YORK ARCHAEOLOGICAL TRUST

CONSERVATION LABORATORIES

Burdale, BUR07

Report on the investigative conservation of selected small finds for

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ABSTRACT:

This report describes the analysis phase investigative conservation of selected iron and copper alloy small finds from the site of Burdale. Please also refer to the assessment report dated 6th August, 2007.

AIMS AND OBJECTIVES

This report aims to meet the requirements of MAP2, Phase 4, Analysis, (English Heritage, 1991). The work carried out has been the investigative cleaning of the objects submitted. Following radiography and assessment the objects were authorised for treatment. Once the artefacts had been treated they would be packed appropriately for return to the client and for archive storage.

DESCRIPTION

Below is a table listing the objects selected for investigative conservation.
Recommendations for further work were those made in the assessment report mentioned above and were made without the input of a finds researcher or other members of the project team

X-ray	RF	Context	Assessment
6759	39	1043	Labelled as Fe loop. X-ray shows the metal core to be fairly solid, with a twisted construction and a rolled over end indicating this to be a handle fragment. Soil over thin reddish corrosion products and spots of active corrosion. Overall condition is good.
6759	43	1004	Labelled as Fe nail/?heckle pin. Probable textile processing spike (heckle pin). Fair to poor condition with areas of spalling, cracking and bright orange active crusty corrosion. X-ray shows the metal core to be fairly solid but with pitting along the edges.
6759	52	1046	Labelled as iron nail? Possible knife blade fragment with intact tang. Broken at other end although possible perforation may be present. No active corrosion, good condition. X-ray shows the metal core to be fairly thin and patchy.
6759	64	1004	Labelled as Fe blade. Iron fragment with a fresh break near the centre. Patches of active weeping corrosion otherwise very little corrosion. Both ends appear broken and worn. X-ray shows the metal core to be thin with visible striations.
6759	65	1004	Labelled as Fe blade. Tip section of an iron knife blade. Soil over reddish corrosion products. Broken edge and spots of active corrosion. Fair overall condition. X-ray shows the metal core to be thin with large corrosion pits.
6759	66	1005	Labelled as Fe blade? Iron fragment, quite heavy with a reddish surface covered with soil. No active corrosion, good condition. X-ray shows the metal core to be thick with thinning at edges.
6759	67	1018	Labelled as Fe knife. Whittle tang knife blade fragment. Crusty corrosion with soil over. Tang is intact, other end broken. Minor cracking and spots of active corrosion. X-ray shows the metal core to be fairly thick but with thinning along one edge and towards the end of the tang. Back is slightly curved.
6759	68	1018	Labelled as Fe knife. Whittle tang knife blade fragment in two pieces, the tip having been broken recently. End of the tang is also broken. Areas of crusty corrosion products and spots of active weeping corrosion. Overall condition is fair. X-ray shows the metal core to be thin and patchy, especially along the cutting edge.

6759	69	1019	Labelled as Fe blade. Whittle tang knife blade in two pieces, the tip having been broken off in a relatively fresh break. Very thin reddish corrosion with areas of loss to spalling. Minimal cracking. Condition is fair. X-ray shows the metal core to be patchy and thin. Groove running along back of blade but does not extend the entire length of the blade.
6759	70	1050	Labelled as Fe blade. Whittle tang knife blade in two pieces, fresh break near centre with active corrosion. Covered in soil over thin, crusty corrosion products. Overall condition is fair to good. X-ray shows the metal core to be patchy and thin with degradation to the edges.
6759	71	1050	Labelled as Fe blade? Three iron objects, one stone. Two possible fittings/strips with broken ends and one strip with rounded, perforated ends. All are in fairly good condition with minimal corrosion. Good general condition. X-ray shows the metal cores to be thin with corrosion pits. Larger object is more solid with degradation to the sides.
6759	72	1066	Labelled as Fe blade. Sand and silt over thin orange brown corrosion products. Areas of active corrosion near hook. Broken at one end. Object is bent into a 'U'-shape. Overall condition is fair. X-ray shows the metal core to be thin and pitted with degradation to the edges. Possible latch/hook or shears blade.
6759	73	1072	Labelled as Fe blade. Soil over orange surface with very little corrosion. Object is very solid and does not appear to have a cutting edge. Overall condition is good. X-ray shows the metal core to be pitted and degraded.
6759	74	1100	Labelled as Fe blade. Blade of iron whittle tang knife with a slight bend to the end of the tang. Thick layers of soil over thin orange brown corrosion products. Overall condition is good. X-ray shows the metal core to be thin and pitted with areas of the back being completely mineralised.
6760	75	1157	Labelled as Fe knife. Whittle tang knife blade, thin reddish corrosion products with soil over. Wear and corrosion pits along cutting edge and more crusty corrosion along the back. Areas of active corrosion, especially at the tip where there is substantial loss. Overall condition is poor to fair. X-ray shows the metal core to be thin and severely pitted.
6760	76	1179	Labelled as Fe blade. Two pieces; the larger is a probable whittle tang knife blade, very little corrosion, some spalling, spots of active corrosion. Fair condition. Smaller piece has similar corrosion. X-ray shows the metal core to be fairly thin with pitting at the edges, split/crack along the back of the blade. Smaller piece has very little metal left in the core.
6760	77	1180	Labelled as Fe blade. Whittle tang knife blade in two pieces. Bulky soil layers over orange brown corrosion products. No active corrosion. Good condition. X-ray shows the metal core to be thin with striations visible and thinning near the tip.

