

tur aut aere, aut nummo aureo, aut taleis ferreis ad certum pondus examinatis pro nummo"). This passage has suffered much at the hands of transcribers; and many authors, including Dr. Percy, have accepted the reading "annulis," and have accounted for the total disappearance of the iron-ring coinage by oxidation. A fresh ray of light has been thrown on the matter by Mr. Reginald A. Smith, of the British Museum, who, in a paper read before the Society of Antiquaries in 1905, described a remarkable series of iron bars that were undoubtedly the money described by Caesar. They roughly resemble swords with a rude handle in a square end, averaging 2 feet 7½ inches in length, and have often been found secreted in a manner suggestive of hoards of coins. Several specimens are preserved in the British Museum. There are three series all of similar form. In the first the weight is approximately 4770 grains, in the second the weight is double (9540 grains), and in the third the weight is quadruple (19,080 grains). A convincing proof of Mr. Smith's contention is afforded by the fact that there is preserved in the Cardiff Museum a bronze weight of 4770 grains found in a hoard of Late Celtic bronzes at Neath. It is of a common Roman form, cheese-shaped with "I" cut on the top. A similar weight, but made of basalt (4767) grains, is in the museum at Mayence. As these British currency bars do not date earlier than 400 B.C., their use must have been due to Greek influence. We know that the Spartan money took the form of iron bars; and even at the present day in Central Africa iron bars, spearheads, and other forms with uncomfortable spikes, are used as currency.

Mr. Smith's theory appears to me to be borne out by the weights of 26 spindle-shaped iron blocks found in 1866 at Monzenheim, and now for the most part preserved in the Museum at Mayence. These blocks are on an average sixteen times as heavy as Mr. Smith's unit weight of 4770 grains, or 309.74 grammes. Eight of them, including the heaviest and the lightest, gave the following weights:—4,000, 4,050, 5,000, 5,000, 5,120, 5,470, and 5,700 grammes. Apparently they are blooms made in the forest forges, of a weight suitable for currency; there being no decimal system of weights in those days, when the advantages of continual bisection were fully appreciated. The form was convenient for the smith, as he held the bloom at one end and forged one half. The blooms would be convenient to transport, as the smith could carry them as miners often do their drills, with a strap on his back and breast, horizontally, leaving his arms free. The purchaser, too, could easily try the pointed end in his forge, to ascertain the quality of the iron. Analyses of two of the British currency bars (A and B), made by Professor W. Gowland, and of a Monzenheim bloom (C) by Dr. Ludwig Beck, gave the following results:—

	A	B	C
Carbon	trace	0.08	0.43
Silicon	0.09	0.02	0.36
Phosphorus	0.69	0.35	0.24
Manganese	nil	nil	0.48
Nickel	0.23	nil	—
Sulphur	—	—	0.25

Bar A when examined microscopically showed no slag patches, and may have been an exceptional case of the use of meteoric iron, although it contains less than 6 to 10 per cent. of nickel usual in such metal. Bar B appears to have been produced by the direct reduction of Forest of Dean ore. The bloom C is a soft iron containing a considerable proportion of impurities.

The shape of the currency bars, one cannot help thinking, must have been chosen so as to enable the owner, if necessary, to convert his money into a sword. The spindle-shaped blooms, however, were of a form that was frequently adopted in early times. Even the iron blocks in the treasure-houses at Nineveh had a similar form; but the Assyrian blooms were all perforated, for convenience of transport, with a strap. It will be remembered, too, that in Sweden, the "Järn-bäraland," or "mother-land of iron," as it was called in the seventh century, the Osmund blooms obtained in the peasant furnaces were broken into from 24 to 29 pieces each weighing a pound; and these Osmund pieces served as currency even in foreign countries from the beginning of the thirteenth century, and continued to do so until their export was forbidden by Gustavus Wasa. The copper-plate money to be seen at the museum at Falun, in Sweden, is a further example of the use of heavy masses of metal as currency. The largest, a 10-dollar plate, dated 1644, weighed no less than 43½ lbs.

The Roman influence in Britain was considerable and lasting, but the subjection was not complete until the year 84. When the Emperor Hadrian came to Britain, in 120, he founded an arms factory at Bath, using iron from the Forest of Dean; and the mines there were worked until the year 409. Indeed, the enormous heaps of slag left by the Romans furnished the chief supply to twenty furnaces for nearly 300 years. Similar slag-heaps have been found in Sussex and elsewhere. From explorations made within the Roman fortifications at Wilderspool, near Warrington, Mr. Thomas May has been able to deduce the form of furnace used; and he published in 1905 an interesting account of his remarkable discoveries. Association with Roman pottery, and with a hundred coins dating from 27 B.C. to 337 A.D., shows that furnaces found are of the latest period of the Roman Occupation, A.D. 410. The furnaces consisted essentially of a cavity with a wall and covering of clay, with holes in the base for admitting the draught and for withdrawing the metal. They were usually placed on sloping ground. The remains are of special interest, inasmuch as they show that coal was used with charcoal for smelting—fragments of cannel coal having been found, and that some of the iron was obtained in a molten state. Indeed, Mr. May considers that there is evidence in support of the view that an indirect method of producing cast iron in one furnace, and of converting it into malleable iron in another, was practised by the Romans at Warrington. Interesting as Mr. May's discoveries are, his interpretation of them is not convincing. There is no proof that either bellows or clay moulds for casting were used. The plant appears to have consisted of a roasting kiln, a smelting furnace, and a smith's forge. The fact that some coal was used may explain why some of the metal, like the minute specimen found, collected in a fluid state on the furnace bottom. The metal, as in the direct process carried out at Lagos, was essentially a natural steel, which by reheating was brought down to a malleable iron with a very low percentage of carbon. The process was somewhat similar to that described by Agricola, who makes no mention of cast iron. The passage translated by Mr. May, "From such ore, sometimes once, sometimes twice roasted, iron is *melted* suitable for being reheated in the smithy furnace," should read, "From such ore, once or twice roasted, iron is made, which is again made hot in the smith's forge and is flattened out under the hammer, which is lifted by a water-wheel and cut in pieces with the sharp iron." The analysis of the supposed cast iron, given by Mr.