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ROMAN MINING COMPANIES IN SPAIN

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Introduction

Spain was a key territory for the supply of precious metals during the Roman period.¹ It is even possible that the Roman authorities' decision to retain a military presence there after the Second Punic War was to a large extent motivated by its mineral wealth.² In fact, one of the first measures taken once the territory was secured in 195 B.C.E. was to establish a tribute system intended to tax the iron and silver mines.³

The importance of the Spanish mines contrasts with the scarcity of information available about them. In recent years, our knowledge has advanced significantly, thanks to several archaeological research projects.⁴ We still, however, understand very little about how production was organised, and, since ancient authors rarely pay attention to these questions, we are almost entirely dependent upon epigraphic information, usually of problematic interpretation.

In spite of the limitations, there is a certain consensus among researchers that identifies two major administration models for Roman mining operations in Spain. The first of these is characterised by the existence of a large number of family owned mining and/or metallurgical companies.⁵ The names of the owners of these companies appear on the stamps of the many lead ingots of Spanish provenance that have been recovered to date. Lead was a by-product of the processing of argentiferous galena for silver, and since no stamped silver ingots from Hispania are preserved, lead ingots are almost the only source of information available to us about the organisation of silver production.⁶

This business organisation model, well known to us thanks to the recent work undertaken in Sierra de Cartagena, east of Carthago Nova,⁷ is typical of the period that spans from the middle of the second century B.C.E. to the middle of the following century, to which most of the lead ingots of Spanish provenance

¹ On Roman mining activity in Spain: Cl. Domergue, *Catalogue des mines et fonderies antiques de la Péninsule Ibérique*, 1987; id., *Les mines de la Péninsule Ibérique dans l'antiquité romaine*, 1990. As an introduction to ancient mining: J. F. Healy, *Mining and Metallurgy in the Greek and Roman World*, 1978; Cl. Domergue, *Les mines antiques. La production des métaux aux époques grecque et romaine*, 2008.

² Cf. *Macc.* 1.8.3.

³ Liv. 34.21.7, cf. J. S. Richardson, *The Spanish mines and the Development of Provincial Taxation in the Second Century B.C.*, *JRS* 66, 1976, 139–52.

⁴ Recent archaeological bibliography is extensive. For an introduction, see the following collective works: J. A. Antolinos and J. I. Manteca (eds.), *Bocamina: patrimonio minero de la Región de Murcia*, 2005; L. M. Gutiérrez (ed.), *Minería antigua en Sierra Morena*, 2010; A. Orejas and Ch. Rico (eds.), *Minería y metalurgia antiguas. Visiones y revisiones*, 2012; M. Zarzalejos, P. Hevia, and L. Mansilla (eds.), *Paisajes mineros antiguos de la Península Ibérica. Investigaciones recientes y nuevas líneas de trabajo*, 2012; L. García-Pulido, L. Arboledas, E. Alarcón and F. Cortes (eds.), *Presente y futuro de los Paisajes mineros del pasado*, 2017.

⁵ Richardson 1976 (n. 3) 144–7.

⁶ Domergue 1990 (n. 1) 254–7; id., *Un parcours à travers les lingots de plomb romains d'Espagne (1965–2003)*, *Pallas* 66, 2004, 105–17. We still do not have a systematic catalogue of lead ingots from the Roman period. There are currently two projects dedicated to compiling such a catalogue: one Franco-Italian project lead by C. Domergue, and a German one, which forms part of the work on the publication of the *Corpus Inscriptionum Latinarum* undertaken by the *Deutsches Archäologisches Institut*. A catalogue limited to ingots from the Republican period may be found in: B. Díaz, *Epigrafía latina republicana de Hispania*, 2008, 275–91.

⁷ S. Baron, Ch. Rico, and J. A. Antolinos, *Le complexe d'ateliers du Cabezo del Pino (Sierra Minera de Cartahegna-La Unión, Murcia) et l'organisation de l'activité minière à Carthago Nova à la fin de la République romaine. Apports croisés de l'archéologie et de la géochimie*, *ArchEspArq* 90, 2017, 147–69. As an introduction to the archaeology of the mining districts in the area around Carthago Nova: J. A. Antolinos, J. M. Noguera, and B. Soler, *Poblamiento y explotación minero-metalúrgica en el distrito minero de Carthago Nova*, in: J. M. Noguera (ed.), *Poblamiento rural romano en el sureste de Hispania quince años después*, 2010, 167–231.

belong.⁸ It also coincides with the “silver rush” recorded by Diodorus Siculus, which brought many Italian immigrants to Hispania in search of its mining wealth.⁹

The second model corresponds to the phase of Imperial control of mineral exports.¹⁰ This management model began with Augustus’ direct intervention in starting large-scale activity in the gold mines of north-west Spain after the Cantabrian Wars,¹¹ from which point onwards the intervention of Roman administration in mining activity was a constant.¹²

Between the peak of the family owned mining companies’ activities and the management of the most important mining complexes passing into the hands of the Imperial authorities, there was a period – very poorly known – during which metal production in Hispania seems to have been controlled, at least partially, by a new type of mining companies, that can be called “anonymous”.

This period coincides, furthermore, with the phase of highest activity in the mines of the southern Iberian Peninsula. Various studies of global pollution trends confirm the existence of a significant increase in pollution between the first centuries B.C.E and C.E., which can be directly related to the metallurgical

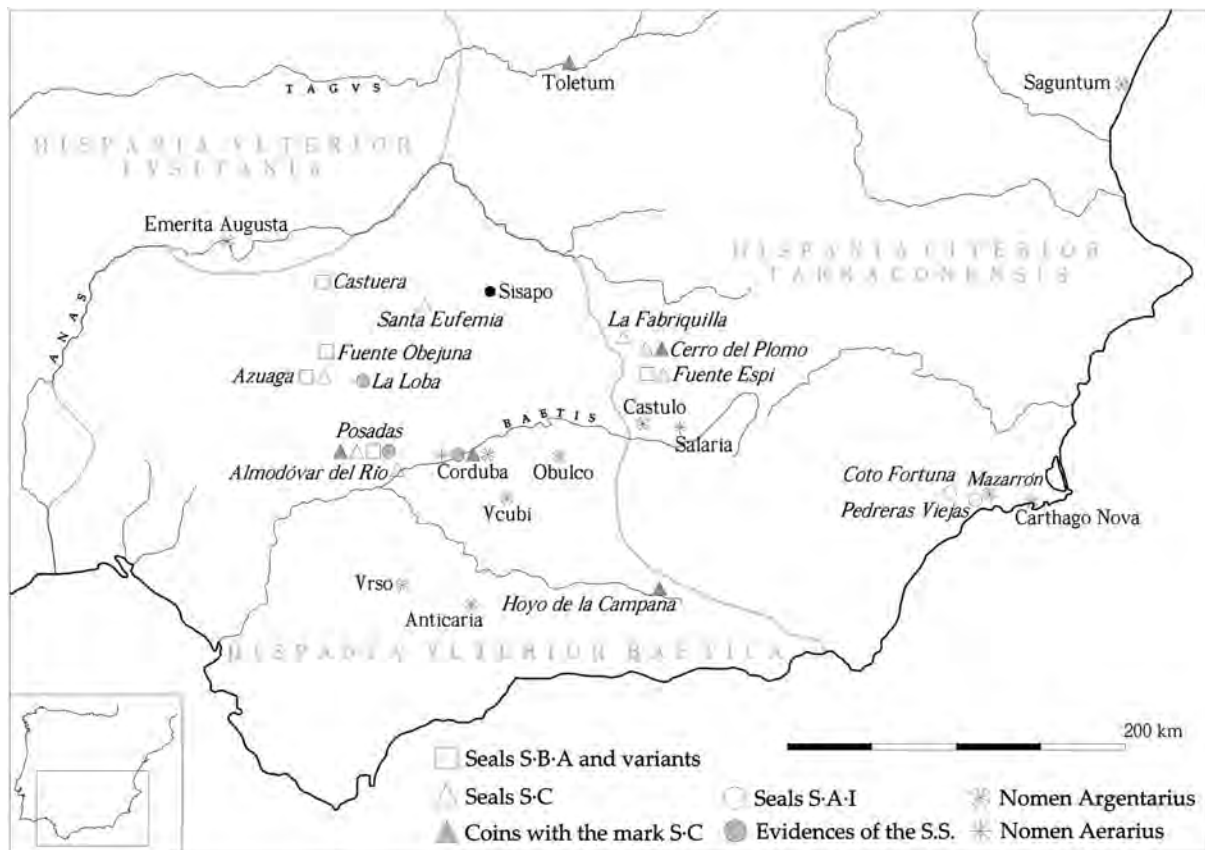


Fig. 1. Map of the south of the Iberian Peninsula showing the evidence associated with Roman mining companies

