



YORK ARCHAEOLOGICAL TRUST
CONSERVATION LABORATORIES

Heslington East, York (HE 11)

Report on a waterlogged wooden bucket for
The Department of Archaeology, University of York
by
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Abstract.

This report covers the assessment and study of a wooden bucket recovered during excavations at Heslington East, University of York by the Department of Archaeology in 2011.

Introduction.

In the autumn of 2011 a wooden bucket recovered from the recent training excavation was delivered to the Conservation Laboratory of York Archaeological Trust for temporary storage. Following authorisation of the proposed work in late October 2012, recording, drawing and assessment was carried out and the artefact put into stabilization treatment. The current document is the report for this initial stage. A separate report on the conservation will be prepared on completion of that work.

Methodology.

The work carried out has been done in accordance with IfA *Standard and Guidance for the collection, documentation, conservation and research of archaeological materials* (IfA 2008). The artefact was almost completely dismantled and arrived packed in a plastic tub with suitable padding. The bucket pieces were removed to a Stewarts Giant Storer and submerged in water for temporary storage.

For recording and assessment, each piece was removed from the Storer in turn and washed under cold clean running water to remove adhering burial deposits. A soft sponge was used to awash away iron based corrosion products which had precipitated out on the surface during storage. During this process, it was found that staves previously adhering to their neighbours had become separated and/or the iron concretion bridging the junctions where parts of hoops survived were too brittle to support the join. All staves were therefore numbered in sequence as they were cleaned to retain their correct associations.

Some of the fe corrosion was loose and detached from the staves and its original location could not be identified. Assessment by passing a magnet over the pieces confirmed the absence of metal and indeed closer examination showed that the fragments were concreted pieces of stone from the burial matrix which had become attached to the bucket during burial. These stone fragments were discarded.

To check for the survival and condition of the metal hoops each of the staves with adhering concretions was submitted for X-Radiography by M. Felter of the Conservation Laboratory. Two plates were produced, X-8093 (adjoining staves 08, 09 and 10) and X-8094 (staves 01, 03 and 12) The latter showed no significant features but that on stave 08 shows that as well as the surviving hoop fragment a staple or plate is also present which would have engaged with the end of the bucket handle. The exact form of this is not known at present owing to the extensive corrosion but following stabilization of the wood air abrasive cleaning of this area should reveal its form.

Each stave was recorded on a proforma sheet tailored for recording bucket staves prepared by this author. Though waterlogged, the wood is in very good condition. A 1:2 scale drawing of each individual stave and the base was produced by hand and

subsequently digitized using Adobe Illustrator (figures 1-5). The digital versions were then assembled and resized to create two 'exploded' views of the vessel one showing the inner faces (figure 6), the other showing the outer faces (figure 7) with the staves in their correct relative order. Finally a 1:2 scale elevation of the vessel with a half section and plan was created (figure 8). Details of the metal fittings have been left as generic blocks of grey tone at this stage but will be augmented on completion of conservation work.

Catalogue.

An overall description of the bucket is followed by individual entries for each of the wooden components. Wood species identifications follow Schweingruber (1982).

Near complete open coopered vessel, probably a bucket or pail. Stave built from twelve individual staves and a single piece base. Impressions of (and occasional fragments from) two 20 mm wide Fe hoops around the exterior, the lower c. 14mm above the foot, the upper c. 30 mm below the rim. Impression of one Fe mount for attachment of handle on stave 01. Remains of second such mount with single loop perforation on stave 08. Both of these staves have notches worn in the upper edge from the handle. Single asymmetric 'V' section croze groove c. 3mm wide, c. 3 mm deep on inner face c.18 mm above lower end, engaging with beveled edge of base (13). Staves reduce in thickness from foot to rim. Possible through Fe nails in face of staves 01 and 08 related to (missing) staples. Minor surface damage. Occasional Fe derived concretions present on faces, more extensive around surviving fragments of hoops. Vertical height (Foot to rim) 226 mm. Outer diameter at rim 218 mm. Inner diameter at rim 207 mm. Outer diameter at foot 153 mm. Inner diameter at foot 139 mm. All staves *Taxus baccata L.* Base board *Fraxinus excelsior L.* Context 2093.

