

Salt production on the Tyrrhenian coast in South Lazio (Italy) during the Late Bronze Age: its significance for understanding contemporary society

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Saltmaking on the Latial coasts in protohistory

Both in historical periods and in antiquity the area between Ostia and the Tyrrhenian Sea was strongly associated with saltmaking and although the literary sources state the importance for Rome of saltmaking near Ostia already during the advanced Iron Age, so far no archaeological evidence for salt production from this period has been found.¹ Palaeographical reconstructions suggest that the protohistoric lagoonal environment was suitable to function as *saline* or salt beds, and two Bronze Age sites are recorded from the area.² Figure 1 shows the location of the sites in a palaeographical reconstruction of the lagoonal environment with the protohistoric coast-line indicated. In scenario A, the Tiber would have flown into the *laguna Ostiense*, which would have been connected to the sea. In scenario B, the Tiber would have flown directly into the sea. However, the pottery record of neither of the Bronze Age sites provides any clear evidence for saltmaking and we do not know whether the salinity of the *laguna Ostiense* was high enough for saltmaking through evaporation, though this seems to have been the case in the 16th c. AD. The map in figure 2 shows the lagoonal environment at the mouth of the Tiber as it appears in an anonymous map of 1557 AD. In it are indicated various so-called *salare* or salt water lakes. In the historical cartography of the area many more examples can be found in which reference is made to these probably brackish lakes (see Alessandri 2009, 16-24). While saltmaking during protohistory in the Tiber delta area is thus likely, it has not been attested archaeologically yet. There is however archaeological evidence from the coastal area 50 km to the southeast on the coast of the Pontine plain from a protohistoric coastal site. Although already mapped in the 1970's, this site was not investigated at the time (Piccarreta 1977, numero 13: there reported as an Iron Age settlement). In two campaigns in 2001 and 2002 a team from the Groningen Institute of Archaeology excavated this site, known as P13 or Pelliccione, as part of the Pontine Region Project, a landscape archaeological project that covers a large part of the landscape south of Rome (figs. 3 and 4; for an overview of this project and references see Attema et al. 2010, chapter 2).

¹ Both cartographic and pictorial sources, such as a fine 19th century oil-painting by the French painter Jean-Baptiste Adolphe Gibert (<http://www.artrenewal.org/pages/artwork.php?artworkid=30553&size=large>) depict the saline at Ostia, lagoons that were exploited for saltmaking. Ancient authors like Ennius, Livius, Cicero and Dionysius of Halicarnassus report how Romans considered Ostia their first colony and they attributed its founding for the purpose of salt production to their fourth king, Ancus Marcius (second half of the 7th century BC). For inland transport of salt the Via Salaria is well-known from the sources, the ancient road by which the Sabines came to fetch salt from the salt marshes at the mouth of the Tiber (see Alessandri 2009, 18 with references to Pavolini 1989; Lanciani 1888; Nijboer et al. 2006 with references to Giovannini 1985; Coarelli 1988a; 1988b). Waarsenburg put forward the hypothesis that a comparable situation may have existed along the Astura with Satricum as a fording place (Waarsenburg, Maas 2001). Satricum is located near to the saltmaking site P13/Pelliccione discussed in this article (see figs. 3 and 4).

² For the sites of Ostia Antica, Collettore (Final Bronze Age 3) and Ostia Antica, Terme di Nettuno (advanced phase of the Recent Bronze Age), see Alessandri 2009, 294-295.

