

St Kilda: quarries, fields and prehistoric agriculture

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ABSTRACT

On the western side of Village Bay, on the island of Hirta in the St Kilda archipelago, there are extensive dolerite quarries for the extraction of stone for production of 'flaked stone bars' or hoe-blades, which are closely comparable to similar tools found in Neolithic and Bronze Age contexts in the Northern Isles. Broken hoe-blades are widely distributed among the walls and buildings of the village abandoned in 1930. Their use was probably coeval with that of irregular walled field systems in Village Bay and Gleann Mór. A viable community evidently occupied Hirta well before the Iron Age. These findings suggest that we should revise current views of the prehistory of Hirta and of the role of agriculture in the island's history.

INTRODUCTION

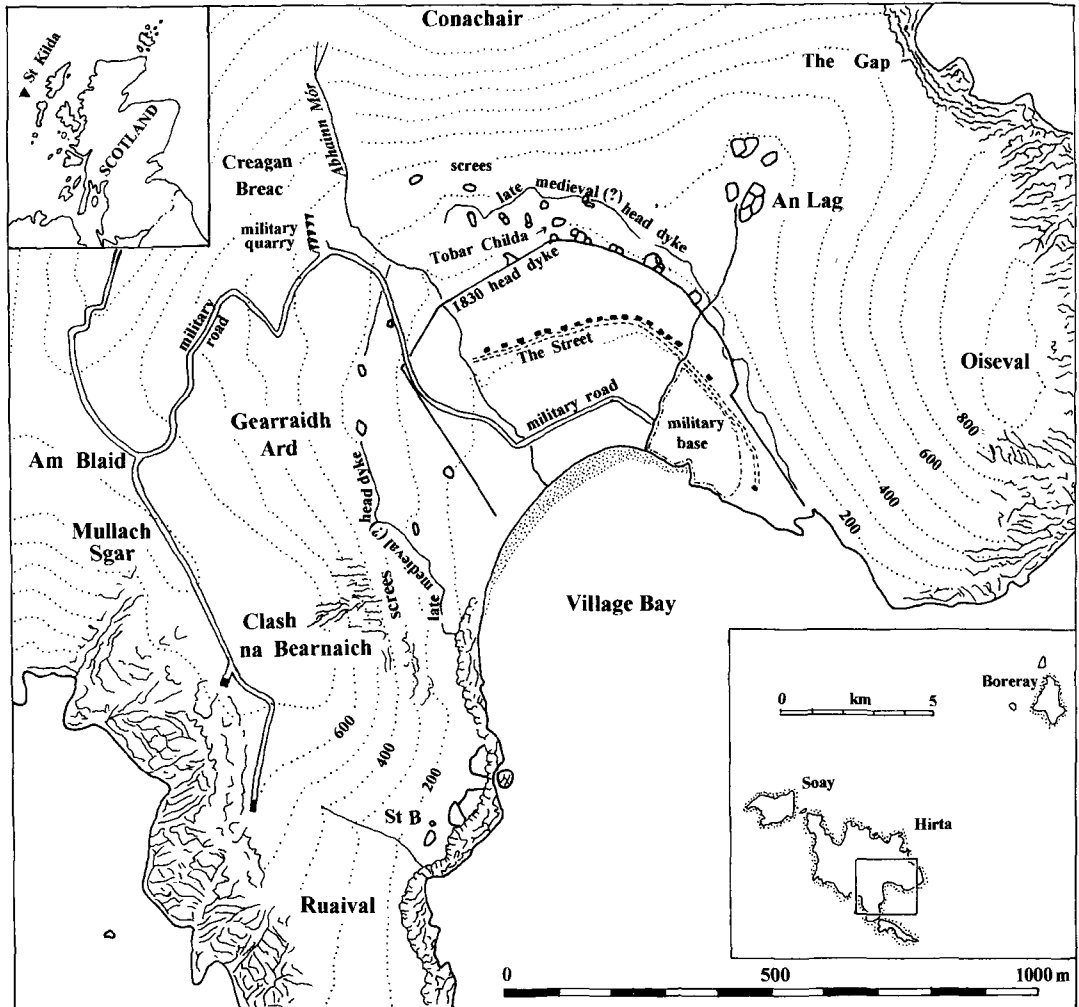
The upstanding archaeology and recent history of the archipelago of St Kilda (60 km west of the Western Isles at 57° 49' N: 08° 35' W) is relatively well known (Stell & Harman 1988; Harman 1997). In particular the main island of the group, Hirta, is renowned for a series of features (illus 1 & 2): the 'street' of houses and blackhouses abandoned in 1930, with the associated head dyke enclosing 16 crofts created in about 1830, and various 19th-century 'enclosures' and gardens. There are also some 1300 cleitean, corbelled structures built to wind-dry and store a variety of resources, from peat and hay to mutton, eggs and sea-birds. Hirta was also the subject of Martin Martin's *A Voyage to St Kilda* (1698), an excellent early ethnographic account of a late 17th-century European rural community. Rather less well known is the existence of a stone industry on the island, one that saw the production of flaked stone tools for use in agricultural and related tasks.

The presence of flaked stone implements on Hirta was first noted in 1876, when J Sands excavated the souterrain in Village Bay. He reported the finding of 'a large number' of 'rude stone implements resembling hatchets or wedges' (one of which he illustrated): 'all to whom I showed the implements recognised them at a glance: "Sean làmhòg, sian sgian", old axe, old knife, they said'. Sands (1877, 187, 192) 'discovered numbers of similar implements in the ruins of old houses above ground'; he assumed they were butchery tools, and thought it probable that they were used 'at a very recent date'.

Subsequent treatments of the early history of St Kilda (eg Cottam 1979; Emery & Morrison 1995; Harman 1997) have tended to minimize the significance of these tools. In August 1994 one of us (AF) noted their widespread distribution among the mainly 19th-century walls and

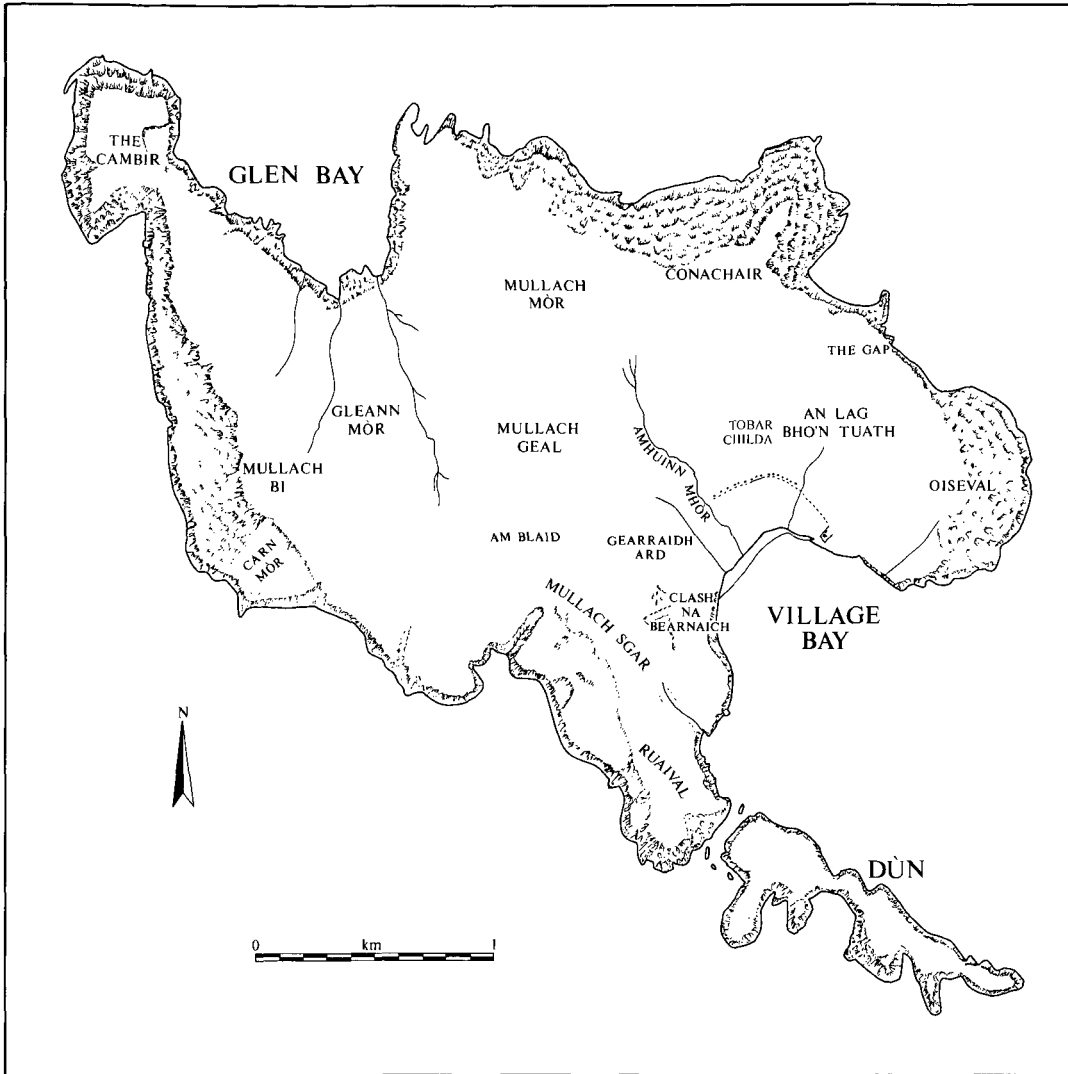
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ILLUS 1 General map of Village Bay area on Hirta, with (inset lower right) the St Kilda archipelago and (inset top left) its location. St B = supposed site of St Brianan's church. Contours at 100 ft (c 30 m) intervals (Based on the Ordnance Survey Map © Crown copyright)

buildings of the Village Bay settlement. In the article which reported this finding (Fleming 1995) it was suggested that the implements were quarried from the dolerite crags around Clash na Bearnaich, the name of a striking cleft (often called The Chimney nowadays) to the south-west of the 19th-century village. It was also inferred from the 'hummocky' character of the less steeply sloping ground of Gearraidh Ard, immediately to the north of Clash na Bearnaich, that quarrying had extended as far as the military road, effectively as far as the interface of the dolerite with the granophyre which underlies most of the Hirta settlement area. Parallels with comparable tools found in Orkney and Shetland in secure archaeological contexts suggested that the Hirta implements were probably prehistoric and used mostly in cultivation. These preliminary observations suggested that at some time in the prehistoric past agriculture on Hirta might have been more important, and the island more productive, than had been generally assumed.



ILLUS 2 The island of Hirta with locations mentioned in the text (Based on the Ordnance Survey map © Crown copyright)

Our field research was designed to explore these suggestions and to place our understanding of this industry on a more secure footing. In four two-week seasons (1995–8) we investigated the screes and quarries around Clash na Bearnaich, to obtain a more detailed understanding of the character of stone extraction and implement production in this area. In addition, almost all the standing structures in the Village Bay area were examined to produce a distribution map of accessible implements, whose presence here mostly reflects their reuse as wedges to stabilize the granophyre blocks generally used in construction. We also undertook a small excavation in order to clarify the relationship between the implements, which we interpret as hoe-blades or mattock-heads, and the pre-1830 walled field system centred on Tobar Childa (to be called the Tobar Childa field system here, but this does not imply that all its elements necessarily belong to the

same chronological horizon). Study of field systems was undertaken on both sides of the island, together with the mapping of quarries on the slopes of Gearraidh Ard, and limited test-pitting there. This article reports on the results and implications of this work.

STONE GETTING

On Hirta, the extraction of stone for making tools appears to have been concentrated within the Mullach Sgar complex. This consists of fragmented intrusions of dolerite, microdiorite and granite, together with blocks of gabbro and granite derived from the Western Gabbro, the Mullach Mór Breccia and the Glen Bay Gabbro (Harding *et al* 1984, 18). All the artefacts identified during the course of our work reflect this basic, if varied, geology, most being made on a fine-grained, grey-green dolerite with occasional granophyre veinlets and other inclusions. According to R Merriman (in litt 26 November 1998) the dolerite was in many cases intruded as a basaltic liquid (magma) into cracks and fissures formed in earlier intrusions of microgranite. During the slow cooling process, 'as a result of heat derived from the microgranite, many dolerites . . . continued to crystallise sub-solidus, ie from the solid material of the quenched basaltic glass, producing a texture of very fine, interlocking crystals of feldspar, pyroxene and magnetite. This produced a tough but fine-grained rock ideally suited for implements.'

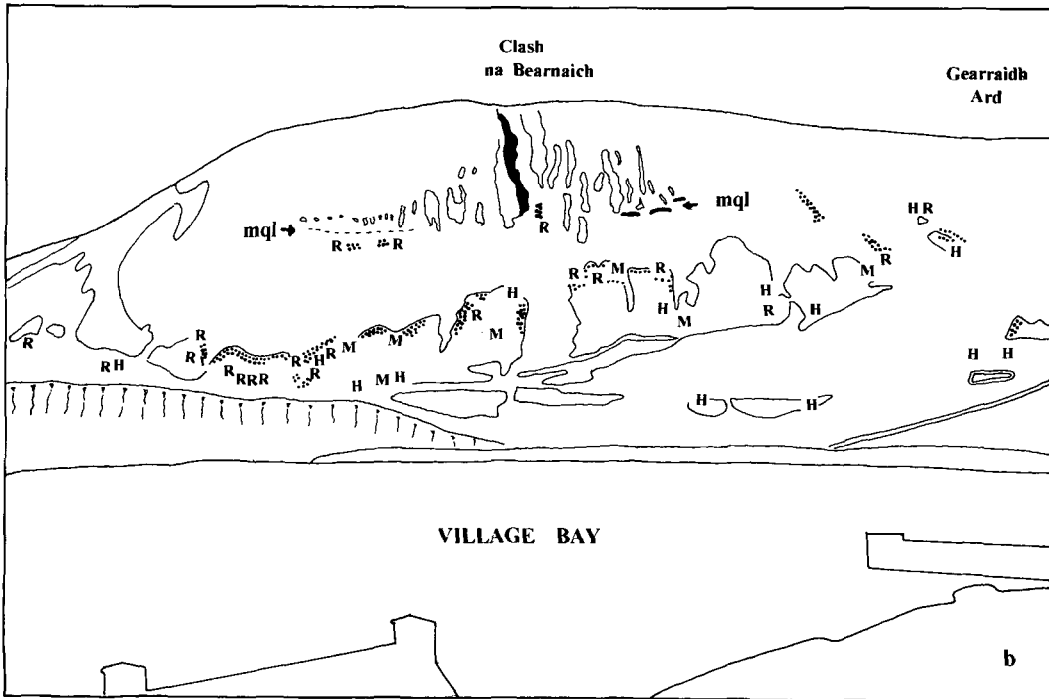
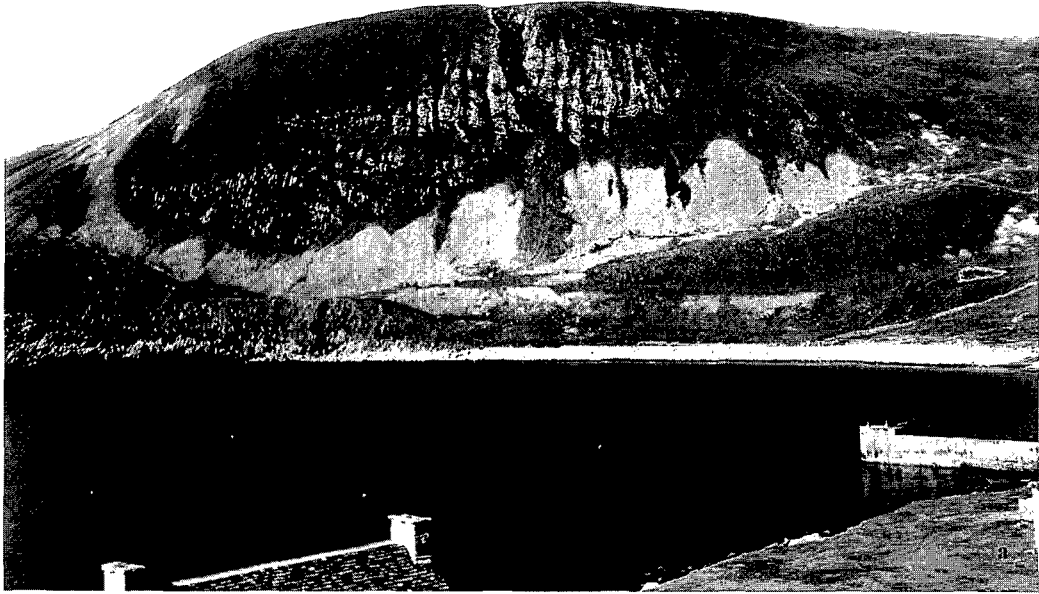
Evidence for the extraction of stone extends from the screes of Clash na Bearnaich in the south to the vegetated slopes of Gearraidh Ard in the north (illus 3). It takes a variety of forms. The screes that emanate from the dolerite outcrops on the face of Clash na Bearnaich contain broken or otherwise discarded 'roughouts' (illus 4). Abandoned prior to completion, these implements often occur with flakes and shattered pieces of stone removed during working. There are also beach pebble hammers and beach boulder mauls of varying sizes. The simple presence of beach pebbles/cobbles at such high levels attests to human activity among the outcrops. At Gearraidh Ard, the short-turfed grassland offers few opportunities to search for worked stone. However, it is clear from the surface relief that there were once extensive quarries here.

