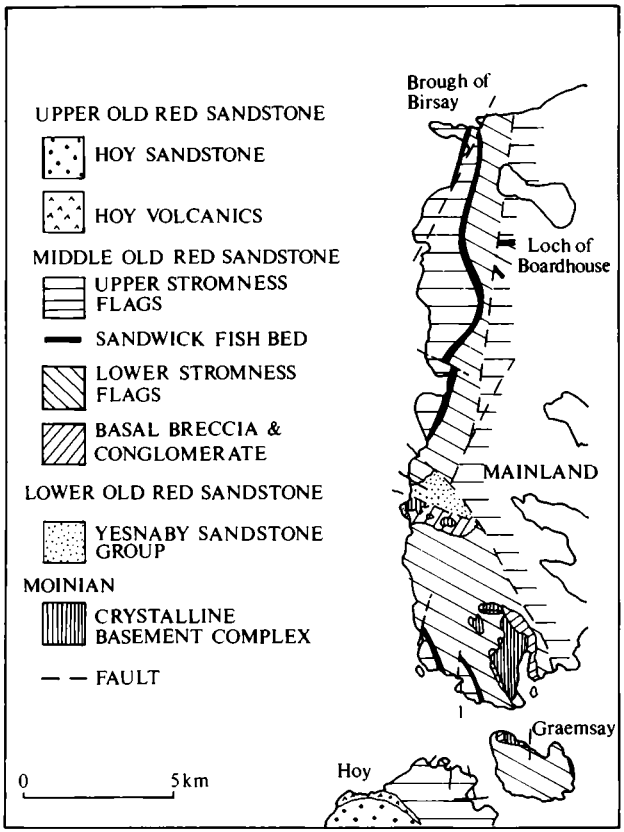

Fig. 3. Geology of coast of W Mainland, Orkney (Norman Emery, after W Mykura & D Reed).

The Upper and Lower Stromness flags of Birsay are separated stratigraphically by the Sandwick Fish Beds (fig. 4c) which can be seen outcropping in the burn draining Boardhouse Loch into the Bay of Birsay; these beds are rich in Devonian fresh water fish fossils. Thin Camptonite dykes up to one metre wide occur on the natural causeway to the Brough of Birsay. Past work on the Mainland of Orkney has suggested that faults do not 'cut across' igneous dykes. However, in the Birsay area, there is clear evidence of small displacement faults displaying the thin igneous dykes (fig. 4b).

Orkney has a flooded landscape as a result of the last major glaciation. Extensive areas, including Birsay, were consequently covered by glacial deposits, which, with glacial erosion of the hills, has smoothed out the pre-existing landscape (7). Pleistocene and superficial deposits in the Bay are represented by glacial till and large accumulations of blown Flandrian sands particularly around the Beachview area. The sand consists mainly of very fine-grained shell fragments blown inland from beaches by onshore gales.

The surface of the Brough of Birsay slopes from around 131 ft (40 m) above sea level at the W, to about 16 ft (5 m) at the E end. The cliff-edge level of the Point of Buckquoy is also around 16 ft (5 m) (although the surface level is at around 30-33 ft (9-10 m)) which suggests that the area now occupied by the Brough Sound was low-lying. Changes in sea-level, and also the effect of sea erosion allied with the geological factors mentioned above (p 208 above) were, no doubt, the main factors in causing the breach between the Brough and the Point of Buckquoy. When this breach occurred is unknown, although important to the topography and subsequent development of the Bay (fig. 5).