6760	97	1046 E	Covered in a crusty mix of corrosion products, inclusions and soil. Fair condition. Object is thin and appears to form an 'L'-shape. One edge is slightly bent over. Broken at two ends. X-ray shows the metal core to be thin and patchy.
6760	104	1295	Labelled as Fe punch? Two objects. Possible punch has soil over very thin corrosion products though there are more crusty, bulky areas with some active spots of corrosion. Overall condition is fair to good. X-ray shows the metal core to be solid and mostly intact with some thinning at the edges. The second object is thin and slightly bent, again with areas of crusty, bulky reddish corrosion with active spots; rest of the object has very little corrosion. Some loss to spalling. Overall condition is fair. X-ray shows this object to have a fairly thin metal core with degradation in the areas of bulky corrosion. Also a possible tool.
6760	112	1012	Labelled as Fe object. Sand and silt over medium thick reddish brown corrosion products. Areas of crusty red and orange active corrosion and there is some loss from spalling. Overall condition is fair. X-ray shows the metal core to be thin with areas of voiding. Spots of possible non-ferrous metal at one end which may be remains of plating or industrial residue in the corrosion products. The object appears to be a loop; possibly a chain link.
6760	113	1018	Labelled as Fe object. Sand and silt over fairly bulky orange to reddish brown corrosion products. Spots of active corrosion and minor cracking. Object is bent into a 'U'-shape. Overall condition is fair to good. X-ray shows the metal core to be reasonably intact but with degradation to the sides. One end is broken. Probable knife blade.
6760	125	1054	Small amounts of soil over thin corrosion products which are crusty in some areas. Object is bent into a 'U'-shape. Spots of active corrosion but overall condition is good. X-ray shows the metal core of the object to the fairly thick but thinning out towards one side. Both ends broken. Probable knife blade.
6760	126	1082	Labelled as Fe object. Sand and silt over medium thick orange brown corrosion products with some spots of possible active corrosion. Overall condition is good. X-ray shows the metal core to be patchy and thin with degradation to the edges. Possible knife blade.
6760	142	1213	Labelled as Fe strip. Covered in a yellowish thin corrosion crust with soil over. No active corrosion. Good condition. X-ray shows the metal core to be thin and pitted. Both ends appear broken. The shape suggests this may be a knife blade fragment or strip fragment.
6760	190	1002	Labelled as Fe blade. Blade of iron whittle tang knife. Surface covered in a crusty mix of corrosion products, soil and inclusions. Some spots of active corrosion. Overall condition is fair to good. X-ray shows the metal core to be degraded along the back and almost completely mineralised at the tip.
6779	226	1443	Labelled as Fe object. Iron knife blade fragment. Some soil over thin but occasionally crusty orange corrosion. Areas of active corrosion and some spalling and cracking especially at one end. Overall condition is fair to poor. X-ray shows the metal core to be fairly thick but with degradation at the edges. Striation faintly visible running down centre.

