

PROCEEDINGS OF THE
XIVth INTERNATIONAL NUMISMATIC CONGRESS
GLASGOW 2009

I

PROCEEDINGS OF THE
XIVth INTERNATIONAL NUMISMATIC CONGRESS

GLASGOW 2009

Edited by
Nicholas Holmes



GLASGOW 2011



International Numismatic Council



British Academy



University of Glasgow | The Hunterian

All rights reserved by
The International Numismatic Council

ISBN 978-1-907427-17-6

Distributed by Spink & Son Ltd, 69 Southampton Row, London WC1B 4ET
Printed and bound in Malta by Gutenberg Press Ltd.

A CENTRE OF *AES RUDE* PRODUCTION IN SOUTHERN ETRURIA: LA CASTELLINA (CIVITAVECCHIA, ROMA)

ALMUDENA DOMÍNGUEZ-ARRANZ AND JEAN GRAN-AYMERICH

Summary

Mineral ores in the Tolfa mountains, behind the Civitavecchia coast and between the old cities of Tarquinia and Caere, were known before the Etruscans and probably even before the Villanovan period. The only coastal site with continuity from the Middle Bronze Age to the Etruscan and Roman times is La Castellina, south of Civitavecchia. Recent researches by the CNRS from Paris, and the University of Zaragoza, in close cooperation with the University of Tübingen and other European institutions, has been developed here. Pottery vases and coinage imported from Greece and the Greek western colonies, from Carthage, Sardinia and the Iberian Peninsula have been documented. Moreover, a centre of recovery and smelting of bronze objects related to the production and distribution of *aes rude* was discovered. It was originally located at the summit of the hill, during the 8th to the 7th centuries BC, and subsequently relocated to occupy the slopes. The principal traces of this metallurgic and early premonetal activity are cut ingots, fragments and drops of melted bronze, as well as possible weighing instruments. The surroundings of La Castellina revealed a dozen bronze deposits which contained: broken artefacts of the Iron Age and possibly the end of the Bronze Age, several thousands of *aes rude* and cut ingots and finally the so called *tesoretto di Santa Marinella*.

Introduction

Etruscan monetary production was sporadic and not generally carried out as in the Greco-Roman world. The contrast between the ‘Golden Age’ of Etruria (7th-5th BC) and the ancient and classical Greek world, regarding numismatic production, constitutes a noticeable paradigm, especially when we consider the broad and parallel peaks of writing, sculpture and monumental architecture in both civilizations, not to mention iconography in ceramics, wall painting and silverwork. Comparing the use of coin in Etruria and in Greater Greece (Magna Graecia), it is possible to conclude that there was *un consistente ritardo*,¹ although this view is open to consideration, as in the case of the eastern Phoenician and Punic worlds. Although rarely found, Etruscan coins are not totally absent, neither in Etruria itself, nor in the farthest geographical Etruscan settlements: whether they be on land to the north of the Po,² or by the sea, such as the finds in Aleria (Corsica) and in areas near the mouth of the Rodano and the Ebro.³ Among the principal monetary finds from the archaic era in Etruria are those from Populonia and Volterra.⁴ The latter is of particular interest, since it includes both silver coins of local production and others of the ‘Auriol’ type, imitations of ancient Greek coins considered to be from the Provençal sector, and consequently, refers to the Etruscan activities from the VI-V centuries in that region of the Mediterranean.⁵ Some authors link the finds from Volterra and Sainte-Maxime in Provence, vindicating the common Etruscan origin of several of those silver coins.⁶

¹ Catalli 2000, p. 89.

² *Atti Mantova 1986; Catalogo Mantova 1986*; on the drachma from Populonia with the Gorgon that was located near Lake Como, in Prestino: De Marinis 1982, pp. 506-509, lám. 71b; Cristofani 1981, p. 17, lám. III; *Catalogo Firenze 1985*, p. 238, n° 8.11.4.

³ The coins of Sainte Maxime, in Chabot 1978; Martelli 1981, lám. XCVII.5-6; Cristofani 1983, fig. 59; Jehasse 1986; 1989; *Catalogue*

Lattes 2002; Catalogue Martigues 2000; Martos 2000. The currency of Tarragona: Asensi 1990; Gran-Aymerich 2006, p. 278, fig. 12.

