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BRONZE MELTING AND SYMBOLIC OF POWER: THE FOUNDRY AREA OF FRAGA DOS CORVOS BRONZE AGE HABITAT SITE (MACEDO DE CAVALEIROS, NORTH-EASTERN PORTUGAL)[1]

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ABSTRACT

Fraga dos Corvos is a Bronze Age habitat site recently studied and located in the north-western versant of Serra de Bornes, Eastern Trás-os-Montes (Macedo de Cavaleiros, Bragança, Portugal). The site visually controls the Macedo de Cavaleiros basin. The results of the first four campaigns at Fraga dos Corvos Early/Middle Bronze Age habitat site, namely the excavation of its Huts 4 and 6 (foundry area), provide the opportunity to discuss the relations between the socio-economic constraints of metal production (the first actual production of binary bronzes in Northern Portugal) and the symbolic of power in northern Portugal emerging Bronze Age societies. We argue that metal production in these societies is an uneconomic process which provides the means for the symbolic expression of status, otherwise difficult in societies with a very conservative and modest economy, close to what Shalins called the "domestic mode of production".

KEYWORDS

First Bronze Age; Northwest Iberian Peninsula; Archaeometallurgy; Bronze melting

INTRODUCTION

During most of the twentieth century the Bronze Age constituted a largely unknown period of Portugal's Late Prehistory.

Mainly equated with metal "hoards" or "deposits", the Bronze Age was usually seen as a period strangled between the Calcolithic and the Iron Age, almost deprived of any significant time length. Old diggings, frequently stratigraphically undifferentiated and scarcely published, and lacking any details of provenance of the artefacts recovered allowed little more than a traditional typological approach for their study.

The "Portuguese Radiocarbon Revolution", largely equated with the creation of the Sacavém laboratory in the late eighties of the twentieth century, changed the perspective on the Bronze Age in Portugal [1], since then seen as occupying the last quarter of the third millennium cal BC, all the second, and part of the first. The lower limit varies according to the regional sub-area in question,

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between the eight century for the littoral of the southern part of the country and the fifth for the northern interior.

Another breakthrough comes with the perception that it was no longer advisable to keep on using a tripartite division of the Bronze Age. So since the organization, in 1995, of the exhibition "*A Idade do Bronze em Portugal, Discursos de Poder*" (The Bronze Age in Portugal, Power Discourses), the old Early and Middle Bonze Ages are usually grouped in a First Bronze Age or "*Bronze Pleno*" followed by the Later Bronze Age [2]. This exhibition was also the starting point for a regional approach very important since it was then clear that, during the Later Prehistory, the Iberian Peninsula was a very complex cultural mosaic with different developmental velocities and processes in each of its different areas.

