

the wider socio-economic impact of early metallurgy on the Chalcolithic communities of the area.

Gauss's approach is based mainly on a combination of trace-element analysis (XRF and NAA), and lead-isotope analysis using both MC-ICPMS (multicollector inductively coupled plasma mass spectrometry) and TIMS (thermal ionisation mass spectrometry) of finished products, production debris and ores (the latter from the aforementioned sites as well as from a variety of ore bodies across central and southern Portugal). This work has produced a considerable amount of fresh analytical data, but the author also draws on relevant legacy OES (optical emission spectroscopy) data from the *Studien zu den Anfängen der Metallurgie (SAM)* project of the 1950s–1970s. One of the undoubted strengths of this volume is the thorough assessment of, and comparison between, the results of different analytical techniques.

Where available from the study sites, metallurgical ceramics and slags have been included in the analysis in order to help determine the types of ore used, and to reconstruct production processes. This use of multiple techniques on a wide range of material, together with the careful analysis of contextual data, constitutes another strong point of the monograph, as does the resulting chronology for the development of early metallurgy in the study area, which provides a higher resolution than most comparable studies from prehistoric Iberia. It should also be stressed that, while archaeometallurgical research in neighbouring Spain has accumulated an increasing number of lead-isotope datasets over the last two decades, the examples presented in this volume are the first obtained for archaeological purposes from any Portuguese sites.

With regard to Gauss's first two stated aims—identifying the metallurgical processes employed and establishing the probable provenance of the ores used—his study is largely successful, with the remaining gaps the result of a lack of available data in some areas. The author is able to dismiss several old ideas that are still prevalent in the literature. Notably, he can convincingly rule out that any of the frequently cited ore sources from the Portuguese Estremadura supplied the raw materials used at the study sites. Instead, he is able to identify the upper Alentejo or neighbouring parts of the Ossa Morena Zone as the most probable source area. He is also able to demonstrate that the material evidence from Cabezo Juré in south-west Spain is inconsistent with the furnace process hypothesised by the site's excavator.

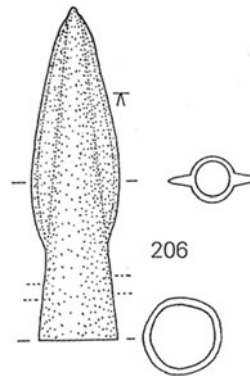
Regarding Gauss's third and final aim—determining the socio-economic impact of early metallurgy on Chalcolithic societies in south-west Iberia—the results are sketchier, mostly because of a dearth of information on many aspects of the social and economic context within which metallurgy was adopted in the study area. Also, the author's repeated recourse to A.J. Toynbee's 'challenge-and-response' theory does not really provide an adequate substitute for model building as an explanatory device, and a broader theoretical footing would have been helpful here.

Given the considerable time and effort that clearly went into the laboratory work and the interpretation of its immediate results, it is easy to see how the final part of the original PhD research was less developed. It is unfortunate, however, that this aspect was not developed any further during the time that elapsed between the submission of the dissertation and its eventual publication. One might equally have hoped for more thorough copy-editing to eliminate the occasional typos and frequent inconsistencies with the German Archaeological Institute's guidelines for authors. These, however, are minor caveats that do little to diminish the overall value of this study. It represents a significant leap forward in our understanding of early metallurgy in Iberia.

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RICHARD DAVIS. *The Late Bronze Age spearheads of Britain* (Prähistorische Bronzefunde Abteilung V, 7 Band). 2015. viii+267 pages, 163 plates, 19 b&w illustrations, 19 tables. Stuttgart: Steiner; 978-3-515-11246-8 hardback €78 & \$117.



With this monograph on the Late Bronze Age spearheads of Britain, the *Prähistorische Bronzefunde* (PBF) series adds another volume to its rich corpus of artefact catalogues. Bronze Age research has tended to overlook spearheads as a

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category of evidence, and it is notable that while 19 PBF volumes are dedicated to swords, only six deal with spearheads. Richard Davis's new contribution brings the latter number to seven and provides a companion for his previous volume on the Early and Middle Bronze Age spearheads from Britain (Davis 2012). What this magnificent work demonstrates is that, contrary to some opinion, spearheads are a rich, varied and interesting category of European Bronze Age weaponry.

Davis presents over 1400 Late Bronze Age spearheads from mainland Britain, the Isle of Wight, Anglesey and the Hebrides. The examples are classified into eight types with up to seven variants; moulds for the production of spearheads are also summarised. The classification is based on design attributes that are carefully explained in order to avoid confusion (pp. 12–18), although as Davis classifies these spearheads on the basis of the evidence from the entire Bronze Age, it is also useful to have his earlier monograph to hand (Davis 2012). Together, these volumes represent the most comprehensive discussion of British Bronze Age spearheads in over a century. The illustrations, the catalogue and the cross-referencing system within the volume demonstrate the expected high standard achieved in other recent PBF volumes.

It is, of course, hard to critique the PBF series without falling into the trap of stating the obvious; that is, it is largely a typo-chronological endeavour. In recent years, however, some authors have tried to expand the analysis, for example, examining the use of these bronze objects and their entanglement in social relations. Dirk Brandherm (2003) has ventured into a discussion of the use of daggers and halberds using historical and anthropological comparisons, and Marion Uckelmann (2012) analyses use-wear on shields. In this regard, Davis's volume falls somewhat short and may feel like a step backwards. Davis frequently mentions the potential uses of spearheads in warfare, or as material symbols for rituals. That discussion, however, is solely based on the typology of the spearheads from which he even tries to infer manoeuvres, such as slashing and cutting for different types of spearhead. This is used to make some sweeping statements about the potential development of weapon technology. It is surprising that Davis did not include published experimental and use-wear evidence (see Anderson 2011, with references) and the same observation can be made of his previous volume. In the catalogue, Davis frequently describes

relevant damage, but seemingly only incorporates such observations as a line of evidence for ritual damage (e.g. p. 37, no. 1202). Arguably, some of the notches and blowmarks—even a fractured tip—could have been caused by use in heavy combat. This disregard for the potential of greater use-wear analysis and a more thorough use of the published literature is puzzling.