The screes around Clash na Bearnaich are generally stable. However, their upper margins remain relatively mobile and cannot be taken as reliable indicators of the true height of specific screes; they are often simply the points at which a steep, vegetated slope overlying loose stone gives way to a more mobile surface of similar material. This affects the interpretation of archaeological distributions (see below). The lower margins of the central screes contain a series of undated features, including substantial walls, small enclosures and corbelled structures.

A number of the screes contain evidence for the extraction and working of stone. Above them are the most obvious quarries — two pronounced ledges, one to the north of The Chimney, the other to the south. Together, they form a linear zone of quarrying c 300 m in length; the northern section is clearly undercut.

There are also zones in which working debris is absent, despite opportunities for recording. Small quantities of flake debris, roughouts and pebble hammers were found at the northernmost limit of the screes (illus 3b & 6), and two large mauls were found at the base of one of the central screes, where they do not appear to be in association with other categories of working debris. The isolated roughouts may reflect *ad hoc* working of material found in screes or on small outcrops; the two mauls have probably rolled downslope. They cannot be taken as reliable evidence for local extraction or sustained working.

More substantial concentrations of working debris were noted along the upper margins of three major screes, two immediately to the north of The Chimney and a third some 100 m to the south. In the former cases, broken roughouts, flakes and hammer fragments were identified on



ILLUS 3 (a) general view of quarry zone on the western side of Village Bay; (b) R: roughout; H: hammerstone; M: maul; dots: areas of flakes from stone-working; mql: main level of quarrying



ILLUS 4 Clash na Bearnaich: roughout and working debris

the interface between the scree and the vegetated slope, with further material eroding down the sides of the major exposures. Whilst the evidence from the two northern screes might result from *in situ* working, it is more likely that it reflects the displacement of working debris from quarries and working areas further upslope, beneath present-day vegetation or immediately adjacent to the outcrop. A large beach pebble maul, roughly 40 mm in length and with a weight of several kilograms, was identified in the more northerly of the two screes; its size and weight, as well as the heavy pecking and damage on each end, indicate that it was used probably in the direct working of the rockface.

The scree to the south of The Chimney revealed evidence of a rather different character. Here, too, large quantities of waste, shattered material and roughouts were recorded close to the upper margins of the scree, as were two large beach pebble mauls, both retaining scars and pecking indicative of use in working the outcrop. The upper margins of this scree have some of the densest concentrations of evidence for stone-working observed anywhere on the hill, and there is good reason to suppose that this activity took place quite close at hand. An exposed outcrop of workable dolerite can be seen less than 8 m above the head of the scree, and nearby lies a small sub-circular mound of upcast material. Taken together, these observations suggest that this particular exposure of dolerite was worked, and that the material in the scree reflects a local focus for stoneworking. Implement forms range from large, irregular, but bifacially flaked 'ovates', reflecting abandonment at an early stage in the production process, to more extensively worked implements with rounded ends and more or less parallel sides (see below for further discussion of working and tool morphology).

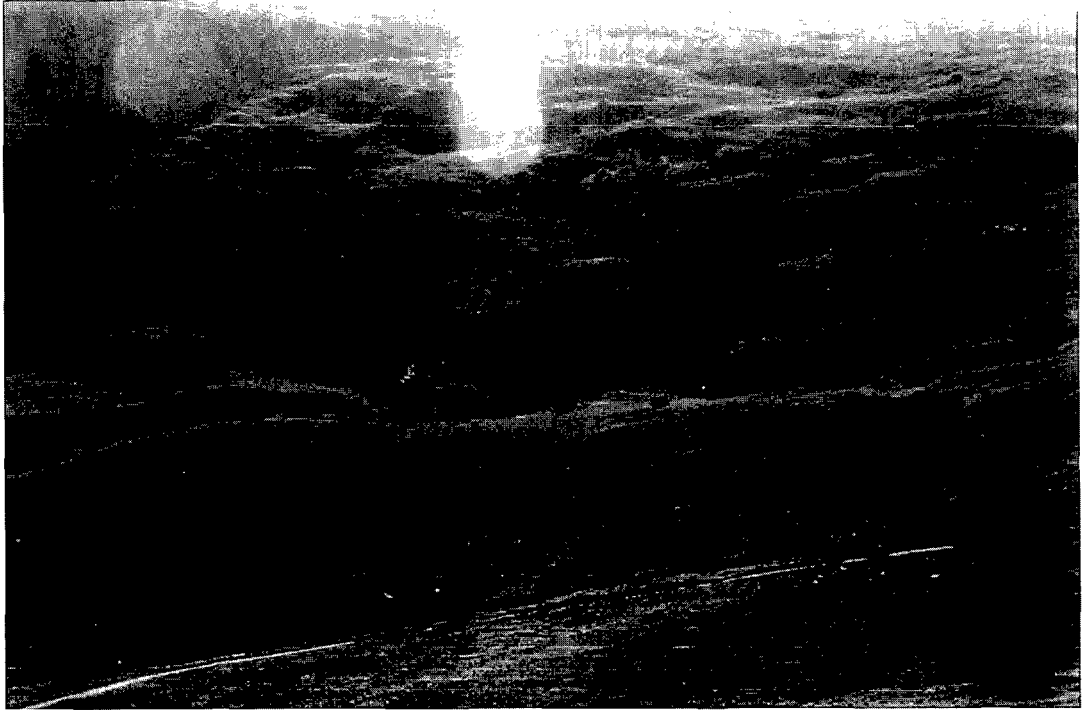
An extensive survey was also made of exposed outcrops of dolerite and dolerite/granophyre, whether or not they had screes emanating from their lower edges. Given the nature of the raw material, which has a tendency to fracture into slabs or plates (largely through frost and ice wedging), the simple presence of flake-like pieces cannot always be taken as a reliable indicator of working. Moreover, the rock itself, whilst possessing the property of conchoidal fracture, is relatively coarse grained; one cannot expect to see clear flake scars on the outcrop, as would be the case with fine volcanic tuff, for instance (Bradley & Edmonds 1993). More often than not, outcrop working is likely to produce angular shattered material and plates or slabs of stone similar in character to those produced by natural processes. It was thus necessary to use a combination of criteria as the basis for the identification of quarries/worked outcrops:

- 1 Roughouts, hammers, mauls or working debris in direct association with an exposed outcrop.
- 2 Roughouts, hammers, mauls or working debris in the head of exposed scree slopes that run directly down from an outcrop.
- 3 Roughouts, hammers, mauls or working debris in the head of *vegetated* scree slopes that run directly down from an outcrop. In this case, confirmation of the presence of archaeological deposits can be gained only through the examination of small exposures and erosion scars (eg those produced by nesting fulmars or sheep).
- 4 Upstanding features in the immediate vicinity of an exposed outcrop. These include banks of upcast material, benches or level terraces immediately downslope of an outcrop.
- 5 Distinct overhangs or caves on the outcrop. Overhangs can occur under natural conditions, so these features need to be assessed in relation to the presence or absence of other classes of evidence, eg those listed in points 1–4.

A comprehensive survey of exposed outcrops revealed evidence for a number of quarries/worked faces, many of which occur above screes containing archaeological material; at least some of the material in the screes must have been derived from higher deposits. Perhaps the most substantial zone of working was identified to the south of The Chimney. Here, a chain of working faces is marked by the presence of overhangs, shattered stone and pronounced benches or ledges. It is possible that the margins of these working areas were delimited by banks of quarried and shattered material; a dense turf cover makes it difficult to test this idea. Further confirmation that these sites are quarries was provided by roughouts and working debris in small exposures immediately beneath their lower edges, with roughouts actually protruding from a grass-covered surface in two locations. It is difficult to determine how much of the current outcrop surface is a product of working. Frost and ice may have split the stone into angular blocks and plates, resulting in the loss of at least some of the working faces. Angular blocks were certainly used by the builders of a small cleit which stands on this ledge, but none has been trimmed or flaked.

The highest known quarrying location here lies approximately two-thirds of the way up The Chimney itself, where a pronounced overhang forms a shallow cave which runs back to a depth of c 1.5 m; a substantial bank runs across its mouth. Work on quarries elsewhere in Britain has shown that these upcast banks are common, reflecting the clearance of debris away from the working face. As the face retreats, spoil is pulled back, often accumulating along the line at which working began. Although no roughouts were observed at this heavily vegetated site, the combination of 'cave' and bank suggests that this too was an area of stone extraction.

Further north, on the Gearraidh Ard hillside, the quarries are almost entirely covered by grassy turf. From the Village Bay area, in most light conditions, the surface undulations look smooth and slight enough to pass for peat flushes and small-scale flows of scree and hillslope material. However, photographs taken at the end of August 1997 (illus 5), with the late afternoon



ILLUS 5 The Gearraidh Ard hillside from the east, taken in low sunlight at the end of August 1997, showing numerous quarries

sun casting long shadows, suggest that much of the upper part of the hillside is pockmarked by quarries, some of them large and deep, with numerous heaps and runs of waste material.

In these conditions, various problems attend both surface observation and interpretation; no plan can be regarded as definitive. Some features can be identified as quarries with a fair measure of confidence; others are probables or possibles. A suspected quarry may look more or less convincing from different viewpoints, in respect of the size and shape of the apparent cut into the hillside, and the definition of the front edge of its 'floor'. Methods of stone extraction evidently varied according to the slope of the ground and the local nature of the bedrock. Views on the most effective or appropriate ways of quarrying stone may have varied, and changed over time. A quarry which appears discrete on the surface may represent only the latest and most clearly observable episode in a palimpsest of quarrying activity. Given the likelihood that most or all of the quarries were abandoned 2000 or 3000 years ago, we may expect that the masking effects of peat growth and soil development will be considerable.

It is not always possible to distinguish between small quarries and erosion at a now-extinct springhead. Environmental change may have been considerable here. The striking feature of the Am Blaid area, the much flatter ground above the Gearraidh Ard hillside, is that it has been almost completely stripped of peat and turf. An unknown volume of blanket peat once covered this zone; the 'perched' cleitean here demonstrate roughly how much peat has been lost, as well as suggesting that it was removed relatively recently. This peat must once have released considerable amounts of water down the Gearraidh Ard hillside. Peat flushes, headward erosion effects and old water channels are relatively easy to identify; but it is also possible that blocks of blanket peat

and flows of silt affected the rear profiles of quarries near the top of the hillside, making them less recognizable as archaeological features.

How far might these undulations in surface relief be a product of agencies other than ancient quarrying? Two possibilities suggest themselves: erosion, due to weathering and the grazing of sheep, and the cutting of the hillside to obtain stone and make platforms for the construction of cleitean. Inspection of the photograph taken in low light (illus 5) gives the impression that there are numerous low vertical quarry faces, running roughly along the contour. Field inspection shows that this effect is mostly created by narrow terraces caused by the interaction between soil creep and sheep movement. However, there are at least one or two relatively low, linear apparent quarry faces running along the upper slopes of the hill. Indeed, many of the individual quarries are arranged in roughly linear fashion, mostly at a slight angle to the contour (with the higher end of the line to the west). Our plan may underestimate the extent of these long low faces.

What of the construction of cleitean? In some places it is possible to suggest that a cleit has been erected in its own small quarry, whose floor has provided an excellent building-platform. Yet some cleitean are in quarries too large, sometimes much too large, to 'fit' them in this way. Others ignore what seem to be excellent sites on nearby quarry floors, sometimes in favour of much steeper slopes, whilst the area which has the greatest density of quarries with small platforms has virtually no cleitean in it. There are also signs of relatively recent surface digging near some of the cleitean, creating small areas of exposed stone. There is a clear distinction between this 'recent-looking' activity and the 'old-looking', grassed-over quarries. Taken together, however, the cleitean have used only a tiny proportion of the stone which has been extracted from the hillside. The conclusion must be that the working of quarries across most of Gearraidh Ard had little or nothing to do with the cleitean, which were built much later than the main use period of the quarries.

Direct evidence for quarrying and implement manufacture in this area extends some 500 m to the north of The Chimney. Running roughly along the contour to the north of the quarried rockface to the north of The Chimney is a series of exposed rocks with sharp edges, which have the appearance of quarried faces, and invite comparison with the sharp outcrop edges still visible in the prehistoric 'axe factory' at Beorgs of Uyea, Shetland (Ritchie & Scott 1988, 88; Ritchie 1968). There is indeed quarry waste exposed by watercourses below these outcrops. Beach pebble mauls, hammers and incomplete or broken flake tools are found as far north as the northernmost of the Clash na Bearnaich screes (illus 3 & 6). Finds of a pebble hammer and a broken implement in this area probably imply working higher up the slope. Small quarries occur just above, at the lower edge of The Shoulder, but it is possible that some of these artefacts may be derived from much higher up, from the Top Crag. These higher areas and the near-vertical slopes below them are grass-covered. It is possible to discern various potential quarry scoops and piles of quarry waste, but we have been cautious in our recording in this area, conscious of the likelihood of rock-falls, landslides, and the effects of water streaming down the hill.

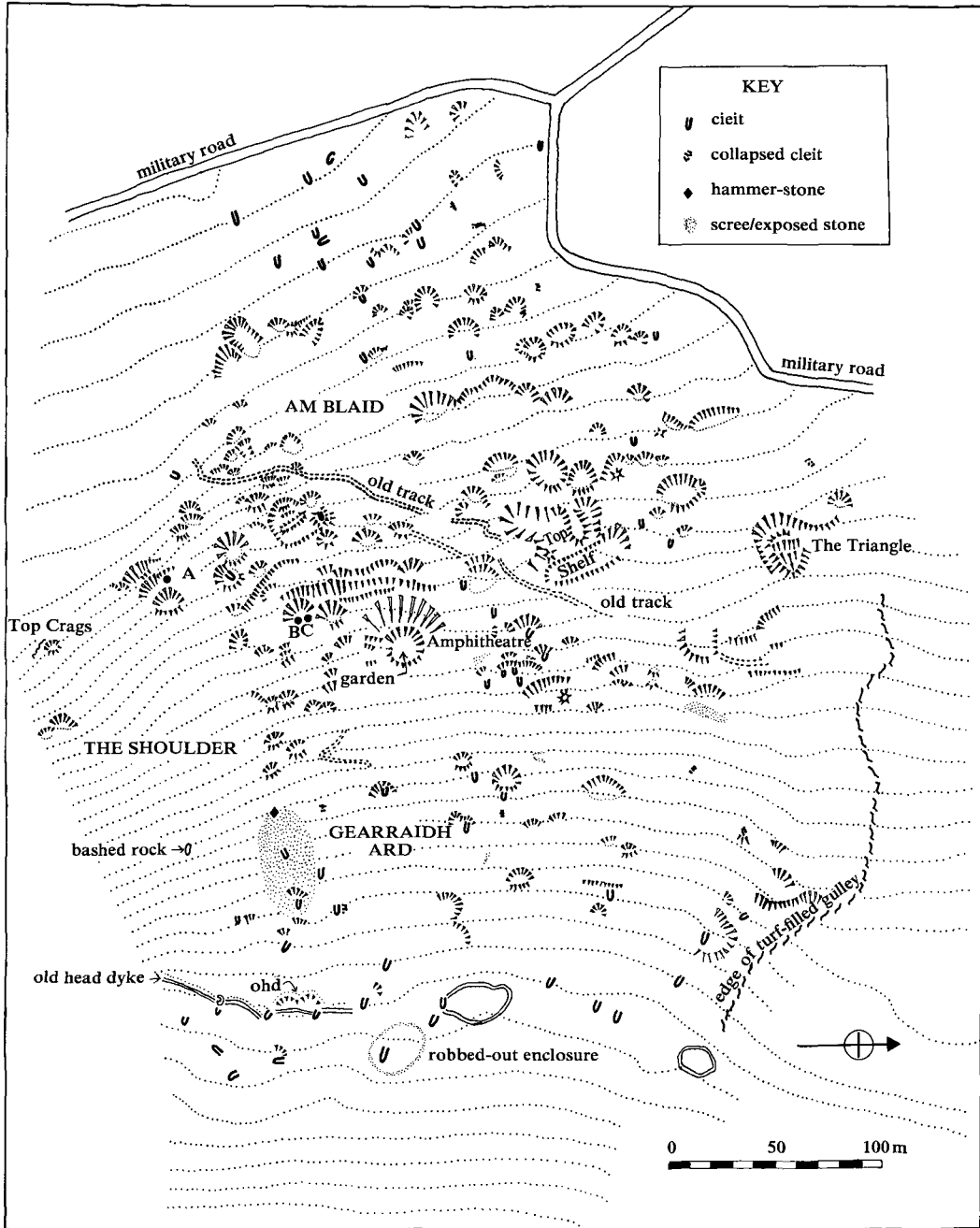
Further north, 'crag' are not visible, but there is a clear change of slope between Am Blaid (the hilltop) and the Gearraidh Ard hillside. As the plan shows (illus 6), there is a zone of intensive quarrying running along the upper slopes of the hillside, with some clear-cut, distinctive platform-quarries and evidence for low linear faces running roughly north/south. However, not every part of the upper area of the intensively worked zone is immediately comprehensible in terms of obvious quarrying activity or geomorphological process. The situation may have been complicated by the removal of large volumes of stone. One large, well-defined quarry (nicknamed

The Amphitheatre) is to be found here. Its floor measures roughly 12 m by 12 m and looks as if it has carried a small garden plot in relatively recent times. Also, appearances may be deceptive. Test Pit C was cut on an apparent spur between two platform quarries. The 'spur' turned out not to be an untouched promontory of bedrock but a pile of redeposited material, including quarrying spalls, which had been placed on a soil which had developed on the flattish floor of the original quarry. This suggests considerable time-depth for the quarrying, in this area at least.

