The Chalcolitihic of the Baixa Estremadura. Contributions for an essay, in reference to Leceia (Oeiras)

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The Chalcolithic of the Baixa Estremadura. Contributions for an essay, in reference to Leceia (Oeiras)

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1- INTRODUCTION

The seventeen annual seasons of excavations conducted at the prehistoric settlement of Leceia since 1983 have produced a large assemblage of stratified materiais, as well as numerous field observations, capable of constituting the basis and reference of future works at other archaeological sites in the region (for a complete bibliography on Leceia, published up to 1998, see CARDOSO, 1997/1998). In fact, the record obtained there shows an evolution, over more than one thousand years, of a dynamic and complex society, exploring in increasingly more exhaustive ways the available natural resources. It was the agricultural potential, enhanced through the successive improvement of the technologies of production, which allowed for the creation of an economic surplus able to support the exchange of products and raw materials with other regions, these exchanges being well-documented by the nature and typology of the artifacts recovered. We are, therefore, faced with a community clearly open to exchanges of products and of goods, strongly connected to a well-defined territory.

The aforementioned economic relations established by the inhabitants of Leceia with the exterior made possible the introduction of new technologies (copper metallurgy is one example) and affirmed itself, as well, at the more abstract level of magico-religious superstructure, as can be concluded by the nature and typology of the ideo-artifacts recovered, which clearly show the integration of their possessors within a world of Mediterranean cultural roots.

On the other hand, there exists a relationship between the architectural complexity and the existence of semi-specialized intramural areas, of production or storage, which are found clearly documented at Leceia by diverse structures of production. Leceia constituted, in this way, the center of a stable and sedentary population grouping, linked together with other settlements, of smaller size, with whom it was united probably bya common origin, by consanguinity.

What is the explanatory model for the genesis and evolution of this society, between the middle of the 4th and the end of the 3rd millennia BC? It appears, above all, to have been characterized by a social process influenced by exogenous influence, conditioned by economic conditions and available natural resources, whose interaction (PARREIRA, 1990, p. 29) resulted in a society with marked specificities, precociously evolved, articulated with other human groups, in a transregional perspective.

Based on the available data, it is usual to consider, for the Chalcolithic of the Estremadura, three principal cultural phases. Such phases can be found stratified at Leceia in a paradigmatic form, corresponding to archaeological levels with different artifactual characteristics and contents. Among these stand out the ceramics, of which some types can be understood as true markers, or stratigraphic fossils, to use the expression from the geological world, with expression and validity at Leceia (Fig. 1), as in other settlements of the same cultural area. We will take a look at, therefore, the principal characteristics of these phases, identified stratigraphically.

2 -THE LATE NEOLITHIC

Throughout the second half of the 4th millennium BC, there occurred, in the Estremadura, the progressive occupation of high altitude sites, with good natural conditions for defense (SILVA, 1983). At Leceia, there was established, at that time, a vast open-air settlement, on top of the rocky outcrops that exist there (Fig. 2), and in the space in between them (CARDOSO, SOARES & SILVA, 1996).

The nine radiocarbon dates obtained situate this occupation, in effect, in this interval of time (CARDOSO & SOARES, 1996). Making use of the program CALIB, graphics have been produced showing the cumulative probability of the group of dates obtained and calculating diverse intervals of confidence. Thus, for a probability of 50%, the chronology obtained for the occupation of the Late Neolithic corresponds to the interval 3350- 3040 cal BC and, for a probability of 95%, to 3510- 2900 cal BC.

There have not yet been identified, in any of these settlements until now, defensive structures; the selection of these places, which were naturally defended, suggest the existence of potential situations of conf1ict, which have not been detected archaeologically up to now; in effect, one only defends oneself if one has something to defend (beyond one's one person). What goods could these have been, that made these communities seek refuge in the heights of the region? Certainly the results of the accumulation of surplus agricultural production, increased by the improvement of technologies of production, specifically the introduction of the plough, the cart and animal traction, as is suggested by the association of bucrania with these two elements, in the exterior of the rock art sanctuary at Escoural (GOMES, GOMES & SANTOS, 1983), is a hypothesis supported by the abundance of domestic cattle remains recovered in the level of the Late Neolithic at Leceia. These are considered some of the most significant aspects of the so-called Secondary Products Revolution (sPR). One perceives, thus, in the existence of goods, for the first time produced in surplus, one of the reasons for the instability and social tension created between groups, 50 well- documented at Leceia, and which will characterize all of the 3rd millennium BC in the Estremadura.

"Walls do not only ref1ect the economy. They ref1ect the economy and society . They were constructed to protect someone and something or another. This being the case, the definition of this something is fundamental. This is how we know what type of society we are faced with. And the economic context is that which allows this" (GONÇALVES, 1991, p. 405). These pertinent observations are what we seek to provide in this contribution, in this study.

3- THE EARLY CHALCOLITHIC

At Leceia, after a period of abandonment, which might have lasted between 30 and 150 years, but probably some decades (CARDOSO & SOARES, 1996), there occurred after the beginning of the Early Chalcolithic, situated around 2900 BC, the construction of imposing fortifications (Figs. 3, 4, 5), created on the geological substrate, as well as on the level corresponding to the occupation of the Late Neolithic (CARDOSO, 1989; 1994a; 1994b; 1995; 1997; 2000). Such a defensive disposition respected, without a doubt, a plan previously defined and methodically brought to practice. The discordance which one can observe between this occupation and the Neolithic settlement does not necessarily mean, however, the existence of ruptures at the cultural level (there must have certainly existed breaks of a socio-economic nature) and, much less, justified the arrival of new foreign peoples to the region. On the contrary, one can

perceive in this fortification the logical consequence of a period of instability generated in the Late Neolithic and the preference for sites naturally defended, as is now verified.

As was seen for the Late Neolithic, the Early Chalcolilthic can also be dated with high precision. The nine available radiocarbon dates permit the construction of a graph of cumulative probability (based on the CALIB program) and, from this, the calculation of diverse intervals of confidence. In this way, for a probability of 50%, the duration of the Early Chalcolilthic can be situated between 2770 and 2550 cal BC and, for a probability of 95%, between 2870 and 2400 cal BC (CARDOSO & SOARES, 1996).

It is appropriate to remember, however, that the interval of 50% represents the *floruit* of the assemblage, that is, its period of tlourishment (see a discussion of this concept in SOARES & CABRAL, 1993, p. 220). In this way, having presented the values referred to, one can affirm that the Early Chalcolilthic would have had a shorter duration than the Late Neolithic, corresponding to the interval of 2800-2500 cal BC. This being the case, the first fortification at Leceia, built immediately after the beginning of the Early Chalcolilthic, would extend to around 2800 cal BC, or perhaps some decades earlier.

Leceia documents, thus, in addition to the two comparable and better-known cases of the region (Fig. 6): Vila Nova de São Pedro (Azambuja), where hundreds of tlint arrowheads have been recovered in veritable caches, perhaps constituting ballistic arsenais, in the sb"atum Vila Nova I of PAÇO (1964, p. 145), and Zambujal (Torres Vedras) -the force of the Chalcolilthic settlement of the Baixa Estremadura, articulated in large fortified centers, with proto-urban characteristics, whose location was determined by a conjunctjon of natural conditions for defense (all can be found on platforms delimited by escarpments, as at Leceia or Zambujal, or on peaks), in connection with agricultural valleys of high fertility , dominating natural routes to the adjacent region; geomorphological conditions that were favorable and high agricultural potentials of the soils were, thus, the two dominant aspects for determining the selection of such fortified sites.

In fact, the agricultural activities in fields or circumscribed plots, well-suited to the cultivation of wheat and barley, known at Vila Nova de S. Pedro (PAÇO, 1954), were determinative in the economy and the subsistence base of these populations, and particularly, of those groups inhabiting the spur at Leceia, overlooking the fertile valley of the stream of Barcarena.

The importance of the cultivation of the adjacent terrains, on a gradual slope toward the stream of Barcarena, appears to be reflected indirectly by the pollen content in the phase of abandonment of the Early Chalcolithic detected at the site. In fact, Prof. João Pais (Universidade Nova de Lisboa) found, in the respective pollen spectra, a predominance of graminea and of (compósites), traditionally associated with cereal agriculture, temporarily dominant in those spaces by the aforementioned abandonment of the settlement, which could have been, therefore, not a complete abandonment.

The artifacts recovered document the importance of agricultural activities: axes, frequently exhausted, with the edge worn from use, and destined for tree-cutting; adzes; numerous manos of siliceous sandstone, obtained in the area at a distance of 5- 10 km away; sickle blades, of flint (Fig. 7). Finally, there was horticulture, in small gardens along the valleys, perhaps already employing systems of primitive irrigation (PARREIRA, 1990); one finds this illustrated at Vila Nova de São Pedro by the existence of fava beans and flax (PAÇO & ARTHUR, 1953; PAÇO, 1954).

At Leceia, however, until now, there have not been recovered any seeds of the above-mentioned species, the practice of agriculture and horticulture are found suggested, in addition to the material remains already mentioned, by the existence of three large stone slabs (Fig. 8) of a circular plan, considered to be the base of threshing floors (CARDOSO, 1989, Fig. 73 and 74; CARDOSO, 1994a, Fig. 15). Such structures, which would have been dressed in stamped clay, or gravei, very hard, the similarity between these and traditional threshing floors can be seen today -vestiges of which are found in one of these -would have made these suitable not only for the processing of cereais, but also the drying of beans, such as fava. In fact, only in this way can its preservation be explained, it not being burnt, at Vila Nova de S. Pedro. There are unique examples, in the Chalcolilthic of Portugal, which give testimony to the vigor of the agricultural economy at Leceia; there is well-documented a small hut, situated intramurally and specialized in producing flour, as can be concluded by the abundance of grinding stones (manos and metates) that were found within it (excavations of 1998).

