

# Traces of beaker-period cultivation at Rosinish, Benbecula

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Excavation on behalf of the Inspectorate of Ancient Monuments in a soft machair environment (for definition of machair see Ritchie 1976), currently suffering from wind erosion on the NE corner of Benbecula in the Outer Hebrides (NGR NF 873537), has revealed extensive midden deposits of beaker date which in places have preserved beneath them an old land surface containing traces of plough and spade agriculture. The speed of erosion of the 330 square metres of midden and logistic problems associated with the site's remote coastal location dictated an excavation strategy based on a 10% random sample by 1 metre squares, designed to isolate important activity traces, and to provide a statistically viable sample of cultural and environmental material. The sampling in 1975 was followed by two seasons of area excavations of the ploughmarks recognised in some sample squares. This paper details principally the earlier of these two seasons: short reports on all the current work at Rosinish have appeared in *DES* (1974), 38–9; (1975), 50; (1976), 35–6; (1977), 18, *Proc Prehist Soc*, 43 (1977), 391, and Shepherd 1976 and 1977.

At Rosinish, the banding and glacially-enhanced discontinuities of the underlying Lewisian gneiss control the pattern of surface topography: machair hillocks rising to *c* 16 m OD which are the product of a complex series of shell sand deposition and deflation interludes. The beaker fields would have been established on a pre-existing machair consisting of a low grassy slope on the bank of the tidal inlet which was, and is, also a stream outlet. The beaker midden would subsequently have been covered by the lower slope of the main machair hillock ridge (Dr W Ritchie *pers comm*).

Two remnants of an area of ploughing divided by a sand blow-out running NW-SE were revealed by the 1975 metre-square sampling (fig 1). The eastern area was the smaller and more affected by prehistoric and modern erosion and by interference from the construction of a (post-midden) burial feature. The larger area stretched to the S and W of the midden and was further revealed by specific area stripping in 1976 (figs 2 and 3). The former extent of ploughing in this area could not be gauged entirely owing to modern erosion on the E and S sides and the constraint imposed by *c* 12 m of machair hillock overburden to the W.

The cultivation traces were represented principally by ard marks, which appeared in plan as dark lines of mostly light humic material around 70 mm wide and of a depth up to 70 mm. Sections were often assymmetrically V-shaped with one side vertical and the other curved (Shepherd 1976, 214, figs 11.4, 11.5). The ard marks were found not only in the subsoil beneath the old land surface but also in the sandblow (*c* 100 mm deep) which had accumulated on the old land surface. The ploughing appears to have continued during a period of small-scale sand deposition, with the result that a plough horizon *c* 200 mm thick had developed, in which was preserved a suite of ploughmarks.

