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Metallurgical findings from a Viking Age chieftain's farm in Iceland

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ABSTRACT

The metalworking, metal import, and use of metal in medieval Iceland is still little understood. When the Scandinavian settlers colonized Iceland in the 9th c. AD, the island was found to contain no useful metal deposits save for bog iron, and the deforestation that followed the settlement resulted in a scarcity of wood. Only in the last decades have archaeological excavations begun to unravel how the first Icelanders dealt with this lack of resources. This paper presents the metallurgical findings from a Viking Age chieftain's farmstead at Hrísbrú in the Mosfell valley, located just outside Iceland's present-day capital Reykjavik. The excavated metal objects had all been crafted with good workmanship employing technology similar to that used in mainland Scandinavia. However, most excavated metal finds show evidence of re-use, which together with the second-grade metal in some of the objects indicates a shortage of raw material that prompted the Icelandic colonizers to improvise and make do with whatever material was at hand.

Even though this chieftain's farm was materially poorer than contemporaneous high-status farms in mainland Scandinavia, it was wealthy by Icelandic standards. The analytical results show that some excavated objects were imported trade goods deriving from both neighboring and far-away localities, proving that the farm was part of the extensive trade network of the Viking world. Most likely, this farm represents the upper limit to what a Viking Age farm in Iceland could afford in terms of material objects and trade goods.

1. Introduction

While the history of metalworking in mainland Europe goes back to the earliest times, metalworking in Iceland only began when the island was colonized by the Scandinavian settlers in the 9th century. The settlers found Iceland to be a land of volcanic rock, containing no useful metal deposits save for bog iron. All other metals, particularly copper, silver, and gold, had to be imported. The deforestation process that followed the settlement eliminated most of Iceland's native forest of dwarf birch (*Betula* L.) and willow (*Salix* sp.) (Samset, 1991, 27), and it has been argued that iron production was a driving force behind this tree-cutting (Smith, 1995). However, the scope and nature of the metalworking, the metal import, and the metallurgical technology in the early days of Iceland's history still remain to be fully understood.

This paper presents the analysis of metal finds excavated from an Icelandic chieftain's farm, dating to the earliest days of the Icelandic settlement. By comparing the material culture of this farm with contemporaneous Icelandic and Scandinavian sites, an example is provided of how a relatively wealthy Icelandic farm managed to compromise between the Scandinavian customary use of metals and Iceland's lack of metals and other material resources.

2. The Hrísbrú site

At the Hrísbrú site, located in the Mosfell valley just a few kilometers outside Iceland's capital Reykjavik, the Mosfell Archaeological Project has excavated a 10–11th century farmstead (Fig. 1). The Mosfell valley runs from the bay Leirvogur in the west to the highlands of the Mosfell heath in the east. The excavated site is located along the slope of the northern side of the valley, at a strategic position from which it is possible to view both the central valley area and the coastline to the west (Byock et al., 2005). So far, a traditional Viking Age (ca. AD 790–1100) longhouse, a farm

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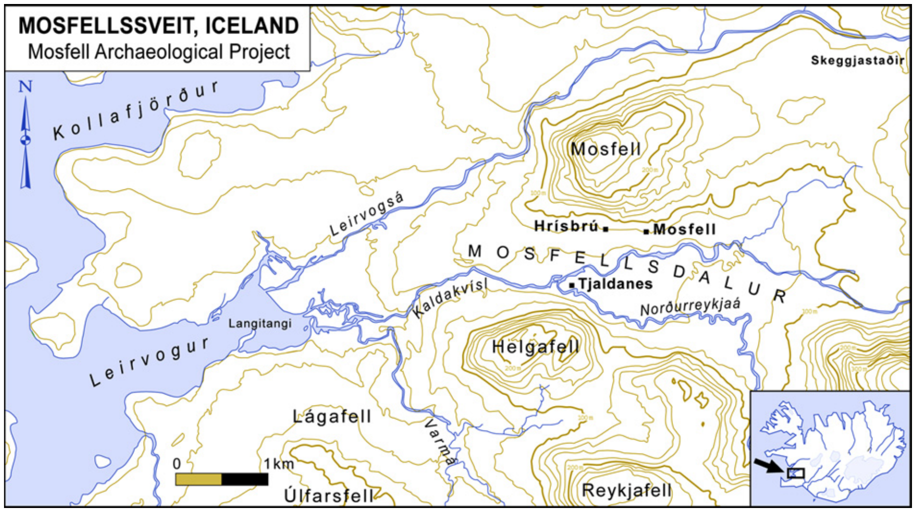

