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Assessment of metalwork from the National Slate Museum (NSM/24/EV)

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Abstract

The submitted assemblage comprised a total of 57 items, weighing a total of 10.4kg, derived from three archaeological contexts. The majority of the items (47 pieces) derive from context (303), with lesser assemblages from contexts (401) (7 pieces) and (506) (3 pieces). The dominance of wrought iron pieces suggests a 19th century date, but the occurrence of hexagonal fastenings suggests a later rather than earlier point.

The overall collection includes one large, perforated iron bar of unknown purpose, one fragment of a boot heel tap and one cotter pin of a form commonly employed to attach dram wheels to their axles (but other purposes are also possible). The remainder of the collection includes eighteen items that can be classified as generic fastenings, two fragments of chain links and twenty-three fragments of generic stock (iron bar, iron rod, iron wire and cast iron plate). There were also three unidentified wrought iron pieces, one small fragment of cast iron and seven pieces of concretion.

Six of the artefacts and ten of the stock items were clearly cut obliquely and many of the other stock must have been cut but the cuts are not clearly visible.

The concretionary materials show a matrix largely formed of pyrotechnological waste – coal dust, coke and clinker. The metalwork assemblage is probably best viewed as an assemblage of waste disposed of from a workshop, in a similar manner to the disposal of the (presumably) steam boiler waste.

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Methods

All materials were examined visually, using a low-powered binocular microscope where required. X-radiographs of the objects have also been consulted. All measurements quoted are in mm, although the objects, where appropriate, would have been designed to dimensions in inches.

This assessment was conducted in September 2024 and was commissioned by Dr Rhiannon Philp of Archaeology Wales

Results

Context (303)

Item #1 is a substantial (560mm x 56mm x 12mm) wrought iron bar with three holes along its axis. The use of such a bar is not intrinsically determinable.

Item #2 (a right-angled corner, 103mm across, fashioned from wrought iron) is likely to have a structural purpose, but that purpose is not specifically identifiable.

Item #3 is a small cast piece with parallel ridges (one with a central 'tooth') together with a central circular large hole. This item is probably best interpreted as part of a clamp. The most common modern use of a component of this type is to secure car batteries onto their housing and this item may have fulfilled a similar mechanical role.

Items #4 to #18 are all examples of fastenings (?rivet, bolts, nuts, nails, ?washer) that are typical of the range of fasteners present in 19th century assemblages. Many of the items show evidence for being cut (the precise tool employed for the cutting is not clear, but they appear to have been by shears or cold-set perhaps.

Items #19 and #20 are fragments of two large chain links (formed from wrought iron rod of 25mm and 22mm diameter respectively), similar severed – in these cases apparently by a single cut traversing both sides of the link.

Items #21 to #29 are fragments of iron rod varying from 13 to 25mm (suggesting stock sizes from ½ to 1 inch). This items almost all show clear evidence of cutting, although with these items they could equally be residual fragments of stock as be debris from dismantling/demolition.

Smaller diameters are represented by items #30 to #34 and these ae classed as wire. With the smaller diameters the origin of the fragments is even less clear, with fragmentation by corrosion and additional potential origin.

Item #36 comprises two strands of tightly twisted wire.

Rectangular- and square-sectioned wrought iron bar fragments are represented by item #36 to #41. Once again, one of these items shows oblique cutting, similar to the items previously described from dismantling/ demolition.

Items #42 and #43 are small fragments from fractured cast iron plates.

Items #44 and #45 are fragments of wrought iron. Piece #44 is an unidentifiable fragment, but #45 is a trough-shaped item, tapering to a point. It is unclear whether this was a deliberate form, or whether, perhaps more likely, this is a longitudinal spall from an object such as a small pick.

Item #46 is a small piece of cast iron that appears to be a worn object fragment but is insufficient to determine from what it was derived.

Item #47 is a small piece of ferruginous concretion, probably purely weathering products and not containing an artefact.

Context (401)

Item #48 is a substantial iron cotter pit, approximately 150mm in overall length. Pins of this size were commonly employed to secure the cast iron wheels of drams to their axles but they were also employed in other settings within both steam power and structures.

