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the beaches of the area and could have been used for a variety of smoothing and polishing tasks on various materials such as bone, wood and pottery.

3.9 COPPER ALLOY
Fraser Hunter

Three copper alloy items were recovered, none particularly diagnostic. In general, copper alloy objects are not common from wheelhouses. The objects were analysed by non-destructive qualitative X-ray fluorescence. All three (and the stud in iron object SF54 (Ill 3.26b)) are bronzes with a suite of impurities. The lack of similar analyses for comparison is regrettable, as it would be valuable to see if sites in the Western Isles were in the circulation area of the much more mixed alloys which became prevalent in southern Scotland as Roman metal became available (Dungworth 1996). Although these samples show no influence from Roman metal, the ring-headed pin mould (SF 270, Ill 3.27a, see Section 3.12) was used for an alloy with appreciable quantities of zinc, implying there was access to a supply involving Roman metal.

SF31 (Ill 3.26a)
Bronze fitting. Cast collar, expanded and sub-square at one end, sub-circular at the other. Wall thickness 0.35mm, thickened to 1mm at expanded end. As the object is complete and has no sign of any attachment mechanism, it is most likely to be a fitting or finial for an organic item around which it would be hammered. It may have been the terminal of a hollow pipe or stem, either for decoration or durability. Its detailed function, however, remains elusive. L 15mm, W 14mm, T 8.5mm. Leaded bronze with trace iron, zinc, arsenic, antimony. Context 095, Block 6, Phase 1 (Wheelhouse 1 wall-packing) (see Section 2.3.1.1).

SF142 (not illustrated)
Fine ring (according to field records; the surviving fragments are too small for meaningful comment). The only substantial piece is a curving strip 5mm long, 2.5mm wide and 1mm thick; overall dimensions cannot be ascertained. Bronze with trace lead, iron, silver, antimony. Context 103, Block 8, Phase 2 (dumped material sealing occupation in Structure 4).

SF193 (not illustrated)
Pin tip. Two fragments form a broken circular sectioned rod, bent and tapering to a slightly blunt tip. L 8mm, D 2.5mm. Leaded bronze with trace zinc.

Context 172, Block 5b, Phase 2 (Bay 1 of Wheelhouse 1).

3.10 IRON
Fraser Hunter

Only two iron items were found. The spade blade is a highly significant find in view of the general rarity of such once-common artefacts.

SF23 (Ill 3.26c, colour plate 5)
Spade blade, with folded socket and rounded blade (a hemispherical item of uncertain character, D 38mm, has become attached by corrosion to one edge). The socket is 65mm long, 85mm wide, and a maximum of 30mm thick. A fragment of wooden shaft survives (maximum thickness 20mm): its species cannot be identified (Theo Skinner, pers comm). The folded edges of the socket are c 15~20mm broad. The blade is rounded and asymmetrically worn. It is slightly but distinctly angled upwards in section in relation to the socket.

Identification of such implements is always fraught with difficulty, as the boundaries between ard, plough and spade shares are not well drawn. This example is identified with some confidence as a spade on the basis of its short shaft and blade and the shaft/blade angle.
Material Culture

(I am grateful to Hugh Chepe and Sandy Fenton for advice on this). Iron Age spades are few and far between. Since Fenton’s study (1963), the only other Iron Age find is from Leckie broch, Stirlingshire (MacKie 1989, plate 4). The Cnip example is particularly important as it is all but identical to the ‘straight spade’ or cas-dhúnreach known ethnographically in the Western Isles in the recent past (Cheape 1993a) and characterized, apart from its general form, by the ‘lift’ of the blade towards the user which allowed extra leverage. The spade rather than the plough was the prime cultivating implement in the Islands in the recent past (ibid, 81). The only contemporary iron cultivation tool known in the Western Isles is the badly damaged spade blade or plough share from A’Cheardach Beag, South Uist (Fairhurst 1971, 102–3; Fenton 1963), although the use of whale bone for ards and spades is well-attested (Rees 1979, 40–1; Crawford 1967).

In view of the find’s importance an AMS ¹⁴C date was obtained directly from the preserved wood. This gave a date of 1910±45 BP (AA–29767), which calibrates to AD 4–216 (2σ), entirely consistent with its context. L 150mm. Context 072, Block 12, Phase 2 (upper infill of Wheelhouse 2 entrance passage) (see Section 2.3.2.2).

SF54 (Ill 3.26b)
Perforated sheet. Thin plate, sub-rectangular in plan, tapering on its short axis towards one edge, the corners rounded. Now in three fragments with a small part of one edge lost. It has a slightly off-centre angled lentoid perforation (15×5mm). A bronze stud with trace zinc and lead (H 2mm, D 2.5mm) has been inserted at the broken edge, while X-rays suggest there are a number of perforations in the narrower half of the plate. Details are unclear, but a series of at least three perforations along the edge seems quite certain, and there are suggestions of others which do not form a discernible pattern. All once probably held copper alloy studs.

The function of this plate is enigmatic. The stud and perforations suggest it may have been a decorative mount. However the only obvious means of attachment is the lentoid perforation, whose shape would suggest an organic rather than a metal fitting. Alternatively it could have been clamped in place, leaving the perforation free for some uncertain function. No obvious parallels can be quoted. L 53mm, W 35mm, T ε 1mm. Context 108, Block 6, Phase 1 (wall-packing of Wheelhouse 1) (see Section 2.3.1.1).

3.11 THE VITRIFIED MATERIAL
Dawn McLaren and Andrew Heald

3.11.1 OVERVIEW
A total of 3.8kg of vitrified material was recovered from Cnip (one piece of slag (SF064; Context 108) is missing from the assemblage and is not catalogued here). Visual examination allows the material to be categorized based on morphology, density, vesicularity, and colour. A range of slag morphologies are produced during iron production although only a few, for example tapped slag and hammerscale, are truly diagnostic (of smelting and smithing respectively). A significant amount of material within most slag assemblages is unclassifiable, making the allocation of individual pieces – particularly small samples – to specific types and processes difficult (Crew & Rehren 2002, 84). Further scientific analyses would be necessary to refine the classification. The slag has been described using common terminology (eg McDonnell 1994; Spearman 1997; Starley 2000).

Although different types of slag were recovered, the majority fall into two main types: those indicative of ironworking, usually smithing; and those created during a range of pyrotechnic processes, and not necessarily indicative of metalworking. All of the vitrified material was recovered from secondary contexts; there is no evidence of in situ ironworking. A full catalogue of the material is given in the archive report.

3.11.2 CLASSIFICATION
3.11.2.1 Plano-convex hearth bottoms and slag amalgams
There are two main forms of evidence for the smithing of iron on archaeological sites: bulk slags and micro-slags. Of the bulk slags only ‘plano-convex hearth bottoms’ (PCHB) are unlikely to be confused with the waste products of smelting and are therefore diagnostic of smithing (Starley 2000, 338). Hearth bottoms are formed in the smithing hearth, and can come in a range of sizes. They are recognizable by their characteristic plano-convex form, having a rough convex base and a smoother, vitrified, upper surface which is sometimes hollowed.

Six plano-convex hearth bottoms and a further two possible fragments were recovered weighing a total of 2868g. The dimensions and density of these pieces, ranging between 85–110mm in diameter, suggest that they are the product of iron smithing.