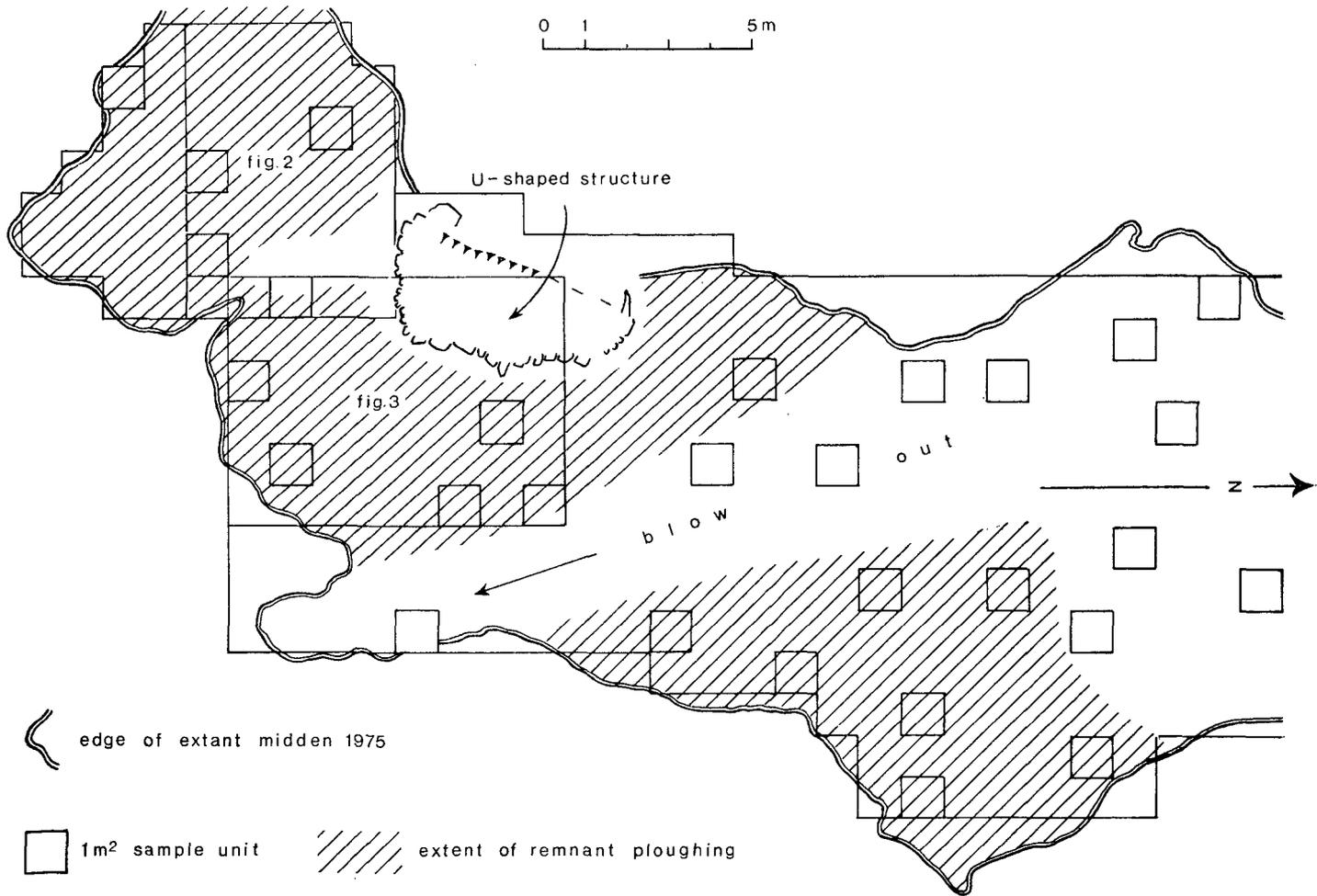


FIG 1 Rosinish: plan of S half of main beaker midden (Area 1)

The ard marks shown on fig 2 within the confines of the field boundary have three principal orientations: NNE/SSW, E/W and NNW/SSE, and were from 0.2 m to 0.5 m apart. Those orientated generally N/S appear to represent the later phases of ploughing. Of particular interest is the pair of tightly curved ard marks visible in the south central area: they are continuations of NNW/SSE-orientated furrows and appear to demonstrate that ploughing, in this phase at least, was two-directional. The plough marks to the W of the field boundary occur in a small positive lynchet. The ploughmarks shown in fig 3 include those in the surface of the sandblow on the old