⁸ B. Díaz and J. A. Antolinos, *The Organisation of Mining and Metal Production in Carthago Nova between the Late Republic and Early Empire*, *Athenaeum* 101, 2013, 535–53 (539–45).

⁹ Diod. 5.36.3–4; cf. M. Stefanile, *Dalla Campania alle Hispaniae. L'emigrazione dalla Campania romana alle coste mediterranee della Penisola Iberica in età tardo-repubblicana e proto-imperiale*, 2017.

¹⁰ Cf. A. M. Hirt, *Imperial Mines and Quarries in the Roman World*, 2010, with extensive bibliography.

¹¹ F. J. Sánchez-Palencia, I. Sastre, A. Orejas, and M. Ruiz del Árbol, *Augusto y el control administrativo y territorial de las zonas mineras del Noroeste hispano*, *Gerión* 35, 2010, 863–74; F. J. Sánchez-Palencia, *El oro hispano. La explotación romana del oro en el noroeste de la Península Ibérica*, in: J. M. López Ballesta (ed.), *Minería y metalurgia en el Mediterráneo y su periferia*, 2015, 148–59.

¹² Domergue 1990 (n. 1) 279–307; A. Mateo, *Observaciones sobre el régimen jurídico de la minería en tierras públicas en época romana*, 2001, 87–166.

activity undertaken in Hispania. These levels of pollution were not reached again until the early Middle Ages,¹³ when the silver production outside Europe began to increase.¹⁴

As P. Kay has recently observed, the massive Spanish silver supply was a decisive factor in the acceleration in economic activity in the Mediterranean between the end of the Republic and the beginning of the Julio-Claudian period.¹⁵ All evidence suggests that a substantial proportion of the metal from which Roman silver coins were minted in this period would have come from those very Spanish silver mines.¹⁶

Four of those new type of companies are well attested in several of the mining districts of southern Spain. We know the names of two of them: the *societas argentifodinarum Ilucronensium* (or *montis Ilucronensis*) and the *societas Sisaponensis*. Only the initials are known of the other two: the *societas C.* and the *societas a(rgentifodinarum?) Ba.* The activity of these four *societates* is attested both in Carthago Nova and in the area of Sierra Morena, in the wide belt of land that extends between the Guadiana and Guadalquivir rivers, and includes the mining regions of Castulo, Sisapo, and Corduba (fig. 1). In contrast, there is no information about the Riotinto (Huelva) district, which has produced very little epigraphic material.¹⁷ Knowledge about these companies is still very fragmentary, but different traces suggest that they could have played a significant role in the extraordinary increase in metal production at the end of the Republican period. The available evidence will now be considered.

The *societas argentifodinarum Ilucronensium*

This *societas* is perhaps the best known of the four companies. It was active in the area around Mazarrón (Murcia), in the far west of the mining district of Carthago Nova.¹⁸ It takes its name from an indigenous placename, *Ilucro*. It contains the root *il(t)i-/il(t)u-*, typical of the region's autochthonous toponymy, but its location is still uncertain.¹⁹

Several lead ingots from this company are known. One of them was recovered at the end of the nineteenth century from the Tiber, next to the Via Marmorata in Rome (fig. 2.1).²⁰ Another five were discovered at the beginning of the twentieth century in the mining-metallurgical complex of Coto Fortuna, in

¹³ F. de Callataÿ, The Graeco-Roman Economy in the Super Long-Run: Lead, Copper, and Shipwrecks, *JRA* 81, 2005, 361–72; Ph. Kay, Rome's Economic Revolution, 2014, 48, fig. 3.1, and recently J. R. McConnell, A. I. Wilson, A. Stohl, M. M. Arienzo, N. J. Chellman, S. Eckhardt, E. M. Thomson, A. M. Pollard and J. P. Steffensen, Lead Pollution Recorded in Greenland Ice Indicates European Emissions Tracked Plagues, Wars, and Imperial Expansion during Antiquity, *Proceedings of the National Academy of Sciences of the United States of America* 115.22, 2018, 5729–31; cf. J. I. Manteca, M. Ros, S. Ramallo, F. Navarro, T. Rodríguez, F. Cerezo, J. E. Ortiz, T. de Torres and M. Martínez, Early Metal Pollution in Southwestern Europe: the Former Litoral Lagoon of El Almarjal (Cartagena mining district, S.E. Spain), A Sedimentary Archive more than 8000 Years Old, *Environmental Science and Pollution Research* 24, 2017, 10584–603. On this question, vid. also Domergue 2008 (n. 1) 212–3.

¹⁴ Cf. I. Blanchard, *Mining, Metallurgy and Minting in the Middle Ages. Vol. I, Asiatic Supremacy*, 2001, 425–1125.

¹⁵ Kay 2014 (n. 13).

¹⁶ Cf. W. Hollstein, *Metallanalytische Untersuchungen an Münzen der römischen Republik*, 2000; K. Butcher and M. Ponting, The Roman Denarius under the Julio-Claudian Emperors: Mints, Metallurgy and Technology, *OJA* 24.2, 2005, 163–97; A. Orejas, I. Montero, Y. Álvarez, L. F. López, M. A. López, and I. Rodríguez, Roman Denarii from North Western Hispania, Findings from Castromaiaor (Lugo). A Contextual, Numismatic and Analytic Approach, *MM* 56, 2015, 232–57.

¹⁷ Cf. J. A. Pérez and A. Delgado, La minería romana en el suroeste ibérico, *CuadGranada* 24, 2014, 239–65; J. A. Pérez, La faja pirítica ibérica en época romana, in: García-Pulido et al 2017 (n. 4) 109–20; A. Delgado, M. Bustamante, and A. Marins, La faja pirítica ibérica en época de Augusto, *Gerión* 35, 2017, 895–924.

¹⁸ J. A. Antolinos and B. Díaz, La *societas argentifodinarum Ilucronensium* y la explotación de las minas romanas de Carthago Nova, *Chiron* 42, 2012, 25–43.

¹⁹ Cf. J. Untermann, *Monumenta Linguarum Hispanicarum. Band VI. Die vorrömische einheimische Toponymie des antiken Hispanien*, 2018, 138–9.

