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The Isola di Coltano Bronze Age village and the salt production in North coastal Tuscany (Italy)

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Résumé

Le village de « Isola di Coltano » était situé le long des rivages d'une lagune dans le secteur méridional d'un système de dunes pléistocènes. Cette aire, qui actuellement fait partie d'une zone agricole du territoire de Pise, a été étudiée dans le cadre d'un projet pluridisciplinaire relatif à la Toscane nord occidentale. Sur le site, cinq campagnes de fouilles ont été effectuées entre 1993 et 1997 : il en résulte que le village fut actif à partir de 1600 jusque 1200 avant J.-C. ; il fut submergé au moins quatre fois par la lagune et chaque fois tenacement réoccupé. Les fouilles n'ont pas révélé de traces de cabanes ni de résidus de repas. Les couches anthropiques sont constituées de plus de 10 000 fragments de gros récipients céramique. Quelques foyers y sont associés. S'ajoutent à ces données des objets en terre réfractaire de forme cylindrique ou parallélépipédique, objets que l'on retrouve habituellement près des centres de production du sel. Nous en avons déduit que le site de « Isola di Coltano » était spécialisé dans la production du sel. D'autres installations similaires de l'époque protohistorique et historique ont été individualisées le long des côtes de la Toscane et du Latium.

Abstract

The Isola di Coltano (Pisa) village was located on the banks of a coastal lagoon, in the southern sector of a Pleistocene dunal system. The area is now part of an agricultural tenute in the Pisan region and it has been studied within a multidisciplinary project concerning coastal north Etruria. Five campaigns were undertaken from 1993 up to 1997. The Isola di Coltano village appears to have been occupied from 1600 BC to 1200 BC. The site was repeatedly submerged by the lagoon (almost 4 times), but it was always tenaciously reoccupied. During the excavations, no evidence for houses or food waste was identified; the cultural layers were formed by more than 10 000 fragments of large coarse vessels. Numerous clay parallelepiped and cylindrical firedogs were found in areas with hearths; they are typical of saltmaking centres. Therefore we can deduce that the Isola di Coltano village was specialized in this activitity. Other similar protohistoric and historic sites have been identified along the Tuscan and Latial coasts.

Zusammenfassung

Die Siedlung Isola di Coltano (Pisa) befand sich am Ufer einer Lagune im südlichen Teil eines pleistozänen Dünensystems. Heute gehört das Gelände zu einem auf pisanischem Gebiet liegenden Landgut, und es ist im Rahmen eines multidisziplinären Projekts, das im Nordwesten Etruriens durchgeführt wurde, untersucht worden. Auf dem Gelände sind in den Jahren 1993 bis 1997 fünf Ausgrabungskampagnen durchgeführt worden: Aus diesen ging hervor, dass die Siedlung von 1600 bis 1200 v. Chr. Bestand hatte. Mindestens viermal wurde sie von der Lagune überschwemmt und jedes Mal wurde sie hartnäckig wiederbesiedelt. Im Verlauf der Grabungen wurden keine Reste von Hütten oder Nahrungsmitteln entdeckt. In den Siedlungsschichten fanden sich über 10000 Scherben von großen Behältern aus grober Keramik. Im Befundzusammenhang mit einigen Feuerstellen sind außerdem zahlreiche, zylinder- oder quaderförmige Objekte aus feuerfestem Ton entdeckt worden, die für die Salzgewinnung charakteristisch sind. Es wird daher angenommen, dass das Gelände der Isola di Coltano auf eben diese Aktivität spezialisiert war. Weitere, ähnliche Siedlungen aus vorgeschichtlicher und geschichtlicher Zeit befinden sich an der toskanischen Küste und an der Küste des Latiums.