Further north again is the Top Shelf. Though this seems too large and ill-defined to be a quarry, it is hard to imagine a geomorphological cause for the feature as a whole. On balance, it may well be *the largest quarry on the hillside. This is certainly how it appears from a distance.* Another feature, referred to in the field as The Triangle, may also be a quarry, though it does not look like any other. It has a distinct platform below an apparent working face on top of a triangular buttress-like feature. This seems to have achieved its form partly because of erosion gullies which meet at its base. The middle and lower slopes of the hillside contain fewer quarries, and they are usually discrete entities. Still further north is a wide, grassy gully which separates the main ancient quarry area from the modern quarry at Creagan Breac begun by the military in the summer of 1957. An air photograph (F22 58/RAF/2147: 24APR57 – 0054) taken not long before work began suggests that the recent quarry destroyed a major ancient quarry located here, one with a linear, near-vertical face like the ones on each side of The Chimney.

As noted above, many of the quarries just below the top of the hillside occur in lines or linear zones following a north/south axis. This is explicable in geological terms, the dolerite sheets within the Mullach Sgar Complex being orientated approximately north/south along the western side of Village Bay. Contact between the Complex and the Western Gabbro dips steeply at 80 degrees towards the south-west, exposing the full thickness and range of intrusion types, making it easier to locate the fine-grained dolerites (R Merriman, in litt 26 November 1998). A preference for a linear north/south arrangement, in fact, makes it easier to accept the likely antiquity of some of the 'quarries' on the more level ground of Am Blaid. Because these are not like the semicircular 'platform' quarries visible lower down, an observer on the ground is inclined to interpret them as natural features caused by processes perhaps akin to stream-head erosion. However, the occurrence of these features in north/south lines, which emerges strongly when they are drawn on plan, suggests that many of these are probably also quarries, and probably ancient ones, since they seem to represent more quarrying activity than required to construct the local cleits. In this zone the latter are mostly perched on pedestals of blanket peat which has been removed almost everywhere else (see above). At the time of their construction then, much of the surrounding area, including the zones with evidence for quarrying, was probably masked by blanket peat.

In sum, survey confirms a remarkably extensive spread of quarrying in this part of Hirta. Extraction occurred across a wide area, with a limited amount of material perhaps procured from screes and other derived deposits. Using large beach pebble mauls and hammers (and perhaps wedges), people pounded the outcrop surfaces, making use of the natural propensity of the stone to fracture into long slabs or plates. These activities led to the creation of earthworks, overhangs, benches and spreads of worked material emanating from the heads of a number of the screes that can be seen today. The volume of this evidence implies patterns of working of considerable antiquity and duration. There is little evidence from Gearraidh Ard to suggest that the quarries were in operation here in recent centuries. It is worth pointing out the marked contrast in appearance between the Gearraidh Ard quarries and the steatite quarries at Catpund, Cunningsburgh, in Shetland (Turner 1998). The latter, which are known to be mostly of medieval date, are much clearer and sharper than the former.



ILLUS 6 Plan of probable and possible quarries at Gearraidh Ard and Am Blaid. A, B and C indicate sites of excavated test pits. Contours at 5 m intervals

TEST PITS

The locations of Test Pits A, B and C (each of which measured 1 m by 1 m) are indicated on the plan (illus 6).

TEST PIT A

Test Pit A was located on the lower part of a platform which slopes down quite steeply from south to north and forms the top of a distinctive 'buttress'; the grass on the platform is lusher and lighter in colour than the surrounding vegetation. Interpretation of the sequence is as follows. The base of the trench is the top of a high pile of angular rocks, large 'spalls' whose density suggests that they came down from quarries above the site rather than from natural processes of weathering (frost-shatter, etc). (The platform is overlooked by at least two possible quarries, one above the other, and material could also have come down from the Top Crag.) A deep soil (400–500 mm, and in places up to c 700 mm) built up on this pile, presumably under a near-continuous vegetation cover, and in a context where earthworms have been active agents of soil development (several were encountered during the excavation); from time to time further rock spalls fell onto the platform from above, probably as a consequence of natural weathering. The rich brown colour of the soil suggests that leaching was counterbalanced by continuous supplies of soil nutrients and minerals.

TEST PIT B

Test Pit B was dug not far from the front edge of the southernmost of a pair of semicircular quarries on a relatively gently sloping hillside; the rear faces of these quarries are relatively low. The flattish floor of the southernmost quarry measures c 7m from front to back, and also from side to side. The interpretation of the sequence encountered is as follows. A deep soil formed on top of stones quarried, or weathered, from bedrock on the floor of a quarry. Probably some obstruction on the front edge of the quarry prevented soil from washing downhill, and a cover of surface vegetation here may also have aided soil formation processes. There is evidence for the leaching of clay and iron down the profile.

TEST PIT C

Test Pit C was c 5 m north of Test Pit B, on what looked like a narrow spur of untouched 'natural' between two quarries. It was expected that a small pile of quarry waste would be found just below the surface turf here, but this proved not to be the case. The sequence was as follows. A soil developed on a quarry floor, its A horizon represented by a very dark, humus-rich clay, varying from 60 mm to 120 mm in thickness, its B horizon by a mid-brown clay/silt mixture mottled with pockets of yellow clay, c 110–180 mm thick. On this was dumped c 350–550 mm of redeposited quarry overburden which was highly mottled in appearance, containing voids, and stones which were both fluted and spall-like as well as rounded and weathered. Evidently the 'spur' between the quarries is not untouched ground but a linear dump of spoil; clearly there were two quarrying episodes here, separated by the time period required for the buried soil to develop.

STONEWORKING

What form did stoneworking take? How were distinctive flaked stone bars produced and how was this organized spatially? Survey around exposed quarries and screes suggests that once acquired, blocks and plates were often worked down *in situ*. Smaller beach pebble hammers and diminutive flakes in some of these areas are unlikely to relate to the working of the rock face itself. To the south of The Chimney, as elsewhere, people probably sat and worked on the more level margins of particular quarry ledges, the sounds of their efforts echoing back and forth across Village Bay. A similar pattern of *in situ* working was also probably witnessed along lower

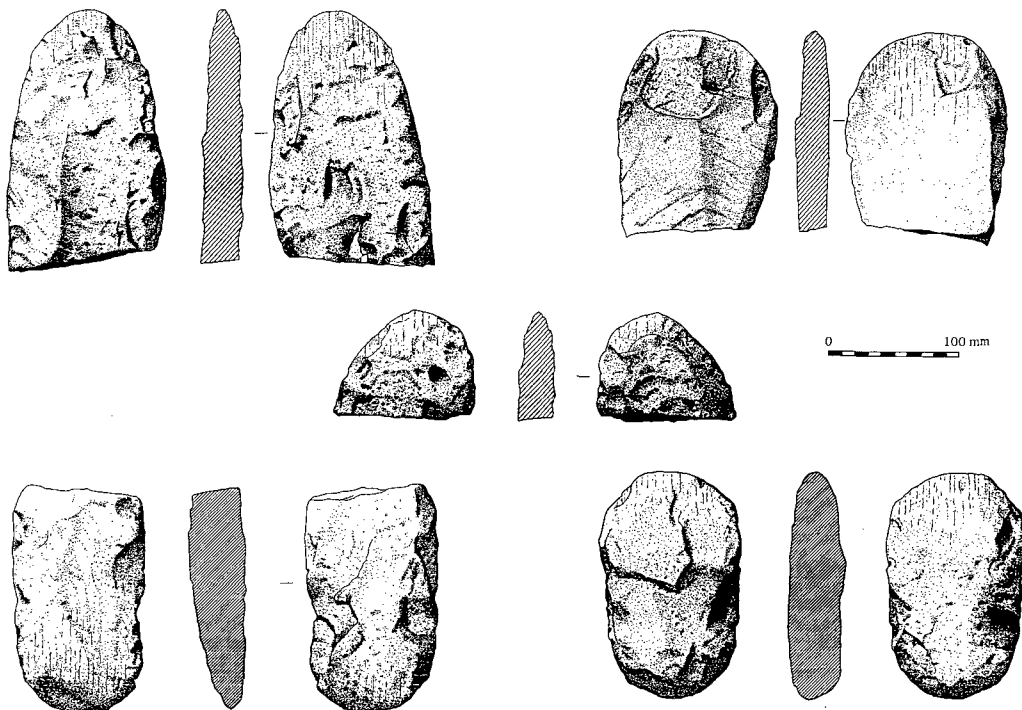
contours, amongst screes and on the margins of exposed material that was ready to hand. Roughouts and plates with limited flaking were also recovered in walls and screes lower down, between Clash na Bearnaich and the supposed site of St Brianan's church (marked as 'St B' on *illus 1*), suggesting that material was also brought down to more level ground where the flaking of implements was completed. Distribution patterns suggest that many implements were then spread throughout the Village Bay area (see below). Some probably moved as more or less finished tools, but many are likely to have required final trimming and shaping, which also took place in the area of the recent village. It is in this zone that we find the examples retaining traces of use — smoothing, striations and impact fractures resulting from cultivation and perhaps other tasks. Most of the implements here were recovered from upstanding structures.

The morphology of the implements on Hirta is sufficiently standardized to suggest a distinctive tradition of stoneworking (*illus 7, 8 & 9*), a set of repertoires involving technical knowledge and skills that cannot be explained as a product of sporadic or *ad hoc* patterns of working. The quality of working on some implements is extremely high, particularly given the stone's poor flaking properties and the persistent, perhaps exclusive use of hard hammers. Most worked stone artefacts identified are 'flaked stone bars' in Rees' (1979) terminology. Many pieces possess a basic symmetry in both plan and section, with parallel sides and lenticular section. The extent of bifacial flaking on many pieces appears to some extent to be a function of the form of the original block or plate. Occasionally, working seems to have amounted simply to adding definition to a pre-existing form. Often, though, working was more extensive and concerted. Numerous bars retain invasive flake scars on both faces, some at least resulting from a pattern of alternate flaking common on large bifacial tools such as axes. Clearly, these were the products of accustomed hands.

IMPLEMENT USE

While most of our samples reflect variations on the flaked stone bar, distinct sub-classes of artefact were identified (see Appendix). Although many tools had clearly been broken during use, size ranges suggest that more than one form was used; this is supported by morphological detail. The dominant forms are roughly parallel-sided (often c 200 mm in length) with heavy wear traces in the form of smoothing and striations. These tend to be concentrated at, or confined to, one end of the implement, but can occasionally be seen on both ends. Wear tends to be far more pronounced on one face rather than equally distributed across both faces. Most of these pieces have shallow, convex working edges, although in a few cases the working edge tapers to a distinct point, perhaps a product of breakage during use. The form, damage and wear patterns on many of these implements are consistent with their use in agricultural tasks, principally as mattock-heads or hoe-blades. The suggestion that many implements were hafted and used in this way is supported by the presence of a few with markedly angular profiles. These pieces display pronounced curves or sharp changes of angle when viewed in longitudinal section, suggesting that they were hafted as adzes or mattocks, rather than axes or spades.

In a few cases, wear traces (again confined to one face rather than both) appear to extend along 50–75% of the length of individual implements. This implies movement of tools through the earth at very shallow angles, perhaps as simple ard points. These implements are morphologically similar to those with wear confined more closely to their cutting/digging edges. Related forms, more ovate in plan, bear similar patterns of wear to the more parallel-sided pieces, usually on their shallower, rounded ends. Following Ann Clarke (*pers comm*), we do not regard these more ovate forms as a separate class.



ILLUS 7 Implements from survey, showing examples with wear traces

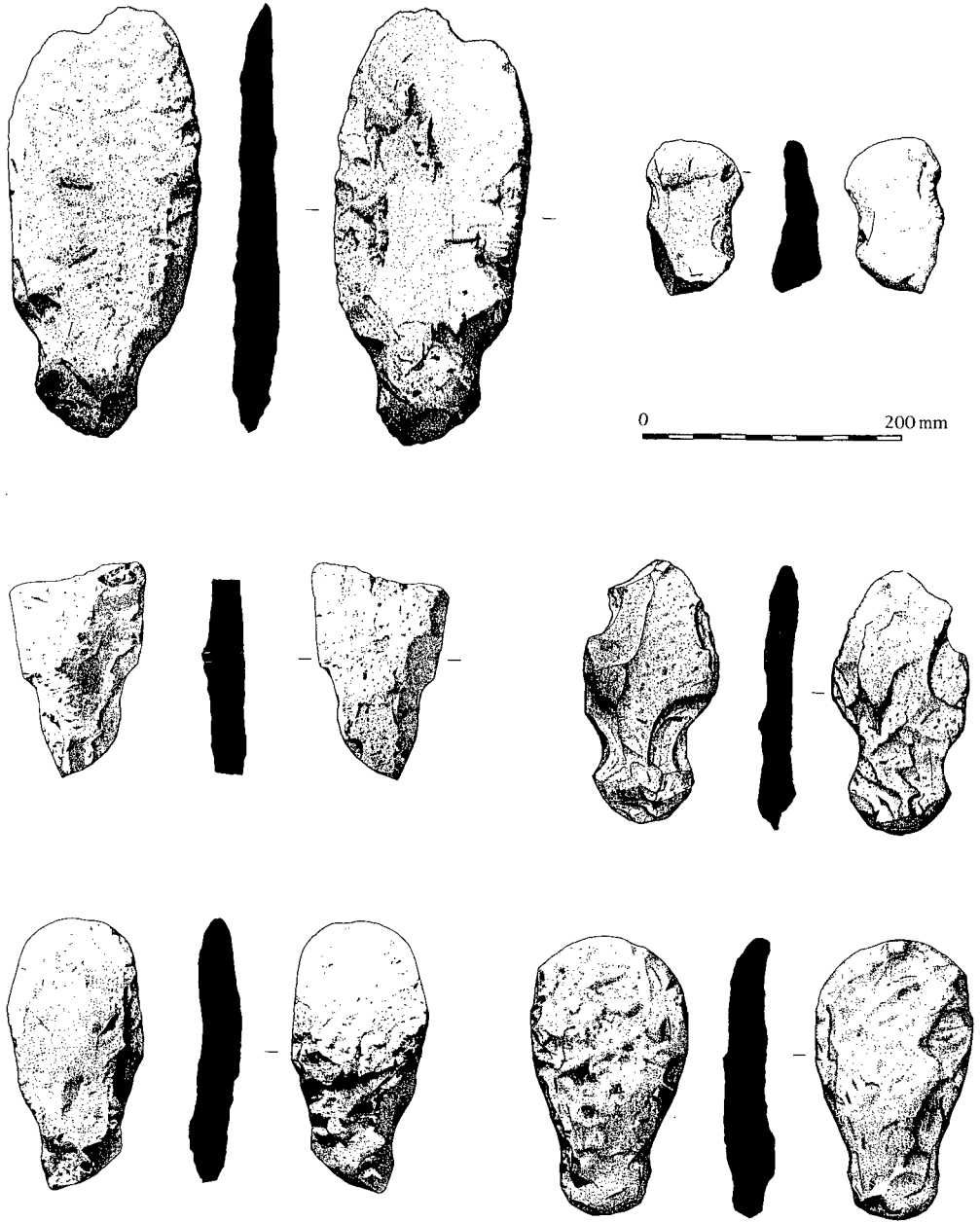
Some implements have butts that have been trimmed rather more extensively, presumably as an aid to hafting. Often broken, with transverse 'endshock' fractures, these pieces take a variety of forms — ovate with rounded working edges, and parallel-sided. A number of implements are closer to being circular in plan, albeit with a distinct hafting tang at one end. These, at least, warrant discussion as a separate class. Their haft ends display a relatively narrow size range, normally between 60 mm and 80 mm, a pattern which may reflect the premium attached to hafts, made as they probably were from wood. Current environmental evidence shows that wood on Hirta would have been virtually non-existent (Walker 1984), though there would have been some driftwood. Demand for wood, including material for hafts and other tools, must have far outstripped local supply, a problem presumably solved at least in part by contact and communication with other people. This last question is difficult to explore. Yet the tight clustering of hafting tang measurements suggests that there may have been many occasions where an implement was shaped to fit a pre-existing haft rather than the other way round. On Hirta's stony ground, the breakage of blades would probably have been a much more frequent occurrence than the snapping or splitting of hafts.

