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Assessment of archaeometallurgical residues and metalwork from Longtown Castle

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Abstract

The submitted materials included a small collection of archaeometallurgical residues (124g; 4 pieces) and 70 pieces of metalwork (64 ferrous, two of lead, three of copper alloy and one compound).

The upper level of Trench 4 (401) contained many pieces of modern metalwork, whereas that of Trench 3 (301) contained a single 19th – 20th century shoe iron. Trench 2 produced several clothing related items of the 17th-early 19th centuries, but only a single unstratified ring-pull tag that was certainly younger.

Trench 3 produced three medieval horseshoe nails (contexts (303) and (304)). Context (304) also produced some blacksmithing slag with an adhering fragment of probably medieval pottery.

No certain medieval objects were recovered from the other trenches, although Trench 4 (context (407), SF #1) produced a broken object that appeared to be part of a thick knife blade, of possible medieval date.

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Methods

All materials were examined visually, using a low-powered binocular microscope where required. As an assessment, the materials were not subjected to any high-magnification optical inspection, not to any form of instrumental analysis.

The identifications of materials in this report are therefore necessarily limited and must be regarded as provisional.

This assessment was conducted in March 2018 and was commissioned by Tim Hoverd.

Results

General description of the assemblage

The assemblage comprised a very small collection of material, submitted as probable archaeometallurgical residues (112g; 3 pieces) and as metalwork (1.2kg; 84 items).

The majority of the metalwork collection comprised iron objects (dominated by 35 certain or probable wrought iron 'standard' nails). There were four modern steel objects, three items of cast iron, three items of copper alloy and two of lead. One object contained both ferrous and non-ferrous components.

Archaeometallurgical residues

The material submitted as archaeometallurgical residues comprised two pieces (from contexts (223) and (304)) that were partially melted stones or ceramic. Such items may be generated from the accidental placement of a stone into the hearth (for instance as an accidental inclusion in the fuel, either as an accidental inclusion in charcoal or an impurity in coal) or from the hearth surround, particularly in cases where a floor level hearth was cut into a gravelly substrate. Their derivation from a fragment of hearth cermaic that had been lost into the hearth is also possible, though less likely.

The larger fragment of slag from context (304) is a deformed slab of low-density, iron-poor, slag, with a strong component from the partially melted hearth wall, and with a maroon upper surface. The lower surface is largely obscured by ferricrete accretion and by lime, but appears to be pale, dimpled and bearing small inclusion of charcoal. This piece is most likely to be a smithing slag from blacksmithing (the end use of iron), where the work has been fairly light (i.e. not involving extended periods of welding).

Context (215) produced a small fragment of ceramic (included within the metalwork collection as #84) that was strongly oxidised-fired, except on one surface where it was slightly reduced. The fabric contained an organic temper. This piece is most likely to be fragment of lining from a metallurgical hearth or furnace, although a lower-temperature origin cannot entirely be excluded.

Metal objects

The assemblage included a total of 39 nails, three identifiable as Goodall Type A 'fiddle-key' horseshoe nails of medieval age (#1 - #3), one a modern steel wire nail (#4), but the remainder were generally rather poorly-preserved wrought iron nails (#5 - #39).

Fastenings were also represented by a modern steel bolt (#40). There was also a wrought iron-spike of uncertain nature (#41) and two eyed-spikes (#42 - #43).

A broken wrought iron hook (#44), a short length of wrought iron chain, together with a broken single link (#45 - #46) are also undated.

A shoe iron (#47) was of 19th to early 20th century date. Non-ferrous clothing-related items included two buttons (#45 - #46) and a fragment of a shoe buckle (#47). One button (#48) was a simple pressed shirt button probably of 18th to 19th century date, whereas the other (#49) was somewhat damaged, but probably of similar date. Part of a copper alloy shoe buckle, of 18th to early 19th century date (#50) was unfortunately unstratified.