This system of production was complemented by the herding of sheep, goats, and cattle, from which most of the protein was acquired, as well as by the raising of domestic pig, which betrays the marked sedentarization of these communities and the full command of the manipulation of all the domestic species which then, as now, figure 50 importantly in our diet.

The hunting of deer and boar documents the existence of forests punctuated by open spaces, occupied by natural pasture, favorable for the movement of aurochs and wild horses, also present in the faunal inventory. The gathering of molluscs and fish, on the neighboring coast, at that time more easily accessible owing to the earlier Flandrian transgression and the non-silting of the openings of the waterways, are found similarly documented in the majority of the settlements of the region, completing the subsistence base of these populations. The presence of various copper fishhooks, in addition to numerous remains of ciprinidea (catfish and snapper) demonstrate the practice of coastal fishing, with the use of small boats (ANTUNES & CARDOSO, 1995).

Finally, the state of exhaustion, already alluded to, of the many polished stone axes, provide evidence of important forestry activities, not only for the creation of agricultural fields or pasture, but also for timber and forestry products, such as acorn, as is present at Vila Nova de S. Pedro (PAÇO, 1954), which could have been made into flour. There is evidence for, therefore, a community methodically and exhaustively exploring the available resources in the diverse adjacent biota, from the estuary, the coast, the forests or prairies which extended into the interior of the territory, up to the serra of Sintra.

The successive phases of reinforcement of the structures, observed at Leceia (Fig. 9) throughout the Early Chalcolilthic, as at Zambujal and at Vila Nova de S. Pedro (evidenced by the excavations of V. Gonçalves, in the 1980s), respected, as did the initial construction, a global plan and planned readjustments; they reveal, as wel\, the maintenance and, perhaps, the worsening of social stability throughout the Early Chalcolilthic, a period of around 300 years, during the lst half of the 3rd millennium. The imposing quality of these constructions reveal, as well, a society that was hierarchized, at the inter- and intra-community levei. The tribal model, which presupposes egalitarianism, strengthened by consanguinous ties, cannot be adapted totally to the observed reality; it is more adequate to suppose a sedentary society , clearly established in the territory , whose openness to exogenous stimuli would have encouraged and favored the arrivals of outsiders; their presence would have accentuated a growing intracommunity social differentiation. This explanation is supported by the existence of diverse residential structures of differing construction quality and size, depending on the greater or lesser privilege that they had in the area, proportional to the social ranking that its respective inhabitants attained. Such is the case of a large

house of circular plan (Fig. 10) situated in the best-defended area, while the others, of smaller size and poorer quality construction were situated in zones that were more exposed to eventual enemy attacks.

On the other hand, in the construction of this notable fortification -whose area of construction approximates that of Vila Nova de S. Pedro, (1 ha) and which is larger than that of Zambujal (0,7 ha) one finds implied the existence of subsistence surpluses, making possible the support of productive activities of the most active segment of the population, for a long period ot time.

At last, there is evidence not only for the division of labor (as in any tribal community), but the actual hierarchization of their function, with the elite of the community coordinating the work of ali. The Early Chalcolilthic corresponds, unquestionably, in the Estremadura, to a period of economic growth, revealed by the improvements obtained in productive capacity , some known since the Late Neolithic, others only from the Chalcolilthic.

4- THE LATE CHALCOLITHIC

The following cultural phase -the Late Chalcolilthic of the Estremadura -whose beginning can be situated in the first half of the 3rd millennium BC -in general can be well-documented in the settlements occupied or founded in the earlier cultural phase.

The eighteen available radiocarbon dates for Leceia for the Late Chalcolilthic, together with the respective dates for the other cultural dates there represented, make this settlement the best characterized, in terms of chronological-cultural evolution, of ali those known in the Portuguese territory .The respective statistical treatment of the group of dates permits, for the first time, to situate the transition between the Early and the Late Chalcolilthic at around 2600 cal BC (CARDOSO & SOARES, 1996). A greater precision is, at the moment, impossible, given that the available calibration curve is weak and has many oscillations. The *terminus* of this cultural phase can, in the same way, be situated at around 2200 cal BC.

At Leceia, there were produced, in this phase, in restricted areas of the inhabited space (as the presence of slag and drops of melted metal show), a variable copper industry, with an emphasis on small artifacts, such as awls, chisels, and punches. The preference shown for these kinds of artifacts can be explained, on the one hand, by the scarceness of the metal at that time; on the other hand, copper would have been a better material than stone for the specific functions that they were used for. The large copper axes -no complete example of which has been found at Leceia - would have corresponded more to objects of prestige, of ritual character or, only, simple blanks, without practical function.

It is clear that pure copper, of which they were made, could not compete, in terms of durability and resistence, with any amphibolite axe, which was much less costly to obtain. Copper can be seen, in this way, only as an extension of the Secondary Products Revolution, when taking into account the improvement of the efficiency of determinate instruments of production or of transformation, contributing to the diversity and specialization of consumer goods, namely subsistence. In this context, we do not believe one should value its action too mud1 as an agent of economic or social change (CARDOSO, 1999 a). In the Early Chalcolilthic of the Estremadura, the absence of copper artifacts is notable, at least at Leceia (they are also unknown at Zambujal; at Vila Nova de S. Pedro, the deficiency of the archaeological record prevents much rigor, although SAVORY (1970) did not find them, in the section of 1959, in the level with the "cups", belonging to this cultural phase.

This aspect is of greater importance; at Leceia, the criterion of absence is significant, taking into account the representativeness of the excavated area -allowing us to demonstrate that the construction of this fortification was dictated by defensive needs other than metallurgy , in contrast to the thesis based on the excavations of Zambujal, during the 1960s and 1970s, according to which copper constituted the "leit- motif" of the presence in this corner of Europe of groups of prospectors, metallurgists, and merchants of this metal, originating from the eastern Mediterranean.

The late introduction of copper in the Estremadura accompanies, simply, that of other technological novelties, typical of the SPR, in the 3rd millennium BC, such as weaving (the loom weights are almost unknown from Level 3, of the Early Chalcolilthic) or the transformation of dairy products (the sieves also also absent). For this proposition it is interesting to observe, with all the reservations for the methods of excavations that were not rigorous and the archaeometric analyses that were equally undeveloped, that PAÇO (1964, p. 146) had also mentioned, in reference to Vila Nova de S. Pedro, that \\The economic conditions that underwent a change with the arrival of the copper metallurgists, present now more indications with the industries of weaving, of the manufacture of dairy products..."

Already in the 1950s, there was related the progression of the constructors of the \tholoi' -identified with populations of prospectors and copper metallurgists -with the diffusion of the use of this metal, from Andalucia, to the Estremadura, passing through the Alentejo (FERREIRA & VIANA, 1956). The dates of the Chalcolilthic settlements of the Southwest Group appear to confirm this proposition, with the use of this metal predating its use in the Estremadura (SOARES & CABRAL, 1993).

In fact, being rare or non-existent, in the Estremadura, both native copper as well as the ores that would have allowed one to obtain this metal -it was important to carry out systematic analyses, that were non-destructive, using methods of X-ray fluorescence (XRF) and of FNAA, passing neutrons rapidly in a cyclotron, which is not available in Portugal. This is a rigorous method, of a quantitative character, which has the advantage of not damaging the pieces, and was systematically done in the case of the metal artifacts excavated at Leceia (CARDOSO & GUERRA, 1997/1998).

The results of the analyses systematically carried out by XRF on ali of the approximately 130 artifacts recovered until now at Leceia -one of the largest prehistoric assemblages of metal objects in Iberia with homogeneous chronological- cultural characteristics and coming from one site -as well as the 45 pieces submitted for analysis using FNAA -allow for the following general conclusions:

-the original raw material is, invariably, native copper; the analyses revealed, in fact, almost pure copper, compatible with the characteristics of such minerals;

-there is nothing to suggest the existence of alloys; however, one piece with an elevated level points to a mineral of a different composition from the rest;

-arsenic varies between 0,5 and around 5% (FNAA analysis). The continuity of the distribution of this elements provides evidence for the accidental character of its presence, subordinate to the composition of the minerals used and not as a consequence of any intentional addition (Fig. 11); this conclusion confirms, entirely, an earlier opinion (FERREIRA, 1961, 1970);

-the superficial secondary enrichment of arsenic, as well as iron, can be shown comparing the results of FNAA, respective to the non-altered interior of the pieces and of XRF, respective to its surface.

The demonstration that native copper constituted the source of the raw material, although consistent with what has already been known with respect to Chalcolithic metallurgy, reinforces the hypothesis that its mining was carried out especially in the zone of iron outcrops in veins of metallic polysulfates in pyrite bands, in addition to the veins of quartz with mineralizations of native copper. In this context, the occurrence of diverse blanks of copper at Leceia becomes important: one of these was submitted for metallographic study (CARDOSO & FERNANDES, 1995). Its find illustrates the trade of copper, in the form of blanks, from the area of exploration where they were produced to the settlements, where they were transformed into a variety of artifacts, employing especially the technique of hammering. Also, the occurrence of amphibolitic rocks in the Chalcolithic settlements of the Estremadura, where this type of rock is unknown, illustrates, even more clearly than copper does, the transregional trade of raw materials considered at that time to be strategic. At Leceia, amphibolitic rocks constituted about 70% of the total of hard rocks used (CAROOSO & CARVALHOSA, 1995) and the picture from other settlements should not be different (Fig. 12). One is impressed by the massive importation of this raw material, in the form of true lithic blanks -some of examples recovered at Leceia with little or nor transformation attest this to us -coming above all from the Alto Alentejo, where this type of stone occurs in diverse locales, presupposing the existence of stable routes of commerce and of the circulation of products, permanent and enduring. Only about 30% of the hard stones were of local origin, including a variety of rock types (igneous, metamorphic, and sedimentary rocks) all available in the region of Sintra -Mafra - Loures. Such rocks document the existence of a trade of a more circumscribed nature, regional or transregional, not negligible, in which can be included the trade of clay, either/or of non-plastic elements used as temper in ceramic pastes.