IMPLEMENT DISTRIBUTION

Survey of the Village Bay settlement area investigated cleitean, walls, blackhouses, revetments, 'benches' in front of houses, and exposures of stone in linear banks and clearance cairns (illus 10). It encompassed the main area of the village, within and outwith the 1830 head dyke, and extended upslope to An Lag and The Gap. All recognized implements were plotted, using the



ILLUS 8 Implements from survey



ILLUS 9 Implements from survey, including those displaying hafting tangs

Royal Commission plan (Stell & Harman 1988). Many areas could be sampled at a basic level, though there are one or two where search opportunities were absent, and others where they were plentiful. Since taphonomic processes have clearly varied from area to area and structure to structure, we did not attempt to compensate statistically for these variations in sampling potential. Patterns of distribution reflect a mixture of the spatial extent of ancient cultivation and patterns of later land use, clearance and construction.

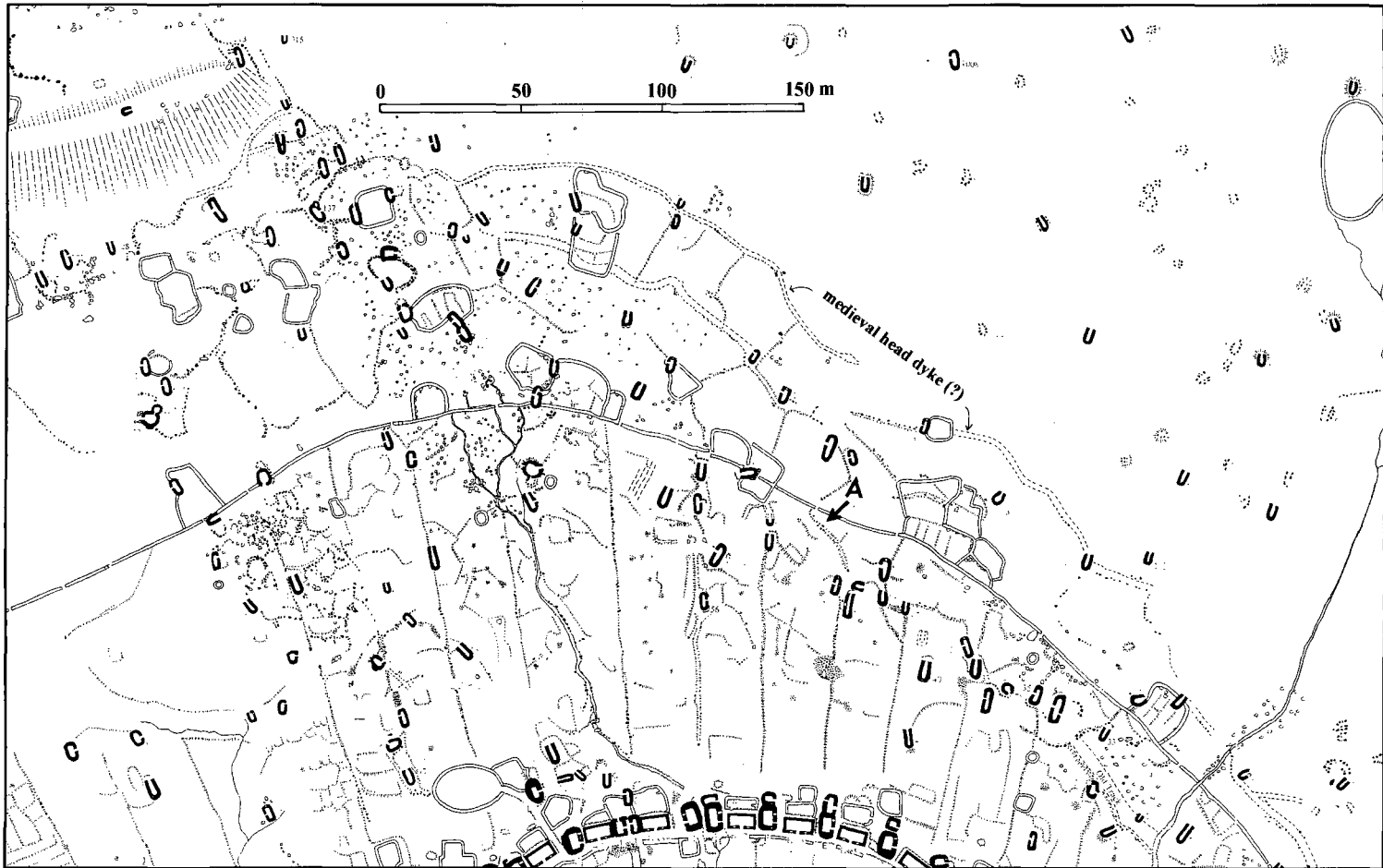
Most of the implements found have been reused as wedges in structures made mostly of granophyre blocks (although granophyre wedges were also used). Many are loose and easily removable, their associated structures having 'settled'. Others are still tightly held in walls and roofs. All were left in place after plotting and measurement. We used a torch inside most of the cleitean. The colour contrast between granophyre and dolerite means that broken hoe-blades are relatively easy to spot, except where there is a heavy lichen cover, and to the west, where structures are made almost entirely of dolerite. The Village Bay distribution plot (illus 11) is divided into areas defined by implement densities.

Zone A areas contain high numbers of implements, which have been moved some distance from their previous locations. The three 19th-century 'consumption dykes' in area A1 contain numerous implements, many probably from the extensively cleared zone immediately to the east (which has no search opportunities). Area A2 mostly represents small-scale tipping by earth-moving machines during Operation Hardrock in 1957; the implement source is presumably the line of the road just to the north, and/or the military base zone. In this area, implements are well represented right up to the edge of the sea, as indicated by their recurring presence in the low 19th-century wall on the cliff.

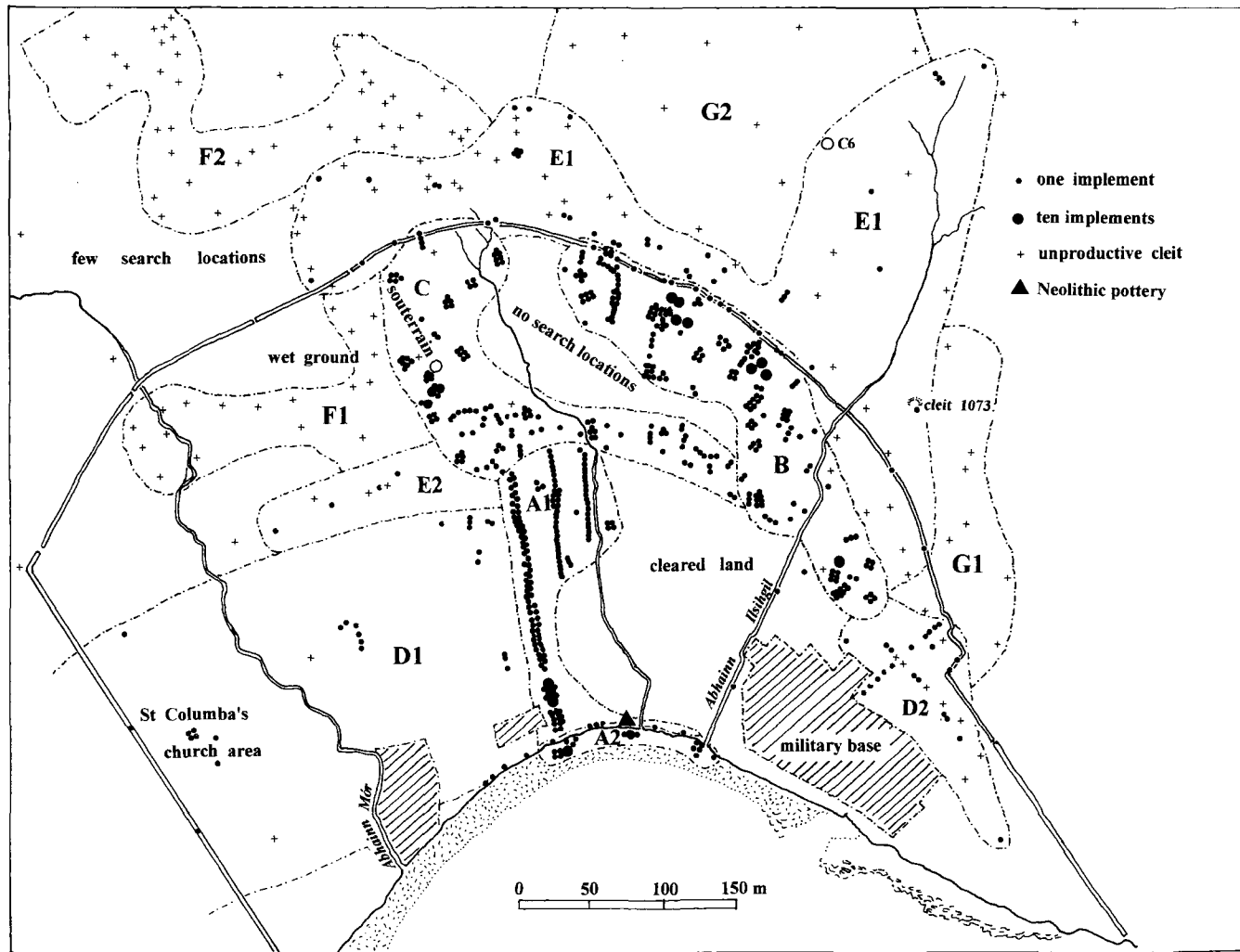
Zone B is an area of high density, where there is reason to believe that the implements are derived locally. Most of the finds come from cleitean erected on well-drained, exposed positions on massive old field-banks, which have been robbed for stone and had their tops levelled in places to accommodate these corbelled structures. It is likely that the dolerite implements derive mostly from such destroyed field-banks (illus 10). Most or all of these distinctively large cleitean were probably erected in the mid 19th century, as drying-sheds on crofts with fixed boundaries. The alternative hypothesis, that the broken hoe-blades mostly came from clearance of garden surfaces onto temporary stone-heaps, is less well supported given that most 19th-century gardens would have been raised beds, or in 'plantie-crues', fed mostly by compost, without much disturbance of the lower soil horizons (MacDiarmid 1877, 243; Buchanan 1983, pl 13).

Zone C Here, implements are still numerous, though their density is lower than in areas A and B. Here, their provenance is variable and not very well understood. Those around the cottages and blackhouses might have come from the levelling of building-platforms in the 19th century, the destruction of old field-banks, or from gardens. Many of those found near the souterrain probably come from the souterrain itself, the product of various excavations. The souterrain area also produced numerous fire-cracked stones. Almost all the fire-cracked stones observed were encountered in area A1 and zones B and C, and one has to wonder whether a burnt mound, or mounds, once existed here, perhaps not far from the burn flowing from Tobar Childa.

Zone D In areas D1 and D2, implement numbers are low, and there are few search opportunities. However, where such opportunities occur, it is notable that implements are represented; there is no reason to suggest an 'original' lower density in the D areas.



ILLUS 10 Part of Royal Commission plan of Village Bay settlement. Note excavation site (A) and 'boat-shaped structures' (beyond 1830 head-dyke).
(Royal Commission on the Ancient and Historical Monuments of Scotland © Crown copyright — based on OS mapping)



ILLUS 11 Distribution plan of Village Bay, showing distribution of implements and zones defined by taxonomic factors (Based on Stell & Harman 1988)

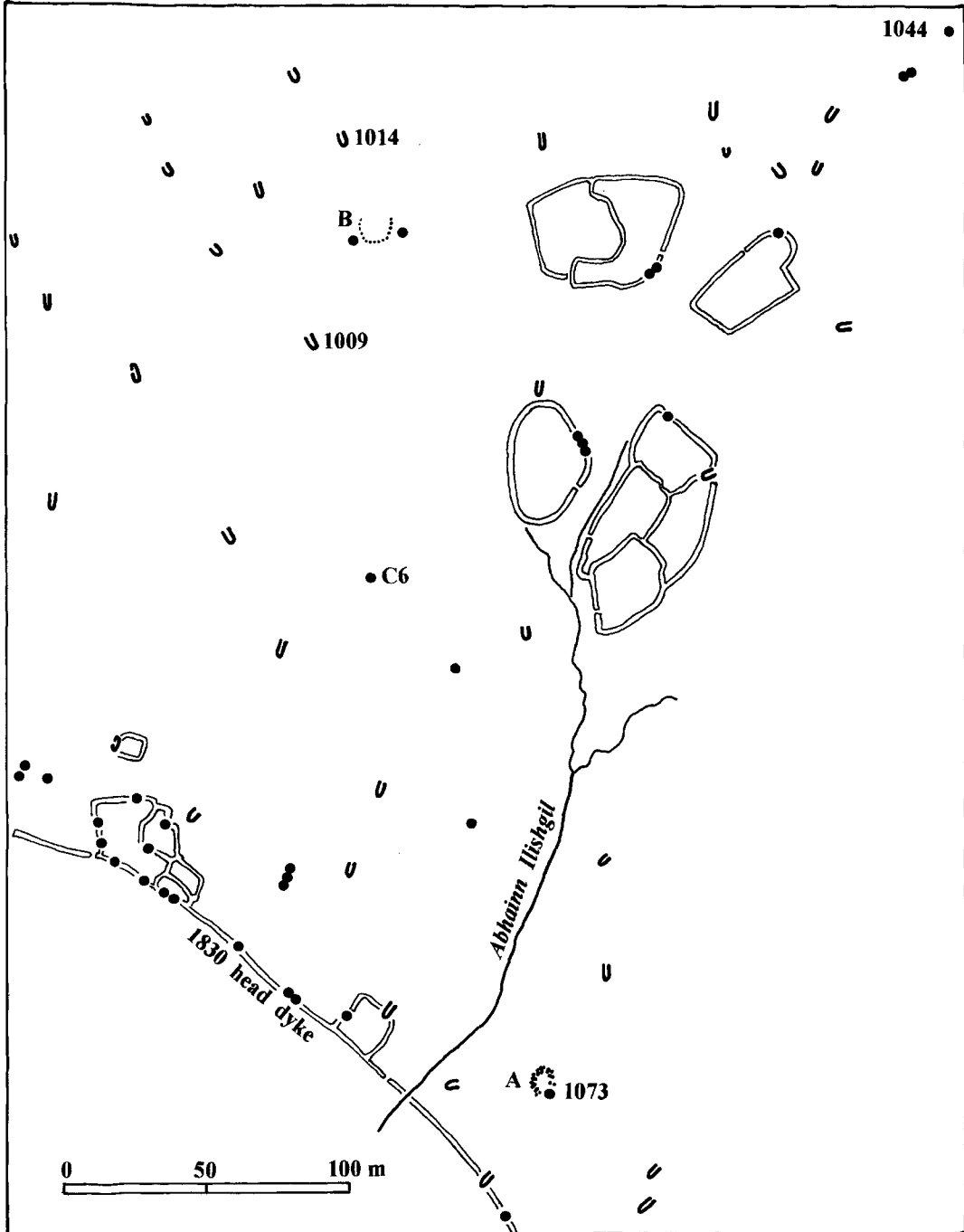
Zone E Areas E1 and E2 display low numbers of implements in relation to the number of search opportunities. In the case of E1, this is surprising at first sight; the western lobe of this area, around Tobar Childa, is comparable to zone B in that numerous cleitean are perched on old field-banks. The explanation may be a composite one. It seems that, in this area, stone for local cleit and wall building came not so much from demolished field-banks as from blocks and slabs broken up locally (many chocked-up examples are still visible on the slopes just above the head dyke); some stone may have come from quarried screes above the nearby protalus rampart at the foot of Conachair. But it is also possible that fewer hoes were actually used in the past on the relatively steeply sloping land around Tobar Childa. Area E2, the western end of the street, is also poorly supplied in relation to the number of search opportunities. It will be noted that this end of the street lies outwith the Tobar Childa field system; comparison may be made with the street zone further east, which does apparently lie within a zone of old field-banks, extant or destroyed. The apparent absence of the Tobar Childa field system in area E2 may perhaps be explained by the wet ground further north.

