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IAN ARMIT	Archaeological field survey of the Bhaltos (Valtos) peninsula, Lewis	A4 - G5
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FIELD SURVEY OF BHALTOS

ARMIT

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Appendix One: Gazetteer

This gazetteer concentrates on sites with some evidence for human settlement, economic or funerary activity. It thus excludes stray find-spots with insecure identifications. It also excludes areas of cultivation or boundary walls which are instead discussed in the discussions on the individual survey areas (App. 3). Also excluded are structures represented as occupied or as 'ruins' on the 1st edition Ordnance Survey map. A general discussion on these sites is included in the text report.

A number of previously recorded sites in the area have presented some problems in constructing and cross-referencing the gazetteer. NMR site NB 13 NW 4 is a complex of monuments and middens which have been subdivided into a number of components in this catalogue. It can be identified with RCAHMS 1928, no. 84, which describes the locations of a number of hut circles. These in some cases relate to the various settlement mounds listed here but can seldom be located with precision.

Similarly, RCAHMS 1928 no. 97, a grave at Cnip, is imprecisely located and probably corresponds with the shoreline middens recorded separately in the present survey. It has, therefore, not been given a separate entry. All other sites recorded in the RCAHMS volume have been included in the catalogue.

No survey in an area such as the Bhaltois peninsula can hope to be definitive. Many sites have been located by chance, e.g. through coastal erosion, and their counterparts behind the beach-fronts will not always be visible from the surface. The wheelhouse complex at Cnip was a good example of such a site which would not have been located from the surface. Similarly, many sites recorded by earlier workers have entirely disappeared, whilst others now obvious, were presumably not visible a few decades ago. This variability in the machair systems, which alternately exposes and masks the archaeological landscape, is the prime reason why repeated, periodic survey and consistent monitoring are essential in such prime archaeological areas of the Western Isles.

Early Prehistoric

No. 1

NGR: NB 1015 3568

Class: Cairn / Hut circle

Location: Traigh na Berie, hill-foot

Quality of Preservation: Moderate

Aspect: North-west

Land Use: Grazing

Vegetation Cover: Machair grass

Stability: Highly unstable

Description - This is an unexcavated stone structure, possibly a kerb cairn of similar form to that excavated by Joanna Close-Brooks (2), or possibly a hut circle. It lies at the foot of the hills which back the Traigh na Berie and is visible as a series of displaced stones projecting above the sand cover. Its uphill circuit survives almost intact although severely disturbed by rabbit burrowing. The downhill circuit has almost disappeared. The external diameter across the slope is c. 5.5m, with an internal diameter of c. 4m. The wall faces comprise large stones with a core of smaller rubble. A possible external alignment of large stones lies a few metres downhill of the eroded downhill wall of the structure.

Photographic archive references (B + W): F1.9-10, F2.31, 34-35

No. 2

NGR: NB 0997 3638

Class: Cairn and cist burial

Location: Cnip headland, hillside terrace

Quality of Preservation: Excavated, highly unstable

Aspect: South-east

Land Use: None - sand deflation

Vegetation Cover: None - sand deflation

Stability: Highly unstable

Description - This is the site of a small Bronze Age kerb cairn excavated in 1976 and 1978 by Dr Joanna Close-Brooks and shortly to be published (Close-Brooks forthcoming). The cairn was found to contain three burial phases. It overlies a buried

organic soil which contained ard marks. The site was originally exposed in the eroding sand dune section which is presently progressing up Cnip headland. In the fifteen years since excavation the erosion face has progressed rapidly in the surrounding area and has moved by an estimated 10m. At the same time the cairn has been undercut by sand deflation and the kerbstones are now collapsing. In 1992 a further Bronze Age burial in a corbelled cist, which was not exposed during the 1970s excavations, was excavated by the Centre for Field Archaeology (Dunwell forthcoming).

References: NMR NB 03 NE 11; Close Brooks forthcoming; Dunwell forthcoming

Photographic archive references (B + W): F1.27, 34

No. 3

NGR: NB 0993 3635

Class: Hut circles

Location: Cnip headland, hillside terrace

Quality of Preservation: Unknown

Aspect: South-east

Land Use: Grazing

Vegetation Cover: Machair grass

Stability: Unstable

Description - When visited by Lacaille earlier this century a circular structure, approximately 7m in diameter, and associated features were visible in an eroding sand hollow (Ill. 6). The main structure was defined by a wall one stone in width (and possibly, therefore, sand-revetted). In recent years they have been obscured by blown sand and the complete circuit of the structure photographed by Lacaille is no longer visible (Lacaille 1954, fig. 136). Lacaille records finding a chipped stone assemblage associated with these structures. This site is clearly unstable in the medium term, suffering periods of deflation and accretion.

Two hut circles were identified by magnetic survey (App. 3) in locations corresponding with the surface features. Auguring of a transect across the site demonstrated the surviving presence of archaeological deposits at a depth varying from 0.3 - 0.45m below the present machair surface. The deposits appear to survive to a depth of at least 0.2m although outside the structures the presence of buried

soils is variable, confirming the picture of recent deflation removing areas of previously preserved deposits. The evidence suggests, however, that significant deposits still survive within these structures.

References: part of NMR NB 13 NW 4 wrongly located in original NMR entry; Lacaille 1954, 299-303

Photographic archive references (B + W): F1.28, 31, F2.19

No. 4

NGR: NB 084 364

Class: Hut circle

Location: Traigh Clibhe, machair

Quality of Preservation: Unknown

Aspect: n/a

Land Use: n/a

Vegetation cover: n/a

Stability: n/a

Description - A circular stone setting disturbed by sand deflation was recorded by the RCAHMS, 10m above HWM on Traigh Clibhe on a steep sandy slope. The area above the erosion face now contains almost no visible stones and is a flat, featureless area of poorly consolidated machair. The area is subject to considerable erosion although, on the occasion of both survey visits in 1989 and 1992, the erosion face was banked up with sand. In this situation it was not possible to assess the survival of archaeological deposits in section. The surface features noted in 1914 appear to have been entirely removed by coastal erosion.

References: NMR NB 03 NE 5; RCAHMS 1928, 23, no. 82

Iron Age

No. 5

NGR: NB 0988 3533

Class: Complex atlantic roundhouse (Dun Bharabhat)

Location: Loch Bharabhat, rocky islet

Quality of Preservation: Good

Aspect: Open

Land Use: n/a

Vegetation Cover: None

Stability: Stable

Description - This complex roundhouse site has been excavated by Professor Dennis Harding and Dr Nick Dixon since 1986 (Harding and Armit 1990). The site occupies a consolidated outcrop islet in Loch Bharabhat. The roundhouse dates to the later centuries BC and overlies a number of earlier, submerged structures.

References: NMR NB 03 NE 4; Harding and Armit 1990; RCAHMS 1928, 21, no. 72

No. 6

NGR: NB 1035 3517

Class: Broch tower (Loch na Berie)

Location: Loch na Berie, former islet

Quality of Preservation: Good

Aspect: Open

Land Use: n/a

Vegetation Cover: None

Stability: Stable

Description - This broch tower with later cellular structures was occupied from the later centuries BC at the latest, until the eighth or early ninth century AD (Harding and Armit 1990). It is situated on a former islet in the partially infilled Loch na Berie (Ill. 4).

References: NMR NB 13 NW 3; Harding and Armit 1990; RCAHMS 1928, 20, no. 69

No. 7

NGR: NB 0852 3641

Class: Traditional site

Location: Clibhe beach

Quality of Preservation: n/a

Aspect: n/a

Land Use: Grazing

Vegetation Cover: n/a

Stability: n/a

Description - The traditional location of a broch or dun (Dun Camus na Clibhe or An Chaisteil) lies under a recent sheep bank. There is no trace of any stone structure here and the site does not suggest that such an identification is likely. Intensive survey was carried out in this area as part of the 1992 survey. There is a possible, minor stone structure in the area corresponding to the traditional site, but this is marked only by a surface irregularity with some signs of loose stone. The site is more likely to have been a smaller structure than an atlantic roundhouse. It is possible that traditional knowledge of an atlantic roundhouse on Traigh Clibhe was mistakenly applied to this stone structure, once the real site had been forgotten.

References: NMR NB 03 NE 9; RCAHMS 1928, 30, no. 101

No. 8

NGR: NB 083 361

Class: Atlantic roundhouse (possible)

Location: Traigh Clibhe, hillside

Quality of Preservation: Moderate

Aspect: North-west

Land Use: Grazing

Vegetation Cover: Grass

Stability: Moderate / disturbed

Description - This structure is perched on a steep hillside overlooking Traigh Clibhe with commanding views along Loch Sgailier to the south (Ill. 8). It appears to be a massive stone roundhouse 14.5m east west diameter by 10m north-south, although it is badly eroded to the north. It appears to have had an entrance on the south circuit. Its slumped walls are c. 2 - 2.5m wide. The walls of the structure are grassed over

although some very large stones are visible around the base. The structure has been recently disturbed by two successive telegraph poles, one over the wall and one over the interior. It is possible that this structure represents the correct site to which the place name Dun Camus na Clibhe refers (see 6).

Photographic archive references (B + W): F1.35-6

Later Iron Age and Pre-Norse

No. 9

NGR: NB 0979 3660

Class: Wheelhouse and later structures (Cnip 1)

Location: Machair, Cnip

Quality of Preservation: Excavated, excellent

Aspect: n/a

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - The site of two adjoining wheelhouses and later cellular and linear structures was excavated here in 1988. The lower wheelhouse levels of Wheelhouse 1 were not excavated and these, along with the superstructure of Wheelhouse 1 remain intact below the present ground surface. No trace of this site was visible from the surface and its discovery was possible due to the appearance of stonework in the eroding dune face. This part of Cnip beach has since been stabilised by the construction of a sea wall.

References: NMR NB 03 NE 17; Harding and Armit 1990;

No. 10

NGR: NB 0879 3683

Class: Souterrain

Location: Bhallos, hillside

Quality of Preservation: Unknown

Aspect: n/a

Land Use: n/a

Vegetation Cover: n/a

Stability: Unknown

Description - The souterrain at Sidhean a' Chairn Bhuidhe was located by local contractors in 1965 and subsequently covered over. It is not now locatable. The position marked on the Ordnance Survey map does however have several structures associated with it. These comprise several wall fragments and possible platforms set in the northern and eastern lee of the rocky outcrop Sidhean a' Chairn Bhuidhe. At

least two substantial but residual wall fragments trend east-west in this area and clearly pre-date the Bhaite's head dyke which runs to their east. This latter feature dates earlier than 1850 when it was recorded on the 1st edition Ordnance Survey map, and probably has a considerably earlier origin. There is therefore clear evidence of pre-nineteenth century activity in the area, and this may be associated with the souterrain identified in 1965.

References: NMR NB 03 NE 3

No. 11

NGR: NB 088 367

Class: Souterrain

Location: Bhaite's, Upland

Quality of Preservation: Unknown

Aspect: n/a

Land use: n/a

Vegetation Cover: n/a

Stability: n/a

Description - A souterrain was exposed by sand movement and subsequently covered over c. 1914. Contradictory locational information is recorded and the site cannot now be located.

References: NMR NB 03 NE 7; RCAHMS 1928, 29, no. 96

No. 12

NGR: NB 1023 3568

Class: Wheelhouse (Calum MacLeod's wheelhouse)

Location: Tralgh na Berie, hillside terrace

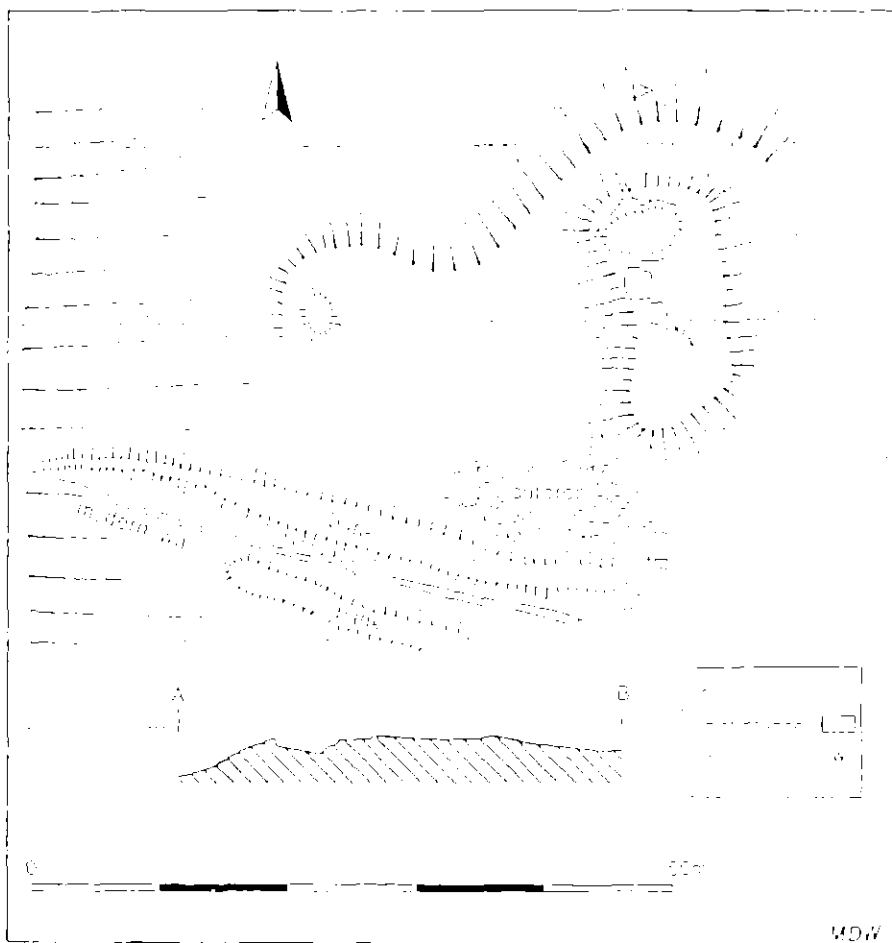
Quality of Preservation: Good

Aspect: North-east

Land Use: Grazing

Vegetation Cover: Grass

Stability: Unstable



Ilus 16 - Site 12

Description - This is the site of a probable wheelhouse partially excavated by Mr Calum Macleod of Reef in the 1950s (Ill. A1.1). The site is presently visible as an eroding mound on a spur above the Traigh na Berie. The mound is c. 27m long (north-south), by 16m wide. The excavated area lies at the northern end and this is presumably the wheelhouse. The excavation trench is clearly visible. The upper, inner wall face is visible in its northern arc due to sand erosion. This has occurred since 1985 and became noticeably worse between 1989 and re-survey in 1992. The northern mound area is suffering from downhill slumping and sand erosion, accelerated by rabbit burrowing. This is likely to destabilise the wheelhouse in the medium term. The internal diameter of the wheelhouse appears to be c. 7-8m and several piers are visible. The mound is considerably larger than the wheelhouse and almost certainly contains further structures to the south. The nature and date of these structures is unknown. The presence of near-surface gneiss bedrock prevented any significant results from geophysical survey (App. 3). This is the only site in the study area protected by scheduling.

References: part of NMR NB 13 NW 4

Photographic archive references (B + W): F1.14-15, F2.31, 36

No. 13

NGR: NB 0975 3663

Class: Settlement and industrial site

Location: Cnip beach

Quality of Preservation: Good

Aspect: n/a

Land Use: Grazing

Vegetation Cover: Machair grass

Stability: Highly unstable

Description - The site of Cnip 2 / 3 was identified during the 1989 field survey and partially excavated (Armit and Dunwell 1992). Further excavation in 1992 confirmed that the elements recorded in 1989 did indeed form part of a single, extensive site. The site represents a stratified settlement and industrial complex probably dating to the pre-Norse period. No trace of the site is visible from the surface and discovery was made possible by the erosion of the retreating dune face.

