

Metals, microanalysis and meaning: a study of metal objects excavated from the indigenous cemetery of El Chorro de Maíta, Cuba

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Abstract

This is the first publication reporting systematic analytical research conducted on archaeological metals from Cuba. The main focus of the study consists of beads and small metal objects excavated at the cemetery of El Chorro de Maíta, which comprises some of the richest funerary deposits so far recovered on the island. Some comparative samples from the nearby site of Alcalá were also investigated, with an emphasis made on the manufacture, composition and origins of the different alloys. The resulting picture is that members of the social elite of the indigenous Taíno peoples were buried with beads made of placer gold exploited locally, gold–copper–silver pendants brought from continental South America and, above all, brass lacetags from European clothing that were perceived as sacred metals. The archaeometallurgical approach offers fresh insight into the relationships between Europeans and Taínos, and the impact of colonization on the indigenous customs, values and social structures.

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1. Background

The emergence of permanent settlements, intensive agriculture and ceramic production began around AD 850 in Cuba, based on archaeological evidence predominantly from the east of the country [13]. The generic name of ‘Taíno’ is given to the indigenous peoples of the Greater Antilles in the Caribbean that are perceived to have had this developed agricultural subsistence economy. Taíno sites are identified almost exclusively through ceramic typologies and there are over 200 Taíno sites currently recorded in Cuba. Publications of archaeological research at these sites and the interpretation of socio-economic development, including the emergence of chiefs or caciques, has received little international exposure in

comparison with publications on comparative topics from the Dominican Republic and Puerto Rico [7,46]. However, recent excavations at sites such as Los Buchillones and El Chorro de Maíta have started to provide more widely accessible data from a Cuban perspective [28,42,43]. The relatively large amounts of sumptuary material at these sites indicate a certain degree of craft specialization, the existence of social hierarchies and the possibility that some chiefdoms may have exerted power beyond their own local communities [41,42]. It was probably this scenario of societies with increasing social stratification that Columbus encountered when he first arrived in eastern Cuba in 1492. The gold of the New World quickly became one of the major ambitions and aspirations of the European colonists, and ethnohistorical accounts highlight how they endeavoured to liaise with the emerging local elites to barter for their circulating gold and exploit some of their other natural resources. The relationships between Europeans and Taínos, in which metals seem to have played a very significant

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role, would dramatically affect the later history of both peoples. This paper is presented as an archaeometallurgical contribution to our further understanding of this crucial contact period.

2. Introduction

Located in the Banes area of the Holguín province, El Chorro de Maíta is well known as one of the largest archaeological sites in northeast Cuba. Survey and excavations carried out in 1986 and 1987 revealed a large cemetery of 2000 m², surrounded by a settlement and domestic remains which cover a region of 22 000 m² [15] (Fig. 1). The cemetery space may also have served as a central plaza for the settlement. Radiocarbon dates obtained on human bone from the cemetery have provided a chronological range from cal. AD 1080 ± 70 to cal. AD 1590 ± 80, that is a long span from the settlement of the first agricultural groups in Banes until the first decades subsequent to the arrival of European conquerors [41:114]. It should be noted, however, that the earlier date appears problematic, as it was obtained from a body directly associated with European brass (see below). More samples for radiocarbon dating are under analysis.

There is information on the excavation of more than 120 skeletons from the cemetery and studies of burial position, stratigraphy and cranial morphology have indicated the indigenous nature of most of the burials [42]. There was no archaeological evidence for the differentiation of burials above ground. Conversely, some of them contained distinctive grave goods that appeared to mark and perpetuate differential ranks. Significantly, all the materials recovered were concentrated in 25 burials [42:157], most of them towards the centre of the

cemetery, with a prevalence of women, children and adolescents accompanied by rich deposits, particularly metallic objects. The combination of a centralized but unstructured cemetery with such unevenly distributed grave goods was seen as the expression of a society with reminiscences of an egalitarian cohesion, together with emerging social inequality that was institutionalized and transmitted by inheritance [14]. When the size of this settlement and material assemblage, found both inside and outside the cemetery, is compared to the small size of the surrounding sites it leads to the hypothesis that the power exerted by the chiefs or *caciques* at El Chorro de Maíta may have reached beyond their own community [41,42].

The presence of a cemetery is itself exceptional for the Banes area, where pre-Columbian human remains are more commonly encountered in caves and middens. Another peculiar feature of this cemetery is the nature of the funerary deposits. Burials with ceramic vessels, sometimes containing food remains, are often reported in the Banes archaeological area. Also frequent are stone celts and necklaces of stone beads [23,33]. In El Chorro de Maíta, contrary to this pattern, none of the burials contained ceramic vessels, and only seven of them include quartzite beads. In turn, the most abundant materials in these burials are small metal objects. Further materials recovered in El Chorro de Maíta burials, and invariably used for beads, are fish vertebra, pearl, resin and possibly coral, although these were only found in small numbers [14].

Given the exceptionality of the metal finds, an analytical study was deemed appropriate as a way of exploiting the information contained in the archaeological materials. An initial sample of the metal objects was submitted to the Centro de Aplicaciones Tecnológicas y Desarrollo Nuclear, part of the