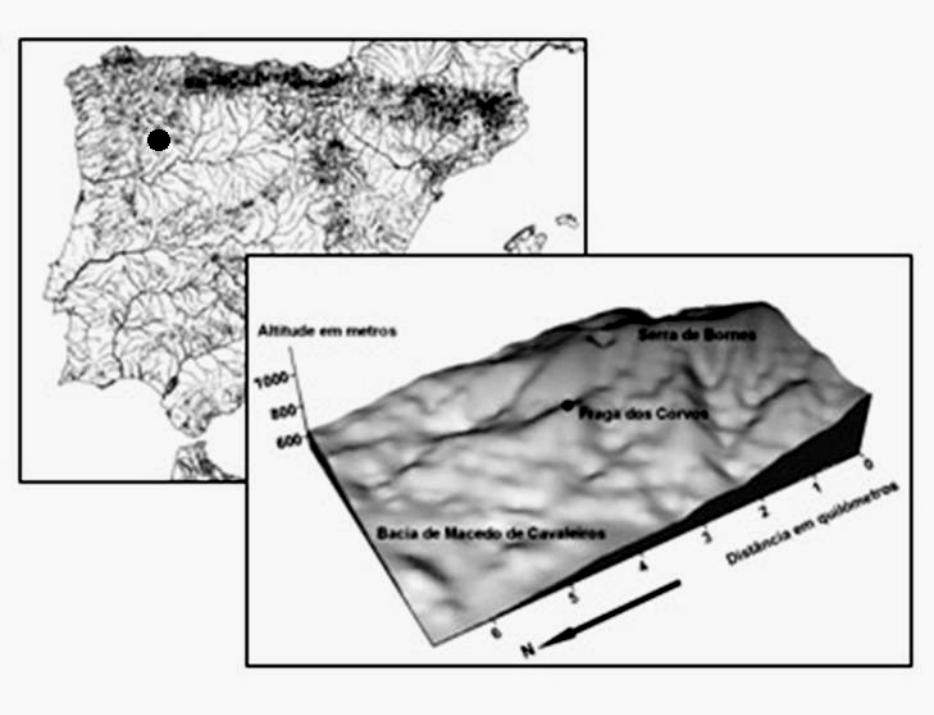

Fig.1 – Location of Fraga dos Corvos habitat site in the Iberian Peninsula and in the Macedo de Cavaleiros Basin

1. THE HABITAT OF FRAGA DOS CORVOS: GEOGRAPHICAL AND ARCHAEOLOGICAL CHARACTERIZATION

Fraga dos Corvos is a Bronze Age habitat site recently studied and located in the north-western versant of Serra de Bornes, Eastern Trás-os-Montes (Macedo de Cavaleiros, Bragança, Portugal). With an altitude of 870m, it rises over the modern hamlet of Vilar do Monte which belongs to Macedo de Cavaleiros County, District of Bragança. The site Gauss geographical coordinates are 99.122,194 of longitude and 203.403,721 of latitude, sheet 78 of the 1:25000 Portuguese Military Map (Fig. 1).

The site was already known as an Iron Age fortified settlement. In 2003, agricultural work on its northern platform put in danger part of it and revealed Bronze Age levels which determined the actual archaeological intervention [3].

The hilltop of Fraga dos Corvos visually controls the Macedo de Cavaleiros basin. It is in the main traditional passes into and out of this basin that have been found the deposits of halberd copper blades which gave the name to the so called Carrapatas type of the Iberian Early Bronze Age Atlantic halberds (Abreiro, Carrapatas, Vale Bemfeito y Vimioso)[4].

During the summer of 2006 it took place the fourth field campaign of excavations on its northern platform, which can be now characterized as a habitat belonging to the First Bronze Age which comprises, in its uppermost stratigraphic phase, four huts already excavated as well as another metal working area adjacent to one of them.

Three of the huts (1 to 3) are small and sub-circular constructions (about 3m of diameter), limited by 13 to 14 post-holes and with a central bigger one.

The Hut 4 is bigger and ellipsoidal, with axes of 4m × 3,2m, limited by 20 post-holes and also with a central bigger one [5]. In the 2005 field season we finished digging the floor of Hut 4. To build the hut the local schist substrate was artificially excavated in order to accommodate its southern end. This part of the hut floor contained a negative structure of oval configuration (Stratigraphic Unit 57 – UE.57 – with axes measuring 88cm × 77cm and of about 20cm of depth), filled with blackened sands containing ashes (UE.58) and delimited by a ring of small stones (Fig. 2).

Fig. 2 – Fraga dos Corvos Hut 4, with its post-holes excavated as well as the sandbox. The location of the principal finds related to metallurgical activities is inserted.

The structure found is interpreted as what is left of a sand box where moulds were filled with the molten metal.

Around this structure were found 3 metal drops, several slag and non metallic vitrified elements, 1 crucible fragment, 2 fragments of stone moulds for awls and 1 piece of metal sheet (Fig. 4).

Adjacent to the western limit of Hut 4, and excavated in 2006, lies a quadrangular structure (c. 4mx4m), Hut 6, limited by four corner post-holes and a central ovoid depression filled with termoclasts, slag, some broken pottery sherds, tinny pieces of charcoal and the broken cover half of a mould in stone (Fig. 3). From the immediate surroundings come 3 pieces of slag or vitrified non metallic materials and 2 other mould fragments.