It was, for certain, the existence of an economic surplus, resulting from the accumulation of agricultural production, that allowed these Chalcolithic communities of the Baixa Estremadura to establish and maintain this exchange, that was not only regional in scope, as already mentioned, but was also of a transregional nature, allowing for the provisioning of strategic raw materials -in this case, amphibolitic schists -whose existence was critical to the carrying out of activities vital for the survival of the community (axes, adzes, hammers, and chisels). It is one of the most interesting examples, for the distances involved, for the specialized supply of a raw material in Iberian prehistory , and even European prehistory .

Such products are evidence, as well, of the economic strength of these communities, clearly open to the establishment of exchanges over the medium and long distance, favored by the geographic location of these settlements, dominating the principal routes of circulation or penetration of the interior of the territory .If one finds demonstrated the mutual infJuence of a transregional character between the Chalcolithic cultural areas of the Baixo Alentejo and the Estremadura, the subject of a pioneering study which is important for its continuity (SIIVA, SOARES & CARDOSO, 1995), there can be found, equally, such a phenomenon between geographic areas even more distant. We are referring to the omnipresent Chalcolithic female divinity, of apparent Mediterranean roots, because of which it might be possible to invoke, through its presence in the Baixa Estremadura, the arrival of an exogenous population. In a world marked by profound social transformations, in part resulting from its extreme openness to the exterior, the diffusion of practices and ideas would naturally be possible (Figs. 13,. 14).

However, the existence of objects genuinely imported, which in some way could support the direct presence of exogenous population elements, are not known up to now (SIIVA, 1990). In any case, to value excessively this argument would be dangerous: on the one hand, the simple presence of one artifact in these conditions would eliminate the argument of absence; on the other hand, even if this came to be verified, it would not prove on its own the direct presence of allochthonous elements among the population, seeing that they could have arrived through a long chain of exchange, facilitated by other intermediaries. It is in this way that the yet-to-be confirmed recent discovery of Chalcolithic Anatolian ceramics (of the Early Bronze Age II, ca. 2600-2200 BC) in Andaluda, in "a context characteristic of the Southeast Copper Age -of the Millares-El Malagón types, associated with Beaker *ceramics'l* can be interpreted (GQNZÁLEZ PRATS et al., 1995).

The diffusion of ideas and concepts, made possible or favored by commercial contacts, which are very poorly understood is the model that, at this moment, we consider possible and acceptable, for the explanation of artifacts of marked exoticism at the beginning of the Chalcolithic In the region of the Baixa Estremadura (Fig. 15). The general environment of Mediterranean character, prevalent throughout the Chalcolithic of the Baixa Estremadura - reinforced by its geographic position -had favored in diverse adjacent regions identical Internal evolutions and phenomena of convergence. Furthermore, the valorization of the commercial component in the diffusion of the architectonic tradition, of metallurgy, and of prestige objects was previously argued by PARREIRA (1990, p. 29). ,

Therefore, the available archaeological record suggests an "in situ" evolution for the Chalcolithic formation of the Baixa Estremadura on the part of the populations that lived there, and who cleary left traces of their presence, in the late Neolithic throughout the second half of the 4th millennium, according to radiocarbon dates obtained at Leceia.

In fact, each fortified settlement, as well as those of the same cultural region as the Estremadura, then adopted common architectonic solutions, would have behaved and evolved In an independent way, adapting themselves to the natural geomorphological conditions in distinct ways; the defensive solution found at Vila Nova de S. Pedro, with an imposing central fortification, is distinctive from that at Leceia and Zambujal, these being, in their turn, different among themselves. Surely the size of the constructed area influenced the architectonic solutions adopted in each case. Such variability is directly proportional, as is evident, with the number of inhabitants of each site. This fact brings us to the question of knowing what this number was, at Leceia and at the larger settlements of the Baixa Estremadura.

The population calculations proposed by CHAPMAN (1991) give, in the case of Leceia, an estimate of 200 inhabitants at the peak of occupation, considering the area of the site (around 1 ha), a value slightly lower than that obtained by the relationship proposed by RENFREW (1972) for the settlements of the Aegean, around 300 per ha. To be in this way, Leceia would have had a number of inhabitants identical to that of Vila Nova de S. Pedro and around one third more than that of Zambujal (with 0,7 ha). Other calculations, based on the number of occupants of each residential unit, or by the square meters of area covered are not applicable, seeing that we do not know, in large part, the residential structures that existed in the fortified area. The large disharmony that is revealed, in whichever of the cited settlements, between the imposing nature of the structures of defensive character and the contemporary habitations, suggest that an important part of the population would have lived outside the walls, seeking only the shelter of the walls in situations of greater social tension. This evidence was possibly confirmed at Leceia, having been observed numerous vestiges of 'hut foundations', which were extramural, at the base of the escarpment facing the valley of the stream of Barcarena.

To feed a population of 200 to 300 people, a number which we consider to be adequate for the observed reality at Leceia, it would not be necessary an area of resource exploitation greater than that which could be attained in two hours walk. Within this territory are not known, yet, through archaeological and actualized maps (CARDOSO & CARDOSO, 1993), any active center in the Early or Late Chalcolithic, which could have constituted a threat to the security of the inhabitants of Leceia. An identical affirmation is valid considering the eventuality of partial superposition of that territory with that of another settlement outside that limit. Thus, although it is not possible to invoke the threat embodied by another settlement of similar size, of regional expression, the group of sites of smaller size identified at a radius of 15km could have constituted a constant pressure, although still diffuse, over the lands utilized by the inhabitants of Leceia. Thus, we believe that the construction of this fortress owed more to reasons of a preventive order. The simple presence of a fortification of this size, constituting a clear sign in the landscape, which could be viewed from a distance, would have embodied the power and rights over the involved territory , serving at the same time as an element of dissuasion (or intimidation, cf. SANGMEISTER & SCHUBART, 1972, p. 197) for any group, whether coming from the region or not, who considered invading this domain. In effect, over the approximately 300 years of the effective functioning of the fortification, this would have occurred: in a structure for the accumulation of domestic water, of the Late Chalcolithic, there have been recovered the remains of three individuais, unburied, adults and ali male, which makes one believe they were an attacking horde decimated by the defenders of the settlement (CARDOSO, CUNHA & AGUIAR, 1991; CARDOSO, 1994a).

We believe, therefore, that Leceia is a clear example of how, in the Baixa Estremadura, during the Chalcolithic, it is possible to correlate the traditional concepts of \\fortification", \\cultural interaction" and \\economic intensification's (cf. for the last two, JORGE, 1994, p. 473 and 475). To us, this interdependence is unquestionable: although there might have been interaction and intensification with fortification, the inverse we do not consider to be possible, for the time and region in question.

Thus, the genesis of the fortified Chalcolithic settlements of the Baixa Estremadura, as with those of the Beira Alta and Trás-os Montes and Alto Douro, resulted in the internal evolution of an agro-pastoral system inherited from the Late Neolithic: the increasing exploration of territory, each time more organized and efficient, reinforced by the improvement of technologies of production, led to the occupation and effective demarcation of territories with resulting forms of tension increasingly more intense, where the beginning of copper metallurgy did not have any expression. The Mediterranean stimuli, without a doubt important, though always expressed in an indirect form, would have been determinant in the introduction of this metallurgy, in a phase of consolidation of the agro-pastoral system, whose progression to regions increasingly more western, beginning in Andaluda, appear to be proven by the available absolute dates. The populations, established and governed by fortified settlements, with the use of determined parcels of territory demonstrate a level of social organization increasingly organized and hierarchized, clearly open to external stimuli, transmitted by intense commercial trade on which, in part, the success of the group depended (such as is the case in the importation of hard rocks for daily work).

At the level of the archaeological record, decorated ceramics continue to be the most diagnostic archaeological elements, as they were in the earlier cultural phase. They are characterized by the well-known oval impressed motif, organized in pairs (acacia leaf) or forming quadrifoils ("crucifera"), totalling unknown, at Leceia, in Level 3, corresponding to the Early Chalcolithic, the cultural phase characterized, as at Vila Nova de S. Pedro, by the well-known "copos canelados" (channeled cups) (Fig. 1).

The evidence offered by these ceramics is notable. The consistency of the decorative motives and forms, well differentiated, in the Early Chalcolithic as in the Late Chalcolithic, in the region of the Baixa Estremadura is significant. Such a phenomenon must have, certainly, a social explanation. If one accepts that ceramic production was an essentially a female job, the aforementioned consistency might be explaining by virilocality; that is, that wives took the home of the husbands, assuring in this way the diffusion of these ceramics, through multiple marriages, in the interior of the cultural area of the Baixa Estremadura.

In the Late Chalcolithic of the Estremadura, there is abundant, more than in the previous period, the large spherical vases for storage ("vessels of provision"), now proven, from the shape of the mouth, with the exuberant decoration of "acacia leaf" and "quadrifoil". The litchi industry was characterized by the numerous ovoid blades of flint, in the majority (if not in the totality) used as sickle blades, of which there are 6 times as many, at Leceia, than in the Early Chalcolithic. These factors are indicative of the improvement of the levels of production made possible by the perfection of agricultural techniques, in addition to the introduction of new activities involving the more complete exploration of resources, and are proven by artifacts that are almost or truly unknown in the Early Chalcolithic; they include those already referred-to rectangular loom weights and those sieves with perforated walls, in addition to copper. The SPR was already in clear expression, in the Baixa Estremadura, during the Late Chalcolithic, as which occurred, both in the Northeast, as in the Southwest; for the Alto Algarve Oriental GONÇALVES (1991, p. 409) gives us explicit evidence.

However, despite the evident success of the economy of the Late Chalcolithic community established at Leciea, it is during the cultural phase that one observes the decline of its defensive character, evidencing perhaps the emergence of a new type of social organization, which lasted until the Late Bronze Age. According to this model, the fortifications no longer constituted central nodes for the occupation of territories, although some of the most important might have continued to be inhabited sites, until the Late Bronze Age, as was the case at Zambujal and Vila Nova de S. Pedro.