⁴ For the ‘treasure’ of Populonia cf. Scamuzzi 1941; Petrillo 1976; id. 1977; id. 1981; *Catalogo Firenze 1985*, pp. 338-40. That of Volterra: Gamurrini 1874; Cristofani Martelli 1976; *Catalogo Firenze 1985*, p. 239, n° 8.13, fig. 239 y 235.

⁵ *Catalogo Firenze 1985*, p. 240. Catalli 2007.

Currency and pre-currency in Etruria

The problem of studying the origin of currency has gone through several phases, among them a period favouring a purely economic aspect, in which prices of goods were established in accordance with a monetary system of weights and measures. Later, a more articulated vision was developed, associating the concepts of currency and pre-currency, in which the former was linked to ceremonial functions and demonstrated the existence of political power, both of an oligarchic as well as monarchic nature.

The first Etruscan coins identified are from the end of the 6th century or the beginning of the 5th, and are minted of silver attributed to the cities of Vulci and Populonia, evolving in the following centuries.⁷ The most frequent iconography is that of the Gorgon's head, and the first inscriptions bear the legend *Thezi* or *Thezie* (*Thezle*). The models of these first mintings could have been Chalcidian and Phocaeen colonial coins, especially from the mint at *Massalia*. The first gold coins issued, with a lion's head,⁸ are interpreted as being produced privately, related to high-level functions rather than to simple commercial transactions of that time.⁹ The circulation of currency in Etruria develops in the second half of the 4th century and during the 3rd century, with the bronze series that include the anchor among dolphins and the inscription *Vatl* (Vetulonia), and those with tongs and a hammer accompanying the legend *Pupluna* (Populonia).¹⁰ The highly sumptuary character of the power wielded by patrician Etruscan families is reflected in the decoration of the walls of the tomb Giglioli (Tarquinia), in which the main source of iconographic inspiration is weighted units comparable to early Roman coins.¹¹ The development of these mintings is also related to the payment of enlisted troops, during the wars with Rome as well as during the alliances with this state during the first and second Punic Wars. The first circulation of money in Gaul¹² is attributed to this mercenary role.

Ingots, cast bars and *aes rude* in central Italy: from the end of the Bronze age to the Archaic period

The current investigation links the spread of the copper ingot, in the shape of a bull's hide, in the western Mediterranean and in continental Europe, to its division in equal parts.¹³ Among the significant presence in all Etruria of different types of broken ingots, considered within the generic area of *aes rude*,¹⁴ the finds of cast bars, plaques or hack-silver are much more remarkable, such as those found in the impressive site at Volterra.¹⁵ Prior to the introduction of the minted coin, these fragmented ingots, *smistamento*, of variable weight, known since the end of the Bronze Age,¹⁶ had value in weight and status, and were used for operations of commercial exchange, along with other

⁶ Chabot 1978; Cristofani 1983, fig. 60-61.

⁷ *Catalogo Firenze 1985*, pp. 240-41, n° 8.14; Camporeale 2004, fig. 115, from the 4th century a comprehensive study of the question in: Melillo 2004.

⁸ Breglia 1976, pp. 75-85.

⁹ Cristofani 1983, p. 17, lám. II, with a comprehensive chronology, end of 6th or 5th centuries, attributed to Populonia. For the copy in the British Museum, perhaps from Populonia, which dates from the 6th century or the beginning of the 5th: Haynes 2000, p. 165, fig. 147; nevertheless, the piece from the Archaeological Museum in Florence dates from the second half of the 5th century: Camporeale 2004, fig. 114.

¹⁰ Camporeale 2004, fig. 283a-b y 123a-b, coins from the 3rd century in the Museum in Florence. Camilli 1976, pp. 181-96, Castellani 1931, pp. 587-603.

¹¹ *Catalogo Firenze 1985*, p. 338, fig. n° 14.3.1.

¹² Nash 1987a. For the role of Etruscan currency with relation to

payment of mercenaries from the last quarter of the 4th century: *Catalogo Firenze 1985*, pp. 371-73, n° 15.4, 'I mercenari'.

¹³ *Katalog Bochum 2005*; Lo Schiavo 2005; id. 2006.

¹⁴ Lo Schiavo 2006, fig. 5 y 6.1-2.