References: Armit and Dunwell 1992; Dunwell 1992

Norse

No. 14

NGR: NB 085 363

Class: Norse burial

Location: Traigh Clibhe, machair

Quality of Preservation: Unknown

Aspect: n/a

Land Use: Unknown

Vegetation Cover: Unknown

Stability: Unknown

Description - This is the approximate location of a Norse burial discovered in 1915. The finds indicate a female burial of probably 9th century date. The site cannot now be located. The site was originally disturbed by agricultural activity. No agriculture is now carried out in the area. There are numerous stony patches in the area, some of which may be former clearance cairns, and others being collapse from the erosion terraces above. It is possible that such features now mask the position of the burial and any features which may be associated with it.

References: NMR NB 03 NE 1

No. 15

NGR: NB 099 364

Class: Norse cemetery

Location: Cnip headland, hillside

Quality of Preservation: Good

Aspect: South-east

Land Use: Grazing

Vegetation Cover: Grass

Stability: Highly unstable

Description - This is the site of a probable Norse cemetery of unknown extent. The first burial to be excavated was a rich female grave removed by the local Procurator Fiscal in 1979. Subsequently a child burial was excavated in 1991 by Trevor Cowie, some 40m north-east in an adjacent sand blow-out. In 1992 the Centre for Field Archaeology excavated three further burials some 10m east of the rich female grave.

It is anticipated that further burials remain in the area. The site is currently under active sand erosion and deflation. Sand depth over the areas yet to be eroded prevents any reliable results from geophysical survey (App. 3).

References: Welander et al 1987; Cowie 1991; Armit, Dunwell and Neighbour 1992

Photographic archive references (B + W): F2.1-10, F3.13-22

Ecclesiastical

No. 16

NGR: NB 0891 3673

Class: Teampull

Location: Traigh Clibhe, hillsicá

Quality of Preservation: Gone

Aspect: Open

Land Use: Cemetery

Vegetation Cover: n/a

Stability: n/a

Description - The remains of Teampull Bhaltos are reputed to lie in the now-enclosed, old graveyard of Bhaltos. No walling is now visible although the ground inside the graveyard is extremely irregular. The age of the structure is unknown. The graveyard itself has now been superseded by a modern cemetery sited towards the beach.

References: NMR NB 03 NE 2, RCAHMS 1928, 29, no. 99

Settlement Mounds and Middens

No. 17

NGR: NB 1015 3588

Class: Midden

Location: Traigh na Berie, machair plain

Quality of Preservation: Unknown

Aspect: Open

Land Use: n/a

Vegetation Cover: None

Stability: Highly unstable

Description - On the shoreward side of the sharp curve in the road through Traigh na Berie is an area of recent dumping in a severe roadside blow-out. A lower level of rounded boulders is also eroding out here, associated with stained sands. While these may be an earlier period of relatively recent dumping, an archaeological interpretation cannot be ruled out.

No. 18

NGR: NB 0988 3616

Class: Settlement mound

Location: Traigh na Berie, machair

Quality of Preservation: Good

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Moderate

Description - This is the site of a large settlement mound known locally as the site of a 'Teampull' (Ill. 10). The mound is c. 47m long, north-south, by c. 32m, by c. 3.5m high. It has gently sloping sides and a flat top with several set stones projecting through its surface. From a distance it appears clearly artificial. The modern road runs over its west shoulder. The clearest structure on the mound is partly defined by projecting orthostats on the top at the northern end of the mound. These form a curved arc of walling. If they represented a circular structure then much of its east and west circuit must have been eroded. The mound appears to represent an

accumulation of structures of unknown date and function. During the 1989 and 1992 surveys the site appeared stable and did not show signs of active rabbit damage.

Geophysical survey of the mound produced two complementary sets of data from magnetic and resistivity survey (App. 3). Resistivity in particular demonstrated the presence of at least two well-defined circular structures. Their degree of definition suggests that the structures may be well-preserved.

References: probably part of NMR NB 13 NW 4

Photographic archive references (B + W): F1.30, 32, F2.21

No. 19

NGR: Not known - sites lie along Berie beach front

Class: Middens

Location: Traigh na Berie, machair

Quality of Preservation: Unknown

Aspect: Open

Land Use: Caravan stances, grazing

Vegetation Cover: Grass

Stability: Unknown

Description - A string of middens were recorded along the Traigh na Berie. The locational information is imprecise but the size of the middens enables their approximate area to be relocated. The area is now used for recreational purposes and caravans, and recent dumping may have disturbed and obscured the remains. No clear trace of prehistoric midden is now visible along this beach. It appears that coastal erosion since the RCAHMS survey in 1914 may have removed the remains of the middens. Two sherds of Samian ware were found in these middens as were apparently a number of stone structures, possibly including a wheelhouse or similar structure with elements of corbelled roofing.

References: part of NMR NB 13 NW 4; RCAHMS 1928, 29, no. 98

No. 20

NGR: NB 0988 3634

Class: Settlement mound

Location: Cnip headland, hillside

Quality of Preservation: Moderate

Aspect: South

Land Use: Grazing

Vegetation Cover: Grass

Stability: Unstable

Description - A substantial mound c. 35m north-south by 20m east west, by c. 2m high, lies immediately east of the road across Cnip headland (Ill. 11). This mound is rectilinear and flat-topped with signs of stone structures at various points along its surface. It merges into the hillside to the north end and stands highest at its south end. Numerous stones are visible in the mound sides and top. It contains several surface hollows mostly full of weed growth. Some of these may relate to recent disturbance. There is local information that the mound was planted with potatoes several years ago. The surrounding area was certainly used for this purpose until the mid 1980s.

The sides of the mound were undergoing severe rabbit damage during the 1992 survey. Much loose sand was being cast up from these burrows. Stone and stained sand was visible in several of the burrows. This disturbance was most concentrated at the south and east end of the mound. There is no local knowledge of any structure having stood here.

Photographic archive references (B + W): F1.29, F2.17-18

No. 21

NGR: NB 1059 3536

Class: Settlement mound (dubious)

Location: Traigh na Berie, machair

Quality of Preservation: Unknown

Aspect: Open

Land Use: Grazing, road

Vegetation Cover: Grass

Stability: Stable

Description - This is a relatively small hollow-topped mound over which the road through the Traigh na Berie runs. Stones are visible eroding from the sides. It is possible that this is a small settlement mound, although the identification is insecure due to the position of the modern road. It is probably the least secure of the settlement mound identifications in the area.

No. 22

NGR: NB 1007 2340

Class: Midden

Location: Cnip headland

Quality of Preservation: poor

Aspect: n/a

Land Use: None

Vegetation Cover: None

Stability: Highly unstable

Description - This is an 8m length of midden, c. 0.1m deep, extending along the erosion face of a steep rocky part of the shore on the east of Cnip headland. It comprises a mid to dark brown stained sand with charcoal flecks. It underlies sterile windblown sand and overlies decayed gneiss.

No. 23

NGR: NB 116 352

Class: Midden

Location: Dune face

Quality of Preservation: Unknown

Aspect: n/a

Land Use: None

Vegetation Cover: None

Stability: Highly unstable

Description - This is a 1m thick, buried, organic-rich soil on the eroding beach front of Traigh Teinsh. A sterile sand overlies a stained brown sand which in turn overlies a black organic soil over bedrock. There are indications of collapsed stonework in section.

No. 24

NGR: NB 1066 3536

Class: Settlement mound

Location: Tralgh na Berie, machair

Quality of Preservation: Unknown

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass, eroding

Stability: Highly unstable

Description - This is a steep-sided, flat-topped mound, c. 20m north south by 13m in overall area surviving to c. 2m in height, in an otherwise flat area of machair surrounded by deflating dune systems (Ill. 15). Stones and areas of midden are visible within the mound in the numerous rabbit burrows. There are indications of a possible stone structure to the north-west.

Between 1989 and 1992 there was a noticeable increase in the damage visible as a result of rabbit burrowing, particularly on the south-east of the mound. In this area several additional stones had become exposed and were being undermined.

Photographic archive references (B + W): F1.23-4, F2.26-27.

No. 25

NGR: NB 1066 3546

Class: Settlement mound

Location: Traigh na Berie, machair

Quality of Preservation: Unknown

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass, eroding

Stability: Unstable

Description - This is a conical mound set within a flat machair plain near site 23, lying in a similar relationship to the surrounding topography (Ill. 15). It measures 10m north east / south west by 7m at its base and survives to c. 1.3m in height. It has

been damaged by rabbit burrows. It appears to represent a formerly more extensive midden deposit. One rabbit burrow has disturbed compact shell-rich midden material and small stones, while another has produced a sherd of undiagnostic, heavily-gritted pottery.

No noticeable increase in the number or extent of rabbit burrows was identified between the 1989 and 1992 surveys, but the presence on both occasions of loose sand containing shell and pot sherds suggests that gradual attrition is damaging the mound.

Photographic archive references (B + W): F1.21-2

No. 26

NGR: NB 1036 3552

Class: Settlement mound

Location: Traigh na Berie, machair

Quality of Preservation: Unknown

Aspect: Open

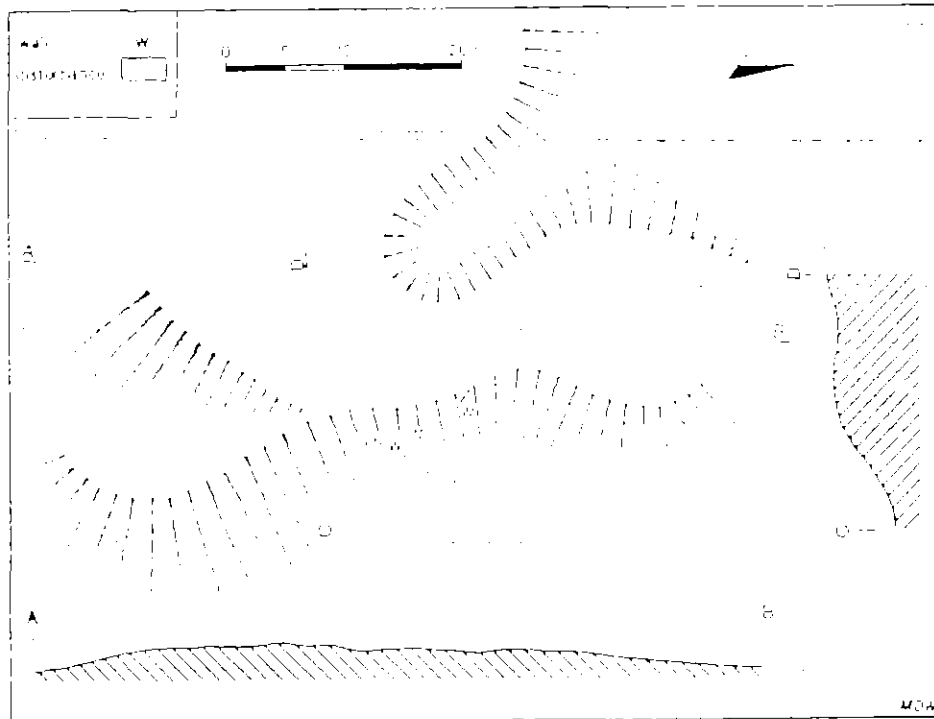
Land Use: Grazing

Vegetation Cover: Grass

Stability: Unstable

Description - This is an extensive settlement mound detectable only by the presence of eroding wall fragments which are emerging from its northern edge (Ill. A1.2). The mound has a sharply scarped northern edge (descending c. 4.5m) but descends much more gradually to the south and east and somewhat more sharply to the west. There are numerous surface irregularities but little visible stone and it is not clear that the site would have been identified as anthropogenic in origin other than by the eroding walling. The estimated extent of the site is c. 50m east-west by c. 30m although only the northern edge is securely identified.

The most extensive wall fragment is eroding from the northern edge towards the eastern part of the mound. This is at least three courses high and appears to be single-faced with small-medium angular stones. It appears also to be revetted into a stained sand and contains a dense dark brown midden material rich in shell. This midden is overlain by a sterile sand 0.05 - 0.1m in depth, which in turn underlies a mid-brown sand c. 0.1m of depth under slumped turf. The wall is visible in a rabbit



illus 17 - Site 26

damaged section of the mound and underlies the top of the mound in this area by c. 1.2m. The wall is clearly curving. A further wall fragment lies at the same level c. 6m west, this time under c. 0.9m of overburden. Other stones appear to indicate additional wall fragments eroding along this face. The relative lack of stones on the flat machair deflation surface to the north suggests that no substantial structures have yet fallen from the erosion face. It is probable, therefore, that the erosion of the mound has just begun to expose structures and archaeological deposits.

Geophysical survey demonstrated the presence of extensive deposits likely to be anthropogenic in origin.

Photographic archive references (B + W): F1.16, F3.1-3

Miscellaneous features

No. 27

NGR: NB 1002 3628

Class: Boat noost

Location: Gridig, shoreside

Quality of Preservation: Moderate

Aspect: South-east

Land Use: None

Vegetation Cover: None

Stability: Moderate

Description - Two parallel walls of very massive construction define an area leading into the waters on the north side of the Traigh na Berie. The east wall is built into an existing outcrop for part of its alignment, which is an overall 20m. This is formed of up to 6 surviving courses standing up to 1.8m high with a single face facing into the noost, and with rubble packing behind. Some of the individual blocks exceed 1m square. The west wall is much less well preserved being unprotected by the natural outcrop. It is c. 2m wide. The area defined by the two walls is 20m long and 9m wide and filled with a layer of water-rolled pebbles covered in places by sterile sand. Its shoreward terminal lies at the point where the modern eroding dune face begins. The structure is drowned by extreme high tides.

The structure lies in a sheltered location, and was presumably designed to harbour boats. It probably relates to a period of somewhat lower sea level. There is a local tradition that this was the location of an old pier, but no such structure is recorded on the available early map sources.

Photographic archive references (B + W): F1.33

No. 28

NGR: NB 099 354

Class: 'Norse' mills

Location: Traigh na Berie, hillside

Quality of Preservation: Good

Aspect: North

Land Use: Grazing

Vegetation Cover: None

Stability: Moderate

Description - A series of five, well-preserved 'Norse' mills is set on the stream leading down from Loch Bharabhat to the Traigh na Berie. The lowest of these mills has its millstone lying displaced some metres away. At least one of the others has its millstones *in situ*. Traces of an artificial water channel lie next to the present course of the stream.

Photographic archive references (B + W): F1.8

No. 29

NGR: NB 0885 3644

Class: Structure

Location: Bhaltos, upland

Quality of Preservation: poor

Aspect: n/a

Land Use: Mission hall

Vegetation Cover: n/a

Stability: Stable

Description - The modern Mission Hall overlies a stony mound with clear traces of facing stones on its north-west side. No earlier structure is marked on early map sources at this location. The structure is therefore likely to represent a pre-nineteenth century building.

No. 30

NGR: NB 1002 3628

Class: Shell midden

Location: Gridig, rock outcrop

Quality of Preservation: residual

Aspect: Open

Land Use: None

Vegetation Cover: None

Stability: Highly unstable

Description - On the outcrop rock at Gridig, projecting into the sea, is a small patch of highly concentrated shell midden. This is on the same outcrop around the base of which the boat noost (site 27) has been constructed. This material is not clearly of anthropogenic origin but other explanations are equally difficult to formulate. It comprises a depth of up to 0.4m of mixed compacted shell fragments in a brown silty-sand matrix. This overlies a thin band of darker soil, over the outcrop rock. The midden is preserved only in isolated small pockets in the bedrock.

No. 31

NGR: NB 1000 3630

Class: Wall fragment

Location: Gridig

Quality of Preservation: residual

Aspect: n/a

Land Use: None

Vegetation Cover: None

Stability: Highly unstable

Description - A 0.5m high fragment of walling, comprising seven superimposed courses, was recorded projecting from the sand dune section at Gridig. This had a preserved length of c. 0.6m. Small scale excavation showed no associated deposits and no indications of its age or function.

