4 The environmental evidence *by Stephen Carter, the late Camilla Dickson and Beverley Ballin Smith*

4.1 Introduction

One of the aims of the project was to date and explore the chronology of the house and its use. This aim, however, remains largely unachieved because of the environmental conditions and history of the site. Although some carbonised organic material was present in the soil samples, and coprolites were collected for analysis, the material was either not suitable for dating or was heavily mineralised. Later use and disturbance are most likely responsible for the paucity of sediments from earlier phases of the site, and possibly for their deliberate removal. Much later activities such as improvement of the soil and its drainage, together with the construction of the *planticrub*, may well have contributed to the removal of archaeological deposits as well as structural remains from the site. How much soil improvement and the high biological activity (earthworms) noted in the soil affected the survival of prehistoric organic material is a matter for discussion and research in future projects.

Another factor influencing the survival of archaeological evidence was colluvium (soil creep) from the hill to the immediate west of the site. The natural formation of deeper soils across the site buried part of the enclosure wall, and might also have affected the survival of information about land use activities on the platform because of increased waterlogging. It was expected that ard marks might have survived to complement the evidence of the ard points themselves, (Section 5.2.4) and to indicate that the platform had been cultivated, but none were found.

A product of the soil development on the platform is iron pan. The thick layers of heavily compacted iron pan encountered during the excavation were largely impenetrable by modern archaeological techniques. Iron pan formation was so extensive in Trench C that the stratigraphic relationship between the enclosure wall and the surrounding soil matrix had been destroyed. The development of iron pan may also have affected the survival of organic evidence for prehistoric activity in the lower horizons of the soil. For a description of the problems caused by iron pan formation see Limbrey 1975, 329–30.

4.2 Soils around the house

The prehistoric house and enclosure lay within an area of recently improved pasture. Two soil profiles were recorded through the magnesian brown soils of the area. Profile 1 was recorded from a section at the base of the slope to the west of the enclosure, and illustrates a profile deepened by the accumulation of colluvium. Profile 2 was recorded within the enclosure, 15m north of the house in an area free of visible archaeological remains. An auger survey of the whole enclosure showed that this profile was typical except at its north end where much deeper, peaty soils were encountered.

The surface 0.2–0.25m of both soil profiles, with their granular structure, indicated high biological activity and rapid recycling by earthworms. Mottling found in the lower horizon (B) of Profile 2 indicated gleying. In magnesian rich soils, surface gleying can lead to the formation of iron pans in the lower level of the soil horizon, with strong brown/reddish colours. Due to the high iron content of the soil these may be very thick (over 10mm), as was demonstrated in Trench C.

In both profiles, the field determination of particle size was made difficult by the presence of a high proportion of talc in the groundmass. This forms platy/fibrous particles and gives a silty feel to the groundmass although the particle size may be much larger than in true silt. Therefore, horizons recorded as silt loams may be loams or even sandy loams.

Mottling found in the Bw horizon of Profile 2 is an indication of gleying (although not sufficient to designate it a Bg horizon). In magnesian soils like these, any surface gleying can lead to the formation of iron pans (Bf horizon). Due to the high iron content of the soil, these may be very thick (greater than 10mm). Less extreme movement of iron will impart strong brown/reddish colours to the soil.

The granular structure of the Ah horizon is an indication of high biological activity, which was confirmed by the abundance of earthworms in this horizon. The surface 200–250mm of these soils is rapidly recycled by invertebrates.

4.2.1 *Profile 1*

Slope: very steeply sloping (30–40°). Complex.
Aspect: east

Small erosion faces on terracettes associated with sheep paths and soil creep. Rocky, with small outcrops of talcose rock.

4.2.2 *Profile 2*

Slope: simple, gently sloping.
Aspect: north
No rock outcrops or erosion within 10m.

Table 1 Soil profile 1

Depth (mm)	Horizon	Description
0–280	Ah	10YR 4/3 (brown) silt loam. Very slightly stony with very small sub-angular stones. Small-medium granular peds, moderately developed. Low packing density, moderately porous with few fine macropores (root channels, burrows). Many very fine and common fine fibrous roots. Clear wavy boundary.
280–770	Bw	10YR 4/4 (dark yellowish brown) at top, 7.5YR 3/4 (dark brown) at 500mm to 10YR 3/2 (very dark greyish brown) at base; moderate stony, sandy loam with small and medium sub-angular stones. Apedal (massive) with few, very fine roots. Abrupt, wavy boundary.
770–1200	1Cu	2.5YR 4/4 (olive brown). Very stony, sandy silt loam with small, medium and few large angular stones (steatite and acid metamorphic). Apedal (massive). No roots. Clear wavy boundary.
1200–1500+	2Cu	10YR 6/6 (brownish yellow) very talc-rich, possibly sandy silt matrix between angular equidimensional to platy fragments of steatite about 20–100mm long. Lower boundary not seen (steatite).