The land around the S bay rises from the rock and gravel beach at the Point of Snusan to the 287 ft (87.5 m) high cliffs of Marwick Head, renowned for its seabird colony. To the W, fresh water from Boardhouse loch makes its way westward, via the Burn of Boardhouse, to the sea at Birsay Bay. This junction of burn and sea is now the main area of settlement, centred around the 16th Century palace of Earl Robert

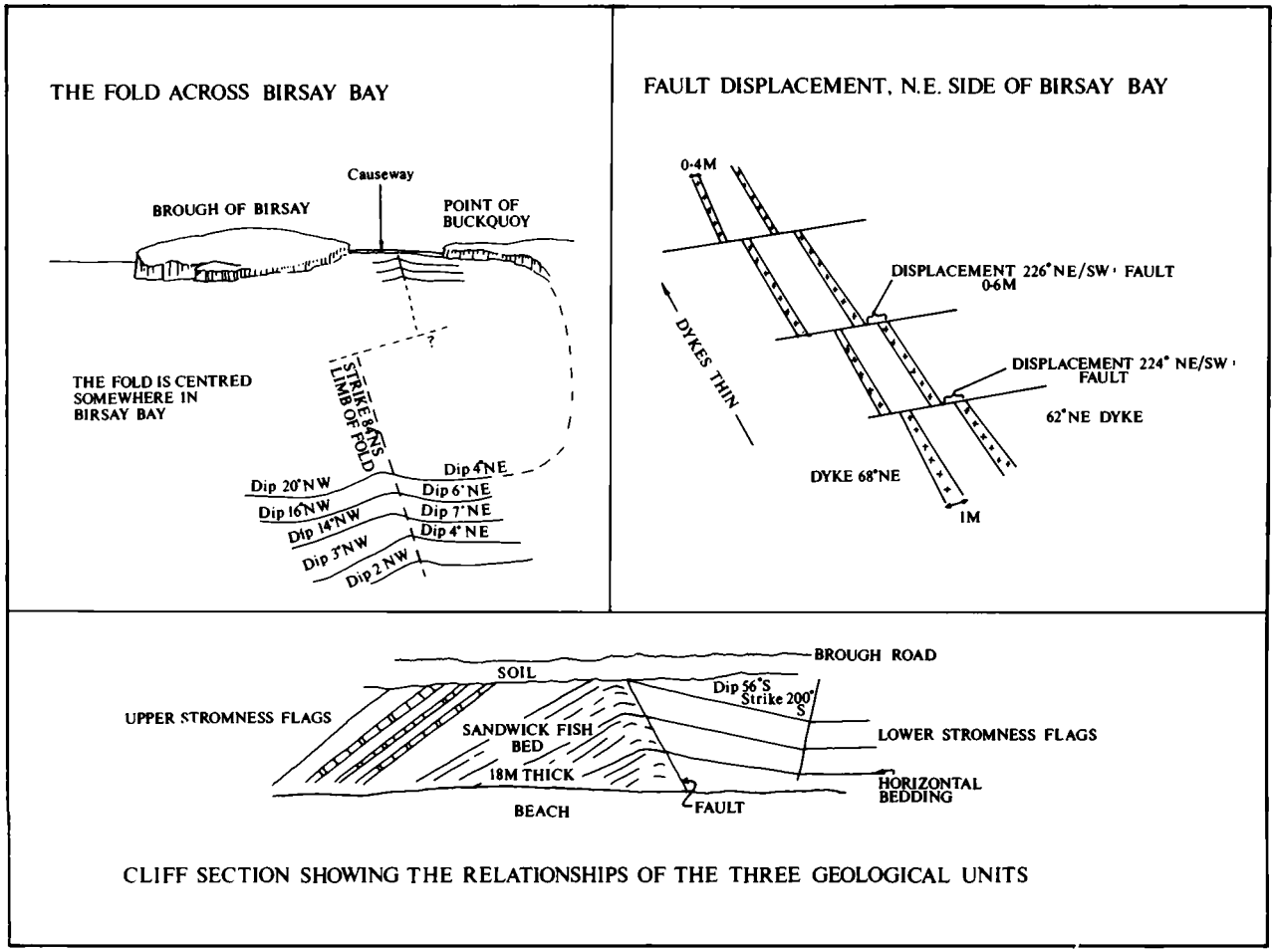

Fig. 4. Birsay Bay Geology (Norman Emery, after D Reed): (a) The Fold across Birsay Bay. (b) Fault Displacement, NE side of Birsay Bay. (c) Cliff Section showing the relationships of the 3 geological units.

Stewart on the N bank, with a spread of later cottages across the burn to the S.