No. 32

NGR: NB 0988 3602

Class: Stone lined bank

Location: Traigh na Berie

Quality of Preservation: Moderate

Aspect: n/a

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - A curvilinear alignment of stone defines a bank edging an area of former strip cultivation. The position of the feature and its irregular curving form

suggest that it may have formed some form of levee for Loch na Cuile at a period of higher water level. Its construction is distinct from any other feature in the vicinity.

No. 33

NGR: NB 0864 3647

Class: Cairn

Location: Traigh Clibhe, hillside

Quality of Preservation: Unknown

Aspect: North-west

Land Use: Grazing

Vegetation Cover: n/a

Stability: Unstable

Description - A small stone heap c. 2m in diameter is eroding out of a small blow-out on the hillside above Traigh Clibhe.

Photographic archive references (B + W): F2.14

No. 34

NGR: NB 1009 3575

Class: Cairn

Location: Traigh na Berie, machair blow-out

Quality of Preservation: Good

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Moderate

Description - This is a stony cairn preserved in the flat base of an area of sand dune deflation. It comprises flat slabs and several possible orthostats forming an oval or boat-shaped plan. The structure is c. 2m wide by 3.15m in length and 0.8m high. It is not associated with any other visible features. Its orientation is north-north-east / south-south-west.

Photographic archive references (B + W): F1.11-13, F2.30.

No. 35

NGR: NB 099 363

Class: Buried soils

Location: Cnip headland

Quality of Preservation: Moderate

Aspect: n/a

Land Use: n/a

Vegetation Cover: None

Stability: Highly unstable

Description - In the sand dune section actively eroding around the kerb cairn (2) on Cnip headland, are two buried sandy soils. The upper soil is a light brown sand c. 0.4m deep on average. The Norse burials in the area may be cut into this soil. The lower is separated by up to c. 1m of sterile sand and comprises a mid-dark brown, organic-rich, sandy soil. This lower soil appears to be related to a soil below the kerb cairn which produced evidence for early ploughing. Neither soil can be definitively related to any other archaeological feature at present. Both soils have produced bone and pottery of undiagnostic type. In other parts of the headland the picture appears somewhat more complicated with further soil horizons discernible between the two main levels.

Additional detail on these soils is provided in Appendix 4.

Photographic archive references (B + W): F1.25

No. 36

NGR: NB 084 358 (centre)

Class: Cairnfield and structures

Location: Glen Bhaltos, hillside

Quality of Preservation: Moderate

Aspect: West

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - Trailing south from the nineteenth century settlement at Clibhe along the 20m contour are a series of c. 30 - 40 clearance cairns. These features range in size from c. 1m diameter to c. 4m diameter. Most are irregular heaps but a number comprise linear clearance alignments running upslope. Some appear to be focused on former structures of which the original size and form cannot be discerned without excavation. The cairnfield features are truncated by the enclosure walls associated with the early nineteenth century and earlier settlement. Approximately 100m south, on a slightly higher level, is a rectangular stone bothy c. 3m north-south by 2m externally. This may be an outlier of the cairnfield group.

No. 37

NGR: NB 1110 3505 (centre)

Class: 'Norse' mills

Location: Loch Linish, upland

Quality of Preservation: Good

Aspect: South east

Land Use: Grazing

Vegetation Cover: None

Stability: Stable

Description - A series of three 'Norse' mills are set on the stream running into Loch Linish. These are in a good state of preservation although somewhat less so than the examples on the stream from Loch Bharabhat.

No. 38

NGR: NB 1007 3571

Class: Stone alignments

Location: Traigh na Beie, machair plain

Quality of Preservation: Moderate

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - a series of at least five parallel rows of stones are visible projecting through the machair surface at the eastern edge of the formerly cultivated area

adjacent to Loch na Cuilc. The rows are aligned in the same way as adjacent strips of cultivation. These latter, unmarked strips tend to be significantly wider and at a somewhat lower absolute level which is reflected by a more waterlogged surface. The stones are small, edge-set, and angular, approximately 1m apart, projecting up to c. 0.2m above the surrounding surface. The rows are c. 1.8m apart and aligned east-north-east / west-south-west. They are only some 12m away from the cairn (39) at their closest point. The longest visible row runs for some 24m. No immediate explanation is apparent for these features.

Photographic archive references (B + W): F2.33.

No. 39

NGR: NB 1009 3571

Class: Cairn

Location: Traigh na Berie, machair plain

Quality of Preservation: Good

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - This is a cairn located behind Berie beach near the series of stone alignments (38). The cairn is c. 2m in visible diameter and irregular in shape. It lies on a raised patch of machair which may indicate a greater size for the cairn in its lower levels. The cairn is constructed of small and medium angular boulders and is the only such concentration of stone in the area. Although it lies in an area of relatively recent cultivation, therefore, it cannot be assumed that it is a simple field clearance feature.

Rectilinear Structures and Agricultural Landscapes

No. 40

NGR: NB 1151 3539

Class: Rectilinear structure

Location: Traigh Teinish, machair

Quality of Preservation: Moderate

Aspect: Open

Land Use: None

Vegetation Cover: None

Stability: Highly unstable

Description - The outlines of a sub-rectangular structure are visible in the sand in a deflating area of machair behind the Traigh Teinish. This structure is 4m long by 2.5m with a possible entrance in the northern end. Parts of the wall around the entrance form slight mounds while the remainder is defined by individual stones.

No. 41

NGR: Various centred c. NB 09 36

Class: Agricultural landscape

Location: Trialabhat, upland

Quality of Preservation: Good

Aspect: n/a

Land Use: Grazing

Vegetation Cover: Various

Stability: Stable

Description - Within the constraints of the present survey it was not possible to record in detail the monuments of the upland Trialabhat area which represent a rich farming landscape of probable post-medieval date (Ill. 13). Most of the features are field walls, lazy beds and linear clearance features together with small sheiling-like structures and small cairnfields. Many of these were seen to be stratigraphically related suggesting the potential for more detailed survey. Many of the major boundaries, including the interrupted linear clearance features, are indicated on the 1st edition map for the area.

Photographic archive references (B + W): F1.3, F3.12

No. 42

NGR: NB 0947 3617

Class: Annular structure

Location: Terrace

Quality of Preservation: Moderate

Aspect: West

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - This is an annular structure with external diameters of 7.5m north-south by 7m east-west. It has a wall width of 0.8 - 1m. The structure survives as grassed-over stone wall-footings. It lies on a terrace overlooking the Trialabhat area. The structure is associated with a residual bank running off to the south-west for a distance of 14m.

Photographic archive references (B + W): F1.4-5

No. 43

NGR: NB 0943 3618

Class: Rectilinear structure

Location: Terrace

Quality of Preservation: Moderate

Aspect: East

Land Use: Grazing

Vegetation Cover: None

Stability: Stable

Description - This is a rectilinear drystone structure built over by a relatively recent bothy. The structure has external dimensions of 5m north-south by 3.5m east west within a wall width of c. 1m. A 1m wide break in the west facing wall at the south-west corner may represent an original entrance. A similar break, 0.9m wide, occurs in the east wall, 1.1m from the north-east corner. The southern half of the structure is filled with rubble while the northern half is occupied by the modern bothy.

No. 44

NGR: NB 0967 3597

Class: Rectilinear structure

Location: Stream-side

Quality of Preservation: Moderate

Aspect: North-east

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - This is a structure of internal dimensions c. 6m east-west by 2.5m. It has an entrance in the north-east corner. Its inner facing is of stone, with a poor stone outer face standing up to 1.2m high, but its core appears to be of turf. The structure has markedly rounded internal corners. The base of the internal face is of orthostats with stone coursing above. The orthostats on the west wall appear to be founded considerably higher in absolute terms than those on the east, suggesting possibly a re-facing. This re-facing may correspond to the heightening of the external wall with looser rubble.

This structure is marked on the 2nd edition Ordnance Survey map for the area, though not on the earlier edition. Its general construction and condition however give it the appearance of an earlier date than the late nineteenth century and it is possible that it was the partial rebuilding and re-use of the structure which led to its inclusion on the map rather than its original construction.

Photographic archive references (B + W): F1.2

No. 45

NGR: 0868 3662

Class: Enclosure (fragmentary)

Location: Hillside

Quality of Preservation: poor

Aspect: South-east

Land Use: Grazing

Vegetation Cover: Grass / none

Stability: Highly unstable

Description - Fragmentary walls probably representing an enclosure are presently eroding out of a steep, sandy hillside above the Traigh Clibhe. The walls have an orthostatic foundation course with upper stone coursing.

A 10m long north-south alignment, and a further 8m east-west alignment were identified, possibly forming the east and north walls respectively of an enclosure. These features are identifiable at the area of greatest current erosion at the NGR given above. The wall can be traced leading south from this area in sporadic former blow-outs and erosion patches. It appears to run for at least 100m.

The walls would have revetted material back on their landward side and may represent artificially delineated cultivation terraces, built to prevent the erosion of cultivated soil down the cliff face.

Photographic archive references (B + W): F2.12-13

No. 46

NGR: NB 0798 3638

Class: Rectilinear structure

Location: Traigh na Clibhe, hill-foot

Quality of Preservation: Moderate

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - This is a residual sub-circular structure c. 4m in external dimensions and c. 2m internally. The north western part of the circuit is missing. The bank appears to be of turf with some stones visible. The structure is set upon a possibly artificial mound, c. 10m by 8m in dimensions.

No. 47

NGR: NB 081 362

Class: Settlement complex

Location: Traigh Clibhe, knoll

Quality of Preservation: Moderate

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Moderate

Description - This is a series of features clustered on a knoll overlooking the Traigh Clibhe (Ill. 14). The features comprise a rectilinear structure, five annular structures, two sets of parallel banks, and a series of rigs. The rectilinear structure appears to be the focus of the settlement. This is aligned approximately north-east / south-west and is c. 11m by c. 6.5m externally. It has an entrance in its short south-west wall and a semi-circular extension on the western end of its north wall. The structure is somewhat eroded and active rabbit damage is being caused to the walls. Bare patches of the walls show a stone inner and outer facing with an earthen core. No artefacts were recovered.

The annular structures vary from c. 3.5 - 6m in external diameter and appear as raised platforms with hollow interiors. The three to the north of the rectilinear structure have north-facing entrances but the remaining two have no apparent entrance. All appear to be constructed largely of turf and / or earth, with little sign of stone walling. Two sets of parallel turf banks lie on the north-eastern and north-western areas of the site. Each pair are c. 5m apart and residual. Their function is unknown.

No. 48

NGR: NB 1027 3532

Class: Rectilinear structure

Location: Terrace

Quality of Preservation: Moderate

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - This is a rectilinear structure 25m south of the blackhouse site 52 above Loch na Berie. The structure is c. 6m north-south by 4m externally. It has a drystone wall, 0.8m wide and up to 1m high, with a turf / earth core. It has markedly

rounded internal corners. The internal wall on the east side is irregular and hints at a central 'waist' or partition. The structure has been truncated to the north by a drainage ditch.

Photographic archive references (B + W): F1.20

No. 49

NGR: NB 104 352

Class: Settlement

Location: Marsh

Quality of Preservation: Moderate

Aspect: Open

Land Use: Summer grazing / winter submerged

Vegetation Cover: Reeds, grass

Stability: Stable

Description - Three rectilinear structures are visible as raised areas in the marshy field in which Loch na Berie lies. The structures are indicated as unoccupied on the 1st edition Ordnance Survey map surveyed in 1850, which also indicates another, fourth, structure in the group. None of these structures has any obvious entrance.

The northernmost of the group lies on the modern fence-line and is truncated by a modern ditch draining Loch na Berie. No structural remains are visible in the drainage section. This structure has dimensions of c. 20m north east - south west by 6m.

South of this is a rectilinear structure 19m north-west / south-east by 8m externally. It is divided by a partition into a south-eastern area of 9m by 6m internally and a north-western area of 4m by 6m internally.

To the west of this and south of the first structure is a further structure 8.5 east-west by 6.5m north-south with a wall c. 1m wide.

A further structure, possibly an enclosure, is recorded to the south on the 1st edition map. None of the structures are recorded on 2nd or subsequent editions of the Ordnance Survey coverage.

The dating of this group of structures is intriguing. Their location at the modern winter water table argues for an early date, certainly earlier than the string of blackhouse settlements along the hillfoots. Morphologically too, they are hard to relate to these blackhouse settlements. Probing of the structures revealed no trace of stone, indicating a construction of turf or timber. This again supports an early date. The structures must post-date the occupation of the eighth century structures in Loch na Berie, on the basis of their geomorphological setting. The most likely interpretation is that they occupied the shores of Loch na Berie when the loch was larger and in the process of infilling. They are perhaps most likely to date from the Norse - medieval period.

Blackhouse Settlements

No. 50

NGR: 0968 3602

Class: Blackhouse settlement

Location: Terrace

Quality of Preservation: Good

Aspect: East

Land Use: Grazing

Vegetation Cover: Grass, nettles

Stability: Stable

Description - This is a post-medieval blackhouse with two associated enclosures forming the northernmost of the blackhouse settlements on the Berie foothills (with the exception of the uniquely located site at Longol which overlooks both Traigh na Berie and Traigh Cnìp). The walls of the main structures are of drystone with a turf / earth core. In places a massive boulder foundation course is visible. The walls are generally up to 1.5m wide and survive to 2m in height. The internal corners of this structure were rounded. The western part of the structure has been cut into the hillside. The structures have externally rounded corners.

The surviving structure began as a single blackhouse 16m by 6m in external dimensions. It had opposing central entrances c. 1m wide in the north and south walls. A stone platform projects from the western end of the structure. This may relate to an earlier structure or to a massive foundation for the blackhouse.

A secondary, smaller blackhouse was subsequently built on to the north side of the original structure, opening off the latter's north entrance. This was of similar construction to the primary structure, running parallel to it, with internal dimensions of 10m by 3m and a wall 2m wide. Its south wall was formed by the original structure. This structure had an entrance in the north-west corner of its north wall. The internal corners of this structure were markedly more square than the earlier blackhouse. The internal area of this secondary structure, and the west end of the primary structure have filled with nettles as opposed to the grass cover inside the eastern end of the primary structure.

Subsequent partition walls have been added to both structures. The primary blackhouse has been divided into two rooms at the entrance area. The secondary

structure has been walled off near its entrance to create a much smaller internal area accessible from its entrance. The connecting entrance between the two structures has also been blocked.

The site is indicated as unoccupied on the 1st edition Ordnance Survey map surveyed in 1850 but as occupied on the 2nd edition, where it is also indicated as a simple single rectilinear structure. The implication is that the site underwent an abandonment of uncertain duration including the period around 1850, but was reoccupied prior to 1895.

Photographic archive references (B + W): F1.1

No. 51

NGR: NB 0980 3588

Class: Blackhouse settlement

Location: Terrace

Quality of Preservation: Good

Aspect: East

Land Use: Grazing

Vegetation Cover: Grass, nettles

Stability: Stable

Description - This is a two-phase site comprising two adjoining blackhouses associated with one enclosure and a 'garden enclosure'. The walls are of drystone construction with a turf / earth core and survive up to 2m high. The structural walls are c. 1.5m wide. All of the structures have externally rounded corners.

The primary blackhouse was the eastern and smaller of the two, measuring 12m north-south by 3m. This structure is now entered only from the interior of the later larger structure. It appears that the original external wall of the primary structure now forms the internal wall of the northern end of the later structure.

The larger blackhouse was 22m north-south by 6m east west, with two opposing entrances 7m from the north end. A stone platform projects from the southern half of the west side of the structure. It was built on to the primary structure and has a number of specialised architectural traits associated with late blackhouses.