²⁰ CIL XV 7916: *Societ(at)is argent(i) // fod(inarum) mont(is) Ilucr(onensis) // galena.*

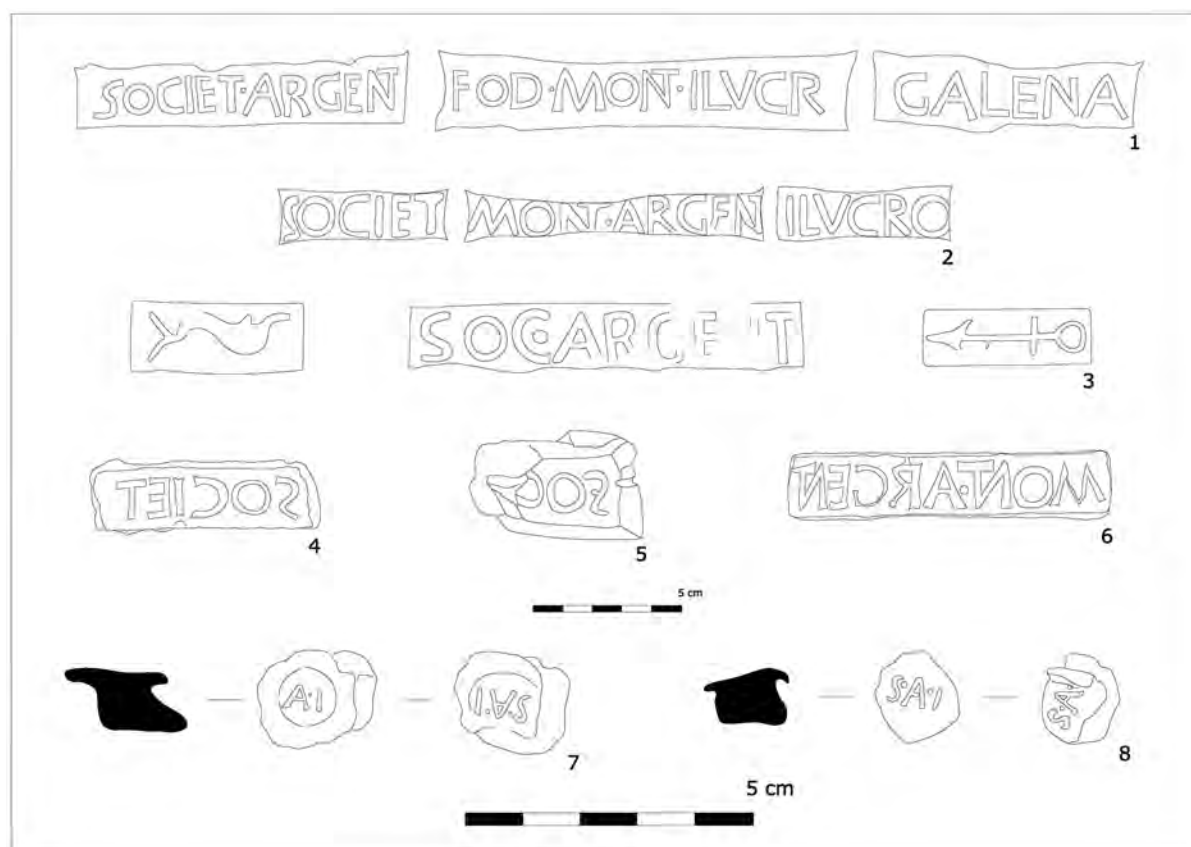


Fig. 2. Materials associated with the *Societas Argentifodinarum Ilucronensium*:

- 1, stamp on a lead ingot from Rome; 2, stamp on a lead ingot from Coto Fortuna; 3, stamp on a lead ingot from Corsica; 4–6, lead matrices from Mazarrón; 7–8, lead seals from Mazarrón

Mazarrón (fig. 2.2).²¹ To this collection may be added various ingots, still unpublished, recovered in a shipwreck discovered near Messina (Sicily).²²

It is possible that a series of ingots found in the south of Corsica may be associated with this company, five of which were recovered from the sea near U Puntonu, and another nine from the Gavetti wreck, in the Strait of Bonifacio. All of them have stamps bearing the same text: *societas argentifodinarum?* (fig. 2.3).²³ Their appearance and palaeography allow them to be associated with those discussed above. Isotopic analysis has confirmed, furthermore, that they came from the mines in the area around Carthago Nova.²⁴

Three lead matrices survive which, judging by their content, could have been used in the production of the *societas Ilucronensis*' lead ingots. All of them are from the area around Mazarrón: one was discovered in the mineral-metallurgical complex of Los Perules, while the other two were found in Coto Fortuna (fig. 2.4–6).²⁵

²¹ AE 1907, 135: *Societ(at)is // mont(is) argent(ifodinarum) // Ilucro(nensium)*.

²² P. Rothenhoefer, M. Bode, and N. Hanel, Old Finds – New Insights: Remarks on Two Roman Lead Ingots from Minas de Riotinto (Huelva, España), *Revista Onuba* 4, 2012, 127–33 (129): *Societ(at)is argent(i) // fod(inarum) mont(is) Ilucro(nens)is // [galena?]*.

²³ J. M. Bontempi, M. L. Di Vacri, Cl. Domergue, N. B. Fabry, M. Ferrante, A. Nesta, St. Nisi, V. Ortoli, J.-Cl. Ottaviani, A. Pasquet, P. Quaratim, P. R. Trincherini, and D. Vitali, Lingots de plomb antiques trouvés dans les eaux de Corse-du-sud, *Bulletin de la Société des Sciences Historiques et Naturelles de la Corse* 754–755, 2016, 7–58 (18–36).

²⁴ Bontempi et al. 2016 (n. 23) 13–14.

²⁵ Antolinos and Díaz 2012 (n. 18) 32–3. The one from Los Perules reads: *MONT ARGENT*, while the ones from El Coto Fortuna read: *SOCIET* and *SOC[---]*.

A collection of lead seals from Coto Fortuna and the neighbouring mine complex of Pedreras Viejas also belong to the *societas Ilucronensis*. They bear the initials *S.A.I.*, the abbreviation of the company's official name which is written in full on the ingots (fig. 2.7–8).²⁶ According to C. Domergue, it is possible that this type of seal was used to guarantee that the bags of ore were not tampered with during their transfer to the foundry.²⁷

The ingots and the lead seals indicate that the *S.A.I.* was responsible not only for mineral extraction, but also for its processing, and therefore for the final production of silver and lead. The discovery of materials associated with the company in three of the four large mining and metallurgical complexes in the area around Mazarrón, and especially in the most important of those, Coto Fortuna, suggests that the company's activities in this mining district could have constituted a virtual monopoly.

There is no evidence that would allow us to date these materials precisely, but the lead ingots correspond to the typology of ingots manufactured in the region of Cartagena-Mazarrón between the end of the second century and the end of the first century B.C.E.²⁸ It appears that mining and metallurgical production reached its peak in Coto Fortuna around the end of the first century B.C.E. and the beginning of the first century C.E., although the absence of archaeological intervention in this important site demands caution.²⁹

We know of another mining company in Mazarrón, the *societas montis Ficariensis*, which is mentioned in one of the inscriptions that accompany three statues dedicated to *Mater Terra*, the *genius montis Ficariensis* and the *genius* of the *societas* itself.³⁰ The group of sculptures can be dated to the last third of the first century C.E., a chronology consistent with the inscriptions' palaeography.³¹ No further information survives about this company, and it is unknown when its activity started, nor what its relationship was with the *S.A.I.* It is likely that the companies were not contemporary, but successive, an interesting possibility but one which cannot as yet be proven.³²

The *societas C*(---)

Numerous lead seals, recovered largely from the main mining districts of Sierra Morena, can be associated with this mining company. These seals, similar to those found in Mazarrón, bear the initials *S.C.* and, occasionally, numbers. They have been found in various local mining and metallurgical facilities near Castulo (Linares, Jaén), as El Centenillo (Baños de la Encina) and La Carolina; as well as near Corduba, in particular in Santa Eufemia, Posadas, and Almodóvar del Río, and in Azuaga (Badajoz), to the far west of Sierra Morena (fig. 3.1–4).³³

The abbreviation *S.C.* is recorded on two lead weights and a bronze bucket recovered in El Centenillo (fig. 3.5).³⁴ It also appears as a countermark, on a series of local bronze coins found both in El Centenillo

²⁶ J. A. Antolinos, B. Díaz, and C. Guillén, *Minería romana en Carthago Nova: El Coto Fortuna y los precintos de plomo de la societas argentifodinarum Ilucronensium*, *JRA* 26, 2013, 88–121 (104–12).