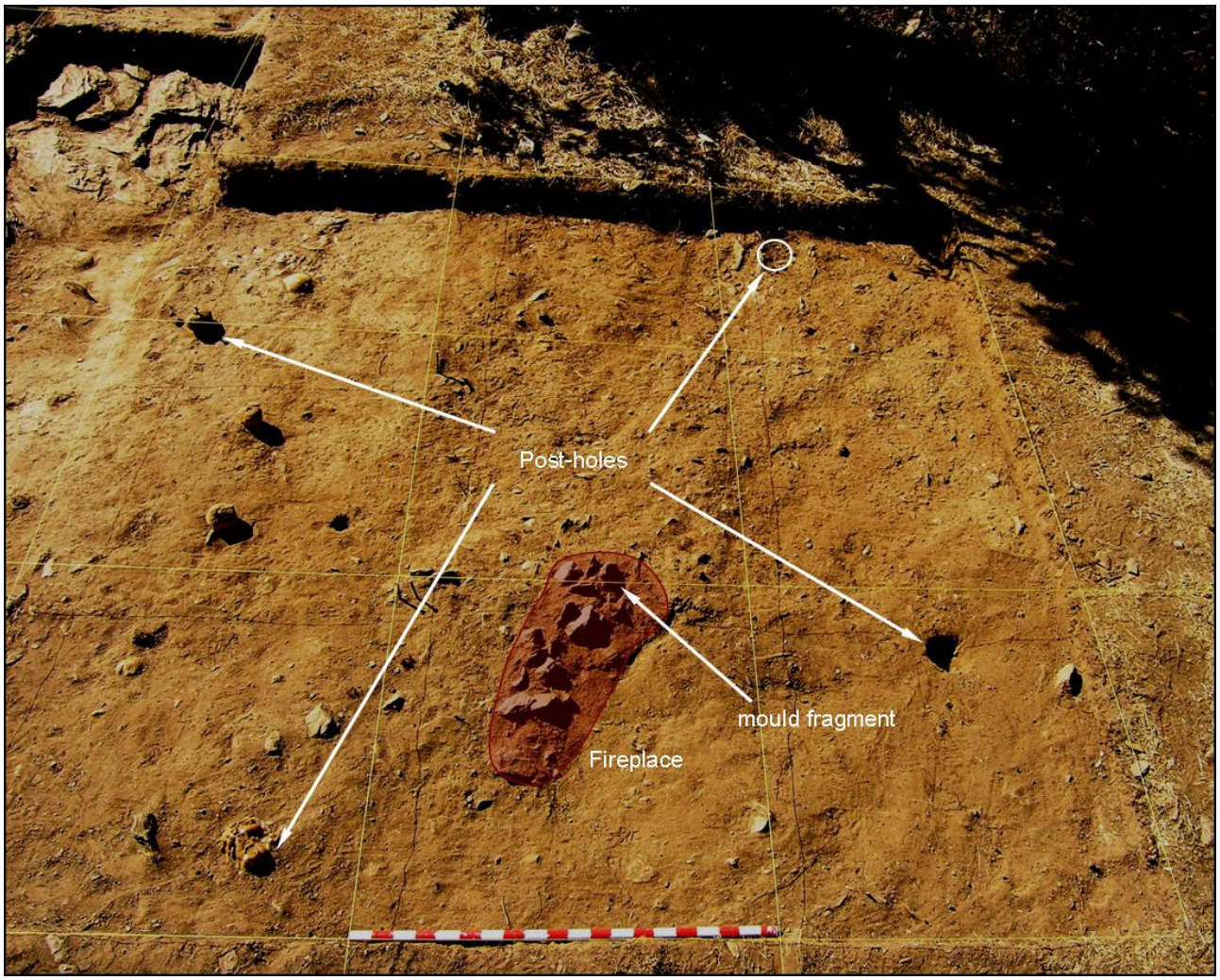

Fig. 3 – The quadrangular structure we called “Hut 6” with its four post-holes excavated and the fireplace revealed. The location of a halve from a stone mould is shown.

