V: Two Recent Discoveries in Wrexham County Borough

1: A Roman Lead Ingot from Rossett

by Susie White*

The Roman lead ingot found by a local metal detectorist near Rossett in 2019 is significant in a number of ways. It is the first epigraphic attestation of M Trebellius Maximus, governor of Britain AD 63–9; it attests a new place-name; the detailed examination of its composition contributes to the debate on the question of the desilvering of ingots; and it adds to our information on the start of the Roman military occupation of the area and the exploitation of Flintshire lead.

Introduction

In early September 2019 a local metal detectorist, Rob Jones, reported the highly unusual discovery of a Roman lead ingot near Rossett to the Portable Antiquities Scheme. Following best practice, he had left the ingot in the ground (Illus V.1.1), and the author and Steve Grenter, Heritage and Archive Lead at Wrexham Museum, immediately joined the detectorist and landowner on site to make sure that any available archaeological evidence relating to the context of the find was recorded. Having cleaned up the area around the ingot, it was agreed that there was no obvious cut to be seen in the section and no associated finds, so the ingot was lifted. Subsequent geophysical survey and trial trenching were carried out on the site by a team from the University of Chester and Archaeology Survey West in September 2020 (*see* following article). This work confirmed that there was nothing of archaeological significance relating to the deposition of the ingot, suggesting that it was a stray loss, possibly in transit. A reading of the cast inscription on the ingot showed that it attested Trebellius Maximus, governor of Britain AD 63–9, while the composition of the metal was examined in detail at the University of Liverpool. The ingot is recorded on the Portable Antiquities Scheme database as WREX-8D3982.

Background: Roman lead ingots in Britain

In the Roman world, lead ore (galena) was mined both to be smelted to lead metal and, often, for the recovery of the silver that it contained. Silver was needed, for example, for coinage, vessels and personal adornment, while large quantities of lead were needed for the manufacture of sheets, pipes, cisterns, coffins and weights. After initial smelting, the silver

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Illus V.1.1 The ingot *in situ*. Photograph by Dr S D White

was extracted by cupellation, in which the lead metal was turned into oxide (litharge). The litharge could subsequently be reduced to lead metal again.