¹⁵ Gamurrini 1874; Martelli 1976; *Catalogo Firenze 1985*, p. 239, n° 8.13: 'un numero imprecisato di verghe dello stesso metallo' that is, of silver. On the fragmentation of ingots and silver jewellery and their use in transactions in the near-east and Greek worlds: Balmuth 2001; Kroll 2008, 12ss. Also, Alfen 2008, p. 265: in this case the value of the treasures in the monetization of Iberia in the 3rd century BC is highlighted with jewellery and fragmented silver ingots.

¹⁶ Lo Schiavo 2005, pp. 399-414, fig. 2-3. Ingots from this chronology are even found in Oberwillingen, Bâde-Wurtemberg: Primas 2005, pp. 385-89, fig. 4, 6.

metallic objects such as small axes, fibulas or ornaments. In such cases, there was constant use of the scale to weigh objects for monetary transactions.¹⁷

Between the 8th and 7th centuries these ingots and metal objects served as privileged intermediaries of exchange, and toward the end of the latter century maintained their value while other forms of exchange began appearing i.e. the *aes signati* with *ramo secco*.¹⁸ These discoveries testify to a wide circulation throughout the Italian peninsula (Friuli, Venice, Lombardy, Emilia-Romagna, Tuscany, Campania, Sicily), remaining in circulation until the 3rd century AD, together with the true currency. This is documented by treasures discovered in several centres (Castelfranco Emilia, Vulci, Ariccia, La Bruna).¹⁹ For Panvini, it had to do with trade in used goods in order to acquire others, or to hoard them, rather than for monetary exchange.²⁰ There has been minimal exploration of the fragmented ingots, and their presence and production in the habitats has been undervalued. One of the best-documented cases is that of Marzabotto.²¹

From the end of the 6th century to the beginning of the 4th, there was a flow of merchandise and luxury objects between central Europe and the Mediterranean, detected in Etruria and Lazio, used as a means of payment and measurement to evaluate goods and services, and to set the amount of fines and tariffs on heads of livestock.²² Ancient texts also tell of tributes and taxes paid with amorphous lumps and melted bars, which seems to indicate that the monetization of this territory preceded the appearance of actual currency. In Forcello (Etruria padana) deliberately fragmented bronze ingots are found together with merchandise, one of the ingots having been broken in half, with the image of the *ramo secco* on both sides (810,5g, 9,4 x 7,7cm)²³ whose metal probably came by way of exchange with centres in Tyrrhenian Etruria. Another similar ingot (2240g) comes from the region of Mantova.²⁴ At the foot of La Castellina, the exceptional *tesoretto* called Santa Marinella is found, which not only combines a fraction of *aes signatum* with *ramo secco*, but also with elements of *aes rude*, a specimen of an unknown series of *aes grave* and other pieces.²⁵ The *ramo secco* acted in this case as a mark of legitimacy of weight and composition. In the same way, other marks appeared on minted coins as these achieved the functions of measure and deposit of value.²⁶

The *aes rude* in cities and towns: the fortified town of La Castellina del Marangone to the south of Civitavecchia

The *aes rude* is frequently found in Etruscan shrines, cities and settlements,²⁷ as well as in tombs, functioning as *obolo de Caronte* (*Charon's pence*).²⁸ The presence of *aes rude* in tombs from the first Iron Age is significant both in southern and central Etruria (Tarquinia, Vetulonia, Orvieto) and in northern Italy (Certosa, Arnoaldo, Spina, Savignano sul Panaro, Fraore, Padova).²⁹ Fragments of ingots have been discovered in several tombs in the vicinity of La Castellina.³⁰

¹⁷ As proof of this statement, the discovery in the Castellina of ingots next to other pieces of bronze and lead that we have considered as instruments related to weighing operations.

¹⁸ The Etruscans, like other peoples of Central Italy, used bronze as currency, first in the form of objects, later *aes rude* and *signatum*, as appear in different treasures distributed throughout Etruria. Regarding stamped ingots and the *aes grave* the study by Haeblerlin (1910) continues to be fundamental. See also Pelegrini 2002.

¹⁹ The treasure of Castelfranco, in Panvini 1971, pp. 15-26; that of La Bruna, in Milani 1891, pp. 27ss. In general, Ercolani 1975.

²⁰ Panvini 1971, p. 24.

²¹ Massa-Pairault 1979, pp. 131ss.

²² De Marinis 1986a, pp. 197-200; Parise 1987, p. 92.