Fig. 1. Map showing the Mosfell Valley and the Hrísbrú excavation site in Southwest Iceland.

church with an associated cemetery, and a pagan cremation site have been unearthed.

Viking Age Scandinavia was a stratified society with a chiefly elite (Byock, 2001, 66–69; Roesdahl, 1999), and Vésteinsson (2004, 74–75) has grouped Icelandic houses into low, middle, and high status by reference to three parameters, i.e. house size, artifacts/ prestige goods, and historical records indicating status. At Hrísbrú, the longhouse measures an impressive 28 m from end to end, which makes it one of the largest Viking Age longhouses so far excavated in Iceland. The excavation yielded more imported glass beads than any other archaeological farmstead in Iceland (see below), and there are several medieval Icelandic sagas mentioning chieftains living at the old Mosfell farm, which was located at the site of modern-day Hrísbrú (Byock et al., 2005; Grímsson, 1886). Thus, there is ample evidence for Hrísbrú being one of the more important high-status households in Iceland during the 10–11th centuries.

Although the Hrísbrú farmstead has been continually inhabited from the Icelandic settlement up to the modern period, the habitation sites have changed over time, and the excavated Viking Age structures are located no more than 50 m from the present-day farmhouse. The longhouse dates from the original settlement of Iceland in the late 9th to early 10th century, and the small accompanying church was built around AD 1000. Both the longhouse and the church are very well preserved as no subsequent structures or occupation has disturbed the site since it was abandoned in the 11th or early 12th century, save for a small agricultural building located on top of the knoll where the church is located. The floor of the longhouse was buried approximately 1 m below the surface of what is now a meadow, where the soil covering the longhouse has been deposited through domestic trash dumping inside the cavity of the house, followed by aeolian soil deposition from the nearby eroding mountains. This aeolian soil is slightly acidic (pH 6–7) and generally sandy, allowing rainwater to seep through and access any buried objects. The average rainfall in the valley is about 100 mm/month, and the average temperature in the valley ranges from −2 °C in the winter to +14 °C in the summer, creating yearly freeze–thaw cycles (personal communication from Guðrún Gísladóttir at the Icelandic Meteorological Office, 2008). The preservation conditions at the site are therefore unfavorable, and most excavated objects are severely deteriorated due to the exposure to a combination of oxygen and moisture. On the upside, it appears that the meadow in which the structures are situated has been used exclusively for grazing, never for growing crops. Consequently, the buried material has not been disturbed by plowing, and the stratigraphy of the soil is mostly intact up to the topsoil, even though the meadow has been mechanically leveled in modern times. For example, above the longhouse, a volcanic ash layer from the Katla eruption in AD 1500 was found in situ some 20 cm below the current surface level.

In all excavation areas, i.e. the longhouse, the church, the surrounding graves, and the cremation site, metal artifacts were encountered. Although the artifacts were heavily corroded, some contained enough remaining metal to allow extraction of useful metallurgical information.

3. Materials and methods

X-ray fluorescence (XRF) spectroscopy was carried out on all metal samples in order to characterize their elemental composition. The XRF spectra were recorded with a tungsten filter at 45 kV/ 11 mA, and with no filter at 35 kV/10 mA, using a Jordan-Valley Excalibur benchtop XRF (model EX-2600U).

X-ray diffraction (XRD) spectra were recorded of corrosion products and bead colorants using a Rigaku R-Axis Spider unit employing an image plate in Weissenberg geometry to collect Debye-Scherrer-rings. Minute amounts of material were scraped off the samples and placed on the end of a rotating glass spindle, and XRD spectra were recorded at 50 kV/40 mA for between 600 and 1500 s. After baseline-correction, the spectra were searched and matched against reference spectra from the International Centre for Diffraction Data (ICDD) using the JADE v8.2 software from Materials Data Inc.

