



2 iron ingots also known as Doppelspitzbarren/Double pyramid & Bi-pyramid bars. The only ones of their type found in Britain.



A. 60.3cm long 8.9cm x 8.3cm wide at centre. 6.8kg weight.



B. 52.1cm long. 10.2 x 7cm wide at centre. 6.4kg weight.

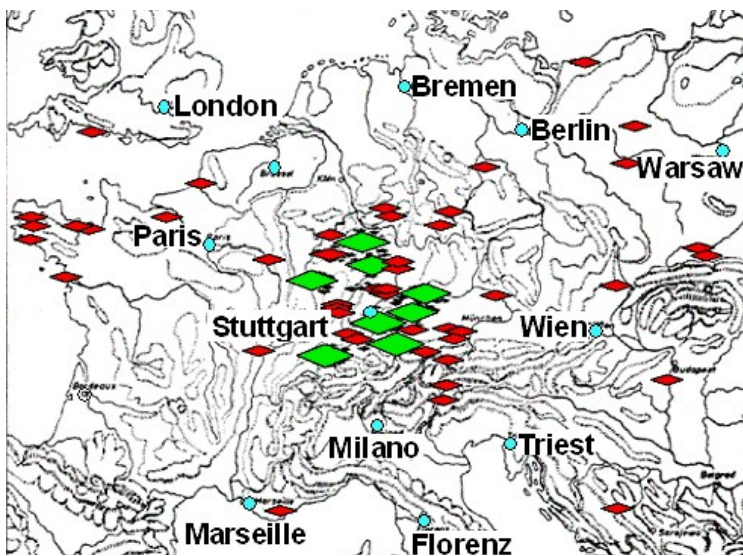
Figure1: Photograph: James Stone: Portland Museum.

Archaeological discovery.

According to the Historic Environment Record (HER no: MWX379) the ingots were found on the north bank of Verne Hill on the Isle of Portland, Dorset in the late 1860s when the Royal Engineers were constructing the Verne Fort [Fig. 2]. After their discovery, the ingots were shown by Captain Tyler and Captain Mainguy to antiquarian James Buckman who in 1868, records them as 'iron instruments' found near other artefacts including a Roman enamelled brooch, a Roman copper coin of Antonius (presumably Antonius Pius Emperor 138-161 AD) and burials in stone cists he also believed to be Roman [2].

A complete inventory of all the associated finds according to Captain Mascall from the Royal Engineers is detailed by local archaeologist Susann Palmer [3]. The ingots were used as doorstops on the Island before being recognised by a local antiquarian and given to Portland Museum. They are identified in letters from archaeologist Leslie Grinsell to the Museum caretaker Mr Lidbetter in 1957 as 'the most important objects' in the Museum collection and the only ones of their type found in Britain to date.

Figure 2. Map of Portland and ingot findspot. Google Earth.



KEY: Red: single/double finds. Green: hoard/ multiple find.

Figure 3.* Map of double pyramid irons. Württembergisches Landesmuseum.

Common in Northern Europe, with over 700 ingots found in Germany, Bavaria, Switzerland, and Austria [Fig. 3], and with no other finds in Britain, we can assume that the Portland ingots were produced in these European areas. Other finds on sites in the vicinity of the ingots' discovery on Portland revealed late La Tene (150-50BC) mirrors, a bronze/copper alloy collar, and 2 gold coins of Phillip of Macedon [3] indicating that exotic goods were traded along routes between Portland and these areas in Northern Europe [5] as mentioned in the writings of Greek philosopher and historian Strabo and by archaeologist Barry Cunliffe in his research into the extensive and well used 1st Century BC Roman and Celtic trade routes into Southern Britain [6].

Dating and origin.