The cultural environment documented in the fillings of the studied structures comprises a manual pottery industry with typical First Bronze Age types (sub-spherical bowls, conic open vessels with flat bottoms, carinated bowls, deep storage and cooking jars with everted rims and flat bottoms, etc.) some of them decorated with a mixture of motifs of epi-bell-beaker geometric comb-stamped

type and carinated bowls of "Cogeces or Protocogotas type" decoration, sometimes both in the inside and the outside surfaces, with alternate panels either with comb-stamped geometric motifs, or with herringbone motifs incised or side punctuated, both types of decoration being sometimes incrusted with white kaolin paste (Fig. 5).

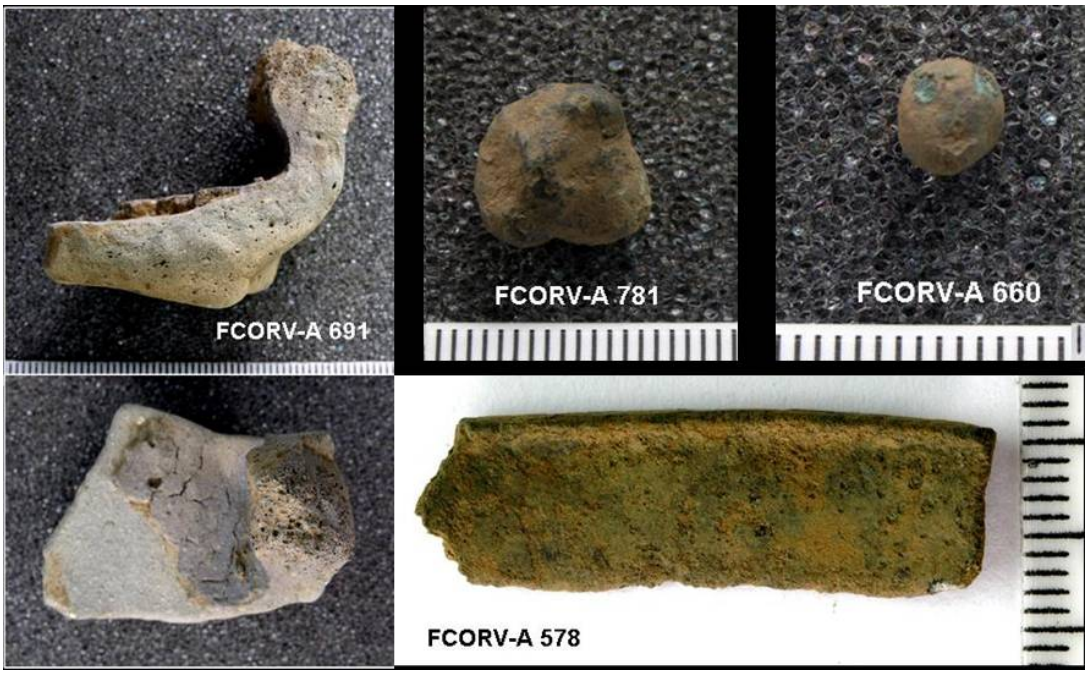

Fig. 4 – The principal elements of archaeometallurgical evidence recovered in Hut 4 and subjected to compositional analysis. Crucible fragment with foreign adherences (FCORV-A 691); metal droplets (FCORV-A 660, 781); metal blade fragment (FCORV-A 578).

The lithic industry uses local schist, quartz, quartzite and chalcedony to produce a variety of denticulate sickle-blades, arrowheads, scrapers, borers, etc.

Mainly from an older second stratigraphic phase, but belonging to the same cultural environment, comes fragmented bone evidence of a macro fauna consumption, with preliminary evidence of the presence of ovi-caprids and either pig or wild boar.

The association, in all the areas so far excavated, of pottery decorated in an epi-bell-beaker tradition with vessel types and decorations typical of the "Cogeces World" constitutes a strong argument to chronologically situate this habitat in a relatively early period of the First Bronze Age.