The two bays have a rocky shore, with boulders, gravel and tidal pools. The bedrock on the landward side is overlain with boulder clay, and extending in from the sea for about half a mile are extensive areas of blown sand which has formed locally into dunes, particularly in the vicinity of Saevar Howe (8). Sand has,

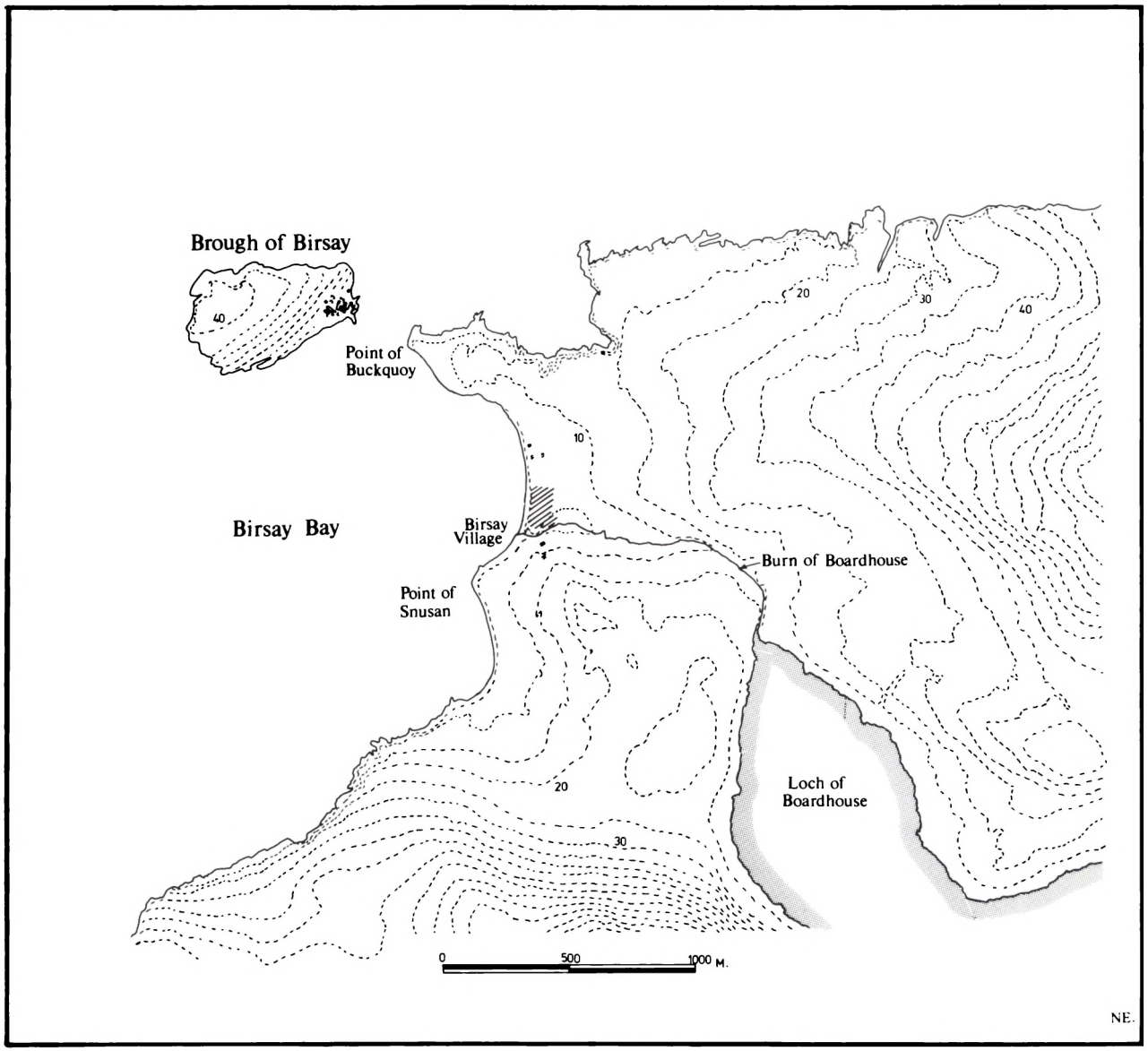

Fig. 5. Topography of Birsay Bay (Norman Emery).

however, not accumulated on the Brough or along the Point of Buckquoy in the area known as Red Craig (although previous accumulations may have been lost), perhaps due to a slight ridging at this point, resulting in sand accumulation on either side. All the land is now covered by a grass sward.