Two items may be furniture-related. The first was a small cast iron 'beehive' pull, probably from a drawer or cupboard (#51). This is not closely datable but is likely to be 18th to 19th century. The second item is a thin sheet (or possibly sheets) of copper alloy penetrated by a ferrous rod, with an unknown fastening. This compound item derives from an unidentified object, but which is likely to have been a domestic fitting.

Four items may have been derived from knives (or other thin-bladed tool), but each is somewhat problematic. The first (#53) is an iron spike, one end of which is flattened and extended asymmetrically to one side. It is possible that this is a fragment from an bladed tool with a large tang. The second is a broken iron object with a wedge-shaped cross-section (#54). It appears to be a blade, although the back is very thick (8mm) for a blade only 20mm wide. If the tip preserves the original shape, the outline suggests a straight-backed tanged whittle knife, comparable with Goodall's Type C. The other two objects are small pieces of thin iron that may be blade fragments (#55 - #56).

Indeterminate fragments of iron rod and strip are presented by eight pieces (#57 - #64). A fragment of bent steel bar with green paint (#65) was also present.

Two pieces of rolled lead strip, both from Trench 2, were of uncertain purpose (#66 - #67).

Two fragments of cast iron, one irregular, one an angular fragment from a thin iron plate (#68 - #69) were also of uncertain purpose.

A modern ring pull tag was amongst the unstratified material from Trench 2 (#70).

Eleven pieces of concretion (#71 - #81) probably contained fragments of iron, but the nature of the iron was concealed.

Other material present in the collection included two pieces of natural stone (#82 - #83) and one fragment of ceramic (#84), probably a fragment of metallurgical hearth lining (see above).

Distribution of the material

Trench 2: this trench yielded two items likely to be archaeometallurgical residues: a probable partially-melted stone from context (223) and a piece of probable heath lining (#84) from context (215).

Contexts (207), (207/218) and (227) yielded small collections of metalwork of indeterminate age. Context (215) yielded a more diverse assemblage of metalwork, including a sew-through stamped copper alloy shirt button of 18th century or 19th century date. Unstratified material from Trench 2 included, notably, both a modern ring-pull tag (#70), an 18th to 19th century button (#49) and part of an 18th to early 19th century copper alloy shoe buckle (#50).

Trench 3: Context (301) produced a shoe iron heel of 19th to 20th century date (#47). Context (302) produced what may be the tang of an indeterminate bladed tool (#53). Contexts (303) and (304) both yielded 'fiddle-key' horseshoe nails, probably of 11th to 13th century date (#1-#3). Context (304) also produced a variety of undated metalwork and context (311) a single piece.

Trench 4: context (401) produced an assemblage including several 20th-21st century items (#65, #40, #4), together with several others that were 17th century or later (#68, #51, #52). Contexts (402), (403), (404), (409) and (411) produced only undatable iron artefacts. Context (407) yielded an iron bar with a wedge-shaped profile, suggestive of an edge tool, possibly a very heavy knife, with a form somewhat similar to that of a Goodall Type C straight-back whittle tang knife. Although the incomplete preservation makes this identification only very tentative, it indicates compatibility with, although not certainty of, a medieval age.

Interpretation

The metalwork assemblage provides some indication of date, although the commonest artefact type, the wrought nails, are not datable except as probably earlier than 20th century. In Trench 2, context (215) produced a button of 18th or 19th century age, and a second button and shoe buckle, both of 18th to early 19th century date were also recorded from the trench (although unstratified). In Trench 3, context (301) produced a 19th to 20th century shoe iron, but contexts (303) and (304) produced the only certainly medieval artefacts, fiddle-key horseshoe nails. Trench 4 produced a variety of modern artefacts from context (401) and no datable artefacts from deeper contexts, although a possible blade fragment from context (407) might be medieval.

The assemblages from the three trenches also differed in character. Trench 2 (context (215) and unstratified material) yielded clothing associated items of 17th to early 19th century date. Trench 3 produced the only clothing-related item of 19th to 20th century date, a shoe iron, but also the only medieval horse-related items, three fiddle-key nails. The co-occurrence in this context of a low-density blacksmithing slag would potentially be compatible with the residue of a farrier. Trench 4 produced typical 19th to 21st century domestic and structural items from context (401).