Davis's discussion of the find spots reveals that Late Bronze Age spearheads come overwhelmingly (72 per cent) from hoards. In this hoard category, however, Davis includes burial sites. This might be assumed to mean votive deposits made at the site of earlier burials, but the precise meaning is unexplained, and readers are therefore left to wonder whether Davis believes that spearheads from burial sites are grave goods or later deposits. Despite their potential for insight into Bronze Age social relations, these finds, and the hoards with which many are associated, are not explored in further detail, and Davis, referring almost exclusively to the British literature, omits discussion of the wider European context and theory of hoarding practices.

In the catalogue, some descriptions mention associated finds, but leave open the contexts of these associations (e.g. no. 177). In other cases, Davis mentions finds as possibly associated, and, although these objects might be contemporary, simultaneous deposition can most probably be ruled out. For example, the entry for spearhead no. 794 notes the "possible association" with a palstave, even though the latter was discovered some 300m away, effectively excluding any direct connection.

In light of the invaluable service of the PBF series in making available an extraordinary inventory of bronze metalwork for researchers, all of the above criticism is of minor significance. Davis's volume, conjoined with his previous contribution, fills an important gap in the study of Bronze Age weaponry. These books highlight spearheads as a major—maybe even the most important—type of weapon in terms of abundance during the British Bronze Age, and will promote the re-evaluation of the role that spearheads played during the wider European Bronze Age. As Davis himself emphasises, there are many aspects of this material still to be studied; a more detailed inventory of contexts and associations would be very helpful in that regard. Nonetheless, with this volume, Davis has already achieved a great deal and it will no doubt serve to stimulate further research.

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FRANK FÖRSTER. *Der Abu Ballas-Weg. Eine pharaonische Karawanenroute durch die Libysche Wüste* (Africa Praehistorica 28). 2015. 620 pages, 376 colour and b&w illustrations, 23 tables. Köln: Heinrich Barth Institute; 978-3-927688-42-1 hardback €78.



Roads are a source of endless fascination and obsession for many of us, from Route 66 and the Pacific Coast Highway,

to the Ridgeway and the Via Appia. Roads can also define and mould us—my first eight years were framed by the Coast Road stretching between Newcastle upon Tyne and Whitley Bay, passing by pit heaps, pubs, a famous cigarette factory and the Battle Hill housing estate (sadly not named after a battle), *en route* between the city and the sea. The Abu Ballas caravan route passes through 400km of somewhat less hospitable terrain in the Eastern Sahara, from the Dakhla Oasis in the north to the Gilf Kebir in the south (and probably beyond that, towards the water source at Gebel Uweinat). Frank Förster's dense and rewarding monograph presents us with an account not only of the route itself but also of its ancient travellers and more recent explorers. The route is characterised by some of the earliest significant archaeological traces of trans-Saharan traffic so far surveyed or excavated, including indications of groups both from the Nile Valley and of 'local' Bedouin and others from the desert oases.

Back in 2003, in a very brief article about the site of Abu Ballas ('father of jars'), and its depot

of more than 100 intact pottery vessels, Förster, and his colleague Rudolph Kuper, noted that: "The purpose(s) and destination of this ancient pharaonic road, provisionally labelled the 'Abu Ballas Trail', still remain obscure and will require further research" (Förster & Kuper 2003: 167). Twelve years later we have Förster's definitive volume, documenting what appears to be every grain of sand and donkey dropping along the trail. Many of the staging posts or depots that form a chain, at predictable intervals along the trail, were first discovered by such illustrious figures as the Hungarian explorer László Almásy (the inspiration for Michael Ondaatje's 'English Patient'), John Ball (the intrepid British geologist and mining engineer who rediscovered Abu Ballas itself in 1918) and Carlo Bergmann (a German explorer still actively surveying the eastern Sahara).

The book is divided into three main parts. The first outlines the basic components of the road and the kinds of material that define it (primarily rock art, pottery, lithics, botanical and faunal remains); the second explores the various roles probably played by the route; and the third examines the changing function and significance of the road in historical context, from the late third millennium BC through to the early Islamic period (although the vast bulk of the Pharaonic-period artefacts date from the Old Kingdom through to the Ramessid period, c. 2800–1000 BC).

Given that the camel (specifically the dromedary) does not appear to have been present in Egypt's deserts until around the ninth century BC (although there is some debate on this), one of the other fascinating aspects of Förster's study of the Abu Ballas trail is the clear indication that the ancient Egyptians plying this route were using donkeys. Förster provides photographic evidence of well-preserved and relatively straight donkey tracks (figs 64–67), contrasted with an example of a meandering camel track along the main route between the Dakhla Oasis and the Nile Valley (fig. 68). There is contemporary ethnographic evidence for the existence of donkey caravans much farther south, in northern Sudan, where large groups of donkeys (some load-bearing) are still sometimes led over a distance of 900km, from the Debba Bend of the Nile to El-Fasher in Darfur. The presence of donkeys along the Abu Ballas trail is also indicated by the survival of excrement (pp. 281–82, fig. 246), one instance of which is among a small group of organic materials that have been radiocarbon-dated; others include late Old Kingdom charcoal

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