Fourier transform infrared (FTIR) spectra were recorded with a Perkin–Elmer Spectrum One instrument equipped with a solid state Attenuated Total Reflectance (ATR) sample stage. Spectra of corrosion products were recorded in the 4000–550 cm^{-1} region with a resolution of 4.0 cm^{-1} and matched against the UCLA/Getty Conservation Program's IR database, as well as the spectral database of the Infrared and Raman Users Group (IRUG).

Small samples were cut from some of the metal finds with a jeweler's saw, mounted in Buehler transparent Epoxide resin, and oriented to expose the cross-sections. The samples were then ground and polished in steps ending with the Buehler Metadi 1 micron diamond suspension. The polished cross-sections were etched in 2% ferric chloride for copper and 2% nital for iron in order to make visible the grain structure in the samples (Scott, 1991). The etched surfaces were examined under reflected as well as polarized light in a metallographic stereomicroscope at 50×–400× magnification.

4. Results and discussion

4.1. Iron objects

Iron artifacts were unearthed from the longhouse, the church, the cemetery and the cremation site.

In the longhouse four knife blades (2006-27-48; 2007-21-106; -107; -110) were found on the floor together with two iron fittings (2006-27-49; -50) belonging to a wooden construction. All four knives were single-edged with straight backs, and measured around 10 cm in length. No handles remained, suggesting that these were made from wood or bone which has now decomposed. XRF measurements showed no presence of other metals in the knife blades, indicating they had been crafted without decorations of e.g. silver, tin, or bronze/brass. As both the knife blades and the iron fittings were completely mineralized without any pseudomorphic retention of microstructural detail in the iron corrosion products, further metallographic analysis was not possible.

In the church building, a knife blade (2003-41-46) was found in a stratigraphic layer above the church floor, post-dating the abandonment of the church. The blade retained some solid metal under a thick crust of corrosion, allowing a sample to be taken for metallurgical analysis. The cross-section revealed that the blade was fashioned from two pieces of wrought iron, welded around a core of high-carbon steel, and aligned along the length of the blade (Fig. 2). The fine pearlite between the acicular ferrite plates allows the carbon content to be estimated at about 0.2–0.3% carbon, and it has been known since the early days of iron-working that such mixing of softer iron with harder steel can improve the overall material properties of iron objects (Carpenter and Robertson, 1930a, 1930b). Unfortunately, not enough of the cutting edge has survived to make it possible to tell whether the steel was quenched in this area or not. The particular fashioning of this knife closely matches the three-layered "sandwich" method (Tylecote and Gilmour, 1986; Tylecote, 1987, 263), which has been employed in mainland Europe since at least the first centuries AD (McDonnell, 1989; Ottaway, 1992). This method does not appear to have reached Scandinavia until the 9th–10th centuries (Arrhenius, 1970, 1989a; Peets, 1995; Lyngstrøm, 1995). Upon its arrival, it gained wide-spread popularity, and soon became the dominant method for steeling knives in Scandinavia (Arrhenius, 1998, 1989b; Carlsson, 2003; Lyngstrøm, 1995).

Underneath the church floor, in a stratigraphic layer related to an earlier structure, small magnetic metal flakes (2003-41-74) were encountered. XRD spectra of the flakes identified them as magnetite, Fe_3O_4, indicating that they are magnetic hammer scales, formed at high heat during smithing activities (Tylecote, 1987, 320). Together with two pieces of iron slag (2007-21-273; -294) found on the longhouse floor, the hammer scales suggest that small-scale iron working, such as repairs, took place at the site. Iron making using local ore has been demonstrated at different sites in Iceland (Espelund, 2007), such as in the nearby Reykjavik area where a number of 9th-10th century smithies and iron bloomeries have been found (Vala Garðarsdóttir, personal communication, 2010), but so far no evidence for large-scale iron production has been found at Hrísbrú.