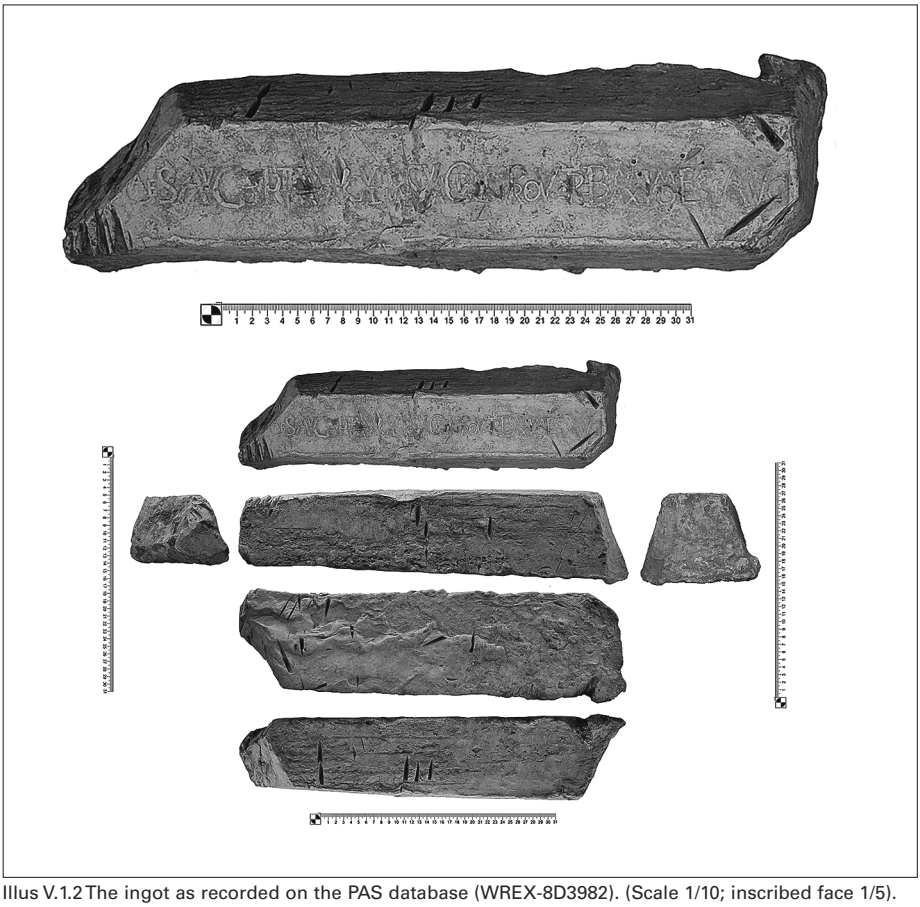
For transport in bulk, lead was commonly cast into rectangular ingots, mostly weighing between 60 and 90kg, and it is from these ingots, and the inscriptions on them, that much of our information about the industry in Britain comes. A brief survey of the ingots found in Britain has been published by Gardiner (2001). Only some 102 examples have been recorded since the sixteenth century, of which less than half are known to survive (*ibid*, 11). Their findspots, and the inscriptions on them, attest mining in five areas and minimum periods of operation: the Mendips (from ?AD 49 to 164–9), Shropshire (under Hadrian, AD 117–138), Flintshire (hitherto under Vespasian and Domitian, AD 69–96), Derbyshire (from Vespasian to Hadrian) and Yorkshire (under Domitian and Trajan, AD 81–117). Gardiner (2001, 11–12) identifies four periods in the management of the industry: an initial military phase; an early commercial phase covering the late first–early second centuries AD; the reassertion of state control under Hadrian; and a later commercial phase from which there are few large, inscribed ingots. In fact, the picture is more complicated, with named agents or lessees already active from AD 60 in the Mendips and imperial control still being asserted there in the 160s. At Pentre Ffwrndan, south east of Flint, furnaces were established *c* AD 75–80, and a courtyard building, plausibly interpreted as the headquarters of an official overseeing lead mining on Halkyn Mountain, was erected *c* AD 120 and survived in use until *c* AD 240, a lifespan later than the dated ingots from the Flintshire orefield (Burnham & Davies eds 2010, 124–5, 308).

The silver content of the ingots is quite variable. Gardiner (2001, 12) compared the thirty-two ingots for which analyses were available and noted that it ranges from below the

detection limit of the technique used to 0.0564% (564 parts per million (ppm)), with seventy-five percent of ingots containing up to 0.012% (120 ppm). The content of the previously known ingots from Flintshire ranges from 0.0019% (19 ppm) to 0.0037% (37 ppm) (Tylecote 1986, table 38, no 22 and table 39, nos 36, 37, 58 and 74).

Description

The Rossett ingot is of the normal rectangular plan and trapezoidal section. The base is 530mm long and 160mm wide, but the top is smaller, measuring 490mm long by 80mm wide. The maximum height is 110mm. It weighs 63.4kg, which is very close to the suggested 'standard weight' of 195 Roman *librae* (63.85kg) for ingots, although Gardiner (2001, 12) identifies three modal peaks, of which 65–70kg is the lowest. At least four layers can be seen within the make-up of the ingot, giving an indication of the way in which it was produced, by pouring four separate batches of metal into the mould. The left-hand end of the ingot has been lost and there are cut marks on all faces, where a small, sharp, blade has either been driven into it, or where an attempt has been made to remove parts of it (Illus V.1.2)



Illus V.1.2 The ingot as recorded on the PAS database (WREX-8D3982). (Scale 1/10; inscribed face 1/5).