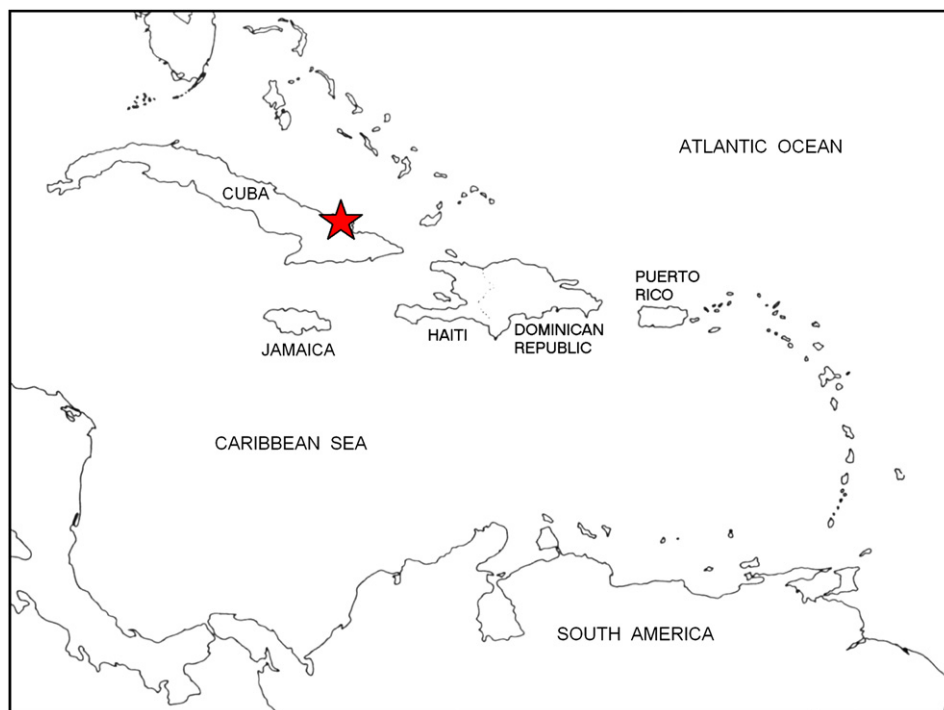


Fig. 1. Map of the Caribbean. The star indicates the location of El Chorro de Maíta and Alcalá in northeast Cuba.

Ministry of Science, Technology and Environment in La Habana, Cuba, where energy-dispersive X-ray fluorescence (ED-XRF) surface analyses were carried out. These already indicated the presence of several alloys, including ternary gold–copper–silver alloys and zinc-rich copper alloys. However, even though corrosion layers were mechanically removed in some of the objects, the small size and corroded condition of some did not allow a full quantification of the metal compositions based on ED-XRF. Subsequently, a more detailed analytical study was carried out at the Wolfson Archaeological Science Laboratories, UCL Institute of Archaeology, London, with more focused research questions. By investigating the manufacture, composition and likely origins of the different metal objects, and combining analytical and ethnohistorical information, we hoped to offer a fresh insight into the supply, value and use of different alloys amongst the Taíno, as well as into the use of metals in the symbolic perpetuation of social ranks. Moreover, the analytical approach clearly revealed the extent of the European influence in indigenous material culture and values.

3. Methodology

The analytical study carried out in London was based on energy-dispersive X-ray fluorescence (ED-XRF), optical microscopy and scanning electron microscopy with an attached energy-dispersive spectrometer (SEM-EDS).

ED-XRF analyses were performed with a Spectro X-Lab Pro 2000, using three polarizing secondary targets (Compton/Secondary Molybdenum, Barkla Scatter Aluminium Oxide and Barkla Scatter HOPG) and an evaluation method optimized for alloys. The objects analyzed were smaller than the detector window (ϕ 25 mm), and were placed directly in the chamber without any preparation (although some had had the corrosion layer mechanically removed in Cuba). Accordingly, the results could only be taken as qualitative. This was, however, useful to compare consistency with the results obtained in Cuba, and also to assess whether results from the pieces analysed invasively could be extrapolated to the rest of the objects analysed non-invasively.

Examination by optical microscopy involved the use of a standard Wild Heerbrugg stereoscopic microscope for complete objects, and a Leica DM LM for reflected light microscopy of metallographic cross sections. These were mounted in epoxy resin and polished to 1 μ m grain size following established procedures. In the first instance, it was decided that no chemical etching would be attempted in the metallographic

specimens, as this could selectively remove some phases and hinder the interpretation of SEM-EDS data. Later it was seen that internal corrosion in some samples was sufficient to reveal the crystallographic structure, hence no etching was performed.

SEM-EDS was carried out using a Philips XL30 instrument with an INCA Oxford spectrometer package. Cross sections and unmounted pendants were observed in secondary electron (SE) and backscattered electron (BSE) modes, and analyzed using the EDS system. Operating conditions for data collection were as follows: working distance of 10 mm; accelerating voltage of 20 kV; spot size of 4.7–5.3 (INCA conventional units) and process time 5, corresponding to a detector dead-time of 25–40%; and acquisition time of 75 s. Based on previous analyses, the lower confidence limits for this instrument may be established at 0.3 wt%, and values below this limit can be taken as indicative only. Bulk compositions given in this paper are averages of five measurements taken in areas of \sim 100 by 100 μ m, either on the surface of the artefacts analyzed non-invasively, or in the polished sections of those mounted for microstructural analysis.

4. Metal objects in El Chorro de Maíta

4.1. *Caona* (native gold)

Pure gold, known as *caona* amongst the Taínos, is represented in El Chorro de Maíta only by two minuscule beads, of approximately 2 mm in diameter. They were found in burial 57, belonging to a young woman, which also yielded numerous beads of various materials.

One of these gold beads was analysed non-invasively. Given its small size, it seemed plausible that it could have been made out of a single nugget of placer gold. This was supported by its composition as measured by SEM-EDS, showing gold containing small amounts of silver (5.2 wt%) and copper (1.3 wt%), in ranges usual for native alluvial gold [10:50,26:18,31,32:6–7] (Table 1). Although Cuba is not particularly rich in gold deposits, some ore formations do contain small amounts of this metal. One of the few auriferous regions is precisely in the Holguín area, with one of the main centres in Aguas Claras, about 45 km to the West of El Chorro de Maíta. Gold occurs there in hydrothermal quartz mineralizations, together with some carbonates and sulphur. In the 1970s, findings of native gold were still reported from this area [1]. Furthermore, ethnohistorical sources attest to the local lack of smelting technology and, conversely, the

Table 1
Composition of *caona* and *guanín* objects from El Chorro de Maíta (CMP) and Alcalá (ALP), as obtained by SEM-EDS

	Object type	Cu	σ	Ag	σ	Au	σ
CMP 3	circular bead	1.3	0.06	5.2	0.57	93.4	0.62
CMP 1	triangular pendant	47.9	1.29	12.6	2.73	39.5	1.53
CMP 2	lobular pendant	55.1	0.65	10.0	0.87	34.9	1.36
ALP 14	sheet fragment	56.8	0.64	6.6	0.32	36.7	0.69
ALP 15	sheet fragment	57.2	0.42	6.3	0.34	36.5	0.56

Results are averages of five measurements of \sim 100 by 100 μ m areas on the surfaces of CMP 1, 2 and 3, and cross sections of ALP 14 and 15. Minor amounts of sulphur and chlorine detected on the surfaces of CMP 1 and CMP 2 have been neglected.

exploitation of placer gold [3,4:29,27:199,44]. With this in mind, it can reasonably be hypothesized that the *caona* beads were made of local native gold.