6779	235	1040	Soil with inclusions over uneven reddish surface. Some spalling has taken place. Overall condition is fair to poor. Cross-section seems to be triangular. X-ray shows the metal core to be fairly thick but patchy. Rivet visible at one end, going through object.
6779	244	1472	Labelled as Knife blade. Complete iron whittle tang knife blade. Soil over possible areas of mineral preserved organic material and very thin corrosion products. No active corrosion. Overall condition is good. X-ray shows the metal core to be relatively even and intact thought with thinning and mineralisation along cutting edge.
6779	248	1472	Labelled as Fe pin. Complete iron pin, end possibly broken. One area of crusty reddish corrosion with cracking, otherwise good condition with soil over thin corrosion products. Overall condition is fair to good. X-ray shows the metal core to be fairly even though with some pitting and degradation to the edges and end.
6758	24	1072	Labelled as Ae faceted pin head. Complete polygonal pin head with dot ornament. Shank missing. Soil over black and green surface. No active corrosion, good condition. X-ray shows the metal core to be solid and even.
6758	26	1018	Labelled as Roman coin. Complete copper alloy coin. Soil over dark green smooth patina with crust in places, good condition no active corrosion. X-ray shows the outlines of a motif but this is not clear.
6779	206	1471	Labelled as Ae pin. Complete copper alloy pin with decorative head. Slightly bent. Soil over green patina, with some areas of light green powdery corrosion which may be active as well as areas of fresh metal. Overall condition is fair to good. X-ray shows the metal core to be intact and even with a slight thickening near the tip and a decorative head with perforations.

METHODOLOGY

Iron objects were cleaned selectively using the air abrasive with 29 micron aluminium oxide powder. Cross-sections were selected on each object to give information about the shape of the core below the corrosion products. Many of the objects had mineral preserved organic material and this was left in situ where necessary. It should be noted that the majority of the iron knives bear resemblance to different examples found at 16-22 Coppergate, York; see Ottaway, 1992.
Copper alloy objects were investigated mechanically using a scalpel and mounted needle and the surfaces were cleaned afterwards using Industrial Methylated Spirits.
The antler comb fragments from SF157 were adhered using HMG Paraloid B72.
Digital images taken before and after conservation have been included on the attached CD.

ANALYSIS

SF24 Copper alloy faceted pin head. Corrosion was removed from the object to reveal the shape and nature of the decoration. The object has squat faceted polyhedral head with punched ring and dot motifs on four of the surfaces. It is very similar to dress pins found in Anglo-Scandinavian contexts in York at 16-22 Coppergate (Mainman and Rogers, 2000, 2577) and at Fishergate (Rogers, 1993, 1364).

SF26 Complete copper alloy coin which was investigated to reveal the motif. The surface is very worn but the head can clearly be seen on one side and it is now also possible to make out the motif on the other side, if faintly. It is recommended that this coin be referred to a numismatist for confirmation of a date.

SF39 Iron object with a hooked end and a twisted cross-section. This is possibly a handle fragment. The iron core is thin and mineralised and the magnetite surface is also quite thin. Part of the hooked end became detached during corrosion removal and was re-adhered using HMG Paraloid B72 (methyl methacrylate co-polymer).

SF43 This object was investigated for identification as a possible heckle pin. The burred end would suggest that this is a correct identification, the spike having been broken off from a wool comb.

SF52 Labelled as iron nail but the X-ray (X6759) suggested this to be a possible knife blade fragment. The cross-section revealed across the tang confirms this identification. The magnetite surface is in good condition.

SF64 Iron blade fragment. Two cross-sections across the object were investigated to reveal the shape. There is a 'V'-shaped break in one area and the cutting edge is shown to be worn.

SF65 Iron knife blade fragment which is broken at the tang end. One cross-section was investigated to reveal the shape of the blade.

SF66 Investigation shows that this is not a knife blade fragment. The core is very solid. One cross-section was investigated and this has revealed a ridge running along the length of the object.

SF67 Almost complete whittle tang knife blade with the tip broken. Cross-sections were investigated at the shoulder and across the blade to reveal the shape.

SF68 Complete whittle tang knife blade. There was a break near the tip which was re-adhered using HMG Paraloid B72 (methyl methacrylate co-polymer). Two cross-sections were investigated to clarify the shape at the shoulder and at the blade.

SF69 Complete whittle tang knife blade with tip broken. This was re-adhered using HMG Paraloid B72 (methyl methacrylate co-polymer). A cross-section was investigated at shoulder and tip (the tip is slightly worn/broken and the core is thin here). The cutting edge appears worn. There is mineral preserved organic material on the tang and blade which takes the form of reddish brown criss-crossing wood and plant structures. The incoherent and random pattern of the structures would suggest that this is perhaps the remains of small twigs or straw in the burial environment.

SF70 Complete whittle tang knife blade which arrived in two pieces. The pieces were re-adhered using HMG Paraloid B72 (methyl methacrylate co-polymer). A cross-section was revealed at the blade. There were substantial amounts of mineral preserved organic remains on the tang showing clear wood structures which may the remains of a handle. Further analysis using the scanning electron microscope may confirm the identification of the MPO.

SF71 Possible iron draw knife in two pieces. One end is broken. The two pieces were re-adhered using HMG Paraloid B72 (methyl methacrylate co-polymer). Two cross-sections were investigated at one shoulder at one end and near the middle of the blade. Incoherent and unstructured mineral preserved organic material was found on the blade, in the form of reddish brown powdery corrosion.