In effect, it was in these final moments of the Chalcolithic, situated already at the end of the millennium, or already in the first half of the following (the 2nd), which embodied the transition to the Bronze Age, and that witnessed the (re)occupation of sites, in the majority without natural conditions of defense, throughout the Baixa Estremadura. What is the meaning of this fact? Is it significant that the climate of generalized tension which occurred throughout the third millennium in this same region and so well-documented at Leceia, by the numerous reinforcements of walls and bastions, had a gradual or abrupt end? Briefly put, the internal social evolution of these communities, characterized by intense intercommunity competition between the powerful in the best territories, led to situations of generalized conflict, evidence of which existed already in Late Chalcolithic settlements, as has already been mentioned. This "localism", which was so important for the survival of the communities that practiced it (SILVA, 1993), did not favor, in the same way, the craft activities that were not related to production, such as metallurgy: \\the \imperfect' craft specialization and the limitations of procurement current in an economic system excessively divided impeded the development of that activity that was considered to be the engine, attendant to its capacity of inducing the structural changes in the productive and social sphere" (SOARES & SILVA, 1995, p. 136).

5 -THE BEAKER 'PHENOMENON'

Beginning in the Late Chalcolithic, the new socio-economic order that was, at that time, progressively implanted, at least in the Baixa Estremadura, was transformed at the end of the Chalcolithic by the almost universal abandonment of the old fortified settlements

and by the multiplication of small nuclei in open settings, without natural conditions of defense, where Bell-Beaker ceramics predominate. In this context, the emergence of Beaker ceramics can only be understood as a simple fashion, with local craftsmen rapidly copying imported prototypes, as is suggested by the analyses carried out on the pastes of the fragments from Porto Torrão (ARNAUD, 1993). However, the coexistence in the stratigraphy of Beaker ceramics with vessels characteristic of the Late Chalcolithic, as at the settlement of Rotura, Setúbal (SILVA, 1971; GONÇALVES, 1971), has expression in the radiocarbon dates, obtained up until now, which demonstrate the contemporaneity between the two ceramic traditions, in the rare sites where they are found isolated, as at Leceia: in this way, when in the interior of the fortification, there continue to be produced vessels with non-Beaker decoration, throughout the entire Late Chalcolithic (seeing that these only occur, in dispersed form, in the upper part of the respective level), in two huts identified in the adjacent extramural area (Figs. 16, 17), they were exclusive, between the decorated ceramics, the Beakers (Figs. 18, 19), despite their corresponding absolute chronologies falling within the interval corresponding to the occupation of the Late Chalcolithic, respectively: Sac- 1317- 2825-2654 cal BC (Hut FM) and ICEN -1241 -2629-2176 cal BC (Hut EN), both to 2 *sigma* (CARDOSO & SOARES, 1990/1992). This being the case, it is possible to offer the hypothesis that we are confronting two populations with distinct cultural roots (CARDOSO, 1999b), which reopens the question, already much discussed, although in other forms, of the status and significance of the diffusion and expression of the Beaker "phenomenon". Whatever the case, the disarticulation of Chalcolithic social structure, coincident with the full expression of the Beaker ceramics, in the Estremadura, before the middle of the 3rd millennium BC (CARDOSO & SOARES, 1990/1992), and which led, apparently, to the return to defensive settlements of the same region of the Neolithic, corresponded, in reality , to an increase in social hierarchy, accompanied by the affirmation of a reduced number of fortified sites, which then appeared, for the first time, as true 'central places' at the regional scale. These functioned, therefore, in the exploration of vast territories and in the establishment of trade networks over large areas, and were accompanied by the standardization of artifacts of large diffusion: the artifacts of the Beaker "package": vessels, Palmela points (Fig. 20), daggers, wrist guards, and bone buttons. Such elements would have played a part in the arming of a warrior class, emerging at that time, which would come to be fully expressed in the Bronze Age.

Preferring a gradual transition to abrupt leaps in social evolution, such remains ref1ect the slow passage to a new social regime, based on the figure of a chief, surrounded by an elite with whom it competed for the maintenance and overseeing of the determined territory, a hypothesis supported by the well-known Bell-Beaker battle panoply, mentioned above, which made increasing use of arms, with the rise, at the end, of daggers or short swords. We would be, therefore, be far from a tribal society, based on the principal of consanguinity / "by nature, a closed and suspicious society , in which the exclusivity of the alliance which allowed it maintained internal conduct and externally discord" (CARVALHO, 1946, p. 17-18). The transition to an inegalitarian society, of the type described, for a socially stratified society , such as that of the Bronze Age, was ref1ected, gradually, by Chalcolithic society. The proto-urban characteristics of their settlements, the intracommunity differentiation which existed among them, the clear openness that the respective inhabitants maintained with the exterior world, as evidenced by the artifacts, from the most sophisticated to the most simple - highlighting among these the ceramics -with the western and Mediterranean world, from which they received simuli of various types, made the Baixa Estremadura a privileged zone where, over a space of around one thousand years, one can witness the internal transformations of a dynamic society , in constant change, foreshadowing the first proto-state societies of western Europe.

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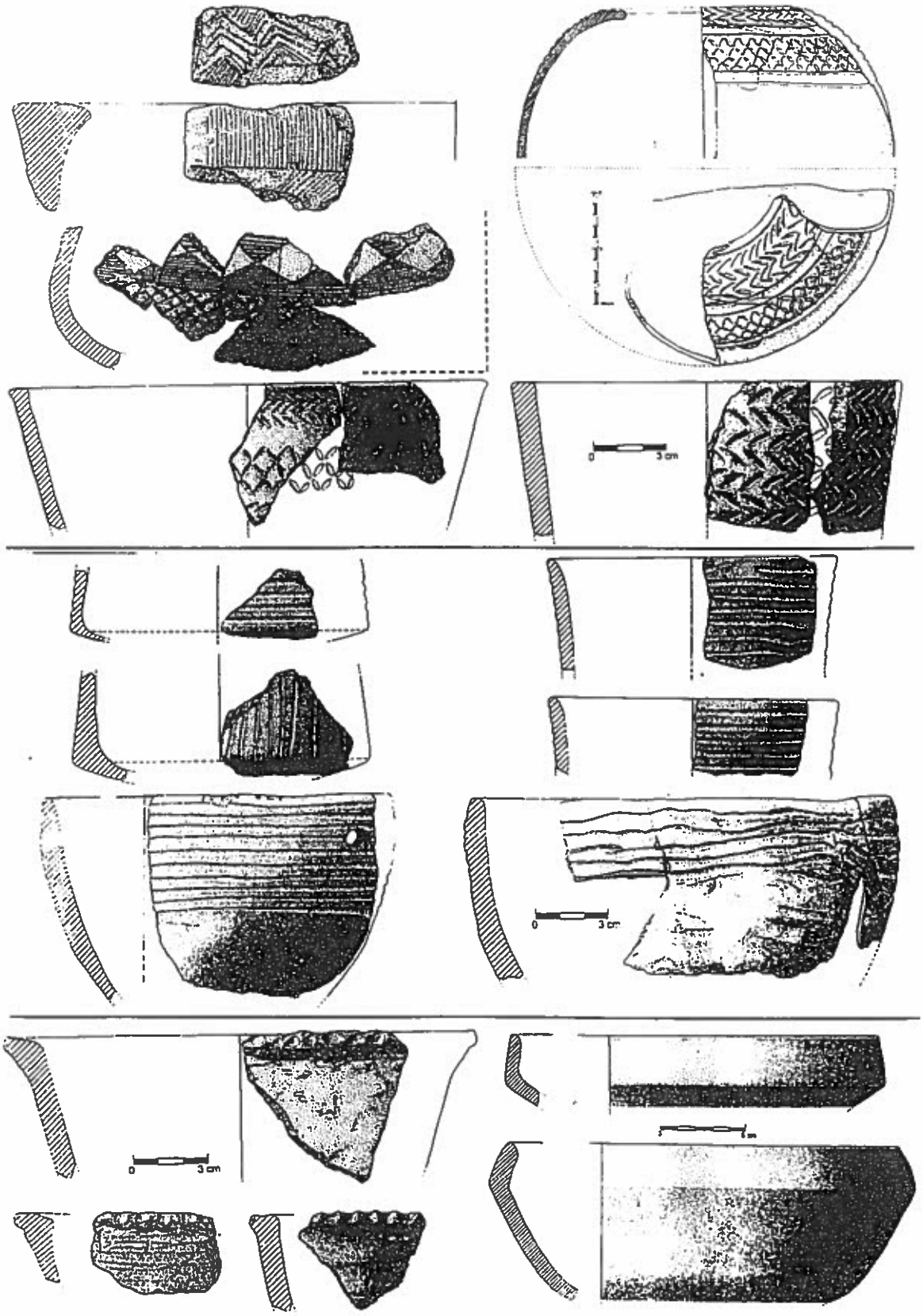
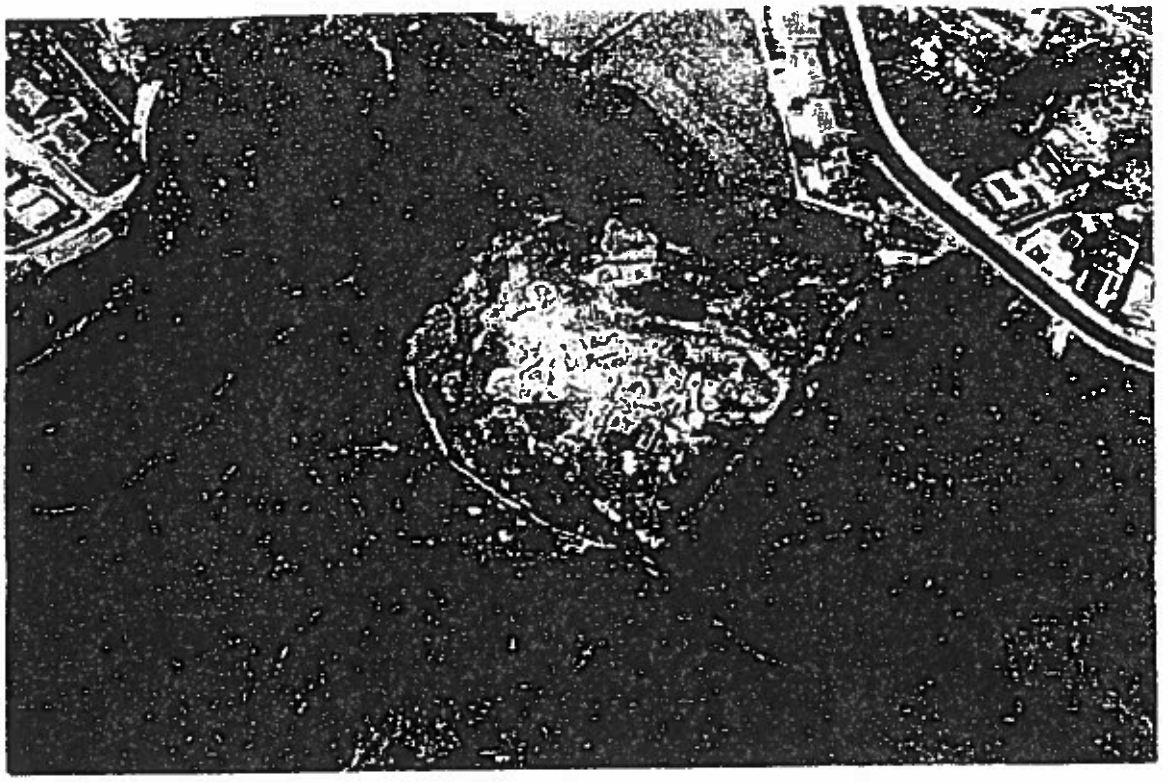
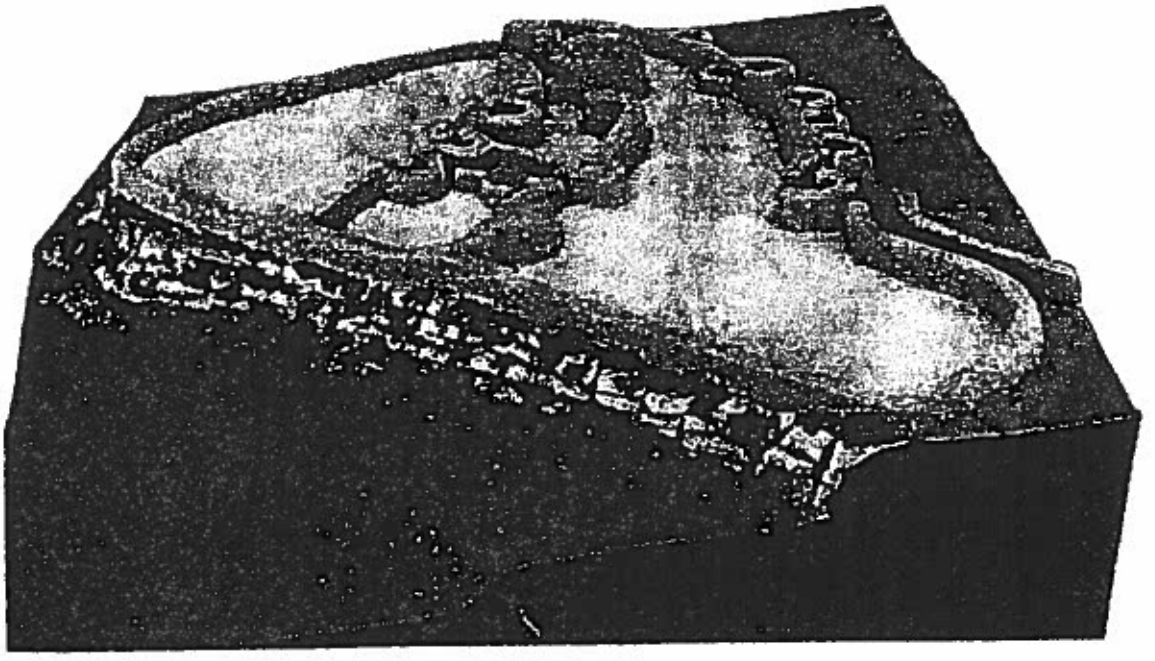