Corrosion/accretion obscures item #49, which appears to show a curving length of round bar reducing to a chisel tip. This might perhaps be interpretable as a curved spike of a form used to attach rails (or their chairs) to sleepers, but it is insufficient to confirm this interpretation.

Item #50 is a small fragment of a boot heel tap.

Items #52-54 are pieces of ferruginous concretion, dominated by coal, coke and clinker. Some small incorporated particles, particularly millimetric spheroids, might be potentially be from iron working (hammerscale) rather than being clinker droplets.

Context (506)

Items #55 and #56 are fragments of concretion, similar to those from context (401).

Item #57 is a concretion containing a tapering void indicating the former presence of a small iron object, probably a nail.

Interpretation

The materials mostly appear to represent the deposition of scrap, rather than more casual loss or discard. Most of the items fall into the categories of either offcut/remainders from stock materials or debris generated by dismantling or demolition.

Very few of the items are specifically identifiable; most are generic components/materials.

The identification of deposits rich in coal and coal burning waste, presumably from steam boilers, may be another outcome.

Further work

There is no further work necessary on the assemblage.

Table 1: summary catalogue, weights in g.

context	item wt	item #	notes
303	3036	1	Bar: 560mm x 56mm x 12mm iron bar; perforated by 24mm diameter holes, 65mm from one end and 60mm from the other, this end also has a smaller 16mm diameter hole, 28mm from the end; one side shows patches of adhering slatey concrete or mortar, within which the single hole has a 40mm diameter shadow, suggesting the location of possible washer.
	219	2	Wrought iron corner brace?: irregular wrought iron right angle; bar has maximum section of 20mm x 10mm, irregularly tapering down to 5mm x 10mm at tips; arms 103mm long; the accretion includes hammerscale
	83	3	Clamp?: 42mm square, 5mm thick, flange to 12mm on one side with raised part (13mm x 4mm) to 17mm above base; low ridge 5mm wide to 10mm above base 10mm from opposing side; X-ray indicates central hole is 15mm in diameter
	111	4	Rivet?; 105mm long, 13mm diameter, head tapers out to 23mm over c.8mm.
	151	5	Bolt: 18mm diameter bolt shaft; thread approximately 10 turns/inch; one end flat, the other cut oblique to wedge; 85mm max length
	432	6	Bolt: 18mm diameter bolt shaft, thread approximately 10/inch; one end cut twice obliquely to wedge; 147mm max length; other end carries two square nuts, each 30mm square and 17mm thick
	76	7	Bolt: 27mm a/f hex, but swollen, 12mm thick, on shaft c.12mm across, shaft appears square, so possibly carriage bolt head, but this is not certain
	251	8	Bolt: dome head 35mm diameter and 14mm tall, shaft 17mm in diameter; threaded for at least 32mm; probably round section continues to head
	448	9	Bolt: square headed bolt; 34mm square head, 10mm thick; 194 long, 18mm diameter, threading visible for 50mm
	280	10	Bolt: 42mm a/f hex bolt head; 23 mm thick; c30mm diameter shaft bent and cut obliquely
	76	10	Bolt: 17mm diameter bolt shaft, 50mm long, c10 threads/inch; one end straight, the other cut slightly oblique
	339	12	Nut/bolt: appears to be a 33mm x 33mm x 38mm large nut on c20mm shaft; X-ray provides hint this is actually two nuts in alignment.
	104	13	Nut: 30mm square x 17mm thick item
	40	14	Nut: 23mm a/f hex by 12mm (1/2 inch) thick, probably a nut, but the apparent hole is only visible on one side
	15	15	Nail: chisel ended nail; shank starts at a size of 4mm x 5mm below head and 5mm x 1.5mm at preserved tip; the head is obscured; machine made
	9	16	Nail: 80mm nail, rectangular section, chisel tip; similar to 15g example above, but head as preserved is smaller
	3	17	Nail: 25mm long fragment of head section of wire nail, highly corroded
	21	18	Washer: concretion bearing 25mm diameter 3mm thick perforated disc
	247	19	Chain link: fragment of probable chain link forged from 25mm rod, cut across both sides on single line oblique and at 45 degrees to link
	430	20	Chain link: part of chain link formed of 22mm rod; overall 85mm x 90mm; cut obliquely at right angles to link
	100	21	Rod fragment: 50mm length of 20mm diameter rod, both ends cut obliquely
	83	22	Rod fragment: 45mm length of c18mm diameter rod; concreted and bloating; both ends cut obliquely in a more-or-les parallel manner
	96	23	Rod fragment: 70mm length of c18mm diameter bloating iron rod, but ends cut obliquely, one leaving pointed burr