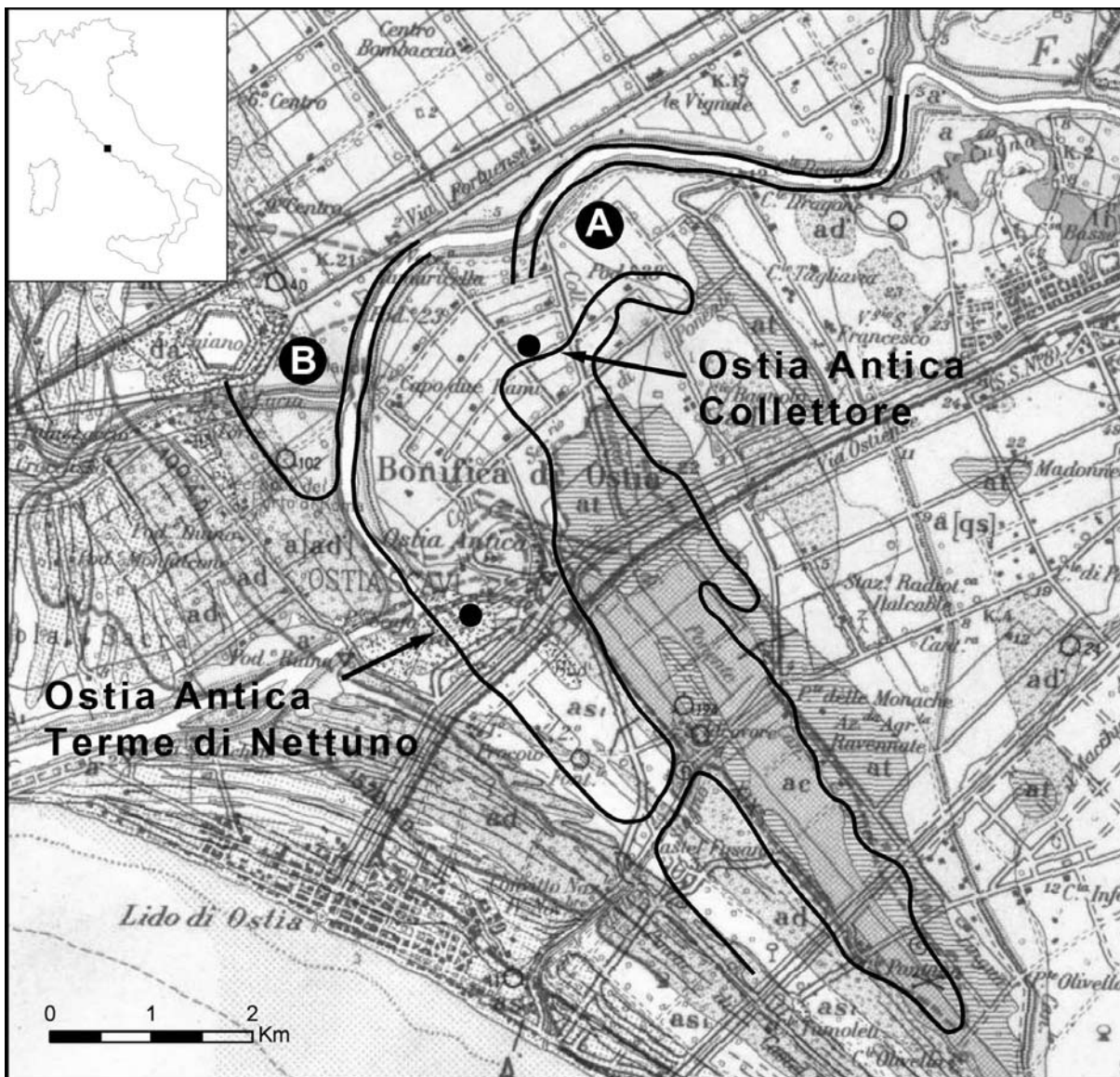


Fig. 1. Geological map of the area of the mouth of the Tiber river. The black outline indicates the reconstruction of the lagoon, i.e. the coastline during protohistory as it probably was during the late Bronze Age, and the course of the river in two scenarios: A) when it would have flown into the lagoon and B) when it would have flown directly into the sea. The Bronze Age sites of Ostia Antica Collettore and Ostia Antica Terme di Nettuno are depicted (reconstruction following Bellotti 1994) (Map: Luca Alessandri)

Briquetage at P13/Pelliccione

The saltmaking site that we will discuss briefly here is located on a small cape on the coast between Anzio and Astura and has been interpreted by us as a saltmaking site of the briquetage type.³ The photograph in figure 5a shows the environmental setting of the excavation: the site was located on a heavily overgrown sand dune (here stripped of its bushes by the excavators) that due to its vegetation had resisted local marine erosion. Figure 5b shows one of the excavation pits with a close packing of potsherds. From the pits, a sample of 45,000 sherds was recovered. The closely packed sherds in Trench

³ There is an ample bibliography on briquetage sites (e.g. Weller 2002). For the interpretation of the remains found at P13/Pelliccione, we have especially looked at Lane, Morris 2001. For an overview of traditional modes of salt-making and their archaeological correlates in different parts of the world, see: Parsons 2001, chapter 7. See fig. 4 for accretion and erosion of the shoreline (after Alessandri 2007a, fig. 2.28).