SF72 Bent and cracked possible knife blade fragment. A cross-section shows the shape of the blade. There is no a significant difference in thickness of the core between the back of the blade and the cutting edge. The magnetite layer is somewhat patchy.

SF73 Possible wide iron blade fragment. The magnetite layer is thin and patchy. A cross-section across the width of the object was investigated as well as the area of the possible shoulder or choil. There is no significant difference in thickness of the metal between the possible cutting edge and the blade back.

SF74 Complete whittle tang knife blade. A cross-section was investigated to clarify the shape of the blade. Mineral preserved organic material in the form of orange criss-crossing plant and wood structures was observed on the blade and this would suggest the remains of small twigs and plant material in the burial environment.

SF75 Almost complete whittle tang knife blade with some damage to the tang area. Three cross-sections were investigated; two at the blade and one at the damaged tang. The cutting edge towards the tip of the blade is worn.

SF76 Labelled as iron blade but the cross-section shows no tapering towards a cutting edge. Both ends are broken. This is possibly a narrow iron bar fragment.

SF77 Complete whittle tang iron knife blade. Substantial amounts of mineral preserved organic material was observed on the blade which takes the form of brown to reddish corrosion with many voids. There are no clear wood structures or grain patterns visible so they may be the remains of organic material in the burial environment. A cross-section was revealed at the shoulder. Part of the tang was broken and this was adhered using HMG Paraloid B72 (methyl methacrylate co-polymer).

SF97 Corrosion removal has revealed this object to be a folded sheet fragment with one end tucked under the fold (see digital image). The metal core and magnetite layer is pitted and thin.

SF104 This object was investigated for identification as a possible punch. The object has a diamond shaped cross-section and has a very solid metal core. Identification as a possible punch or awl is probable. The magnetite surface is very thin, with the metal core showing through in many places.

SF112 X-ray (X6760) showed potential plating material in some areas of this object. A cross-section was revealed to show this and to clarify the shape of the object. If the object was plated, very little of the plating material survives. X-ray fluorescence analysis would confirm the material, but as the material is a white metal this is likely to be tinning or silvering. The shape of the object would suggest that it is a potential chain link.

SF113 This object was investigated to show the shape of the blade. As with SF72 above, there is no significant difference in thickness between the cutting edge and the back of the blade. There is a large pit in one area.

SF125 This object was investigated to show the shape of the blade of this bent knife fragment. The magnetite surface is thin.

SF126 Blade and tang area of this knife blade was investigated. The magnetite layer is slightly thin and there is damage to the area around the tang where the fragment was broken in antiquity.

SF142 Labelled as iron strip. The revealed cross-section would suggest this to be a knife blade fragment with a fairly wide tang.

SF190 Complete whittle tang knife blade. Two cross-sections were investigated, at the tang and at the blade, for clarification of the shape.

SF206 Corrosion was removed entirely from this dress pin with faceted polyhedral head with punched dot motif. Similar to SF24 but smaller. The shank has an area which is slightly thicker about three-quarters of the way down. Surface is slightly uneven.

SF226 This object was investigated to aid identification. Two cross-sections were cleaned of corrosion one at the end and one across the width of the object. The end appears to have a slight lip indicative of hammering, and the remains of a slight tang. Cross-section does not appear to be consistent with a knife blade. ?Possible small tool.

SF235 Corrosion was removed around the rivet to clarify the shape of the object. Investigation revealed the shape of a possible blade and it is possible that this is a fragment of a pivoting knife (see Ottaway and Rogers, 2002, 2791; Ottaway, 1992, 586). Large rivet and good metal core and magnetite layer.

SF244 Complete whittle tang knife blade. Cross-section was investigated at the blade as there was substantial amounts of mineral preserved organic material at the shoulder. The MPOs have some wood grain structures in some areas but there are also areas of more incoherent organic matter which could be the remains of grass or straw from the burial environment. Further analysis using the scanning electron microscope may confirm the identification of the MPO.

SF248 This object was investigated to reveal the shape of the pin head. This is shown to be multi-faceted and solid. Again, the magnetite surface is thin, showing the core beneath in large areas. This dress pin is similar to examples found at 46-54 Fishergate, York (Rogers, 1993, 1367).

RECOMMENDATIONS

The objects are stable but should be stored in a dry environment of less than 15% Relative Humidity to avoid active corrosion. The objects should be handled with care due to the fragile nature of the exposed surfaces.

REFERENCES

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