The southern end of the later structure was more carefully built than the northern end. It had carefully squared corners and a well-built, funnel-shaped window in the western wall (because of variations in the external ground surface this window was at external ground level). By contrast the northern end had rounded corners and was less carefully finished, being partly formed of the wall of the earlier blackhouse. It is possible that much of the southern end represents reconstruction contemporary with the installation of a secondary partition and fireplace. This secondary partition has been inserted into the larger blackhouse towards the southern end. It contains a well-built fireplace facing into the southern chamber. It appears to replace an earlier residual partition located immediately south of the entrance. The enlarged secondary northern chamber was filled by nettles while the southern chamber (4 x 3m internally) was grass-covered.

It appears that the later structure had its living quarters at the southern end, to which all of the elaboration and careful construction was directed. The northern end would have formed a byre with the central portion and the older blackhouse presumably used for additional accommodation and / or storage.

The primary blackhouse and enclosure are indicated on the 1st edition Ordnance Survey map surveyed in 1850 but they are marked as open blocks and thus appear to be unoccupied and presumably unroofed (although they are not labelled as 'ruins'). On the 1895 edition the site is indicated as it survives now, with adjoining blackhouses, and is clearly occupied. This provides useful dates for the incorporation of the developed blackhouse construction traits, since the later blackhouse is clearly constructed between the 1850s and 1895.

Photographic archive references (B + W): F1.6-7

No. 52

NGR: NB 1027 3535

Class: Blackhouse settlement

Location: terrace

Quality of Preservation: Good

Aspect: East

Land Use: Grazing

Vegetation Cover: nettles, grass

Stability: Stable

Description - This is a blackhouse 14m north-south by 5.5m east-west. A smaller rectilinear structure (6m by 3m externally) adjoins it to the west and is entered from the main structure. This structure may be a later addition. The main entrance is at the south end of the east wall. An original partition divided the structure into two chambers. The northern chamber contains three niches built into the walls (one in each of the north, east and west walls). A small secondary partition has been built into the northern part of this chamber. This latter area is filled with nettles while the remainder of the interior is grass-covered. These secondary partitions also partly block one of the niches.

The walls survive up to 1.8m in height and parts of the east wall show indications of turf construction. All of the corners are rounded.

The site is indicated as occupied on the 1st edition Ordnance Survey map surveyed in 1850 but as unoccupied on the 2nd edition, by which time the associated enclosure is no longer indicated on the map.

Photographic archive references (B + W): F1.17-19

No. 53

NGR: NB 1039 3545

Class: Blackhouse settlement

Location: Traigh na Berie, machair

Quality of Preservation: Moderate

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Moderate

Description - A structure marked as occupied on the 1st edition Ordnance Survey Map, and as an occupied but smaller structure on the 2nd edition, is visible in a field north of Loch na Berie. The visible structure is a simple rectilinear stone building which accords with the shape and size of the structure surveyed on the 2nd edition map in 1895. The structure lies amid a series of amorphous stony mounds which probably represent earlier buildings, presumably including the larger complex

recorded on the 1st edition map. The area contains evidence for strip cultivation and numerous relict stony banks.

The structure is visible as an embanked depression. The wide banks have no visible walling, but enough loose stone is located in the interior and around the site, to suggest that the walls were at least stone-faced. The external dimensions of the structure are 13m north-south by 8m with internal dimensions of 8m by 2.5m. The average wall width is c. 3m with a maximum height of c. 0.6m externally and 1m internally. The ends of structure are markedly rounded although this may have been accentuated by the collapse of the walls. The most likely entrance is in the north wall, although there is a further possible gap in the north end of the east wall. There are no signs of any internal partitions, although weed growth is largely confined to the northern half of the interior, possibly suggesting differential deposition.

There is some rabbit burrowing within the walls which has caused localised damage. In one of the rabbit scrapes a rim fragment of a blue and white glazed china plate was recovered. This appears to be of late nineteenth century or later date.

No. 54

NGR: NB 0975 3625

Class: Blackhouse settlement

Location: Hillside

Quality of Preservation: Good

Aspect: Open

Land Use: Grazing

Vegetation Cover: Grass

Stability: Stable

Description - The deserted blackhouse settlement of Liongol is located between two rocky ridges, with views over both Traigh Cnip and Traigh na Berie. The site comprises the remains of a substantial blackhouse, a large enclosure and two fragmentary enclosures. Numerous other boundary walls relating to the settlement are represented on the 1st edition Ordnance Survey map.

The focus of the settlement comprises two adjoining blackhouses, sharing a long wall and aligned north-north-west / south-south-east. Both have stone outer and inner faces with a turf / earth core. The walls average c. 1.5m high externally and c. 1m

high internally. Both have a single internal partition, and neither has any internal variation in vegetation cover. The partition of the northern structure contains some exceptionally large stones. The walls are c. 1 - 1.5m in width, relatively well-preserved and regular in construction with no markedly rounded internal corners.

The northernmost of the two is 15m by 3m internally and has an entrance in the western end of its northern long wall. Opposite this is the entrance into the other structure which has internal dimensions of c. 15 by 2.5m. The southern structure is entered only through the northern showing that the two were in use contemporaneously, although either may have been constructed earlier on the basis of the survey information. The northern structure is in generally poorer repair but this is not necessarily any guide to its chronological primacy. The northern structure has had its eastern end re-faced, while, in the southern structure this end contains a box-bed.

The largest of the associated enclosures lies to the west of the blackhouse and survives to 2m in height. It is square and bisected by a north-south wall with gaps at its north and south ends.

A further three-sided enclosure lies to the north-west of the large enclosure. Its northern edge is provided by a rocky ridge. A similar structure also lies to the north-east of the blackhouse. Both structures are formed of collapsed drystone rubble.

The settlement is indicated as occupied on the 1st edition coverage but appears to be unoccupied on the 2nd edition. It is therefore likely that the settlement was abandoned between the 1850s and 1890s. The 2nd edition map indicates the surviving two adjoining blackhouse structures and the large enclosure, as well as the smaller enclosure to the south-east. The absence of gables, fireplaces or mortared walls is instructive in the context of the probable abandonment date of the site.

Photographic archive references (B + W): F3.11

Appendix Two: The machair systems of the Bhaltois peninsula

Introduction

This appendix summarises the condition of the three Bhaltois machair systems in terms of their known archaeology. It is based on surveys carried out in September 1989 and April / May 1992, and thus includes information on changes taking place over a period of two and a half years. Added time depth is given by the reports of earlier fieldwork described in the accompanying text report. Each of the three machair systems is described in some detail and recommendations are made for the management of the recorded archaeology of each.

The summary section for each machair system includes an analysis of likely future threats based on the currently available evidence and on the changes witnessed over the period of three winters between the two survey seasons.

The geology and geomorphology of each of the machair systems has previously been described by Ritchie and Mather (1970, 59-67) and their descriptions provide a background for the archaeological study. Where areas of erosion etc are identified in the present report these generally deal with the local, site-specific scale rather than the 'system-scale' used by Ritchie and Mather. This is because many small-scale erosion problems may be highly threatening to individual archaeological sites, while being trivial in terms of the survival of the machair system as a whole. There are therefore significant differences of emphasis between the archaeological approach and that of Ritchie and Mather.

Traigh na Berie (III. A2.1)

Traigh na Berie is the largest of the machair systems in the Bhaltois peninsula and the most complex in terms of its sub-zones of erosion and accretion. It also contains, on Cnip headland, the most urgently threatened archaeological part of the area.

The entire machair system has been field-walked in considerable detail and all archaeological monuments recorded. The intensive field-walking included the hillfoots and terraces overlooking the machair. The geomorphological characteristics of the beach have been previously described by Ritchie and Mather (1970, 59-62).

Sub-zone 1 - Cnip headland (south-east facing)

This is the sub-zone of Traigh na Berie under most serious and immediate threat, from both coastal erosion and machair deflation. The south-east facing slopes of the headland are deeply scarred by a linear band of erosion some 80m inland from the beach. This band culminates in the east in two large sand blow-outs. The western of these contains the Norse cemetery (15) and Bronze Age cairns (2), as well as extensive buried soil deposits (35). This deflation scar appears to be moving uphill, causing displacement of stone features and dispersal of soil deposits as they become uncovered. Photographs by Lacaille (published in 1954) show that this deflation scar was some distance downslope when the hut circles (3) were exposed. In the mid-1970s the kerb cairn excavated by Close-Brooks was exposed (2) and subsequently the first of the Norse burials (15). It is likely that, if this deflation continues, the remainder of the Norse cemetery, further Bronze Age burials, and any other features associated with the soils in the vicinity, will be destroyed.

The beach-front in this sub-zone is also eroding despite attempts to block the retreating machair erosion face by dumping stone and other modern debris. A wall (31) is visible in the eroding section, but otherwise there is no indication of archaeological features here. This problem, although significant, is over-shadowed by the deflation in terms of its threat to the known archaeology.

As well as the coastal erosion and machair deflation the sites in this area are also being damaged by rabbits. This is particularly marked on the settlement mound (20) which would otherwise be largely stable.

Sub-zone 2 - West end

This area contains the important settlement mound 'Teampull' site (18), as well as traces of at least two phases of pre-recent cultivation and related features (e.g. 32). The area behind the dune face here is relatively stable despite some evidence of past erosion scars and blow-outs. Rutting by the wheels of cars and caravans has caused localised damage here, but this has not led noticeably to erosion problems. Most of the localised erosion in this area is now attributable to rabbits. Behind the machair the area contains former cultivation plots backing onto the marshy northwards extension of Loch na Cuilc, which contains the waterlogged remnants of rigs.

The beach-front is itself here being undercut through mature machair in places while, in others, the undercut turf has slumped and temporarily halted the erosion. No archaeological features appear to be affected by this erosion at present, although in the sections which stand up to 1m high above the banked up sand there are clear traces of old soil horizons.

Sub-zone 3 - East beach front

This area is the one most used for caravans. It is an area of sand dune accretion and is characterised by young sand dunes with primary colonising vegetation. Nonetheless Ritchie and Mather present geomorphological evidence for a recent period of severe seaward erosion (1970, 60). This erosion may well have removed traces of the midden sites reported in the area by the Royal Commission (1928). There are localised blow outs but no traces of any former ground surfaces or archaeological features.

Sub-zone 4 - Central machair

This is an area of mature machair, the shoreward parts of which are used by caravans and have been scarred by wheel ruts. Erosion areas, however, are generally confined to the rear of the road, where the machair backs onto the hillfoots. The sites in this area (1, 12) are being badly damaged by rabbit burrowing and downhill slumping of the broken machair surface. The area contains several relict and active blow outs including a major active blow-out area west of the curve in the road along the beach. A further active erosion face is situated overlooking Loch na Cullach on its east side. Cultivation, practised in this area into the 1970s, appears now to have entirely ceased.

Sub-zone 5 - East machair / Loch na Berie

Like the central machair, this area contains a mixture of active and relict blow-outs. It currently contains the most extensive blow-outs in the Bhaltois peninsula, to the north of Berie house, where the sections stand c. 4.5m high, with traces of old soil horizons. There is no trace of any archaeological features in this blow-out however. The entire area between Berie house and the fence which separates this sub-zone from the beach front dunes, is formed by successive deflation episodes. The archaeological sites which lie within this area (24, 25) survive as islands of

preservation, held together by their stone and midden components, in a wide expanse of deflation. The deflation appears to have removed all sand to the level of the winter water table, creating extensive flat areas. Although these flat areas are now very stable, erosion, particularly by rabbits, continues on the archaeological features.

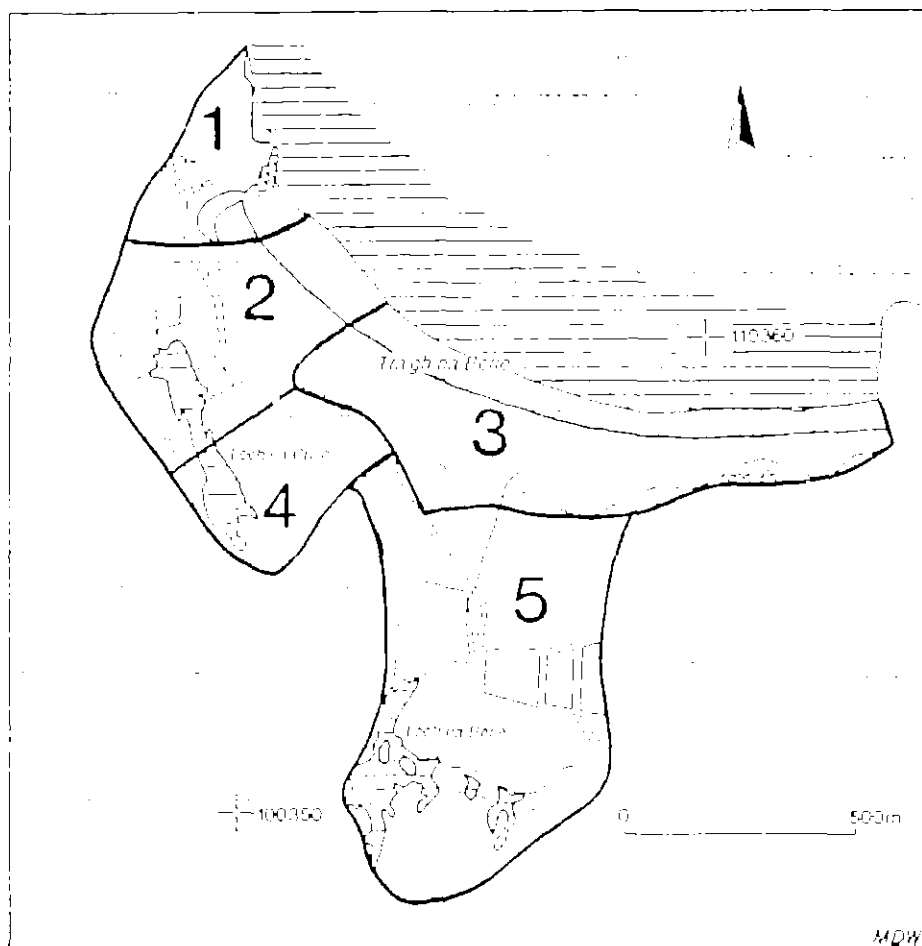
Loch na Berie and the machair to its north and east are relatively stable. The main threat here comes from rabbit damage to individual sand mounds, and the continuing erosion of site 26, a settlement mound. Much of this area is relatively flat and areas around Berie house and elsewhere have extensive evidence of cultivation.

Summary

The most threatened areas of the machair system at present are:

1. Cnip headland and its beach-front.
2. the west beach front.
3. localised blow-outs on the mature central machair and eastern machair.
4. a series of settlement mounds riddled with rabbit warrens (detailed in Appendix 1).

Of these, Cnip headland and the settlement mounds are of most pressing archaeological concern.



Illus 18 - Traigh na Berie

Traigh Bhaltois / Cnip (III. A2.2)

This part of the survey area can be divided into three: the beach front and coastal strip of machair; the western facing part of Cnip headland; and the area of the modern townships of Cnip and Bhaltois.

Sub-zone 1 - Beachfront

Serious beachfront erosion on this machair system has been recognised for some years. Comhairle nan Eilean has recently constructed a sea wall to halt the erosion on the eastern part of the beach where several houses were becoming threatened. It was in this context that the wheelhouse and later settlement complex was excavated here in 1988 (Harding and Armit 1990). The sea wall has halted erosion along its length. The problem now, however, is that the western part of the beach (the Traigh Cnip, rather than the Traigh Bhaltois), is still rapidly eroding and exposing further areas of significant archaeology: Cnip site 2/3 (13). This area is being cut back by tidal erosion year by year and the site is in imminent danger of destruction. The extreme western part of the beach, Traigh Bhaltois, appears to be in less danger and is possibly accreting rather than eroding. There is no evidence of any features of archaeological significance in this latter area.