As observed under the microscope, the nugget would have been carefully hammered to form a square-section wire, and then bent around a thin stick or rod into a circular shape. This is particularly noticeable at the point where the two ends of this wire meet to close the circle, which is an unlikely feature for a cast bead. These two tips were made slightly thinner, so that the thickness of the bead remained the same at the joint (Figs. 2 and 3). No compositional difference was identified at this joint, which suggests that it was bonded together simply by gentle heating, as usual for gold, without use of salts or soft soldering metals. The porosity identified on some areas of the surface of this bead is interpreted as remainders of the original nugget texture, rather than as casting porosity. Finally, although some siliceous accretions are visible on the bead surface (Fig. 3), it is not possible to confirm whether they are natural inclusions of the native gold, or post-depositional incrustations from the soil.

4.2. Guanín (gold–copper–silver alloy)

Ternary alloys with varying proportions of gold, silver and copper are typical of Pre-Columbian metallurgy in Central and South America [12,19,22,34,36]. ED-XRF analyses of some adornments excavated at El Chorro de Maíta showed them to be made of this alloy, which the Taínos named *guanín*. Interestingly, all of them came from the same burial (number 57, mentioned above). The *guanín* objects include an ornithomorphic pendant, which has been stylistically related to Caribbean Colombian types [27:201 and 207 (note 37)], a tear-shaped jingle-bell that appears similar to examples found elsewhere

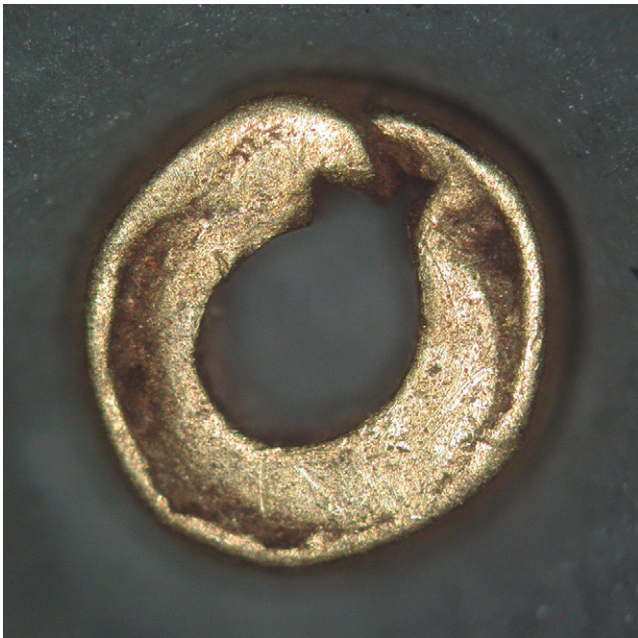


Fig. 2. Image of one of the *caona* beads under the optical microscope. Note the shape of the wire with a roughly square section, resulting from the hammering of a gold nugget, with thinner tips for a smooth joint (sample CMP 3).

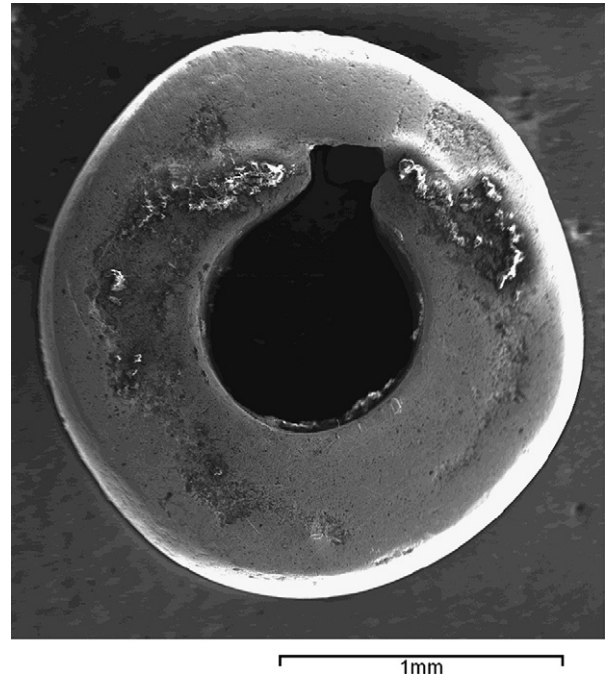


Fig. 3. Secondary electron image of the underside of the *caona* bead, showing a better fusion between the two ends of the wire (top right), achieved by simply heating the metal. The bright crusts shown on the surface are probably incrustations from the soil (sample CMP 3, SE image at 40× magnification).

in the Caribbean [40], Central America [14:24] and Colombia, and four laminar pendants that are also similar to the examples found in Colombia [9:143] (Fig. 4). Of the latter, two are trapezoidal, a third one is triangular, and the last one is elongated with two lobules; they weigh 0.3 g each (Fig. 4). Two of these were subjected to more detailed investigation by optical microscopy and SEM-EDS.