The inscription

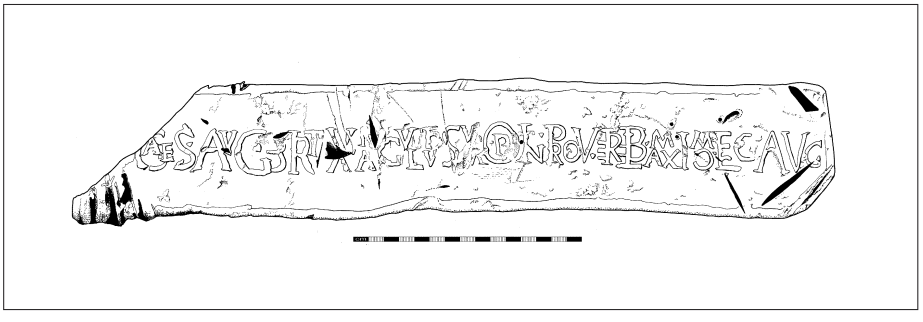
It is the inscription, moulded in relief lettering on the upper surface, that singles the ingot out as being unique. Unlike other examples that have been recovered, which have fairly standardised inscriptions, the Rossett ingot has an unusual one and has multiple ligatured letters.

Thanks to staff from the Department of Archaeology, Classics and Egyptology at the University of Liverpool, the inscription was photographed using Reflective Transformation Imagining (RTI). The images were created from information taken from multiple digital photographs shot from a stationary camera. This technique allowed the surface shape of the ingot to be looked at in minute detail, which helped with the reading of the inscription.

Copies of the RTI images and a drawn illustration prepared by the author (Illus V.1.3) were sent to Roger Tomlin of Wolfson College, Oxford, who was able to provide the following reading of the inscription (2020, 522, no 90):

> [...] CAES ^ AVG ^ BRIT ^ X MAGVL ^ FVSVM ^ OP IN
> ^ PROV ^ TREBEL ^ MAXIMO ^ LEG ^ AVG
>
> [Neronis] Caes(aris) Aug(usti) (plumbum) Brit(annicum) (e)x Magul(...) fusum op(eribus) in prov(incia) Trebel(lio) Maximo leg(ato) Aug(usti)
>
> (Property of Nero) Caesar Augustus, British (lead) from Magul(...), smelted at the works in the province when Trebellius Maximus was imperial legate

Marcus Trebellius Maximus was governor of Britain from AD 63 to 69. No previous archaeological finds can be directly associated with his governorship, and so not only can the ingot be dated quite tightly, but it also bears the only known inscription found in Britain that can be attributed to him. Trebellius Maximus seems to have continued the policy of



Illus V.1.3 Inscription on the upper surface of the ingot. (Scale 1/5). Illustration by Dr S D White

bringing stability to Britain after Boudica's revolt in AD 60/1. However, the consequent lack of military activity (and possibly also lack of pay) led to a decline in the discipline and morale of the army, and ultimately, under the leadership of Roscius Coelius, commander of Legion XX, it forced him to flee the province (Birley 2005, 52–6).

It is frustrating that the one part of the inscription that is most damaged is around the name of the place where the ingot was produced, which Tomlin has read as Magul(…) and is otherwise unknown. It was therefore important to see if isotope analysis of the metal could suggest a possible source.

Metal composition

Initial non-destructive analysis was carried out, again by staff from the Department of Archaeology, Classics and Egyptology at the University of Liverpool, using a Thermo Niton XL3t GOLDD+ Precious Metal Analyser pXRF. This form of analysis can only take readings from the surface of an object, which may be subject to contamination from environmental material adhering to the object or from corrosion products. However, it is a method that provides a useful 'first look'.

Readings were taken from the uppermost layer, which bore the inscription, and then from the remaining three layers that were clearly visible within the ingot. The results of this initial analysis indicated a high silver content of 0.0325% (325 ppm), which led to speculation that it had not been desilvered. However, Matthew Ponting (pers comm) notes that silver can be enriched at the surface of a base metal object through the action of corrosion; over time the base metal dissolves, leaving behind the less reactive silver. The minimum concentration of silver in lead metal needed to make it worth attempting extraction in Roman times is uncertain; figures from 100 to 600 ppm have been suggested (Williams 2012, 36).