Sub-zone 2 - Cnip headland (north-west facing)

The part of Cnip headland overlooking Traigh Cnip is eroding badly, especially towards the summit. There is clear evidence of old soil horizons in these eroding areas, parallel to those on the archaeologically rich, west-facing side. No archaeological features have, however, been identified on this side of the headland.

Sub-zone 3 - townships

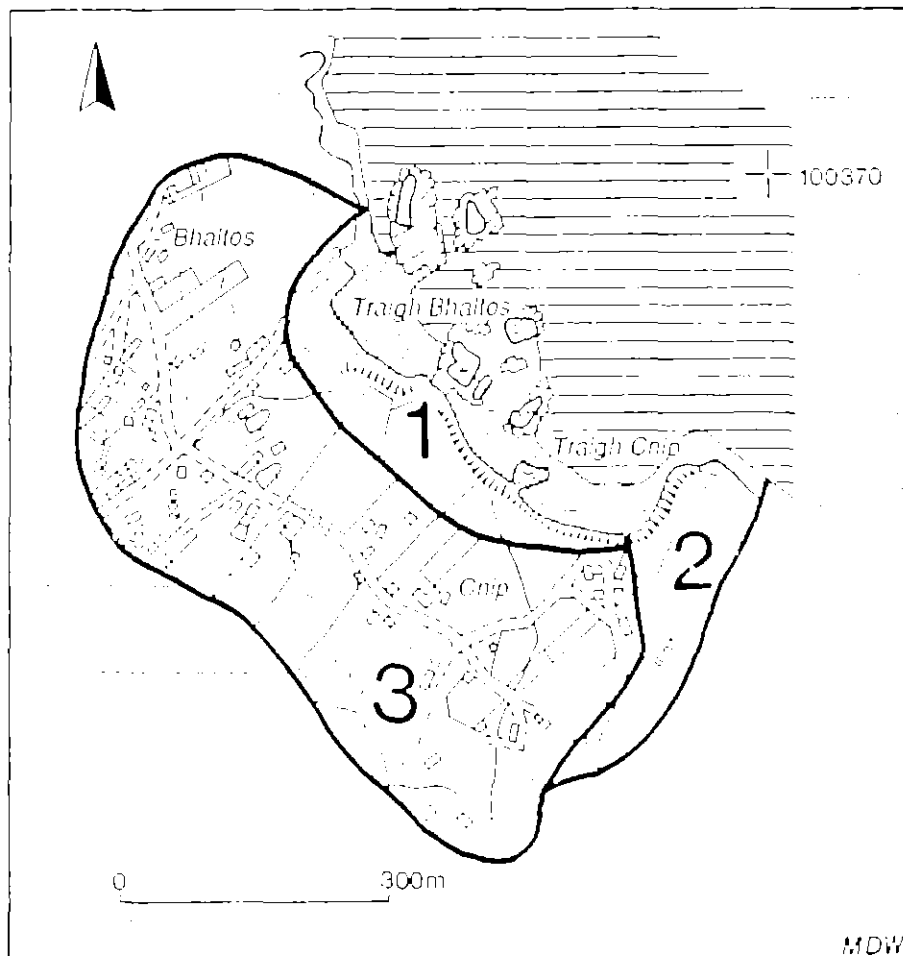
The remainder of Traigh Bhaltois / Cnip is heavily settled, forming the townships of Cnip and Bhaltois. The modern houses lie beside their predecessors, the blackhouses shown on the 1st and 2nd edition Ordnance Survey maps. The settlement here is so dense that there is very little chance that any structures significantly pre-dating the nineteenth century will survive as recognisable surface features form. The area is also very stable, although limited rabbit damage is occurring in the walls of the relict structures.

Summary

The most actively threatened area in Traigh Bhaltois are:

1. the beach front from the end of the present sea wall to the boundary of Cnip and Bhaltois. Principally this comprises site 13.
2. the eroding terraces on the west-facing side of Cnip headland.

Of these only the first is of archaeological significance. The extensive site of Cnip 2/3 (13) is clearly multi-phase and probably later prehistoric at least in part. It contains industrial as well as settlement activity and would be of particular value in the context of the previous excavations at Cnip site.1 (9).



Illus 19 - Traigh Cnìp/Bhailios

Tralgh Clibhe (ill. A2.3)

This machair system can be divided into three sub-zone: the steep eastern slopes; the eastern and central machair areas and beachfront; and the more stable west end.

Sub-zone 1 - Eastern slopes

The worst erosion on this beach is concentrated on the steep eastern slopes below the modern road to Bhaltois. These slopes are deflating rapidly. Below the cemetery here is a gash in the hillside which has exposed a series of walls and other features. Further north along this hillside are the remnants of former blow outs which are not currently active. Two such blow-outs lie immediately north of the cemetery. In the northernmost of these are traces of a major stone wall running north-south. In the southern example are smaller walls and a possible structural platform. Both contain cultivation traces in the form of strips divided by slight ridges. Such indications of cultivation extend along the headland to the north, lying outside the enclosed areas belonging to Bhaltois township in the nineteenth century and earlier.

Sub-zone 2 - Eastern and central beach-front and machair

The Clibhe beach front is currently being undercut, particularly at its eastern end, and structures recorded earlier in this century have disappeared (e.g. site 4). This beach-face is often, however, banked up with blown sand and archaeological deposits can thus not be identified here. Such deposits, if present, are only likely to be visible after severe storms.

Between this beach-face and the hills is a flat area of formerly cultivated machair divided by cultivation strips. It was here that a Norse burial (14) and the traditional site of a dun are recorded (7). The area contains amorphous raised areas (one centred NB 0845 3627, which may be a denuded settlement mound) and stone features which may, in some cases, represent informal clearance features. Since the end of cultivation here, the area has been relatively stable, although numerous erosion-cut terraces lie on the steep hillside between this area and the road.

Sub-zone 3 - West end

West of the main area of beach, Traigh Clibhe is relatively stable. Extensive cultivation traces, probably associated with site 47, dominate the western end of the area, backing onto steep hills devoid of machair cover. The central strip of land leading from Loch Sgailler to the mouth of the machair itself is dominated by houses built since 1850, which comprise the only parts of Clibhe now inhabited. Above these houses on the east hillside above Loch Sgailler is the remains of the old Clibhe, the settlement present on the 1850 map. The 1850 blackhouse complex lies adjacent to its successor (built before 1895 and also now abandoned). These structures and their associated enclosures overlie an earlier cairnfield and associated structures (36).

The other area of principal erosion is near the mouth of Abhann na Clibhe, the stream which drains Loch Sgailler. The west bank of this stream is particularly vulnerable to deflation and several blow outs are currently active.

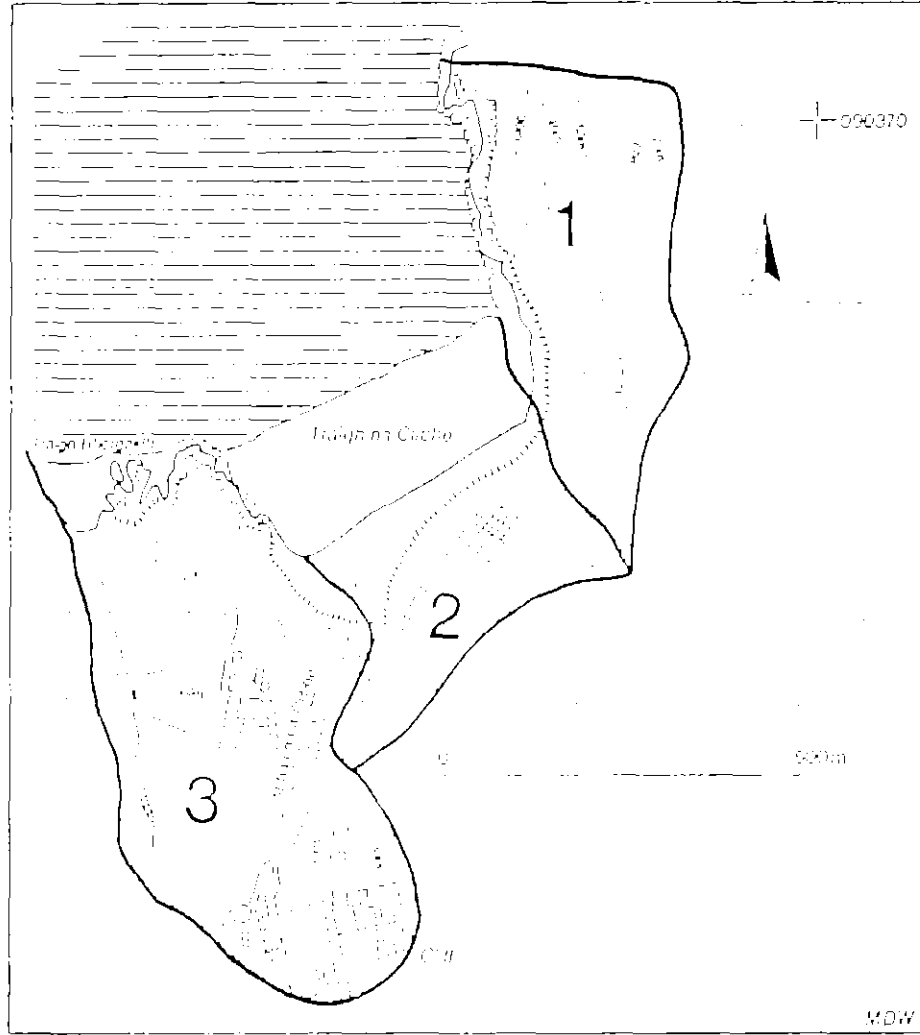
Summary

The three areas most actively threatened in Traigh Clibhe are:

1. the eastern slopes above the beach.
2. the western bank of the stream draining Loch Sgailler as it enters the beach.
3. the beach front from its eastern end to the stream draining Loch Sgailler.

Of the three, only the east slopes have clear evidence of archaeological features, and these are predominantly walls, which are most likely to have formed land boundaries. Other features of archaeological significance have been identified in the flat machair behind the beach, but the ending of cultivation has prevented the exposure of further features here.

In archaeological terms Traigh Clibhe is currently the least threatened of the three machair systems surveyed.



Illus 20 - Traigh na Cúcho

1: E1

Appendix Three: Geophysical survey

Part 1 - Magnetic survey (1989)

Steve Dockrill and Jim Pocock, Dept. of Archaeological Sciences, University of Bradford

Introduction

An initial programme of geophysical survey and sub-surface sampling was carried out in September 1989 by members of the Department of Archaeological Sciences, University of Bradford. The sites were all located in the belt of machair which runs NW-SE following the coastline, with gneiss forming the underlying solid geology.

Choice of Method

The two main methods open for archaeological 'area' geophysical prospecting are those of resistivity and magnetic surveying. Resistivity surveying essentially reflects moisture content in the soil beneath the electrodes, thus concentrations of stone representing a wall surrounded by a matrix of midden-like deposits would produce in normal circumstances a clear high resistance anomaly. The reverse situation can also be plotted, that of concentrations of material with a greater moisture content such as the above example, of the midden-like deposit or the fill of a ditch, which may give a clear low resistance anomaly. The use of this technique on machair sand with variable depths of sand in excess of a metre is problematic. The well-drained nature of the windblown sand at the surface produces a very high contact resistance, as has been found in some surveys on machair regions of Sanday, Orkney. This method was not, therefore, thought to be appropriate for the initial geophysical survey.

The second method of archaeological geophysical prospecting, that of magnetic survey, was chosen. This method, using a 0.5 metre Fluxgate Gradiometer (with a built-in data-logger), detects slight underlying variations in the earth's magnetic field. These variations may be caused by the underlying geology, where intrusive igneous or metamorphic features are present, or by archaeological deposits. *Archaeological deposits which are rich in burnt material*

or which have had a high organic content (such as midden material) have an enhanced magnetic susceptibility and this may be detected by the fluxgate gradiometer. In lowland areas, where extensive agricultural use has reduced the surviving archaeology to 'negative' features such as ditches and pits, whole landscapes may be planned by this survey method. Experience from detailed survey of buried prehistoric sites in the Northern Isles produces a different picture, where one is looking at *in-situ* accumulations of deposits. On such a site it is possible to locate expanses of midden material, and sometimes discrete features such as hearths. The information, however, is often more difficult to interpret and rarely produces the type of plot that, for example, may be associated with a chalk site in Wessex displaying individual features cutting the underlying geology.

Two factors which might have hindered this form of magnetic survey in the Bhallos region were firstly, the gneiss geology, and secondly the variable depth of sand concealing any archaeological deposit. The effective depth of detection by the fluxgate gradiometer is determined by anomaly strength and size, but a depth of about a metre is not unreasonable for an anomaly caused by an archaeological feature such as a ditch. With these considerations in mind it was felt that greater success might still be obtained from the magnetic survey method.

Method of Survey and Data Analysis

The fluxgate gradiometer (Geoscan FM18) was used to record points at one-metre intervals in a square 20-metre grid. The 400 data points for the grid were held within the internal data logger before transfer to a portable personal computer. The data was analysed by using a number of graphical techniques including dot density, contour plots and an image enhancement programme using a bi-cubic spline. Given the nature of the data, with problems of interpretation, the data is presented in total in the form of XY stacked traces or profiles. This has the advantage of clearly showing the both the positive and negative elements of an anomaly together with its relative magnitude. The plots were also superimposed upon the conventional survey results to facilitate location and interpretation.

Soil samples were taken from augur profiles within the survey area. This allowed an assessment of deposits up to 0.9m deep, as well as providing samples for magnetic susceptibility measurement.

Part 2 - Resistivity (1992)

Tim Neighbour, Centre for Field Archaeology, University of Edinburgh

Introduction

As part of the 1992 survey a programme of resistivity survey was conducted over a number of known and suspected archaeological sites in the Bhaltois area. The sites were all on machair, with gneiss forming the underlying solid geology. The use of resistivity survey was designed to test the value of the method on the Western Isles machair sites, bearing in mind the possible problems detailed by Dockrill and Pocock. It was undertaken also to enable comparisons between data recovered by geomagnetic and resistivity surveys. It was hoped that this would enable the evaluation of the usefulness of the geophysical techniques in common archaeological usage in future machair-based research programmes.

Resistivity survey

An outline of the method is given by Dockrill and Pocock above. Two traverses over natural sand dunes were conducted as a control experiment to test the effect of variable depths of sand. Over the higher parts of the dune the well-drained sand produced very high contact resistance, with the opposite being true on the lower parts. This outcome is as predicted by Dockrill and Pocock. Variable depths of bed-rock can be expected to add further problems to the background of any resistivity survey in this region, but the generally substantial depths of sand on the areas to be examined made this a less significant problem.

Method of Survey and Data Analysis

The resistance meter (Geoscan RM4) was used to record points at 1m intervals in 20m x 20m grids. The data was analysed using the Geoplot (Geoscan) program and presented in the form of dot-density plots.