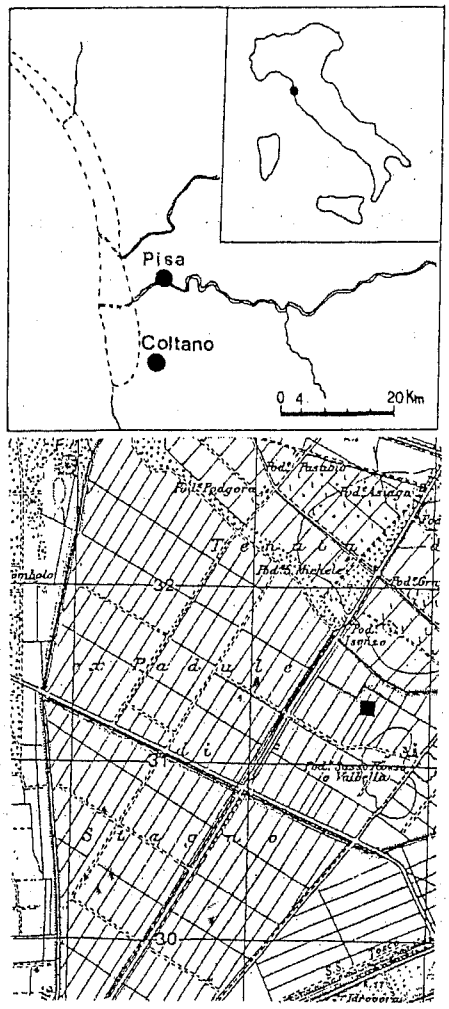

Fig. 1 : The Isola di Coltano site
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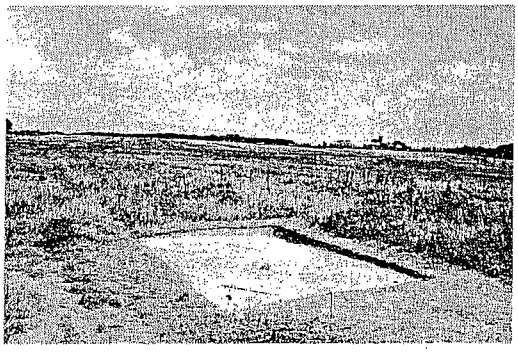

Fig. 2 : Trench I (overall view from south-west)

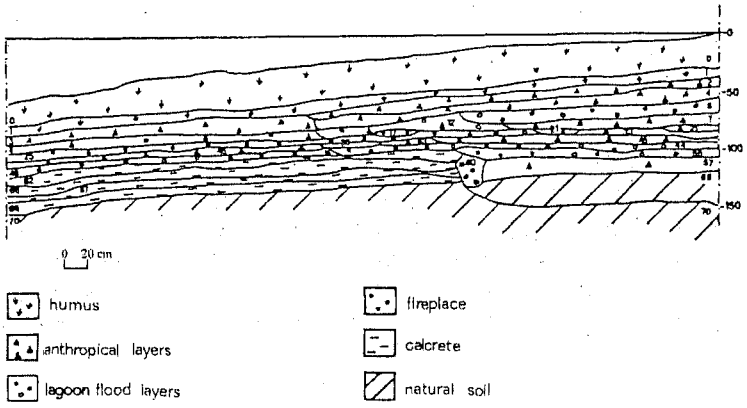

Fig. 3 : Trench I (east-west section)

Presentation and excavation (M.P.)

The Isola di Coltano (Pisa) village was located on the banks of a coastal lagoon, in the southern sector of a Pleistocene dunal system (Mazzanti, 1994). The area is now part of an agricultural tenute in the Pisan territory (fig. 1) and it has been studied within a multidisciplinary project concerning North Coastal Etruria (Pasquinucci *et al.*, 2002).

In 1984-1986, intensive surveys carried out in the Isola di Coltano ploughed fields provided the following data :

- The area has been frequented from the Middle Palaeolithic period (many Mousterian tools have been found) ;
- Anthropic activities are documented also in the Neolithic and Protohistoric periods.
- Small archaic and hellenistic farmsteads have been identified.
- A *villa rustica* was built in the last decades of the century BC and remained active up to the late period.

ıe ground of these remarkable evidences, excavations were planned in the Isola di Coltano area, in the site where the Roman villa scatters were more concentrated. Two trenches were opened (I : m 12 NE/SO x 7 NO/SE ; II : m 4 NE/SO x 5 NO/SE) (fig. 2), and five campaigns were yearly performed from 1993 up to 1997 (Paquinucci and Menchelli, 1997).