²⁷ Cl. Domergue, *El Cerro del Plomo, mina 'El Centenillo' (Jaén)*, *Noticiario Arqueológico Hispánico* 16, 1971, 265–363 (351–3).

²⁸ L. Laubenheimer, *Recherches sur les lingots de cuivre et de plomb d'époque romaine dans les régions de Languedoc-Roussillon et de Provence-Corse*, 1973, 173–92; Cl. Domergue, *Les mines et la production des métaux dans le monde méditerranéen au I^{er} millénaire avant notre ère. Du producteur au consommateur*, in: A. Lehoërff (ed.), *L'artisanat métallurgique dans les sociétés anciennes en Méditerranée occidentale. Techniques, lieux et formes de production*, 2004, 129–59 (142).

²⁹ Antolinos, Díaz, and Guillén 2013 (n. 26) 89–104.

³⁰ CIL II 3525: *Genio loci Ficariensis / sacrum / Albanus dispens(ator)*; 3526: *Matri Terrae / sacrum / Albanus disp(ensator)*; 3527: *Genio s(ocietatis) m(ontis) F(icariensis) / Albanus disp(ensator)*.

³¹ J. M. Noguera, *El conjunto escultórico consagrado por el dispensator Albanus. Algunas puntualizaciones para su estudio iconográfico y estilístico*, *Verdolay* 4, 1992, 75–98; M. J. Pena, *S(ocietas) M(ontis) F(icariensis)*. Nota sobre la inscripción CIL II 3527 (Mazarrón, Murcia), *Verdolay* 8, 1996, 43–7.

³² Antolinos and Díaz 2012 (n. 18) 36–7.

³³ J. A. Antolinos and B. Díaz, *Los precintos de plomo del Museo de Badajoz y la actividad de las compañías mineras romanas en el sur de Hispania a comienzos de época imperial*, *MM* 56, 2015, 211–31 (213–23), with above bibliography.

³⁴ Domergue 1971 (n. 27) 351.

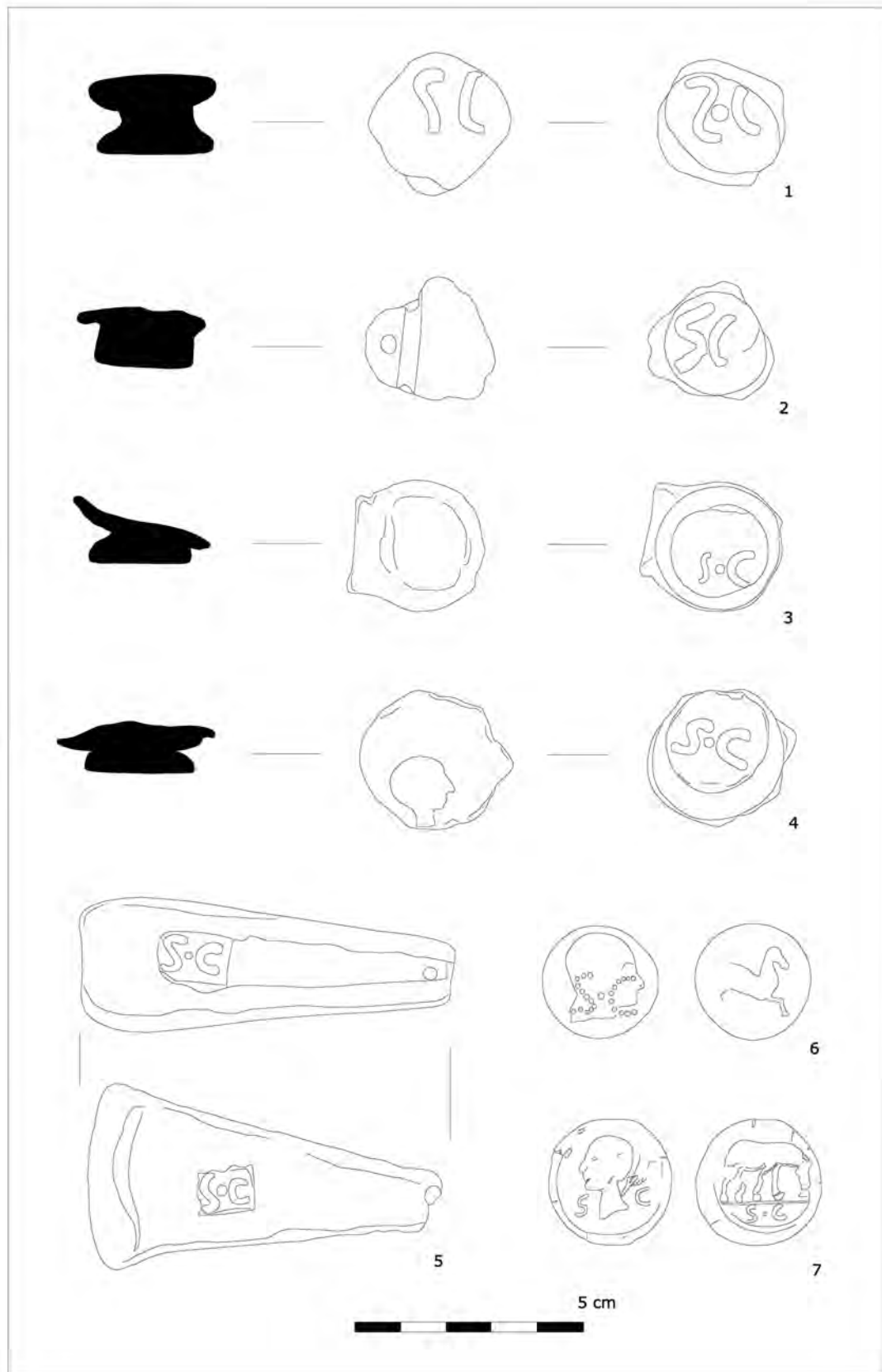


Fig. 3. Materials associated with the *S(oietas) C(---)*: 1–4, lead seals; 5, lead weight from El Centenillo; 6, coin from the *kese* mint with countermark; 7, coin with the legend *S.C.*

as well as in Posadas, Marrubial (Córdoba), Toletum (Toledo) and perhaps also in Hoyo de la Campana (Granada). The majority of these countermarked coins come from the Iberian mint of *kese* (Tarragona) (fig. 3.6).³⁵ There is also a rare collection of bronze coins which display a male head – probably Augustus’ – on the obverse and a standing horse on the reverse with the legend *S.C.* repeated on both faces. Of the four known examples in this collection, one was discovered in El Centenillo itself (fig. 3.7).³⁶

It is not currently possible to reconstruct the name of this company. Traditionally, the initials have been expanded to *s(ocietas) C(astulonensis)*, given that the majority of the seals originate from eastern Sierra Morena.³⁷ The discovery, however, of other seals both in the centre as well as the far west of Sierra Morena also present the possibility that the name could be *s(ocietas) C(ordubensis)*.³⁸ A lead ingot recovered in the sea around Menorca, but originating from the mines of eastern Sierra Morena, bears the stamp *SOC. PLVM. [-2-]R.*,³⁹ which could perhaps correspond to a *soc(ietas) plum(bar)ia [Co]r(dubensis)*.⁴⁰ In any case, given the lack of conclusive evidence, the question must remain open.