The cemetery included a number of iron artifacts, consisting mostly of heavily corroded nails and clench bolts from burial features. The iron nails and bolts had remnants of wooden planks attached, and as these planks are otherwise completely decomposed, it appears that the iron in the nails and rivets has slowed the disintegration of the adjoining wood. The clench bolts consist of round-headed nails which have been passed through boards and then hammered over an iron square or diamond-shaped rove placed around the nail (Fig. 3A). In Scandinavia, this type of clench bolt was typically used in the construction of ships and smaller boats built in the *klinker* style, and is also known as a ship rivet (Bill, 1994; Lundström, 1972; McGrail, 2004) (Fig. 3B). In the burials, the iron nails were found along the edges of the burials, often in association with rectangular organic soil stains from decayed wood, indicating that they were part of coffins. The clench bolts, which are unsuitable for making square boxes, were found on top of the skeletons, indicating that they were part of wooden constructions other than coffins or burial biers. It is unusual to find clench bolts or ship rivets in burial features, and it appears that the clench bolts and the decayed wooden planks that they bound together are recycled material from boats (Zori, 2007). Re-use of material from Viking Age boats in Christian burials has previously been reported from Sebbersund in Denmark, although there the iron fittings had been removed for re-smelting and the boards were found below the bodies, suggesting to Birkedahl and Johansen (1995) that the re-use was purely functional. At Hrísbrú, the presence of the bolts and their placement on top of the body precludes a purely utilitarian role of these objects, and suggests that these boat fragments were ritually deposited in the graves as symbolic references to the pagan tradition of boat burials and the ship as a vehicle to the afterlife (Zori, 2007).

In addition to the clench bolts, two other iron grave goods were found in the cemetery. In burial Feature 3, a nine cm long hooped iron dress pin was unearthed (2002-57-55) (Fig. 4). In mainland Scandinavia, dress pins were used by both men and women from at least the migration period (ca. AD 370–570) onwards, and in the Vendel period (ca. AD 570–790) the early protuberant style was

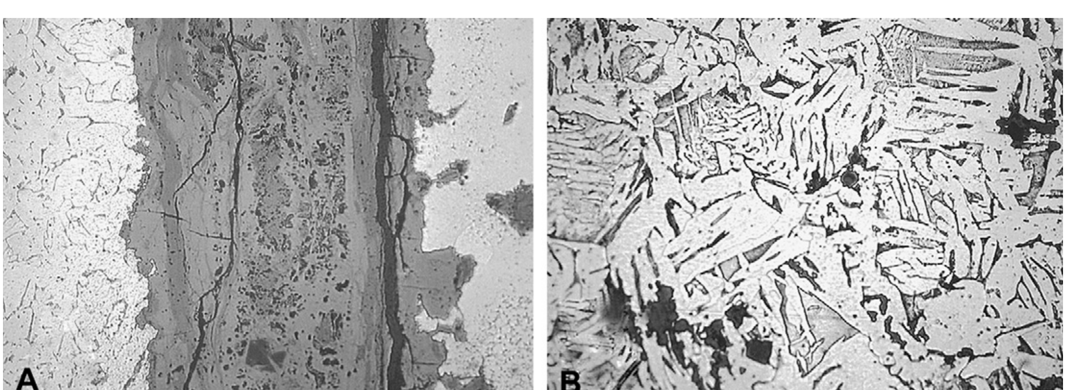

Fig. 2. Etched cross-section of knife-blade 2003-41-46, found in the church building at the Hrísbrú farm. A) The rightmost region is wrought iron, while the leftmost region is carbon steel. The region in between is the weaker welded interface, displaying cracking and corrosion. B) This close-up of the leftmost region in (A) shows the typical Widmanstätten structure for low-carbon steel.