The archaeological stratigraphies (fig. 3) can be summarised as follows :

- The superficial layers are formed by agricultural soil (US 0, US 1) containing Archaic and Roman finds (pottery and metal items). The villa stratigraphies were most probably destroyed by recent agricultural activities, since no Roman evidence was discovered in situ.
- Protohistorical stratigraphies have been found below 0 and 1; the layers (US 2-3-4-5) were well-preserved as they had not been reached by ploughing : they were formed by mounds of fragmented Bronze age vessels (fig. 4). They covered yellow silt deposits (US 6, 11, 13) containing a large amount of molluscs (mostly *Cerastoderma edule*) which were characteristic of a low brackish marine habitat, typical of a lagoon. The molluscs valves were closed : it provides

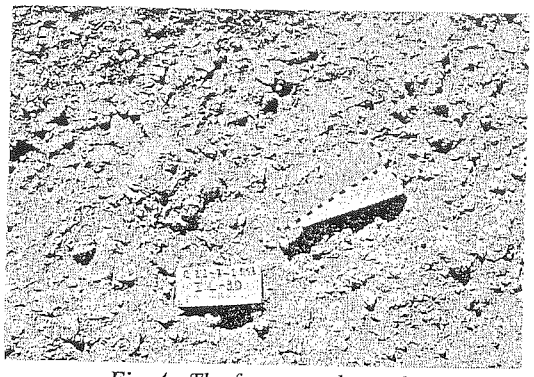

Fig. 4 : The fragmented vessels

evidence they died *in loco* and the 6-11-13 layers were formed by a lagoon flood in the village site.

- The silt deposits covered mounds of vessels (US 7, 20-21, 26), mostly in the Eastern sector of the excavated area. A fireplace (US 17) belonged to this village phase : a charcoal sample has been dated back to 1686-1538 cal. BC (^{14}C analysis by the Centre for Isotope Research at Gröningen).

- The layers below (US 25, 28, 29, 31) provide evidence of a further lagoon flood: they were grey-yellow silt deposits with very numerous *Cerastoderma edule* specimens. These molluscs were of various size, according to the different biologic cycles : e.g. US 28 was characterized by mature individuals.

- The anthropic layers below were documented by vessel heaps: (US 43, 45) ; three fireplaces (US 16, 36, 46/50) were connected with this phase. Many clay firedogs have been found in these stratigraphies. Below were other silt layers (US 44, 47, 48), covering a remarkable mound of *Cerastoderma edule* individuals (US 55) (fig. 5), mostly deposited in the central sector of the excavated area (US 60) (fig. 6), where they sketched the undertow line. At this depth two different situations were evident, separated by the molluscs mound described above. In the Eastern sector, in the dune offshoots, were thick silt deposits containing rare pottery fragments (US 57) (fig. 7), while westwards, in the plain part that was flooded for a longer time were layers of very hard *calcrete* (US 62, 66-67, 68). This formation originates in the water evaporation and is characteristic of soils rich in carbonates which are often submerged (fig. 8). Many fragmented vessels have been found in the *calcrete* layers : they appeared rounded and tossed by the waves.

- The silt and *calcrete* deposits covered the natural soil : this consists in a yellow sandy fine silt (US 69) in the Eastern sector, while in the Western one the natural layer was formed by a very plastic yellow-green clay containing large molluscs (US 70). Below the sandy silt, the clay was found also in the Eastern sector (depth about -1, 55 m) and it appeared to be present in the whole area.

During the excavations no evidence of huts or waste foods was identified; as seen, the anthropic layers were formed by pottery mounds : more than 10 000 fragments of vessels were found !

Concerning the chronology of the site, some vessels in the calcrete layers date back to the Middle Bronze Age, corresponding in Tuscany to the