Manufacturing traits indicate that the outline of these pendants was cut out of a thin sheet, the edges being subsequently polished to remove sharpness (Fig. 5). Although some remnant casting porosity is visible on the surface of the object, it is likely that the original metal sheet was subject to hammering after casting. The small ($\phi \sim 1$ mm) perforation used for threading was not punched or drilled but cut, perhaps using a flint tool, as suggested by repeated shallow cutmarks in several directions (Fig. 5b). The pendants also exhibit some simple *repoussé* decoration, normally in the form of shallow grooves parallel to the edges (Fig. 5c). The chemical composition of the two pieces analysed falls within a relatively narrow range. Roughly, this composition reflects the artificial alloy of one part of alluvial gold (with a silver to gold ratio of 0.3) with one part of pure copper (Table 1).

Artefacts of similar compositions have been recovered in several sites across Latin America (see references below). When analyzed in cross section, it was often found that their surfaces appeared enriched in gold, probably as a result of attacking the objects by oxidation and using salts, acid plants or mineral solutions in order to deliberately remove the copper (and sometimes silver) and obtain a more golden surface. These processes are generally known as depletion gilding [2,18:231–236,19:369–375,22,34]. In the present study, uniqueness of the pieces



Fig. 4. Group of *guanín* pendants recovered in El Chorro de Maíta, including one jingle-bell, one ornimorphic and four laminar pendants.

discouraged the removal of cross sections to investigate compositional gradients and determine whether any similar practice had taken place. It was only possible to attempt this test by placing the entire object in the SEM chamber and trying to probe the metal core from the cut edges of the central perforation (Fig. 5b). Notwithstanding the unavoidable lack of analytical geometry, these analyses showed no significant compositional difference between the core and the surfaces of the pendants. In this sense, it should be noted that the *guanín* pendants exhibited a black patina when excavated, which might have suggested some sort of artificial patination. However, the relatively high copper

content would have made this alloy “susceptible to tarnishing and corrosion” [12:136] and hence this surface appearance is probably natural.

Two small fragments of very thin (~ 0.2 mm) metal sheet excavated in the nearby site of Alcalá could be analysed invasively in cross section, and they turned out to be also *guanín*, although this being slightly poorer in silver than the samples from El Chorro de Maíta (silver to gold ratio of 0.2, as opposed to 0.3 in the samples from El Chorro; see Table 1). The microstructure of this sheet (both fragments probably come from the same piece) shows a tight lamellar texture and some stress cracks,

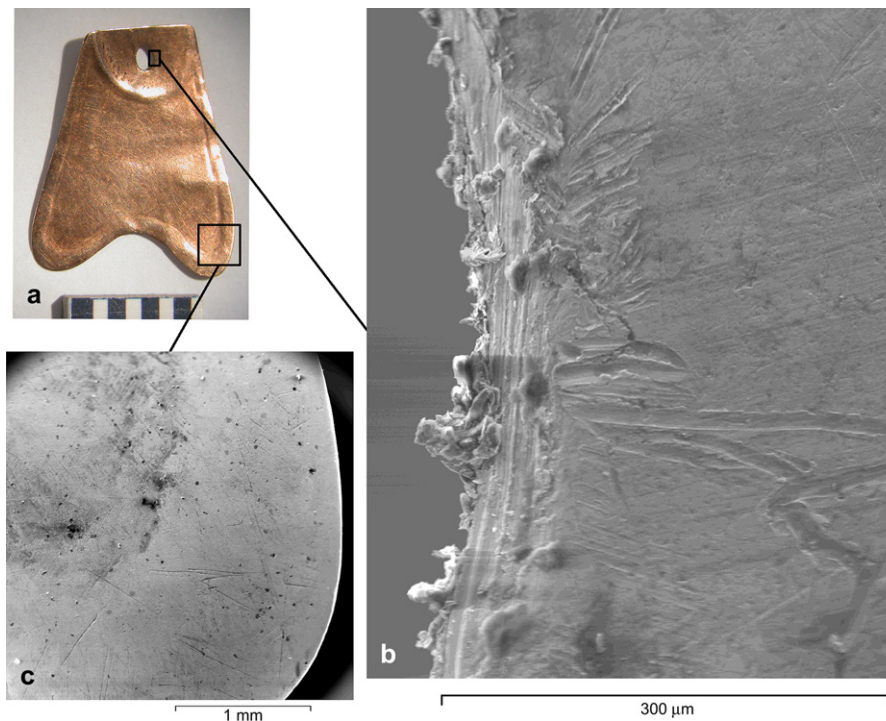


Fig. 5. (a) Laminar *guanín* pendant (max. length ~ 20 mm) and details of its manufacture as seen in secondary electron images. (b) Detail of the inner hole, showing repeated shallow cutmarks in several directions (sample CMP 2, SE image at $200\times$ magnification). (c) Detail of the *repoussé* decoration on one corner, achieved by engraving three parallel lines (sample CMP 2, SE image at $35\times$ magnification).