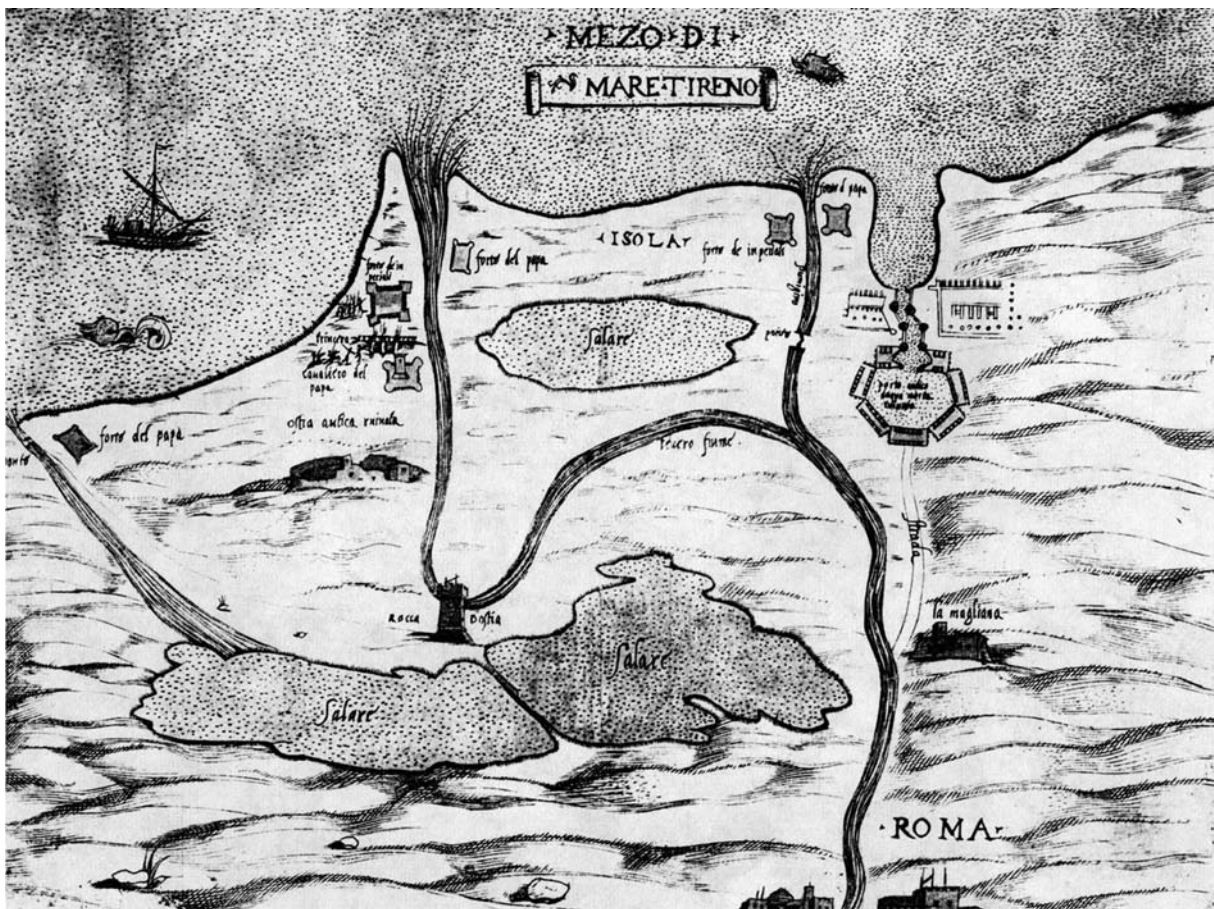


Fig. 2. Part of a map (by anonymous) showing the 'salare' (salt water bodies) in the Tiber delta (From Frutaz, 1972, tav. 39b)

D (shown in fig. 5b) are noteworthy. There, from a very small area of 0.4 m³, more than 10,000 sherds were excavated, all belonging to the same types of vessels.⁴ Figure 6 shows a typical profile of blackish soil with potsherds exposed by marine erosion and cleaned by the excavators. Figure 7 shows the type of vessels we are dealing with, mostly jars of large dimensions with diameters between 30 and 40 cm. The vessels generally have straight rims and either plain bodies or simple notched cord decorations. Although various classes could be distinguished, almost all pots can functionally be classified as storage jars. The vessels are made of coarse red-fired clay, in Italian archaeology referred to as *impasto*. Fabric analysis of a sample of sherds indicates that all classes of storage vessels that we distinguished were hand-made. The quality of the *impasto* is rather low, and most sherds are very friable. Finds that are characteristic of domestic refuse, such as animal bones, are almost lacking. And although some fragments of cups, plates and bowls did occur, they were negligible as to their number, though useful for dating purposes.⁵ It was thus clear that we dealt with the debris of a special purpose site here.

Our interpretation that we deal with the debris of a saltern is based on the combination of fragments of worked volcanic tufa stone with traces of burn and the huge amounts of sherds of storage vessels. In figure 8a and b, the debris layers are photographed as they showed up in the stratigraphy of the site. Figure 8b shows fragments of tufa with traces of exposure to fire and the typical potsherds. We assume that, in order to boil brine, tufa stones would have been used as provisional stands onto which the vessels with brine were placed, which then were heated in such a way that salt crystals would form.

⁴ Pasquinucci, Menchelli 2002, 179, report comparable quantities of potsherds from a Bronze Age saltmaking context on the Tyrrhenian coast near Pisa.

⁵ For a catalogue of vessel forms and for the fabric classification, see Nijboer et al. 2006 and http://www.lcm.rug.nl/lcm/teksten/teksten_uk/lcm_uk.htm.