Stave 01. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 17mm above foot. Impression of Fe hoop around outer face towards foot end. Worn vertical groove at mid point across width from worn notch in rim. Two Fe nails/pins through face c.182mm above foot. Concretions adhering to outer face at rim and below Fe nails. Concretions adhering to inner face below rim. 236 l, 67-40 w, 10 th.

Stave 02. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 17mm above foot. Impression of Fe hoop around outer face towards each end. Concretions adhering to outer face around hoop impressions. Concretions adhering to inner face below rim and croze. 232 l, 56-39 w, 11 th.

Stave 03. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 17mm above foot. Impression of Fe hoop around outer face towards each end with fragment of lower hoop adhering to face. Concretions adhering to outer face around hoop fragment. 233 l, 37-27 w, 11 th.

Stave 04. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of lower hoop

adhering to face. Concretions adhering to outer face around hoop fragment. 232 l, 42-25 w, 11 th.

Stave 05. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 17mm above foot. Impression of Fe hoop around outer face towards each end. Concretions adhering to outer face around lower hoop impression. 232 l, 65-40 w, 11 th.

Stave 06. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Sapwood present along most of one edge. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end. Small concretions adhering to outer face around hoop impressions. 231 l, 56-37 w, 11 th.

Stave 07. Tangentially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of upper hoop adhering to face. Concretions adhering to outer face around hoop fragment. 229 l, 59-37 w, 10 th.

Stave 08. Radially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of upper hoop adhering to face. Two Fe nails/pins through face c.171 mm above foot. Concretions adhering to outer face around hoop fragment. 227 l, 58-38 w, 11 th.

Stave 09. Tangentially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of upper hoop adhering to face. Concretions adhering to outer face around hoop fragment and around impression of lower hoop. 225 l, 56-37 w, 12 th.

Stave 10. Tangentially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of upper hoop adhering to face. Concretions adhering to outer face around hoop fragment. 226 l, 56-38 w, 11 th.

Stave 11. Tangentially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end with fragment of lower hoop adhering to face. Concretions adhering to outer face around hoop fragment and around impression of upper hoop. 228 l, 37-25 w, 12 th.

Stave 12. Tangentially faced *Taxus baccata L.* billet, backed and hollowed, both edges planed. Single asymmetric 'V' section croze groove across inner face 18mm above foot. Impression of Fe hoop around outer face towards each end. Concretions adhering to outer face around upper hoop impression. 230 l, 60-40 w, 10 th.

Stave 13. Tangentially faced *Fraxinus excelsior L.* board, cut to sub circular plan with wide continuous rough hewn bevel around lower face/edge. Faint axe hewing marks on

bevel. Minor damage around edge and on lower face. Upper face abraded. 139 l, 135 w, 11 th.

Discussion.

The survival of the artefact is due to burial within waterlogged anaerobic conditions and it appears this environment was maintained in this particular context until the excavation. The vessel is reported to have come from a well or water hole of Roman date. There is nothing in the technology of this artefact which would challenge that date and a good deal to support it. Though Iron age and sub Roman stave built vessels with metal hoops are known, these are elaborate high status items usually associated with burials. The container described here is more utilitarian.

Unusually, two types of wood are used in its construction, yew (*Taxus baccata L.*) for the staves and ash (*Fraxinus excelsior L.*) for the base. Yew is a native softwood, close grained and fairly tough. Ash is a native hardwood, again fairly tough. Both tree species are native to the British Isles. The wood from which the staves were cut appears to have been a reasonably large tree, certainly of a diameter from which a baseboard could have been cut without significant problems. However the incorporation of sapwood along one edge of stave 6 and the use of a tangentially faced stave 7 might suggest that the maker was struggling to find yew of uniform appearance and quality. The use of ash therefore could have been a deliberate choice. There is no evident damage to the artefact which would suggest this was anything other than an original feature of its construction.

The stave edges are carefully planed to allow a tight fit between adjacent staves and the croze is sharp and narrow. These features would suggest the container was intended to carry and contain liquids rather than solids and the findspot in a well is probably therefore not a coincidence. An estimate of the maximum capacity can be made by using the internal radius at the rim, the internal radius at the croze and the vertical height from croze to rim and from this volume can be estimated at around 4.9 litres.