Part 3 - Results

Site 3 - Hut circles (Magnetic survey reference VAL6)

[Survey size 50 by 40 metres]

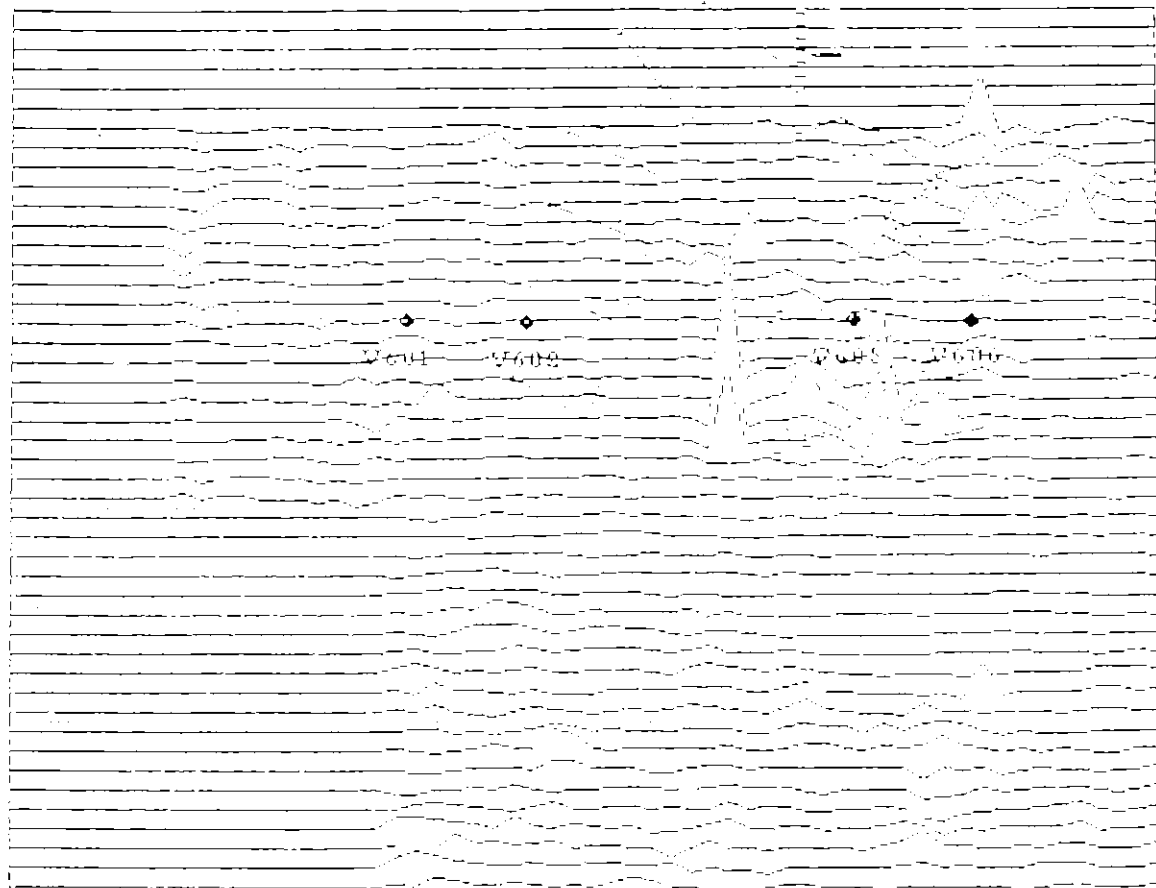
Site 3 consisted of stone scatter, orthostats, and the partial remains of a bank, which suggested a possible settlement area in the SE grid. An erosion gully in the NE grid revealed buried soil and midden deposits.

The geophysical survey (Ill. A3.1) confirmed an area of magnetic enhancement consistent with past settlement activity in the SE grid square coinciding with the surface evidence. Slight magnetic enhancements were also seen in the NE grid reflecting the buried ground surface. Similar areas were observed in the data in the N grid, possibly indicating the presence of a soil with an enhanced magnetic susceptibility.

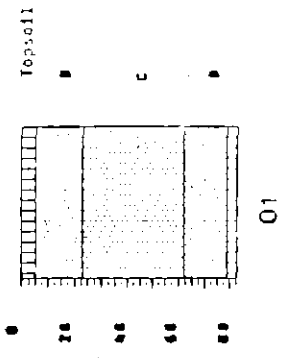
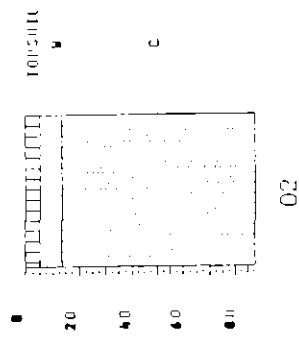
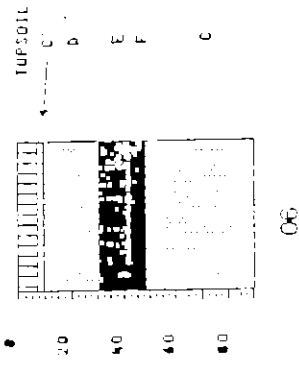
Augur profiles revealed the presence of buried dark (10YR3/2) compact loam soil with flecks of carbon at V606-F (Ill. A3.2) and traces of shell midden and carbon flecking at V605-D indicating archaeological deposits. The buried soil is indicated as 'D' on profile V601 and the absence of buried deposits in the profile V602 should be noted, explaining the low level of activity represented in the geophysical data.

Magnetic susceptibility readings indicated slight magnetic enhancements for these deposits:

Sample	Magnetic Susceptibility $\text{emu} \times 10^{-6}/\text{g}$
Buried soil in exposed section	8
Midden in exposed section	44
Profile V601-B	6
V602-D (buried soil)	13.8
Profile V606-A Topsoil	6
V606-D	17.8
V606-F	28.9



Illus 21 - Site 3 magnetic survey



Illus 22 - Site 3 augur profiles

1: E8

Site 12 - Wheelhouse complex (Magnetic survey reference VAL2)

[Survey size 40 by 40 metres - Anomaly size 10nT between XY traces at 0nT]

This survey area contained a known archaeological site, that of a wheelhouse. The site is visible as a mound with part of the internal wall-face of the structure exposed.

The area to the S and NW of the partially exposed structure had a thin covering of sand and the underlying geology exposed as outcrop. The presence of surface and near-surface geology can be seen upon the XY traces of the survey area (Ill. A3.3). These anomalies range from 5 - 20nT and can be seen on the southern edge of the survey area adjacent to the planned exposed outcrop. A negative v-shaped trough up to -20nT running E-W in the SE quadrant of the survey area is also thought to reflect the underlying geology rather than archaeology. An area of enhancement (approximately 10 - 15nT) in the centre of the NW quadrant again appears to reflect the close proximity of the underlying geology.

An area of positive peaks and negative troughs are present around the site of the wheelhouse. These are seen as slight anomalies (varying mainly from +1 or -1nT to +10 or -10nT) compared to those associated with the surrounding geology. With the close proximity of the underlying geology it is difficult to identify any area beyond this area as being of potential archaeological interest.

Auguring from the centre of the survey northwards was unable to identify any near-surface archaeological deposits.

Resistivity

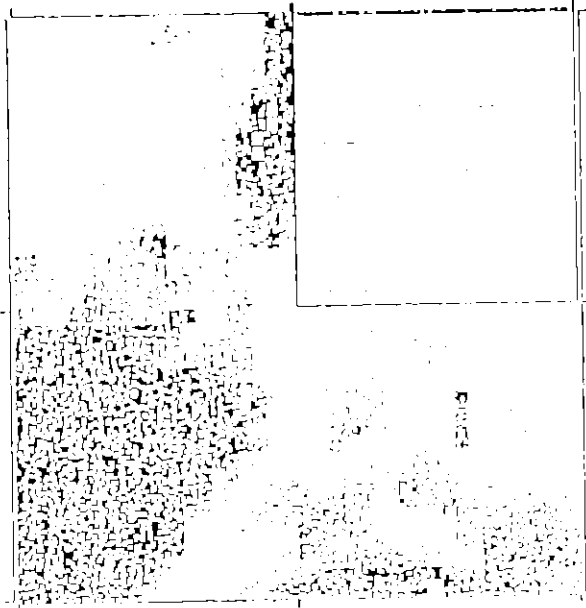
Survey size - 40m x 40m

Three 20m x 20m grids were placed in an L-shape over the known site of a wheelhouse. In some places walls over several courses high were visible so the site could be positioned within the grids with some precision. Outcrops produced most of the anomalies visible. Three plots were produced with normalised and unnormalised means, and at up to plus or minus 1.6 standard deviations around the mean. A high contrast figure was used to attempt to narrow the very spread out normal distributions that resulted from the data on this survey.

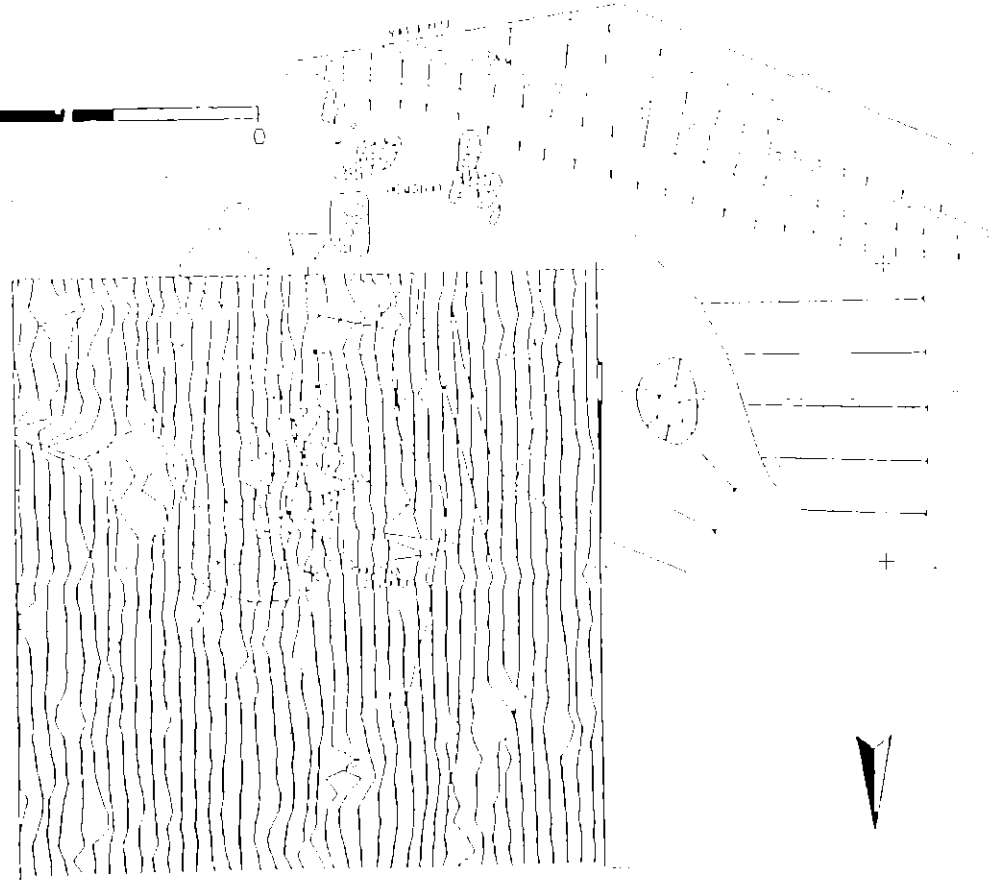
1: E10

Fig. 23 - Site 12 magnetic and resistivity survey

0 20m



0 20m



Despite these difficulties it is possible to identify a circular structure in the plots. No additional information of reliable quality can be taken from the resistivity survey on this site, although it is useful to note that the resistivity survey in this case has provided a clearer picture of the site (in terms of its already known structure) than the magnetic survey.

Site 13 - Settlement and Industrial site (Magnetic survey reference VAL7)

[Survey area 40 by 20 metres - Anomaly size 10nT between traces at 0nT]

A survey of the coastal fringe behind an eroding cliff section revealing settlement evidence was undertaken in order to gauge the suitability of this site for further geophysical survey. The survey results, seen in the form of XY stacked profiles (Ill. A3.4), indicate an area of slight enhancement upon the coastal fringe (NE of the survey) with a possible linear anomaly running SW, possibly reflecting underlying geology. A number of undulations can be seen in the data. The larger ones with peaks exceeding 15nT may reflect underlying archaeology in the form of midden concentrations, or alternatively underlying rock, either as imported stone for building or in-situ geology. Magnetic susceptibility samples from the exposed deposits produced values of 31 and 39 $\text{emu} \times 10^{-6}$ per gram. An augur profile 5 metres within the survey area revealed a dark sand with charcoal flecks at a depth of 0.45m with a magnetic susceptibility of only 12.6 $\text{emu} \times 10^{-6}$ per gram. The slight magnetic enhancement seen in this and the exposed cliff samples combined with the depth of over-burden explain the poor survey results. It would be valuable to test the areas of isolated peak concentrations to identify their source in any future excavation programme.

Resistivity

Survey size - 60m x 20m

This survey was undertaken on the eroding mature machair immediately above and behind the settlement and industrial complex of Cnip 2/3. Most of the anomalies in the northern grid can be ascribed to natural phenomena: the slope up to a rocky knoll to the west of the grid, and a small knoll in the centre of the grid. A modern drainage feature cutting across from the middle of the eastern survey boundary to the extreme south west corner shows as a low resistance anomaly. A curving, low resistance anomaly to the south of the drain probably results from a similar feature.

The variable sand depth over this site appears to have prevented any meaningful reflection of the archaeological features in the resistivity data. The small blow-out immediately above the structures at Cnip 3 is however detectable as a small area of low resistance, due to the absence of sand cover.

Site 15 - Norse cemetery

Resistivity only

Survey size - 15m x 20m

A small survey was undertaken above the blow out, to the immediate north of the graves excavated in May 1992. The depth of sand here was in excess of a metre at the southern edge, tailing off to the north, and this seems to have prevented any archaeological features from appearing. The observed anomalies appear to relate to geology, varying depths of sand and rabbit action.

Site 18 - Settlement mound (Magnetic survey reference VAL1)

[Survey size 40 by 40 metres - Anomaly size 10nT between XY traces at 0nT]

A survey of 1600 sq.m was carried out over a rectangular artificial mound. The survey area was bisected in the west quadrants by a road running N-S. A linear anomaly is seen to approximately follow the course of this road. This may reflect disturbance to the underlying deposits caused by the construction of the road. Careful note of this anomaly was made in the field and it was observed not to follow the exact alignment of the road. It is possible that this may represent some underlying feature, possibly geological.

A number of undulating positive peaks can be observed upon the flank of the mound (between 5 and 10 metres E and W of section line A1-A2). These may reflect underlying archaeological deposits. The platform of the mound itself shows less variation in the data.

Augur profiles were taken at 5 metre intervals along the axis of A1-A2 from the centre of the mound at station V101 (20 metres E of A1) to station V105 (at A2, 40 m E of A1). At the centre of the mound the profile consisted of a dark, sand-based soil to a depth of 0.51m and then clean white windblown sand to the limit of the profile of 0.88m. At 25 metres E of A1, this profile was repeated with dark sand 0 - 0.30m, white sand 0.3 - 0.6m. From 0.6 to 0.75 metres a band of dark sand with carbon flecking was observed. This was found to seal white windblown sand to a depth of 0.88m. This carbon-rich deposit was again present at 30m Station V103 (30m E of A1), and is illustrated diagrammatically (Ill. A3.5). Two layers of ash appear sandwiched between layers of windblown sand beneath this carbon-rich deposit. This stratigraphic sequence did not appear in the two profiles taken at 35 metres and 40 metres (A2) from A1. Here the surface darker sand gave way to a profile to topsoil sealing white windblown sand.