²³ Cattani 1989, p. 210, n° 263; De Marinis 1986b, pp. 201-203, fig. 101;

Breglia 1965-1967, p. 274: points to the first half of the 6th century as the beginning of the production of these ingots; Bergonzi 1985, p. 79, takes it to the first years of this century.

²⁴ This ingot from Mantova is in the Museo Nacional Romano, Panvini 1971, p. 20, n. 8; De Marinis 1986b, p. 203, fig. 102.

²⁵ Catalli 1995.

²⁶ Parise 2003, p. 89.

²⁷ For the emblematic example of Marzabotto see Massa-Pairault 1980; id. 1997.

²⁸ Bergonzi 1987.

²⁹ Cattani 1989, p. 208.

³⁰ Palmucci 1966, dates them from the mid 6th century to the 5th. Catalli 1986, p. 298. Id. 1989.

In this last *castrum*, the presence of *aes rude*, bronze ingots and other evidence have alerted us to the possibility of metallurgic activities, where traces of a workshop from the orientalizing period have been discovered. An area of hard-packed ground is made evident, with a stone anvil in situ and abundant remains of slag, metal drops, residues of smelting, and trimmings of metal pieces as well as sides and bottoms of containers used as crucibles. These latter, when analyzed, present indications of vitrification, as well as remains of slag adhering and metal globules trapped in their siliceous matrix.³¹ This could indicate a workshop for the production of small objects, such as bronze pins and fibulas, but it seems more feasible for us to relate it to other finds in the same place like small plaques and rolled up lead bars, fragments of shapeless bronze pieces and various additional elements with a pre-monetary value and to weigh small quantities of metal. Similar evidences of workshops for bronze work have been found in Marzabotto: lumps of slag oxidized and containing iron, at times with a drop of bronze attached, interpreted as *aes rude* or remainders of smelting operations.³² In the area outside the walls of La Castellina, ingots have been gathered, among them a *pane di rame* of a section of convex plane (3976g), showing traces of cuts for its fragmentation. The archeometric analyses applied to this large bronze cake seem to indicate that, in this case, it is not for the use of scrap bronze.³³

We have, therefore, in this locale, true evidence of a pre-monetary complex based on the presence of ingots and pieces of bronze in diverse contexts. Other similar deposits are those at Fontanile delle Vignacce-Ponton del Castrato, and at Santa Marinella, in the shrine at Punta della Vipera, in grave goods of several tombs, and above all in the habitat and its immediate surroundings.³⁴ The production of *aes rude* at this *castrum* could have been done in two areas successively, first in the eastern sector of the summit and later on the periphery of the walled enclosure. The oldest location corresponds to the metallurgic workshop of the orientalizing period discovered beneath the architectonic structures, streets and conduits, from the end of the 7th to the beginning of the 6th centuries. The second sector of these metallurgic activities is located outside the walls, from the 6th century, and its production seems to remain until the 4th-3rd centuries. In light of these finds, we point to the fact that in the settlement of La Castellina, a centre of production, hoarding and distribution of *aes rude* could be identified, as could also be seen at sites like Murlo, Acquarossa Roselle and Marzabotto, outside the large metropolis.³⁵

We have to assess a second use, of a sacro-institutional character, in the same field, a detailed analysis of which we will present in another place.³⁶ In fact, the position of two important buildings from the archaic and Hellenistic periods, respectively, whose function was that of chapels or treasuries, is confirmed above the first metallurgic workshop. This use has been documented in other small buildings annexed to the shrine, like that of *Pyrgi*, where numerous ingots and *aes rude* were found forming part of the strata that preceded the erection of the new building in the 5th century.³⁷

³¹ Rovira 2011.

³² Massa-Pairault 1997, p. 105.

³³ Giardino 2011.

³⁴ We point to the similarity of these finds to those of the Lombardy habitat of Bagnolo San Vito, that has yielded an important number of ingots, intermittently and through excavation: 343 pieces, among *aes rude*, from 3 to 240 g (the most numerous between 15 and 30 g), three fragments that correspond to portions of *pane di rame* of small dimensions and circular aspect, some form of *aes signatum*, and instruments of weighted

use like stone and lead weights, Cattani 1989, p. 205, fig. 1-26. Within the isolated finds of La Castellina there is also a cut portion of an ingot in disc profile and an edge of a biconvex section.