3. Geological Resources

As has been observed above, the flagstones of the Stromness series are a very fine natural building material, and have been used as such at all sites around the Bay of Birsay. In addition, excavations at Birsay have uncovered fragments and pebbles of camptonite which would be useful as hammers due to their dense, durable nature. These were presumably from a local source. Mica schist is found on Orkney from the Basement rocks and is easily worked to make spindle whorls, loomweights and net sinkers all of which have been found on sites around Birsay Bay. Slate is also locally found and has been used for whetstones. Unlike Shetland, there is no steatite occurring naturally in Orkney, so all the raw materials and steatite artefacts must have been imported from Shetland or Norway (9). Iron, lead and copper ores occur in Orkney, but they are not found in large enough quantities to be mined economically. However, it is possible that metal objects from Orkney could have been made from local ores.

Flint and chert can today be found randomly around the shorelines of the Orkney Islands, and many sites around Orkney have small amounts of chert lithics. The only known outcrops in Orkney Mainland are two thinly-laminated iron-rich beds of silty dolomite which contain large chert nodules below the Sandwick Fish Beds, and there are also outcrops in sandstone on Eday and in boulder clay on Shapinsay (10). However, the chert is of very poor quality for knapping. Flint can be obtained from glacial deposits on North Ronaldsay and Swona in the Orkney Islands group, and from the nearby island of Stroma in Caithness (11). It may be, then, that pebble flint recovered from the Birsay excavations came from very localised, glacially deposited material.

4. Trees

The relative absence of trees from the Orkney landscape in the last three millenia is noted from pollen diagrams (12), but charcoal of alder, willow and birch suggests the continued occurrence of these trees in sheltered locations in the Pictish and Viking periods (13). The pine remains are probably driftwood and occasional findings of spruce, a species native to North America and Scandinavia, supports this (14). Structural timbers are likely to have been imported, but for fire the rich sources of peat in the area were no doubt an essential supplement to the meagre supplies of local wood and driftwood. Evidence of its use and that of heather has been found at Saevar Howe and, in the Birsay Bay Project, both the sites beside the Brough Road and those on the Brough (15).

5. Agriculture

Because of the moderately severe climatic constraints, the land is graded as class 4, capable of producing a narrow range of crops, though with a potential for high grass yield, and therefore suitable for livestock production (16). Pastoral agriculture, based on sheep and cattle, is well attested, and, although the Rev George Low did not consider that the parish was exceptional, the small black cattle of the time were slaughtered for sale and export (17). In 1795, there were 1500 head of sheep to 700 cattle, but it is clear from Low's account

(18) that not many would have been kept in the coastal area around Birsay Bay:

...the wool, in some districts, is good; that about the shores is much hurt with the sand, which destroys its fabrick, and likewise spoils the mutton, by the sheep feeding upon sea ware...

A feature notable in *The [Old] Statistical Account* of 1795, is the large number of horses throughout Orkney, of which 523 are attributed to Birsay parish (19). As William Thomson has explained, they had an integral part to play in the Orcadian agricultural organisation, as well as imparting some degree of prestige to their owners (20).