In the Iberian Peninsula it is now clear that the "Bell-Beaker phenomenon" encompasses a much larger diachrony that was once thought [1]. Namely, it goes well into the second millennium cal BC and so it is an important component of the development of the First Bronze Age societies in several cultural areas of the Peninsula, specially the westernmost ones.

Otherwise, the existing evidence on the first manifestations of the "Cogeces or Protocogotas Cultural Group" point to a starting point around 1700 cal BC [6,7]. The recent data on the Portuguese sites of Castelo Velho de Freixo de Numão [8] and Fumo [9], in the Côa Basin, allow us to consider an even earlier date around 1800 cal BC.

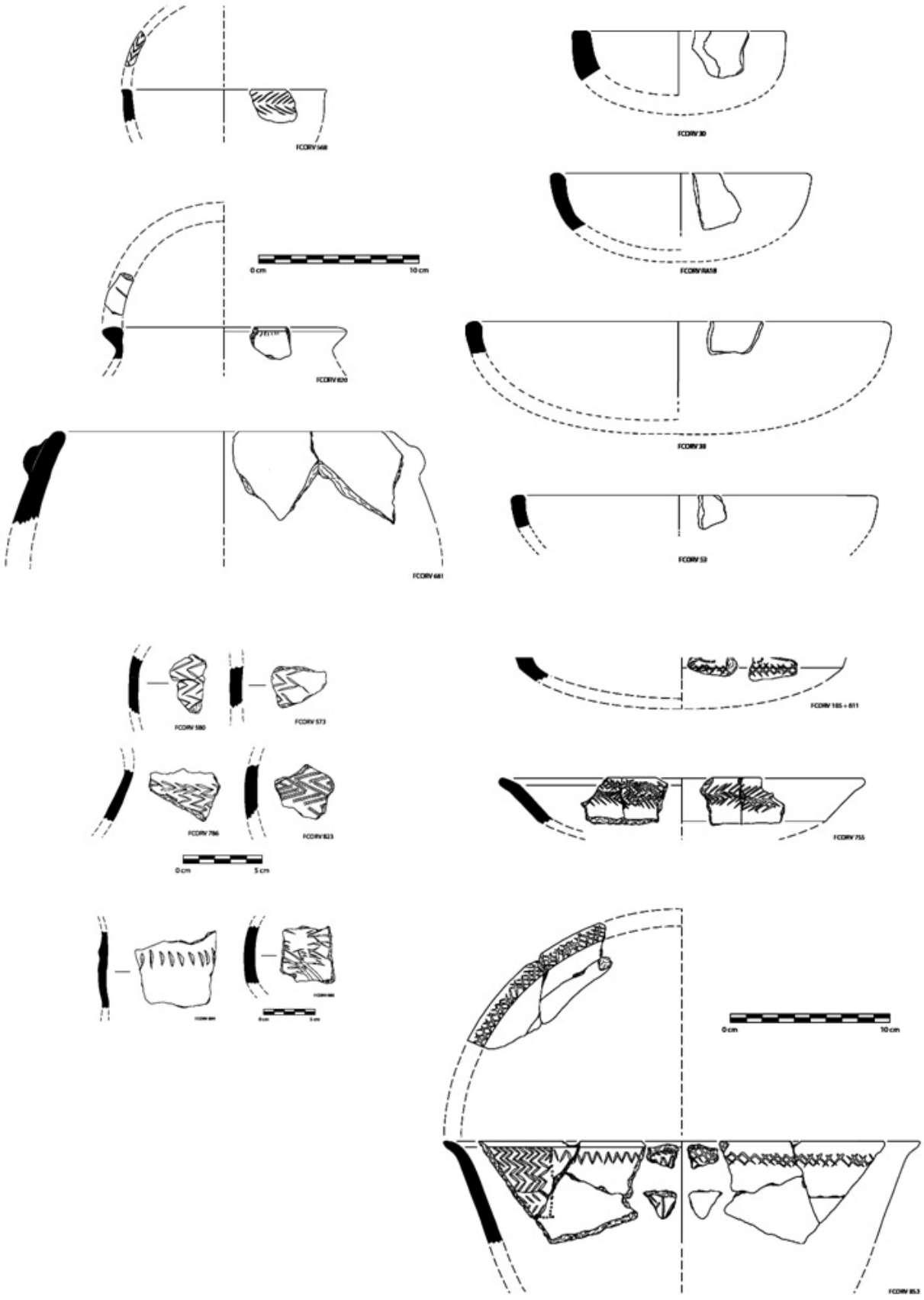

Fig. 5 – Pottery from Huts 4 and 5 of Fraga dos Corvos habitat site.

So, while we wait for radiocarbon dates to be processed, we think that it is correct to propose a chronology within the first quarter of the second millennium BC for this First Bronze Age habitat site occupation.

2. EDXRF ANALYSIS OF RECOVERED METALLURGICAL EVIDENCES

Non-invasive elemental analysis of the metal blade fragment (FCORV-A 578) and the three metal drops (FCORV-A 194, 781, 660) were carried out by energy dispersive X-ray fluorescence spectrometry (EDXRF). The crucible fragment (FCORV-A 691) was analysed on both surfaces in order to determine the presence of metals regarding ancient metallurgy in its inner surface.

For the EDXRF analyses it was used a Kevex 771 spectrometer with an incident X-ray beam that permits analyses of a circular area up to 3 cm diameter [10]. Quantification was made using a standard material - Phosphor bronze SS551 from British Chemical Standards. Detailed descriptions of the equipment as well as the quantification procedures were previously described [11].

The EDXRF analyses of the crucible surfaces showed metal enrichment in the inner side of the crucible, namely of Cu, Sn and Pb. This demonstrates that the crucible fragment has held melted metal, proving some metallurgical operations at the site.