In the Sud-Lavezzi 2 wreck, to the south of Corsica, several hundred copper ingots have been recovered, some of which are stamped with the letters *SAC*, along with other inscriptions of an onomastic nature.⁴¹ This wreck, dated to the first third of the first century C.E., carried various goods from Baetica, which included amphorae Haltern 70, Dressel 7–11, and Dressel 20, as well as new lead ingots with the stamp *Minuciorum*.⁴² It is therefore feasible to propose the possibility, as mere hypothesis, that these letters could refer to a *s(ocietas) a(rgentifodinarum)*, perhaps the same *S.C.* that is documented on the lead seals. The fact that these are copper ingots is not an obstacle, since this company could have exploited polymetallic seams which would allow for copper extraction, as well as silver and lead, which is common in the mining districts of central Sierra Morena.⁴³

Most of the seals bearing the letters *S.C.* were discovered in the excavations by C. Domergue in El Cerro del Plomo (El Centenillo), for which reason they should be dated to the beginning of the first century B.C.E.⁴⁴ The company must have remained active at least until the beginning of the Julio-Claudian period, the time when the foundry at Fuente Espí (La Carolina) was active, which has also provided numerous seals.⁴⁵ The countermarked coins from *kese* could be dated at the latest to the first half of the first century B.C.E.⁴⁶ It therefore seems that the period of activity for the *S.C.* in Sierra Morena largely coincides with that of the *S.A.I.* from Mazarrón.

³⁵ M. P. García-Bellido and C. Blázquez, *Diccionario de cecas y pueblos hispánicos*, 2001, 1, 110–12; A. Arévalo *La circulación monetaria en las minas de Sierra Morena: El distrito de Córdoba*, *Numisma* 237, 1996, 51–82; L. Arboledas, *Minería y metalurgia romana en el sur de la Península Ibérica. Sierra Morena oriental*, 2010, 45–6; A. Taboada and S. Azcárraga, *Nuevos datos sobre el diseño urbano de Toletum: las cloacas de la Bajada del Barco*, *Gerión* 34, 2016, 249–87 (265).

³⁶ RPC I 132.

³⁷ E.g. Domergue 1990 (n. 1) 261–3; Arboledas 2010 (n. 35) 46–8; C. Rico, *Sociétés et entrepreneurs miniers italiens en Hispanie à la fin de l'époque républicaine. Une comparaison entre les districts de Carthagène et de Sierra Morena*, *Pallas* 82, 2010, 365–415 (398).

³⁸ Cf. Domergue 2008 (n. 1) 194.

³⁹ HEP 14, 2005, 69.

⁴⁰ Antolinos and Díaz 2015 (n. 33) 221; *contra* I. Rodá, *Agripa y el comercio del plomo*, *Mastia* 3, 2004, 183–94 (185 and 189).

⁴¹ AE 1991, 923b; B. Liou and Cl. Domergue, *Le commerce de la Bétique au I^{er} siècle de notre ère. L'èpave Sud-Lavezzi 2 (Bonifacio, Corse du Sud)*, *Archaeonautica* 10, 1990, 11–123 (95–115).

⁴² A. J. Parker, *Ancient Shipwrecks of the Mediterranean and the Roman Provinces*, 1992, 414–15.

⁴³ Cf. Domergue 1990 (n. 1) 47–8.

⁴⁴ Domergue 1971 (n. 27) 349–51.

⁴⁵ Domergue 1971 (n. 27) 351.

⁴⁶ García-Bellido and Blázquez 2001 (n. 35) 1, 240–41.

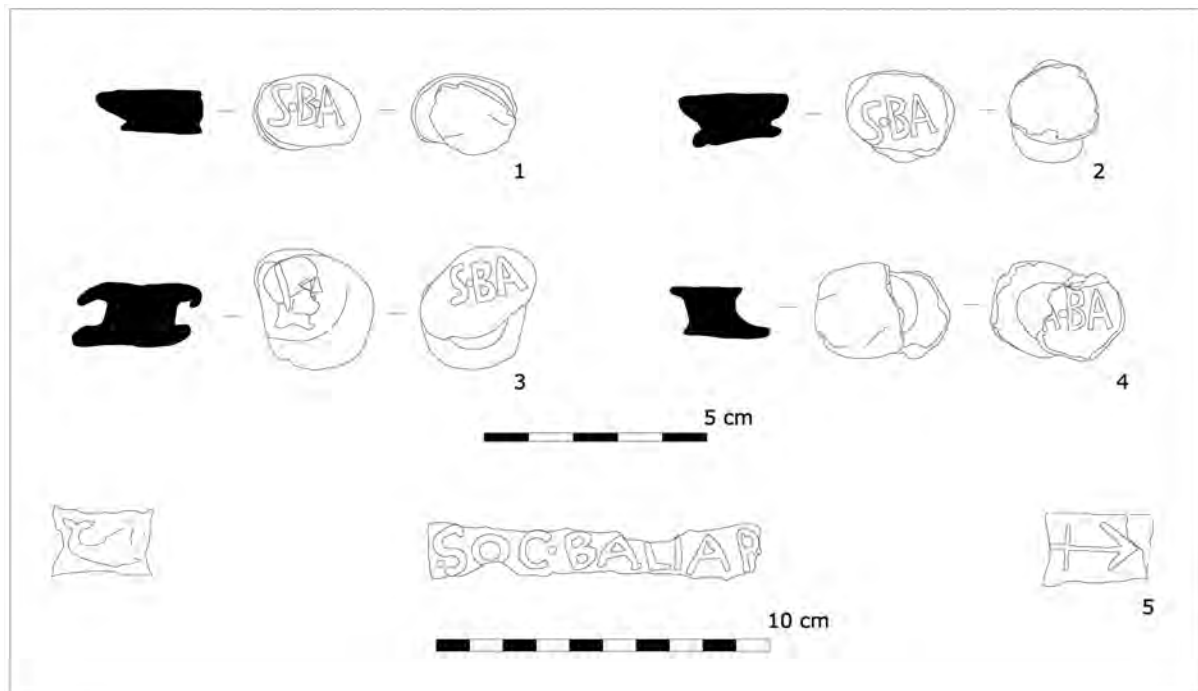


Fig. 4. Materials associated with the *societas a(rgentifodinarum?) Ba(---)*: 1–4, lead seals from the Museo de Badajoz; 5, stamp on a lead ingot from Carthago Nova

The *societas Ba(---)*

The *societas a(rgentifodinarum?) Ba(---)* is known by a collection of lead seals that display the legends *S.B.A.*, *[S.?]A.BA.*, and *S.B.A.*, occasionally accompanied by schematic representations of male heads, similar to those which are replicated on indigenous Spanish coins (fig. 4.1–4). These seals have been recovered principally in the central and western areas of Sierra Morena, in particular in Fuente Obejuna and Posadas (Córdoba), and in Castuera and Azuaga (Badajoz). There are, nevertheless, several examples with the legends *S.A.B.* and *AB* from the Fuente Espí foundry, in La Carolina.⁴⁷

The full name of the company is unknown, so different suggestions have been proposed (*societas Baetica*, *Baedronensis* or *Baeculensis*).⁴⁸ A lead ingot with the inscription *SOC. BALIAR.* was recovered from the Escombreras 2 wreck, at the entrance to the port of Carthago Nova,⁴⁹ but isotopic analysis nevertheless reveals that it could have originated from the mines of Sierra Morena (fig. 4.5).⁵⁰ It is not impossible that it refers to the same company mentioned on the seals, although new finds would be needed to help confirm this possibility.

The characteristics and provenance of the seals of the *S.A.Ba.* indicate a date between the first century B.C.E. and the beginning of the first century C.E. Their wide distribution suggests that this company could have had interests in the majority of the main districts of Sierra Morena, and it is even likely that in some of them, the company overlapped with the *S.C.*, as the presence of seals from both companies in Azuaga, Posadas, and La Carolina attests. The lack of data, however, currently makes it impossible to determine what the relationship between the two companies could have been.