The archaeological evidence at present tells us little of the manner of the exploitation of the domestic animals. The remains from Buckquoy, Saevar Howe and Room 5 on the Brough of Birsay testify to the keeping of cattle, goats, sheep, pig, horse, fowl and domestic geese, with dogs and cats also (21). The cattle and sheep constitute the most frequent remains at all these sites, with their relative frequency fluctuating both between sites and between phases at each site. Both Noddle and Rowley-Conwy remark on the high number of young cattle and sheep remains, the latter supporting Noddle's comment that there is "little evidence of any economic function for the animals other than the provision of meat and hides", while suggesting that there is perhaps evidence from the slaughter of very young cattle, some no more than a few weeks, of dairying being practised (22). Noddle has suggested that it is unlikely that the sheep found at Buckquoy were wool-bearing, but rather carried a hairy coat, and she suggests that the age at death indicated by the bones illustrates that they were not kept for wool production (23). Nevertheless, spindle whorls do occur at the site and at Saevar Howe indicating that, however hairy, the fleece may have been spun for yarn (24). Rowley-Conwy has proposed the possibility that the sheep were exploited for milk (25), and it may be that the few goat bones from Buckquoy and the single specimen from Saevar Howe represent animals kept largely for milking (26) – there would seem little point in maintaining a small goat herd for skins in the face of the large proportion of juvenile sheep being slaughtered.

The land around the Point of Buckquoy was used for corn harvesting in the 18th century; a drawing of "A South View of the Earl's Palace in the Parish of Birsay, Orkney" in the University Library, Edinburgh shows stooks in the fields her; these were known as Biggaquoy and Cleatfurrowes in 1760 (27). The place-name Buckquoy itself was seen by Marwick as being derived from ON *bygg-kvi*, indicating the growing of bere barley (28). The Rev George Low reported in *The [Old] Statistical Account* that both oats and bere (or big) were produced in the parish, with sowing of oats in March and bere in late April or early May, and harvesting beginning about the middle of August (29). Half a century later, the Rev Thomas Blyth noted (30) that:

The lands forming what is called the barony of Birsay, are considered by far the richest and most fertile of the parish, or perhaps in Orkney; the soil, in general, is a mixture of clay and sand, and yields most luxuriant crops of oats and barley, "without intermission."

There are, then, at least the indications that, under a different system in the past, agriculture might have been both more varied, and, conceivably, more productive.

The only evidence so far published for the cereal

crops grown in the Pictish and Viking periods at Birsay comes from Saevar Howe and the preliminary results from the sites beside the Brough Road, Birsay (31). Both Dickson and Donaldson record carbonised *Hordeum vulgare* (bere barley) and oat grains, the latter sites producing *Avena fativa* (wild oats) and *Avena sativa* (cultivated oats). Dickson also records hundreds of seeds of cultivated flax, *Linum usitatissimum*, a sure testimony to the cultivation of this crop (32). Fenton notes that flax processing was replaced in Birsay by straw plaiting in the early 19th Century, and Dickson recalls its alternative use for oil in order to explain a baked clot of flax seeds from the Viking period site at Carrigalla II, Co Limerick, Eire (33). Kiln drying of grain was employed in the area, as in most of Orkney, and a square form of drying kiln can still be seen associated with a croft at Northside. From the 16th Century, the Burn of Boardhouse was also harnessed to power a series of corn mills at Barony Mill (34).

6. Wildfowl

Wildfowling for food, feathers and oil has been commonly practised in the Northern Isles, and apparently from very ancient times (35). The sea-cliffs N and S of Birsay Bay are currently the nesting grounds for thousands of guillemots, razorbills and kittiwakes, and would have been a rich source for eggs and fledglings during the breeding season, and at other times birds may have been caught while roosting or by swapping or netting (36). The list of wildfowl exploited in this way includes gannet, puffin, Manx shearwater, fulmar, razorbill, guillemot, shag, cormorant, kittiwake, gulls, eider duck, great auk, great skua and rock dove (37), and the finds from Buckquoy illustrate an even more extensive variety – although many of the species listed by Bramwell may not have been exploited by humans (38). The most significant species in the archaeological collections are gannet, Manx shearwater and guillemot, but only the frequency of gannet suggest any significant contribution in terms of food.