Table 2 Soil profile 2

Depth (mm)	Horizon	Description
0–210	Ah	10YR 3/2 (very dark greyish brown) stone-free, silty loam. Fine/medium granular structure, poorly developed. Low packing density. Many very fine and few fine fibrous roots. Clear, smooth boundary.
210–270	Bw	10YR 3/3 (dark brown) very slightly stony, silty loam with small (< 5mm) redder and blacker mottling. Fine/medium granular structure, poorly developed. Common very fine fibrous roots. Clear, wavy boundary.
270–560	1Cu	5Y 5/2 (olive grey) sandy silt loam (very talc-rich) with orange mottles. Very stony with small to long sub-angular steatite (common) and acid metamorphic (rare) stones. Apedal (massive). Few very fine fibrous roots. Clear wavy boundary.
560–650	2Cu	2.5YR 6/4 (light yellowish brown) very talc-rich matrix (silt or sand?) to weathered top of steatite bedrock. No roots. Abrupt irregular boundary.
650+	R	Steatite bedrock.

4.3 Botanical analysis

Traces of heather (*Calluna*), charcoal and burnt peat, retrieved from the floor of the house, probably represent fuel burnt on a hearth. Megaspores (approximately 0.4mm in diameter) of lesser clubmoss (*Selaginella selaginoides*) were found on the floor close to the hearth complex, and in the drain. The megaspores seem to be very resistant to decay, and the plant is a component of the present flora of Catpund.

Occasional fragments of *Sorbus* charcoal were found in the abandonment rubble that covered the house. These fragments are most probably *Sorbus aucuparia* (rowan), which still grows locally in ungrazed areas of Shetland. Cf *Fraxinus* (cf ash) was found as rare charcoal fragments in the rubble fill of a kerbed recess in the south-east of the house. Ash is not known as a native tree on Shetland and was probably imported or occurred as driftwood.

An organic sample from the clay-luted stone box set into the floor of the house consisted of occasional small lumps of burnt, humified peat and much fine, carbonised material, probably all peat. There was a small admixture of silt and sand, but no charcoal suitable for radiocarbon dating was found.

A sample from the house drain contained frequent knobbly, mineralised, non-calcareous fragments, each measuring approximately 65mm by 50mm by 17mm. The fragments are irregular in shape, dark-brown with reddish-brown mottling (both externally and internally) and have partly embedded sand grains. One surface is knobbly and tends to be convex, the other tends to be rough and concave; some fragments have cavities which occasionally penetrate the surface. Occasional fragments are completely roughened and paler, and resemble iron concretions. The fragments can be crushed in a mortar, as they are easily broken. A fragment broken apart yielded a wood fragment of cf birch (cf *Betula*), 9mm in diameter, and a seed of toad rush (*Juncus bufonius*). Occasional adherent spherical golden-brown egg cases, each approximately 0.3mm across, were noted.

These fragments are very similar in appearance to collapsed calcified faeces recovered from an Iron Age site at Warebeth, Orkney (Bell & Dickson 1989, 115). Cylindrical fragments were also found at Warebeth and from their contexts and appearance all appeared to be of human origin. Both Catpund and Warebeth coprolites are impregnated with sand grains as would be expected if, before becoming mineralised, soft faeces were in contact with the sandy silt from which both were recovered. The Warebeth coprolites seem to have derived from mainly meat meals, and the general lack of visible plant material in those

Table 3 Plant remains

Description & context	Identification
Turf and topsoil over house (1)	Burnt peat
Earth within *planticrub* (5)	cf partly burnt peat
Rubble (7)	*Sorbus aucuparia* type (Rowan type) charcoal
Rubble fill of wall (9)	cf *Fraxinus* (cf ash) charcoal
Rubble fill of entrance (10)	cf burnt peat
Patchy black material of floor (17)	*Calluna vulgaris* (heather), charcoal, burnt peat
	Calluna charcoal, *Selaginella selaginoides* (lesser clubmoss), rare megaspores, burnt peat
	Calluna charcoal
Brown earth in centre of house (21)	*Selaginella* rare megaspores, burnt peat
Grey flecked ash-silt of floor (23)	cf burnt peat
Drain/gully (26)	*Selaginella* frequent megaspores, cf burnt peat
	Potentilla sp (cinquefoil, tormentil) 1 achene.
	Knobbly, mineralised fragments frequent
Blue/black area west of hearth (30)	*Selaginella* rare megaspores, burnt peat.
Contents of stone box (41)	Burnt peat

from Catpund could suggest a similar diet. Due to their collapsed and mineralised state, however, it is not possible to be certain if the donor was human. Furthermore, it was not possible to submit samples for radiocarbon dating.