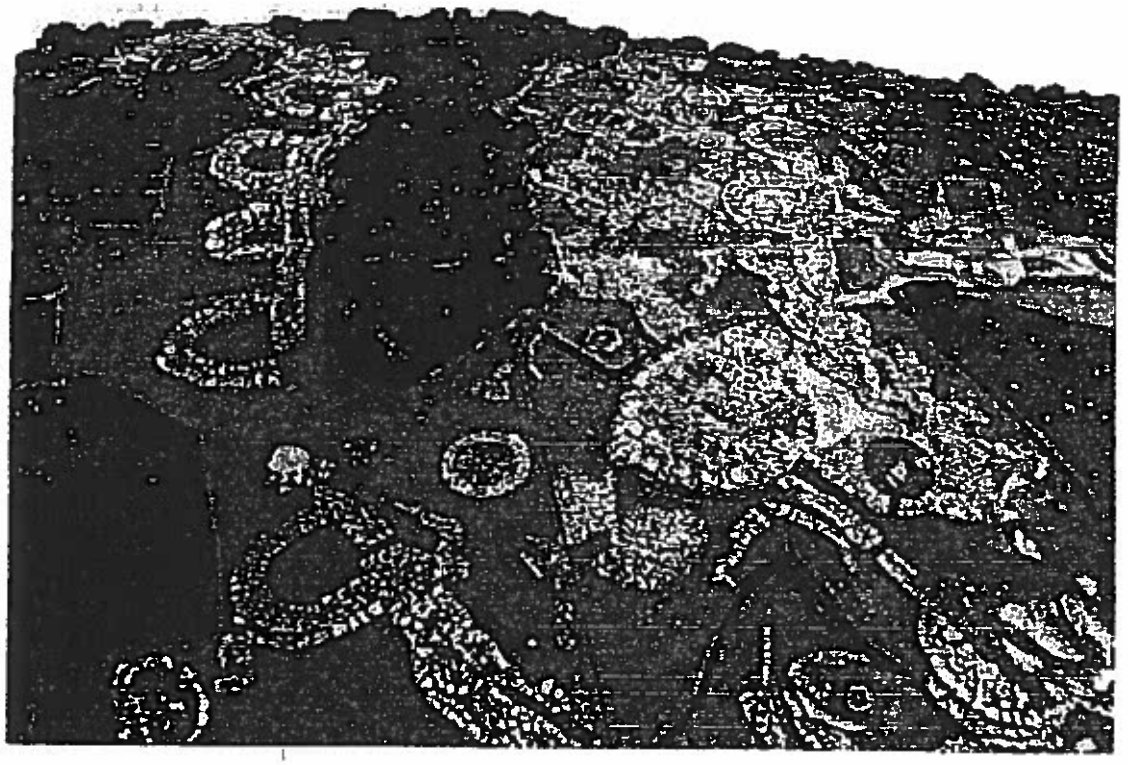
1- Reprsentative ceramics from each of the cultural phases at Leceia. Below, from the Late Neolithic; in center from the Early Chalcolitic; above; to the right, from the Late Chalcolithic; and, to the left, from the Beaker phase.



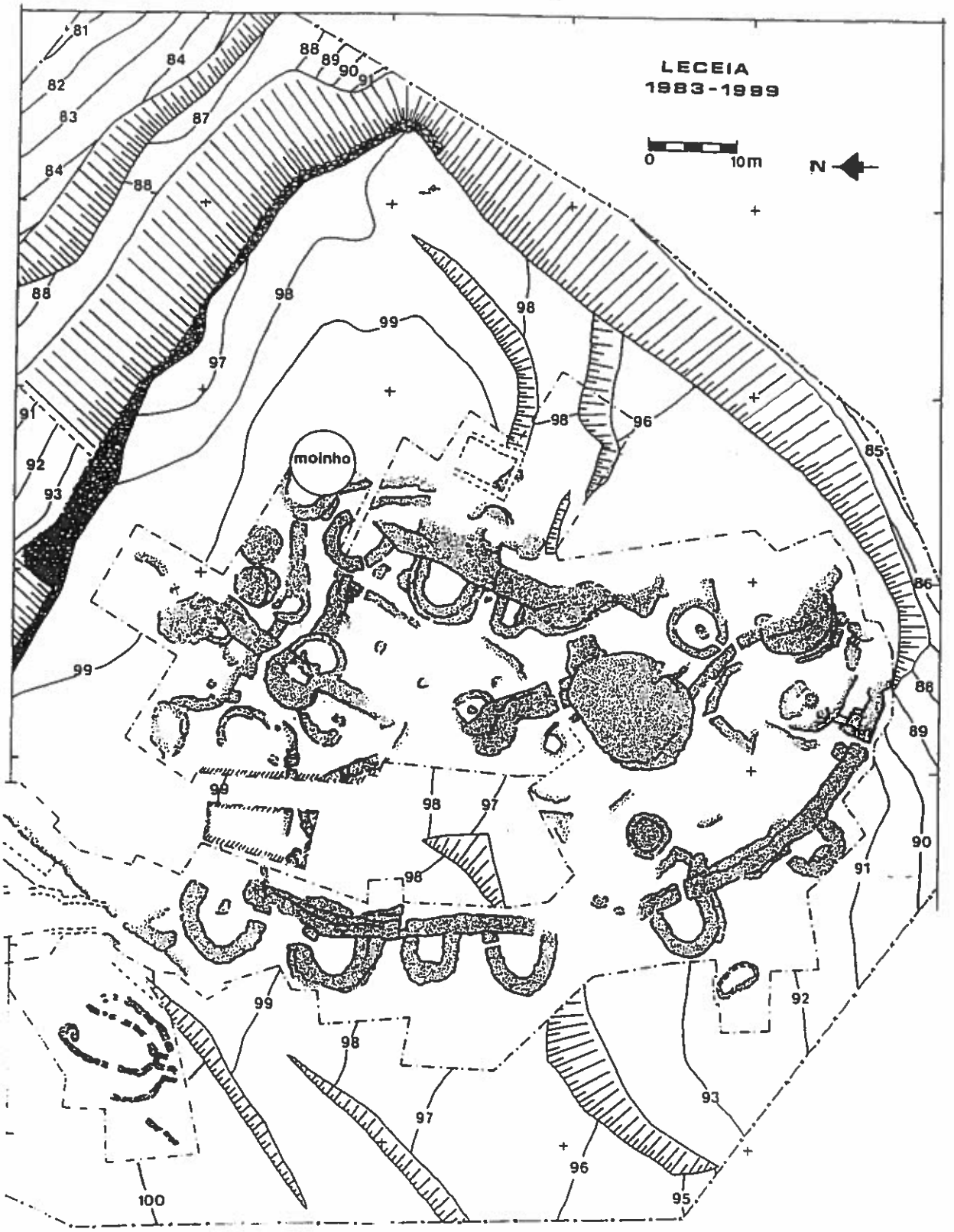
2- Aerial photograph of the prehistoric settlement of Lecela, showing the shape of the rocky outcrop on wich it is situated.