7. Fishing

The sloping effect of the rock in the Bay of Birsay, the Brough Sound and Northside has made the bay today a dangerous landing place for anything but small boats. However, there are the remains in the northernmost bay of old nausts near the Point of Buckquoy (Castra Geo) and at Skippie Geo ("ship's geo"), places at which small oared fishing boats are still landed. Hauling onto the beach and up to the nausts was originally manual, then by winch and now by tractor. These were clearly the main harbours at the end of the 18th and in the 19th centuries, with a few boats also landing "in the S side of the barony", presumably in the village area beyond the outfall of the Burn of Boardhouse (39). Although the Rev George Low observed that "most of the people of the barony and Marwick are bred fishermen", he added that "We have no large vessels, nor any proper harbours" (49). Thus, large vessels could not be utilised in the Bay, despite various writers observing that Birsay could have been a suitable location for a fishing station: the Rev George Barry favouring cod and ling, and the Rev Thomas Blyth herring (41). However, it must be remembered that these accounts relate to the modern period, when larger vessels had been developed. They may not necessarily be reliable guides to the possible former importance of Birsay Bay for fishing, when such vessels were not in existence, and the topographical features of the Bay may hve been somewhat different.

A number of local place-names indicate some of the

resources of the sea: Koopa Geo, "the geo of seals", from ON *kopa-* or *kobba-gja,* Kuithe Oil Rock, referring to one-year old saithe, and Lyber Ness, from ON *lyrr,* or "pollack" (42). The potential of the sea is further indicated by a detailed account given by the Rev George Low of the fish caught in the parish or known to exist off the coast (43). In 1795 this seems to have been essentially for home consumption: only dog fish were sold outside the parish. Otherwise, he mentions "a few poor cod, a few thin ling, a few haddocks now and then, a hallibut now and then". Although coal fish or saithe ("sillicks"), and many other fish, including skate, were caught in the area, it seems they were either in "inconsiderable quantities" or "seldom caught upon lines". Several kinds of whales were observed hereabouts, a small whale or shark sometimes coming in, and "tusk" (presumably torsk) and "steinbiter" (lumpsucker) are also mentioned as being "two of the best kinds of fish we have", but they were not exploited at the time Low was writing nor have they been found in archaeological remains from the bay (44). Fresh water fish were to be found also: an occasional salmon, but Low particularly noted that "There are 2 or 3 burns, one of which washes the middle of the barony, all full of fine trout". It has been suggested, by Norwegian analogy, that the farm-name Hunto may indicate a good fishing-place, and the location of the burn, represented by the second element *á*, "could be well adapted for catching trout going up or down" (45). The Rev George Barry also elaborated upon this theme, regarding the availability of excellent fishing off the coasts of Orkney, and observed that the people of Birsay caught "the ordinary kinds of fish for their own consumption" in between work on the farms and with the kelp (46). The Rev Thomas Blyth noted in 1845 that over 20 fishing-boats were in general very successful, mainly exploiting cod and dog-fish, but also herring (47).

These varied fish resources, perhaps under-utilised in the modern period, could well have had very different significance in the past for the inhabitants of the Bay of Birsay. Fishing in Orkney has been one of the major commercial and subsistence activities over many centuries. This is evidenced in many early sites on the Islands and in the Bay itself (48). For more recent periods, in the area of the Bay itself, recent work has illustrated the range of species exploited in the Pictish and Viking peirods particularly. At Buckquoy, in deposits from the Pictish and Viking farmsteads excavated by Dr Anna Richie, the fish included conger eel, trout, cod, saithe, haddock, ling, hake, ballan wrasse, red seabream, mackerel and grey gurnard (49). Although recovery techniques, preservation and disposal practices may have affected the composition of the collection (50), gadids (cod family) are the most frequent remains. Among the collection from Room 5 on the Brough of Birsay, Seller records cod, mackerel and ray from the "kitchen refuse" (51). At this site, cod dominate the sample of fish bones, and in the later phases – in particular Phase 4 – they constitute the most abundant fragments after cattle and sheep bones. At Saevar Howe, in the S part of the Bay, some hundreds of fish bones were recovered after sieving, during the excavation of the Pictish and Norse features and deposits on the top of a large mound. The collection was again dominated by gadids, with cod, saithe and ling in descending order of importance; torsk, plaice and salmon were the only additions to the species already identified from these periods elsewhere (52).