It was therefore hoped that further chemical and isotope analysis would resolve the issue as to whether or not the ingot had been desilvered and could potentially indicate where the lead had come from. Three samples were taken using a 1mm drill bit, along with one further sample that was taken by scraping the surface of the ingot with a scalpel blade. By taking drilled samples the potential for external contaminants, such as the environmental material or corrosion products that may have influenced the results from the pXRF, was reduced.

The chemical composition of the samples was determined using microwave-plasma atomic emission spectrometry (MP-AES) to determine the content of silver and other elements and was carried out by Matthew Ponting and his team from the University of Liverpool. The lead isotope determination was carried out by Vanessa Pashley at the NERC Isotope Geochemistry Laboratory, Keyworth, Nottinghamshire. The results showed that the ingot was 99.2% pure lead with the usual trace elements of silver, copper, antimony, nickel, and arsenic. Bismuth, tin and zinc were also found but not in any measurable quantity. The average silver content was 0.0059% (59 ppm). What was particularly interesting was that in the sample taken with the scalpel blade the silver, as well as the trace elements of bismuth and tin, were significantly higher than in the other samples and more in line with the pXRF results, therefore confirming the suspicion that the concentrations of these elements had been altered by the effects of corrosion and burial.

This lower level of silver in itself, however, is not sufficient evidence that the lead in the ingot had been desilvered; it could equally have been smelted from ore too poor in silver to warrant cupellation. Tylecote (1964, 29, 38) noted that, even within the same mining

area, the silver content of ores could be quite variable, and Williams (2012, 34–5, 42) argued that in Flintshire the veins richest in silver were to be found near to the surface. A piece of lead metal found during excavations at the Roman settlement at Pentre Ffwrndan contained 0.03% (300 ppm) silver, suggesting that some moderately rich ore was being smelted, but two samples of galena found there contained only 0.01% (100 ppm) and 0.017% (170 ppm) silver (Tylecote 1964, 29, 38). In his review, Williams (2012) noted that the typical silver content of lead metal produced from Flintshire ore in the eighteenth and nineteenth centuries ranged from about 77 ppm to over 500 ppm and argued that, as the previously known Roman lead ingots linked to the area had silver contents that were much lower (19 to 37 ppm), this suggested that they had been desilvered (35, 42).

There is evidence in the literature that can be used to decide whether lead had been recovered from litharge after cupellation; this involves examining the levels of other trace elements such as copper, bismuth, zinc and tin. These would have been concentrated by further smelting, resulting in a 'hard' lead. In fact, the Rossett ingot contains low levels of these trace elements and comprises a good quality 'soft' lead, considered far superior for many uses because of the ease with which it could be worked. The analysis of the trace element levels therefore supports the view that the lead in the Rossett ingot was not produced from reclaimed litharge and so had not been desilvered by cupellation. This suggests that the ingot was the result of smelting relatively low-silver ore for the lead that it contained.

The lead isotope analysis provides information about the likely source of the lead and suggests that the Rossett ingot is consistent with a source in the north-east Wales lead orefield, with the closest known match being the mines on Halkyn Mountain.

The Rossett ingot and the start of Roman occupation of the Chester area

Tylecote (1964, 32) noted that: 'By A.D. 74 inscribed pigs were being produced in the mines in Flintshire'. We can now push that date back to AD 63–9, between six and twelve years before the founding of the legionary fortress at Chester. However, we should also note the ingot found at Carmel, Holywell, in 1950, which carries a finely moulded inscription with the name of Caius Nipius Ascanius (Tylecote 1986, table 39, no 74; Opper 2021, 105, fig 82). Ascanius is also attested in a stamped inscription on an ingot found at Bossington, Hampshire, in all probability to be attributed to the Mendip field, dated by a moulded imperial inscription to AD 60 (Tylecote 1986, table 38, no 21; Opper 2021, 104, fig 81). Regarding the Carmel ingot, Whittick (1982, 120–1) speculated:

> The period of consolidation, however, that followed the ending of Boudicca's revolt may well have allowed a private prospector to start work in a small area where as yet official interest was not sufficiently aroused, or was temporarily too distracted, to warrant a full imperial take-over.
>
> At what date the change to imperial working took place [represented for Whittick by the Chester ingots of AD 74] we do not know – there may have been a brief period when production was interrupted. Events of A.D. 68–70 are likely to have disturbed the export-routes from Britain to Italy via Gaul …