Fig. 3. A.) Examples of the clench bolts found in burial feature CK-2007-5 in the graveyard next to the Hrísbrú farm church. Note the decomposed wood that has been preserved due to close proximity to the corroded iron. B.) Clench bolts employed in two methods for joining overlapping planks (redrawn by Jennie Dillon from Ottaway, 1992, 617).

replaced by polyhedral pins (Waller, 1996). In the Viking Age, the use of dress pins declined, as women began to fasten their clothing with characteristic oval brooches (Jansson, 1985). Men, on the other hand, continued to use dress pins which were usually made from bronze or brass, but sometimes they were fashioned from iron, and occasionally from expensive silver (Waller, 1996). Pins with hoops were typically used in pairs, which allowed a chain to be strung between them that could be used for carrying decorative or utilitarian items. A pin made from iron had multiple purposes, as it was sturdy enough to also be used as a tool for punching holes or as an awl. For find 2002-57-55 only one of the hooped pins, and not the full pair, was deposited in the grave. The corroded state of the pin precludes stylistic and metallographic analysis. To the best of the authors' knowledge, it is the only iron dress pin so far encountered in Iceland.

The second iron gravegood is a fragment of an iron pot (2003-41-65). It corresponds to about 1/5 of the original vessel, and was found deposited in burial Feature 49. The diameter of the original vessel was estimated to 19 cm, and the fragment consists of two iron sheets welded together with a loop riveted to the pot (Fig. 4). The latter allowed a chain to be fastened so that the pot could be suspended over a fire. The design and construction is similar to other welded and riveted iron pots from Viking Age Scandinavia, such as the ones found as grave goods in pagan graves (Fridell, 1930, 229; Odencrantz, 1937). The typical pagan grave however encompasses whole objects, while at Hrísbrú a fragment of a pot and an incomplete dress pin pair was deposited in a cemetery including partial boat material. Presumably the excavated parts were meant to symbolically represent complete objects.

4.2. Bronze fragments

A handful of copper alloy objects and fragments were encountered at the Hrísbrú site, and four fragments were selected for detailed technical examinations, i.e. 2007-21-61 found in the collapsed southern wall of the longhouse, 2003-41-33 from the church floor, 2002-57-68 from the cremation site, and 2006-27-16 from the soil above the longhouse. The 2006-27-16 fragment rested within the tephra layer from the Katla eruption of AD 1500, approximately dating the find to that year. Due to their fragmentary and corroded nature, it is not possible to accurately determine the original alloy composition of the finds or from what kind of objects they derive. However, X-ray fluorescence analysis revealed that the four finds consist of tin-bronze alloys. This constitutes a deviation from the standard composition of Scandinavian Viking Age copper alloys, which typically contain zinc, often lead, and less frequently tin (Arrhenius, 1989c; Craddock, 1990; Oldeberg, 1966; Söderberg, 2010). As there are no tin deposits in Scandinavia, geographic proximity suggests that the tin might originate from the British Isles where tin has been mined since at least 1000 BC (Barton, 1957; Varyl et al., 2004), even though other regions of origin are possible also. For 2006-27-16, XRF analysis identified small amounts