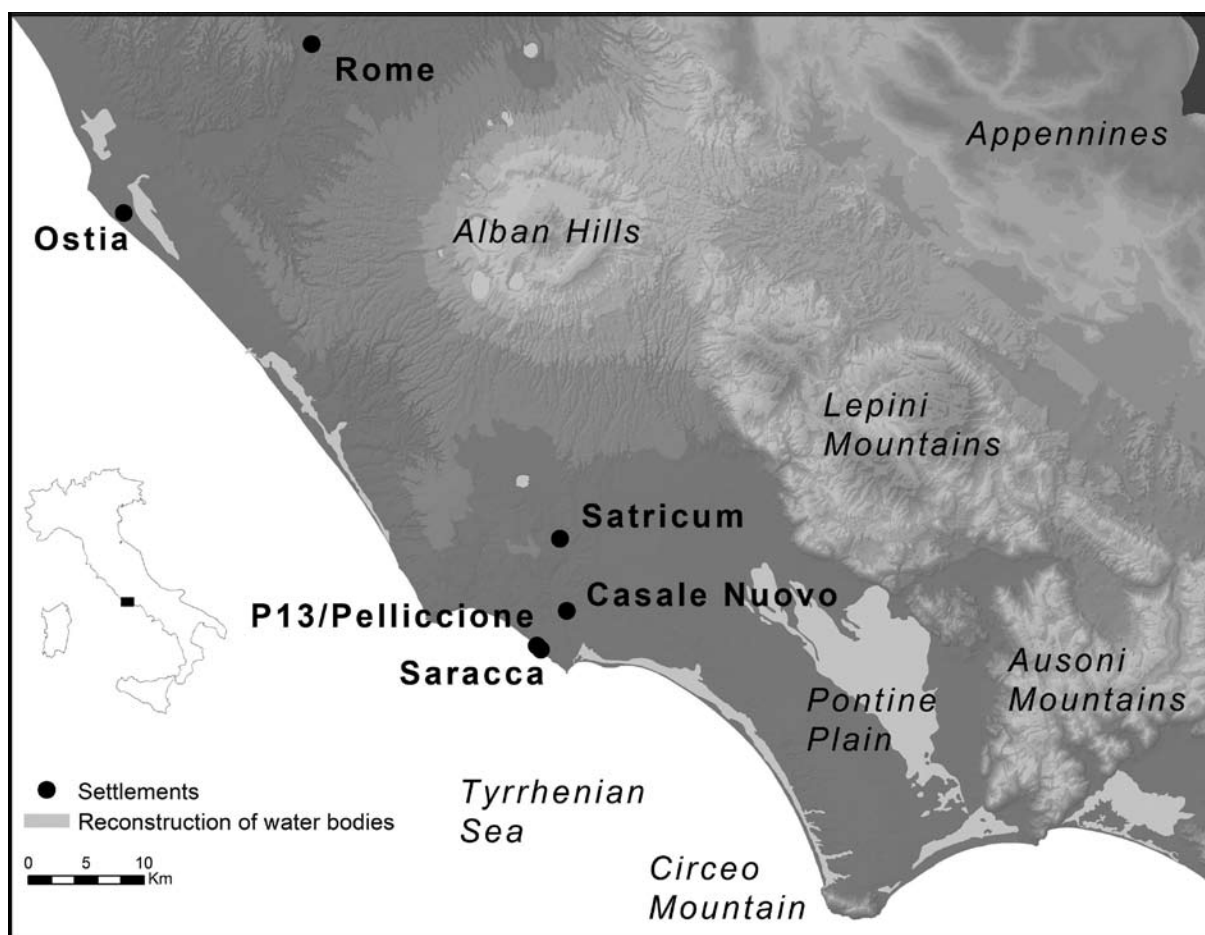


Fig. 3. Map of the Pontine Region in relation to Rome and Ostia with the location of sites mentioned in the text (landscape reconstruction after Alessandri 2009) (Map: Luca Alessandri)

To obtain the salt, the vessels would have to be broken intentionally as is common practice in salterns of the briquetage type. In his ethnoarchaeological study of the last saltmakers in the valley of Mexico, Jeff Parsons mentions a parallel for the use of stones as ‘stilts’ when he mentions the numerous remains of fire-cracked rock throughout the excavated strata used to support the boiling vessels while being heated (Parsons 2001, 281).

A second observation that points to saltworking is the particular colours on the pots, which in the literature on the subject have been labelled ‘salt colours’ (Lane, Morris 2001, 41; Crosby 2001, 410-412). Some containers from P13 display a range of pinks, whites, greys and lavender on the inner surface, possibly caused by direct contact with brine under moderately high temperatures. Figure 9 shows the base of one of the many vessels found with these typical colours preserved. African examples from sub-Saharan Africa learn that boiling operations may take as long as 24 hours before the brine is sufficiently concentrated to deposit the salt on cooling. The cone of salt that is then formed is extracted by breaking the pot, which accounts for the immense accumulations of sherds we found at our site.

Dating of P13/Pelliccione

As mentioned, the bulk of the excavated sherds consisted of large jars. These are noteworthy difficult to date with sufficient precision because of their very generic type. The few sherds of bowls and cups that were found in the stratigraphy of the site have however all parallels in the Final Bronze Age (Nijboer et al. 2006, 149). A fragment of probably an Italian-Mycenaean sherd of depurated clay and a cup of very fine *impasto* indicate a date of the saltern at the transition of the Recent to Final Bronze Age, and this refines the radiocarbon dates that place the site roughly between 1400 and 1000 BC, suggesting