Zone F These areas have reasonable numbers of search opportunities but have produced no implements. F1 lies outside the Tobar Childa field system and very close to wet ground, the edge of which is closely respected by the (19th-century?) cleitean. Either there was no ancient cultivation here (possibly because of local drainage factors), or such cultivation did not produce walls which could later be robbed for stone; in any case, the stone for these cleitean was evidently taken from a source which did not include broken implements. F2 is problematic because it has produced no implements despite lying within the Tobar Childa field system and containing cleitean which are mostly perched on or beside the walls of that system. It is not clear whether the absence of implements is because stone for the cleitean came mostly from the nearby screes, because fewer hoes (or none at all) were used here, or because these stratigraphically late fields post-date the use of stone hoe-blades. The first explanation is perhaps the most likely given the physical appearance of the cleitean in this zone.

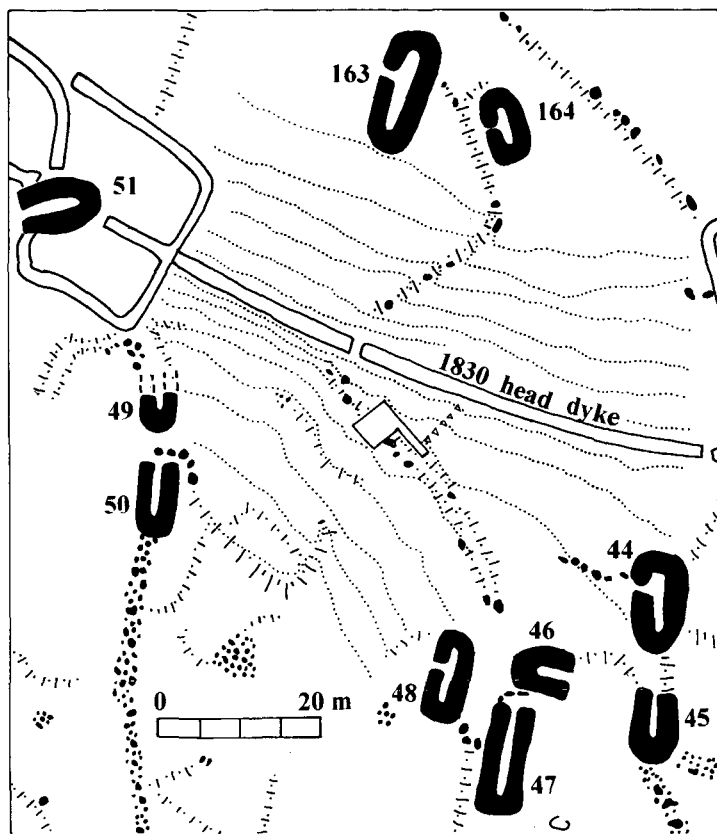
Zone G Areas G1 and G2 have low numbers of search opportunities, and no implement finds.

Head dyke In view of the assertions made above about the relationship between broken hoe-blades and the Tobar Childa field system plotted by the Royal Commission, the distribution of implements along the 1830 head dyke is worth noting. The field system apparently dies out in the western part of the 19th-century crofting zone. This is perhaps explained by the fact that the northern part of this area is badly drained, while the southern part, being off the low stony promontory which extends south from the Conachair protalus rampart, probably has deeper soils less in need of clearance. But old field walls resume to the west of the Abhainn Mór, on and to the north of the knoll on which St Columba's chapel is supposed to have been situated (Mathieson 1928a, 124; 1928b) and it is here that broken implements crop up again in the head dyke (as well as in most of the search locations). Thus the occurrence of broken hoe-blades is highly correlated with the local presence of old field-walls, and their absence is associated with land without field walls. This pattern is also maintained along the eastern sector of the head dyke.

An Lag Implements were also found in very small numbers in the walls of the An Lag exclosures, and in cleitean between these structures and The Gap (illus 12). (Just outside the area of illus 12, a line of cleitean extends north-east from cleit 1044 towards The Gap; the first and the third cleit in this line have each yielded an implement.) The explanation for the An Lag implement distribution is not obvious. Much of this area is 'scraped land', which has had both peat and turf removed, and perhaps old walls too; there are a few lengths of ruined wall here which make no sense in their present form. A 'boat-shaped' stone structure, C6 (marked on illus 11 & 12), excavated by the University of Glasgow, contained at least one implement (A Morrison, pers comm). One or two single finds in this zone may hold significance beyond their numerical importance. A possible association exists between implements and small walled enclosures; one occurs in cleit 1073, which has probably robbed a small enclosure (A on illus 12), and two occur on the surface, spatially



ILLUS 12 Plan of distribution of implements and unproductive cleits around An Lag (Based on Stell & Harman 1988)



ILLUS 13 Plan of area around excavation trench (at centre), with local contours at 1 m intervals. Numbers refer to cleits. (Royal Commission on the Ancient and Historical Monuments of Scotland © Crown copyright — based on OS mapping)

correlated with the old-looking enclosure lying between cleits 1009 and 1014 (B on illus 12). In this zone of very low implement density, it is hard to believe that these associations are coincidental.

Although 19th-century patterns of clearance, building and stone-winning have strongly affected the pattern of implement distribution recoverable today, much of that distribution can be treated as a general cultivation signature across the best land of the Village Bay area. More specifically there are good correlations (1) between a high density of implements and the zone where field walls of the Tobar Childa system have been robbed; (2) between the local presence of implements and a definable zone of old 'fields' and 'enclosures' in the St Columba's chapel area; and (3) between implements and small walled enclosures, in areas of low incidence.

When details of implement size or morphology are compared with distribution, there are few signs of patterning. Spatial analysis revealed little or no significant variation; all classes of artefact are distributed widely. The only break with this pattern is a tendency for the more circular implements with distinct hafting notches to be found more frequently in the low-lying ground near the Street. This relatively subtle pattern may be a function of chronology (see below).

EXCAVATION

The distribution patterns discussed above focused our attention on the Tobar Childa field system. Our principal purpose in working here was to explore the relationship between these field-banks and the hoe-blades, examples of which were visible in the few locations where the turf had been



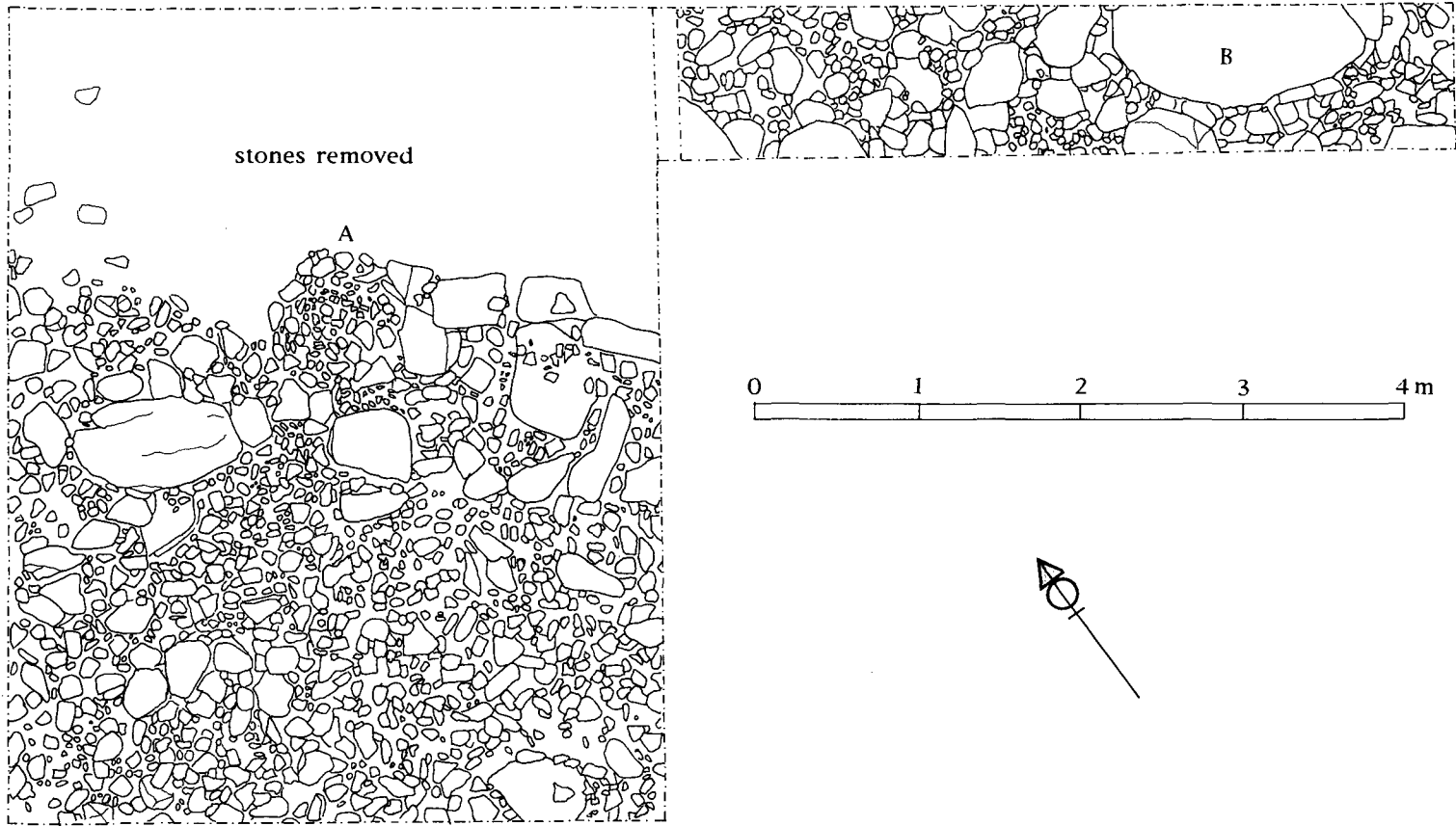
ILLUS 14 Excavation: upper levels of wall from south-east (north face partly robbed out)

lost on these banks. However, it was unclear whether these were integral to the composition of the banks, or represented episodes of much later clearance for relatively recent gardens on the crofts within the area enclosed by the 1830 head dyke.

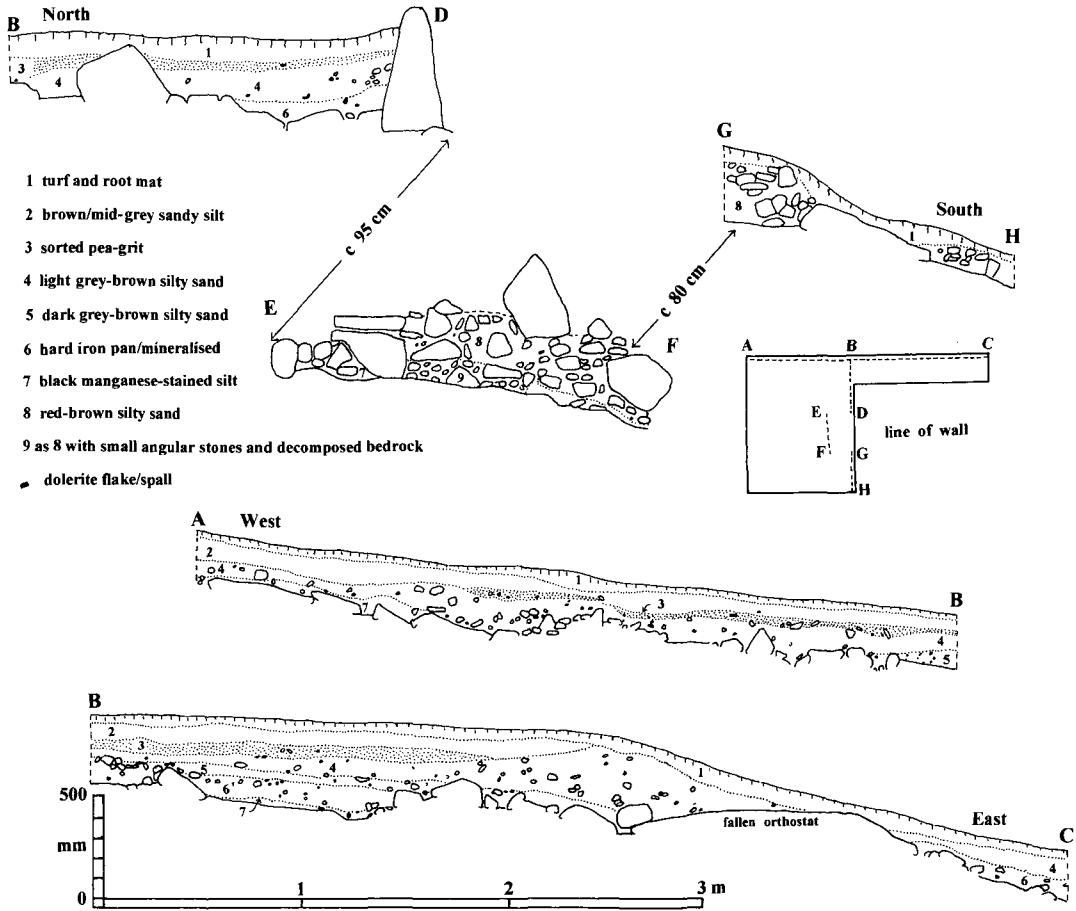
We opened a 4 m by 5 m trench across a relatively well-preserved old field-bank, with *in situ* orthostats along part of its length, but also signs of stone robbing (A on illus 15 is a bed of stones from which an orthostat has probably been removed). An extension ran east from the northern edge of the trench to cut a low earthen bank which could be traced upslope, running up to, and beyond the 1830 head dyke. The trench was located c 125 m ESE of Tobar Childa, just inside the head dyke (illus 13). Excavation established that the field-bank was a multi-phase wall (illus 14, 15 & 16) with associated clearance deposits. Complete and broken stone implements (including small 'impact fracture' flakes) occurred in all phases. To the north was a relatively deep soil, maintained in position on the slope by the wall and by the short, straight bank a little further east. Implements and implement fragments were found at all levels on the southern side of the trench. On the northern side, their frequency increased with depth. Excavation revealed a valuable sequence. The site is located on a slope of some 30 degrees; thin lenses of a dark silty soil directly on the bedrock and beneath the later wall suggest that ground cover here may have been relatively sparse. There was no evidence to indicate the substantive truncation of a pre-existing soil of any depth that would have been capable of sustaining cultivation or rich pasture.

Phase 1

The first phase of activity saw a shallow cut into sloping ground, creating a relatively level surface. This cut was irregular and intermittent. Where large flat earthfasts were exposed by digging, they



ILLUS 15 Excavation trench, upper level plan



ILLUS 16 Excavation: section drawings

appear to have been left in place. This shallow cut formed the base for a level bank of granophyre boulders. These effectively formed a terrace, and created a break of slope. This terrace was revetted on its downslope side by large orthostats designed to keep the face in place. The buildup of material along this revetment suggests both the purposive strengthening of the terrace bank and more casual additions of stone to the line, perhaps over an extended period beyond the initial phase of building.

Phase 2

Some time later, the revetted terrace formed the base upon which a narrow wall was constructed, 0.6 m in width, widening to 0.9 m where it incorporated the large boulder in the western half of the trench. This wall included a 'through' stone near the eastern edge of the trench. It was later thickened on its northern side by the addition of further stones and a series of orthostats leant against it, three of which survived later robbery. In its well-preserved eastern section the wall eventually reached a width of 1.2 m, and originally had numerous small stones in the upper part of its core, some of which remain. As a generalization, the lower stones in the wall were more

rounded and weathered than those encountered at higher levels, which would imply a normal sequence of clearance starting with surface stones and boulders before more angular stones were encountered at lower levels. Upstanding orthostats can be seen elsewhere along this boundary and on others in the Tobar Childa system. Whatever other purposes it served, the wall became a trap for soil moving downslope. Over time, this led to a marked increase in the volume and depth of cultivable soil on its northern side.

Phase 3

A mid-19th-century date for the robbing of the wall is not unlikely given the massive scale of earth and stone movement associated with the improvements of the 1830s. Clearance in the environs also appears to have led to the dumping of material against the revetment on the southern side of the wall. This included fragments of stone implements. Given the nature of this deposit, there is no stratigraphic evidence which can be used to determine whether this material represents clearance activity over the last 150 years or considerably earlier. Further clearance to the north, combined with disturbance of the wall core during robbing, contributed to the tumbling of smaller granophyre stones down the southern face.

Adjoining low bank

The low bank which joins the main wall a little to the east of the trench was investigated by a narrow extension trench. This feature appeared short, straight and stone free on the surface, as if it was the edge of a small, recent garden plot. The presence of 18th/19th-century artefacts in a distinct band of well sorted humic material in this area supports this interpretation. However, the original boundary on this line was a stony bank of 'ancient' type, partly robbed out, but including a large fallen or pushed-over orthostat (B on illus 15, and note its position in section, illus 16). It is clear that this wall originally joined the main (excavated) one, helping to trap soil here long before the recent garden was established. Field observation suggests that before the local stone robbing of c 1830, the wall would have swung slightly north-east to integrate with the field system.