Magnetic susceptibility samples from the illustrated profile at V103 produce the following results:

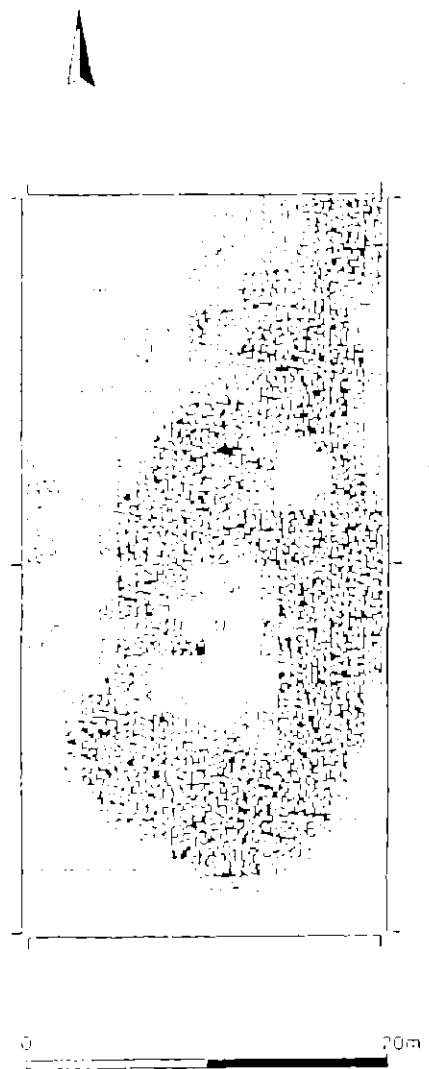
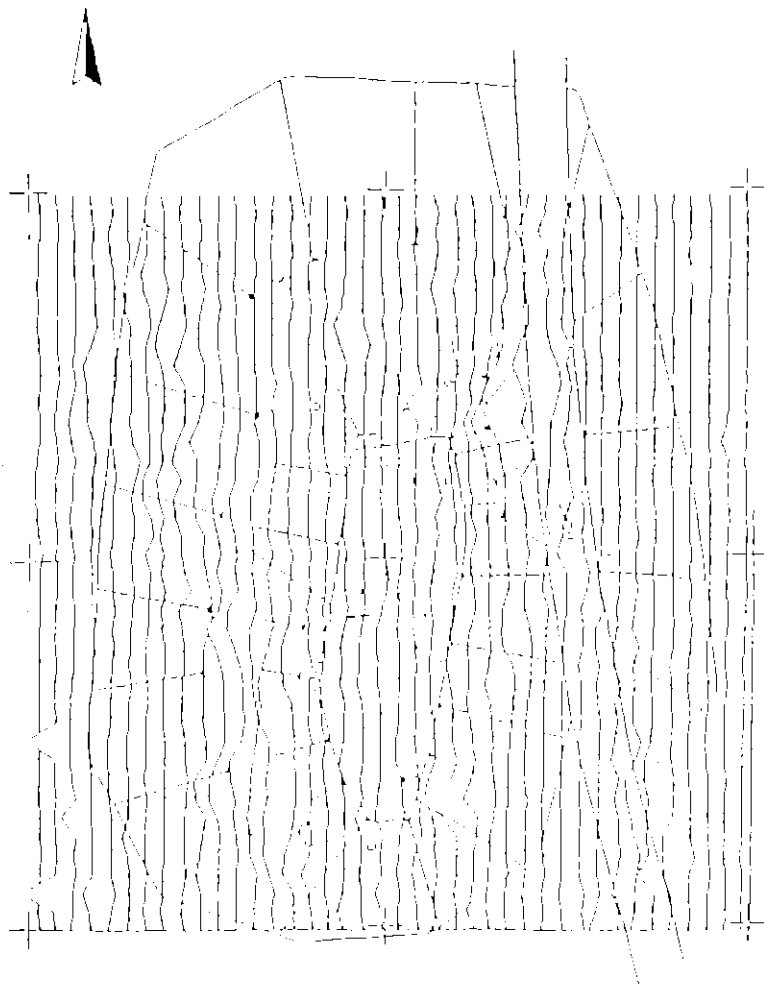
Sample	Magnetic Susceptibility $\text{emu} \times 10^{-6}/\text{g}$
Topsoil	7
Dark sand & carbon flecking (0.24m)	104.3
Dark sand & carbon flecking (0.28m)	82.4
Upper ash layer	158.4
Lower ash layer	159.5

The evidence of the augur profiles in the region of 5 - 10 metres from the centre point of the survey together with the enhanced magnetic susceptibility of these buried deposits suggest an archaeological origin for the survey anomalies. The magnetic susceptibility of the buried anthropogenic deposits are in a range that may be associated with settlement activity.

Resistivity

Survey size - 40m x 20m

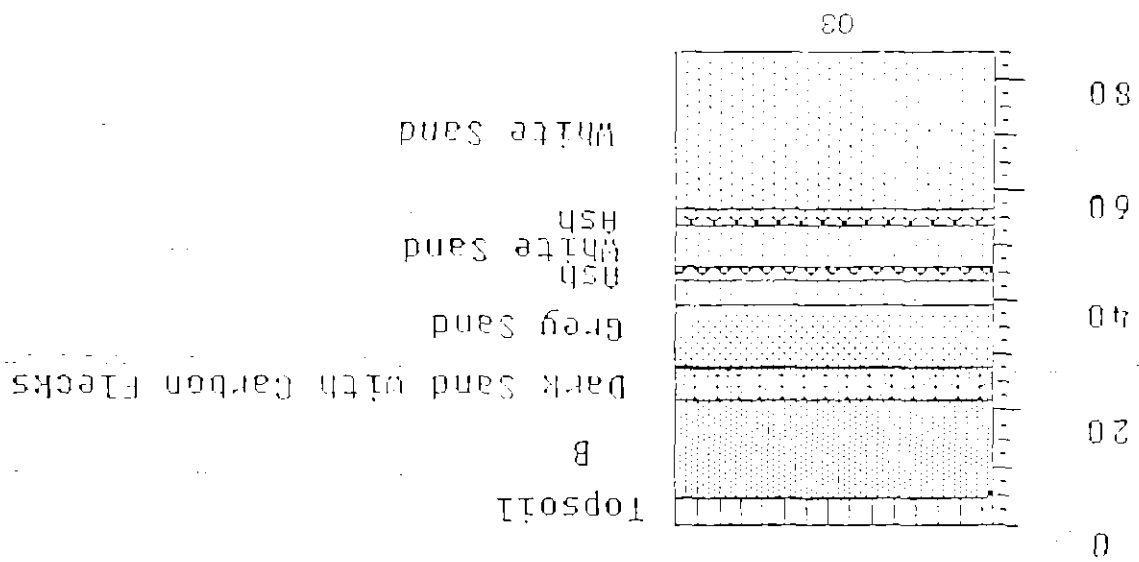
This proved to be the most successful of the resistivity surveys undertaken. A simple plot based around a normalised mean at plus or minus one standard deviation produced evidence of a circular structure. This may equate to a structure visible on the ground as an arc of orthostats. A second smaller cell lies to the north-east of the survey area. The structures are represented by circular areas of low resistance surrounded by concentric areas of higher resistance, probably representing domestic structures (the low resistance occupation deposits) revetted into sand (well-drained with high resistance).



Illus 24 - Site 18 magnetic and resistivity survey

1: F3

illus 25 - Site 18 auger profiles



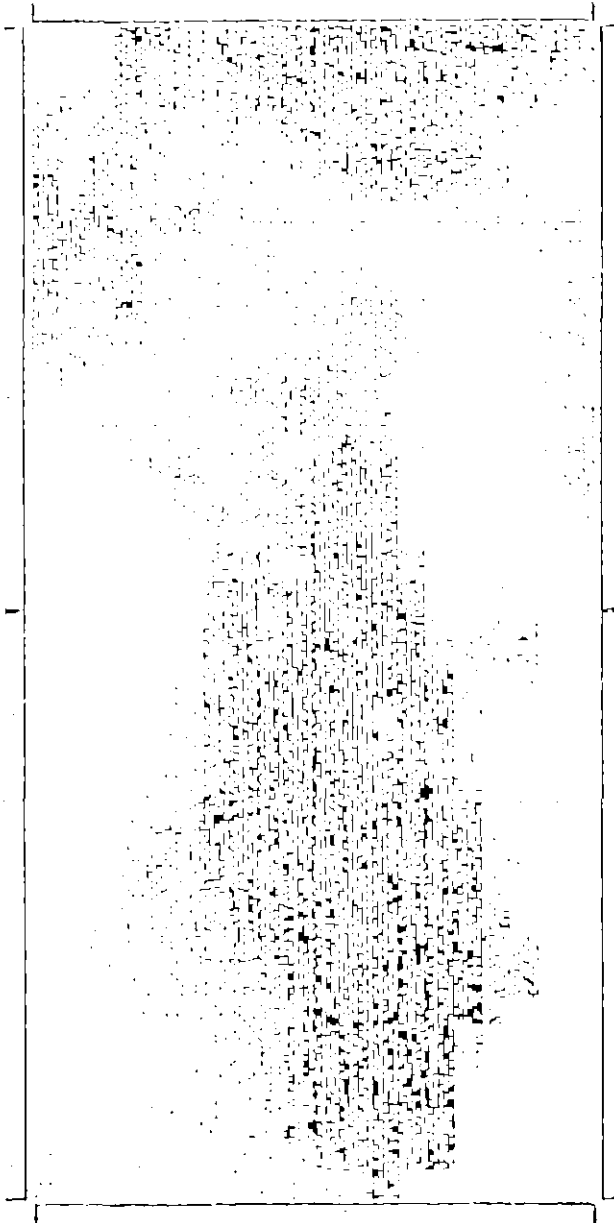
Site 20 - Settlement mound

Resistivity only

Survey size - 40m x 20m

A number of possible structures cluster on the top of a small outcrop, with some possible circular enclosures down slope to the north-west. Resistivity survey was not very revealing on this site (Ill. A3.6). The high resistance anomaly correlates with the shape of the outcrop and is probably due to increased depth of sand. To the extreme north of the area a semi-circular high resistance anomaly is probably due to the presence of bedrock.

Attempts were made to look for structure within the large high resistance anomaly (Ill. A3.6) revealing possible traces in the southern grid. However one must conclude that, on this site, the technique produces considerably less information than can be gained by ordinary survey.



Illus 26 - Site 20 resistivity survey

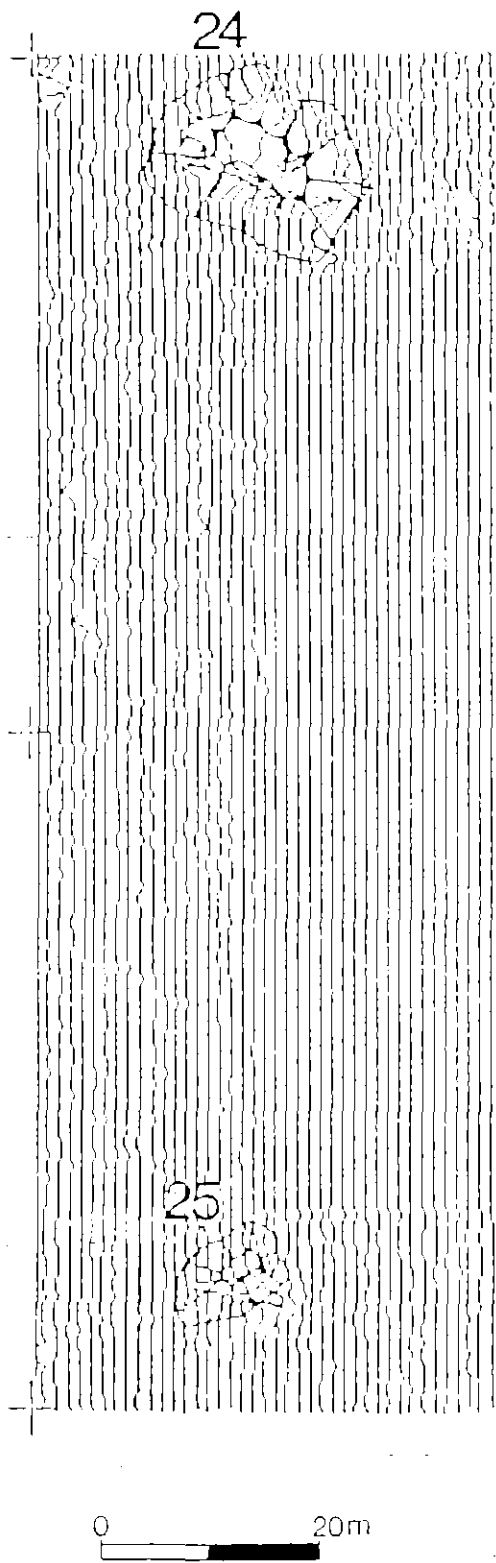
Sites 24 and 25 - Settlement mounds (Magnetic survey reference VAL5)

[Survey size 120 by 40 metres]

The area contained two mounds, both of which appeared to be of archaeological origin. The aim of this survey was to identify and map any surrounding buried archaeological features or deposits. The mounds were surveyed in detail and linked by a transect 20 metres wide.

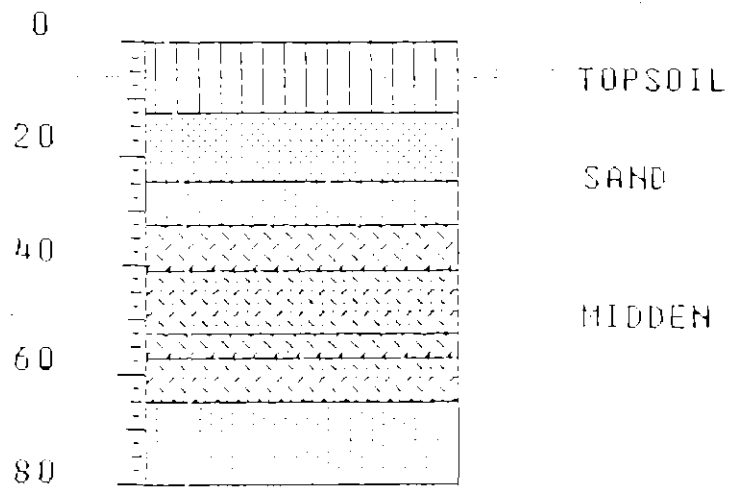
The two mounds were clearly identified by the survey (Ill. A3.7), with the positive anomaly representing the mounds, and indicating a high midden content. The survey results suggested that these sites were isolated islands of archaeological survival in the surrounding landscape.

Augur profiling along the baseline A1-A2 confirmed the absence of any near sub-surface archaeological deposits or ground surfaces contemporary with the mounds. Profile V508 (Ill. A3.8) through the larger southern mound (profile located 10m N of A1) indicates that the core of the site has a high midden content and seals white windblown sand. Magnetic susceptibility samples of the midden deposits produced values of 270 and 689 $\text{emu} \times 10^{-6}$ per gram. These results suggest that the contemporary ground surface to these monuments has been lost through wind erosion. The nature of the midden deposits and any stone work within the mounds was resistant to erosion, leaving the mounds as isolated archaeological islands. A clear parallel to this can be seen with the exposed ring-cairn, site 2.