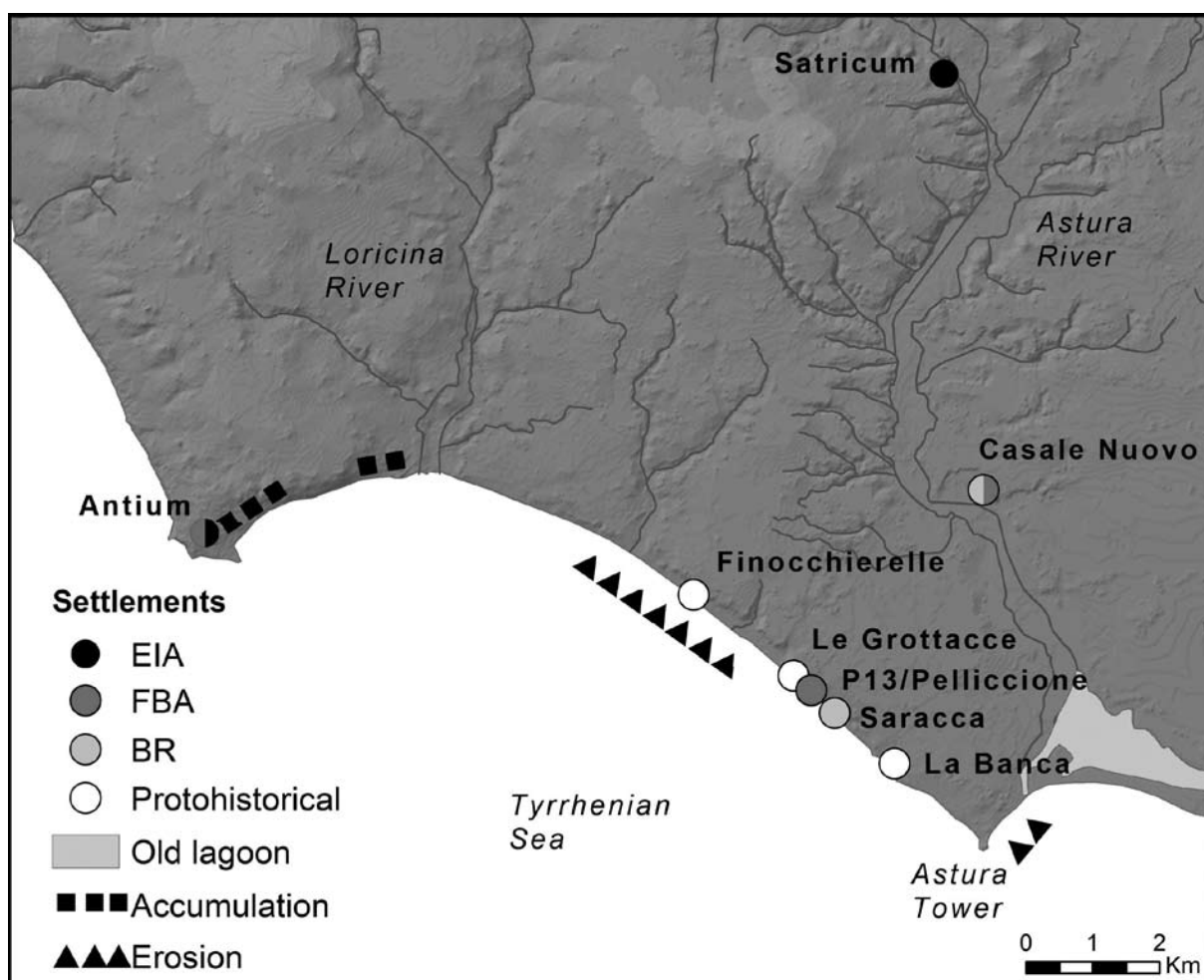


Fig. 4. Map of the coastal zone between Anzio and Torre Astura with location of sites mentioned in the text and indication of marine erosion and deposition (landscape reconstruction after Alessandri 2009) (Map: Luca Alessandri)

a date of the debris accumulation around 1200 BC (Nijboer et al. 2006, 147-148; Attema 2006, 61-65).

The coastal economy of the Pontine region in the late Bronze Age

Judging from comparable concentrations of reddish friable *impasto* pottery elsewhere along the Pontine coast, saltwinning along the Tyrrhenian Sea was a fairly common and necessary activity during the Final Bronze Age.⁶ This activity would have been accompanied by pottery production. Parsons, in his archaeological ethnography, states that ‘pottery is a special problem for archaeological studies of ancient saltmaking. Saltmakers require a great deal of pottery: as containers for holding and storing brine and water, for solar-evaporating and boiling brine, for moulding, drying and packaging crystalline salt... Because pottery is so heavy, and because so much of it is required, many saltmakers would have needed to make most of their pottery at or near their workshops. The archaeological remains of pottery-making can easily be confused with the archaeological remains of saltmaking at sites which, in their totality might be classified as saltmaking workshops’ (Parsons 2001, 301). Nearby P13/Pelliccione, we indeed

⁶ For a recent overview of protohistoric coastal sites, see di Gennaro 2008. There are several other prehistoric sites along the west coast of Italy associated with salt production. Mandolesi assembled the possible evidence for the early use of the saline near Tarquinia, where comparable pottery as recovered at P13/Pelliccione was found during a survey (Mandolesi, 1999, 174-176 and 194-204). The coastal area near Pisa also functioned as a salt-making centre since the Bronze Age (Pasquinucci, Menchelli 2002; 1999).



Fig. 5a. Overview of the environmental setting of protohistoric site of P13/Pellicione. The site is shown here already stripped of its bushes and in the course of excavation (Photo Peter Attema GIA)



Fig. 5b. Trench D at P13/Pellicione with dense packing of sherds (Photo Peter Attema GIA)



Fig. 6. Typical profile at P13/Pellicione caused by marine erosion after cleaning showing blackish layer packed with potsherds (Photograph Peter Attema GIA)

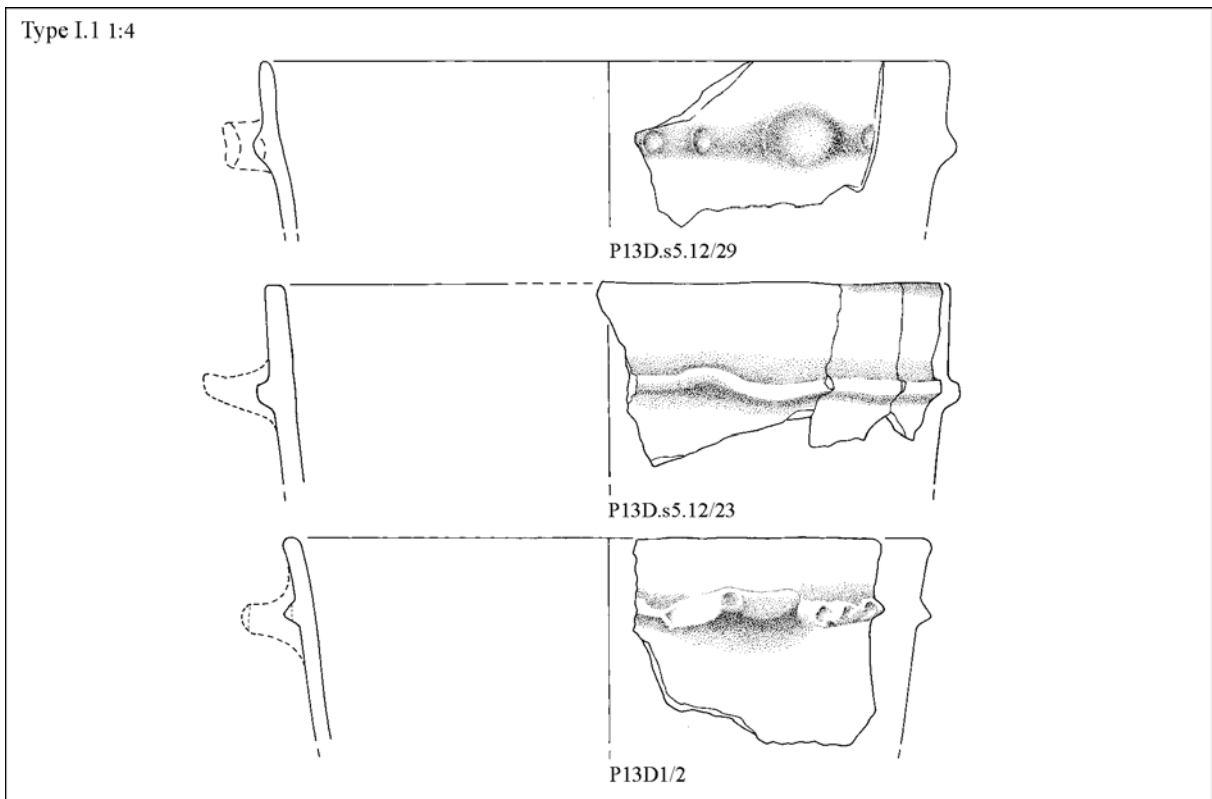


Fig. 7. Drawing of vessel types (drawing GIA)