514	24	Rod fragment: 140mm length of 25mm diameter rod; one end flat, the other cut obliquely, wrought iron
123	25	Rod fragment: 74mm long, 20mm diameter, rod; both ends have oblique cuts
83	26	Rod fragment: 74mm length of 18mm diameter rod; one end even the other oblique
166	27	Rod fragment: 92mm length of c20mm rod; both ends have slightly oblique fractures and whole piece curves slightly
114	28	Rod fragment: 127mm long 13mm diameter rod; one end has possible burr, the other cut obliquely
186	29	Rod fragment: 40mm long section of 33mm rod; both ends oblique - not clear if the rod is deformed or cut obliquely
8	30	Wire: 83mm long section of 6mm rod
13	31	Wire: 5mm x 5mm wire expanding to 12mm x 5mm at one end; 105mm long
12	32	Wire: 87mm long, 6mm diameter rod
6	33	Wire: 60mm long piece of 5mm wire expanding into bulbous tip
9	34	Wire: 115mm long wire to 5mm diameter, but frequently corroded narrower
32	35	Twisted wire: 200mm two-strand twisted wire; 1 twist per 15mm approximately,
10	36	Bar fragment: 28mm long fragment of ?8x12 bar, highly corroded and edges worn so section and dimensions uncertain
155	37	Bar fragment: almost rhomboidal bar sides 20mm and 17mm, 65mm long; axes 25mm and 20mm
95	38	Bar fragment: 15mm square-sectioned bar, 50mm long; both ends cut obliquely
162	39	Bar fragment: c.27x12mm bar 110mm long, slightly curved
64	40	Bar fragment: 90mm length of irregular form c.24x5mm section but variable,
136	41	Bar fragment: 80mm long 10mm square bar, slightly bent
442	42	Plate fragment: 105mm x 55mm fragment of cast iron plate 16mm thick with chamfered edge; narrows asymmetrically to 32 mm; probably simple fractures, not cut and not an intentional shape.
40	43	Plate fragment: 25mm x 55mm triangular section of 8mm thick cast iron plate
12	44	Wrought iron fragment: 35mm x 5mm x 12mm scrap of wrought iron
133	45	Wrought iron fragment: 110mm x 30mm trough-shaped piece of wrought iron narrowing almost to point at one end; too accreted to determine if this is a torn piece of thick wrought iron (e.g. pick point) or a folded piece of thinner iron; the density appears too high to be a folded thin sheet
15	46	Cast iron fragment?: magnetic, stone-like material, presumably cast iron; 19mm x 17mm approximately flat base; profile rises to a central, approximately 5mm wide strip 8mm above the base; this carries a with central boss c6mm in diameter with its top at 12mm above the base; the profile is asymmetric: one basal angle is a simple angle, the other has a vertical face3-5mm tall; object has passing resemblance to a gun flint in shape.
8	47	Concretion: small fragment of concretion, probably not artefact in itself

401	163	48	Cotter pin: formed of 18-20mm x 5mm bar; eye c 12mm across internally and 35mm x 25mm externally; tails overall 120mm and 115mm from top of eye; they show a bend 60mm below eye, suggesting the thickness of the bar through which the cotter passed.
	61	49	Spike?: 93mm x 15mm x 20mm concretion, appears to show iron inside wedging to 10mm x 2mm at one end, from 12mm diameter round at the other; possibly a spike?
	7	50	Boot heel tap: curved decomposed iron, 10mm x 5mm section, c 50mm long
	29	51-53	Concretion: coal/iron/coke rich concretion
	435	54	Concretion: clinker-rich concretion apparently broken from planar surface, X-ray shows ghost of square object within
506	500	55-56	Concretion:, debris not just slate but is dominated by clinker/coal
	6	57	Nail?: elongate concretion, iron now mould- square/rectangular section narrowing down the 45mm length of the concretion; suggests nail?

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