8. Seals and Whales

Seals and whales have been a major resource on the

Islands, and even today the former has been the subject of commercial culling by Norwegian sealers. The number of seals on the Islands appears to fluctuate considerably, since grey seals, present today in number about 20,000, were recorded as comparatively rare during the 19th Century (53). This was offset by common seals being the commoner species then, in contrast to the 3,500 today (54). Whatever their numbers, these animals are concentrated both during breeding and at other times on the skerries, uninhabited islands or humanly-inaccessible parts of the shoreline. They occur all the year round in the Islands but, although regularly seen in the Bay of Birsay, do not breed there, and rarely occur in numbers or are likely to be caught. Inhabitants of Birsay may well in the past have joined the annual hunts to the breeding grounds on the skerries and earned their quota of sealskins and oil, but the bones found on archaeological sites in the Bay probably derive from local chance catches or beached carcasses, and may represent waste from consumption (55).

Whaling as organised exploitation or industry is relatively recent, although Clark noted claims that the Basque whale fishery was already active in the 10th Century and had penetrated to Ireland, Iceland and Norway by the 15th and 16th Centuries (56). In Orkney, commercial whaling in the form of vessels passing through, and picking up crews, for the Arctic whaling waters around Greenland and the Davis Straits probably started in the 18th Century (57). Prior to this, whaling was an occasional domestic exercise involving the stranding or beaching of schools that strayed into the local waters. Fenton records that in the 19th Century, these provided "flesh for food, oil for light, skin for leather and offal for manure" (58). Although whale meat was not eaten in the Orkneys in recent times except perhaps in times of famine, Evans records the salting of whalemeat in Ireland, and Fenton its consumption on Fair Isle (59). Childe remarks on the presence of "considerable quantities" of whalebone from Skara Brae (69).

A further resource is that of whalebone, MacGregor suggesting that only carvings in cetacean bone reach "the level of an art, north of the Alps" and noting the increase in artefacts in Southern Britain during the Viking period (61). While whalebone is easily recovered from beaches after the decomposition of stranded carcasses or by their butchery, MacGregor has argued that this would not have yielded sufficient for the development of certain standardised types of whalebone tool (62). This may or may not be the case, but it is plausible that the multiple strandings and slaughter of recent centuries in the Northern Isles had their origin much earlier. This suggestion would perhaps receive some support from part of Alfred's *Colloquy* which appears to indicate whale hunting at about 1000 A D (63), and also from Ohthere's report to King Alfred which records how in N Norway he and his companions slaughtered 60 whales in two days (64). Birsay is an unsuitable bay for such hunting, but cetaceans occasionally are beached in the Bay – a dolphin was washed ashore in the S bay in 1978 during the excavation. The species most commonly found around Orkney is the pilot whale, but unfortunately, although unworked whalebone has been found at Buckquoy and whalebone artefacts at Saevar Howe, the Brough of Birsay and Buckquoy, none have been identifiable as to species (65). Berry notes the occurrence of other species in the waters around Orkney today, and Clarke illustrates many prehistoric sites on Orkney with whale bones (66).

9. Seaweed

In addition to access for fishing, the Bay of Birsay was also rich from the accumulations of kelp which washed (and still washes) onto the beaches. Alexander Aberdeen's map of 1760 prominently records the presence of kelp in the Bay and this part of the beach was called "Ware Shore" (67). At the end of the 18th Century, between Birsay village and Marwick, 17 to 18 tons per year of the kelp ash used in soap and glass manufacture were produced, and, although not large, this rose to about 20 tons in the early 19th Century (68). At this time, the areas by the shore were used for kelp burning, providing an extra source of income here, as elsewhere in Orkney, for the farmers and crofters (69). A preliminary report on the evidence for the collection of seaweed from sites of the current project at Birsay has been made by Donaldson *et al* (79). Fragments of Bladder wrack, *Fucus vesiculosus,* have been found from a probable Norse context on the Brough of Birsay and the occurrence of marine molluscs often found on the holdfasts of the larger seaweeds have been noted from Room 5 on the Brough of Birsay and Buckquoy (71). Whether this was for food, manure, caulking or cattle fodder is unknown, but recent sampling on Norse sites in Orkney is consistently revealing carbonised seaweeds (72).