Artefacts

The distribution and stratigraphic relationships of artefacts recovered during excavation add an important dimension to the picture. To the north of the boundary, a small number of 18th- and 19th-century artefacts were recovered soon after the removal of turf cover. Fragments of china, coal, glass and slate were entirely confined to a dark humic horizon c 0.1 m in depth, which lay directly above a thin layer of shattered granophyre and pea grit. It is likely that this latter layer was the base of the recent garden, reflecting the depth to which the soil was generally worked over; 18th- and 19th-century material was not found at any greater depth. The presence of these finds may reflect the application of compost derived from the Street area; alternatively, it may represent the casual loss of material from compost in transit to cultivated ground beyond the head dyke. The distinct band of shattered stone probably represents the inwash of smaller particles of debris generated during the construction of the head dyke immediately upslope. Variably defined in places, probably as a function of worm action, this horizon could be traced along the full extent of the south facing section. The fact that it was also present in the section of our trench extension suggests that the robbing of the wall and the toppling of the orthostat in that area must have preceded its development.

Several sherds of coarse-tempered, handmade pottery were found at various depths in the profile, though not at the base and not in secure contexts within the make-up of the boundary itself. All pieces were heavily abraded. In all cases, inspection with a hand lens confirms that the tempering agent was granophyre; almost certainly, these are fragments of pots made on the island. Unfortunately, it is impossible to determine anything regarding the form of vessels or their date, not least because of the level of abrasion. The recovered sherds closely resemble so-called 'Craggan Ware', which is notoriously difficult to date, but they are also similar to material recovered during the most recent excavations at the souterrain.

As noted above, implements and implement fragments were recovered throughout the profile and on both sides of the main boundary. Examples were also recovered in the make-up of the boundary itself. Various points can be made regarding these distributions. To begin with, a contrast can be drawn between the character of material on either side of the wall. Upslope and to the north, complete hoe-blades occur in some numbers, particularly within the wall and in close proximity to it. Elsewhere, it is common to find pieces of broken blades and smaller spalls and fragments, the latter likely to be the product of impact damage during use. Interestingly, the frequency of these impact spalls, like that of the hoe-blades themselves, increases with depth. This might indicate that the main use period of the hoe-blades lay in the earlier stages of the development of the field system. Alternatively, it may simply show how increasing soil depth after the construction of the wall reduced the potential for damage, there being fewer stones in a deeper and well-sorted soil. On the southern, downslope, side of the boundary, hoe-blades again occur in some numbers. Impact spalls are, however, altogether rare. The reason for this contrast may be relatively straightforward. Much of the make-up of deposits on the southern side of the boundary reflects the later clearance of material from the cultivated ground immediately downslope. This dumping of stone as a precursor to, and a persistent feature of, cultivation would lead to a preponderance of medium to large stones (ie larger than c 100 mm).

Conclusions

Limited though it is, our trench offers useful insights into the character and development of the Tobar Childa field system in this area. The field walls represent a serious investment in land enclosure and clearance. The revetted pre-wall terrace confirms that the land clearers were not simply piling stones casually at plot edges; they knew very well the weight and volume of the stone to be removed, and had a clear concept of the character of the intended wall. That concept was maintained and subsequently reinforced, as walls were thickened over time.

In our view, the density of hoe-blades and hoe-blade fragments confirms that their use was contemporary with the foundation and use of the fields. By the time the later, 19th-century garden plots were established, they were no longer ready to hand. Instead, they were encountered as stone in the soil and cleared accordingly, accumulating on the heaps that built up along plot boundaries and older revetments that remained standing. It seems unlikely that the broken implements are all 'residual' — derived from an agrarian episode pre-dating the establishment of the field system. Such a hypothesis would imply that hoeing with stone blades took place for some considerable time on this slope *without* attempts to make field-walls and clearance banks. It would be surprising to find such a phenomenon on Hirta when in other parts of Britain and Ireland, on much gentler gradients and in more clement climatic conditions, upland cultivators from the Bronze Age onwards ran into clearance problems which led them to create cairnfields, walls, and clearance banks. At present, then, there is a better case for regarding the implements as contemporary with the field system than for believing that they precede it. One further inference

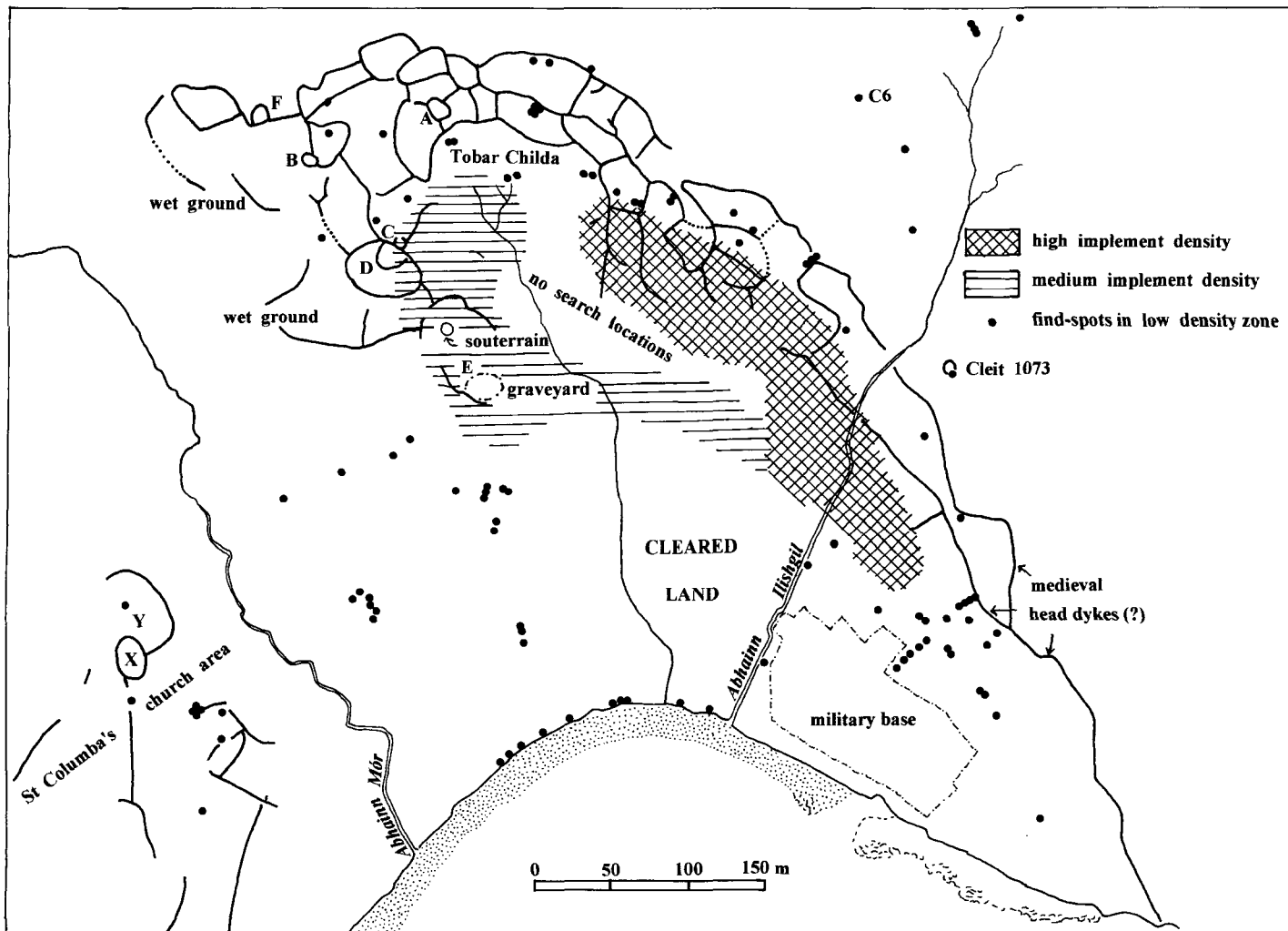
can be drawn. The suggested concern with soil loss implies that, as we might expect, agricultural activity would have been initiated lower down in Village Bay (and we should not forget that a perhaps quite considerable amount of land in this area will have been lost to the sea in the last 4000 years or so). Later a system of soil-trapping walls would have been developed on the stony slopes further north. On the more low-lying ground, with deeper soil, it may have been unnecessary to define cultivation areas with walls and stone banks. This might account for the apparent absence of old field-banks to the south of the Street, except for those on the stony ridge to the south of Houses 10–12. Alternatively, relict field dykes may only have survived in less intensively used ‘marginal’ zones, having been destroyed by more intensive later activity in these low lying, more deep-soiled areas.

FIELD SYSTEMS

There are numerous other places in the Tobar Childa field system where it appears that there are orthostats both in the core of a wall, and along its edge, implying a gradual thickening of walls as clearance problems intensified. On this slope, preventing downslope movement of soil would be at least as important as marking boundaries, a factor which might explain the ‘lobate’ character of some of the land parcels within the field system. Perhaps the surfaces of the ‘fields’ here were never used in a uniform manner, with corn growing from edge to edge. The fields may rather have been nutrient traps, grazed in winter, with gardens at their lower edges fertilized by the downhill transfer of manure, nutrients and soil in the rains of winter and spring. Such a pattern would be potentially ancestral to the high input/high output garden agriculture described for the 17th and 18th centuries (albeit at that time with winter stabling of cattle). According to Martin Martin (1698, 18), barley on Hirta, as well as being the finest in the Western Isles, had a yield-seed ratio of 15/20:1. In the mid 18th century, Macaulay (1764, 33–4) commented favourably on the potential of the arable land, which was ‘rendered extremely fertile by the husbandry of very judicious husbandmen’; barley ripened earlier here than anywhere else in the Western Isles.

We have made our own plan of the Tobar Childa field system (illus 17) published by the Royal Commission. The two plans are broadly similar, but there are a few divergences. We have re-interpreted the ‘trackways’ on the Royal Commission plan as partly robbed-out ‘head dykes’ (Fleming 1995, 33–4). Also, where ‘fields’ seem incomplete on the Royal Commission’s plan, we have looked for and in places identified the remains of robbed-out walls to fill some of the gaps. Our revisions have been essentially minimalist, and some severely robbed-out walls may have eluded us.

This field system is stratigraphically ‘old’; it pre-dates not only the cleitean but also corbelled buildings of ‘Calum Mór’s House’ type (this can be clearly demonstrated in the cases of structures 123, 137 and 142 — see Stell & Harman 1988, 21–3 and endpaper plan). Such structures have been claimed to be medieval, or at any rate older than the houses of the 17th century described by Martin Martin (Williamson & Boyd 1960, 58–66). The field system could also be claimed to be older than the old head-dyke which starts at the point to the east of the Feather Store where it has been truncated by the sea, and splits into two near cleit 1270 (see illus 10). From here, one may follow a lower (earlier?) head-dyke which meets the field system to the south-east of cleit 34, or an upper (the latest?) one which reaches it at or near cleit 167. There seems little doubt that this upper head-dyke is the same as the one which is also cut by the sea on the other side of the Bay (illus 1); originally it would have been just under 2.5 km long. It looks like a Norse ring-garth, separating the *inmark* from the *utmark*, built at a time when the Hirta community must have been well organized and fairly populous. Both of the pre-1830 head-dykes appear to



ILLUS 17 Plan of Tobar Childa and St Columba's church field systems and implement density (Based on Stell & Harman 1988)

be approaching and adapting themselves to the (pre-existing) Tobar Childa field system (though it is possible that the uppermost fields might have been added to the system when the upper head dyke was constructed). If these observations are valid, the Tobar Childa field system, possibly with the exception of its upper tier of fields, should be at least early medieval in date.

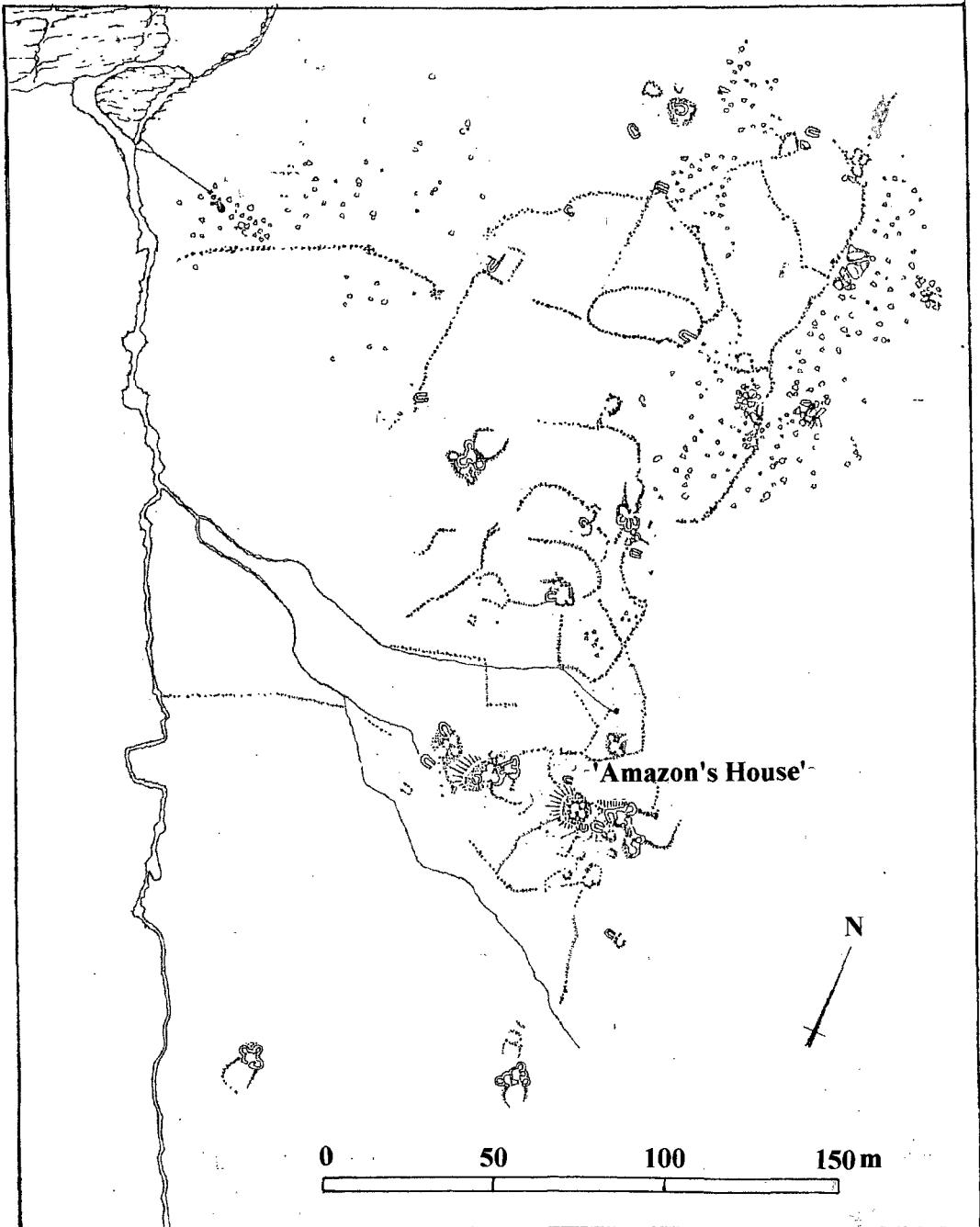
Our plan has simplified the field system into a network of single lines. We may be fairly confident that it did not continue much further west. This is, after all, wet ground, and indeed the southern boundary of the most south-westerly field now impedes drainage and traps peat. The plan might suggest that the area around Tobar Childa was reserved meadow land, enfolded by the field system. This might have been the case, but it is by no means certain; this is a very difficult area to work in. Caution as much as anything has led to a dearth of lines on the plan here. Further east, the field-banks are massive, but have nevertheless been comprehensively truncated.

Despite the fieldwork problems, the Tobar Childa field system displays a distinctive character. On our interpretation it contains three small enclosures, A, B and C, which are primary in terms of horizontal stratigraphy, two larger, ovoid enclosures, D and E, which are also primary or early in stratigraphic terms, and the 'D-shaped' enclosure F. The old field-banks in the St Columba's church area to the south-west also include a small ovoid enclosure X (slighted by the military road) and a large ovoid enclosure Y joined to it. It was suggested above, on the basis of the implement distribution, that these old field-banks are likely to be coeval with those of the Tobar Childa system. Enclosure X is joined from the south by a long boundary running along the contour, perhaps a long 'lower head dyke' like the one running east from the Tobar Childa system. If this is the case, the relationships between long 'head dykes' and 'ancient' fields are comparable both to the east and the south-west of the core settlement area. Both the souterrain and the church which once stood in or near the graveyard were constructed in the space enclosed by enclosure E, and there may once have been a burnt mound here as well (see above). However, it seems impossible to deduce the true chronological relationships between these features from surface inspection or by argument.

The character of the Tobar Childa field system is quite distinctive, with its stratigraphically early enclosures, large and small, and one or two apparently attached ('D-shaped') enclosures. A large and a small cluster of mostly small, curvilinear fields are incorporated into the system as a whole by longer, straighter field-walls of the kind which seem to characterize the western part of the system, and which might be significantly later in date.

