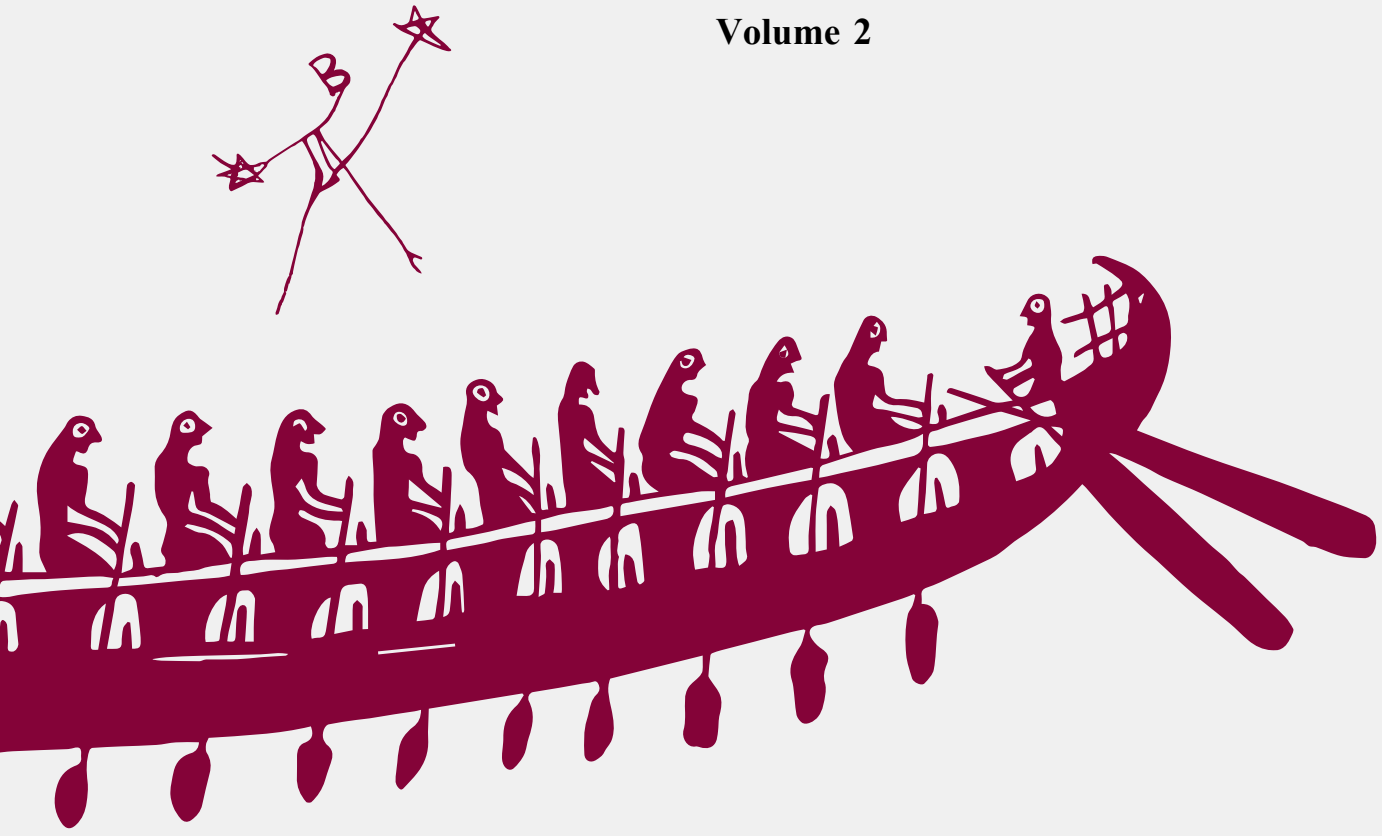
EUBOICA II

Pithekoussai and Euboea between East and West

Proceedings of the Conference
Lacco Ameno (Ischia, Naples), 14-17 May 2018

Teresa E. Cinquantaquattro, Matteo D'Acunto and Federica Iannone

Volume 2



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ABBREVIATIONS

Above sea-level: above s.l.; Anno Domini: AD; and so forth: etc.; Before Christ: BC; bibliography: bibl.; catalogue: cat.; centimeter/s: cm; century/ies: cent.; chap./chaps.: chapter/chapters; circa/approximately: ca.; column/s: col./cols.; compare: cf.; *et alii*/and other people: *et al.*; diameter: diam.; dimensions: dim.; Doctor: Dr; especially: esp.; exterior: ext.; fascicule: fasc.; figure/s: fig./figs.; following/s: f./ff.; fragment/s: fr./frs.; for example: e.g.; gram/s: gm; height: h.; in other words: i.e.; interior: int.; inventory: inv.; kilometer/s: km; length: ln.; line/s: l./ll.; maximum: max.; meter/s: m; millimeter/s: mm; mini- mum: min.; namely: viz.; new series/nuova serie etc.: n.s.; number/s: no./nos.; original edition: orig. ed.; plate/s: pl./pls.; preserved: pres.; Professor: Prof.; reprint: repr.; series/serie: s.; sub voce: *s.v.*; supplement: suppl.; thick: th.; tomb/s: T./TT.; English/Italian translation: Eng./It. tr.; volume/s: vol./vols.; weight: wt.; which means: scil.; width: wd.

Abbreviations of periodicals and works of reference are those recommended for use in the *American Journal of Archaeology* with supplements in the *Année Philologique*.

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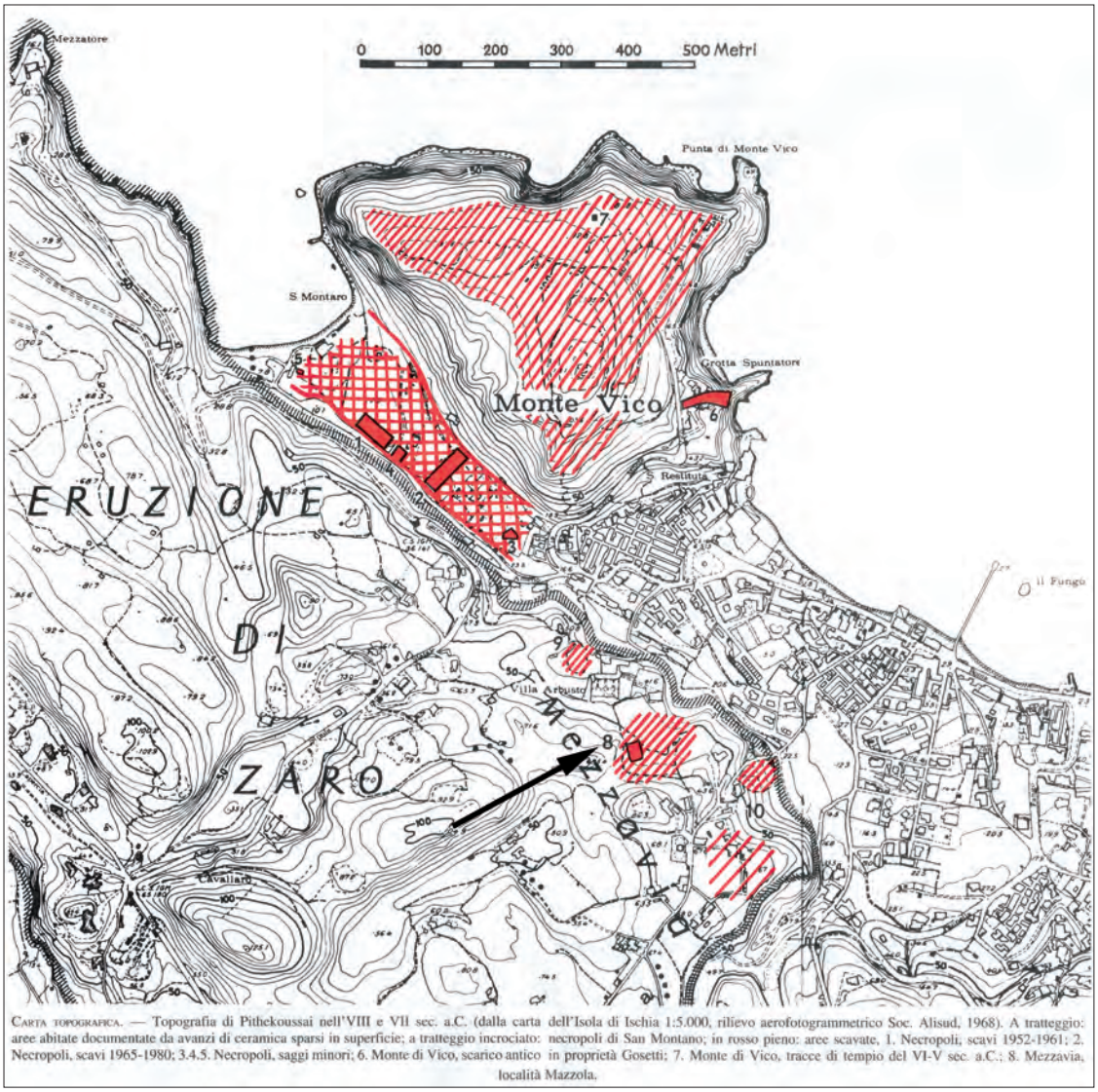
THE MANUFACTURING DISTRICT IN MAZZOLA AND ITS METAL PRODUCTION

Costanza Gialanella, Pier Giovanni Guzzo

In this paper we present the manufacturing district in Mazzola. After a section on the architectural and stratigraphical evidence, taken from J. Klein's excavation diaries, the finds will be examined.

I. Architectural and stratigraphical evidence

The Mazzola settlement, known in the bibliography as the "metal district", is situated at Lacco Ame-



Carta topografica. — Topografia di Pithekoussai nell'VIII e VII sec. a.C. (dalla carta dell'Isola di Ischia 1:5.000, rilievo aerofotogrammetrico Soc. Alisud, 1968). A tratteggio: aree abitate documentate da avanzi di ceramica sparsi in superficie; a tratteggio incrociato: necropoli di San Montano; in rosso pieno: aree scavate, 1. Necropoli, scavi 1952-1961; 2. Necropoli, scavi 1965-1980; 3.4.5. Necropoli, saggi minori; 6. Monte di Vico, scarico antico in proprietà Gosetti; 7. Monte di Vico, tracce di tempio del VI-V sec. a.C.; 8. Mezzavia, località Mazzola.