The HER record states that Archaeologist Gordon Childs dated the ingots to 100BC, and Grinsell in his 1957 letter to Portland Museum suggests they are '400BC through to Roman'. In Europe comparable finds have been dated to both the 'Celtic' Hallstatt (1200-450BC) and La Tene (450-50BC) periods. The Museum für Franken in Germany holds 9 of a hoard of 23 similar ingots found in Aubstadt which, being near to a Hallstatt settlement and gravemounds, are dated to this period and thought to have been deposited by a metalworker or trader. There is also a similar ingot which was discovered at the Villa Borg on the border between Germany, France and Luxembourg. The most accurate dating comparison that we have is from Saint-Connan, Brittany [Fig 4] where the ceramics found with these ingots have been dated to La Tene I & II (450-50BC) equivalent to the Iron Age & early Roman periods in Britain [4].

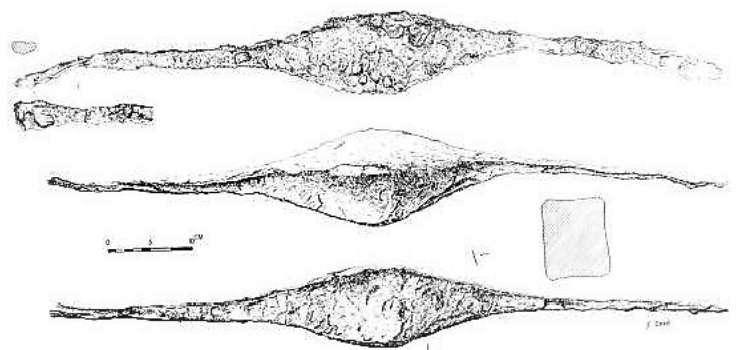


Figure 4. One of the bipyramidal ingots from the finds at Saint Connan [4].

Composition and Production.

The ingots are made from iron. Metallurgical analysis using Reflective Optical Microscopy (ROM) in 1985 by Archaeologist R. Ehrenreich shows that the ingots have the same hardness and grain size, but differences in trace elements, and slag content [1]. To create the ingots the iron ore would be collected then ground or roasted to create small size granules for processing. Unlike its predecessors, copper and tin, iron requires much greater temperatures in excess of 1200° C to melt and would need to be reheated and smelted in a furnace several times to remove slag impurities and to soften it enough to be hand shaped into objects.

Likely use.

Buckman suggested the ingots were stone working tools with one end a chisel and the other a point, but was unsure due on their weight and difficulty to hold [2] [Fig. 6]. According to records in Europe they were used to make metal tools and weapons [Fig. 5] or may have been deposited as a cache, hoard or as high-status offerings.

Analytical techniques and conservation.

Lead isotopes could be used to identify and determine the location of the European ore used to create the ingots. We could use X radiography- a non-destructive, cost effective and time efficient method allowing us to see underneath layers of rust and other contaminants to give us an idea of what the ingots looked like when they were made. This can provide us with a digital record of the iron ingots' interior joins and shape, which rust will continue to deteriorate, and be used for reference to identify and record other ingots.

The ingots were found in limestone soils and have a reasonably good state of preservation. They should be conserved in anaerobic, dry conditions using humidity indicator cards to monitor, and silica pouches to reduce moisture.



Figure 5*. Poster:Landesmuseum für Vorgeschichte (Halle). A double pyramidal bar and what was made from it.



Figure 6. Buckmans' drawing of an 'iron object found in Portland' [2].

Peer reviewed paper: M. Senn, M. Kraak, A. Flisch, A. Wichser, M. Obrist. An aspect of the Celtic iron trade: the Spitzbarren. The deposit from Bellmund (canton Bern, Switzerland). Early Iron in Europe. Ed. B. Cech and Th. Rehren. Monographies Instrumentum 50. Éditions Monique Mergoïl, Montagnac, pp.147- 160, 2014.

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*Figures 3 & 5 are sourced from Materials Scientist Helmut Fölls' extensive and highly informative website resource on Iron, Steel and Swords featuring European Iron production and trade. <https://www.tf.uni-kiel.de/matwis/amat/iss/index.html>

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Other Reading

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