The patterns identified in Village Bay may be compared with evidence from the other side of the island. The field system on the east bank of the burn in Gleann Mór (Stell & Harman 1988, 26) shares several characteristics with the one in Village Bay (illus 18). This system also has ovoid enclosures which are apparently primary in terms of horizontal stratigraphy, and a couple of relatively long, straight walls which seem to be 'late' in those terms. It is also clear that the walls of the field system pre-date structures of the type characterized by the 'Amazon's House', which was described by Martin Martin (1698, 15) as occupied in summer 'though it be some hundred years old'; there is no obvious relationship between the fields and the clustered and corbelled structures of the type represented by the Amazon's House. A search of the structures within this field system has revealed no implements, though perhaps this is not surprising, given that there is not much evidence that the builders of Amazon's House type structures robbed out the field system's walls. The abandonment of the Gleann Mór 'fields' may have been followed by a permanent shift to summer pasture land here.

There are two small enclosures not far away from this field system, further upstream and on the east bank of the burn. The nearer one is ovoid, measuring c 21 m by 18 m. It is rather obvious in the field, and from above looks like part of a stone circle. The other is best seen looking



ILLUS 18 East Bank field system, Gleann Mór (*Royal Commission on the Ancient and Historical Monuments of Scotland* © Crown copyright — based on OS mapping)

down from the path going up to Am Blaid; it is about 15 m in diameter, and more overgrown with peat than the one mentioned above. These two small enclosures not far from the field system are comparable to the two on the slopes above the Tobar Childa system, towards An Lag, one c 12.5 m in diameter (enclosure B, *illus 12*) and the other c 11.5 m by 7.5 m near cleit 1073 (enclosure A, *illus 12*); both of these are associated with stone implements. They are also comparable in size and character to some of those within the Tobar Childa field system. Here, enclosure X measures c 22.5 m by 19.5 m, enclosure A (which has been replaced by the enclosure at the Bull's House) about 13 m across; the others are smaller.

To summarize, the Tobar Childa field system and the field-walls and enclosures near the 'St Columba's church' site are morphologically similar and are both associated with broken hoe-blades. They have comparable near-circular and ovoid enclosures in and near them. The Tobar Childa system and the Gleann Mór East Bank system are also morphologically similar, and have small enclosures near them (and within them, in the case of Tobar Childa). They can also be shown to be earlier than structures of 'Calum Mór's House' and 'Amazon's House' type respectively. This means that they are likely to be pre-medieval in date, and possibly significantly earlier. Just how much earlier is difficult to determine.

At this stage in our research, it seems best to be somewhat circumspect about the date of the field systems. However, given the associations and suggested dates for many of the hoe-blades (see below), we should certainly entertain the possibility that the fields and their incorporated and outlying enclosures belong to a Neolithic/Bronze Age horizon of activity on the island, perhaps extending into the Iron Age. In that scenario, a well-occupied Hirta would have had two settlement zones, with the lesser one in Gleann Mór. The use of this glen as a summer pasture for the Village Bay settlement may have developed later.

DISCUSSION

It remains to discuss the chronology and duration of stone tool production and use on Hirta. In the absence of absolute dating, these questions can only be approached via circumstantial evidence. So far, this suggests that we may be dealing with two distinct traditions, one prehistoric, the other rather more recent.

As noted earlier, the form, pattern of working and character of wear traces on the majority of implements makes them closely comparable with 'flaked stone bars' (Clarke 1994; Rees 1979). These tools are well represented in the Northern Isles, where they were made, used and discarded during both the Neolithic and Bronze Age. Examples also occur there in the fabric of Iron Age stone structures, perhaps selected for use in building some time after they had originally been made and used. Such implements are altogether rare in western Scotland. However, the close resemblance suggests a comparable date for many of the tools identified on Hirta.

Other lines of evidence add weight to this idea, particularly where associations can be traced between implements and other features. As outlined above, hoe-blades are associated with field boundaries that are clearly older than both the cleitean and structures of 'Calum Mór's House' type. Implements were also found in the souterrain, where excavations were undertaken by Sands in 1876. According to the records that survive (Sands 1877), he entered the structure through the roof, believing that he was using an original entrance. This was probably a gap which had opened up due to the collapse of one or more of the lintels, perhaps the event which led to the re-discovery of the souterrain in about 1844, after which it was apparently covered over again until Sands' time (*ibid*, 186). Theoretically, broken implements might have fallen, or been cleared, into the souterrain through this gap between the roof lintels. Indeed Sands (1877, 187) wrote: 'I imagine

that the hole in the roof was the original door, because I found a number of stone implements lying around it, above the stones and under the soil.' The following year (1878, 78) he described 'stone axes stuck around the aperture in the roof, from which I had concluded that this had been either the door or the chimney: at all events, that it had been open when the house was occupied.' In neither account, unfortunately, does the text make clear to what extent the implements were intrusive, built into the walls, or found stratified in the floor deposit which consisted of 'a foot or more' [c 300 mm] of peat ash (1878, 78). In Sands' second (1878) account he claims that he also found 'the kitchen-midden of the establishment' nearby 'which contained a large quantity of the same refuse as I found on the floor, including a stone implement or two, and some fragments of pottery'.

The uncertainty about the precise context of the implement finds at the souterrain may result in part from the fact that Sands was relaxed about questions of dating, since he believed that stone implements had been in use in relatively recent times. There are several reasons why this idea may have had its attractions at the time (see below), but a case can still be made that the implements in and near the souterrain are at least Iron Age (in the broad sense) in date. It is not unlikely that they would have been discovered by the builders of the souterrain in the trench which they dug to contain it, and also in nearby field-banks, if they robbed them for building material. They may well have been reused as wedges in the walls of the souterrain, which might be the best interpretation of Sands' remark about them being 'stuck around the aperture in the roof'. One or two examples wedged so firmly into the fabric of the structure that they must be intrinsic to its build can still be seen today (implements were not used in the conservation work that accompanied more recent excavations on the souterrain: R Ritchie, pers comm). This evidence does suggest that some of the hoe-blades are at least as old as the souterrain.

The relationship between stone implements and the Tobar Childa and St Columba's church field systems has been outlined above. It was also suggested that the Gleann Mór East Bank field system should be provisionally dated to much the same chronological horizon. It is, however, unclear how far morphological similarities between these field systems and others found in northern Scotland might be used to draw chronological conclusions. In the Western Isles, sub-peat field walls have been investigated in recent years at Sheshader and Callanish (Lewis) and at Bharpa Carinish and Loch Portain (North Uist) (see Mills *et al* 1994 for a summary and references). These have been roughly dated by radiocarbon to the first half of the first millennium BC. However, it is not clear that these walls relate to arable activity, let alone 'fields' or 'field systems', and there is little reason to link this emergent horizon to the field systems of Hirta. A closer parallel to the latter occurs on the isle of Canna in the Inner Hebrides. Here, recent work carried out by the Royal Commission (J Stevenson & A Gannon, pers comm) has revealed small sub-rectangular 'huts' and more conventional 'hut-circles', associated with field systems which include small curvilinear enclosures and stretches of wall of varying length. Neolithic Unstan ware has been found in six locations on Canna, though not as yet at any of the main field system/hut sites, which the Royal Commission's investigators regard as prehistoric.

Although we do not know of field systems in the Northern Isles which are comparable to the Tobar Childa field system, it would not be difficult to find parallels for the Gleann Mór East Bank fields in Shetland, where there are many unrecorded pre-peat field systems and boundary-walls. At sites like Scord of Brouster (Whittle 1986) it has been established that some of these date to a Neolithic/earlier Bronze Age horizon during which stone-bladed hoes (and ards) were in use. In other words, good parallels for the walled fields, like those for the hoe-blades, occur in a Neolithic/Bronze Age context in the Northern Isles. (Morphological arguments have their

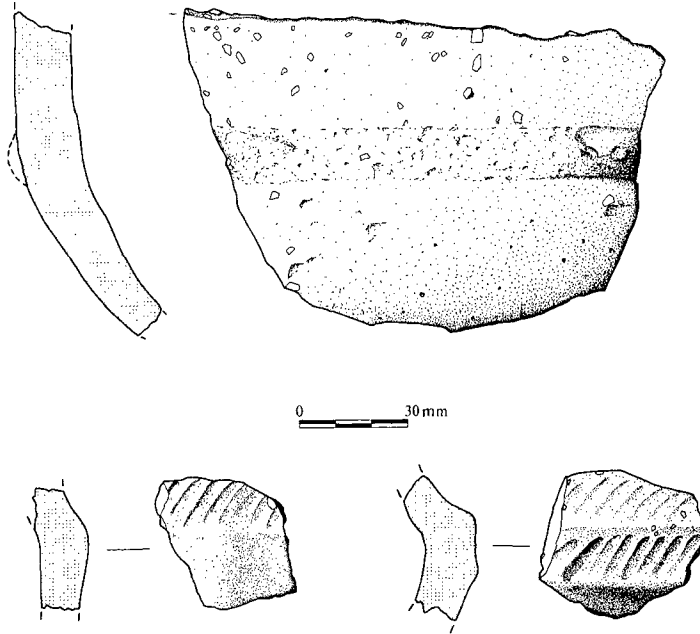
limitations, however; the 'Early Christian' fields and enclosures of north Antrim in Northern Ireland (Williams 1983) are also not unlike those on Hirta.)

On Hirta, direct evidence to corroborate this dating has not yet been obtained. The physical appearance of the Gearraidh Ard quarries, as well as their relationship to cleitean, and the soil evidence obtained from test-pits A and C, suggest some considerable antiquity for them. The evidence from the souterrain excavation may also imply a pre-Iron Age date for the implements. There are, however, further lines of evidence to consider. A Neolithic and later human presence can certainly be attested on the island. Inspection of cliff sections in Village Bay in 1996 resulted in the discovery of several sherds of coarse-tempered pottery, including two distinctive incised rims of 'Hebridean Ware' (illus 19), with a dolerite flake, complete with dorsal scars and trimmed platform, in direct association (for location, see illus 11). The find-spot is not very far from the 'subterranean cell' discussed by Stell & Harman (1988, 49) who note Mackenzie's (1905) accounts of 'very numerous' 'fairy mounds' cleared away during the Improvement period; apparently they covered both stone cists and small corbelled chambers, most containing pottery and a few containing bones. Stell & Harman refer these to the Bronze Age. On his map of St Kilda, Mathieson (1928) marked 'stone coffins found 1835' just south of House 9, and 'underground chamber found 1835' in the central of the three modern enclosures to the north of the modern church (probably this is the one 'at the foot of Oiseval' described by Mackenzie 1905, 398). There is thus reasonable evidence for Neolithic and/or Bronze Age occupation, irrespective of the date of the stone implements.

Further hints of an early horizon for occupation can be found in the palaeoenvironmental evidence, and it is interesting to read Walker's comments on his Gleann Mór pollen diagram (1984, 107–8). Pointing out that the consistent record of *Plantago lanceolata* begins shortly after c 5800 BP (uncalibrated radiocarbon years), he noted that the first consistent records of *Plantago lanceolata* at Murraster (c 5350 BP) had been taken by Johansen to reflect human immigration into Shetland. Although in 1984 Walker was unable to cite evidence for Mesolithic or Neolithic occupation phases on Hirta, it now seems reasonable to draw the same inference for the early *Plantago* horizon on Hirta.

The evidence, then, would be consistent with a Neolithic/Bronze Age date for most of the Hirta implements, but does not compel its acceptance. However, the alternative scenario — that the majority of the implements date from some time in the period from the Late Bronze Age to the earlier Middle Ages — seems more problematic. Such a hypothesis would have to explain how a self-confident stone-working tradition suddenly started up on Hirta some time after the demise of a closely comparable tradition in the Northern Isles. It makes little sense to explain this as a function of the archipelago's isolation, a factor which is often over-played in the St Kilda literature. In the time of Martin Martin, for instance, 300 years ago, the islanders were not particularly 'old-fashioned' or different from other Hebrideans; indeed, the community was firmly bound into the larger social, political and economic sphere represented by the MacLeod chiefdom (Fleming 1999). Furthermore, there seems no strong reason to postulate a regional dearth of iron for making agricultural implements in the Iron Age. The larger 'wheelhouse' at A' Cheardach Bheag, at Drimore on South Uist, which was dated to the 'Romano-British' period, produced an iron ploughshare and accompanied an iron-working furnace during the early part of its existence; the excavator pointed out that iron slag had been found at five other Hebridean wheelhouses, the necessity of using peat as a fuel evidently proving no problem (Fairhurst 1971).

Thus the balance of the argument and available evidence suggests a date for the bulk of the implements in the Neolithic/Bronze Age. Some of them, however, may be inventions of yet more recent date. There is certainly evidence which may support this idea. At the time of Sands' visits,



ILLUS 19 Pottery recovered from sea-cliff, including two sherds of 'Hebridean' ware

the implements found in the souterrain were recognized as '*Sean làmhòg, sian sgian*' (Sands 1877, 187). Sands believed that the St Kilda stone implements had been used 'at a very recent date' and recorded that 'one man told me he had seen a long thin stone used to fell oxen' (1877, 187, 192). Earlier, Neil Mackenzie, minister on St Kilda between 1829 and 1843, had observed the 'primitive' nature of the cultivation implements in use at the time. Noting the inadequacy of the *caschrom*, he pointed out: 'they have to go over the ground a second time using an implement which they call *Caibe*. It is hoe shaped, like a carpenter's adze, but very much heavier' (Mackenzie 1911, 8). There is an earlier suggestive reference: Martin Martin's account (1698, 70–1) mentions how Roderick the Impostor, a charismatic incomer who claimed to speak for St John the Baptist, encouraged the community to slaughter sheep, not with their metal knives, but with their 'crooked spades', with blades 'almost half an inch thick'. The fact that blades and shafts are differentiated, and that a distinction was drawn with metal, may imply that people at the time were using stone in this way.

The fact that these references are sparse and mostly vague is not necessarily significant; most visitors arrived in summer and stayed for a short time. They would not have seen the preparation of gardens. On the other hand, by the 1870s the St Kildans were quite accustomed to putting on performances for visitors and telling them what they wanted to hear. One cannot rule out the possibility that a visitor with antiquarian interests had identified the 'old axes' and told the islanders about them not long before Sands' visit; after all, prehistoric stone implements from the Northern Isles were apparently first publicized in the 1860s (Petrie 1868; Mitchell 1868). On the other hand, these references are interesting given the clustering of distinctively circular or markedly ovate blades with hafting tangs in the vicinity of the 'Street'. Despite their similarities to the 'handled clubs' of the Northern Isles, themselves apparently prehistoric in date (Rees 1979), the presence of these forms may perhaps relate to a second, much later tradition of stone

tool use on Hirta. This is difficult to test, and the patterns are by no means exclusive. Parallel-sided pieces were also recovered during excavations in and around the blackhouses (Emery 1996). However, it remains possible that many of the more spade-like forms date to the centuries leading up to the visit of Martin Martin, and that the shape of these implements reflects familiarity with the form of metal blades. Production in stone at this later date would perhaps have been a response to fluctuating supplies of iron tools or the periodic absence of a smith. But almost every time people turned the earth and encountered the tools broken by their ancestors, they would have been reminded of old stone-working traditions. So it is possible that the practice was taken up anew without an external stimulus, as the re-invention of a way of working, or the legacy of a tradition that was never entirely forgotten.

FURTHER IMPLICATIONS

If the potential of the archipelago actually favoured settlement during prehistory, what of its location? The idea that St Kilda's 'remoteness' would necessarily have had an adverse effect on its cultural development derives largely from a modern, mainland, perspective. For many 'small-scale' island societies, water is a familiar and routine medium for contact across broad social geographies (Gosden & Pavlides 1994). As Dodgshon (1998, 12) points out: 'the survival of communities on such sites cannot be rationalised by treating them as remote or isolated settlements surviving on the edge of a much larger and wider system *and as handicapped by that fact* [his italics], but by seeing them as sufficient unto themselves or as communities that functioned within a relatively localised network of relations. Such sites only became remote when the pressures of modernity forced them into the framework of a national economic system.'

Other 'remote' islands in northern Scotland were settled at comparably early dates, among them Fair Isle (c 40 km north of North Ronaldsay in Orkney), where there is evidence for pre-Iron Age occupation, in the form of sites such as the Ferny Cup and several cairns which are likely to have contained prehistoric burials (Hunter 1996). On Foula, some 20 km west of Shetland, there is also evidence for pre-Iron Age occupation in the form of a probable small megalithic tomb near Harrier at the north end of the island, and a field system of prehistoric type, three skyline-sited cairns and a quartzite industry at the southern end.