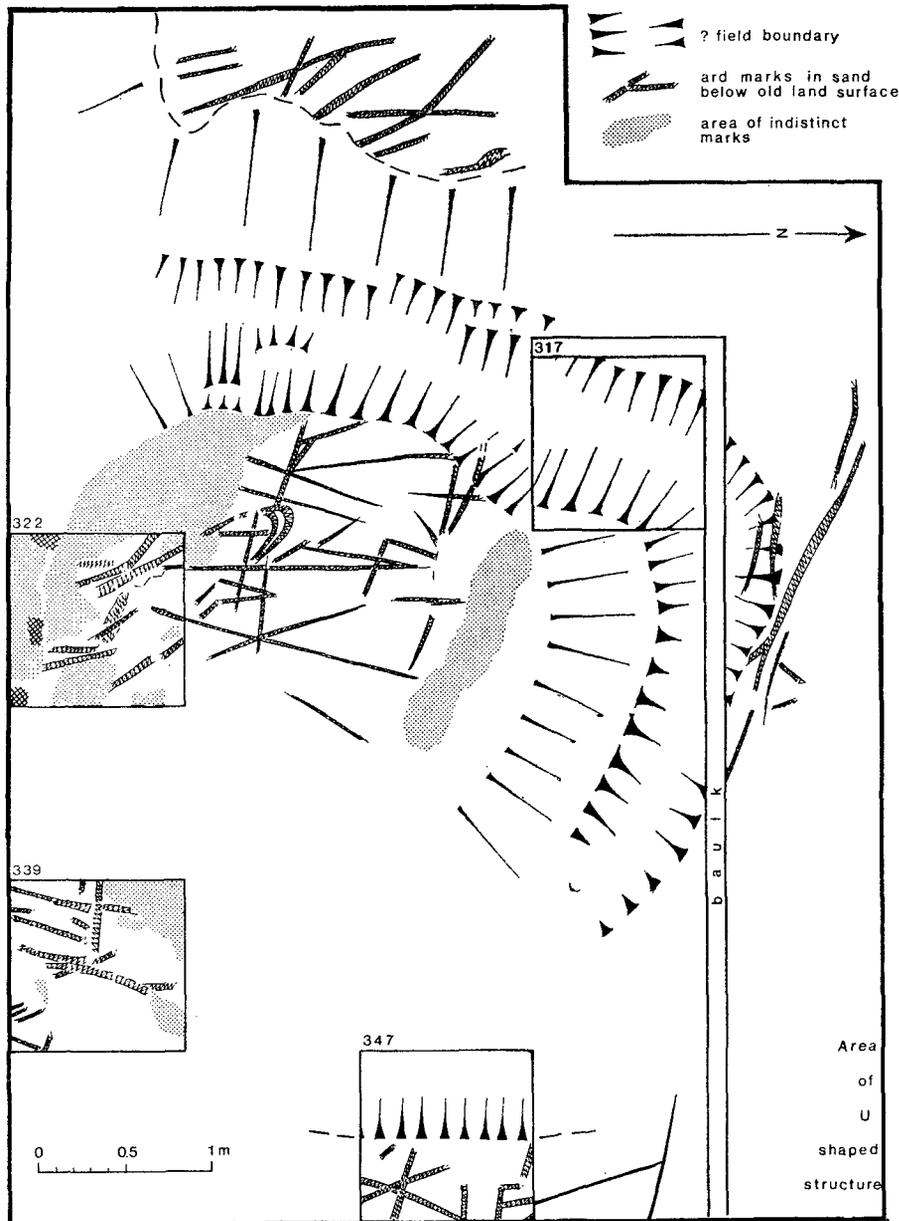


FIG 2 Rosinish: plan of field boundary and basal ard marks

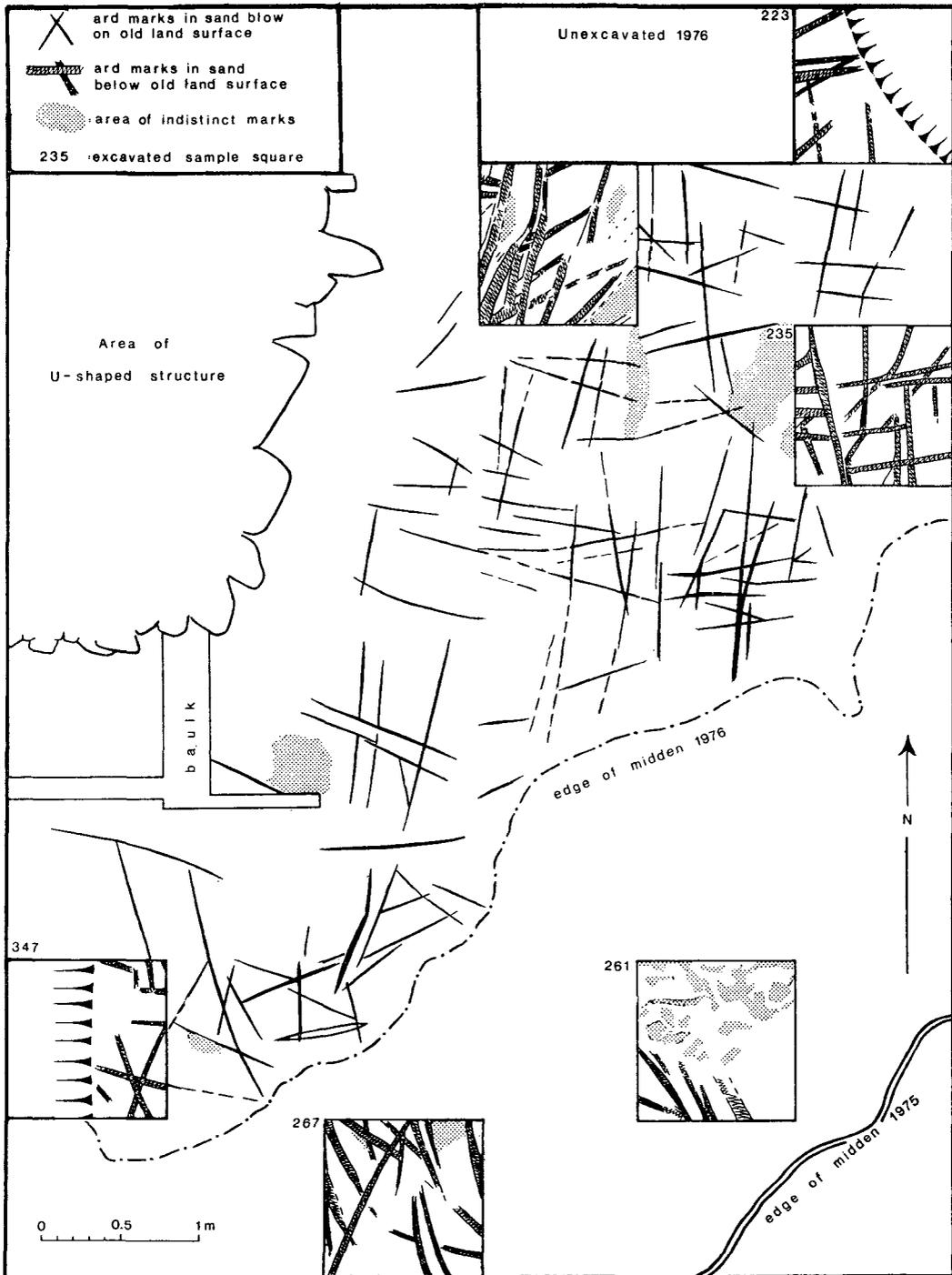


FIG 3 Rosinish: plan of ard marks in sandblow on old land surface

land surface. They are from 0.1 m to 0.5 m apart, and are orientated N/S; E/W and, in the SW of the area, NNW/SSE. The ploughing sequence is clearest in the SW corner. Here, the earliest ploughing was the N/S orientated set, succeeded by the E/W ones, on which are superimposed the latest, NNW/SSE furrows. It is possible that these ard marks which survive in the soft surface of the sandblow represent one single interlude of ploughing, as they have been preserved through the deposition of midden material on to the plough-ridged surface. The nature of the sandblow is such that the ard marks are unlikely otherwise to have maintained their profiles. This cross-ploughing into sandblow replicates in some detail the circumstances at the top of layer 5 at the bronze-age settlement at Gwithian, Cornwall (Megaw *et al* 1961, fig 23).