The results of EDXRF analyses made over the metal leftovers are shown in Table 1. The data shows that all metal drops and the metal blade fragment are made of a bronze alloy. The high Sn values must be understood as a result of corrosion phenomena, namely decuprification [12], undergone in the metal surface during burial. In a recent work about metal artefacts from other Portuguese archaeological site it was demonstrated that those phenomena may raise the Sn values in corrosion layers up to five times higher than in the metal bulk [13]. The Pb values obtained using this analytical technique may also be highly enriched in the superficial layer [14,15]. The high Fe contents (2.7-7.9%) is not related with the metal bulk. Instead, the Fe presence is due to the incorporation of this element from the surrounding soil to the corrosion layers during burial.

Regarding the fact that the analytical data concern to the corroded surfaces, the elemental compositions obtained for all metal leftovers seem to show some metallurgical unity. This reveals that that the metal worked at the site is most likely a bronze alloy with Pb present in the alloy as an impurity.

Table 1. EDXRF analyses performed in unclean metal leftovers (n.d. – not detected)

		% wt, normalised						
FCORV-A		Cu	Sn	Pb	As	Sb	Fe	Ni
578	Metal blade fragment	55	38	3.1	n.d.	0.2	3.3	n.d.
781	Metal drop	58	33	2.5	n.d.	0.03	7.9	n.d.
660	Metal drop	55	38	1.7	n.d.	0.13	4.6	n.d.
194	Metal drop	57	40	0.2	n.d.	n.d.	2.7	n.d.

3. MELTING THE POWER. THE SIGNIFICATION OF FRAGA DOS CORVOS MELTING INSTALLATION

Taking into consideration the above summarised archaeological data, we think appropriate to interpret the structural set composed by what we call “Hut 4” and “Hut 6” as a melting area devoted to the production of artefacts made of binary bronze.

The characteristics of the studied structures, the small amount of melting leftovers recovered and the even smaller amount of metallic fragments so far recovered in the excavated structures, all point towards a very small operational scale for metal production within the site.

Recent work [16], still in progress, let us think that there existed, within the site catchment area, mineral resources of copper and tin ores enough for the small scale of production documented. We hope that further work will clarify the issue.