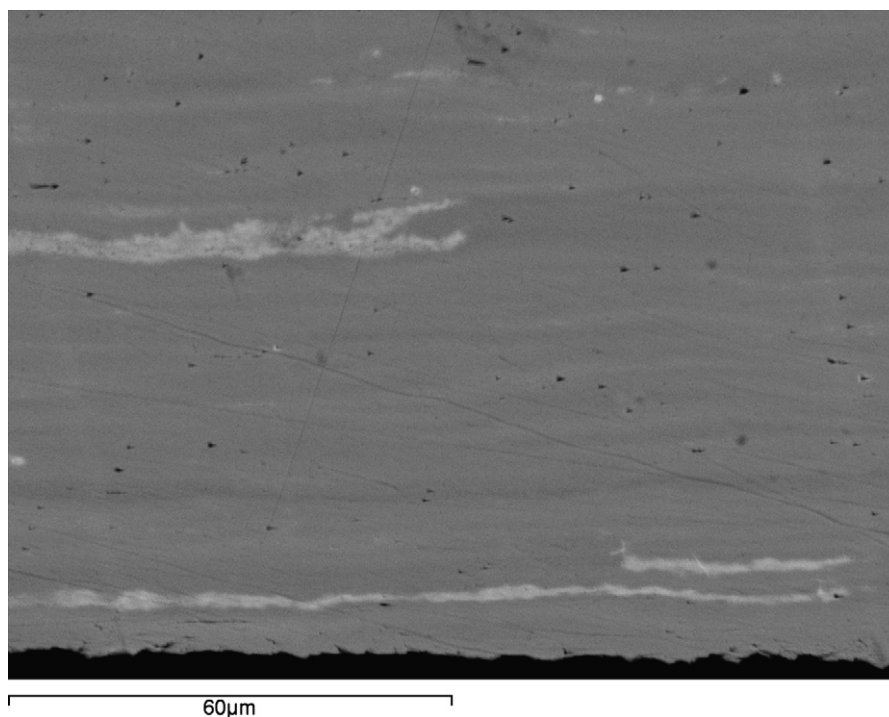


Fig. 6. Backscattered electron detail of the microstructure of a *guanín* sheet from Alcalá in cross section, showing the tight fibrous structure typical of a heavily cold worked two-phase alloy. Brighter phases are richer in gold (sample ALP 14, BSE image at 1000 \times magnification).

typical of heavily cold worked two-phase alloys that have not undergone annealing [35:14–15] (Fig. 6). No significant compositional gradient or surface treatment was detected. Although this point cannot be confirmed at present, this relatively simple manufacture might be extrapolable to the sheets used for making the *guanín* pendants found at El Chorro de Maíta.

Ternary alloys with such high levels of copper are not known to occur naturally. These *guanín* objects are the only examples of gold-copper-silver alloys to be found in Cuba and there is currently no archaeological or historical evidence for metal smelting in indigenous contexts in the Caribbean [37:77,44:38]. However, there are distinctive stylistic similarities between these *guanín* objects from El Chorro de Maíta and examples found in Colombian archaeological contexts [9:143, 182]. Therefore it appears likely that these ternary alloys found at El Chorro de Maíta were not produced locally but were imported from continental South America.

4.3. *Turey* (brass)

The single artefact type most frequently represented in El Chorro de Maíta is a thin, metallic tube with an average length of 29 mm and 2 mm diameter, produced by rolling a thin (~ 0.3 mm) metal sheet (Figs. 7 and 8). These tubes, with a slightly tapered profile, seemed ideal as pendants, as they would allow for a thread or string to be sewn into and knotted at the distal end. Some of them still preserve textile remains adhering, which microscopic study has shown to be cotton. In burial 25, five of these tubes were found in association with a copper-alloy disc, perhaps forming a ‘medallion’, which was found near the knee of the deceased. Others were recovered near the neck, thorax or abdominal areas in other burials. Altogether, 29 of them have been recovered from the cemetery, and identical ones are documented in Alcalá (one of which was also analyzed for this study) and other Caribbean sites [40].



Fig. 7. Two of the brass/*turey* tubular ‘pendants’ from El Chorro de Maíta, one of them as found (bottom) and the other one after mechanically removing the corrosion layer. Their length is 30 mm.



Fig. 8. Cross section of a tube, showing how it was made by rolling a metal sheet. Darker areas are corroded. The bright spots are lead globules within the brass matrix (sample CMP 6, BSE image at 40 \times magnification).

Analytical examination of five of these tubes showed all of them to be made of alloys of copper and zinc, i.e. brasses, with relatively high zinc concentrations: from 15 wt% to 26 wt%. They generally contain small amounts of lead (≤ 1.7 wt%) and minor concentrations of iron, nickel and, occasionally, tin (≤ 0.7 % each), as well as traces of silver (Table 2). As expected, those tubes with a higher zinc content are more corrosion resistant and thus appeared in a better state of preservation (Figs. 8 and 9). In the others, part of the zinc may have been lost in a process known as dezincification, and lead has clearly migrated to the object surface and redeposited as an oxide (Fig. 10). This explains the variable lead concentrations reported in analyses of metal matrices. In more corroded samples, small metallic grains very rich in silver were more easily identified, as opposed to better preserved tubes where the silver would be more diluted within the copper-rich matrix and was generally below the detection limits of the SEM-EDS system. Within these limitations, it can be said that all the tubes analysed fall within a consistent compositional range. This was confirmed by the ED-XRF surface analyses of a larger number of tubes, which always showed similar patterns in the major and minor elements.

The metallography of these specimens shows recrystallized and twinned grains resulting from cold working followed by

annealing (Fig. 11). In addition, microscopic examination of the edges of the metal sheet shows vertical cutmarks, suggesting that the sheet was cut by punching or striking with a sharp tool in one single cutting event (Fig. 9). This appears in contrast with the repetitive cutmarks observed in the *guanín* pendants and described above (Fig. 5b).

From the discovery of these pieces, it had been hypothesized that they could be the result of European influences [27:201]. However, the large chronological span of the site and the lack of analytical data left the question unresolved. After the present study, it can be safely concluded not only that these are the result of contacts with the Spanish, but indeed that the ‘pendants’ themselves were brought from Europe to Cuba. This point can be argued by providing the relevant technical and archaeological background.

Given the volatility of zinc, the production of high-zinc brass in premodern times could only be achieved by the method known as cementation, i.e. the heating of metallic copper with zinc ore and charcoal in a closed crucible. In this process, zinc oxide is reduced to zinc metal at a temperature around 1000 °C. At this temperature, zinc metal forms a vapour phase, which is readily absorbed by the copper metal, forming brass directly [6,29,30,47]. Before the inception of the method of zinc sublimation in closed retorts – which in Europe did not take place before the 18th century AD – cementation was the only known technique to produce brass. Late 15th-century crucibles used for brass cementation and casting have recently been identified in Germany [21], and the process is also described in several Renaissance metallurgical treatises [38,39].