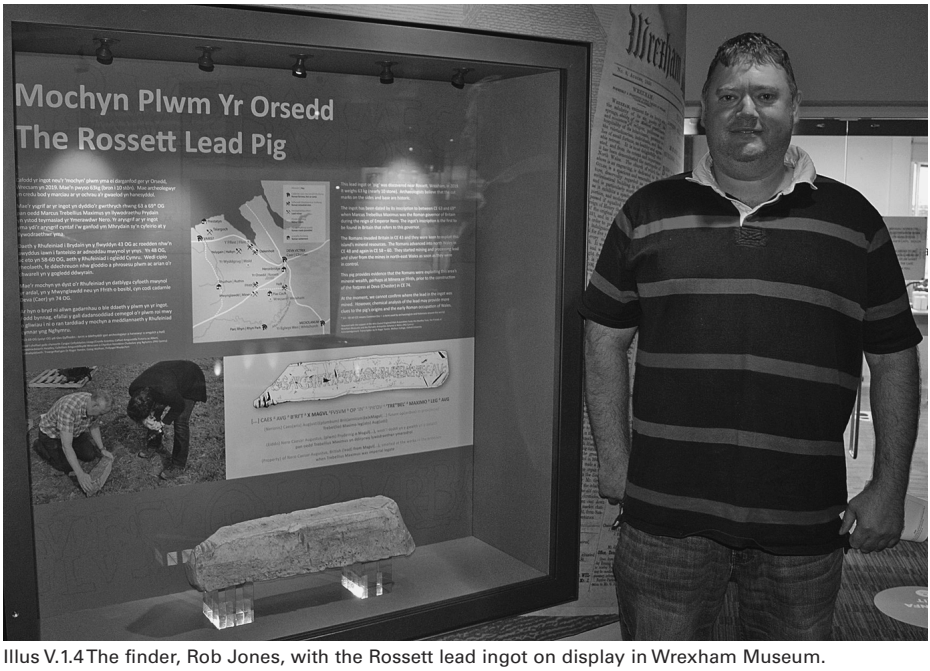
The Rossett ingot has an important contribution to make to this debate.

The questions also arise: what was the military situation in the Chester area in the late 60s of the first century and where was the Rossett ingot bound? Work on the legionary fortress at Chester started in the mid-70s. However, remains found beneath the 'Elliptical Building' suggest two earlier phases of military occupation (Mason 2000, 8–12), while an as-yet undated fort has been detected by LiDAR at Huntington, three kilometres south-east of Chester (Collins 2019, 427–8). According to Shotter (*RCNWE* suppl 2, 77–9), coins from Chester could attest activity in the 60s, and he also suggested pre-Flavian activity at Holt (*ibid*, 92), which could have lain on a route southward from the Rossett area, perhaps to the legionary fortress at Wroxeter.

Conclusion

This new find adds to the small number of surviving Roman lead ingots in Britain and provides much potential for future research. Not only is it one of the most significant Roman objects found in Wales in recent years, but it is arguably one of the most significant, non-treasure, Roman objects to be recorded by the Portable Antiquities Scheme to date.

The ingot has now been acquired for Wrexham Museum thanks to generous grants from the Arts Council England/V&A Purchase Grant Fund, the Headley Trust and the Friends of Wrexham Museum. The ingot was included in the exhibition 'Nero: the man behind the myth' from 27 May to 24 October 2021 at the British Museum (*see* Opper 2021, 105, fig 83), after which it returned to Wrexham Museum for display (Illus V.1.4).



Illus V.1.4 The finder, Rob Jones, with the Rossett lead ingot on display in Wrexham Museum. Photograph by Dr S D White

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For isotope analysis thanks are due to Matthew Ponting, Peter Gethin and Alan Williams (Department of Archaeology, Classics and Egyptology, University of Liverpool), and Vanessa Pashley (NERC Isotope Geochemistry Laboratory, Keyworth, Nottinghamshire).

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