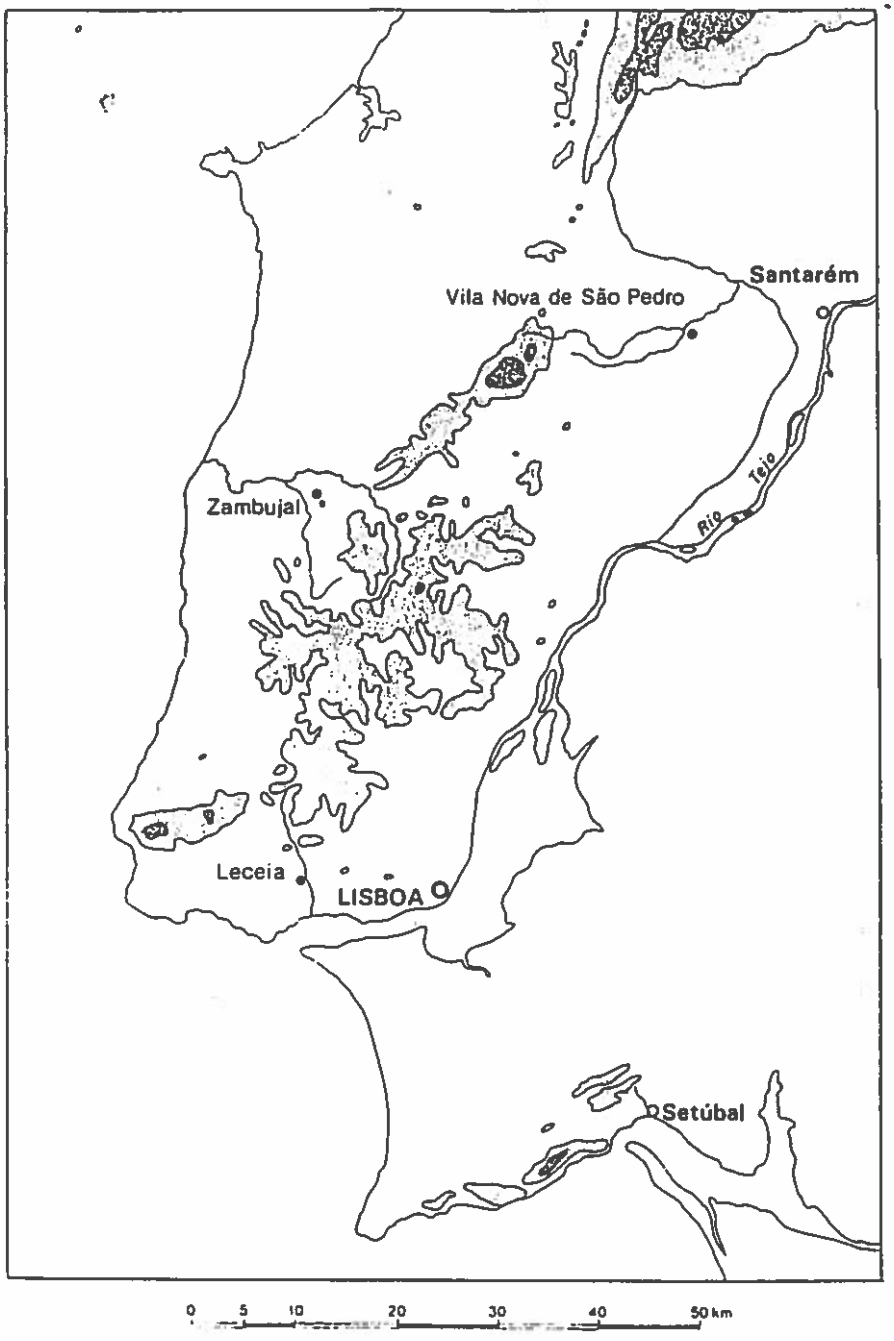
3- Oblique photograph of na idealized maquette of the defensive disposition of Chalcolithic settlement of Lecela; located on a rocky outcrop.



4- Detail of the maquette, at a scale of 1:20, of the excavated area of the prehistoric settlement of Leceia.

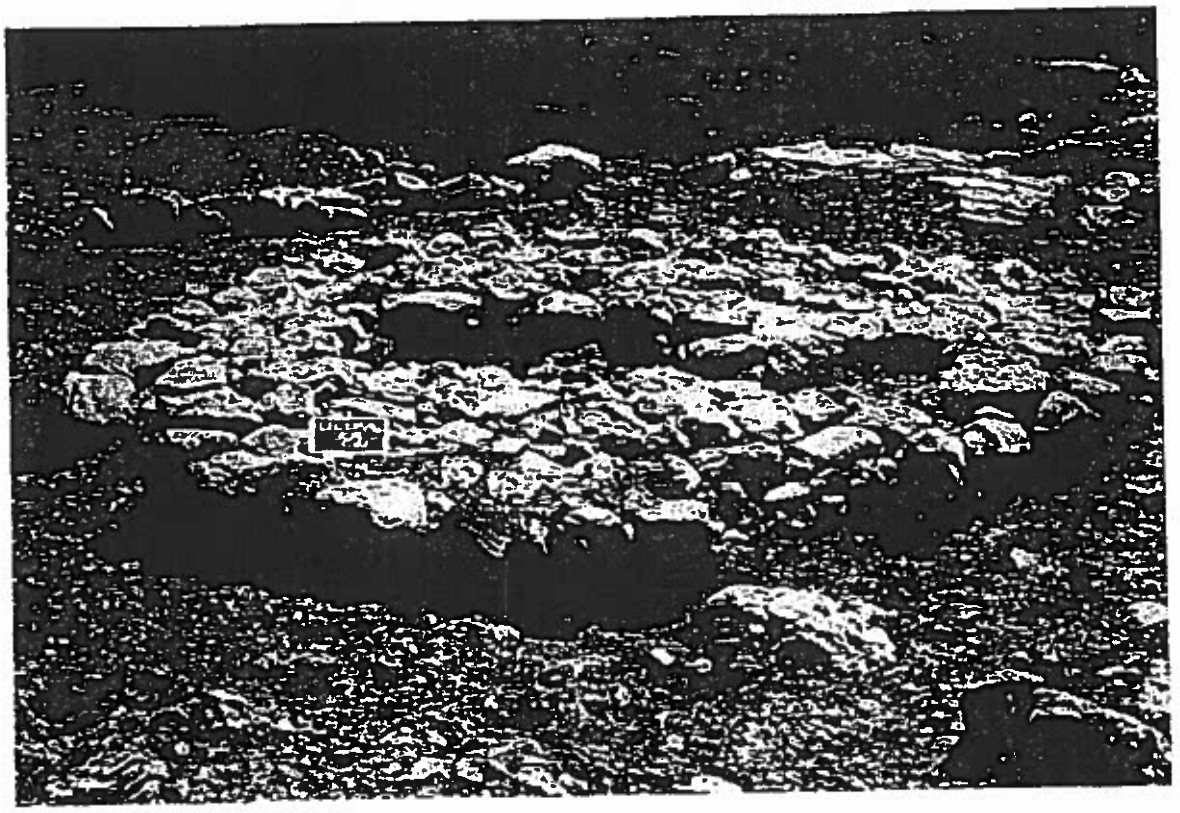


5- Leceia (1983-1999) - General simplified plan of the excavated area.