⁴⁷ Antolinos and Díaz 2015 (n. 33) 213–19.

⁴⁸ Cf. Domergue 1971 (n. 27) 350.

⁴⁹ AE 2000, 784.

⁵⁰ Antolinos and Díaz 2015 (n. 33) 220–21.

The *societas Sisaponensis*

This *societas* is mentioned in a *terminus* found near Corduba, datable to the second half of the first century B.C.E:

[H]ic viae / servitus / imposita / est ab soc(ietate) / Sisap(onensi) / susum / ad montes / s(ocietatis) S(isaponensis) lat(a) ped(es) XIV (CIL II²/7, 699a).

It demarcated a road that only served the *montes s(ocietatis) S(isaponensis)*, that is, the mines exploited by this company.⁵¹ The city of Sisapo probably corresponds to the site of La Bienvenida (Almodóvar del Campo, Ciudad Real), situated some 150 km north of Corduba, in the centre of Sierra Morena.⁵²

An epitaph from the beginning of the first century C.E. also comes from Corduba, and belonged to the tomb of three *liberti* of the *s(ocietas) S(isaponensis)*. All of them used the *nomen* *Argentarius*, which will be discussed later:

M. Argentarius s(ocietatis) S(isaponensis) l. Philinus / A. Argentarius s(ocietatis) S(isaponensis) l. Rufus / M. Argentarius s(ocietatis) S(isaponensis) l. / Succio / suo testameto fieri iussit (CIL II²/7, 415a).

Another epitaph dated to the first century C.E. from Capua (Campania) belonged to a *vilicus* of the *socii Sisaponenses*, whose relationship with the mining company still raises many questions:⁵³

Epapra socioru(m) / Sisapo[n]es[i]u[m] vilico / o(ssa) h(ic) s(ita) s(unt) / et Provincia / uxor (CIL X 3964 = EDR005791).

The letters *S.S.* appear on two coins from *kese*, similar to those countermarked by the *S.C.*, and on another from Carmo (Carmona) (fig. 5).⁵⁴ The same mark was apparently reproduced on a bronze bucket found at Posadas, on various lead seals discovered in Posadas and the Guadiato Valley (Cordoba), as well as on lead ingots from the surroundings of Corduba and from the mining town of La Loba (Fuenteovejuna). Unfortunately, none of these pieces has yet been published properly, so they should be interpreted with caution.⁵⁵



Fig. 5. Coin from *kese* with countermark *S.S.*

⁵¹ A. Ventura, *Susum ad montes s(ocietatis) S(isaponensis)*: nueva inscripción tardorrepública de Corduba, *Anales de Arqueología Cordobesa* 4, 1993, 49–61; E. Rodríguez Almeida, Una nuova iscrizione ispanica relativa ai *socii miniararum Sisaponensium*, *BullCom* 96, 1995, 173–8.

⁵² C. Fernández and M. Zorzalejos, ¿Sisapo en La Bienvenida (Ciudad Real)? De nuevo sobre la radicación geográfica y el estatuto jurídico de la capital del cinabrio hispano, in: P. Bueno et al. (eds.), *Arqueología, sociedad, territorio y paisaje*, 2010, 361–73; M. Zorzalejos, G. Esteban, L. Mansilla, J. L. Gallardo, P. Hevia, and J. Bermúdez, Espacios de explotación minera en la periferia de la ciudad de Sisapo-La Bienvenida (Almodóvar del Campo, Ciudad Real), in: García-Pulido et al 2017 (n. 4) 397–408.

⁵³ Cf. L. Chioffi, *Il sociorum sisapone(n)sium vilicus e l'argentum da Sisapo(n) a Capua*, *Antichità Altoadriatiche* 85, 2016, 173–82.

⁵⁴ M. P. García-Bellido, Nuevos documentos sobre minería y agricultura romanas en Hispania, *ArchEspArq* 59, 1986, 13–46 (20–21). For the mint at Carmo: García-Bellido and Blázquez 2001 (n. 35) 1, 80–86. A similar mark has been recorded on a piece from Iulia Traducta (Tarifa?) dating to the Augustan period, but its interpretation is unclear: RPC I 108.

⁵⁵ For the bronze bucket: H. Sandars, *The Linares Bas-Relief and Roman Mining Operations in Baetica*, *Archaeologia* 59, 1905, 311–32 (330); Domergue 1971 (n. 27) 352–3. For the seals: A. Ventura, *Placa de libertos de la sociedad minera*

The *societas Sisaponensis* is the only mining company mentioned by an ancient author, although not explicitly. In the second *Philippics*, Cicero, in an attempt to demonstrate the isolation and rootlessness of Antony, asks his opponent rhetorically:

Domum dico? Quid erat in terris ubi in tuo pedem ponerēs praeter unum Misenum, quod cum sociis tamquam Sisaponem tenebas? (Cic. *Phil.* 2.19.48).

Home do I say? Nowhere on earth was there a place where you could set foot on your own ground, excepting only your property at Misenum, which you held with partners like a property at Sisapo (trans. D. R. Shackleton Bailey, Loeb).

The text does not mention the mines, but the reference seems clear. The passage is of particular interest because it implies that the *socii* controlled (*tenebant*) Sisapo, which in this context should perhaps be understood as a figurative reference to the mining district of which the city was capital. A story recounted decades later by Strabo in the third book of his *Geography*, dedicated to Hispania, reinforces this possibility:

ἔστι δὲ καὶ νῦν τὰ ἀργυρεῖα, οὐ μέντοι δημόσια, οὔτε ἐνταῦθα οὔτε ἐν τοῖς ἄλλοις τόποις, ἀλλ' εἰς ἰδιωτικὰς μεθέστηκε κτήσεις· τὰ δὲ χρυσεῖα δημοσιεύεται τὰ πλείω (Str. 3.2.10).

The silver-mines are still being worked at the present time; they are not state-property, however, either there (at New Carthage) or anywhere else, but have passed over to private ownership. But the majority of the gold-mines are state-property (trans. H. L. Jones, Loeb).

It is therefore reasonable to propose that the *societas Sisaponensis* could have owned the mines that it exploited and, by extension, it is reasonable to suspect that the same could have been true of the other mining companies engaged in silver production, both in Sierra Morena and in Carthago Nova.

The district of Sisapo was not only important for the production of silver and lead, but also for cinnabar (*minium*).⁵⁶ This mineral was a very rare resource that could only be obtained from the mines around Ephesus, as well as in Sisapo. Vitruvius and Pliny describe how cinnabar had to be transported in sealed bags to Rome, where it was processed in workshops situated on the Quirinal.⁵⁷

It is possible that the extraction of cinnabar was the responsibility of the *societas Sisaponensis*, since it seems to be the most important mining company in the Sisapo district. It is doubtful, however, that it was also charged with processing the mineral, which could only take place in Rome with a state permit.⁵⁸ A cinerary urn from the Via Salaria, datable to the second half of the first century C.E., mentions a *procurator sociorum Miniariarum*.⁵⁹ It is reasonable to think that this *societas Miniaria* could have been the company that benefitted from the licence to process cinnabar. Its *liberti* seem to have used the *nomen* Miniarius and not Argentarius, which was used by the *liberti* of the *societas Sisaponensis*, thus confirming that these were two separate companies.⁶⁰

The overall impression is that the activity of the *societas Sisaponensis* could date back at least to the middle of the first century B.C.E. and could have continued well into the Julio-Claudian period, which would make it contemporary with the *S.A.I.*, the *S.C.*, and the *S.A.Ba.*

sisaponense, in: Córdoba en Tiempos de Séneca, 1996, 216–17. For the lead ingot: Sandars 1905 (supra) 330; C. Fernández, M. Zarzalejos, C. Burkhalter, P. Hevia, and F. Esteban, *Arqueominería del sector central de Sierra Morena. Introducción al estudio del área Sisaponense*, 2002, 75.