Fig. 1. Topographical map of Pithekoussai (from Buchner – Ridgway 1993)

no, on the western side of the Mezzavia hill, facing the western side of the Monte di Vico acropolis (Fig. 1). It is on a slope and is almost semicircular in shape.

After its discovery in 1969, it remained almost unpublished, except for the three articles by Buchner and the excavator Klein[1]. Thanks to the meticulousness of N. Manzi, as part of her "Scuola di Specializzazione" thesis at the University of Naples "Federico II"[2], a new reading of this settlement was realized.

This work was carried out under a number of difficult circumstances. Many of the methodological approaches used by Klein did not adequately correspond to the current stratigraphical system of excavation: thus it is difficult to make a point-by-point comparison between the stratigraphical information reported in the excavation diaries and in the graphic documentation of the Superintendence, which did not take the stratigraphical sequences into account.

To give some examples, the layers of soil were distinguished by colour and consistency, the floors by their position and relation to each building, and, fortunately, the buildings and walls were marked with Roman numbers and letters respectively, and noted on the plans. Later these could have been modified as the investigations progressed, moving from trials and trenches to larger areas.

In such conditions, the links between the stratigraphy and the ceramics were not easy to work out, even if the latter had been collected separately (as we read in the notebooks) and arranged in "numbered boxes" following the context of origin. However, it is not possible to identify a "box" with a single stratigraphic unit or "lot", because material coming from a single stratigraphic context can involve several "boxes". The "lots" are also not entirely reliable: for example, the layers of soil that are not identified as floors are defined simply as "fills", even though they are actually composed of a sequence of layers, while the postholes were excavated together with the layers in which they had been cut, without any distinction.

We must also consider that the excavated area we know of is in fact only one of four clusters, all datable to the LG I, which were identified thanks to surveys and small sondages carried out in the first campaign in 1969 – and for which there are no documentary records – which is also the case forn the last campaign in May/June 1971. All are located on the Mazzola hill at different heights, as the slope was organized in terraces descending towards the sea, as also attested in the Punta Chiarito settlement[3].

A recent confirmation of this settlement modality, a distinguishing feature of the Pithecusan settlements, comes from the discovery of small segments of dry-stone walls, a terrace wall of tufa blocks, and from pottery. All are located in the park of Villa Arbusto, the site of the Archaeological Museum of Pithecusae, on the site of Mazzola, where a German team has been operating for two years[4].

We must here remember that before the Greek settlement, the site was occupied by local people, the same who were living on the Castiglione peak, in Casamicciola[5], and whose presence in Lacco Ameno is also attested by prehistoric material in the Gosetti Dump on Monte di Vico[6]. However, at Mazzola, as in the Gosetti Dump, material from the Iron Age is absent, thereby proving that the Euboeans settled in a place that had not been inhabited by natives.

The Mazzola structures were built with the local trachyte stones; the site, according to the large amount of ceramic material found there, can be set in a chronological framework between the mid-8th and the beginning of the 7th centuries BC. During the first quarter of the 7th century BC, perhaps because of a landslide or an earthquake, the complex was largely abandoned except for a limited area, occupied once more in the first half of the 6th century BC and then abandoned again after a few more decades.

[1] Buchner 1971a, 63-67; 1971b, 364-369; Klein 1972, 34-39.

[2] Manzi 2005.

[3] For the Greek settlement in Punta Chiarito: see Gialanella 1994 and 1996; De Caro – Gialanella 1996; Gialanella 2013.

[4] About the results of these new excavations, see below, N. Burkhardt and S. Faust.

[5] On the settlement of Castiglione see, most recently, Pacciarelli 2016, with previous bibliography.

[6] For the Gosetti Dump, cf. Ridgway 1984, 96-97.

Fig. 2. Ischia, Mazzola. Metallurgical District during the excavations

The buildings are located on two sloping terraces, separated by a retaining wall (Fig. 2). Another retaining wall delimits the western edge of this area. This wall, around 2 m high, is made of large, unhewn trachyte rocks; it was facing the slope behind, made up mostly of crumbled rocks, some of which were incorporated in the structures.

N. Manzi, who generously made her work available to us, proposes a chronological definition of the settlement; the phases she identified lasted for just over a generation. As already pointed out, the reconstruction of the contexts of the materials is only partially reliable and therefore greater precision is not feasible.

Building I was built on the upper terrace in its first phase (Fig. 3), dating to LG I; it ends in an apse against which a mound, not a bench as suggested by Mazarakis[7], is heaped. The walls, as in Buildings VIII and III dated in the same phase, present two quite regular but unplastered facades; the space between the two is filled with soil and small stones. Larger stones had been used for the foundations – all the buildings, as for those in Punta Chiarito, are set directly on the ground and the upper stones decrease in size. Only the south-eastern wall (I,1) has no such double facades, probably because of the presence of wall 1 of the older Building VIII, which was partially demolished and partially rebuilt to the southwest and closing a space between Buildings I and VIII; inside this space, two postholes had been found. In the apsidal area, the banked soil lies on a yellow-brown soil layer from which came the fragments of two kraters – one of which was partially pieced together with a Late-Geometric decorated krater and now exhibited at the National Archaeological Museum of Naples in the Pithecusan section, to which we will refer below – as well as a large SOS amphora.

A small olla was buried in the Building's first phase of the floor level: it had a terracotta lid and contained some charcoal and non-human osteological remains. In association with the olla was a krater of local manufacture, an imported SOS amphora and another large container, also imported. Thanks to these discoveries, we were able to identify the apsidal area as a storeroom which supports the interpretation of this structure as a residential building, as no traces of metal manufacturing were found. These aspects, however, do not allow us to hypothesise that, this building could be the residence of an important personality, on the basis of the well-known Euboean comparisons, such as the owner of the near *ergasterion*, Building III[8].

The size of the house - having only 17.40 sq.m. of inhabitable space, more similar to that of the oval house in Punta Chiarito than to the Euboean buildings – is also in contrast with the interpretation of a rich residential building. Moreover, even if environmental factors played a considerable role – namely the steep slope to which the Pithecusan buildings had to adapt – these structures, unlike the Greek ones, are not surrounded by enclosure walls. It does not seem possible, therefore, to attribute to the aforementioned substructure walls of the terraces in Mazzola the same defining purposes as the limits of the *oikoi* that Mazarakis assigns to the Euboean and Oropos *periboloi*[9].

Concerning the ceramics, in the first phase fine wares are represented by the Late Geometric and Corinthian material, both imported and local, as well as a few fragments of Late Geometric in "white on dark"; in the second phase, this ratio is reversed. During the first phase of the building's life (and the second, about which, see below), there is continuity among the containers for transportation of liquids and food, as well as in the kitchen ware. However, while in the first phase the quantity of finds pertaining to the female sphere is remarkable, in the second, containers for food are completely absent.

Moreover, as stated above, there is no proof of activities linked to metal manufacturing thus confirming that the building was intended for a residential function only. This theory is also supported by the circumstance that the majority of the finds had been recovered in the apsidal area, both in the first and in the second phases, confirming its identification as a storeroom with a mound heaped against the curved wall. Something similar is attested, for example, in the Greek sphere, in "Building Θ" in Oropos or the oval building in Viglatouri, though here it is supposed that both these spaces had a sacral function[10]. The hypothesis that explains the second phase of room B (Fig. 4) as a *thalamos* is not conceivable either, because it was occupied by the large containers in the pantry, even if people could have slept on simple mattings, or on a wooden loft, as attested in Punta Chiarito at Pithecusa. For the western area in room A, the fixed hearth identified there confirms the use of this space for cooking and consuming food. Lastly, we have to remember that this build-

[7] Mazarakis Ainian 2007.

[8] Klein, 1972, 39; Fusaro 1982, 16; Pesando 1989, 18 ff.; Mazarakis Ainian 1998, 201-203; Mele 2003, 17-18.

[9] Mazarakis Ainian, 2007, 163.

[10] Mazarakis Ainian 1997, 48-63.