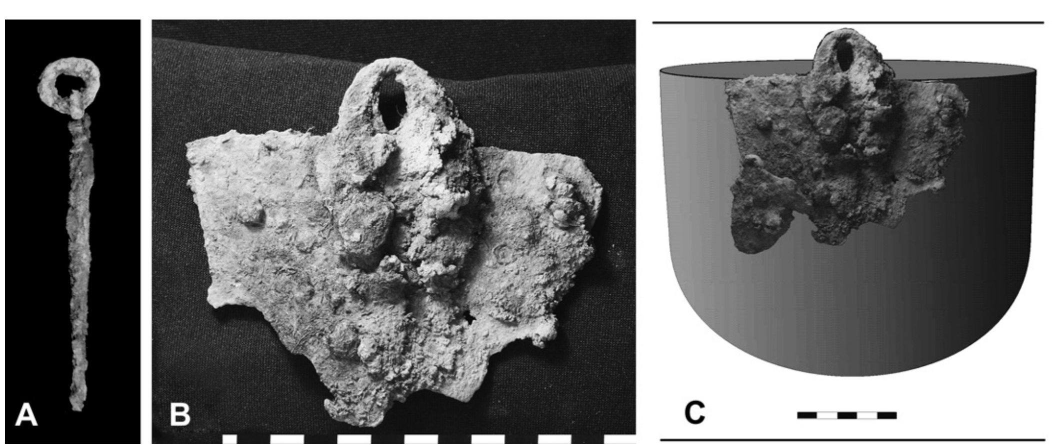

Fig. 4. A) Hooped Viking Age iron dress pin (2002-57-55) of West-Norse/Celtic style, found in Burial Feature 3 at Hrísbrú in the Mosfell Valley. B) Fragment of an iron pot (2003-41-65), found in the same cemetery. Bar is 1 cm. C) Reconstruction of the iron pot. The curvature of the fragment suggests that the pot was rather small, measuring about 19 cm in diameter. Bar is 1 cm.

(around 2% each) of lead and silver in the material, in addition to the copper and tin. While lead and tin are common additions to copper, silver is not, suggesting that the fragment was manufactured from a recycled bronze object with some silver decoration.

Metallographic analysis revealed annealing twins, small grain sizes, and occasional strain lines in the microstructure of all samples, indicating that cycles of cold-working and annealing were employed to skillfully hammer the objects into their desired shapes. In samples from objects 2002-57-68 and 2006-27-16 relatively high amounts of copper sulfide inclusions were encountered, indicating that the copper in these two objects was not of the highest quality, even though the copper must have been processed with some sophistication in order to yield sulfide rather than oxide inclusions. In 2006-27-16, cracks were present in addition to numerous strain lines, providing evidence of heavy stress-related deformation. Possibly the object had a functional rather than a decorative use – perhaps as a hinge – and the deformation may have been related to this use.

4.3. Beads

A number of monochrome and polychrome glass beads found in the longhouse were subjected to technical analysis and found to contain different metallic colorants. In mainland Scandinavia, bead-making from recycled glass or imported glass rods has been documented at sites such as Ribe, Hedeby, Kaupang, and Birka (Callmer, 1977; Sode, 2004). Since no glass-working sites have been found in Iceland, it is safe to assume that these beads were imported in their finished form.

Four of the beads (2007-21-142, -143, -144, and -145) have an intricate design pattern, consisting of a black body adorned with white bands together with eyes in red and blue (Fig. 5). XRD and XRF analysis indicate that the white colorant is tin oxide (SnO_2), the red colorant is haematite (Fe_2O_3), the black colorant is magnetite (Fe_3O_4), while the blue colorant is an unidentified copper-based compound. Beads with the same characteristic design pattern have been found at other places in Iceland (Eldjárn, 1956) as well as in Birka, Sweden, (Arbman, 1940), and in Eastern Europe (Callmer, 1977, 97). The other find sites all date to a narrow time window of AD 960–990 (Callmer, 1977, 85), which seems to be a plausible date also for the current finds from the Hrísbrú longhouse. It appears that beads with eyes were never produced in Scandinavia, and Callmer (1977) suggests that the style of the four excavated beads originated in Turkmenistan. Most likely, these beads were imported along the Viking Age trade routes that descend from Scandinavia down the rivers of Russia towards Asia.

Two of the other beads, 2006-27-53 and 2007-21-179, were manufactured with a decorative metal foil coating, identified with XRF as silver. This technique for bead ornamentation was relatively common in the Viking world, and while bead 2006-27-53 was excavated in pristine shape, formation of silver sulfide (Ag_2S) on bead 2007-21-179 has caused all the silver surface to turn golden, suggesting differential preservation conditions at the site.

For the three yellow beads 2006-27-9, 2006-27-54, and 2007-21-204, XRF analysis indicated the presence of tin, in addition to the normal elements found in glass such as lead, silicon, calcium, and potassium. XRD spectra of minute scrapings of bead 2006-27-9 identified the compound lead-tin oxide, $PbSnO_3$, also known as the pigment *lead-tin yellow* (Fig. 5). This pigment comes in two chemical forms, where type I, Pb_2SnO_4, is more common than type II, $PbSnO_3$. Both forms are chemically stable and lightfast, which helps to explain the pristine appearance of the beads. Lead-tin yellow was used in European easel paintings from the 14th century onwards (Kühn, 1968), but its main use during the Middle Ages was as colorant in yellow glass (Estaugh, 2004). Venice was the center in Europe for such glass production (Estaugh, 2004), which makes Italy a plausible origin for the raw material in the beads. However, as glass colored with lead-tin yellow type II has recently been encountered at local glass production sites outside Italy, such as the Merovingian site of Schleitheim in Switzerland (Heck et al., 2003), the geographic origin of the glass cannot be absolutely ascertained.