³⁵ The *aes rude* here, as in La Castellina, appear distributed throughout the habitat, in significant places, Massa-Pairault 1997, pp. 131-37. For Murlo, cfr. Warden 1985.

³⁶ Gran-Aymerich / Domínguez-Arranz 2011.

³⁷ Baglione 2000, p. 352; Id.2004: appeared next to bones and two *olpai* turned over, as an expiatory offering prior to their removal.

The Etruscan monetary system: the oriental model and prehistoric tradition

In Etruria, minted coin also appeared within the framework of each city-state. The first signs of this phenomenon are recognized in cities known for their exports of metal and prosperous trade, such as Populonia and Vulci.³⁸ Another city having prosperous foreign trade is Tarquinia, to which coins without inscription are also attributed, such as the wild boar series. In addition, there is the indirect evidence of the wall paintings at the tomb at Giglioli, to which we have referred.³⁹ Similarly, coins from Vetulonia are known, and mintings from the city of Volterra have recently been identified.⁴⁰ Within maritime Etruria, the paradigm of Veio persists and even more, that of Caere-Cerveteri, both of which seem to have done without the use of currency during the most prosperous periods of their commercial activity. Perhaps it can be recognized that more than an *attardamento*, this was an early flowering of trading companies open to the Mediterranean, following ancient plans used in the second millennium, during the middle and end of the Bronze Age. At least, that is what is suspected for the Tolfa mountains, a region rich in mineral resources, with its finds of Mycenaean ceramics, the early appearance of amber and ivory objects and on whose seaward face La Castellina is located.

BIBLIOGRAPHY

- Alfen, P. G. van, et al. (2008), 'A new Celtiberian hacksilber hoard, c. 200 BCE', *AJN* 20, pp. 265-93.
- Asensi, R.M. (1990), 'Una moneta etrusca en la provincia de Tarragona', *Faventia* 12-13, pp. 175-79.
- Atti Firenze 1979: L'Etruria mineraria. Atti del XII Convegno di Studi etruschi e italici. Firenze, Populonia, Piombino 1979*, Firenze, 1981.
- Atti Firenze 1985: Secondo Congresso Internazionale di Studi Etruschi, Firenze 1985*, Roma, 1989.
- Atti Mantova 1986: Gli Etruschi a Nord del Po. Atti del Convegno Mantova 1986*, Mantova, 1989.
- Atti Napoli 1975 = Contributi introduttivi allo studio della monetazione etrusca. Atti del V convegno del centro internazionale di studi numismatici*, Roma, 1976.
- Atti Orvieto 2005: Gli Etruschi e il Mediterraneo. Commerci e politica*, Roma, 2006.
- Atti Roma 1983: Il commercio etrusco arcaico. Atti dell'incontro di studio*, Roma, 1985.
- Baglione, M.P. (2000), 'Pyrgi. I rinvenimenti di ceramica attica dal santuario dell'area sud', *Scienze dell'Antichità* 10, pp. 337-82.
- Baglione, M.P. (2004), 'Il Santuario Sud di Pyrgi', in M.B. and Ch. Reusser (dir.), *Attische Vasen in Etruskischem Kontext. Funde aus Häusern und Heiligtümern (Beiheft zum CVA Deutschland)*, München, pp. 85-106.
- Balmuth, M. (dir.) (2001), *Hacksilber to Coinage: New Insights into the Monetary History of the Ancient Near East and Greece. ANS Numismatic Studies* 24, New York.

³⁸ Catalli 2000, p. 89.

³⁹ Catalli 2000, p. 92.

⁴⁰ Catalli 2000, pp. 93-95.