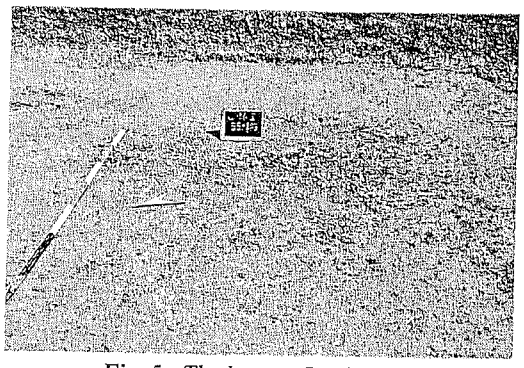

Fig. 5 : The lagoon flood layers

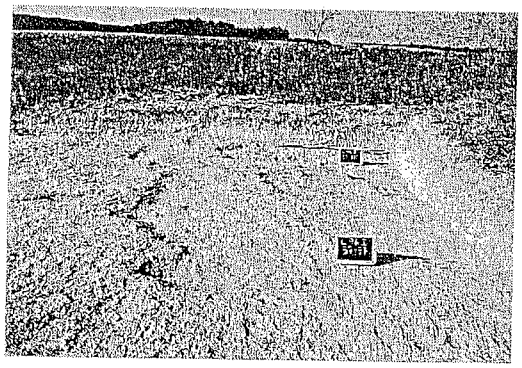

Fig. 7 : The undertow line

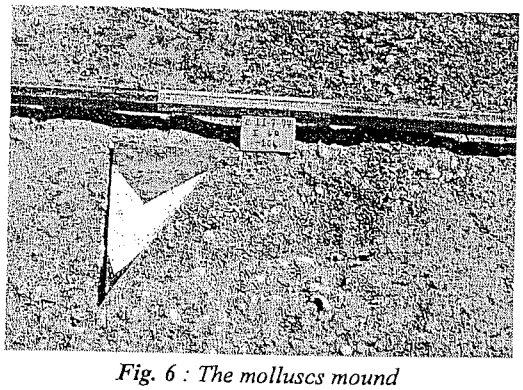

Fig. 6 : The molluscs mound

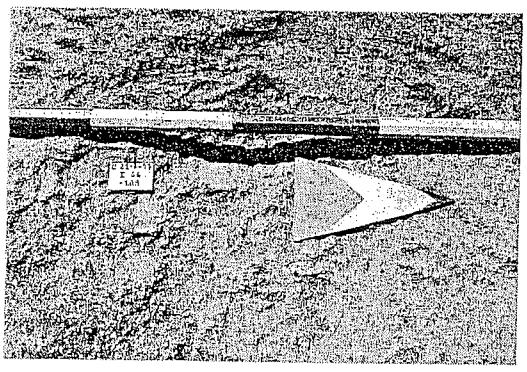

Fig. 8 : A calcrete layer

Protoapenninic facies (1600 BC : Bietti, 1996) ; this datum wholly agrees with the ^{14}C analysis regarding fireplace US 17. The upper deposits date back to Recent Bronze Age (Subapenninic facies : 1300 BC), while the superficial layers contain some Final Bronze Age vessels (Protovillanovian facies : 1200 BC). Therefore the Isola di Coltano village appears to have been living for four centuries : the site was repeatedly submerged by the lagoon (almost 4 times), but it was always tenaciously reoccupied.

Pottery and Saltmaking (S.M.)

In a such long period the Isola di Coltano pottery facies shows a surprising both morphologic and technical continuity. More than 75 % of the ceramic finds are constituted by coarse vessels and their forms and fabrics appear not to have changed from 1600 up to 1200 BC (di Fraia and Secoli, 2002).

The most common forms in the site were large subcylindrical and frustum-conical vessels; their rim diameters often reach 50 cm (fig. 9, 1-4). They were decorated with horizontal relief fillets, either plain or finger-printed. Their walls and bottoms are thick (from 1 to 2 cm). The fabrics appear to be constantly red-brown, coarse, porous, with white and black inclusions ranging from 1 to 3 mm and over in size. Their minero-petrografical characters agree with a strictly local production. The fine table pottery is less than the 5 % of the total ; we did not find tools and/or vessels connected with domestic activities, e.g. weaving and milk-working.

The archaeological data till now examined provide evidence that the Isola di Coltano site was a not a dwelling but an « industrial » village. After the location on the lagoon banks and the numerous clay firedogs found in the excavations, the site was evidently specialised in the salt production.

11 parallelepiped and 14 cylindrical firedogs (average size : 35 cm high and 12 cm wide) were discovered, as well as many fragments (fig. 9, 5-6 ; fig. 10) ; they were mostly concentrated in the fireplaces areas. Similar items are documented as supports for the vessels in the saltmaking both in Prehispanic Belize (Valdez and Mock, 1991 ; Liot, 2000) and in the Medieval Lorena (Bergier, 1984). Such clay firedogs were used for the salt production in the Manga Region (Niger) in 1973 (Hees, 1999, p. 167).

From these data, we can infer that in the Coltano area people gathered salt by means of coastal lagoon water evaporation ; afterwards the product was boiled in the vessels in order to refine and reduce it in salt lumps. This saltmaking process is documented since the Neolithic period (Weller, 1998, p. 282-283). After boiling the brine, a strong cohesion might bind the pottery and the crystallised salt; it was often necessary to break the bowls in order to recover the precious product. Therefore we can explain the large quantity of fragmented pottery usually found in the salt production centres (Weller, 1998, p. 283).