found evidence for pottery production in the form of clay basins filled with depurated clay ready for use raising the possibility of a relationship between pottery production and saltmaking (Alessandri 2007b).⁷ Figure 10 (and figure 4 more in detail for the study area dealt with in this paper) shows sites dating between the Middle Bronze and Early Iron Age so far. The sites recorded by us along the Pontine coast probably only constitute a small sample of protohistoric sites once extant here, given marine erosion, modern urbanization and factors affecting the visibility of the Bronze Age archaeological record such as Aeolian sand cover.

From the Recent Bronze Age onwards, we can relate the special activity sites on the coast, above plausibly connected with saltmaking and local pottery production, to settlement sites located inland along the main rivers in the area. Figure 4 makes clear the spatial relationships of the inland sites with those on the coast. We identify one particular inland site here, Casale Nuovo, that gives insight into the character these inland sites may have had. So far, Casale Nuovo is the only inland site to have been excavated, however with important results regarding craft specialization.

Casale Nuovo is located on a hillock in a bend of the river Astura less than 5 km from the coast and has been excavated by the Archaeological Superintendence of Lazio between 1985 and 1987 in two sectors with a total surface of 100 m² (Angle 1992; Angle et al. 1993; Angle 1996). In the first sector, 25 pits were found measuring between 1.50 – 2.00 m in diameter thought to have been used for the preparation of clays for the production of fine wares, notably a type of grey ware that we know from Bronze Age settlements in northern Calabria. However, also evidence for metalworking was found at Casale Nuovo in the form of remains of lead and copper smelting (Angle et al. 1993; Giardino 2006). Household pottery found in these pits reused as debris pits, dates the artisan activities at Casale Nuovo to the Final Bronze Age. In the second sector, a pit was found dating to the Recent Bronze Age likewise with traces of metalworking. Here a painted sherd of an *anfora a staffa* was found datable to the Late-Helladic IIIB/IIIC period. The piece may have been produced in Calabria, South Italy, but also sherds were found of pottery produced in the Aegean itself (Angle et al. 1993; Jones, Levi 2004). At Casale Nuovo we have thus evidence for specialisation in metalworking and pottery production as well as the presence of imported pottery, the latter probably via contacts with South Italian Bronze Age settlements, which testifies to the maintaining of long-distance contacts.

From the Casale Nuovo excavations, it follows that we have to read Bronze Age salt production in a local setting of artisan activities and trading contacts (as the region itself has no metal ores) as well as overseas exchange contacts (as the imported pieces of pottery from South Italy suggest). In the theoretical framework of the Roman School of protohistory, this would indicate the presence of persons in settlements as Casale Nuovo who would have controlled such artisan activities, and by implication that vertical mobility took place in late Bronze Age society (Peroni 1996; Pacciarelli 2001).⁸ This is an important observation as burial and ritual evidence informing us on the complexity of late Bronze Age society for Central Italy is not abundant (Bietti Sestieri, De Santis 2003; De Santis 2005) and we consequently have little information on social stratification of Bronze Age society. The Italian protohistorian Annamaria Bietti-Sestieri has pinpointed the intensity of overseas contacts and integration with Aegean peoples as one of the indicators of political and socioeconomic complexity in Bronze Age Italy, alongside factors as settlement hierarchy and level of craftsmanship (Bietti Sestieri 2005). On account of the few imports of Aegean pottery we dispose of now, it becomes clear that Bronze Age South Lazio was not as isolated as once was thought. While there certainly remains a major difference between the degree of socioeconomic complexity in the Pontine region and, for instance, Sicily, Calabria or Sardinia, it shows that even a less developed area such as the Pontine region participated in interregional exchange networks during the late Bronze Age. This is indeed contrary to the idea that the region was isolated and dedicated to subsistence farming and pastoralism only (e.g. Puglisi 1959). In the next paragraph we will zoom further out and have a brief look at the overall settlement pattern in South Lazio and current ideas on the complexity of late Bronze Age social organization.

⁷ However, no potsherds have been found yet to confirm this hypothesis.

⁸ By 'vertical mobility' the movement of individuals or groups is meant from one status to another; in this case the formation of elite is meant in control of artisan production and trade.

