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Iberian bronze figurines: technological and stylistic analysis

Robert H. Tykot, Lourdes Prados Torreira and Miriam S. Balmuth

Thousands of votive bronze figurines are known from just three sanctuary sites in the eastern Andalusia region of Spain, where they were clearly an important aspect of Iberian religious practices. Several thousand have been found at the Collado de los Jardines (Despeñaperros, Jaen), the best known of the sanctuaries; another 2,000 at Castellar de Santisteban, c. 35 km distant; and several hundred more at Nuestra Señora de Luz (Murcia). Individual figurines have been found at some 30 other sites in Spain.¹

We report here on a collection of 20 figurines that belongs to the Harvard University Art Museums but is on permanent loan to the Peabody Museum of Archaeology and Ethnology, Harvard University.² This collection was donated to Harvard in 1932 by the Spanish Republic, along with some ceramics and other materials.³ Both the historical provenance of the collection and the typological characteristics of the figurines leave little doubt that they come from the Collado de Los Jardines sanctuary, where many similar figurines have been found.⁴

Unfortunately, their chronology is based primarily on stylistic evidence, since the excavations by Calvo y Cabré were done more than 75 years ago, and many of the other figurines come from clandestine activities. Some of the more detailed figurines are thought to be close to Phoenician models of about 600 B.C., while more schematic types may be later, possibly of Roman age.⁵ More recently, the Iberian figurines have been extensively studied by Prados Torreira, who has catalogued nearly 2000 examples in the Museo Arqueológico Nacional in Madrid.⁶ We estimate that most of the figurines in the Harvard collection date between the end of the 5th and the 2nd c. B.C.

The figurines in the Harvard collection are a heterogeneous group, both stylistically and compositionally, perhaps as a result of chronological differences (figs. 1-2). Several of the figurines are quite simple and schematic, with little detail executed before or after casting. Only one has breasts to indicate that it represents a female; she also wears a cape which covers her head and flows down below her waist (no. 130). Two are clearly males judging from the genitalia (nos. 135 and 113), while a third (no. 114) carries a dagger, as does one of the males (no. 113).

Half of the Harvard pieces may be described as offerers or supplicants, dedicated to an unknown divinity. Prados Torreira has interpreted this group, as well as the phallic males, as having fertility connotations. She also interprets the figurines as reflecting different social classes, in terms of both who they represent and who acquired and deposited them. Some of the figurines represent women wearing jewelry and expensive garments; the quality of the figurines themselves suggests that some were probably made by specialized artisans.⁷

1 R. J. Harrison, *Spain at the dawn of history: Iberians, Phoenicians and Greeks* (London 1988) 126-34.

2 A descriptive catalogue of this collection has already been published: L. Prados Torreira, "La colección de bronce ibéricos del Peabody Museum de Harvard," in *Bronces y religion romana: Actas del XI Congreso internacional de bronce antiguos, Madrid, mayo-junio, 1990* (Madrid 1993) 361-67.

3 This was in appreciation for the return of the sarcophagus of Alfonso, son of Count Pedro de Ansúrez de San Benito de Sahagún.

4 P. Paris, *Essai sur l'art et l'industrie de l'Espagne primitive* (Paris 1903-4); J. Calvo y Cabré, *Excavaciones en la Cueva y Collado de los Jardines: Santa Elena* (Memorias de la Junta Superior de Excavaciones y Antigüedades, Madrid 1919); F. Alvarez Ossorio, *Catálogo de los exvotos de bronce ibéricos: Museo Arqueológico Nacional* (Madrid 1941).

5 G. Nicolini, *Les bronzes figurés des sanctuaires ibériques* (Paris 1969).

6 L. Prados Torreira, "Exvotos ibéricos de bronce: aspectos tipológicos y tecnológicos," *Trabajos de Prehistoria* 45 (1988) 175-99; id., *Exvotos ibéricos de bronce del Museo Arqueológico Nacional* (Madrid 1992).

7 Prados Torreira considers the Harvard collection to represent the average class of figurines from the



Fig. 1. Female figures. Iberian. Bronze. From left to right: inv. nos. 128, 129, 123, 127, 125, 124, 126, and 130. Cambridge, MA, Harvard University Art Museums. (Photo: H. Burger, courtesy Museum)



Fig. 2. Male figures. Iberian. Bronze, h. (of tallest) 10 cm. From left to right, top and then bottom row: inv. nos. 135, 113, 118, 121, 120, 122, 119, 136, 134, and 114. Cambridge, MA, Harvard University Art Museums. (Photo: H. Burger, courtesy Museum)

Chemical analysis

Iberian bronze figurines were cast using the lost-wax process in clay molds that were then broken open and discarded. Knowledge of the alloys provides information on the types of ores exploited, as well as on the technological nature of the production process itself. Issues such as the addition of lead to improve casting properties, the use of standardized recipes, and the recycling of scrap metal may then be considered.

A fine drill bit was used to remove approximately 10 mg of clean metal from the interior of one leg from each figurine, with minimal damage to the appearance of each piece. Samples were put into solution and analyzed for major and trace elements by inductively coupled plasma-mass spectrometry, a technique which is increasingly being applied to archaeological materials.⁸ ICP-MS has a number of distinct advantages over other analytical techniques, the most important for metal analyses being its simple requirements for preparing the samples, low cost, and the ability to produce isotope ratio data in addition to elemental composition. Although the size of the sample removed from each figurine is small (and metals are notoriously heterogeneous), these samples potentially yield a more representative compositional analysis than that obtained by the analysis of surface material alone (e.g., by X-ray fluorescence, PIXE, or SEM-based analyzers).