While brass making was widespread in medieval and earlier Europe, at present there is no evidence of brass production by cementation in America before the arrival of the Europeans. The high zinc content of the tubes found in El Chorro cannot be explained as a result of fortuitously smelting mixed copper and zinc ores, an argument used to explain some low-zinc brasses (zinc $\leq 8\%$) from Pre-Columbian Argentina [5:293,11]. Furthermore, the composition of these tubes resembles strongly that of other cementation brasses produced in Central Europe in the 15th and 16th centuries. The extensive data set published by Mitchiner et al. [24] shows that brass jetons manufactured in Nuremberg (SE Germany) up to 1700 have a diagnostic geochemical signature, shown in their relatively high nickel content (normally between 0.1 and 0.4 wt%, above 0.3 wt% on average), and the virtual absence of arsenic

Table 2
Composition of *turey* tubes from El Chorro de Maíta, as obtained by SEM-EDS of cross sections

	Context	Cu	σ	Zn	σ	Pb	σ	Ni	σ	Fe	σ	Sn	σ
CMP 4	burial 69	82.8	0.21	15.6	0.17	tr		0.7	0.11	0.2	0.05	0.7	0.06
CMP 5	burial 25	81.2	1.81	18.2	1.67	0.3	0.44	0.1	0.07	0.4	0.30	–	
CMP 6 ^a	burial 57	72.0	0.30	26.1	0.75	1.3	0.61	0.3	0.07	0.3	0.04	–	
CMP 12	burial 101	80.1	0.55	18.8	0.22	0.5	0.44	0.4	0.18	0.3	0.12	–	
CMP 17	burial 25	79.7	0.53	19.7	0.16	tr		0.1	0.12	0.3	0.18	0.1	0.17
ALP 13 ^a		79.2	0.61	18.3	0.55	1.7	0.93	0.3	0.13	0.3	0.06	0.2	0.12

Results are averages of five measurements of ~ 100 by $100 \mu\text{m}$ areas.

^a Tubes with the best state of preservation. In all the others, part or all of the lead had migrated to the surface as a result of post-depositional corrosion, and is thus not reflected in these bulk compositions. Traces of silver were also detected in all of them.

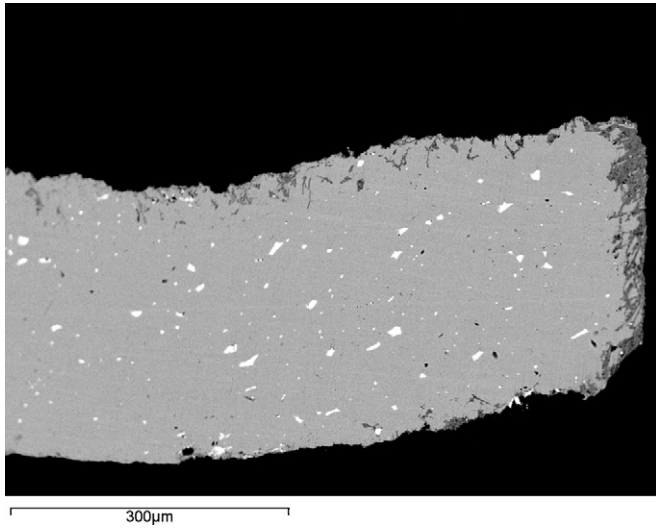


Fig. 9. Detail of the cross section of a tube. Note that the lead globules (bright) show some horizontal alignment, a remnant of hammering. Dark grey lines developing from the surface and the tip are intergranular corrosion favoured by mechanical strain, as a result of the hammering and rolling. The straight edge of the metal sheet (right) indicates that it was cut by applying pressure with a sharp tool at once (compare to Fig. 5b) (sample CMP6, BSE image at 700× magnification).

(<0.05 wt%). This is a very similar pattern of compositions to those documented in the brass tubes found in Cuba. This compositional pattern is characteristic of some nickeliferous copper ore deposits from Austria–Hungary, and differentiates these metals from those from other deposits exploited at the time in Germany, Sweden, England or North America (see also [16]). Even the zinc levels, the iron and lead content, the occasional presence of tin and the traces of silver render the tubes found in Cuba entirely consistent with the brass objects from Nuremberg. Overall, although we lack detailed information on the supply of brass in 16th-century Spain, it seemed

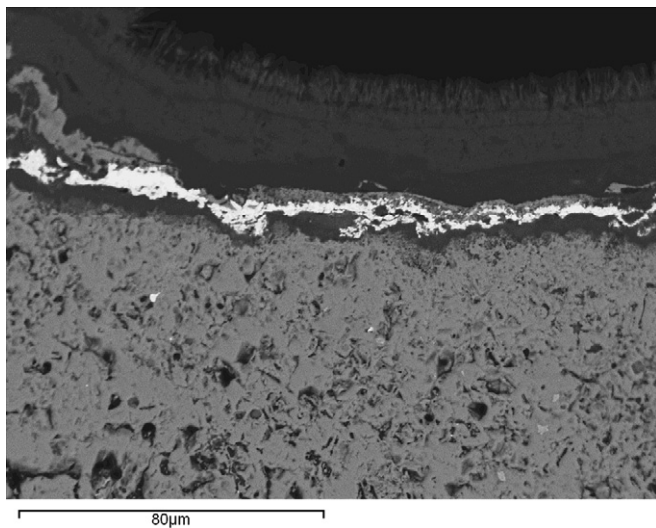


Fig. 10. Detail of the cross section of a corroded tube, showing, from top to bottom: an external corrosion layer, a bright layer of redeposited lead oxide, and a mass of corroded metal with remnant metallic grains (light grey) several of them rich in silver (sample CMP 4, BSE image at 170× magnification).