Close parallels for the Heslington bucket do exist but are not as common as might be supposed. The largest collection of Romano-British buckets from a single site is that from the well at Dalton Parlours, West Yorkshire (Wrathmell and Nicholson 1990). Parts of at least sixteen buckets were recovered (Morris 1990, 206) but although softwoods are present in the wood species identified, none are constructed from yew. Some buckets do incorporate more than one wood species and three of the bases found are cut from ash. All of these buckets appear to be larger than the Heslington example, typically featuring base diameters of around 200-260mm.

A bucket from a well on Skeldergate, York (MacGregor 1978, 47) is of very similar size and capacity, and the fragmentary remains suggest it may have had similar mounts for the handle. The wood is a softwood, silver fir, but a major difference is that the vessel tapers inwards towards the rim.

Buckets made (at least in part) from yew are known from other Romano-British sites. An example was recovered in the late 1970s from a well at Rothwell Haigh, West Yorkshire (Allen 2010, SF77). This bucket is larger and has a two part base with thirteen staves, the handle secured with two Scott type 2 mounts. All of the wood is yew and again, though most staves are radially faced, three are tangentially faced. An incomplete

bucket from Welshpool (Boon 1961, 26) is made from yew, as might be an isolated stave from Prestatyn (Newstead 1938, 186 no. 7). In this latter case it must be noted that Newstead reports the wood species as oak whilst Earwood (1993, 78) describes it as yew.

Though the Heslington bucket is largely intact, there are some missing pieces. Both hoops are fragmentary and only those pieces firmly adhering to the face of the adjacent wood appear to have been recovered. The poor state of the metal and the very difficult excavation conditions could mean these missing fragments were inadvertently lost during retrieval. As iron hoops are not generally fractured in this way before burial, we can be sure that both hoops were present when the bucket was deposited.

The handle is a different matter. It would have been metallic, as it is difficult to envisage an organic handle such as leather or rope wearing the grooves in the upper ends of yew staves 1 and 8. Only one of the mounts by which the handle was fastened to the bucket appears to have survived on stave 8, its upper end terminating in a loop or perforation for the handle. The mount on stave 1 is missing and only the shafts of the two nails pinning it in place remain. The exact form of the mount remains to be defined after cleaning but the X-Ray image 8093 appears to show something similar to the type 4 described by Scott (1990, 200). The mount appears to be laid over, rather than under, the hoop. The upper end of the mount appears to have been lost and damage to the lower end of the surviving mount means that the two nails present on staves 1 and 8 could in fact be the ends of hooks turned over and driven into the face of the relevant stave under the hoop.

Little can be said at present about the hoops beyond their basic dimensions. None of the surviving fragments appear to show rivets and although this is an argument from negative evidence, it is suggested that the ends of the hoops were overlapped and welded. It is presumed the iron hoops were heated, slipped over the temporarily assembled staves and shrank in place as the iron cooled. This would account for the impression of missing hoops around the exterior of the bucket staves but it is worth noting that this heating did not reach a temperature high enough to char the wood surface.

If the vessel had been discarded as waste it is surprising that the metal fittings have not been stripped for recycling. Indeed the wood itself could have been burned as fuel. Disposal as waste therefore seems unlikely. The missing mount and handle might suggest an accidental loss- one mount breaking off and retained with the handle whilst the bucket was being recovered and the vessel falling beyond reach of the owner. However finds of near complete vessels, whether wooden, ceramic or metal, occur so frequently in Romano-British wells that the possibility of deliberate deposition, as a thank-offering at the end of the useful life of a waterhole, should not be dismissed.

The construction of this container provides evidence for the existence of a specialized tool kit. Apart from the tools needed to fell the trees and prepare the billets for finishing, we have a plane used to smooth the edges of the staves. A small adze or round shave was used to 'hollow' the inner faces of the staves and an axe or shave to 'back' or shape the outer faces. An axe was used to trim the base to shape and to hew the bevel around its edge. A croze plane would have been required to cut the croze groove around the inside of the assembled staves to house the base. Many of these items are highly specialized and would not have been used on an everyday basis for casual

woodworking. This bucket is a specialist product from a specialist workshop rather than something made up by a casual or jobbing labourer. We do not know how such trades were organized in the Roman period but it is unlikely that each settlement or farm would have had its own cooper's workshop. Hence the bucket need not have been a local product.

Further recommendations.

Following stabilisation of the wood by p.e.g. treatment and freeze drying it is recommended that the ironwork is cleaned and investigated. The results should confirm or refute some of the suggestions made above relating to the metal fittings and in consequence this report will then need to be modified.

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