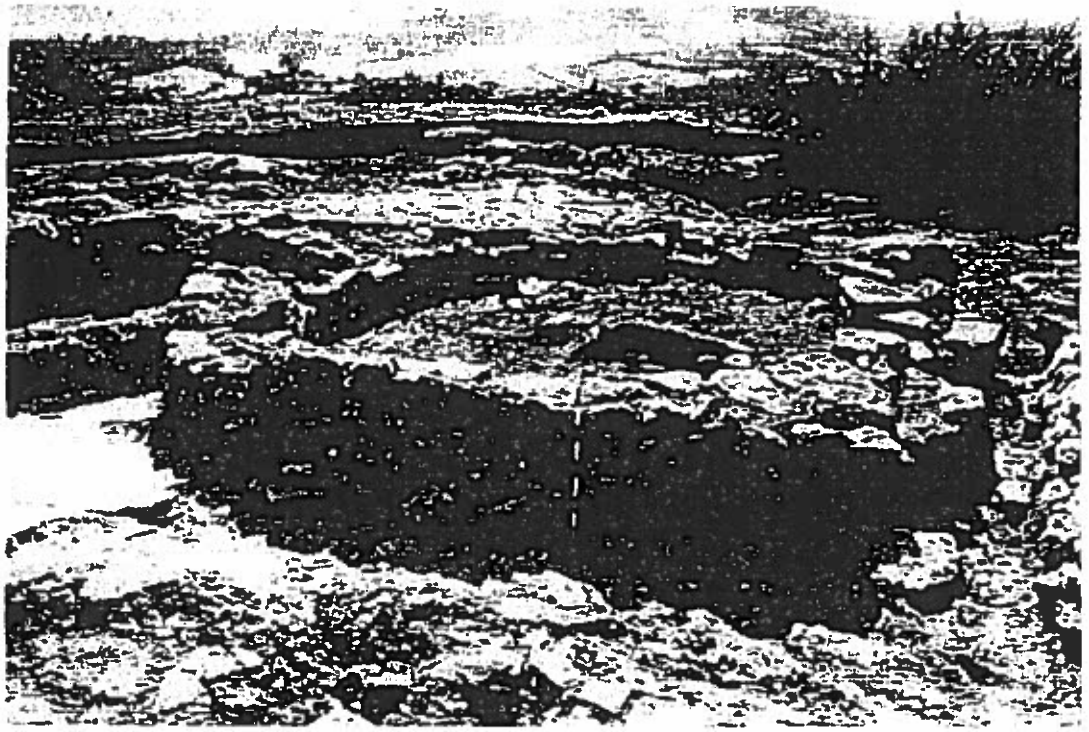
6- Location of the three most importante fortified Chalcolithic settlements of the Lower Tejo.

7- Flint blades with retouch, probably sickle blades. Leceia - Early Chalcolithic and Late Chalcolithic.

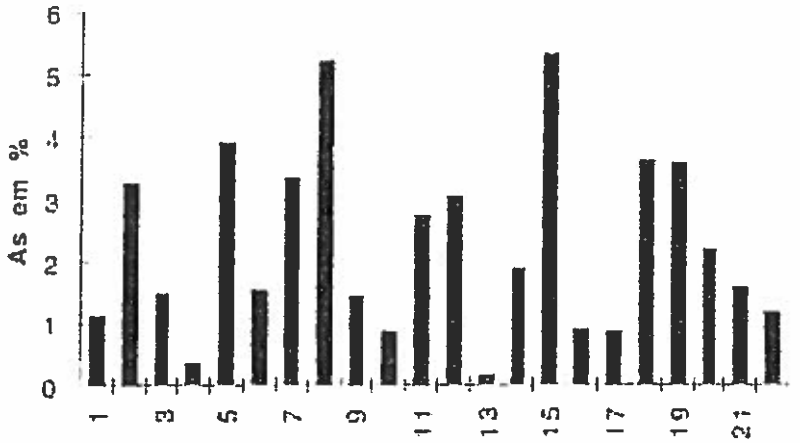


8- Structure of circular plan (paved), attributed to a threshing floor. Leceia - Structure EM (Early Chalcolithic).

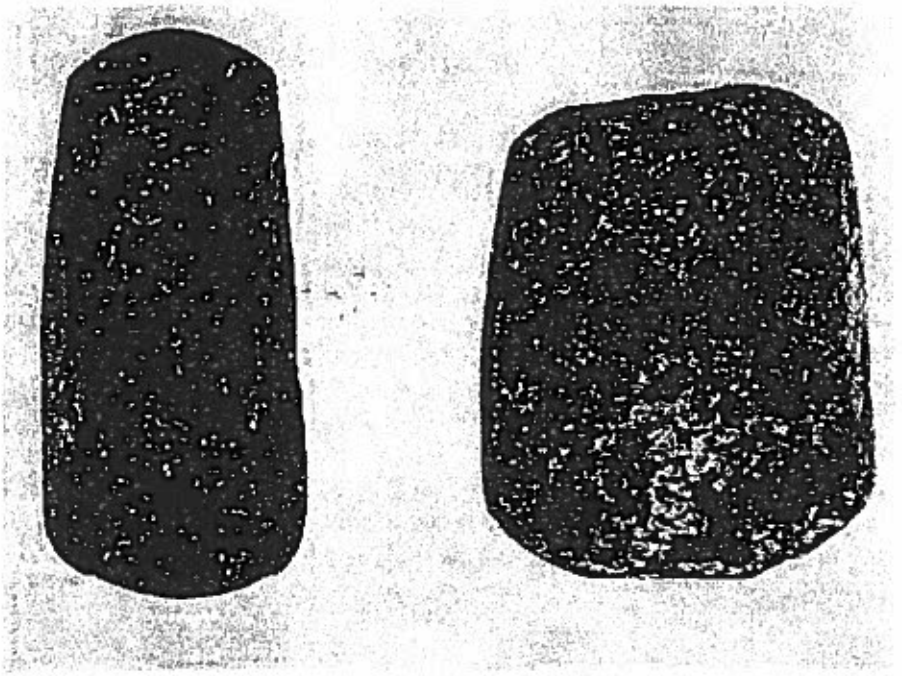
9- Example of a defensive structure, later reinforced on the exterior by large blocks. Leceia - Bastion G (Early Chalcolithic).



10- Large house of a circular plan, with a flooring in mortar masonry, and with na interior hearth. Leceia - House ZZ (Early Chalcolithic).



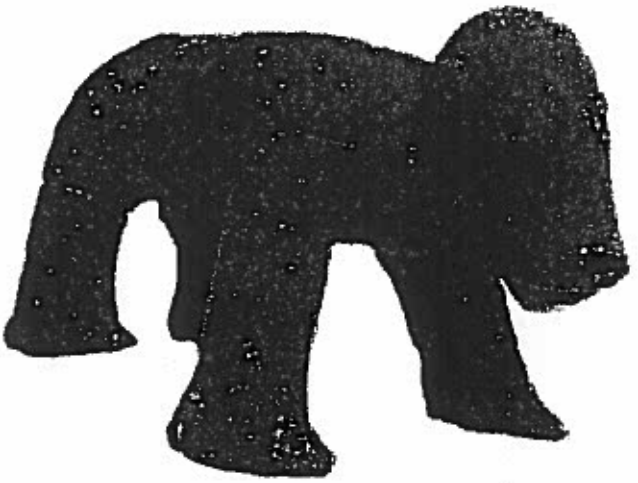
11- Variation in the level of arsenic in the copper artifacts of Leceia, determined by FNAA ("Fast Neutron Activation Analysis"), according to Cardoso & Guerra (1997/1998, Fig.9).

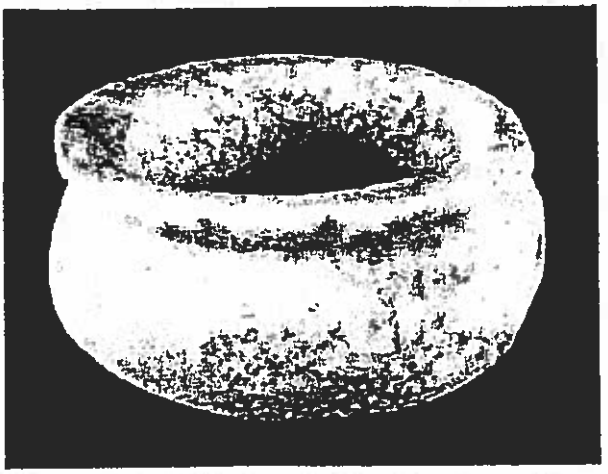


12- Amphibolite axes. Length, from the left: 11,6 cm.

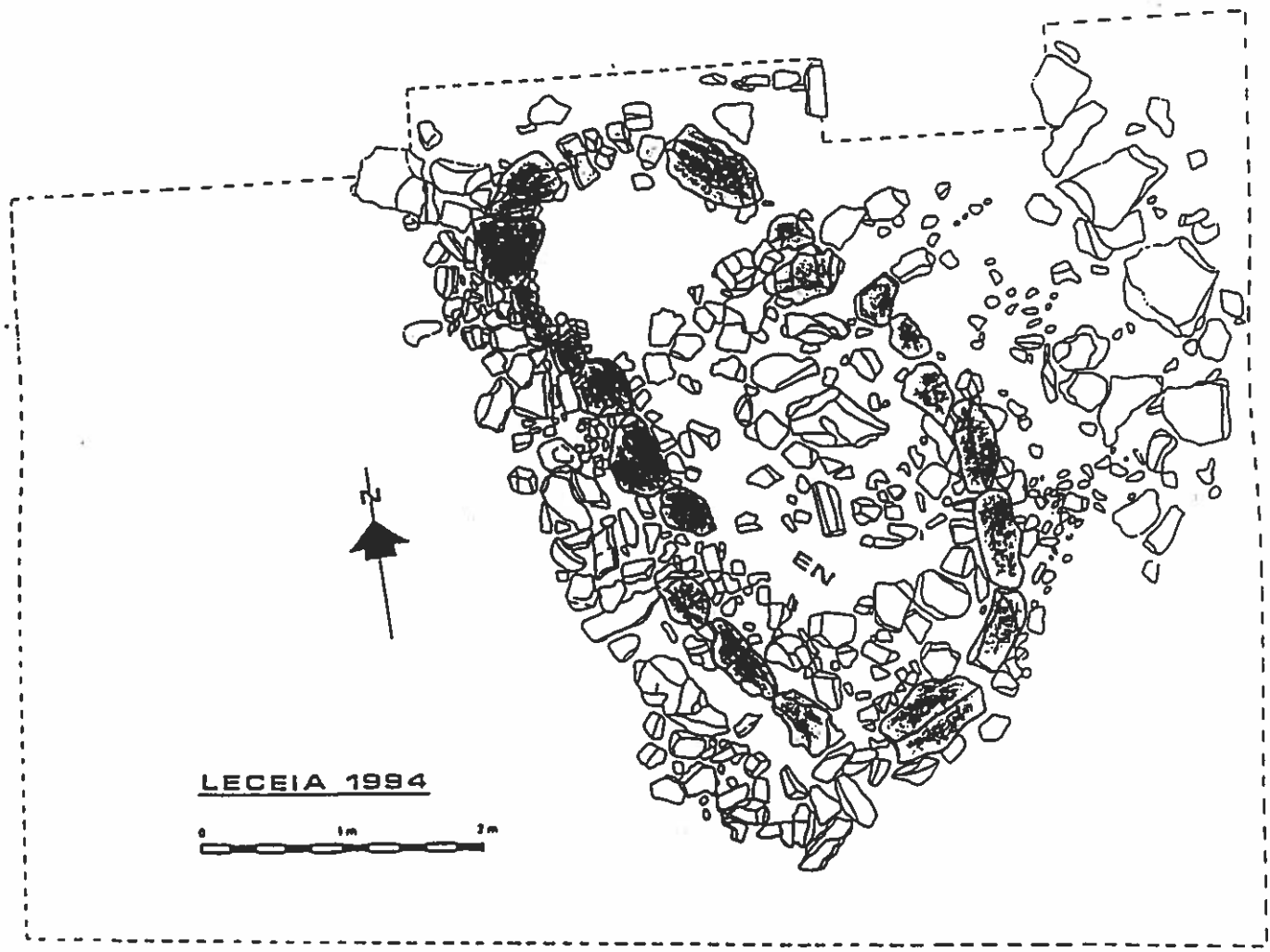
13- Small limestone cylinder, with female sexual characteristics. Leceia - Early Chalcolithic.