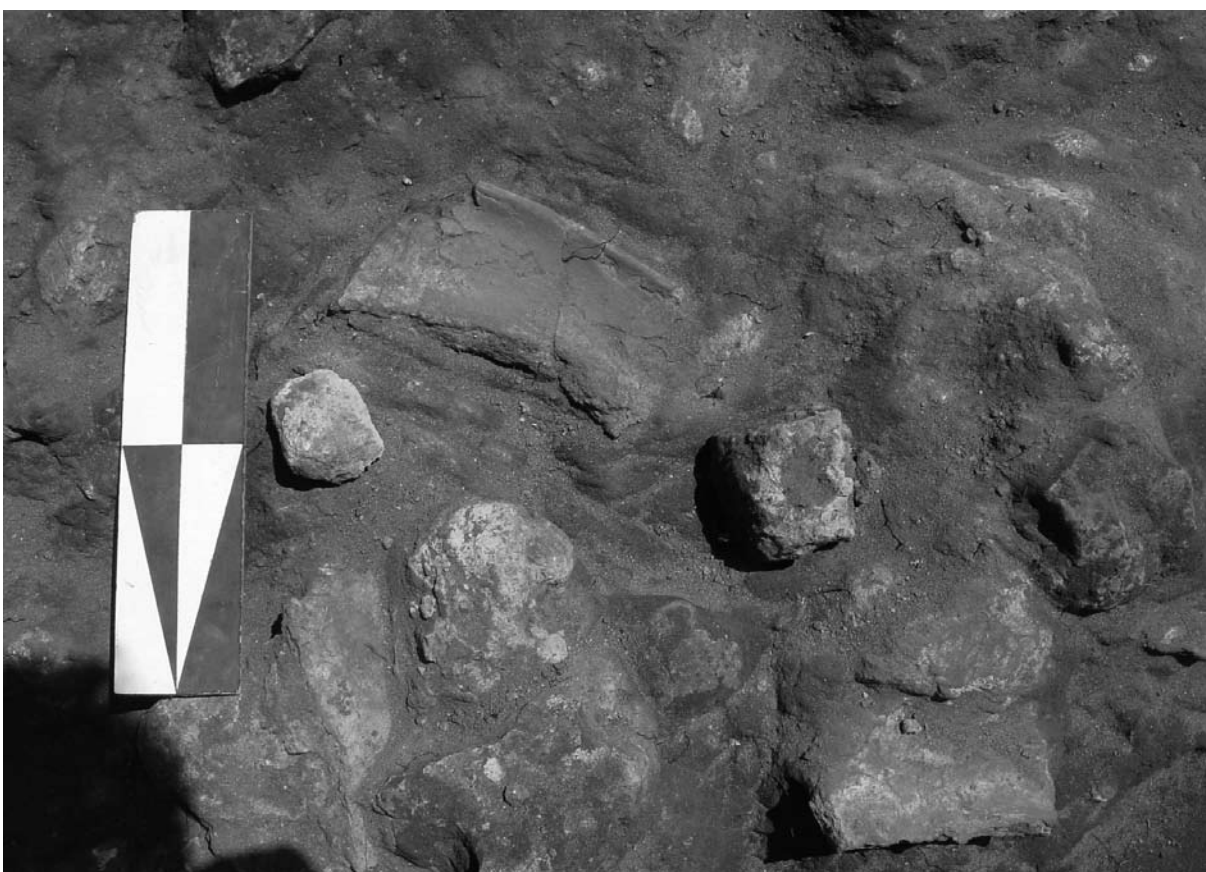


Fig. 8a and 8b. In situ fragments of volcanic stone at P13/Pellicione with traces of burn and sherds of impasto storage vessels (Photos Peter Attema GIA)

Late Bronze Age settlement in South Lazio

Figure 10 zooms out onto Lazio south of Rome including the Alban Hills, the fertile volcanic areas inland. Recently, in a detailed PhD study on Bronze Age settlement in South Lazio by the second author of this paper, it was observed that the Alban Hills and the Pontine plain followed different trajectories as to their settlement development (Alessandri 2009). Already in the Recent Bronze Age settlements in the Alban Hills were located in naturally defended positions along the rim of the crater, with a distance between them of ca. 7 km. In the following period of the *Bronzo Finale* 1, 2 and the *Bronzo finale* 3, settlement density increased dramatically and social competition became evident in the form of cremation burials. Such burials were the privilege of only those members of society with special status. This corroborates our earlier observation that in the late Bronze Age vertical mobility was taking place and elite was created that controlled economic resources and exchange networks. In our opinion there is reason to link the process of demographic increase in the hinterland with the coastal economy that we just discussed. After all we have, with the excavations at Casale Nuovo and the saltern at P13, only caught a glimpse of the probably widespread nature of these activities and their intricate relationship with inland settlements.

Saltmaking in the context of social organisation

Jeff Parsons, in his study on the last saltmakers in the valley of Mexico, sketched a scenario of five stages in prehispanic saltmaking based on the idea that technology, scale and polity formation are closely and directly interrelated. He observes that in a period of demographic growth – in the Mexican case this was the Early postclassic period (AD 900- 1100) – saltmaking will become a highly



Fig. 9. Base of vessel with salt colours (Photo Gert van Oortmerssen GIA)