- Bergonzi, G. (1985), *Società de la tarda età del ferro, loro articolazioni e relazioni*, Bologna.
- Bergonzi, G. / Piana, P. (1987), 'L'obolo di Caronte: *Aes rude* e monete nelle tombe', *ScAnt* 1, pp. 161-223.
- Breglia, L. (1961), 'I precedenti della moneta vera e propria nel bacino del Mediterraneo', *CIN* I, Roma, pp. 5-17.
- Breglia, L. (1966), *Le antiche rotte del mediterraneo documentate da monete e pesi*, Ristampa da *RendAccNapoli* 30.
- Breglia, L. (1965-1967), 'A proposito dell'*aes signatum*', *AIIN* 12-14, pp. 269-75.
- Breglia, L. (1976), 'L'oro con la testa di leone', *Atti Napoli 1975*, pp. 75-86.
- Camilli, L. (1976), 'Le monete a leggenda *Vat'*', *Atti Napoli 1975*, pp. 181-96.
- Camporeale, G. (2004), *Gli Etruschi. Storia e civiltà*, Torino.
- Castellani, G. (1931), 'Monete trovate nel territorio dell'antica Vetulonia', *StEtr* 5, pp. 587-603.
- Catalli, F. (1986), 'L'esperienza monetale', *Gli Etruschi di Tarquinia*, Modena, pp. 298-99.
- Catalli, F. (1989), 'Presenze numismatiche nel territorio tarquiniese', *Atti Firenze 1985*, II vol., pp. 1101-14.
- Catalli, F. (1995), *Monete dell'Italia Antica*, Roma.
- Catalli, F. (2000), 'La moneta', *Catalogo Venezia 2000*, pp. 89-95.
- Catalli, F. (2007), 'Ripostiglio monetale da Volterra', *Etruschi di Volterra*. Volterra, pp. 120-23.
- Catalogo Firenze 1985: Civiltà degli Etruschi*. Catalogo Firenze, Milano, 1985.
- Catalogue Lattes 2002, Les Étrusques en France*, Lattes, 2003.
- Catalogo Mantova 1986: Gli Etruschi a nord del Po*, Mantova, 1986.
- Catalogue Martigues 2000: Le temps des Gaulois en Provence*, Jean-Chausserie-Laprée (dir.), Martigues, 2000.
- Catalogo Venezia 2000: Gli Etruschi, Palazzo Grassi*, Milano, 2000.
- Cattani, M. (1986) 'Aes rude', *Catalogo Mantova 1986*, pp.105-10.
- Chabot, L. / Kurtz, Ch. (1978), 'Monnaies de l'Étang de Berre. Deux oboles étrusques découvertes sur l'oppidum de Ste. Maxime à Guignac, Bouches-du-Rhône (France)', *Cahiers Numismatiques, BSENA* XIV, 58, pp. 230-34.
- Cristofani, M. (dir.) *et al.*, (1981), 'La monetazione', *Gli Etruschi in Maremma*, Milano, pp. 208-19.
- Cristofani, M. (1983), *Gli etruschi del mare*, Milano.
- Cristofani, M. (1985), 'Monetazione', *Dizionario della civiltà etrusca*, Firenze, pp. 176-80.

- Cristofani, M. / Martelli, M. (1976), 'Il ripostiglio di Volterra', *Atti Napoli 1975*, pp. 87-98.
- Cristofani, M. / Martelli, M. (dir.) (1983), *L'oro degli Etruschi*, Novara 1983 (reprint 2000).
- De Marinis, R. (1982), 'Como, loc. Prestino', *StEtr* 50, pp. 506-509.
- De Marinis, R. (1986a), 'Produzione e scambio dell'Etruria padana alla luce degli scavi del Forcello', *Catalogo Mantova 1986*, pp. 197-200.
- De Marinis, R. (1986b), 'Aes signatum', *Catalogo Mantova 1986*, pp. 201-10.
- Ercolani, E. (1975), 'Repertorio dei ritrovamenti di pani di rame. Contributo allo studio delle fasi premonetali in Italia', *RIN* 77, pp. 7-47.
- Gamurrini, G. (1874), 'Le monete d'oro etrusche principalmente di Populonia', *Periodico di Numismatica e Sfragistica per la storia d'Italia* 6, pp. 47-63.
- Giardino, C. (2011), 'Indagini archeometallurgiche sui reperti', in Gran-Aymerich / Domínguez-Arranz 2011.
- Gran-Aymerich, J. (2006), 'Les Étrusques et l'extrême occident (VIIe-Ve siècles av. J.-C.): regards sur l'isthme gaulois et la Péninsule ibérique', *Atti Orvieto 2005*, pp. 253-84.
- Gran-Aymerich, J. / Domínguez-Arranz, A. (dir.) (2011), *La Castellina. Origines protohistoriques et évolution d'un habitat étrusque*, L'Erma Roma.
- Haynes, S. (2000), *Etruscan Civilization. A cultural History*, London.
- Jehasse, M. (1986), 'Une monnaie étrusque à contremarque punique?', *Archeologia Corsa* 10-11 (1985), pp. 76-78.
- Jehasse, M. (1989), *La circulation monétaire à Aleria*, Thèse de doctorat Université de Lyon 2, Lyon.
- Katalog Bochum 2005*: U. Yalcin et al. (dir.), *Das Schiff von Uluburun. Welthandel vor 3000 Jahren. Katalog der Ausstellung des Deutschen Bergbau-Museums Bochum*, Bochum.
- Kroll, J. (2008), 'The monetary use of weighed bullion in Archaic Greece', W.V. Harris (dir.), *The monetary systems of the Greeks and Romans*, Oxford, pp. 12-37.
- Lo Schiavo, F. (2005), 'Metallhandel in zentralen Mittelmeer', *Katalog Bochum 2005*, pp. 399-414.
- Lo Schiavo, F. (2006), 'Il Mediterraneo occidentale prima degli Etruschi', *Atti Orvieto 2005*, pp. 29-58.
- Martos, F. (2000), 'Les relations monétaires entre Marseille et les peuples indigènes de la Provence protohistorique', *Catalogue Martigues 2000*, pp. 67-71.
- Massa-Pairault, F. (1980), 'Problèmes de monnayage étrusque', *Annales Num. It.* 1980, pp. 302-34.
- Massa-Pairault, F. (1997), *Marzabotto. Recherches sur l'Insula V, 3*, Roma.
- Melillo, R. (2004), *Le monete etrusche d'argento di Populonia*, Formia.