The archaeometallurgical residues are very sparse but are likely to be indicative of blacksmithing – although presumably not in the immediate area of the excavations. At least some of this activity is likely to be of medieval age, for two of the four items of archaeometallurgical residue occur in the same context (304) as two medieval horseshoe nails, and the larger piece of slag has accretion containing what appears (subject to specialist confirmation) as a sherd of coarsely-gritted grey medieval pottery.

Further work

The limited assemblage means that there is little research potential for the metalwork. X-radiography of the collection might aid with the identification of some of the pieces carrying ferricrete.

The sparse archaeometallurgical residue assemblage does not require any further analytical investigation.

Reference

Goodall, I.H. 2011. *Ironwork in medieval Britain*. The Society for medieval archaeology monograph 31.

Table 1: summary catalogue of material submitted as archaeometallurgical residues. Weights in grams.

Context	Trench	Sample wt.	Item wt.	Notes
223	T2		9	slightly flowed, viscous appearing grey/green glazed material - probably partly-melted stone or ceramic
304	T3	103	24	rounded dense nub of slag, one end of which has a dull maroon surface, rather than greenish glaze.
			79	ferricrete attached to contorted piece of lining-rich pale green slag with deep maroon surface, ferricrete contains sherd of coarsely-gritted grey pottery.

Table 2: summary catalogue of material submitted as metalwork. Weights in grams.

Context	Trench	Sample wt.	Item wt.	Item No.	Notes
207	T2	11	<1	5	3.5mm square iron rod, nail shank?
			7	6	accreted object - elongate, possible nail
			2	82	stone or fired clay
207/218	T2	50	18	7-9	very poorly preserved nails
			32	71,72	iron-bearing concretions
215	T2	145	<1	48	two-hole, copper alloy sew-through button, 8x4mm impressed area with two 3mm holes, 15mm diameter
			31	66	folded lead strip, probable hole near margin, 30mm wide at wide end, 18mm at narrow, probably 95mm long
			44	41	137mm long, 11x9mm at wide end, tapering to point, iron spike
			12	10-12	highly corroded nails, two shanks, one possibly with a thick shank, but small head
			3	13	corroded large headed nail or stud, 22mm long, head 18mm across
			31	73-75	rounded ferruginous concretions
			6	76,77	ferruginous concretions, probably spalled from iron objects
			7	83	stone
215	T2	98	22	58-62	accreted fragments of iron strip; one piece shows 18x3mm cross-section, other fragments less certain
			23	57	9x6mm rectangular section iron rod, 55mm long
			33	14-18	concretions bearing square-sectioned mineralised iron - probably nails
			12	84	mostly oxidised ceramic (daub or more likely hearth lining?) with organic temper
			7	19	heavily accreted iron nail with large, head 12x8mm, 6mm square cross section of broken shaft
215	T2		5	20	pear-shaped concretion with 3mm square mineralised iron at narrow iron - suggest heavily accreted nail
227	T2		8	21	27x18x17mm, corroded iron lump, possible square shank protruding from one end
u/s	T2	12	4	42	small ring-headed spike, 44mm long, 8mm i/d incomplete loop, 5mm thick at ring, approximately square-sectioned shank tapering to point, 30mm long