Illus 27 - Sites 24 and 25 magnetic survey

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Illus 28 - Sites 24 and 25 augur profile

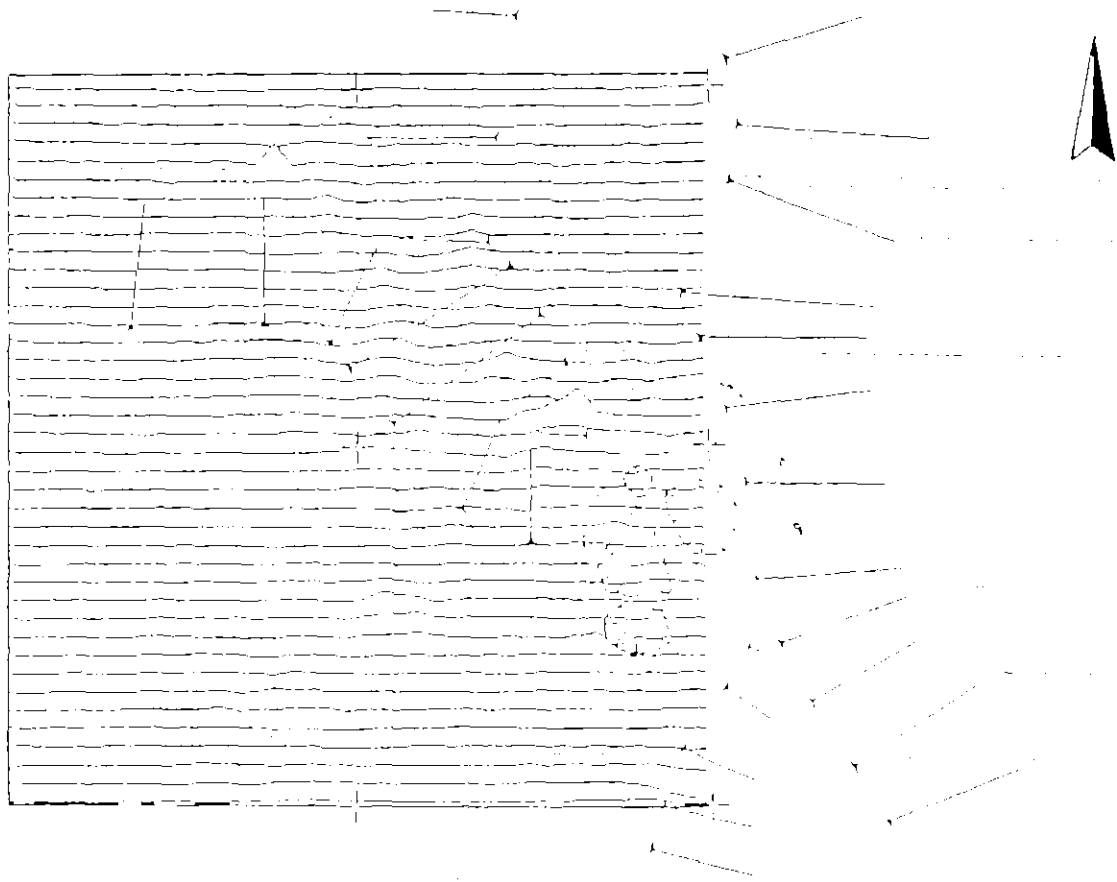
Site 26 - Settlement mound (Magnetic survey reference VAL4)

[Survey size 40 by 40 metres - Anomaly size 10nT between XY traces at 0nT]

A suspected settlement site formed the basis for the survey site VAL4 (Ill. A3.9). The site which appeared upon the top of a dune escarpment showed signs of past disturbance in the form of hollows present in the N of the NE quadrant. The steep slope to the north limited geophysical survey in this direction.

The geophysical survey data shows very slight variations in this area when examined by image enhancement techniques (Ill. A3.9), which appear to reflect archaeological activity. Two positive bands can be seen to correspond to a depression or gully running from the site to the SE which does not appear to reflect underlying archaeology.

Augur profiles along the N edge of the survey area from the NW corner (0m) to the centre of the survey area (20m) revealed a buried soil layer of windblown sand in varying depths in excess of 0.5m. The profile at 15 and 20 metres illustrated as V4-5 (Ill. A3.10) E from the NW corner indicated the presence of midden/ash deposits beneath this soil, separated by a thin layer of windblown sand. A magnetic susceptibility sample of this deposit at a depth of 0.88m produced a value of $315 \text{ emu} \times 10^{-6}$ per gram, indicative of an anthropogenic deposit. The weakness of the magnetic survey anomalies in this area reflects the depth of these layers.

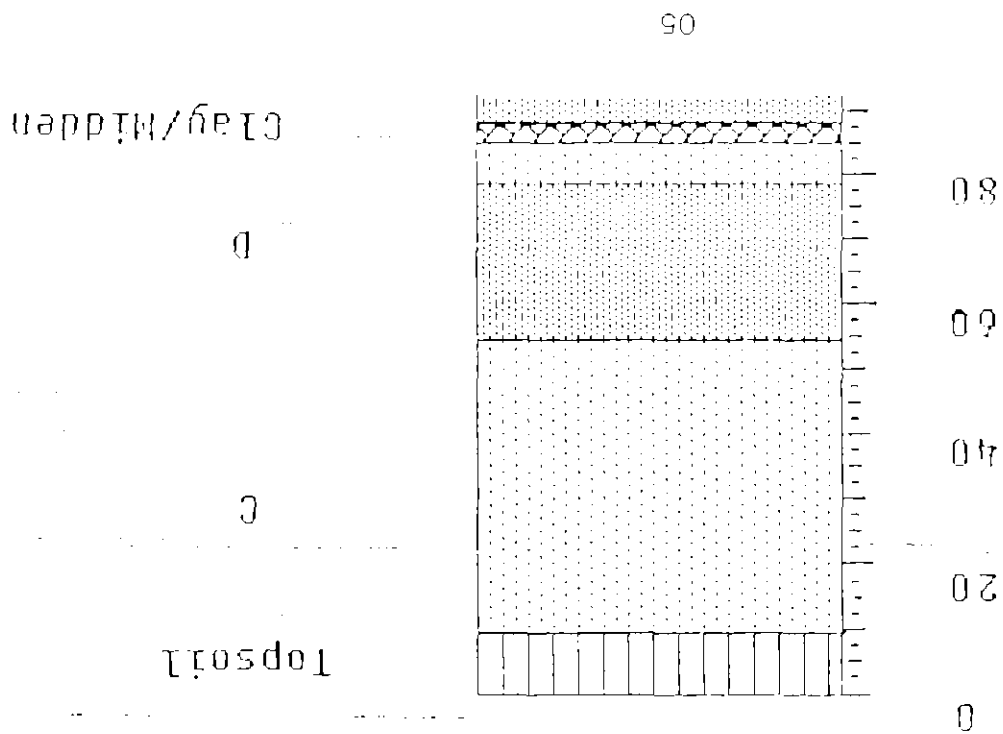


0 20m

Illus 29 - Site 20 magnetic survey

1:111

Illus 30 - Site 26 augur profile



Part 4 - Summary

Ian Armit

The Bhallos survey results have been successful in demonstrating both the possibilities and problems associated with geophysical survey in the machair environment. On different sites magnetic and resistivity survey have been variously successful. Magnetic survey appears particularly suitable for establishing the presence of archaeological deposits suspected on the basis of surface fieldwalking. It seems, however, less able to provide detail of sub-surface deposits, possibly due to the erratic magnetic qualities of the Western Isles gneissic building stone. Resistivity can provide such detail (see site 18) but appears very prone to problems associated with sand depth.

Neither technique seems suitable for initial prospecting for sites, since both require considerable background information for interpretation and sub-surface features unsupported by surface observations would be unreliable. In the context of a coordinated programme, however, supported by surface mapping and coring, an appropriate use of both techniques can provide both confirmation and added detail to our knowledge of machair sites.

Further refinement of both geophysical techniques on the machair would be useful. This should take the form of further control experiments on various natural machair landforms, and of test-trenching geophysical anomalies on a known, large machair site. While the Bhallos survey offers scope for the former type of experiment, none of the sites in the study area appear suited to the second approach: one of the extensive Uist machair sites would appear more suitable for this kind of approach.

Appendix Four: Analysis of soil thin-sections from site 35

Dr Ian Simpson, Dept. of Environmental Sciences, University of Stirling

Introduction

Analysis of soils from Cnip, Lewis by thin section micromorphology was undertaken as a preliminary investigation of soil conditions and soil management activity associated with early settlements in the area. Thin section micromorphology represents an extension of soil observations made in the field with the 30 um slice of undisturbed, resin-impregnated soil examined by petrological microscope permitting a more refined description of soil and sediment organisation.

Sample 1 relates to a sandy soil into which burials of the Norse period were cut - around the 10th century AD. Sample 3 relates to a soil underlying at least two Bronze Age funerary monuments of the later 2nd millennium BC. Sample 2 proved to be unsuitable for analysis.

Materials and methods

Two samples were collected in Kubiena tins for the preparation of thin sections. Thin sections were prepared at the thin section micromorphology laboratory, University of Stirling, following the procedures of Murphy (1986). The sections were described using an Olympus BH-2 petrological microscope and by following the procedure of the International Handbook for Soil Thin Section Description (Bullock *et al* 1985). Interpretation of the sections rested upon the accumulated observations of others, notably Courty *et al* (1989).

Results and discussion

Full descriptions of the two thin sections are provided in the Annex.

Cnip 1

This thin section represents a well-sorted, windblown sand deposit unmodified by human activity. The sands comprise a mixture of single mineral grains and inorganic residues of biological origin. In view of the uniformity of the section it would appear that deposition was over a relatively short period of similar wind conditions.

Limited biological activity, now well decomposed, indicates that a short period of sand stabilisation did occur, causing darkening of the soil horizon. Post-depositional weathering of the deposits giving minute residues is, as expected, most evidently associated with the inorganic residues of biological origin. There is no *micromorphological evidence of anthropogenic amendment or disturbance.*

Cnip 3

While also a well-sorted windblown sand deposit demonstrating similar properties to the sample just discussed, there are several major differences between this section and the Cnip 1 sample. Less inorganic residues of biological origin and a greater proportion of quartz in the coarse component suggests that these windblown sand deposits had a slightly different origin. The presence of fine mineral material gives an *enaulic related* distribution to the groundmass. Three possible explanations can be advanced to explain the origin of this fine material in the thin section. Amendment of the soil by human activity is unlikely given the absence of charcoals, phytoliths and only limited excremental pedofeatures. Windblown sand deposition is also unlikely in view of its limpid crystallitic and speckled appearance. The most likely explanation of this fine material lies with *weathering of biotite and subsequent redeposition* of the weathered material. Further work needs to be undertaken to confirm or refute this working hypothesis and to confirm the precise mineralogy of the fine material. Thin section samples from above and below the Cnip 3 sample would aid in the next stage of analysis. As with sample Cnip 1, there is no *micromorphological evidence of soil amendment and cultivation.*

Annex: Thin-section descriptions

Chip 1

Microstructure

Apical single grain structure. Simple packing voids occurring between single grains, micro and meso, complex shapes, common, no orientation pattern, random and unpreferred distribution pattern.

Basic Mineral Components

c/f limit 10 um; c/f ratio 99.5/0.5

Coarse Material, single mineral grain, quartz, 60-700 um, well sorted, subrounded, subangular and angular, common TCF, common TTS, 0-1 degree of alteration, irregular linear and dotted alteration patterns.

Coarse Material, single mineral grain, feldspar, 100-300 um, well sorted, subrounded and subangular, very few TCF, very few TTS, 0-1 degree of alteration, irregular linear alteration patterns.

Coarse Material, single mineral grain, biotite, 100-325 um, well sorted, subrounded, few TCF, few TTS, 0-1 degree of alteration, parallel linear irregular and dotted alteration patterns.

Coarse Material, single mineral grain, amphibole, 100-250 um, well sorted, subrounded, very few TCF, very few TTS, 0-1 degree of alteration, irregular linear and dotted alteration patterns.

Coarse Material, inorganic residues of biological origin, calcium carbonate, 100-900 um, well sorted, subrounded, common TCF, common TTS, 1-3 degrees of alteration, pellicular, dotted cavernous with minute residues.

Fine Material, light brown and white limpid mineral material.

Basic Organic Components

c/f limit 5-10 cells.

Plant residues, lignified tissue, 300-1000 um, poorly preserved, fragmented shapes, very few TCF, very few TTS, black dark brown and brown, opaque, poorly preserved internal structure, isotropic.

Organic Fine Materials, amorphous fine material, 50-200 um, subrounded, black, opaque, isotropic, very few TTS. Organic Fine Material, amorphous fine material (peat fragment?), 2000 um, subrounded, brown PPL, reddish brown XPL, opaque, very few TTS, with mineral inclusions (quartz, biotite).

Groundmass

c/f limit 10 um, c/f ratio 99.5/0.5

Coarse Material, random arrangement.

Fine Material, fabric stipple speckled, random.

Related Distribution, monic.

Pedofeatures

Excremental, ageing, strong coalescence, dense, 50 um meso, very few TTS, ellipsoid, undulating mamillate, brown, organomineral, monic, associated with plant residues.

Cnlp 3

Microstructure

Bridged Grain.

Intra-aggregate vughs (occasionally interconnected), meso, frequent, undulating mamillate and where there are no coarse grain projections rough digitate, unaccommodated, no orientation pattern, random unpreferred distribution pattern.

Basic Mineral Components

c/f limit 10 um, c/f ratio 90/10.

Coarse Material, single mineral grain, quartz, 50-600 um, well sorted, subrounded subangular and angular, dominant TCF, dominant TTS, 0-1 degree of alteration, dotted and irregular linear alteration patterns.

Coarse Material, single mineral grain, feldspar, 50-400 um, well sorted, subrounded subangular and angular, very few TCF, very few TTS, 0-1 degree of alteration, dotted and irregular linear alteration patterns.

Coarse Material, single mineral grain, biotite, 100-250 um, well sorted, subrounded and subangular, few TCF, few TTS, 1-2 degrees of alteration, pelicular, parallel linear and dotted alteration patterns.

Coarse Material, single mineral grain, amphibole, 100-300 um, well sorted, subrounded subangular and angular, very few TCF, very few TTS, 1 degree of alteration, irregular linear, parallel linear and dotted alteration patterns.

Coarse Material, inorganic residues of biological origin, calcium carbonates, 100-500 um, well sorted, subangular, very few TCF, very few TTS, 2-3 degrees of alteration, dotted parallel linear and core alteration patterns with minute dispersed residues.

Fine Material, mineral, light brown PPL, limp and speckled limpidity.

Basic Organic Components

Organic Fine Material, amorphous fine material, 10-150 μm , various shapes, very few TTS, black to very dark brown, opaque, isotropic.

Groundmass

c/f limit 10 μm , c/f ratio 90/10.

Coarse Material, random arrangement.

Fine Material, b fabric limp and crystallitic and stipple speckled.

Related distribution, enaulic.

Pedofeatures

Excremental, aging, strong disintegrating dense, 50 μm micro to meso, very few TTS, spherical to ellipsoid, undulating mammillate, reddish brown, organomineral, porphyric, random distribution pattern.

Appendix Five: List of threatened sites

This section lists the sites from the Gazetteer by their degree of vulnerability to damage as noted during the 1992 survey. Within each category sites are listed in the same order as in the Gazetteer rather than hierarchically.

Note: a number of sites included in the gazetteer have been omitted where there is no evidence for stability.

Highly unstable (13 sites)

1. Cairn / hut circle
2. Cairn and cist burial (excavated)
13. Settlement and industrial sites (later prehistoric)
15. Norse cemetery
17. Settlement mound (possible)
22. Midden
23. Midden
24. Settlement mound
30. Shell midden
31. Wall fragment
35. Buried soils
40. Rectilinear structure
45. Enclosure walls

Unstable (6 sites)

3. Hut circles
12. Wheelhouse site (scheduled)
20. Settlement mound
25. Settlement mound
26. Settlement mound
33. Cairn

Moderate (7 sites)

8. Atlantic roundhouse (possible)
18. Settlement mound
27. Boat noost
28. 'Norse' mills
34. Cairn

- 47. Settlement complex
- 53. Blackhouse settlement

Stable (21 sites)

- 5. Complex atlantic roundhouse
- 6. Broch tower
- 9. Wheelhouse and later structures
- 21. Settlement mound (dubious)
- 29. Structure
- 32. Stone-lined bank
- 36. Cairnfield and structures
- 37. 'Norse' mills
- 38. Stone alignments
- 39. Cairn
- 41. Agricultural landscape
- 42. Annular structure
- 43. Rectilinear structure
- 44. Rectilinear structure
- 46. Rectilinear structure
- 48. Rectilinear structure
- 49. Settlement complex
- 50. Blackhouse settlement
- 51. Blackhouse settlement
- 52. Blackhouse settlement
- 54. Blackhouse settlement