9 Carbonized Plant Macrofossils *by M Church*

9.1 Introduction

This section analyses the carbonized plant macrofossils and charcoal recovered from the bulk samples. A total of 30 samples were submitted for analysis, 23 of which produced carbonized remains.

9.2 Research basis

The samples were processed as part of doctoral research to produce a regional synthesis on the prehistoric use of plants in Lewis. A number of recurrent research questions were formulated for the archaeobotanical remains from each of these sites including:

Is it possible to propose generic taphonomic models for the origin, preservation and subsequent dispersal of the carbonized plant macrofossils on the site?

What materials were used for fuel?

Can aspects of arable agriculture be seen in the archaeobotanical record, from the crops grown to the crop-processing procedures employed?

What other plants were gathered and for what purpose?

9.3 Methodology

9.3.1 On-site sampling

The samples were taken when the excavator deemed a context to be worthy of sampling, a strategy known as judgement sampling (Jones 1991). This strategy does not statistically represent the sampled population (ie the archaeological contexts across the site) so the results presented in this section will be biased in favour of stratigraphically important contexts and perceived to be rich. However, the 30 samples processed present a coherent picture of the archaeobotanical assemblage across the site.

9.3.2 Bulk sample processing

The bulk samples were processed using a flotation tank (Kenward *et al.* 1980) with the residue held by a 1.0 mm net and the flot caught by 1.0- and 0.3-mm sieves, respectively. All the flots and residues were dried and sorted using a low-powered stereo/binocular microscope at 15–80× magnification. All macrofossil identifications were checked against botanical literature and modern reference material from collections in the Department of Archaeology, University of Edinburgh. Nomenclature follows Stace, with ecological information taken from Clapham *et al.*, Stace and Pankhurst & Mullin (Clapham *et al.* 1989; Stace 1991; Pankhurst & Mullin 1994).

9.4 Results

9.4.1 General

Table 14 presents the carbonized plant macrofossils recovered from the site, sorted by phase and generic context type.

9.4.2 Macrofossil preservation

The preservation of the cereal grains recovered from the site as a whole, follows the preservation classes outlined previously (Hubbard 1990). Experimental work by Boardman & Jones has shown that varied conditions of carbonization produce varied preservation, in terms of the density, condition and range of plant parts, many of which (chaff, culms and seeds) would be destroyed at higher temperatures (Boardman & Jones 1990). Cereal grains are the best class of archaeobotanical remains from which to judge the loss of material because their preservation reflects the greatest range of conditions of carbonization. Over 75% of the assemblage was in the worst two classes of preservation, meaning that only genus identification was possible in general for these remains. However, the material recovered includes fragile plant components, such as culm nodes and seeds, demonstrating both the intensity and variation of temperature and atmospheric conditions within a large fire or funerary pyre (see Section 5.7).

9.4.3 Summary of the results

Most of the carbonized plant macrofossils were recovered from the ash spreads across the interior of the cairn. Soil micromorphology (Section 10), pollen analysis (Section 11) and mineral magnetic analysis of this material (Section 8.3.2) have demonstrated that the spreads represent re-deposited ash from burning peaty turves, possibly in a funeral pyre and/or from a feasting ceremony connected to the closure of the cairn. Peaty turf seems to have been replaced as a fuel source by well-humified, blanket bog peat in later prehistoric periods in Lewis (Church & Peters 2000; Peters *et al.* 2004). However, the evidence from this site may represent special activity, such as the deliberate removal of turf, which was then used in the funerary pyre, rather than as an everyday fuel. It is, of course, difficult to differentiate between domestic and ritual peat ash residues and the precise events which led to peat ash being deposited within the body of the cairn can only be conjectured.

In general, the archaeobotanical assemblage represents a mix of material relating to the fuel source and other plant material incorporated into the fire. Many of the carbonized plant macrofossils relate to the burning of peaty turf (Dickson 1998; Church & Peters 2004). They include relatively large quantities of small culm bases, nodes and rhizome fragments, fibrous burnt peat and seeds and other plant components of heathers (*Calluna vulgaris* L Hull, *Erica* spp), sedges (*Carex* spp) and grasses (Poaceae undiff), notably heath-grass (*Danthonia decumbens* L).

However, there is also a significant proportion of cultivated plants and wild species stemming from cultivated areas. The identifiable cereals are dominated by barley (*Hordeum* sp), with less than 1% wheat (*Triticum* sp.) and oat (*Avena* sp). The latter two species have been interpreted as weeds of the barley crop, rather than crops in their own right. Approximately 44% of the identifiable cereals was hulled barley with just over 11% naked. No rachis internodes were recovered, so species identification was based on the ratio between asymmetric to symmetric grains. From this, the hulled barley was likely to be six-row (*H. vulgare* var *vulgare* L), with the two- and six-row species possible for the naked barley (*H. distichum*/*vulgare* var *nudum* L). The most numerous weeds of cultivation include seeds of goosefoot/orache (*Chenopodium*/*Atriplex* spp), common chickweed (*Stellaria media* L Vill), knotgrass (*Polygonum* spp), heep's sorrel (*Rumex acetosella* L), curled dock (*Rumex crispus* L), cabbage/mustard (*Brassica*/*Sinapis* spp), wild turnip (*Brassica* cf *rapa* L) and ribwort plantain (*Plantago lanceolata* L).

This mixing of material has a number of implications. First, the likely position in the landscape for cultivation cannot be identified because the wild species represent a mix between the peaty turf fuel and the weed community. Also, the incorporation of material relating to arable agriculture into a fire probably associated with the ceremony and closure of the cairn must be explained. This may represent the accidental incorporation of the arable material within the peaty turf fire, or more structured deposition expressing elements of the seasonal and annual economic cycle into the society's system of belief. It is also interesting to note the presence of a few seeds of bilberry (*Vaccinium myrtillus* L) and cowberry (*Vaccinium vitis-idaea* L) within the ash spread at the top of the central cist. Both types of berry would have formed component parts of the wild food gathered in late summer or early autumn and may again represent the structured deposition of designated parts of the ash from a presumed ceremonial fire. Plant macrofossil assemblages from Bronze Age funerary deposits in Scotland are rarely sampled. However, though assemblages dominated by culm bases and nodes of cereal/monocotyledon type were recovered from cremation pits at Seafield, Aberdeenshire (Church 2003), pyre deposits associated with a cist at Cockburnspath, Berwickshire (Church & Cressey unpublished data) and from ash spreads within a cairn at Sketewan, Perthshire (Dickson 1997), these presumably represent the burning of grasses and weeds from cultivated land or hay during cremation, again either through accidental burning or a form of structured deposition. Hence, evidence of the limited incorporation of material from arable agriculture into Bronze Age funerary pyres is beginning to emerge from Scottish sites and is consistent with the pattern across Britain (Robinson 1988).