⁵⁶ Fernández et al 2002 (n. 55).

⁵⁷ Vitr. 7.9.4; Plin. *n.h.* 33.118–24; cf. E. Rodríguez Almeida, *Alcune notule topografiche sul Quirinale di época domiziana*, *BullCom* 91, 1986, 49–60 (52–4); Mateo 2001 (n. 12) 49–55.

⁵⁸ Cf. Cl. Domergue, *Le régime juridique des mines du domaine public à Rome. À propos d'un ouvrage récent*, *MCV* 34.2, 2004, 221–36 (224–5).

⁵⁹ CIL VI 9634 = EDR121613.

⁶⁰ The *nomen* Miniarius is very rare: beyond the inscription of the *procurator sociorum Miniariarum*, who was actually called C. Miniarius Atimetus, it is recorded only on another three funerary inscriptions, all of them datable between the end of the first century and the first decades of the second C.E. Two are from Rome (CIL VI 19397; INVaticano 11 = EDR006388), while the third is of uncertain provenance, although given its characteristics it is possible that it also comes from Rome (CIL X 780 = EDR108034); cf. W. Schulze, *Zur Geschichte lateinischer Eigennamen*, 1904, 415.

The *nomina* Argentarius and Aerarius

The inscription from Corduba for the *liberti* of the *S.S.* draws attention to another source of information that can help trace the mining companies' activities: onomastics. Argentarius and Aerarius were the *nomina* adopted by its *liberti*, just as Miniarius was surely the name used by the *liberti* of the concessionary company charged with processing cinnabar in Rome.⁶¹

Argentarius is a rare *nomen*.⁶² Outside Spain, it is only attested in a few Italian inscriptions, the majority from Rome.⁶³ In Spain, most of the evidence is concentrated around the Guadalquivir Valley, Emerita, and Carthago Nova;⁶⁴ beyond these areas only a single piece of evidence is known, in Saguntum (fig. 1).⁶⁵ The oldest document in which this *nomen* is attested is a funerary inscription found in Mazarrón, datable to the first half of the first century B.C.E., which belonged to an individual named L. Argentarius Nicander.⁶⁶ The use of a Greek *cognomen* and the absence of a father's name suggest that he was a *libertus*. Its chronology would allow him to have belonged to the *S.A.I.*, although this cannot be proven.

Aerarius is even rarer. In Hispania, it is attested in only two inscriptions. One was found in Salaria (Úbeda), near Castulo.⁶⁷ The other, from the Augustan period, comes from Corduba, and belonged to a *medicus* called M. Aerarius Telemac(h)us, who was the *libertus* of a *societas aerar(iarum fodinarum)*.⁶⁸ The use of two different *nomina* – Argentarius and Aerarius – could perhaps satisfy the necessity of distinguishing between the *liberti* of different companies, especially in Sierra Morena, where at least three large *societates* were active contemporaneously.

Final thoughts

Despite the scarcity of information, it is possible to present some reflections on the role played by mining companies in the organisation of mining and metallurgical activity in Spain during the end of the Republic and the beginning of the Imperial period. Firstly, reports by Cicero and Strabo indicate that they could have been the owners of the mining sites in which they operated. This factor reinforces the hypothesis, recently proposed by A. Mateo, that they were genuine *societates argentifodinarum*, and not generic *societates publicanorum*, as they have traditionally been considered.⁶⁹

The evidence from Mazarrón shows that the *S.A.I.* controlled both mineral extraction and processing. It is also known that it was active in the majority of the mining areas in this region. The situation in Sierra Morena seems rather more complex. It is likely that the *S.S.* replicated the same model as the *S.A.I.* in the Sisapo district, although that cannot be confirmed. The distribution of the seals from the *S.A.Ba.* and, above all, from the *S.C.* throughout Sierra Morena is a good indicator that both companies were capable of maintaining their activity in different mining operations dispersed across a very wide area.

There are not sufficient data to specify what caused the evolution of mining and metallurgical companies typical of the period between the second and first centuries B.C.E., which were of a markedly family nature, into this “anonymous” *societates*. Stamps on lead ingots provide evidence of the existence of associations of indi-

⁶¹ On the *servi* of Roman companies: A. di Porto, *Impresa collettiva e schiavo 'manager' in Roma antica* (II sec. a.C. – II sec. d.C.), 1984.

⁶² B. Díaz and J. A. Antolinos, *Los Argentarii y las societates mineras de la zona de Carthago Nova*, in: J. López (ed.), *Govern i societat a la Hispània romana. Novetats epigràfiques. Homenatge a Géza Alföldy*, 2013, 115–20.

⁶³ Roma: CIL VI 1975, 12300–12302 and 38766; AE 1988, 157. Beneventum: CIL IX 1748; Nomentum: AE 1976, 113. Liternum: AE 2001, 854.

⁶⁴ Corduba: CIL II²/5, 415; Castulo: CIL II 3283; Obulco: CIL II²/7, 130; Ucubi: CIL II²/5, 452; Urso: CIL II²/5 1044–5; Anticaria: CIL II²/5, 762; Carthago Nova: J. M. Abascal and S. Ramallo, *La ciudad de Carthago Nova: La documentación epigráfica*, 1997, n° 102 and n° 228; Emerita: AE 1993, 903–4; AE 1997, 791.

⁶⁵ Saguntum: CIL II²/14, 402.

⁶⁶ AE 1987, 658: *L. Argentarius Nicander / salve*.

⁶⁷ CILA III 362.

⁶⁸ CIL II²/7, 334: *M. Aerarius soc(ietatis) aerar(iarum fodinarum) l. / Telemac(h)us medicus / hic quiescit vale*; cf. Domergue 1990 (n. 1) 270.

⁶⁹ Mateo 2001 (n. 12); cf. Domergue 2004 (n. 58).

vidual producers,⁷⁰ but it is unknown whether these were circumstantial alliances, like those envisaged in the second Vipasca bronze (Aljustrel),⁷¹ or if, instead, they represent the basis of more stable company structures.

M. P. García-Bellido has previously suggested that the appearance of the large companies could have been related to the privatisation of mining activities, recorded by Strabo.⁷² Without discarding this attractive possibility, it is possible to consider other reasons. The intensification of extraction operations inevitably resulted in the progressive depletion of the most profitable and accessible seams. It was consequently necessary to make increasingly significant investments to guarantee continued production. In turn, the increasing cost of the production process probably stimulated the implementation of measures intended to optimise costs and guarantee the viability of the operations.

The first century B.C.E. witnessed an increase in scale of the size of both the mining and metallurgical complexes. A good example of this is Coto Fortuna. Once the superficial seams were exhausted, extraction continued underground at ever increasing depth, which meant it was necessary to undertake expensive engineering works to drain sub-surface mines. At the same time, important facilities were constructed at the surface to process the mineral at the pithead.⁷³

Work in increasingly deep shafts and tunnels posed new technological challenges. In the first century B.C.E., there is evidence that the Archimedes screw was introduced in the mines of El Centenillo and Posadas in Sierra Morena.⁷⁴ This innovation not only entailed a qualitative leap in the mechanisation of mining operations, it also brought radical changes to the actual nature of the work in the mines, since it required uninterrupted operation night and day to prevent the sub-surface mines from flooding.

It is reasonable to propose that the need for large investment required by the transformation of the old mining operations, added to the expedience of pursuing the vertical integration of the whole production process in order to reduce costs, could have been the stimuli that encouraged the development of increasingly-large stable business alliances. This could have been the starting point of the process that would culminate in the appearance of the “anonymous” *societates* that begin to be attested in the first half of the first century B.C.E.