TABLE 1. CHEMICAL ANALYSES OF IBERIAN FIGURINES (tr = trace)

Sample no./inv. no.	Cu	Sn	Pb	Zn	Fe	Ni	Ag	As	Total
PM 33-67-40/113	80.45	6.97	10.66	1.31	0.60	0.13	0.06	0.14	100.00
PM 33-67-40/114	83.40	10.54	4.69	1.37	tr	0.03	0.09	0.10	100.00
PM 33-67-40/118	87.97	3.51	7.48	1.04	tr	0.01	0.05	0.02	100.00
PM 33-67-40/120	94.74	2.62	1.53	1.11	tr	0.03	0.06	0.03	100.00
PM 33-67-40/121	94.58	5.16	0.26	tr	tr	0.00	0.03	0.01	100.00
PM 33-67-40/122	83.43	4.63	11.62	0.33	tr	0.06	0.04	0.20	100.00
PM 33-67-40/123	82.90	5.68	10.57	0.84	tr	0.04	0.08	0.08	100.00
PM 33-67-40/124	71.02	5.55	23.11	0.32	tr	0.02	0.06	0.05	100.00
PM 33-67-40/125	95.10	1.41	3.49	tr	tr	0.03	0.05	0.01	100.00
PM 33-67-40/126	92.54	2.81	4.29	0.36	tr	0.01	0.06	0.05	100.00
PM 33-67-40/127	88.92	5.46	5.62	tr	tr	0.02	0.06	0.05	100.00
PM 33-67-40/128	89.07	9.96	0.97	tr	tr	0.01	0.06	0.03	100.00
PM 33-67-40/129	91.61	1.29	6.69	0.41	tr	0.02	0.05	0.09	100.00
PM 33-67-40/130	89.91	5.06	4.65	0.39	tr	0.03	0.05	0.11	100.00
PM 33-67-40/134	76.32	4.17	18.77	0.74	tr	0.03	0.09	0.10	100.00
PM 33-67-40/135	80.31	5.01	13.84	0.85	tr	0.04	0.06	0.09	100.00
PM 33-67-40/136	89.85	6.93	2.85	0.37	tr	0.03	0.06	0.05	100.00

Results were obtained for 17 of the Harvard figurines (Table 1). As a group, these Iberian figurines are extremely variable in their lead content: they average 7.7%, but range from 0.26% to 23.1%. Tin, which averages 5.1%, ranges from 1.3% to 10.5%. Several of the figurines have measurable quantities of zinc (average 0.72%), but never more than 1.4%. There does not appear to be any correlation between our analyses and the type or style of the figurines. For example, the most elaborate figurines (e.g., no. 128), whose casting might have been facilitated by the use of leaded bronze, are not among those with more than 10% lead (nos. 113, 122, 123, 124, 134,

Collado de los Jardines sanctuary. Figurines of higher quality may be found in the Museo Arqueológico de Madrid and in the Museo Arqueológico de Barcelona.

⁸ R. H. Tychot and S. M. M. Young, "Archaeological applications of inductively coupled plasma-mass spectrometry," in M. V. Orna (ed.), *Archaeological chemistry: organic, inorganic, and biochemical analysis* (Washington, D.C. 1996) 116-30.

135). Our results are largely consistent with those previously reported for figurines from sanctuary sites in Spain,⁹ and complement those available for Bronze Age Iberian metalwork.¹⁰

The extreme compositional variability present in the Harvard collection, and in other collections, implies that a standard recipe was not used in the production of Iberian votive bronze figurines, and that metal production in Iron Age Spain may have been a largely decentralized activity. This variability is also not easily explained by chronological changes in alloy composition, whether for technological, economic, or social reasons. Most likely, the variability present in these collections results from the widespread recycling of scrap metal containing copper, tin, and/or lead in differing proportions. This may have occurred for reasons of convenience, cost, or availability of alternative materials. Further analyses of Iberian bronzes from dated archaeological contexts may help resolve these issues and allow us to connect metallurgical production techniques to socioeconomic factors in prehistoric Iberian societies.

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- 9 Prados Torreira 1992 (supra n.6) 151-56. XRF analyses of 54 figurines from the same site, Collados de los Jardines, average $9.4 \pm 5.2\%$ Sn, $9.7 \pm 8.5\%$ Pb, and $0.3 \pm 0.3\%$ Zn. Twenty figurines from Castellar de Santisteban average $7.0 \pm 4.9\%$ Sn, $13.7 \pm 7.1\%$ Pb, and $0.2 \pm 0.3\%$ Zn. Eight figurines from La Luz average $9.7 \pm 7.4\%$ Sn, $16.5 \pm 7.6\%$ Pb, and $0.3 \pm 0.2\%$ Zn.
- 10 R. J. Harrison, P. T. Craddock, and M. J. Hughes, "Study of the Bronze Age metalwork from the Iberian peninsula in the British Museum," *Ampurias* 43 (1981) 113-79.