The site food-economy, as far as we can tell from the scarce archaeological data available, could be a small agricultural production of cereals and *leguminosae*, complemented by ovi-caprids husbandry and hunting (boar and dear?). These possibilities are not very impressive as a source of accumulation of resources that would make possible some kind of “staple finance”, in the sense defined by Brumfiel and Earle [17].

Since the main production related artefacts are in knapped stone or in pottery, there is no way in which the small metal production detected could contribute to the development of agricultural produce or even trade with other regional communities and so be of economic value to enhance local social development.

We recently documented and analysed a similar situation for the Central Portugal Late Bronze Age Baiões/Santa Luzia culture group [18,19,20] and, as we did then, we argue here that metal production in these societies is an uneconomic process for which the only social utility is to provide the means for the symbolic expression of status, otherwise difficult in societies with a very conservative and modest economy, close to what Shalins called the “domestic mode of production”.

In the Macedo de Cavaleiros basin the first metal artefacts to appear in the archaeological record are the so called “Carrapatas Type Halberds” of the beginning of the First Bronze Age. They are consensually attributed to a late third early second millennium cal BC dating, consentaneous with a cultural environment with late Bell-Beaker pottery, Palmela arrowheads, daggers and the first gold jewellery. With the exception of the jewellery, all the other metal products, namely the halberds [21], are in arsenic copper [22] with local sources nearby.

A very graphic illustration of the social significance of these early metal artefacts is the Longroiva Stele [23]. It is the representation of a human figure equipped with a halberd, easily recognised as of Carrapatas-Type, a dagger and a bow. The presence of the bow is significant as it would be the main weapon either for hunting or for fighting during most of the Later Prehistory of the Iberian Peninsula and as such largely represented in the available iconography till the Late Bronze Age [23].

The Longroiva stele has been largely interpreted, together with other male steles of Northern Portugal First Bronze Age, as a “figure of power” [24]. In this way, the first metal “weapons”, with their scarcity, are to be seen in these local contexts more as symbols of power than as the effective means of enforcing it.

The successors to the Halberds, either as funerary items such as in the Argaric area [25], or as boundary markers by their deposition near “mountain portals” in the Portuguese Northwest, are the

axes with a wide and arched cutting edge designated in the Iberian Northwest as of Bujões/Barcelos type. These artefacts mark the first appearance of real binary bronzes in these areas. Through their affinity with the argaric ones they are usually situated chronologically as later then 1700 cal BC. The recent publication of a stone mould fragment from the habitat of Sola [26], dated between 1673-1527 cal BC, seams to vindicate such a chronology.

The archaeological data from Fraga dos Corvos seems to indicate that, in a cultural environment chronologically compatible with the dissemination of the axes of Bujões/Barcelos type, there is in the Portuguese Northeast a local production of binary bronzes following a process of technological introduction from northwest to southeast of the Iberian Peninsula as proposed by Fernández-Miranda, Montero Ruiz and Rovira Llorens [27].

We think that the available data allows us to propose that the local development of a binary bronze technology didn't change much from the point of view of the symbolic of power, the axes of Bujões/Barcelos type being only another way of expressing power and so being an adequate substitute of the arsenic copper halberds.

As it was for the halberds of "Atlantic type" the adoption and displaying of the axes of Bujões/Barcelos type as "foreign symbols of power" [28] would have been particularly important for the establishment and enforcing of the local incipient elites. The elite members probably controlled the small production and scarce circulation of metals and metal artefacts as means to ensure their status and control through a system of "wealth finance", as defined by Elizabeth Brumfiel and Timothy Earle [29].

The concern with territory control, especially the natural routes, which we clearly detect either in the location of the deposits of the "Carrapatas type halberds" and of axes of Bujões/Barcelos type or of the Fraga dos Corvos habitat site, is consistent with the necessity of the elites to develop such a control.

So, the metaphor "Melting the Power" can then very well and literally describe the activities taking place around 1700 cal BC at Fraga dos Corvos foundry area.

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