In any case, the appearance of these new mining companies did not entail the disappearance of the old family businesses. Some of them remained active in the second half of the first century B.C.E. and even into the beginning of the first century C.E., as demonstrated by the continued existence of lead ingots stamped with the names of individual producers.⁷⁵ To this period also belonged the activities of Sextus Marius, who according to Tacitus owned profitable gold and copper mines in Hispania.⁷⁶

⁷⁰ We know at least two *societates* of this type: one set up by L. Gargilius and M. Laetilius, and one set up by C. Fiduius and Sp. Lucretius, both attested in lead ingots recovered respectively in the south of France and on the island of Escombreras, near Cartagena, Domergue 1990 (n. 1) 258–9; Díaz 2008 (n. 6) 281–3; Díaz and Antolinos 2013 (n. 8) 547–8. Cf. A. Watson, *The Law of Obligations in the Later Roman Republic*, 1965, 125–46; P. Cerami and A. Petrucci, D. Petrucci, *Diritto commerciale romano. Profilo storico*, 2009³ (2001), 68–106.

⁷¹ Vip. II §§ 6–7; Cl. Domergue, *La mine antique d’Aljustrel (Portugal) et les tables de bronze de Vipasca*, 1983, 141–2; S. Lazzarini, *Lex metallis dicta*. Studi sulla seconda tavola di Vipasca, 2001, 157–66.

⁷² M. P. García-Bellido, *Las monedas de Castulo con escritura indígena*. Historia numismática de una ciudad minera, 1982, 163–5; cf. T. Frank, *An Economic Survey of Ancient Rome I. Rome and Italy of the Republic*, 1933, 157 and 257.

⁷³ Antolinos, Díaz and Guillén 2013 (n. 26).

⁷⁴ Cl. Domergue and J.-L. Bordes, *Quelques nouveautés techniques dans les mines et la métallurgie à l’époque romaine: leur efficacité et leurs effets sur la production*, in: E. Lo Cascio (ed.), *Innovazione tecnica e progresso economico nel mondo romano*, 2006, 197–223 (208–14); cf. A. Wilson, *Machines, Power and the Ancient Economy*, JRS 92, 2002, 1–32.

⁷⁵ Lead ingots of Hispanian lead, stamped by individual producers in the Julio-Claudian period, have been recovered from the wrecks of Comacchio (Cl. Domergue, P. Quarati, A. Nesta, and P. R. Trincherini, *Retour sur les lingots de plomb de Comacchio (Ferrara, Italie) en passant par l’archéométrie et l’épigraphie*, in: Orejas and Rico 2012 [n. 4] 81–103), Cabrera 4 (Cl. Domergue, P. Quarati, A. Nesta, G. Obejero, and P. R. Trincherini, *Les isotopes du plomb et l’identification des lingots de plomb romains des mines de Sierra Morena. Questions de méthode: l’exemple des lingots de l’épave Cabrera 4*, Pallas 90, 2013, 243–56), Sud-lavezzi 2 (Liou and Domergue 1990 [n. 41]), and Chipiona (A. Nesta, P. R. Trincherini, S. Klein, Ch. Rico, P. Quarati, and Cl. Domergue, *Sobre el origen de los lingotes de plomo de Chipiona*. Aportación del método de los isótopos del plomo, *Habis* 42, 2011, 191–207), among others; cf. Domergue 1990 (n. 1) 266.

⁷⁶ Tac. *Ann.* 6.19.1; E. Champlin, *The Richest Man in Spain*, ZPE 196, 2015, 277–95.

The picture that emerges at the beginning of the Imperial period is rather complex. Alongside the individual producers and this four anonymous companies, there were also other, companies attested only locally such as the *soc(ietas) Amat.*, the *soc(ietas) Vesc.*, the *S.F.B.*, and the *SCEL*, which are documented on very few lead and copper ingots.⁷⁷ It is even possible that, exceptionally, certain cities could have directly managed some mines or foundries located in their territory, as revealed by the existence of various lead ingots that mention Carthago Nova and the Colonia Augusta Firma (Écija) respectively.⁷⁸ It is currently very difficult to determine how all these stakeholders interacted.⁷⁹ The evidence analysed so far, nevertheless, suggests that maybe the widely attested companies – that is, the *S.A.I.*, the *S.S.*, the *S.C.*, and the *S.A.Ba.* – could lead silver production and, probably, also that of lead and copper, at least in the mining districts of Sierra Morena and Carthago Nova.

There is very little information about the reasons that led to the disappearance of these companies. From the Augustan period, and above all under Tiberius, the imperial authorities' interest in controlling mining activity intensified.⁸⁰ This is demonstrated, for example, by Tiberius' expeditious reaction to Sextus Marius, whom he condemned to death after expropriating all his mines, as recorded in the aforementioned passage by Tacitus. It is likely that this new political climate had some sort of repercussions upon the business landscape that operated mining activity in the south of Hispania, although the only certainty is that we have no solid data on this point.

It is, however, unnecessary to fall back upon state intervention to explain the disappearance of the mining companies. From the Augustan period onwards, dependence on the supply of Spanish silver for minting coins reduced as a result of new mines opening in Britannia, Gaul, Sardinia, Germania, and Moesia.⁸¹ A recent study has shown that a substantial drop on metal production cannot be detected until the second century C.E.⁸² Nevertheless, it seems that the decline of the mining activities both in Carthago Nova and Sierra Morena could have started earlier, probably during the first century C.E. The emergence of new competitors must have directly affected the profitability of Spanish mines, making it increasingly difficult to maintain the capital investments needed to guarantee large-scale production. In this new climate, it is possible that the complex business structure that had underpinned mining and metallurgical activity in the south of Spain from the end of the Republic simply stopped being viable and ultimately collapsed.

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⁷⁷ Rico 2010 (n. 37) 398–9; Antolinos and Díaz 2015 (n. 33) 222. Other similar mining companies have been attested outside of Spain, in Gallia (G. Barrool and R. Gourdiol, *Les mines antiques de la haute vallée de l'Orb, Herault*, in: J.-L. Fiches [ed.], *Mines et fonderies antiques de la Gaule*, 1982, 79–93; B. Léchelon, *Argent rutène et entrepreneurs romains aux confins de la Transalpine*, in: Ph. Gruat, J.-M. Pailler and D. Schaad [eds.], *Les Rutènes. Du peuple à la cité. De l'idépendance à l'installation dans le cadre romain 150 a.C.–100 p.C.*, 2011, 245–79 [268–73]), Germania (P. Rothenhöfer, *Geschäfte in Germanien. Zur Ausbeutung von Erzlagerstätten unter Augustus in Germanien*, *ZPE* 143, 2003, 277–86; W. Eck, *La romanisation de la Germanie*, 2007, 23–5) and Britannia (RIB 2404-53-60).

⁷⁸ Domergue 1990 (n. 1) 236–7.

⁷⁹ Cf. A. Orejas and Ch. Rico, *Metalla, civitates, coloniae: les mines hispaniques dans les processus de changement des status territoriaux à la fin de la République et au début de l'Empire*, *MÉFRA* 127.2, 2015, 521–34.

⁸⁰ Suet. *Tib.* 49.2; cf. B. Díaz, *Was C. Rubellius Blandus Involved in the Exploitation of the Silver Mines of Carthago Nova?*, *Historia* 68, 2019 (forthcoming).

⁸¹ K. Butcher and M. Ponting, *The Metallurgy of Roman Silver Coinage. From the Reform of Nero to the Reform of Trajan*, 2014, 177–9.

⁸² McConnell et al. 2018 (n. 13).