4.4. Corrosion and deterioration

Due to the environmental conditions at the site all metal finds were heavily corroded. X-ray diffraction identified the copper corrosion as standard copper oxide, Cu_2O, and copper carbonate, ($CuCO_3 \cdot Cu(OH)_2$). For iron standard oxides and hydroxides, i.e. FeO, Fe_2O_3, and FeOOH, were found together with the more uncommon iron carbonate, $FeCO_3$, which previously has been encountered in wet environments such as Danish peat bogs (Matthiesen et al., 2003). For the iron (2002-29-87) and bronze (2002-29-68) fragments deriving from objects deposited in association with the cremation burial (Fig. 6), no unusual corrosion products were found, and Raman spectroscopy of the corrosion crust of the iron fragments identified incorporated particles of graphite (i.e. charcoal) originating from the cremation event, which explains the charred appearance of the pieces.

Due to the uniform thickness of the bronze fragments from the cremation site it was possible to calculate the corrosion rate at the site. The cross-section of fragment 2002-57-68 contains a core of solid metal in a corrosion matrix retaining the shape and dimensions of the original bronze sheet (Fig. 6). With the average thickness of the studied fragment being 200 ± 10 μm, and the average thickness of the remaining metal being 20 ± 3 μm, the corrosion layers on both sides measure roughly 90 μm. With radiocarbon dating of charred twigs providing an approximate date of AD 990

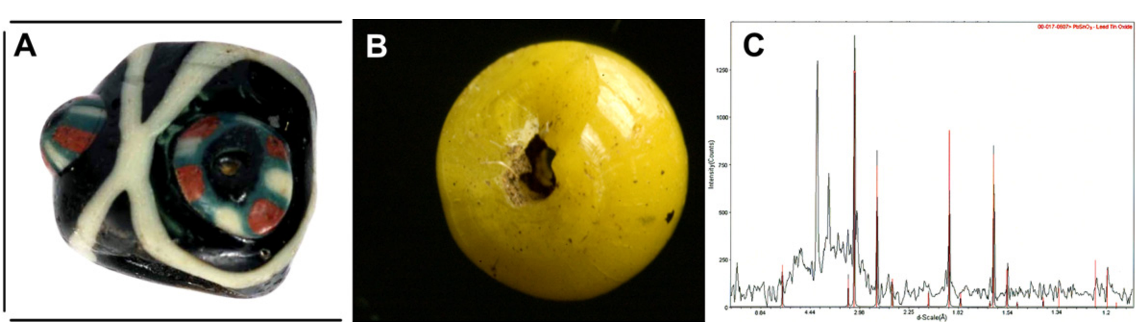

Fig. 5. A) One of the four "eye-beads" (F-2007-143) found in the Hrísbrú longhouse, stylistically provenanced to central Asia. B) The yellow bead F-2006-9. C) XRD spectrum identifying the yellow colorant in F-2006-9 as $PbSnO_3$, i.e. lead-tin yellow type II. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Fig. 6. Fragments of metal objects deposited at the cremation site at Hrísbrú. A.) Charred iron fragment 2002-29-87. Bar is 1 cm. B.) Bronze fragment 2002-57-68. Bar is 1 mm. C.) Polished cross-section of one of the 2002-57-68 bronze fragments, revealing remains of solid metal surrounded by corrosion.

for the cremation feature (Byock et al., 2005), the corrosion rate can be estimated to 90 microns in 1010 years, or about 0.09 microns per year. This can be compared to the rate of 0.005 microns per year found for neolithic copper scraps from Greece (Scott, 2002, 37). Even though pure copper typically corrodes slower than copper alloys, the difference of a factor 20 is significant, and testifies to the aggressive environmental conditions adversely affecting metal preservation at the Hrísbrú site.