The idea of routine, seaborne communication during later prehistory is by no means a new one; it is often acknowledged that among the islands, as on the mainland, our evidence reflects the interweaving of local traditions with more far-flung ideas and artefacts. Parallels can be drawn across the Irish Sea, between wedge tombs and similar structures in the Western Isles (Branigan 1997); Antrim flint artefacts occur in Scotland (Sharples 1992; Sheridan 1992) and Cumbrian axes in both Scotland and Ireland (Cooney & Mandal 1998; Kinnes 1984). Similarities in artefact form can also be seen across broad areas, in ceramics as well as stone (Armit 1996; Wickham-Jones & Collins 1978). Though prestige goods network models (Bradley 1984; Clarke *et al* 1985) have their place, it is likely that the playing out of a very wide variety of relations within and between communities contributed to these patterns (Edmonds 1998). For much of later prehistory, Hirta was probably one place amongst many, visited and settled by communities who recognized that the world extended beyond the local horizon.

An obvious issue arising from our work concerns the relationship between Hirta and the Western Isles. The presence of sherds of distinctive 'Hebridean ware' on the island confirms that there was contact as early as the Neolithic, just as there was at later dates. What remains to be determined is what form such contact might have taken. In immediate, practical terms, it is easy to envisage a demand for various resources, not least the timber required for hafts and other

purposes. There are also the imperatives that arise from the maintenance of customary ties of obligation and affiliation that often run back and forth between communities. It is, however, difficult to trace these possibilities in the evidence. In particular, it is hard to establish whether dolerite hoe-blades ever left the island during the Neolithic or indeed in later periods. Given the poor potential of the pre-Cambrian gneiss which forms most of the available rock on the Western Isles, a certain amount of movement might be expected. But at present there is no evidence to suggest that dolerite implements ever made this journey.

There may be several reasons for this. One possibility is that we have not had sufficient opportunities to sample the record in the Western Isles, where prehistoric land surfaces are often masked by peat or machair. However, there are no records of dolerite implements in the 'impoverished', often quartz-based, assemblages of the Neolithic and Bronze Age identified so far (Armit 1996). A further possibility is that some of the land upon which imported hoe-blades were used has since been lost. This may be implied by the work of Ritchie (1985), who noted numerous occurrences of inter-tidal and sub-tidal organic deposits on the Uists and Benbecula. He argued that from c 8900 BP to c 5200 BP, mean sea level was about 5 m below that of today, but rose fairly rapidly thereafter (for example, a major change from organic deposits to blown sand on Pabbay was dated to c 4400 BP).

Alternatively, the absence of evidence may indeed be evidence of absence. With this idea in mind, it is interesting that in the Northern Isles there is little to indicate the extensive circulation of hoe-blades, which suggests either a lack of demand, or the existence of conventions for exchange that precluded their use in this way.

The source of wood for hafts for the Hirta hoes poses further difficult questions. It is now clear that, contrary to some earlier suggestions, there was indeed woodland on the Western Isles during the Neolithic (Armit 1992, 6–9), but not a great deal is known about the timing of its decline or how such a decline may have been mitigated by management practices operating within varying conditions of exposure and shelter. According to Armit (1992, 9) 'from the end of the Neolithic, timber was becoming, if not a scarce resource, at least one which required increasing effort to obtain'. It is an interesting question how far the Neolithic St Kildans were able to conserve their hafts carefully, supplementing them with driftwood from time to time, and how far they increasingly found it expedient to maintain relationships with people beyond the Long Island.

FUTURE WORK

Given the nature and scope of our work on Hirta, it may be better to conclude with questions rather than answers. Our research so far has demonstrated the existence of a substantial amount of stone extraction on the island, and traditions of stone tool use associated with the working of land during prehistory. Survey and excavation suggests that the use of these tools was related to the development of field systems still visible. The precise chronological range of this tradition is as yet unclear, and the complexity of the problem is compounded by the possible re-invention or resumption of the practice of working stone to similar ends in the post-medieval period. However, the evidence for a Neolithic and later prehistoric human presence on the island is compelling.

Various lines of enquiry might be followed to explore the implications of the arguments put forward here. Occasional finds during the course of our survey suggested that not quite all of the dolerite working on Hirta related to the production of large implements. Without doubt, there is a clear need for further environmental studies on the island. Work on cores from surviving peat deposits is currently under way (J Huntley, pers comm), but it will also be important to sample

relict pollen from sealed archaeological contexts, and to undertake a related programme of detailed soil micromorphology studies. Prime targets here would be the older field systems and enclosures in Village Bay and Gleann Mór, as well as buried soils evidently available at some sites among the Gearraidh Ard quarries, and perhaps peat deposits within undercut quarries such as the one half-way up The Chimney (cf work at the Mount Gabriel copper mines: O'Brien 1994). As noted earlier, extensive geophysical survey may also prove valuable, particularly in Village Bay. Resistivity and magnetometry would also have an important role in determining locations for excavation, particularly on the more level ground below the 'Street' as well as in other settings. Above all, the further understanding of prehistoric activity on the island will depend upon the retrieval of material for absolute dating; the possibility of developing a tephrochronology might be worth exploring in the longer term. The case for dates on various features in Village Bay is just as strong for sites in Gleann Mór. In the absence of secure dates, the relative chronologies suggested by landscape stratigraphy will continue to float.

We hope that the work described above has improved understanding of the prehistory of St Kilda and has raised some questions about its long-term history. We also hope that in adopting a landscape perspective, we have begun to identify a framework for the further exploration of the history of this remarkable archipelago.

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APPENDIX

TECHNOLOGICAL AND SPATIAL ANALYSES OF STONE IMPLEMENTS

Introduction

This appendix gives a descriptive analysis of the implements recovered in the context of surface survey and excavation conducted for this project. Tables summarizing the qualitative and quantitative characteristics of implements and implement fragments form part of the project archive. These tables form the basis for a short discussion which adds a measure of detail to the summary given in the main text.

Quantitative survey in the Village Bay area

Throughout the project, survey work was designed to plot the overall distribution of implements and implement fragments across Hirta, with a particular emphasis upon Village Bay and Gleann Mór. A more detailed level of survey was also undertaken within the Village Bay area. This involved the creation of a series of sampling transects running along the line of the 'Street' and

across the contour, from the sea cliffs up to An Lag. Our purpose in developing these transects was twofold: to establish whether distinct categories or forms of artefact could be identified; and to determine whether certain forms were differentially distributed across the landscape. Implements identified within these transects were subject to detailed characterization. Measurements of length, width, and thickness were taken, together with details of character and morphology.

With the exception of four pieces, all implements were made of dark-coloured medium and fine-grained dolerite from various locations in the Mullach Sgar complex. The existence of a variety of specific sources is suggested by variations in grain size, and by the presence of a number of implements made of porphyritic medium-grained dolerite with traces of granophyre. The likelihood is that these particular implements come from the margins of the Mullach Sgar complex. The four exceptions — one from the long (western) consumption dyke; one from cleit 50; and two from cleit 76 — are all made of granophyric material, presumably derived from the nearby outcrops on Conachair.

Work on the range of implement forms has revealed a range of size variations and at least two distinct classes.

Class A Roughly parallel-sided pieces (often c 200 mm in length) with heavy wear traces in the form of smoothing and striations. These wear traces tend to be concentrated at or confined to one end of the implement, but can occasionally be seen on both ends. Most of these pieces have shallow, convex working edges, although a number of cases were observed where the working edge tapered to a distinct point. Occasionally, this could be seen to be a product of breakage or wear during use. However, a number of pieces were observed which tapered to a point where there were no signs of wear or breakage. Generally, these pieces were rounded at the other end, many displaying signs of wear in this area. Under these circumstances, the taper towards a point may be related to hafting. Related forms which tend to be rather more ovate in plan bear similar patterns of wear to the more parallel-sided pieces, usually on their shallower, rounded ends. The significance of these forms and wear patterns is discussed elsewhere in this paper.

Class B Also identified was a series of implements with butts that had been trimmed extensively; it is difficult to make sense of this technique as anything other than a precursor to hafting. Often broken, with transverse ‘endshock’ fractures, these pieces took a variety of forms — ovate with rounded working edges and parallel-sided. Measurement of the haft ends suggested a relatively tight limit of variation on acceptable size ranges, the majority of pieces in this class having butts which measured between 60–80 mm. How far these implements should be thought of as a different class from those in class A is a debatable point. The fact that they possess a distinct hafting tang does not imply that they saw significantly different patterns of use.

Class C A third group, and here perhaps a distinct class, are those pieces that acquired the name ‘table tennis bats’ in the field. As with class B, these pieces again have a distinctively notched hafting tang. However, members of this class can be differentiated from those in classes A and B on the basis of the form of the blade. Here we are dealing with pieces that tend more towards a circular form, with heavily rounded cutting edges that sweep in towards the hafting tang.

Comments

All of the identifiable implements or implement fragments recovered during our excavation of the field boundary correspond to classes A and B. Inevitably, some of the smaller fragments, such as the rounded tips or medial sections of broken blades cannot be assigned to a specific class. It is interesting, however, that there are no examples of implements corresponding to class C.

Spatial analysis of the implement classes identified in our sampling transects revealed relatively little significant variation. All classes of artefact were distributed widely. However, there was a tendency for pieces with hafting notches to be more closely clustered in the low-lying ground near the 19th-century street, particularly those that correspond to class C. There was no indication that distinct size classes of artefact were distributed in different ways across different landscape zones. Overall, it is likely that differences in the size of implements reflect a normal range of variation. Judged on the basis of wear traces, there is no absolutely clear sense of different-sized tools being used in markedly different ways. Wear traces look very similar on implements at either end of the size range.

Given that we are probably dealing with implements that were engaged in a variety of practical tasks, from hoeing and digging through to wedging, splitting and related activities, these patterns should not perhaps surprise us. We may, however, be dealing with size distinctions that reflect the use of one-handed or two-handed tools. One other possibility can also be suggested, although there is no clear morphological or circumstantial evidence to lend support. Evident size ranges might reflect different forms of hafting. Whilst the bulk of these tools may well have served as hoes/mattocks, some of the larger examples could have been hafted to serve as the blades of *caschroms*. This might account for a small number of large blades, where wear traces extend along more than 50% of the length of one face.

One further pattern worthy of note is the high density of broken implement tips identified in the long consumption dyke. Generally rounded and with signs of heavy wear and attrition during use, these tips are likely to be the consequence of endshock fractures, when a tool used in digging comes into direct and sudden contact with stones in the soil.

REFERENCES

- Armit, I 1992 *The Later Prehistory of the Western Isles of Scotland*. Oxford.
- Armit, I 1996 *The Archaeology of Skye and the Western Isles*. Edinburgh.
- Bradley, R 1984 *The Social Foundations of Prehistoric Britain*. London.
- Bradley, R & Edmonds, M 1993 *Interpreting the Axe Trade*. Cambridge.
- Branigan, K 1997 'Recent fieldwork on Barra, Outer Hebrides', *Curr Archaeol*, 152 (1997), 284–9.
- Buchanan, M 1983 *St Kilda: a photographic album*. Edinburgh.
- Claris, P & Quartermaine, J 1989 'The Neolithic quarries and axe factory sites of Great Langdale and Scafell Pike', *Proc Prehist Soc*, 55 (1989), 1–26.
- Clarke, A 1994 *Coarse Stone Tools in Scotland*. Unpubl PhD thesis, University of Glasgow.
- Clarke, D V, Cowie, T G & Foxon, A 1985 *Symbols of Power at the Time of Stonehenge*. Edinburgh.
- Cooney, G & Mandal, S 1998 *The Irish Stone Axe Project*. Wicklow.
- Cottam, M B 1979 'Archaeology', in Small, A (ed), *A St Kilda Handbook*, 36–61. Edinburgh.
- Dodgshon, M 1998 *From Chiefs to Landlords: social and economic change in the Western Highlands and Islands, c 1493–1820*. Edinburgh.
- Edmonds, M 1998 'Sermons in stone: identity, value and stone tools in later Neolithic Britain', in Edmonds, M & Richards, C (eds) *Understanding the Neolithic of North-Western Europe*, 248–76. Glasgow.
- Emery, N 1996 *Excavations on Hirta 1986–90*. Edinburgh.
- Emery, N & Morrison, A 1995 'The archaeology of St Kilda', in Buchanan, M (ed), *St Kilda: the continuing story of the islands*, 39–59. Edinburgh.
- Fairhurst, H 1971 'The wheelhouse site A'Cheardach Bheag on Drimore Machair, South Uist', *Glasgow Archaeol J*, 2 (1971), 72–106.
- Fleming, A 1995 'St Kilda: stone tools, dolerite quarries, and long-term survival', *Antiquity*, 69 (1995), 25–35.
- Fleming, A 1999 'Human ecology and the early history of St Kilda', *J Hist Geogr*, 25 (2) (1999), 183–200.

- Gosden, C & Pavlides, C 1994 'Are islands insular? Landscape vs Seascape in the case of the Arawe Islands, Papua New Guinea', *Archaeology in Oceania*, 29 (1994), 162–71.
- Harding, R R, Merriman, R J & Nancarrow, P H A 1984 *St Kilda: an illustrated account of the geology*. London.
- Harman, M 1997 *An Isle called Hirte: a history and culture of St Kilda to 1930*. Waternish (Skye).
- Hunter, J 1996 *Fair Isle: the archaeology of an island community*. Edinburgh.
- Kinnes, I 1984 'Circumstance not context: the Neolithic of Scotland as seen from outside', *Proc Soc Antiq Scot*, 115 (1985), 15–57.
- Macaulay, K 1764 *The History of St Kilda*. London.
- MacDiarmid, J 1877 'On St Kilda and its inhabitants', *Trans Highland Agri Soc Scot*, 10 (1877), 232–54.
- Mackenzie, J B 1905 'Antiquities and old customs in St Kilda, compiled from notes made by Rev Neil Mackenzie, minister of St Kilda, 1829–43', *Proc Soc Antiq Scot*, 39 (1904–5), 397–402.
- Mackenzie, J B 1911 *Episode in the Life of the Rev Neil Mackenzie, at St Kilda from 1829 to 1843*. Privately printed.
- Martin, M 1698 *A Voyage to St Kilda*. London.
- Mathieson, J 1928a 'The antiquities of the St Kilda group of islands', *Proc Soc Antiq Scot*, 62 (1927–8), 123–32.
- Mathieson, J 1928b *Map of St Kilda or Hirta*. London.
- Mills, C M, Crone, A, Edwards, K J & Whittington, G 1994 'The excavation and environmental investigation of a sub-peat stone bank near Loch Portain, North Uist, Outer Hebrides', *Proc Soc Antiq Scot*, 124 (1994), 155–71.
- Mitchell, A 1868 'On some remarkable discoveries of rude stone implements in Shetland', *Proc Soc Antiq Scot*, 7 (1866–8), 18–34.
- O'Brien, W F 1994 *Mount Gabriel: Bronze Age mining in Ireland*. Galway.
- Petrie, G 1868 'Notice of some rude stone implements found in Orkney', *Proc Soc Antiq Scot*, 7 (1866–8), 135–6.
- Rees, S E 1979 *Agricultural Implements in Prehistoric and Roman Britain*. Oxford.
- Ritchie, P R 1968 'The stone implement trade in third-millennium Scotland', in Coles, J M & Simpson, D D A (eds) *Studies in Ancient Europe*, 117–36. Leicester.
- Ritchie, P R & Scott, J G 1988 'The petrological identification of stone axes from Scotland', in Clough, T H McK & Cummins, W A (eds) *Stone Axe Studies* (vol 2), 85–91, London.
- Ritchie, W 1985 'Inter-tidal and sub-tidal organic deposits and sea level changes in the Uists, Outer Hebrides', *Scott J Geol*, 21 (2), 161–76.
- Sands, J 1878 'Notes on the antiquities of the island of St Kilda', *Proc Soc Antiq Scot*, 12 (1876–8), 186–92.
- Sands, J 1878 *Out of this World; or, life in St Kilda*. Edinburgh.
- Sharples, N 1992 'Aspects of regionalisation in the Scottish Neolithic', in Sharples, N & Sheridan, A (eds) *Vessels for the Ancestors*, 322–31. Edinburgh.
- Sheridan, A 1992 'Scottish stone axeheads', in Sharples, N & Sheridan, A (eds) *Vessels for the Ancestors*, 194–212. Edinburgh.
- Stell, G P & Harman, M 1988 *Buildings of St Kilda*. Edinburgh.
- Turner, V 1998 'Vikings on the hillside at Catpund, Cunningsburgh', in Turner, V (ed), *The Shaping of Shetland*, 95–106. Lerwick.
- Walker, M J C 1984 'A pollen diagram from St Kilda, Outer Hebrides, Scotland', *New Phytol*, 97 (1984), 99–113.
- Whittle, A 1986 *Scord of Brouster: an early agricultural settlement in Shetland*. Oxford.
- Wickham-Jones, C & Collins, G H 1978 'The sources of flint and chert in northern Britain', *Proc Soc Antiq Scot*, 109 (1977–8), 7–21.
- Williams, B B 1983 'Early Christian landscapes in County Antrim', in Reeves-Smyth, T & Hamond, F (eds), *Landscape Archaeology in Ireland*, 233–46. Oxford.
- Williamson, K & Boyd, J M 1960 *St Kilda Summer*. London.