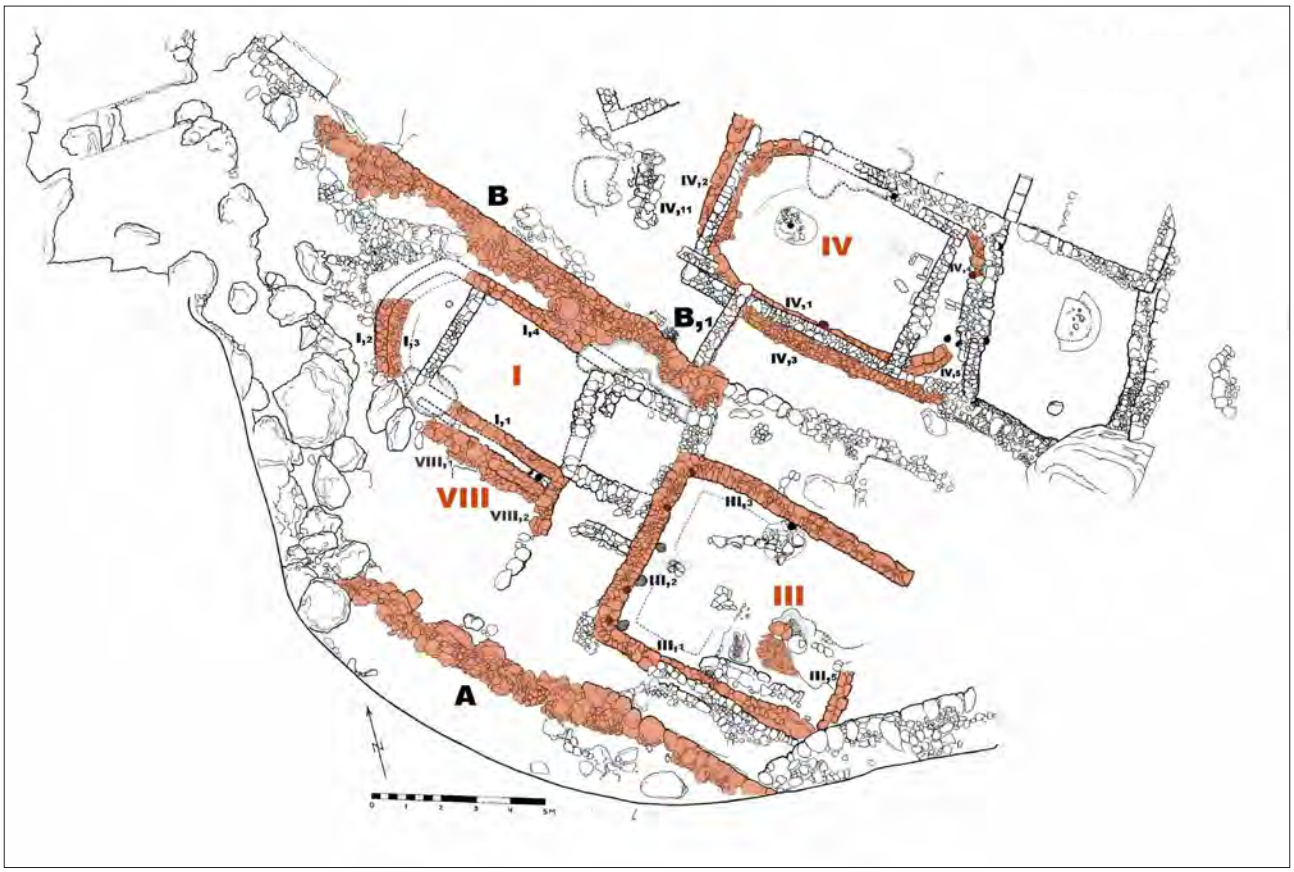


Fig. 3. Metallurgical District, phase 1

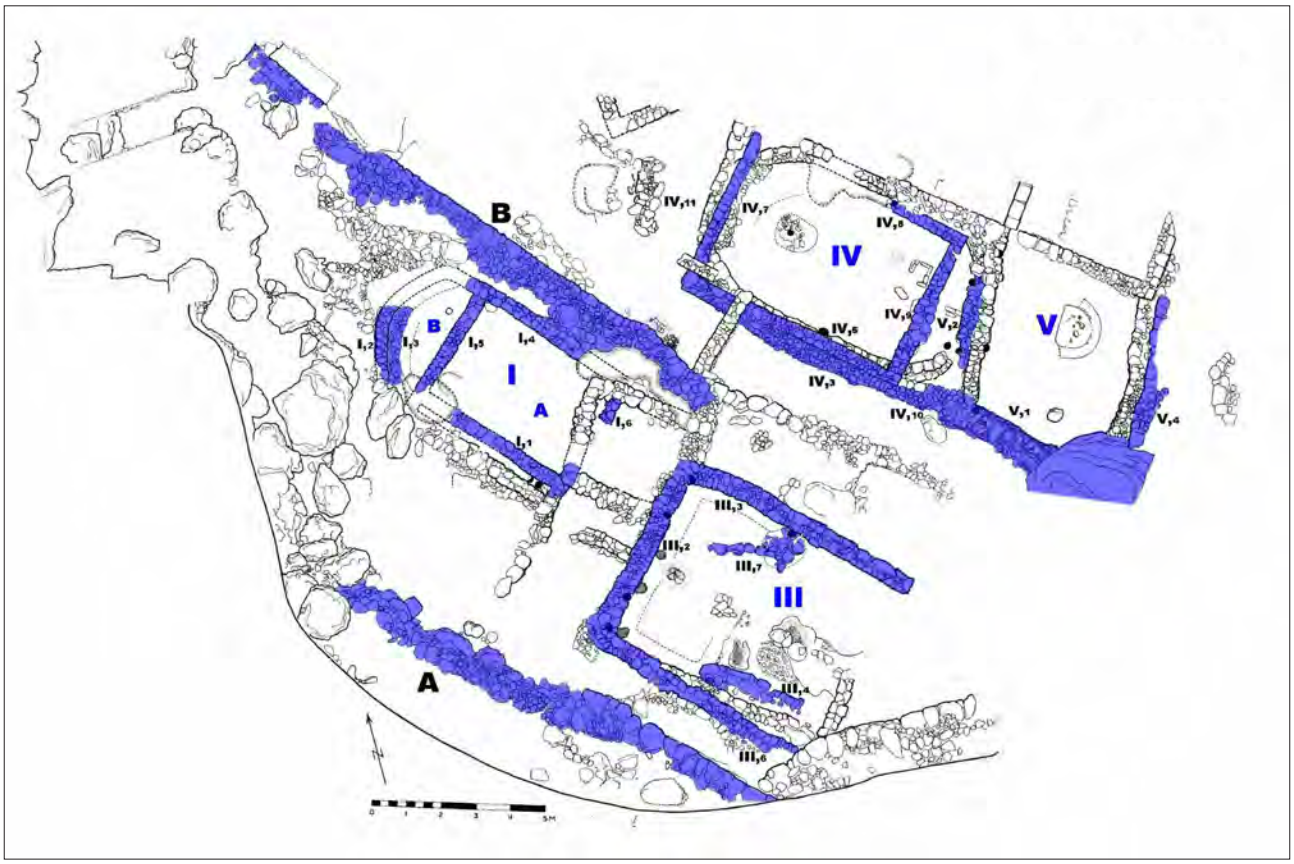


Fig. 4. Metallurgical District, phase 2

ing was completely abandoned between its second and third stages of life, following the collapses that affected all of the northwestern facade of the upper terrace.

Building VIII, perhaps abandoned early because of a landslide, as proved by the presence of two large rocks in the northern area, has only been partially examined; the northern wall, better preserved, has wide and thick foundations that reach down to the level of the Bronze Age, linking with wall VIII, 2. To the south of this wall a compacted earth floor covering the Bronze Age one has been identified. From this layer two local kotylai of the "Aetos 666" type – now exhibited in the Archaeological Museum of Pithecusae– and a local cup with a wavy decoration were recovered. The presence of kotylai "Aetos 666" suggests that the Mazzola inhabited area had been built slightly later than the area with Middle-Geometric skyphoi on the acropolis, thus confirming the above-recorded dating for the installation of the complex.

The other part of the upper terrace was occupied by Building III, the known rectangular structure, identified from the outset as an *ergasterion*: since the beginning it had shown connection with manufacturing, related to iron forging and, probably, bronze melting.

During the first decades of this settlement's life, all the activities seem to be located inside the internal perimeter of the building, even if, to be precise, in this complex we include a sheltered portion near the southeast, where in its first stage the activities related to iron forging were carried out. This is attested by the remains of the forge fire, numerous iron slags, and splinters and iron fragments that permeated the two subsequent floor levels. In the central area of this structure, near the fireplace (as denoted by a yellow-orange colouring surrounded by a circle of white ash), we can define the contour line thanks to the postholes. The posts held up the roofing on the eastern side, which comprised the canopy mentioned above over an open space. Perhaps, it was further delimited by small low walls, considering some small stones found to the east of the above-mentioned contour line.

In the successive phases, the function of the ceramics found in the building do not change. They are predominantly for the consumption of food, with some containers for transport and a few ceramics for actual cooking: this underlines that some sectors of the building were intended for preparing and consuming food. On the contrary, the evidence for the metals varies by phase: in the first phase are mostly found manufacturing slags in cap and drip shape related to the forging, while in the second mainly tools are present. The forge, placed in the southeast corner, was a simple hollow structure whose walls were covered with clay: fired clay traces, in fact, have been identified over most of the floor. Later, the main forging fire was moved to the northeast area, while other forges, as already mentioned, were located in the central area. Klein also published three fragments of a furnace for forging, with holes believed to be openings for bellows, perhaps made in perishable materials, which were not recovered. The transfer of the metallurgical activities inside was perhaps motivated by the level of light required, as a dim-light allows the smith to identify more easily the correct temperature necessary to refine the iron bloom.

Lastly, the presence of fragments of lead and silver in the building, as reported by Klein, and of bronze fibulae, could allow us to suppose that it was used for working these metals too.

All the upper terrace was delimited by the above-mentioned retaining wall B, the only one built with below-ground-level foundations, whose construction entailed, especially in the northwest, the removal of the Bronze Age levels.

The lower terrace, in the first phase, is on the contrary occupied only by **Building IV**. It has an oval shape, its inner area (26 sq.m.) and its division into spaces of different functions recall the oval house in Punta Chiarito: the latter certainly is the most convincing comparison for the Mazzola building. It is far from the only example known, the layout being well known during the Late Geometric in Attica, especially in Euboea and in the eastern Greek islands and along the western coasts of Asia Minor[11].

[11] Mazarakis Ainian 1997, 113-114.

Walls IV, 4 and 5 belong to this building; the curve of the wall to the northeast matches the rise of the vulcanic terrain. The level of the surface is confirmed by the finding of fragments of a large pithos and a large sandstone block explained at one time by Klein to be a column base, but now interpreted more likely to be a kind of monolithic bench. Unlike Punta Chiarito, the postholes are set inside wall IV, 1, while two other holes are situated opposite each other, inside and outside wall IV,5. These were probably used to support a covering whereby the external holes contained poles onto which tie rods were fixed, to fasten strongly the curved part of the covering, the most fragile. Another posthole was found in the centre of the northwest portion of the building. Midway between the poles in IV,4 and IV,5, two trapezoidal phonolite stones were recovered, identified by Klein as «non local stones to wet sharpen»; on the larger, at the time of excavation, there was an iron knife.

There are not many ceramics related to this phase, in part because the floors were cut into by deep modern farming ditches, to the extent that some sherds found inside the building match others that were retrieved from outside: irrefutable proof that, in the span of this settlement's lifetime, the soil was moved from an area to another, often in the deliberate setting of the floors and also within the same building. In addition to fragments of a plain kantharos, those of an imitation EPC kantharos, of non-local Thapsos skyphoi without panels and of a wavy-line decorated oinochoe, (as well as a spindle-whorl) have lately been identified in storage.

No places for fires or hearths are known inside the building, even if the discovery of milling stones supports the idea that some productive activity was carried out. It seems, in fact, that these activities were carried out outside, along the northern side, where a bank and a furnace were located.

In the second phase of this complex, on the upper terrace (Fig. 4), **Building I** was equipped with two new walls that formed a large rectangular space of 13 sq m (A), and a smaller semi-circular one (B) of 3 sq m in the northwest. There is no trace of a door connecting these two rooms but considering that A's floor is around 15 cm lower than B's, we have to imagine that one or two wooden steps existed. On A's floor, in the west corner, was located a kind of "container", described as a platform in the shape of a horseshoe, made of coarse clay, with raised edges and fired *in situ*; it was supported by some burned sherds, from which it was possible to almost entirely recompose an SOS amphora. Klein identified the structure as a furnace, but this hypothesis was then rejected because of the absence of fire traces, apart from those from the firing of the container itself. Ridgway[12] later identified it as a cooking pot made of raw clay.