Context	Trench	Sample wt.	Item wt.	Item No.	Notes
			<1	70	ring-pull tag
			<1	49	14mm diameter button (?), with groove 1mm from margin (edge outside groove commonly corroded away), eccentric raised rectangular lug, 1mm x 4mm.
			3	67	small fragment of rolled lead, 18mm wide strip
			2	50	cast copper alloy fragment, curvature approximately 70mm external diameter, tapers towards ends, but corroded, centrally swells to 5mm wide with perforation, 5mm wide centrally, 36mm long, but if almost complete and hole central originally 38mm. Side bar of Georgian shoe buckle.
301	T3		62	47	80mm w x 90mm l x 4mm t, shoe-iron for heel, with rectangular holes, approximately 2mm x 5mm
302	T3		36	53	105mm long spike, flattened to one side at tip, maximum of 25mm wide, 5mm thick, no indication of blade profile. Approximately 6x3mm at tip, 15x7mm at widest, possible tang of bladed tool.
303	T3		6	1	fiddle key nail, 40mm long, 4mm thick, 18mm x 10mm flat head, probably square shank. Goodall Type A, 11th-13th or 14th century
304	T3	150	60	78,79	fragments, probably joining, of irregular mineralised iron, object uncertain
			20	63	14x3mm iron strip, folded around, possibly only on itself or possibly with iron core, 35mm long, 8mm tall, 14mm wide
			14	2,3	two fiddle key nails with rounded heads, one with incomplete shaft, complete example 40x20x5mm including 27mm tapering shaft 8mm wide at head. Goodall Type A, 11th-13th or 14th century
			30	44	55x37x10mm, iron hook, shaft broken, approximately square sharp point, bow 15mm wide on lower side, shaft side 6-7mm square
			10	22	heavily corroded nail, 40mm preserved, possibly with small head
			2	23	small curved object (nail?) with T shaped head - now fragmented
311	T3		4	24	mineralised iron, probably square-sectioned nail shank, hollow
401	T4	459	44	68	slightly concreted, angular fragment of cast iron plate, 67x27x3mm
			50	65	bent steel strap (or, les likely, bracket) fragment with green paint, 95mm length with right angle bend and possibly a second on one fracture. One nail hole preserved, 25mm (1 inch wide), c.4mm thick
			6	40	5mm x 40mm modern steel hex bolt
			5	4	80mm wire nail

Context	Trench	Sample wt.	Item wt.	Item No.	Notes
			32	25-30	miscellaneous iron nail shanks, mostly equant, but one 7x5mm at wider end and tapering
			97	45	three chain links in concretion, graduated size from 55mm long and 7mm diameter, 45mm long and 6mm diameter and 47mm long and 3.5mm diameter
			38	46	68mm x 48mm x 8mm maximum diameter, chain link, one end broken open
			10	64	broken in three, fragment of narrow iron bar, 60mm x 12mm x 4mm
			65	51	35mm tall, maximum 30mm tall, cast iron knob with 12mm hole through centre, external surface shows ribs every 2mm in height; probably a beehive drawer/cupboard pull
			10	31	probable mineralised square-sectioned nail shank
			22	69	irregular rounded scrap, probably cast iron
			8	32	corroded nail, 18x12mm head
			6	33	corroded nail, 18x12mm head, head strongly asymmetric on shank
			8	52	25x8x2mm fragmented sheet of copper alloy, pierced by iron spindle of uncertain nature. Junction of two too corroded to ascertain nature of join
402	T4	41	38	43	mineralised iron spike with rolled end. Rolled end flattened, forms very small eye (8mm or less); main shank approximately square-sectioned, but mineralised and hollow; 78mm long
			2	34	22mm long section of probable nail shank
			<1	80	small fragment of mineralised iron
403	T4		6	35	38mm long nail, rectangular-sectioned shank; small head, but with unknown loss
404	T4		6	36	stout nail with curved shank and oblique 17x10mm head 3-4mm thick, 35mm of bent shank
407	T4 SF 1		53	54	tapered section bar, broken in two, 20mm wide, 8mm thick at back, possibly a stout knife blade, back appears flat, edge curves up from 10mm from tip, where it was 16mm wide. If blade, no evidence for preserved handle/tang, but overall shape resembles a Goodall Type C whittle tang knife. If a blade, it is unusually thick at the back.
409	T4		9	37	57mm long curved nail shank, tapers to a point, cross-section uncertain
411	T4	20	9	38	nail shank length, 40mm long
			1	39	23mm long nail point

Context	Trench	Sample wt.	Item wt.	Item No.	Notes
			6	55,56	possible small blade fragments, thin iron sheet, highly mineralised
			3	81	iron concretion