Most likely the Isola di Coltano village and the nearby lagoon system played an important role in the economy of North Tuscany. Salt was necessary for human and animal feeding, fish and meat preservation, for cheese making and preservation (Delluc *et al.*, 1995). In the Bronze age the development of sedentary and transhumant livestock breeding is well documented in Northern Tuscany (Zanini, 1997) and most probably this phenomenon increased the salt demand.

The location of the Isola di Coltano village was very convenient both for the production and the distribution of this precious ware by means of the inland lagoon/river navigation system (Mazzanti, 1994). It is worth stressing that a dwelling village has been identified in Paduletto site, a few km North-West from Isola di Coltano (fig. 11). It is dated back to the Ancient/Middle Bronze age ; its inhabitants practised milk working activities (Bagnoli and Panicucci, 1986 ;

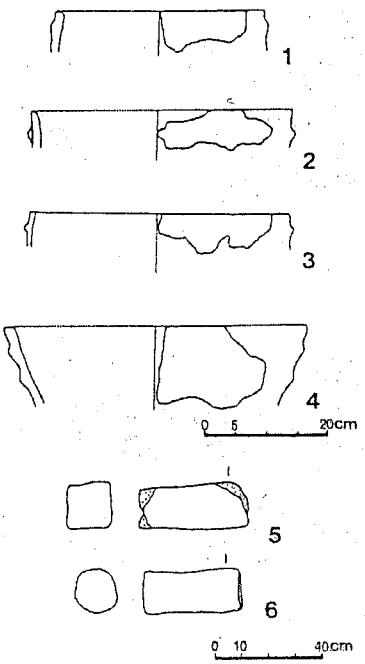

Fig. 9 : 1-4 coarse vessels ; 5-6 firedogs

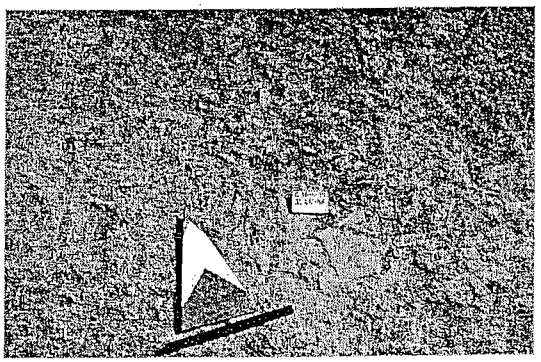

Fig. 10 : A fragmented firedog during the excavation

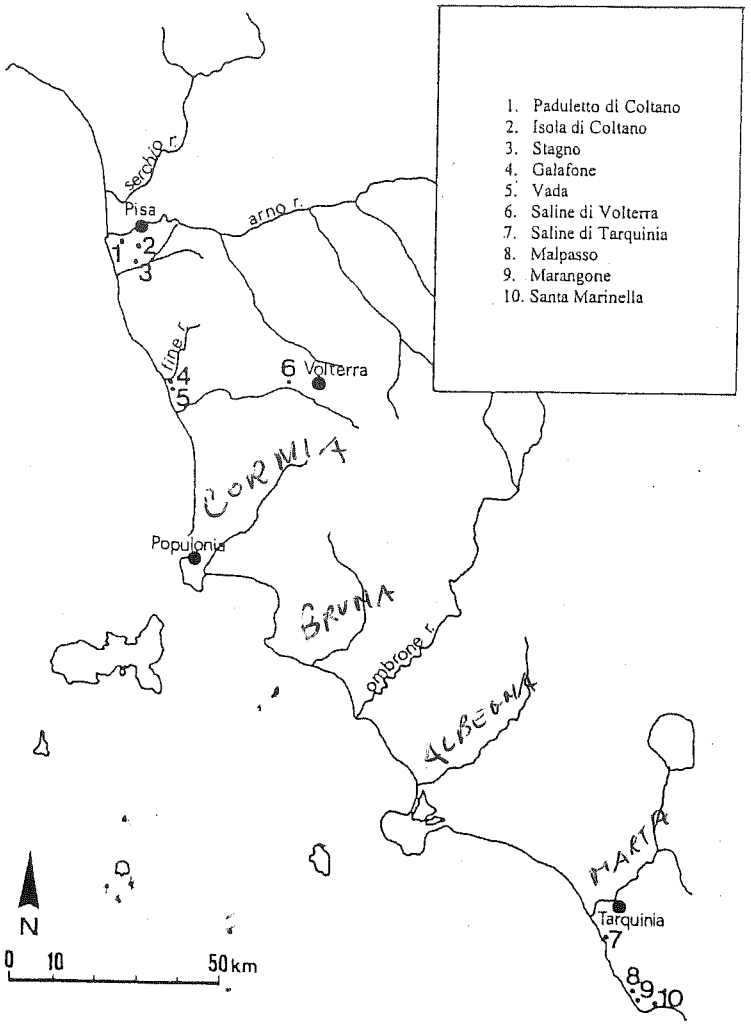

Fig. 11 : The sites mentioned

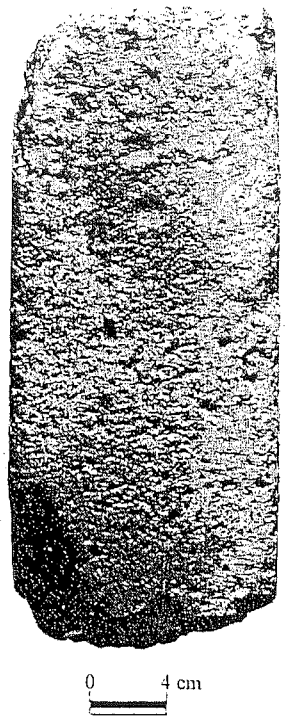

Fig. 12 : A firedog found in the Stagno site

di Fraia, 1997).

Other Bronze age villages specialised in salt production can be probably identified along the Latial shores, in particular in the area between Saline di Tarquinia (meaningful place-name !) and Santa Marinella (fig. 11). This area, characterised by numerous inlets suitable for cabotage navigation, was inhabited since the Middle Bronze age ; afterwards it was intensely occupied in the early Iron age (Belardelli and Pascucci, 1998).

Many villages have been identified. Some of these had a complex typology, showing both sectors for specialised activities and dwelling areas. After the villages location, it is most likely that their inhabitants were involved in saltmaking and perhaps also in the production and trade of salted food (especially fish) (Pacciarelli, 1991). Two sites in particular, Malpasso and Marangone (fig. 11), appear to be specialised villages, as they had no dwelling sectors.

