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Cueva de El Toro (Antequera, Málaga-Spain): a Neolithic stockbreeding community in the Andalusian region, between the 6th and 3th millennia BC

D. Martín-Socas[1]; M. D. Cámalich[2]; R. Buxó[3]; E. Chávez[4]; J. C. Echallier[5]; P. González[6]; A. Goñi[7]; M. Mañosa[8]; T. Orozco[9]; M. A. Paz[9]; M. O. Rodríguez[10]; A. Rodríguez[11]; M. Tusell[9]; J. P. N. Watson[9]

1 Dpt. Prehistoria, Antropología e Historia Antigua. University of La Laguna. dsocas@ull.es
2 Dpt. Prehistoria, Antropología e Historia Antigua. University of La Laguna. dmassieu@ull.es
3 Museo Nacional de Arqueología de Cataluña. rbuxo@gencat.net
4 Dpt. Prehistoria, Antropología e Historia Antigua. University of La Laguna. echavez@ull.es
5 Centre du CNRS de Sophia Antipolis. Valbonne. France
6 Dpt. Ciencias Históricas. University of Las Palmas de Gran Canaria. pgonzalez@dch.ulpgc.es
7 Dpt. Prehistoria, Antropología e Historia Antigua. University of La Laguna
8 Laboratorio Arqueotecnia. Barcelona
9 Dpt. Prehistòria i Arqueología. University of Valencia. Teresa.Orozco@uv.es
10 Dpt. Territorio y Patrimonio Histórico. University of Jaén. moliva@ujaen.es
11 Dpt. Ciencias Históricas. Universidad de Las Palmas de Gran Canaria. arodriguez@dch.ulpgc.es

ABSTRACT – *The occupation evidence shown by the cave El Toro, is that of a unique stockbreeding community in the Andalusian region. The calibrated dates for this occupation period go from the second quarter of the sixth millennium up to the second millennium BP. There is also evidence of occasional occupation throughout later millennia up to the Hispano-Muslim period. The nature of this occupation is determined by the close link between the cave and the community which occupied it, both continuously and periodically. Throughout the occupation levels, the community's skillful control of technical processes and its remarkable knowledge on how to transform local primary resources, have shown that this community reached a high level of technological development. However, its main economic activity was related to agricultural and farming exploitation, particularly to stockbreeding.*

IZVLEČEK – *Podatki o naselitvi jame El Toro kažejo na edinstveno živinorejsko skupnost v andaluzijski regiji. Kalibrirana datacija naselitvenega obdobja sega od druge četrtine šestega tisočletja do drugega tisočletja BP. Obstajajo tudi dokazi za občasno poselitev v naslednjih tisočletjih vse do španskomavrskega obdobja. V vseh naselitvenih plasteh opazimo, da je skupnost vešče obvladovala tehnološke procese in je imela obsežno znanje, kako izrabljati lokalne primarne vire, kar kaže, da je dosegla visoko stopnjo tehnološkega razvoja. Njena glavna gospodarska dejavnost pa je bila povezana s kmetovanjem, posebej še z živinorejo.*

KEY WORDS – *beginnings of production; recent Andalusian prehistory; palaeo-economy; exploitation strategies*

Cueva de El Toro is a cave site in the Sierra del Torcal, a wide mountain range that separates two very different areas: Mediterranean Andalusia and the Subbetic System (Fig. 1). It runs along 27 km and has some height bench marks between 800 and 1400 m above sea level. The morphogenesis of the Sierra is determined by limestones and diaclast systems that have conditioned the flow directions of karstic modelling. Within these, typical *simas* are found, in many cases, old cavities, some of which were inhabited for long periods.

Cueva de El Toro is 36° 57' 23" north, 4° 32' 10" west, and at a height of 1190 metres above sea le-

vel. From the access and entrance to the cave, it is possible to see the natural bed and the outlet of the river Guadalhorce. It also allows a view of the lowlands of the Sierra, where there is a suitable fertile area for various agricultural activities.

In front of the entrance a long cavity of reduced dimensions is located. Following its tectonic and topographical study, this so-called *Sima del Pasillo* has been shown to be a continuation of the Cueva de El Toro, implying that they were once part of the same structural complex (Fig. 2).

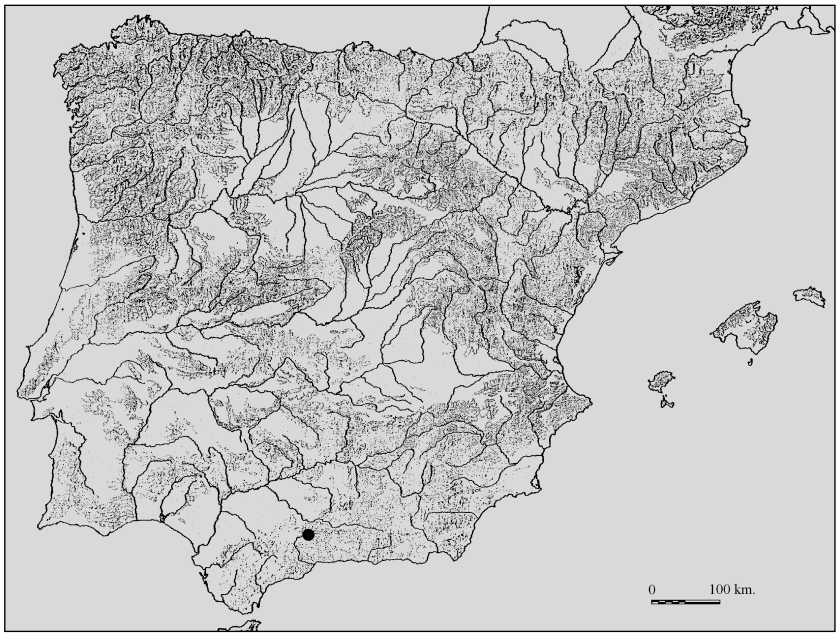

Fig. 1. Cueva de El Toro site.