From the same floor came some vases that can be reassembled from fragments, among which it is worth highlighting some examples of local LG II kotylai with birds and SOS amphorae, as well as a local krater, with a decoration in "white-on-dark"[13]. From room B comes the abovementioned local Late Geometric krater with two horses facing each other, each one framed in a square[14]. Many times, Mazarakis Ainian has remarked upon the presence of horse-decorated kraters – Coldstream and Ridgway[15] interpret horses as indicative of the Euboean aristocracy – found inside buildings both in the Greek world, in particular in Oropos, and in the colonial world, especially Pithecusae: he associates the kraters with the status of the buildings' owners, identifying them as members of a semi-aristocratic elite that supervised the metal-working activities. But, as Mazarakis himself admits, the Mazzola settlement is peripheral to the principal Pithecusan residential area, and so, as we know too little about it at the moment, we cannot safely compare it with the excavations in Oropos[16]. It is thus difficult to provide certain answers to the questions that Mazarakis Ainian himself later asked[17]. Other small and insignificant modifications affected Building III in this phase, such as some rocks which had tumbled from the upper slope, perhaps because of an earthquake, on the southern side. The floor is characterized by a compact but discoloured surface, due to the effect of charring, where a

[12] Ridgway 1984, 106.

[13] For Mazzola ceramics in "white-on-dark", see M. Cuozzo, below in this volume.

[14] The first report about the discovery of this krater is in Buchner 1971b, 370- 371, pl. XCII, 2. Cf. M. Cuozzo, below in this volume. About this krater, which has a simple linear decoration on the reverse, cf. Coldstream 1994, 80, fig. 2; Mazarakis Ainian 2006.

[15] Coldstream 1994, 79; Ridgway 1984, 113.

[16] Mazarakis Ainian, 2007, 163.

[17] Mazarakis Ainian 2006, 202-205; 2012.

great quantity of charcoal was found. In the northern sector, together with a considerable quantity of burnt traces of objects, several tile fragments with traces of burning were found: these were construed by Klein as forge bases, an interpretation also aided by the presence, on the floor, of a black layer deriving from an accumulation of ash material, the result of combustion. To the northwest of this area, there was a mound composed, as in other buildings, of a layer of yellowish volcanic ash, on which sat an iron knife, while inside the mound were three equidistant postholes, probably used to support a covering over it. Metal objects (bronze fibulae, knife blades and iron nails), processing waste and iron slags were also found on the paved floor. Klein also attributes to a forge some pithoi fragments stuck on the floor, within broad areas of charring.

Regarding the ceramics related to this phase, we must point out some amphorae fragments decorated in the Cesnola Painter style, a dish with rays that finds matches in the necropolis and an EPC kotyle.

Building IV on the lower terrace, on the contrary, was affected during this phase by a profound rearrangement, transforming its oval shape into a rectangular one. A strip of its floor has been found to the west of wall IV,9, on which an iron knife was *in situ*, as well as another fragment of phonolite stone, close to which there was a quadrangular structure, made of mud bricks later strongly burnt, interpreted as a forge fire. The only evidence of a covering is provided by the posthole, in continuity with the first phase, on the southwest side. Bronze and iron fragments, iron slags, as well as a great number of EPC kotylai and kantharoi, both imported and of local imitation, fragments of an SOS amphora and of kitchen ware, together with some chytrai, all come from the floor area.

The majority of the ceramics recovered is made up of aryballoi, lekythoi (and a spindle whorl), suggesting a feminine presence related to weaving and food preparing activities (ceramics for food consumption are present too, as already reported). Given the lack of fireplaces, such preparation must have been done on mobile hearths. In the northwest area, the presence of the previously mentioned sandstone block near the mound, the phonolite anvils and the knife blades to the southeast indicate a working area related, perhaps, to the final working stage of metal products. In turn, this is separated from another space conceived as a pantry, with its large pithos. The demarcation of these internal spaces was perhaps indicated by the mentioned covering system. With the transformation of its shape from oval to rectangular, the building was equipped with a forge for smelting metals that was now moved from the exterior to the interior, along the northern wall IV,9. The external space remains organized around mound IV,11, close to which spread the above-mentioned dumping area – formed by the final raising of the floor in the third phase of Building IV – where the famous lead weight[18], as well as a hearth, was found.

We do not know the reasons behind the transformation of the shape of the building and the moving of the forge: nevertheless, it seems reasonable to suppose there was a link with Building III that, in this phase, reached the apex of its manufacturing activity.

The northwest wall of **Building V** is abutted against wall IV,10, built in this phase and only partially investigated because it lies at the very edge of the excavation area and, as a consequence, it was ignored in the first printed reports (Fig. 4). At the base of wall V,2 two postholes were identified, conserved in the following phase. In the centre of this space a semicircular fireplace in volcanic ash, very similar to the one in Punta Chiarito, was also found. Near this fireplace, sunken into the floor, was a block of green tufa. This material, also used for the so-called louterion in Punta Chiarito placed on the mound close to the oval house, was also used in one of the walls of Building VI, from the 6th century BC.

However, we must here emphasize that the building was constructed and modified in a period of great transformations (Fig. 5), both structural and organizational, experienced by the "district" around the end of the 8th century BC (phase 3). These modifications affect both the upper and the lower terraces, tranforming it into a sort of working "complex", where the functions of the *ergasterion* increased, andbecame, along with Building II and Structure VII, the central area in the new arrangement of the space and its productive organization.

[18] Buchner 1971b, 367-368; Ridgway 1984, 108-109; Cantilena 2010, 404-407.

Building I was abandoned; its wall I,6 was overlapped by part of **Building II**, the smallest in Mazzola. Among the objects found here are an iron knife and a knife's grip, iron nails and a little bronze stud. Among the ceramics, the famous local LG II fragmentary krater with the right-to-left inscription …]*inos m'epoise* must be mentioned[19]. This fragment with the inscription was found among the stones that constituted the foundations of wall II,1. Other fragments of the same krater, recomposed and exhibited in the Museum, come from the floor but involve pieces from the external area between Buildings II and III, and from an excavation test of Klein's "on the west terrace".

Compared to the small number of ceramic materials, especially related to EPC and MPC, with Euboean and over-painted ceramics, and the metal objects already mentioned, a great number of slags – especially iron blooms – and numerous scraps linked with metal manufacturing were found in this building; however, it lacks a hearth or furnace. It is therefore possible to assume that this small building was a storeroom, in particular for iron blooms, but perhaps also a workshop where the activity was linked to finishing and assembling the metal objects. It is presumed that this space enjoyed a close relationship with the nearby *ergasterion* which, in the third phase, seems to be equipped with new spaces related to metal production, such as the contiguous Structure VII.

In fact, the *ergasterion* was affected during this phase by another modification, an extension of the retaining wall in wall VII,1 which, with VII,2 and 3, constitutes a new space annexed to the building. The raising of the floor is remarkable, with numerous fragments of common ceramics, bone and metals being found therein. If in the southern area, untouched by any burning activities, the floor is in a yellowish volcanic material that artificially compacted constitutes the floors of the other buildings; the rest of the floor shows traces of burning with fragments of iron, silver, lead, bone, and slags coming from metal manufacturing.

The same situation distinguishes the floor of **Structure VII**, a new outdoor space that lies against the eastern side of Building III which is recognizable as a courtyard and in which activities of the forging workshop were carried out. However, in its northeast sector a circular group of stones was found (VII, 3) which, because of the presence of much charcoal can be considered to be a fireplace, as also attested to by a great quantity of metal remains found in the area.

To the south, another group of stones forms a small rectangular structure, interpreted by the excavators as dedicated to the collection of water but which, perhaps, is better interpreted for the storage of the water needed for the forging-related activities.

It is worth mentioning the finding of a certain amount of Euboic and local imitation red-painted pottery in the building, along with the usual late-Geometric objects of predominantly local production, and food-related pottery, which fits well with the presence of an open hearth. On the other hand, secure evidence of metalworking is lacking, although there is a strong presence of iron splinters and flakes from hammering related to the activities carried out next to wall III, 3 of the *ergasterion*. The activities in this courtyard are therefore complementary both to Buildings III and II which, with Building VII, were dedicated to metallurgy, but also indicate the carrying out of domestic activities.

Another segment was added to retaining wall B (B1), constructed perhaps to contain the dumped filling material generated in the modifications to Buildings IV and V. The filling was made up of slags, and bronze and iron fragments, as well as ceramic material, all datable to the 7th century BC.

The presence of a layer rich in burning traces can also be found in the new **Building IX**, on the upper terrace, of which only a corner is left, and which was probably destroyed by a landslide, as had happened with Building VII.

Because of a landslide or an earthquake, the entire Mazzola settlement was abandoned for a period of about 70-80 years, starting from around 720 BC. Ridgway had already stressed that, following Strabo (V, 5, 9), earthquakes constituted one of the terrifying events that induced the Euboeans to abandon Ischia[20].

Between the end of the 7th and the beginning of the 6th centuries BC (Fig. 6), **Building IV**, on the

[19] Buchner 1971a, 372, pl. XCIII, 2; Ridgway 1984, 112, figs. 26, 96; Bartoněk – Buchner 1995, 177 (no. 43), 219 with fig. 43a-b.

[20] Ridgway 1984, 106.