14- Sculpture of a suid, of cooked clay.
Leceia - Late Neolithic (reconstructed).
Maximum length: 21,0cm



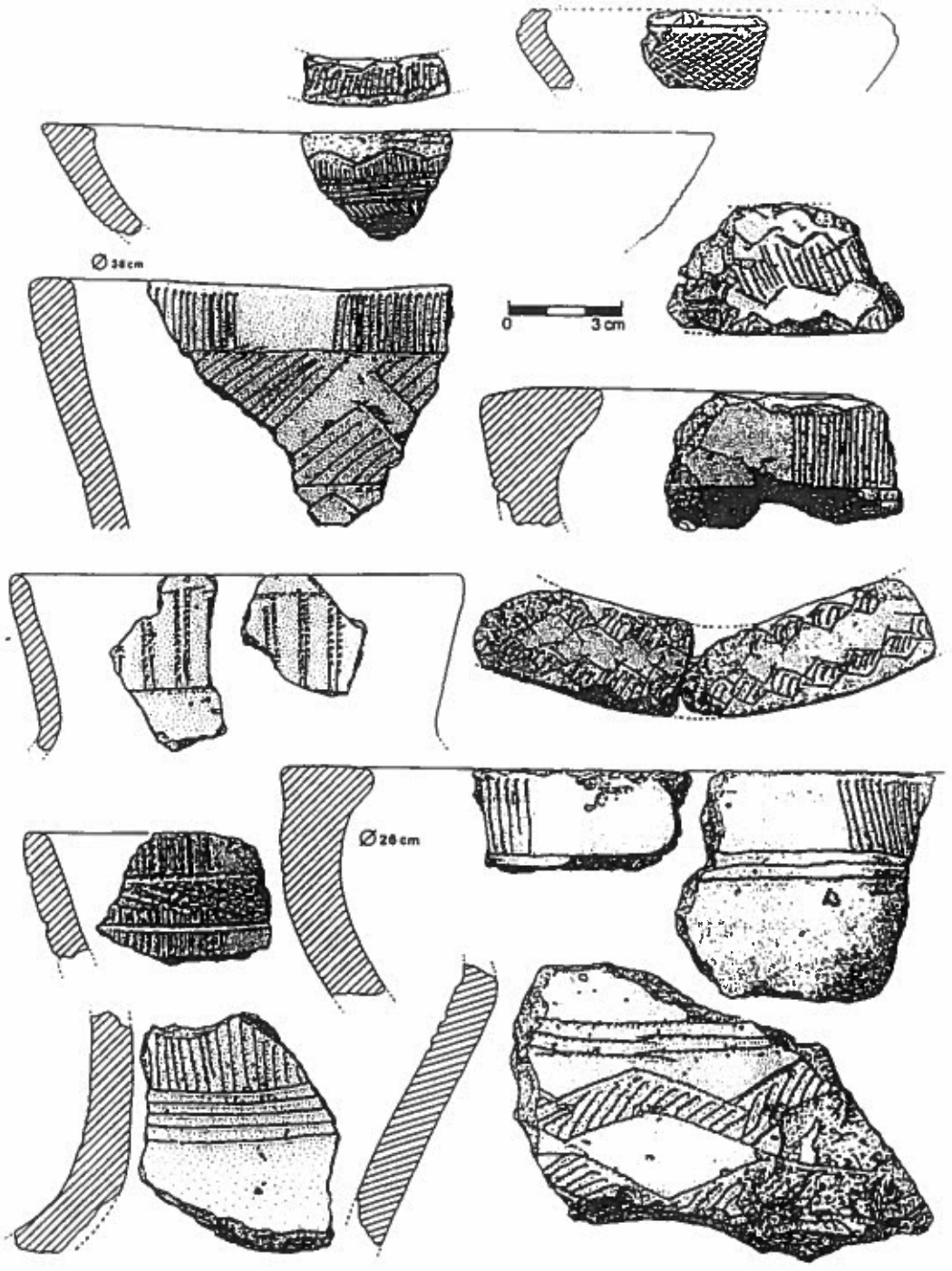


15- Small limestone mortar. Leceia - Early Chalcolithic (maximum diameter: 6,8 cm).

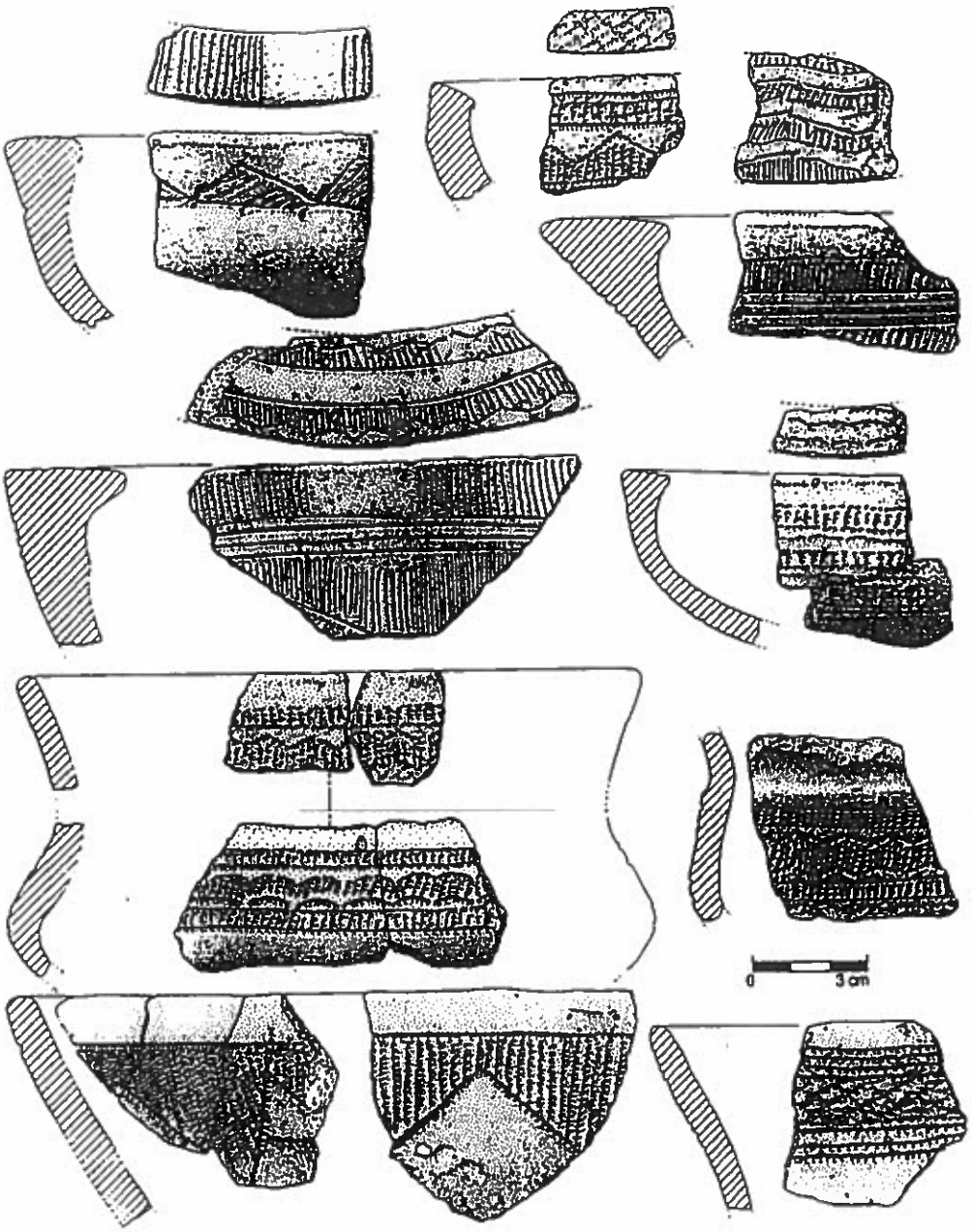


16- Leceia - Plan of the Beaker hut EN.

17- Leceia - Plan of the Beaker hut FM.



18- Leceia - Ceramic material from the Beaker hut. EN.



19- - Leceia - Ceramic material from the Beaker hut. FM

20- Palmela point. Leceia - (lenght: 7,9 cm).