Table 3: metalwork and related material sorted by type

Item #	Context	Trench	Weight	Number	Notes
					FIDDLE-KEY NAILS
1	303	T3	6	1	fiddle key nail, 40mm long, 4mm thick, 18mm x 10mm flat head, probably square shank. Goodall Type A, 11th-13th or 14th century
2, 3	304	T3	14	2	two fiddle key nails with rounded heads, one with incomplete shaft, complete example 40x20x5mm including 27mm tapering shaft 8mm wide at head. Goodall Type A, 11th-13th or 14th century
					STEEL WIRE NAIL
4	401	T4	5	1	80mm wire nail
					MISCELLANEOUS WROUGHT IRON NAILS
5	207	T2	<1	1	3.5mm square iron rod, nail shank?
6	207	T2	7	1	accreted object - elongate, possible nail
7-9	207/218	T2	18	3	very poorly preserved nails
10-12	215	T2	12	3	highly corroded nails, two shanks, one possibly with a thick shank, but small head
13	215	T2	3	1	corroded large headed nail or stud, 22mm long, head 18mm across
14-18	215	T2	33	5	concretions bearing square-sectioned mineralised iron - probably nails
19	215	T2	7	1	heavily accreted iron nail with large, head 12x8mm, 6mm square cross section of broken shaft
20	215	T2	5	1	pear-shaped concretion with 3mm square mineralised iron at narrow iron - suggest heavily accreted nail
21	227	T2	8	1	27x18x17mm, corroded iron lump, possible square shank protruding from one end
22	304	T3	10	1	heavily corroded nail, 40mm preserved, possibly with small head
23	304	T3	2	1	small curved object (nail?) with T shaped head - now fragmented
24	311	T3	4	1	mineralised iron, probably square-sectioned nail shank, hollow
25-30	401	T4	32	6	miscellaneous iron nail shanks, mostly equant, but one 7x5mm at wider end and tapering
31	401	T4	10	1	probable mineralised square-sectioned nail shank
32	401	T4	8	1	corroded nail, 18x12mm head
33	401	T4	6	1	corroded nail, 18x12mm head, head strongly asymmetric on shank
34	402	T4	2	1	22mm long section of probable nail shank
35	403	T4	6	1	38mm long nail, rectangular-sectioned shank; small head, but with unknown loss
36	404	T4	6	1	stout nail with curved shank and oblique 17x10mm head 3-4mm thick, 35mm of bent shank
37	409	T4	9	1	57mm long curved nail shank, tapers to a point, cross-section uncertain
38	411	T4	9	1	nail shank length, 40mm long
39	411	T4	1	1	23mm long nail point

Item #	Context	Trench	Weight	Number	Notes
					STEEL BOLT
40	401	T4	6	1	5mm x 40mm modern steel hex bolt
					WROUGHT IRON SPIKE
41	215	T2	44	1	137mm long, 11x9mm at wide end, tapering to point, iron spike
					WROUGHT IRON EYED-SPIKES
42	u/s	T2	4	1	small eyed spike, 44mm long, 8mm i/d incomplete loop, 5mm thick at ring, approximately square-sectioned shank tapering to point, 30mm long
43	402	T4	38	1	mineralised iron eyed spike with rolled end. Rolled end flattened, forms very small eye (8mm or less); main shank approximately square-sectioned, but mineralised and hollow; 78mm long
					WROUGHT IRON HOOK
44	304	T3	30	1	55x37x10mm, iron hook, shaft broken, approximately square sharp point, bow 15mm wide on lower side, shaft side 6-7mm square
					WROUGHT IRON CHAIN
45	401	T4	97	1	three chain links in concretion, graduated size from 55mm long and 7mm diameter, 45mm long and 6mm diameter and 47mm long and 3.5mm diameter
46	401	T4	38	1	68mm x 48mm x 8mm maximum diameter, chain link, one end broken open
					CLOTHING: SHOE IRON
47	301	T3	62	1	80mm w x 90mm l x 4mm t, shoe-iron for heel, with rectangular holes, approximately 2mm x 5mm
					CLOTHING: BUTTONS
48	215	T2	<1	1	two-hole, copper alloy sew-through button, 8x4mm impressed area with two 3mm holes, 15mm diameter
49	u/s	T2	<1	1	14mm diameter button (?), with groove 1mm from margin (edge outside groove commonly corroded away), eccentric raised rectangular lug, 1mm x 4mm.
					CLOTHING: SHOE BUCKLE
50	u/s	T2	2	1	cast copper alloy fragment, curvature approximately 70mm external diameter, tapers towards ends, but corroded, centrally swells to 5mm wide with perforation, 5mm wide centrally, 36mm long, but if almost complete and hole central originally 38mm. Side bar of Georgian shoe buckle.