One spade mark *c* 180 mm by 190 mm by 80 mm deep was found at the Sedge of the cultivated area shown on fig 3. It was excavated and cast in plaster, and proved to have a slightly rounded triangular profile and to exhibit a notch made by the base of the shaft when it was forced into the edge of the spade-cut prior to removing the soil. A few similar marks were found and excavated in 1977.

A portion of possible field boundary, dividing two lots of cultivation traces, survived in one area (Area Ia: fig 2). It consisted of a length of ditch *c* 4.5 m long and from 0.5 m to 0.7 m wide, forming a right angle in the NW of the southernmost ploughed area. This feature had been dug into the sand subsoil to a depth of *c* 0.3 m but, as it did not survive in the E and S of the excavated area, it is not possible to assess the size of the cultivation plot which it defined.

The ploughing traces were preserved through the deposition of Early Northern (step 5) beaker settlement detritus directly on to the ploughed surface of the sandblow. That there was no significant interval between the cessation of ploughing and the deposition of midden material is suggested by the finding of midden material in furrows on the soft surface of the sandblow. The 1977 season revealed that not only midden material but also pitched stones and pot sherds had compacted into furrows on the top of the sandblow, demonstrating that ploughing had continued through the base of the primary midden which may have originally been deposited in an attempt to consolidate the sandblow. A sample of *Patella vulgata* (limpets) from the primary midden overlying the ploughing produced a C14 determination of 1900 bc  $\pm$  75 (GU 1064), while a sample of similar material from the old land surface itself was dated at 1970 bc  $\pm$  55 (GU 1065). The primary beaker midden and its underlying land surface were subject to erosion from the NW, which removed an unknown area of the fields (fig 1). Subsequent to this blow-out a secondary, late beaker midden was laid down over most of the area during a period of fairly rapid sand accumulation. Structures inserted into the surface of this secondary midden included a corbelled burial cist (*DES* (1964), 33, and Crawford 1977) and a sub-triangular stone-walled shelter. Both middens contained broken animal bone (cattle/sheep) and carbonised cereal grains.

## DISCUSSION

While a full assessment of beaker agrarian techniques must await the final publication of the excavation, it should be noted here that the ard marks were presumably made by a crook ard similar to the Hvorslev example which has a radiocarbon date of 1490 bc (Fowler 1971, 158). The few spade marks are broadly similar to those in a slightly later context at Gwithian (Megaw *et al* 1961, pl II). There is little information on when true fields were first laid out: but those in a sub-beaker context at Ness of Gruting, Shetland, must be among the earliest in Scotland (Calder 1956, 346).

The type of crop cultivated at Rosinish is attested by the recovery, through wet sieving, of carbonised barley and wheat from over 50% of the 1975 sample squares. Examination of the

grain has established the presence of naked 6-rowed barley, hulled 6-rowed barley and emmer in the proportions shown below.

<i>Cereal</i>	<i>No. of grains</i>	<i>Percentage of total sample</i>
Naked barley	162	95.3
Hulled barley	3	1.8
Emmer	5	2.9

While barley cultivation has for long been seen as a characteristic beaker trait (Jessen and Helbaek 1944), Rosinish now joins such beaker settlements as Belle Tout, Sussex (Bradley 1970, 374–5), and Molenaarsgraaf, Netherlands (Louwe Kooijmans 1974, 329) in having wheat as well, although at Rosinish the wheat was in decline as it was at the limit of its range and poorly adapted to local climatic conditions (Maclean and Rowley-Conwy *pers comm*).

In summary, cereal cultivation principally by plough agriculture is attested in a mature beaker context in an area whose littoral soil type had considerable potential for early agricultural settlement (*vide* Crawford and Switsur 1977, 128 fn), albeit on the extreme Atlantic fringe of North West Europe.

#### ACKNOWLEDGMENTS

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