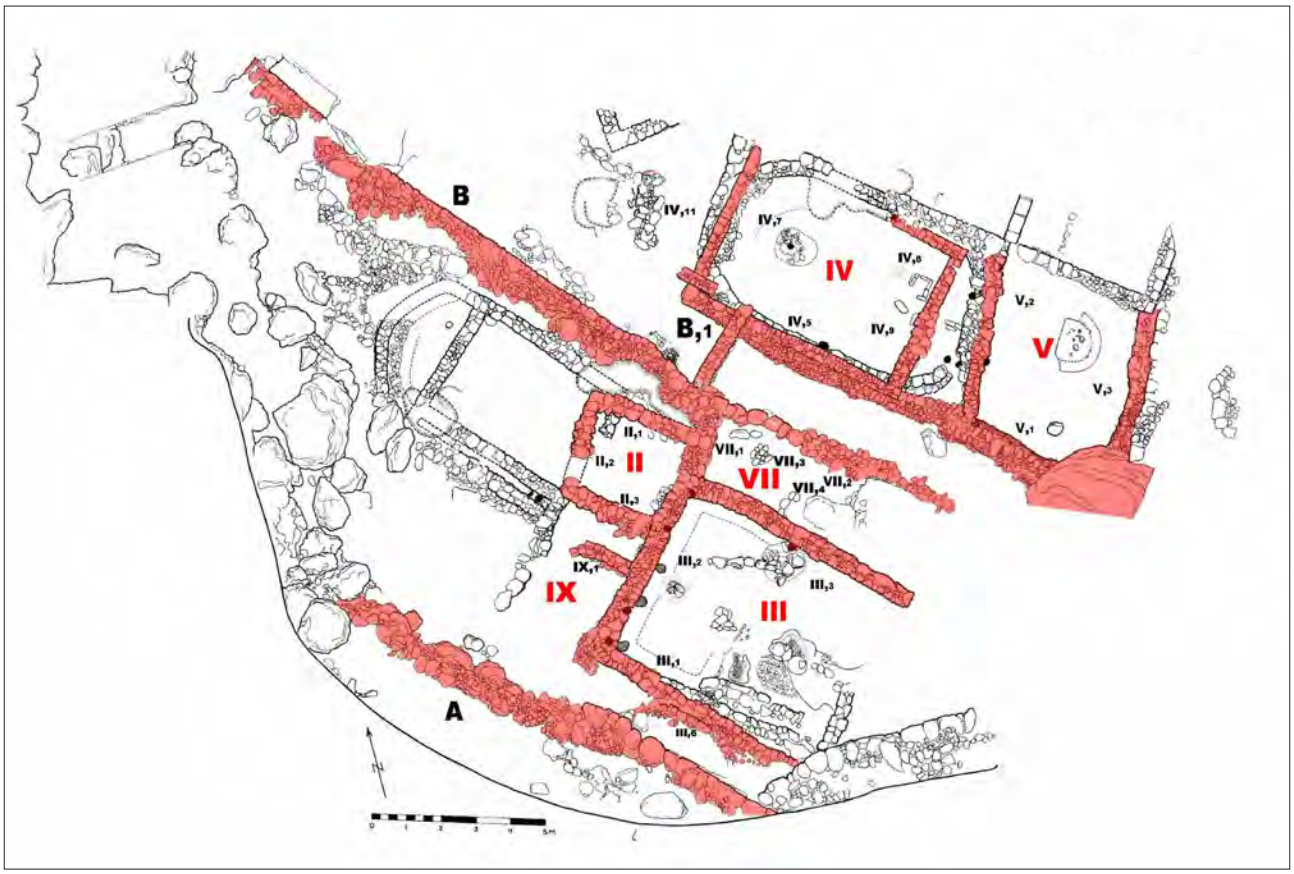


Fig. 5. Metallurgical District, phase 3

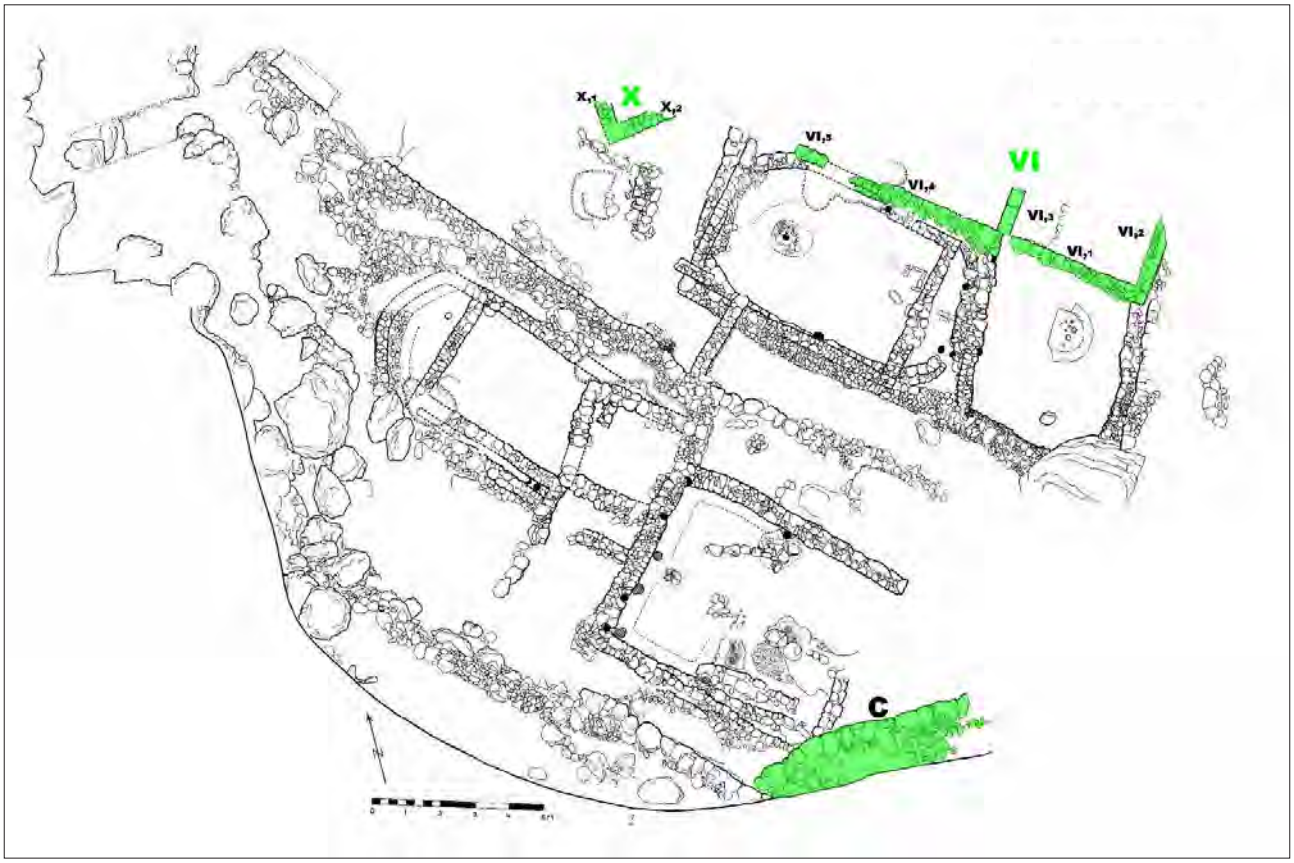


Fig. 6. Metallurgical District, phase 4

lower terrace, was damaged by a ditch being dug for the construction of Building VI. This structure, together with building X, are the only ones to remain active in the last phase of the complex: unfortunately, it is scarcely recorded, given that Klein documented very little about it in his notebooks, perhaps because it was discovered at the end of the last campaign in 1971.

It is possible to suppose that, after the abandonment of the site at the beginning of the 7th century BC due to the fall of rocks from the upper slope, it was easier to start a new occupation at the northeast edge of the area. The whole settlement could have been moved downhill, as the finds in the Park of the Museum seem to testify, though here the excavation is still in its initial stages and therefore it is too early to define the chronology and the plan of the buildings being revealed.

Building VI, from the segment excavated, must have had a rectangular shape and been divided into two parts: the walls are no longer with double facades, but are composed of a single row with small stones even at its base while others that become progressively smaller are placed above. The dividing wall is not made of trachyte stones, but of squared green tufa blocks: this typology of construction had not been recorded in Pithecusa before the 6th century BC. On the paved floor related to wall VI,4, together with some tile fragments, a loom weight and ceramic sherds were found; they can be dated between the end of the 7th and the beginning of the 6th centuries.

For **Building X**, at present reburied, we can only report that Klein claims that the stones were stuck together by a kind of mortar made of a yellowish, compact volcanic material.

One of the last remarks made by Klein concerned Wall C, at the southern end of the settlement and which, according to him, was an extension of Wall A. This circumstance would suggest that, after the first abandonment of the settlement, there was a need to reinforce the area of the existing structures in order to retain the slope and avoid new landslides.

From this evidence, to which only 3000 of a total of 9000 finds belong, we can deduce a relatively clear picture of the succession of activities carried out in Mazzola.

On the upper terrace, building I, the oldest, is the only one to which we can ascribe with certainty the functions of an *oikos*. The interpretation of Building III as an *ergasterion* had not been previously discussed, but now we can assert that Building III becomes the core part of a coherent production complex, completed with Building II, while in Structure VII activities like cooking and the consumption of food were carried out.

The same relationship involving internal and external spaces seems to be repeated in the lower terrace, where, if our hypothesis is correct, we must imagine a functional subdivision operating between the indoors and the outdoors to permit the execution of production activities. Even if in fact Building IV does not seem to have any provision for firing in its initial phase, with the production activities probably all carried out in outdoor areas (except for work related to the grindstones found inside), it seems obvious that the activities pursued inside each building were connected with those carried out in the adjacent outdoor areas. The oval shape of Building IV changed to rectangular when the forge was moved from an outdoor area to an indoor one, though, at the same time, the outdoor areas continued to be used for production (e.g. in the plot of land to the north of our building, where in an area that can perhaps be interpreted as a courtyard – between B and B1). The floor is raised and a fireplace is installed, made from a level of sherds on which the permanent structure was placed. Once again, therefore, the area can be interpreted as revolving around Building IV, which had an organizational role in the economy of the lower terrace. It is therefore obvious that a relationship between indoor and outdoor areas existed that followed a concept that was anything but accidental.

Costanza Gialanella

II. Movable materials

Metal and non-ceramic materials from Mazzola are preserved in circa 40 wooden boxes in the storage that the Superintendence obtained from the Ischia Porto Municipality, inside the "Torre Guevara". Their state of preservation is precarious. In the boxes is the original information written in English on slips of paper, undoubtedly by Klein himself; some other

indications are added in Italian, attributed to Giorgio Buchner[21] because of the handwriting. We have not been able to proceed with a complete descriptive documentation, with drawings and photographic illustrations of the finds, but have only made a survey and a preliminary identification of the material.

There are too many fragments of over-carbonized flat roofing tiles and we are unable to assess whether they are waste or finished works[22].