Item #	Context	Trench	Weight	Number	Notes
					FURNITURE?
51	401	T4	65	1	35mm tall, maximum 30mm tall, cast iron knob with 12mm hole through centre, external surface shows ribs every 2mm in height; probably a beehive drawer/cupboard pull
52	401	T4	8	1	25x8x2mm fragmented sheet of copper alloy, pierced by iron spindle of uncertain nature. Junction of two too corroded to ascertain nature of join
					TOOLS: KNIVES?
53	302	T3	36	1	105mm long spike, flattened to one side at tip, maximum of 25mm wide, 5mm thick, no indication of blade profile. Approximately 6x3mm at tip, 15x7mm at widest, possible tang of bladed tool.
54	407	T4 SF 1	53	1	tapered section bar, broken in two, 20mm wide, 8mm thick at back, possibly a stout knife blade, back appears flat, edge curves up from 10mm from tip, where it was 16mm wide. If blade, no evidence for preserved handle/tang, but overall shape resembles a Goodall Type C whittle tang knife. If a blade, it is unusually thick at the back.
55, 56	411	T4	6	2	possible small blade fragments, thin iron sheet, highly mineralised
					INDETERMINATE IRON ROD
57	215	T2	23	1	9x6mm rectangular section iron rod, 55mm long
					INDETERMINATE IRON STRIP
58-62	215	T2	22	5	accreted fragments of iron strip; one piece shows 18x3mm cross-section, other fragments less certain
63	304	T3	20	1	14x3mm iron strip, folded around, possibly only on itself or possibly with iron core, 35mm long, 8mm tall, 14mm wide
64	401	T4	10	1	broken in three, fragment of narrow iron bar, 60mm x 12mm x 4mm
					INDETERMINATE STEEL BAR/STRAP
65	401	T4	50	1	bent steel strap (or, les likely, bracket) fragment with green paint, 95mm length with right angle bend and possibly a second on one fracture. One nail hole preserved, 25mm (1 inch wide), c.4mm thick
					INDETERMINATE LEAD STRIP
66	215	T2	31	1	folded lead strip, probable hole near margin, 30mm wide at wide end, 18mm at narrow, probably 95mm long
67	u/s	T2	3	1	small fragment of rolled lead, 18mm wide strip
					INDETERMINATE CAST IRON
68	401	T4	44	1	slightly concreted, angular fragment of cast iron plate, 67x27x3mm
69	401	T4	22	1	irregular rounded scrap, probably cast iron

Item #	Context	Trench	Weight	Number	Notes
					RING-PULL TAG
70	u/s	T2	<1	1	ring-pull tag
					MINERALISATION & CONCRETION
71, 72	207/218		32	2	iron-bearing concretions
73-75	215	T2	31	3	rounded ferruginous concretions
76, 77	215	T2	6	2	ferruginous concretions, probably spalled from iron objects
78, 79	304	T3	60	2	fragments, probably joining, of irregular mineralised iron, object uncertain
80	402	T4	<1	1	small fragment of mineralised iron
81	411	T4	3	1	iron concretion
					NON-METALLIC
82	207	T2	2	1	stone (or less probably fired clay)
83	215	T2	7	1	stone
84	215	T2	12	1	mostly oxidised ceramic (daub or hearth lining?) with organic temper

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