5. Summary and conclusions

The most common metal at the Hrísbrú farm was iron, although also a few bronze fragments were encountered. These fragments derive from skillfully worked bronze objects, but the high sulfide content in some of the bronzes indicates that the copper used was not of the highest quality. The presence of tin and absence of zinc in the bronzes suggests trade with a tin-rich region such as the British Isles rather than with mainland Scandinavia. Silver was only encountered as a decorative element in some of the glass beads, and as a minor component in one of the bronze finds, indicating that this piece had been fashioned from recycled material.

Field surveys have shown that high quality bog iron is readily available in the Mosfell valley, but no evidence for large-scale iron production is present at Hrísbrú. The hammer scales encountered in the older structure underneath the church and the iron slag on the longhouse floor indicate that small-scale iron-working activities such as repairs have taken place at the farm. It is still unknown whether the excavated metal objects were manufactured at the farm or obtained from other localities in Iceland or elsewhere.

The main category of iron objects was clench bolts, probably originating from ship material that was re-used in the burial features at the site. A fragment of an iron pot and and a single hooped iron dress pin were also found in the burials. Although fewer and fragmented, the finds are similar in kind to those found in Scandinavian pagan graves (Theliander, 2005), and the deposition of these grave goods in the churchyard may carry symbolic meanings unrelated to traditional Christian doctrine, especially since the practice of depositing grave goods is mainly pagan (Gräslund, 1987, 1991, 1995; Theliander, 2005). A plausible interpretation is that the inhabitants of the farm negotiated between ritual and economic demands, and chose to bury broken or partial artifacts to symbolize the whole objects.

Investigations of the glass beads indicate that the raw materials and some of the design patterns originate from far away, even though it is possible that some or most of the beads were produced at trading sites in Scandinavia. The metal and bead finds at Hrísbrú show that this chieftain's farmstead was part of the extensive trade network of the Viking Age, and that the people on the Hrísbrú farm had access to the same type of goods and technology as mainland Scandinavians. However, the raw materials for the objects were not always the best, and it appears that metal was a scarce resource at Hrísbrú. The use of metal seems to have been characterized by improvisation and making-do with what was available at the moment, including repairing and modifying existing implements. The lack of decorative metal elements suggests that there was little room to use metals for non-utilitarian purposes. The same was true for construction-quality wood in Iceland, most of which was drift timber from Siberia consisting of larch (*Larix* sp.), Swiss stone pine (*Pinus cembra*), and Scots pine (*Pinus*sp.) (Eggertsson, 1993, 19-29; Kristjánsdóttir et al., 2001; Samset, 1991, 27). In line with this, a reasonably well-preserved wooden corner post of the Hrísbrú church was identified as larch (*Larix* sp.), indicating that it was drift timber.

In terms of materials, Hrísbrú appears poor compared to high-status Viking Age farms in mainland Scandinavia (Munch et al., 2003). On the other hand, the Hrísbrú farm appears quite rich in comparison with other Icelandic farms from the Viking Age and medieval period. For example, more than thirty imported glass beads were found in the floor layers of the Hrísbrú longhouse, a number considerably larger than for any other Icelandic Viking Age farmhouse (Hansen, 2009; Hreiðarsdóttir, 2007; personal communication 2009). The metal finds from Hrísbrú even look plentiful when compared to the finds from Margrét Hallmundsdóttir's excavation of the AD 900–1250 low-status farm in Kot in southeast Iceland, which has so far yielded no metal finds at all (Hallmundsdóttir, personal communication 2009). Thus, the Hrísbrú farm may very well represent the upper limit to what a Viking Age farm in Iceland could afford in terms of material goods. Although the unfavourable preservation conditions in Iceland make metallographic analysis of excavated finds difficult, further investigations in this field are necessary in order to understand how the Icelandic colonizers fashioned their material culture in an island lacking many natural resources.

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