- Milani, L. (1891), 'Aes rude, signatum e grave rinvenuto alla Bruna presso Spoleto', *RIN*, pp. 27-116.
- Nash, D. (1987a), *Coinage in the Celtic World*, London.
- Nash, D. (1987b), 'Syracusan influence upon the earliest gold coinage of western Gaul', *Mélanges offerts au docteur Colbert de Beaulieu*, Paris, pp. 657-73.
- Palmucci, A. (1996), 'I Troiani a Corito-Tarquinia', *BollSocTarqArSt* 25, pp. 31-83.
- Palmucci, A. (1998), *Virgilio e Cori(n)to-Tarquinia. La leggenda troiana in Etruria*, Tarquinia.
- Panvini Rosati, F. (1971), 'Il ripostiglio di Castelfranco Emilia. Nuovi elementi', *Emilia Preromana* 6, pp. 15-26.
- Panvini Rosati, F. (1976), 'Gli studi e la problematica attuale della monetazione etrusca', *Atti Napoli 1975*, pp. 34-54.
- Parise, N. (1987), 'Forme de circolazione metallica fra Etruria e Lazio dall'VIII al VI secolo a.C.', *Etruria e Lazio arcaico. Atti de Incontro di studio (10- 11 novembre 1986)*, M. Cristofani, (dir.) Roma, pp. 89-93.
- Parise, N. (2003), *El origen de la moneda*, Barcelona (2000¹).
- Pellegrini, E. / Macellari, L. (2002), *I lingoti con il segno del ramo secco. Considerazioni su alcuni aspetti socio-economici nell'area etrusco-italica durante il periodo tardo arcaico*, Pisa-Roma.
- Petrillo, P. (1976), 'Le serie monetarie di Populonia', *Atti Napoli 1975*, pp. 705-15.
- Petrillo, P. (1977), 'Nota in margine al "Tesoro di monete antiche rinvenuto in Populonia"', *Ann. Ist.It.Num.* 23-24 (1976-1977), pp. 69-104.
- Petrillo, P. (1981), 'Ancora sul ripostiglio di Populonia', *StEtr* 49, pp. 225-36.
- Primas, M. (2005), 'Ochsenhautbarren in Europa', *Katalog Bochum 2005*, pp. 385-89.
- Rovira, S. (2011), 'Estudio analítico de materiales pirometalúrgicos', in Gran-Aymerich / Domínguez-Arranz 2011.
- Scamuzzi, E. (1941), 'Tesoro di monete antiche rinvenuto in Populonia', *StEtr* 15, pp. 141-53.
- Sorda, S. (1977), 'I ripostigli di bronzi protostorici dell'Italia centrale', *Atti Napoli 1975*, pp. 61-74.
- Warden, P. (1985), *The Metal Finds from Poggio Civitate (Murlo) 1966-1978*, Roma.