10. Other Resources of the Seashore

In addition to the exploitation of the offshore fisheries, the sea and coast offer a variety of further resources at the present day, and in the recent and ancient past. Although of less economic importance than the maritime fishing industries, these resources are seasonally important and may offer a buffer against hard times. Shellfish, limpets and winkles are taken today for use as bait by those rod-fishing off the shore and rocks. Fenton records that craigseats (areas or locations on the shore particularly suited to fishing) were common in the last century and often claimed proprietorily, limpets being used as ground bait and to bait the hooks (73). He notes also the use of limpets as bait for haddock fishing from boats (74). Whatever fishing techniques existed in the past, limpets are likely to have been a favoured bait – a suggestion also voiced by Colley (75). That shellfish were also a food resource in the past is documented by Low, who recorded the raking up of vast quantities of cockles at Longhope (76). Fenton records limpets as a food for the poor and, at the present day, clams, *Pecton maximus,* and queens, *Chlamps opercularis,* are exploited commercially (77). The molluscs found on archaeological sites are likely to be present because of a number of factors, but the abundant remains of limpets and periwinkles at Room 5 on the Brough, Buckquoy and Saevar Howe must reflect food consumption as well as bait or accidental deposition, and the consistent occurrence of dog whelks at the latter two sites may also represent a food source (78). Oysters and cockles, which are locally common on other archaeological sites, are not found at Birsay – presumably because the littoral zone is rocky rather than sandy or mudbottomed (79). Lobsters and crabs are commercially exploited today, but although crab remains, probably of *Cancer pagurus,* the edible crab, have been recovered in small numbers from archaeological sites in the Bay (80), there is no evidence of lobster from archaeological sites in Orkney. It may be that the slightly deeper water in which this species is usually found, made it a rarer catch in earlier periods, although by the 18th Century there was quite a sizeable lobster fishery in Orkney, already supplying the London market (81).

11. Postscript

As argued recently, the author would see modern techniques of "environmental archaeology" as giving the opportunity for a level of understanding of the settlement and economy in Orkney in the Pictish and Viking periods that could not be achieved before (82). Work is proceeding on the analysis of material collected both by more conventional archaeological methods, and by sampling, from the range of excavations around the Bay of Birsay. In particular, the excavations at Beachview, Birsay, a mound-site with significant midden deposits (83), allowed the adoption of a wider-ranging sampling strategy than on any of the other sites around the Bay. It is to be hoped that the fuller conclusions that may be drawn from the analyses and results of this work will not now be too long delayed before publication, for they should gain a significance in comparison (an maybe contrast) with those from other areas of the North Atlantic cultural area with which they may be legitimately compared. In particular, it is to be hoped that the work on the parallel project at Freswick Links, Caithness, initiated by the same team as that at Birsay (84), and Bigelow's project at Sandwick, Shetland (85) will at least enable these comparisons to be made for the different component parts of the Earldom of Orkney.

Notes

* The authors wish to express their thanks for contributions from Norman Emery and David Reed (see Reed, 1981). The authors acknowledge the financial support over the years for the excavations of the Inspectorate of Ancient Monuments, Scottish Development Department, and Durham University Excavations Commitee.

1. For interim reports, see Morris, 1983 & Hunter, 1983.
2. Hunter & Morris, 1982.
3. Ritchie 1977: Hedges, 1983.
4. Hunter forthcoming; Morris forthcoming c.
5. Morris forthcoming a.
6. Morris forthcoming b.
7. Mykura et al 1976, 113-4, fig. 29.
8. Wilson G.V., 1935, 67-8.
9. Ritchie P R, 1984, 65.
10. See Whickham-Jones & Collins 1978, Fig 2, 13, & 17.
11. See Whickham-Jones & Collins 1978, Fig 1, 10, & 12.
12. Davidson & Jones 1985, 25-26.
13. Donaldson 1982, 138; Dickson, 1983, 114.
14. ibid.
15. Dickson 1983, 114; Donaldson, et al, 1981, 80-81.
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