The walls of the dwellings in the "district" and perhaps also parts of their roofs involved organic materials, judging from the fragments of hardened mud-plaster with cane imprints[23]. The floors of these structures consisted of a clayey soil surface: a few fire-blackened fragments have been preserved, but it is not possible to determine whether this was a hearth or a forge[24].

Slags from iron smelting, characterized by frequent air bubbles, are abundant and, from what we can gather from the written information recorded during the excavation, were spread throughout the entire excavated area (Fig. 7.1-3). Lead[25], silver, and glass[26] slags were also present. A small amount of metal powder was found, attesting the production of silver, and a lump of silver was found in tomb 147[27]. No bronze processing waste has been identified[28]. In addition to the above-mentioned materials, glasswork and perhaps clay must be added.

Of the final products in lead, only a rectangular piece of sheet from tomb 671 is known[29]. Object in bronze such as small fishing hooks[30] (fig. 7.4-5), needles and tweezers[31], a circular earring of wire with open ends[32], a quadrangular grater in sheet[33], and nails were recovered (Fig. 7.6-11). A similar fishing hook was part of the grave goods of tomb 433[34]; tweezers are recorded in T. 530 and in T. 951[35]. The earring type, needles and grater are not represented in the cemetery.

Numerous fibulae of various classes were recovered (Fig. 8.1-14): one with a serpentine bow and rod-like apophysis; the "navicella" type; with covered bow; others with a simple bow, a serpentine bow with a folding clasp and another with conic knob at the apex[36]; and the leech type[37]. Pins associated with fibulae as part of the arch or spring are just as numerous, if not more so. (Fig. 8.13-14). Pins of this type, as well as bows without a pin or foot, were probably intended for recycling. In T. 671[38], pins are used as textile fasteners on the shoulders of a female child. This seems to be a unique case.

We cannot be sure if the well-known scrap of a plain "leech fibula" of the Pithecusan type and the equally unadorned leech fibula with a long stirrup (unfinished, and unfortunately without context in the San Montano necropolis[39]) – considered to be part of grave goods – come from a collection of scrap for recycling.

Other elements of personal ornamentation in bronze are recorded: a hemispherical stud with a ring welded on the inside for easy attachment; a wire spiral; a small sheet metal cylinder with open ends[40]; and a tapered bead, longitudinally pierced[41]. Studs of a diameter of between 0.7 and 1 cm[42] are known from the necropolis; while our specimen is larger, with a 2 cm diameter, its function is the same. We may suppose that not only were the garments decorated in this way, but other heavier items too (from footwear to head-

[21] Dr Nicoletta Manzi (Manzi 2005) presents an accurate investigation into this and attempts to work out the relationships between these indications and the archaeological situation as mentioned in Klein's excavation journal and the related plans. I thank Dr Nicoletta Manzi for having allowed me to read her thesis.

[22] Stored in the boxes labelled: Mazzola metal 4; Mazzola; Cleaning of the deeper level. Interstice between the inner part and the outer part of the south wall of the apsidal house; Mazzola 70-1. The krater fragment with the oldest inscription by an artisan (Ridgway 1992, 94 fig. 26, 96) had been considered the proof of potting in Mazzola: but evidence of potting kilns is not known.

[23] Stored in a box labelled: Burned floor pieces. Note iron splinters, charcoal.

[24] Stored in a box labelled: Burned floor pieces. Note iron splinters, charcoal.

[25] Stored in a box labelled: L. 70-3.

[26] Stored in a box labelled: Burned floor pieces. Note iron splinters, charcoal; Mazzola metal D.

[27] Buchner – Ridgway 1993, 182.

[28] The small bronze ingot reported by Ridgway 1992, 93 has not been identified, neither among the materials stored in the boxes nor among those exhibited in Villa Arbusto Museum.

[29] Buchner – Ridgway 1993, 654 n. 1; Nizzo 2007, 117: A510A.

[30] Stored in boxes labelled: Mazzola metal D; without indications.

[31] Stored in boxes labelled: Mazzola metal D; Metal 4.

[32] Stored in a box labelled: Mazzola metal D.

[33] Stored in a box labelled: Mazzola metal D.

[34] Buchner – Ridgway 1993, 447 no. 8.

[35] Nizzo 2007, 115: A180; Cinquantaquattro 2012-2013, fig. 9.3.

[36] Finds stored in a box labelled: Mazzola metal D.

[37] Stored in a box labelled: From the surface soil to the north of the enlargement.

[38] Buchner – Ridgway 1993, 654.

[39] Lo Schiavo 2010, 17-18, fig. 3, nos. 4-5.

[40] The three finds stored in a box labelled: Mazzola Metal 4.

[41] Stored in a box labelled: Box 70-85.

[42] Nizzo 2007, 114: A 140.

Fig. 7. 1-3) Slag from iron processing; 4-5) Two bronze fishing hooks; 6-11) Bronze fragment

Fig. 8. 1-14) Fragments of bronze fibulae

gear to curtains). The wire spiral belongs to a class[43] for which different functions have been proposed, in some cases thanks to known excavation data. In our case, we can only propose that it was a covering of a cylindrical element. The small cylinder can be compared with others known from the necropolis[44] and from the votive objects on Timpone della Motta[45], in Francavilla Marittima, as well as those from the Molino della Badia necropolis in Grammichele[46]. The relationships between Pithecusa and the Oenotrian communities of northern Calabria are already known, thanks to the finding of the askos in tomb 325, the one with the scarab of Bocchoris. It is uncertain if the small copper cylinder is a Mazzola production, or if it was found there because it was intended to be reworked, as we can assume for the water-bird figurine, originally belonging to a parade fibula.

The bronze tapered bead is a shape (i.e. "*bulla*") also recorded in the necropolis[47], albeit a larger one, associated with women, and therefore probably belonging to a local woman. As far as silver is concerned, in addition to the fibulae, simple rings of various sizes, found in grave goods, could be of local production[48].

We can deduce that the Mazzola artisans produced ornaments not only for the island inhabitants' requirements, but also for those of potential customers further afield, including the local mainland communitie. Likewise, it can be assumed that a local recasting of objects of different origins was undertaken, aimed at the production of ornaments in keeping only with Pithecusan requirements. The answer to this dilemma is, of course, conditioned by the methodological preparation of those involved in this type of reconstruction. In my opinion, at Mazzola they re-melted every object they could obtain to produce ornaments in the Pithecusan style. However, the local component was not absent, at least in the clothes fashion, as is indicated by the significant amount of fibulae.

In addition to the well-known weight (at 8.79 g) (Fig. 9.1), which is omitted here due to the abundant bibliography on the subject[49], there is also a crouching bull-shaped applique, a handle with a human protome and the aforementioned waterbird-shaped element of a "*fibula da parata*"[50] (Fig. 9.2-4).

This last element lends much credence to the hypothesis proposed above that the activities at Mazzola were centred on recycling. We have no evidence of "parade fibulas" in Pithecusa: therefore, it seems that they were not made on the island. They could easily have been brought to the island, perhaps by the wearer, from the Campania mainland where, between Capua and Suessula, the highest concentration of the use of that type of fibula is attested[51].

Regarding iron, whose provenance is known to be from Elba Island, as is indicated by the hematite fragment from the Gosetti Dump[52], the shapes found in Mazzola are varied (Fig. 10.1-7). We have quadrangular nail shanks[53], slab fragments[54], single-edged knives of various dimensions[55] (only once with a convex edge[56]), a convex-edged axe[57] and a sickle[58].

Two conical elements are to be added to the above objects[59]: the corrosion encrustations make the comprehension of the lower extremities uncertain. However, they were probably originally rectangular and flattened, as in a chisel[60]. The sickle and the convex-edged axe are not included in the grave goods[61], although there are single-edged knives with small nails on the handle, used to fasten their hilt plates, probably made of wood[62].

[43] Nizzo 2007, 109-111: A 70.

[44] Zancani Montuoro 1974-1976, 40-41 no. 60.

[45] Papadopoulos 2003, 111-112, nos. 405-412.

[46] Bernabò Brea – Militello – La Piana 1969, 225 fig. 14 d, from tomb 5; 231 fig. 18 f, from tomb 6.

[47] Nizzo 2007, 100: A 30A 5b1.

[48] Guzzo 2004, 90-92.

[49] Lo Schiavo 2010, 9 with prev. bibl. See also *supra* and *infra*.

[50] Buchner – Gialanella 1994, 59 fig. 25; Lo Schiavo 2010, 886, no. 8094: class LVI type 451.2.

[51] Guzzo 2014b, 78.

[52] Ridgway 1992, 91; Napolitano 2018, 241.

[53] Stored in boxes labelled: Mazzola Metal D; Mazzola Metal 4.

[54] Stored in boxes labelled: Mazzola Metal D.

[55] Stored in boxes labelled: Mazzola Metal D; from the surface soil to the north of the enlargement; 70-F-1012.

[56] Stored in a box labelled: Mazzola Metal 4.

[57] Stored in a box labelled: Mazzola Metal 4.

[58] Stored in a box labelled: From the surface soil to the north of the enlargement.

[59] Stored in boxes labelled: Mazzola Metal 4; Excavation test in Rizzoli's property.

[60] Buchner – Ridgway 1993, tomb 678, 659, pl. 190, 8; Nizzo 2007, 115: A 220 B.

[61] Where only straight-edged axes are recorded: Nizzo 2007, 116: A 290 A.

[62] Nizzo 2007, 116: A 380B1-2.

Fig. 9. 1) Lead weight enclosed in a bronze ring; 2) Small crouching bull of bronze; 3) Bronze handle with protome; 4) Aquatic bird from Capuan "parade fibula"

From this short review, we can deduce that ironworking was related to working tools such as the scythe, axe, chisels and knives. Various types of fibulae were included in the productions.

Among the non-metallic finds are examples of glass or glass paste, amber[63], flint, obsidian, and a fire striker (Fig. 10.8-9). In addition to the glass scraps[64], we have a whitish flattened shaped bead and blue fragments of others[65], as well as a second bead of a similar shape in a dark brown colour[66].

Regarding grey flint, we have a core[67], from which some tools were supposedly made. There are numerous cores of obsidian, from which blades were made[68]. A fragment of a black elongated stone with a semi-circular cross-section, used for whetting metal blades, survives (fig. 10.13)[69]. Some shaped stones were probably used as working surfaces or as anvils.