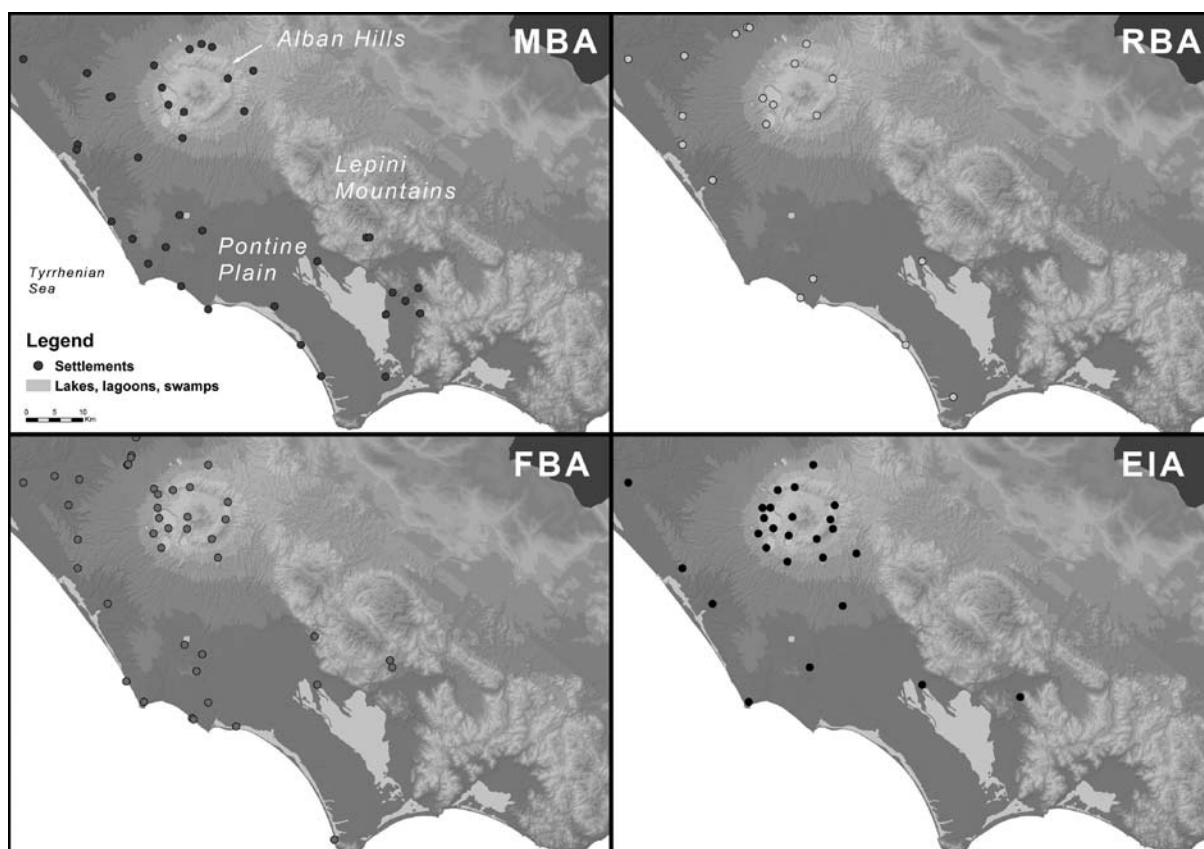


Fig. 10. Site distribution during the Middle Bronze, Recent Bronze, Final Bronze and Early Iron Ages respectively (Maps: Luca Alessandri)

visible activity, involving the boiling of brine with the use of very large quantities of a specialized form of pottery. Parsons notes that ‘supplementary brine boiling may well correlate with the first need to accumulate significantly larger quantities of crystalline salt, a result, perhaps, of population growth or tributary demands imposed on saltmakers in the context of increasing hierarchical and centralized polities (Parsons 2001:298). In the valley of Mexico in the Early postclassic period, the scale of society increased from an estimated 130,000 to 200,000 people in an area that in dimensions is comparable to the area we dealt with in the previous paragraph. We may imagine a situation in which the developing chiefdoms in the Alban Hills shared access to major salt sources, a scenario that would be supported by African examples (Sutton, Roberts 1968, 70 cited in Parsons 2001, 304). While there are many problems with cross-cultural and cross-diachronic comparisons of this kind, Parsons’ scenario may well be valid for South Lazio as saltmaking of the briquetage type on the South Latial coast indeed developed in the context of a society characterized by demographic growth, involvement in long distance trade and investments in craft production. Such developments would have been typical of a society moving from a segmentary organisation in small autonomous villages to a chiefdom based society with a higher degree of centralised power (for a concise discussion of the nature and scale of society in anthropological terms, see Renfrew, Bahn 2008, 180 with bibliographical references on p. 598). Following on the Final Bronze Age both in early Iron Age Etruria and South Lazio, true chiefdom polities came into existence (Pacciarelli 2001; Guidi 2006). In our opinion, it is in this context of an increasingly complex society that we should read the late Bronze Age ‘industrial’ and artisan activities on the coast of Lazio such as specialized pottery production, metalworking and salt production.

There remain however problems with the supposed relationship between an increasing archaeological visibility of saltmaking and increasing population numbers as proposed in Parsons’ scenario. When in the later Iron Age and Archaic period in Central Italy major polities in Etruria and Lazio become a reality, such as Vulci, Tarquinia, Rome itself and Satricum, to name a few, we archaeologically

seem to lose track of salting, while we must postulate a substantial leap in population numbers to have taken place and therefore an increase in the scale of salt production.⁹ Can it be that during this period solar evaporation in salt beds had replaced briquetage as a more efficient way to produce the quantities of salt needed to sustain the growing urban and rural population of Etruria and Lazio in environments with *saline* like the medieval ones in the Tiber delta that we mentioned in the beginning of this paper? Alternatively, during the Bronze Age, briquetage may have always existed side by side with the extraction of marine salt from salt flats, with briquetage being a specialised form of salting with specific functions. Olivier Weller (2004, 296) notes how ‘production of salt, or rather of salt cakes, was probably an integral part of a broader process of intensification of social relations and exchange systems, in which control over salt resources, production and distribution of salt cakes could have become a major preoccupation where salt... could be highly valued’ and that we have to find means to try to understand ‘the particular social contexts within which salt, or rather the salt cake, far from playing an actual role in food consumption, becomes a product of exchange value and a lasting means of storing wealth’. This certainly is an issue that has to be researched in more detail for the salting sites of the briquetage type along the Tyrrhenian coast.

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⁹ Some Iron Age sites may have been involved in salting processes in which pottery was used. From Tarquinia on the coast north of Rome sherds are reported from the saline di Tarquinia, while in the Pontine region near Nettuno, at a short distance of the site P13/Pellicione, a team from the Groningen Institute of Archaeology mapped a profile exposed by marine erosion with thick layers of friable reddish impasto dating to the late Iron Age (Alessandri 2007a, 82-86). A report on the latter site of Depuratore is due to be published in the *Paleohistoria* 53/54, due end 2012.

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