In the Marangone area the anthropic presence dated back to the Middle Bronze age. The early Iron age layers were constituted by pits filled exclusively with fragmentary vessels, by pottery mounds and fireplaces (Buffa *et al.*, 1991-1992 ; d'Ercole *et al.*, 1995-96). The vessels (large pots with *svasato* rim) appear to be standardised in the forms and fabrics, providing evidence that they were used for manufacturing purposes. The Malpasso site shows the same archaeological facies: the Iron age stratigraphies were characterised by the predominant presence of large pots with the same morphology of the Marangone ones (Peroni, 1953 ; Belardelli and Pascucci, 1998).

Most probably in the early Iron age the Latial saltmaking was connected with the new economic mechanisms run by the most important proto-urban centres (d'Ercole *et al.*, 1995-96, p. 442).

In the early Iron age, along the Tuscan coasts the saltmaking is documented in the Galafone site, close to the Fine river mouth (fig. 11). By means of intensive surveys great mounds of fragmented coarse vessels have been identified, together with layers of ashes and some parallelepiped firedogs, similar to the Coltano ones (Pasquinucci *et al.*, 2002).

These supports have been discovered by intensive surveys also in the Stagno area (fig. 11), in a site dated from the early Iron age to the archaic period (Bagnoli

and Panicucci, 1986) (fig. 12). In North Etruria the salt production is significantly documented also in the Roman and Medieval periods. Evidence of the sea salt production along the Volaterran coast is provided by the Late roman poet Rutilius Namatianus (early fifth century AD). He described the salt marshes close to the Vada Volaterrana harbour (now S. Gaetano di Vada area : fig. 11) : the sea entered in the marshes through some canals and a drainage ditch irrigated the water basins *(De reditu suo* I, 475). On the grounds of archival evidence, salt production is documented from 754 AD up to 1237 in the same area (Ceccarelli Lemut, 2000). Large salt mines were located in the Volterran territory, along the Cecina valley, in the area of the modern village « Saline di Volterra » (Volaterran Salt Mines : fig. 11). These mines were one of the main sources of wealth for the local economy ; it is likely that in the Ancient times they were managed by the Volaterran ruling class. Archive researches give evidence that from 974 AD they were run by the Volaterran Bishops (Marrucci, 2001).

Photo by M. Pasquinucci and S. Menchelli
Drawings by G. Picchi

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