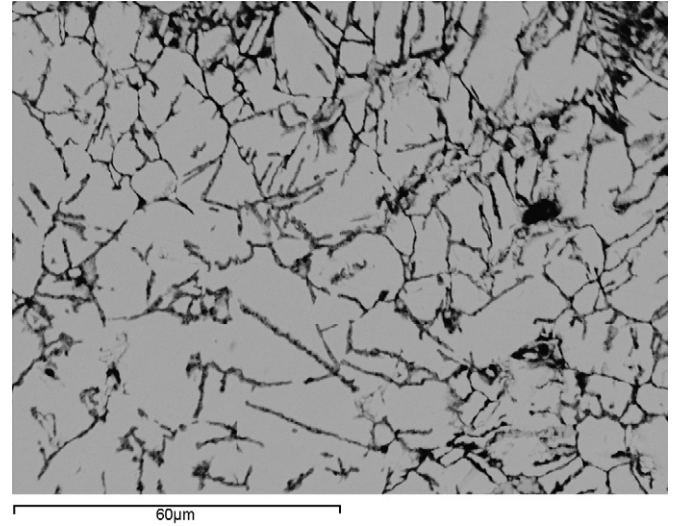


Fig. 11. Detail of the microstructure of a slightly corroded brass tube. Inter- and intra-granular corrosion reveals recrystallized and twinned grains resulting from cold working followed by annealing (sample CMP 12, BSE image at 1000× magnification).

very plausible that the metal used for these tubes was produced in Central Europe, and it could have reached Spain via established commercial routes before being brought to Cuba. However, we still had to investigate whether the artefacts themselves had been shaped in Europe or in America.

Just as the metal composition supports a European origin, so does the shape of these ‘pendants’ corroborate the interpretation. A review of relevant literature and pictorial sources reveals that, in all likelihood, these tubes are not beads but lacetags or aglets from European clothing. From the 15th century onwards, these were used to prevent the ends of laces from fraying, and to ease threading in the points for fastening doublets and hose, or various other laces used in dressing. There are several mentions to copper-alloy aglets in contemporary literature, and they are frequent in period paintings (Fig. 12) and domestic archaeological contexts in Europe [8:281–290,20:22]. Very similar objects have been excavated in early colonial settlements in La Habana, Cuba and North America, including Fort San Juan [25] and Jamestown [17:173–174].

Ethnohistorical sources suggest that the Europeans used these aglets as a trade item in the Caribbean shortly after their arrival [27,40,45]. Therefore an interpretation of their presence at El Chorro de Maíta and the role they played within the indigenous community that lived there requires further discussion of metal symbolism and value among the Taíno.

5. Metal symbolism among the Taíno

Vega [44] and Oliver [27] have compiled ethnohistorical and archaeological information regarding the symbolism of gold and other materials amongst the Taíno elites. Their work provides a useful background to understand the pattern of objects and alloys documented in El Chorro de Maíta.

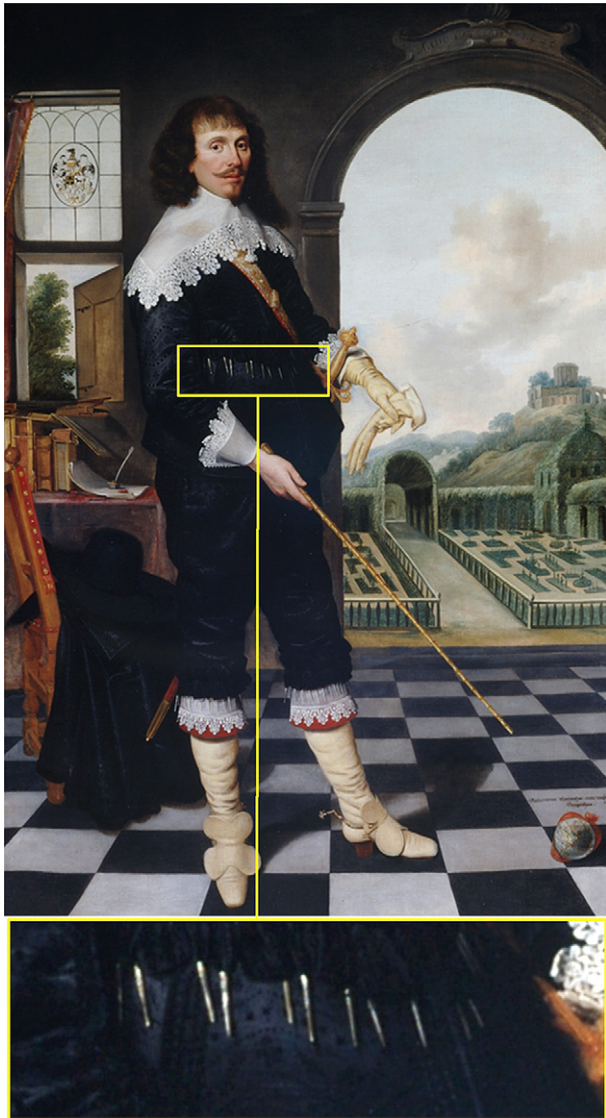


Fig. 12. Portrait of William Style of Langley (British School, c. 1636), showing the use of aglets in his waist to secure his trousers through his jacket (Tate Gallery, London).

Early chroniclers report that pure gold or *caona* was considered the least valuable metal amongst the indigenous peoples, significantly less esteemed and less sacred than copper-based alloys. If we couple this with the contrasting eagerness of the Spanish for plundering noble metals, then we have a paramount factor explaining the scarcity of gold in the cemetery at El Chorro de Maíta.

Of much more value than gold was *guanín*. Importantly, the Taínos did not use the term *guanín* only for the ternary gold–copper–silver alloy, but also for other entities such as some specific feathers, plants, stones and turtles, or even for the vesperine stars. The essence of things *guanín* was their reddish colour, appealing iridescence, sweet smell and exotic origins. *Guanín* was usually worn by *caciques* in combination with other adornments such as *caona*, shell-beaded belts or quartzite necklaces (*cibas*) and these served as a means of displaying their chiefly power and their privileged role as mediators

between the natural and the supernatural [3,27:205]. Highly polished *guanín* metal sheets, known by the Spanish as *espejos* (mirrors), would shine iridescent in the distance, exhibiting the power of those who wore them, and it is probably in this context that we may explain the laminar pendants found in burial 57 of El Chorro de Maíta, or the sheets excavated in Alcalá.