To this group of artefacts, all of which can be traced back to production activities on site, should be added some truncated pyramid loom weights with a quadrangular base and a hole through the lower end[70]. We do not know whether they were made in Mazzola, or simply used for weaving carried out in the buildings of the district. It should be noted that the fragment of a krater mentioned above, with the incomplete reference to the potter, also comes from Mazzola[71]: however, it does not appear to be a fragment that was broken during its production. It is therefore still very uncertain whether ceramic production took place at this site.

It must be remembered that there is evidence for this site being frequented before the establishment of the manufacturing complex and the Euboean settlement: a *capeduncula* with a flared rim in a grey-brown impasto; a small jar in a similar impasto with a finger decoration just below its edge; a closed container in a reddish refined clay with a stippled external decoration[72]; a bifid handle with an upper cylindrical apophysis in a greyish impasto[73] all indicate a 2nd millennium presence. A spindle-whorl in a dark grey *impasto* of a flattened truncated conical shape[74] could be that of a local woman present at the later phase, being of a shape also found in grave goods.

The kantharos in fine black Etruscan bucchero[75] provides some written evidence about those who inhabited Mazzola. An inscribed alpha[76] is preserved on it: it has not been recorded in the anthology of Pithecusan inscriptions, probably for chronological reasons, although several from Mazzola have been included[77].

[63] Stored in a box labelled: Mazzola Metal D.
[64] Stored in a box labelled: L. 70-3.
[65] Stored in a box without indications.
[66] Stored in a box labelled: Box 70-82.
[67] Stored in a box labelled: 70-14 May 1970.
[68] Stored in boxes labelled: Mazzola Metal 4; Excavation test in Rizzoli's property.
[69] Stored in a box labelled: 69-59.
[70] Stored in boxes labelled: Box 70-85; without indications.
[71] Ridgway 1992, 96; Bartoněk – Buchner 1995, 177 no. 43.
[72] Stored in a box labelled: 69-50.
[73] Stored in a box labelled: 70-139.
[74] Nizzo 2007, 172: B 620 (ImL) C 1.
[75] From the few surviving fragments, we can suppose it is a kantharos of type 3 (Rasmussen 1979, 78-80), datable from the third quarter of the 7th to the second quarter of the 6th century BC.
[76] Stored in a box labelled: 72-174.
[77] Bartoněk – Buchner 1995, 156 no. 3; 158 no. 8; 165 no. 22; 168 no. 26; 170 nos. 28-29; 175 no. 38; 177 no. 43.

From this brief overview, although complete restoration and documentary research is still to be done, it seems possible nevertheless to confirm the previously proposed interpretation of the manufacturing processes undertaken at Mazzola. The manufacturing activity carried out here was not limited to iron, although this metal, due to the widespread presence of slag, seems to have constituted the bulk of the activity. We also have evidence for the processing of bronze, silver, lead and glass, perhaps even amber. Indeed, the recycling of bronze objects, whether broken, out of date or out of fashion, must also have represented a considerable amount of work, judging by the quantity of these types of objects. Only ceramics lack convincing evidence, as the craftsman's signature (see above) is not sufficient to settle the question.

Unfortunately, the near impossibility of deciphering the handwritten notes on the provenance of the excavated objects prevents us from knowing whether the manufacture of the different materials took place in one or several buildings.

Fig. 10. 1-7) Iron knife blades; 8) Fragments of amber; 9-12) Stone and ceramic fragments; 13) Obsidian core

The daily life of the manufacturing workforce took place in buildings designed exclusively for residence. To date, it is not possible to effectively answer the questions posed by Mazarakis Ainian a few years ago[78], even though work and manufacturing activities took place together, as the fragments of bucchero kantharos, the impasto spindle and loom weights show.

What has previously been said has no connection with the long discussion on the presence, or absence, of precious metal production on the island: silver "dust" may have been used to produce ingots of a proto-monetary nature. Recently, the question of the existence of a gold deposit on Pithecusa has re-emerged: the metal in its epithermal state is known to be associated with alum, which was abundantly exploited on the island[79].

As far as it is known, alum on the island is not mentioned in any of the ancient literary sources[80]: Strabo (5.4.9), for example, who seems well informed, does not mention it. Yet alum was widely used during the ancient ages, mostly in leather tanning and fabric processing[81]. The relationship between alum and gold is described in detail by Pipino, based on the 1583 report: in Ischia, in a "bath" (namely a thermal spring) known as auriferous, «the waters show an excretion of gold on their surface, which forms a thin layer, almost a veil, of the finest gold, of more than twenty-four carats»; the same is also reported for silver in a different "bath" for silver[82]. Pipino evaluates these reports as follows: «(it is) certainly difficult to believe in the formation of gold or silver veils on the surfaces of pools of water, but it is not impossible... The presence of thin gold films (flor or float gold) and silver (flor or float silver) has been observed with certainty near the deposits of both metals in different parts of the world, as a result of local thickening of the metal contained in colloidal solution or in dispersion»[83]. From this, the event described by Iasolino in Ischia in the 16th century AD can be considered possible: or rather, "not impossible". One could deduce that the amount of gold thus recovered would be minimal but of great purity.

The volume of Iasolino included, in folio I, a map of the island of Ischia (Fig. 11), on which is clearly marked the site of an "Auri Fodine" (sic!)[84], or a "Minera d'Oro" (Gold Mine), depending on the different editions consulted. This is located in the immediate hinterland of Ischia Città, today Ischia Porto, south of the road connecting it to the Campagnano farmhouse, from which the mine takes its name, as explicitly stated by Iasolino [85].

It has been argued that it is possible to deduce the existence of ancient gold mines in Pithecusa from the aforementioned Strabo passage: but the manuscript tradition also allows for a different reading, whereby we do not read of mines but of goldsmith workshops, or simply of objects made of gold[86]. Present studies on this subject are compromised by their acceptance that the island lacked gold mines: Pipino's study would apparently refute this quite convincingly.

But the presence or absence of gold with alum at Pithecusa does not necessarily mean that the metal was exploited then: just as we cannot be certain that alum itself was exploited. Iasolinus' observations on the occasional coexistence of gold in alum-containing waters, together with Strabo's reading of gold mines, or at least of the workshops where gold was worked, certainly influenced Marcus Cartarus, the geographer of the map included in Iasolinus' volume. Iasolinus in fact mentions him explicitly: «Nor is this phenomenon so surprising, because Strabo and others write that there are gold mines on that island, and we can clearly see one at the site they call Campagnano»[87].

[78] Mazarakis Ainian 2006, 202-205; 2012, 137-140.

[79] Olcese 2017, 32-33 recalling Pipino 2009.

[80] Nenci 1982: list of sources at 186-187; Borgard 2005, 161-162.

[81] Picon 2000, at 526-528 it is noted how Phocaea was not mentioned by the known ancient sources as an alum production site, even though there are clear archaeological records of its exploitation during ancient times.

[82] This report is taken, in Pipino 2009, 21, from *De rimedi naturali, che sono nell'isola di Pithecusa hoggi detta Ischia libri due di Giulio Iasolino Filosofo e Medico in Napoli, In Napoli appresso Giuseppe Cacchij*, MDLXXXVIII. I thank Mariarosaria Esposito for the precious bibliographical indications.

[83] Pipino 2009, 22, with previous bibliography.

[84] Pipino 2009, 22 fig. top right; Olcese 2017, 32 fig. II. 18. a.

[85] Cf. Pipino 2009, 21.

[86] For the previous bibliography on this subject cf. Guzzo 2004, 100; then Pipino 2009, 18.

[87] *Apud* Pipino 2009, 21.

Fig. 11. Geographical map of Ischia from G. Iasolino, *De' rimedi naturali*, Naples 1538

Regarding gold in Ischia, unlike its alum[88], there is no other later documentary information about its exploitation. One can legitimately suspect that Iasolino has "improved", and to quite a degree, the so-called "thin gold film" fact attested with alum (see above). The activity of working gold on the island is also far from being archaeologically demonstrable, though it is possible that Cumae had workshops that could produce precious ornaments in which characteristics of different cultures were merged[89]. The precious ornaments known on the island are all in silver, except for one of the three bands[90]. The production of the latter metal shows a situation that seems safer to attribute to Levantine artisans active in the West[91].

One recovered artefact was considered pertinent to gold work. It is the one weighing 8.79 gm., corresponding almost exactly to that of an 8.72 gm. Euboean-Attic stater[92]. This object, a lead flattened cylinder encircled by a kind of bronze ring[93], was found in a stratigraphical context which was not sealed, on the surface of waste, dumped against the northwest wall of structure IV of the working district[94]. Such a context lends an uncertain date: to the 6th or to the first quarter of the 7th century BC[95].

[88] Picon 2005, at 14 fig. 1 is given a geographical map with the indication of the sites where alum is extracted; Ischia is marked: but the map shows ancient and modern information indiscriminately, without any indication of the different time periods in which the indicated sites were active.

[89] Cf. Guzzo 2004, 100.

[90] Guzzo 2004, 92. There are, in addition, an electrum hair tie and rings; a pale gold pendant and a bezel.

[91] Guzzo 2014a, 95-96.

[92] Ridgway 1992, 95; Cantilena 2010, 404-407.

[93] Functional typological comparisons have not been identified yet: one might recall the lead weights, in a flattened or discoidal cylindrical shape, frequent in the Cycladic area during the 2nd millennium. These are usually of bigger dimensions than our weight: but one of 8.7 gm. is recorded from Akrotiri on Santorini: Michailidou 2008, 99 fig. II.81, no. 1398.

[94] Klein 1972, 37.

[95] Ridgway 1992, 95.

Likewise, the original use of the weight is uncertain[96]: indeed, the interpretation may be influenced by the chronology attributed to it (but, as far as we know, there are no decisive comparative elements to decide the question). A 7th-century BC date is generally preferred: but leaving aside the apparent connection to a coin for obvious chronological considerations, it remains uncertain whether «the weight was used both to weigh quantities of precious metal – such as that required for the manufacture of the many silver personal ornaments found in 8th-century BC graves – or, perhaps as part of a set, to weigh finished products in order to establish their value»[97]. In the quoted passage we can observe the conviction of local production of precious personal ornaments, but also a chronological impasse – the burials are almost a century older than the highest date attributable to our weight. Certainly, the lack of archaeological evidence to date in Mazzola related to gold and silver work makes a relation between this object and the manufacture of precious ornaments highly unlikely.