Given the variable preservation and recovery prospects of different materials in burial conditions, it should be emphasized that our focus on metals may be underestimating the presence of *guanín* in the cemetery. We must bear in mind the possibility that less durable *guanín* objects such as feathers or plants may have been buried as well, and they would have appeared as valuable and symbolic for the Taíno. Whatever the case, the Taíno peculiar appreciation of matter was very beneficial for the Spanish, who allegedly obtained exchange rates of 200 *caona* for 1 *guanín* [3]. Even though the use of this alloy seems to predate the conquest [27:202], it seems reasonable to assume that the Spanish would have promoted the import of gold–copper–silver alloys into Cuba, which they would barter for pure gold.

Finally, *turey* or brass only entered the Caribbean after the conquest, but it was soon entrenched in the local metal value system with a very high rank. Bishop Bartolomé de Las Casas stated it clearly: “Anything made of *latón* [brass] was esteemed more than any other [metal]... They called it *turey*, as a thing from the sky, because their name for sky was *turey* [or *tureyro*, *tureygua*]; they smelled it as if by doing so they could sense it came from heavens...” [27:198]. The word *turey* denoted the bright part of the sky and a remote origin. Like *guanín*, *turey* was a heavenly matter with peculiar appearance and smell, coming from remote origins and imbued with sacredness. This high appreciation of the European metal amongst the Taíno must have developed very quickly, as it appears documented in most of the early 16th-century sources and is included in Taíno myths and legends. Furnished with iridescence and exoticism, brass had what it took to appeal to the locals as sacred matter.

It would have been impossible for the first Europeans arriving in the Caribbean to envisage the colossal value that their metal would accomplish in trade with the indigenous population. Accordingly, one could not expect them to have loaded up their ships with unnecessarily large amounts of metals. Upon arrival, with virtually any metal gadget becoming precious amongst the Taínos, European conquerors would have traded anything they had at hand — or at foot, for that matter — including the cheap and dispensable lacetags. Moreover, these had a suitable shape for threading and turning into visible pendants. Functional European brass was thus conceptually transformed into ornamental Taíno *turey* and integrated into their symbolic system. In this sense, it seems more likely that the Caribbean *caciques* reused the European aglets in a different form, perhaps still hanging from their original laces as single pendants, or combining them with *guanín* and other body ornaments that would convey and display their prestige. The latter seems to be the case of the ‘medallion’ found in burial 25 and mentioned above. It is difficult to be certain whether the aglets were separated from the European clothing

in the other burials. This is because the aglets in the burials are located in areas of the body where they may have been attached to clothing (Fig. 12). However, whether they were attached to clothing or detached and used as individual ornaments, it appears that the metals held a higher perceived symbolic significance as elements of *turey*. This suggestion is supported by the example of burial 57 where objects of *guanín* and *turey* (aglets) are found together.

In sum, understandably, the relative abundance of metal alloys in El Chorro de Maíta appears inversely proportional to their value amongst the Europeans, with pure gold being the least abundant and brass featuring in a relatively large number of tombs. This illustrates the considerable impact that the contact with Europeans had in the Taíno value system and, relatedly, in their social customs.

The abundance of brass objects in the burials at El Chorro de Maíta indicates that, after the European contact, relatively more metal objects were available or, at least, susceptible of being buried rather than redistributed. More importantly, these objects are not confined to male burials but they also appear in female and infant burials. The richest grave goods are associated with a female adolescent (burial 57) and a newborn baby (burial 58), both of which were laid next to an adult male (burial 29). This cluster could constitute the burial of a *cacique* with his wife and son, a practice documented ethnohistorically in Hispaniola, and it suggests that access to symbols of power could have been linked to family ties and inheritance.

According to historical sources, the power of brass or *turey* as a heavenly metal was similar to that of *guanín*, the ternary alloy. However, *turey* only arrived with the Spanish and was monopolized by them. The acquisition of the desired *turey* inevitably required liaising with the Europeans who brought and administered the sacred metal. Thus, the possession of brass would have put the Spanish in a strong position to negotiate with local chiefs and obtain their gold and favour. In turn, these local elites could have seen their status reinforced and expressed through the acquisition and display of *turey*. The implications of this exchange for the initial relationship between Taínos and Europeans, as well as for the intensification of social inequality amongst the indigenous populations, may have been dramatic, and these issues will be explored in future work.

6. Summary and conclusion

The scientific study of metal objects from El Chorro de Maíta and Alcalá has provided useful information for the reconstruction of the local history, as well as regarding the use of metals in Cuba and their value during the contact period.

Social elites at El Chorro de Maíta were buried with a variety of body ornaments, notably beads and pendants of several materials, especially metal. These included minuscule beads hammered from single nuggets of probably local placer gold, a variety of gold–copper–silver pendants brought from continental south America and, above all, European brass tubes.

The extent of the European influence is shown by the fact that these tubes, in all likelihood made in Europe, constitute the majority of the metal objects present in the cemetery.

These objects are almost certainly aglets from European clothing that were traded for items holding less value for the Taínos, including pure gold. Brass or *turey* soon became one of the sacred metals amongst the Taínos, and local elites would have had to liaise with the Spanish in order to obtain it. The social implications of this trade are yet to be explored in detail.

It is hoped that future excavations and subsequent analyses will clarify the relationship between the cemetery and the surrounding settlement in El Chorro de Maíta. Amongst other issues, it remains to be ascertained whether any other objects of European brass were adopted as *turey* and given new uses by the Taínos, even if not buried with the deceased. Furthermore, the relationship between the relatively large and stratified society of El Chorro de Maíta and those of the surrounding smaller sites is to be investigated in more detail. If it is true that the power of some *caciques* reached beyond their own communities, it will be interesting to see to what extent this power was given, or reinforced, by a privileged access to the Spanish and their metals. Thus archaeometallurgy presents a promising complementary approach to the European influence on the Taíno material culture and social structures.

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