There is no evidence of local goldsmithing; no personal ornaments made of precious metal have been recovered in early 7th-century BC tombs[98]. Overall – and whatever its actual chronology is – the assumption that the weight was used only for precious metals is unjustified, even if theoretically possible: other materials need to be weighed. Nor can we sensibly choose between the two hypotheses Ridgway proposed for its utilization[99].

The archaeological record known to date from the island related to the use of gold does not include final products in this metal. Of course, this is an *argumentum ex silentio*: this situation, however, could be in contrast with the presence of gold ornaments from the pre-Hellenic tombs in Cumae[100], some of them chronologically precede those with the silver in Pithecusa. The origin of the gold used for the ornaments in Cumae has not been determined: it cannot be clarified whether or not gold possibly related to alum from Pithecusa was used.

The archaeological evidence of ironworking in Pithecusa is, unlike that of gold, completely different in its abundance in the documentation. As far as the ancient literary sources are concerned, only one of the island's toponyms, *Aenaria*, is linked to metal manufacturing, and strictly to bronze working, and only for Latin speakers. The processing slags found in the Mazzola area are abundant[101]: hematite components have been identified in them, characterising the minerals as coming from Elba[102]. A larger range of metallurgical activity, related to bronze and lead[103], is supported by this evidence. Furthermore, there is also evidence of glass paste working[104]. The variety of the metals recorded in the same workshop seems to support the observation of the production of fibulae of a "model" in both in bronze and iron, and perhaps even in silver[105]. It could therefore be that all varieties were made in the same workshop: either by the same artisan, skilled in several metals, or by specialists working in one or two of them.

At the moment, therefore, we can only be certain of bronze working at Mazzola, as is amply demonstrated by the fibula scrap[106] together with other more general objects[107], also intended for recycling, of various forms and origins. The abundance of iron slags also indicates that this metal was also processed in Mazzola, both for ingots and for finished objects.

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[96] Lo Schiavo 2010, 9, suggests its use for weighing in the alloying process to create the bronze.

[97] Ridgway 1992, 95.

[98] Except the mounting and the silver pendant of the steatite scarab from tomb 245: De Salvia 1993, 776-778 no. 245, with a date to the first quarter of the 7th century.

[99] Formigli – Scatozza Höricht 2010, 90 prefer the second.

[100] Formigli – Scatozza Höricht 2010, 33-74.

[101] The processing stage to which they belong has not been clarified.

[102] Cf. already Ridgway 1992, 93, 100.

[103] A galena fragment comes from the working area in Santa Restituta too: Olcese 2017, 32.

[104] Ridgway 1992, 93.

[105] Lo Schiavo 2006, 260-261.

[106] Ridgway 1992, 93, fig. 26 to the top; Lo Schiavo 2010, 8-9; 17-18. At 18 fig. 3, 5 Lo Schiavo 2010 records a second fibula with manufacturing defects, but not such as to prevent its use and then its deposition in a tomb: we can deduce an insular manufacture for this example too.

[107] Klein 1972, 37; Ridgway 1992, 93.

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tures at the site. Despite the lack of completeness and the poor representativeness of the skeletons, the individualisation of the bone assemblages has allowed to identify commingled faunal and human remains (in 20.3% of the tombs) and to estimate the Index of Minimum Number of Individuals (MNI) for each grave unit.

The number of individuals identified is 267 out of 256 tombs. The overall demographic profile shows low child mortality representation (newborns and infants aged 0-1 year represent 7.11% of the skeletons; young children aged 1-5 years, 12.7%), indicating a strong bias in the demographic composition of these age cohorts. Adult age classes (20-40 years; >40 y; >20 years) exhibit diachronic differences in males to females ratios, namely 1.3 in Late Geometric I (LG I, 750-725 BC); 2.5 between Late Geometric I and II (LG I-LG II, 725-700 BC); 0.9 in Late Geometric II (LG II, 725-675 BC); 0.8 in Middle Protocorithian (MPC 675-650 BC).

Osteological evidence has led to a reconsideration of several funerary contexts, integrating the taphonomic observations of the graves with the biological life history of the deceased. Except for two cases (double Cremation 916, LG I, and single Cremation 140, MPC), this study confirms the exclusion of children from cremation customs.

Valentino Nizzo, *Ritual Landscapes and Ritual Codes in the Pithekoussai Cemetery*

The cemetery of Pithekoussai, in its early phases, was in use for about 150 years. The excavated portion of the burial ground contains more than 600 graves, the majority of which belongs to a period concentrated between 740 and 680 BC. Thanks to Giorgio Buchner's excavations we have significant information about the funerary practices.

Among the most interesting aspects that emerged from a systematic analysis of the stratigraphy was the reinterpretation of the diachronic and demographic evolution of the necropolis. This has provided extremely important data, both about the structure of the funerary groups and the way the ritual landscape was laid out. The analysis here reveals that the community did not discriminate based on categories of age, gender, or social status in the formal disposal of the dead, and possibly also not on the ethnic origin of the deceased. Instead the evidence suggests a degree of integration and cultural hybridization, a point that is particularly interesting considering the historical context.

Thanks to the interweaving of stratigraphic data with "sociological" ones, the interpreters have the uncommon opportunity to investigate the burial ground also through its complex web of family, "ethnic" and social relationships. The cemetery in the Valle di San Montano can therefore become the privileged terrain for an accurate reconstruction of the diachronic evolution of a "multi-ethnic" community, whose composition seems to reflect the "natural" demographic canons and whose representativeness, at the same time, it is not excessively altered by the action of those ritual filters that usually distort the funerary sample.

In the present paper, we will briefly limit ourselves to analysing the main characteristics of the funeral sample, focusing attention on some components of the ritual landscape and on the possible interpretation of their codes.

Costanza Gialanella, Pier Giovanni Guzzo, *The Manufacturing District in Mazzola and its Metal Production*

This contribution resumes the notes written by J. Klein during the excavation conducted in 1969 in the locality of Mazzola on the hill of Mezzavia (municipality of Lacco Ameno, Naples). The structures identified, of which the stratigraphic succession is highlighted, are dated between the middle of the 8th century BC and the beginning of the following century. The site is terraced and was probably abandoned due to landslides and earthquakes. In addition to pottery, evidence has been found of metal smelting, manufacture and repair of bronze fibulae. Iron, lead, silver and glass smelting scraps are abundant, but there is no bronze. Among the best-known finds, the known weight of 8.79 gm and some bronze figurines are discussed. No evidence for the production of gold objects has been identified, nor is the presence of gold deposits on the island verified. On Ischia there is only

one mention from the post-antique period of epithermal gold in association with the presence of alum, which could not be used to produce objects. Consequently, the only certain metal production documented in Pithecusa is that of bronze fibulae.

Lucia A. Scatozza Höricht, *Pithecusan Gold: Anatolian Connections*

The absence of gold ornaments in Pithecusa, both among the finds in the metallurgical district of Mazzola and the necropolis, from which only objects of gilded silver are known at present, if compared with those of the necropolis of Kyme in Phlegraean fields, re-launches the discussion on the meaning attributed to the term *chryseia* or *chrysia* in the well-known passage of the Greek source. In the ancient world, the search for metals was a major factor in mobility and raised the question of the role of Pithecusa in the gold trade, which involved the relationship between Euboea and the eastern Aegean. What emerges in Pithecusa can be related to the recent archaeological research, which reveals important interconnections between Euboea and the site of Kyme Aiolis on the coast of central-western Anatolia, perhaps as early as the LPG period.

Gloria Olcese (with a contribution by Gilberto Artioli), *Natural Resources and Raw Materials at Ischia in Antiquity: Some Data and Preliminary Reports from an Ongoing, Interdisciplinary Project*

This paper illustrates the new project begun at Ischia, following the study and publication of the artisan quarter excavated beneath the church of Santa Restituta (Lacco Ameno). The research will focus on the island's natural resources, both environmental and geological, available during the period of colonization, but also later. These resources have not always been sufficiently considered in archaeological investigations. Drawing on literary sources and employing specific scientific analyses for the identification of mineral and clay deposits, the project will reconstruct the agricultural landscape, the use of the land's resources, and the techniques of wine and ceramic production, of which the island has yielded important archaeological evidence.

Nadin Burkhardt, Stephan Faust, *First Results of the Excavations at Pithekoussai from 2016-2018 (Villa Arbusto, Lacco Ameno, Ischia)*

Being the first Greek settlement in the Western Mediterranean, Pithekoussai (modern Ischia) has long been at the centre of scholarly discussions about the early phase of the so-called Colonization of Western Greece. New archaeological evidence of this historical process is provided by a recent project that investigates an area next to the "Museo Archeologico di Pithecusae" in the Villa Arbusto at Lacco Ameno. Here, several terrace walls, which consisted of several layers of boulders with finished surfaces on the front, were found. While the dating of archaeological material from the surrounding trenches (including indigenous as well as imported pottery, roof tiles and a scarab) ranges from the Apennine Culture of pre-Roman Italy to the late Archaic Period, the stratigraphy suggests that the site was occupied by the building structures since the Late Geometric Period. They might have belonged to a domestic context or even a sanctuary.

Mariassunta Cuozzo, *Pithekoussai. Pottery from the Mazzola Area*

Here I present about 100 sherds and partly reconstructed vases from the Mazzola area I selected for the reopening of the room dedicated to Pithecusae at the National Archaeological Museum of Naples. After a quick overview of the types distinguishing the main chronological horizons, I dwell here on two specific subjects: a still understudied class for Pithekoussai, namely, "white-on-black" overpainted ware and a figured Late Geometric sherd lacking close parallels in coeval Pithecusan pottery.

Francesca Mermati, Parerga *and* Paralipomena *to the Study of Pithecusan-Cumaean Ceramic Production in the Light of New Research. Twenty Years after* Euboica

For the study of colonial enterprise in the western Mediterranean in the first half of the 8th century

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The intent of the *Euboica II* conference, *Pithekoussai e l'Eubea tra Oriente e Occidente*, held in Lacco Ameno (Ischia, Naples) from 14 to 17 May 2018, was to discuss the themes of colonization, how colonial realities became rooted in different areas of the Mediterranean, the specific traits of Euboean colonization, and forms of contact and relationship between the Greek element and local communities. These Proceedings are divided in two volumes, arranged geographically. They feature a dialogue between historians and archaeologists, with an emphasis on the new important contributions made over the last twenty years by field archaeology in Euboea and in colonial and Mediterranean contexts.