The study of both cavities has shown that a tectonic movement that affected the whole Penibetic System probably sank part of the original complex. Among other events, the fall of big blocks partially affected a sector of the interior of the cave that can be dated to around the middle of the third millennium BC.

The consequence of this movement is the current disposition of the cave: its interior structure with large collapsed blocks, the formation of a *sima* of more than 30 m inside the cave, and its actual entrance. It has been possible to infer that the original cave entrance, used at least during the Neolithic and part of the Copper Age occupation, was to the south near the *sima*, since it is in this area that the most important stratigraphic continuity and the highest concentration of combustion structures associated with the Neolithic phases are found. Later on, human occupation moved toward the north of the cave, where the current access lies. It is here that most of the evidence corresponding to the societies that occupied the cave after the third millennium BC is concentrated.

Five systematic excavation campaigns (1977, 1980, 1981, 1985 and 1988) were carried out. The stratigraphic and the occupational sequences (2.40 m of deposit) correspond to different periods. These are structured in four phases that have been dated to belong from the middle of the sixth millennium back to the middle of the fifth millennium BC. Phase IV is the oldest, and corresponds to the Middle Neolithic in the conventional cultural sequence in the area. The following one, that corresponds to the Recent Neolithic, is divided into two periods: the earlier sub-phase IIIB, which would have developed between the mid- and late fifth millennium, and the later sub-phase IIIA, which is limited to the first quarter of the fourth millennium BC. After a hiatus in occupation, the cave was re-occupied (phase II) from the first third of the third millennium BC, according to the calibrated ^{14}C dating (Fig. 3).

However, the cave's final occupations are not as easily defined. According to the material indicators, it can be settled to the first quarter of the second millennium BC. Phase II is also subdivided into two periods marked by the structural change to the cave. The oldest (sub-phase IIB), which corresponds to the Copper Age, poses an evaluation problem associated with the alteration generated by the change in the general structure of the cavity, with an inclination toward the south, where the current *sima* opens up. As a result of this parts of the sedimentary units were altered. A more recent problem is that of erosion of the upper layers caused by speleological groups, who use the *sima* for practice.

From this moment on, the cave was to be occupied only occasionally, particularly at the end of the third and first half of the second millennium BC (sub-phase IIA), the Late Copper Age, with Bell Beakers, and the Bronze Age. This occupational dynamic was irregular throughout the second millennium, so that the final moments of the prehistoric occupation of

the cave of El Toro (phase I) can be placed between the mid- and final part of the second millennium BC. A similar situation, documented by scarce surface finds, continued during Roman and Medieval times.

Archaeological work, including different analytical methods and excavations, was also done outside the cave, according to the requirements of the developing studies, particularly, on the plain located immediately before the cave entrance and also under a type of porch, also called *viseras*, which had abundant collapse material that seemed to be associated with the closing of the original entrance. In this area, different materials corresponding to the different phases of occupation of the cave were identified, particularly fragments of clay-pots with vegetable prints that denote the existence of dwelling structures nearby.

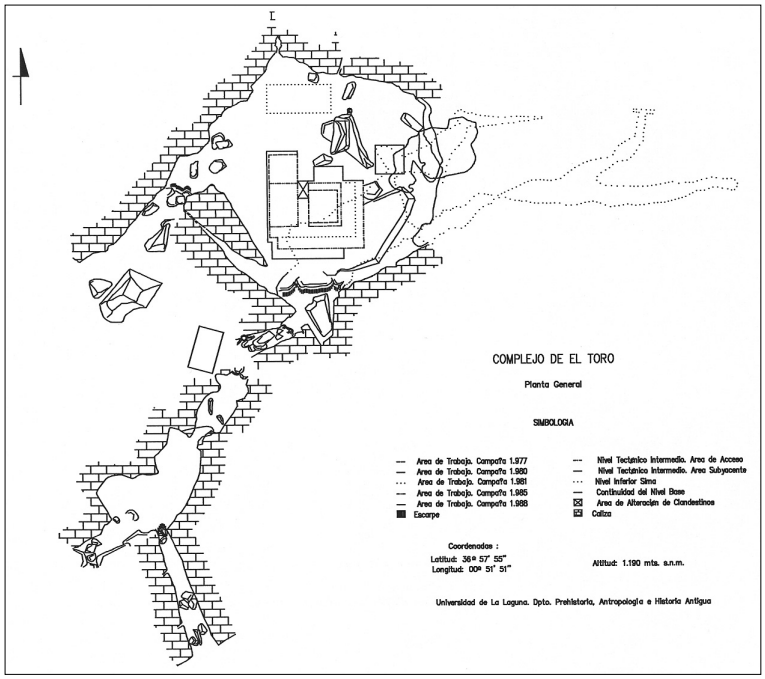

Fig. 2. Plan of Cueva de El Toro.

The structure of the cave divides the interior into two areas: one near the *sima* (sector 1) and the other, connected with the current entrance, which is illuminated by natural light (sector 2).

As a result of the excavation works, as already indicated, four main phases determined by the structural changes in the spatial arrangement of the cave were identified. Each phase indicates the differentiated uses that they made of the site during the historical periods. For the same reason, the two intermediate phases are, in turn, subdivided into sub-phases A and B, where a clear internal cohesion exists between the two.

In accordance with this documentation, the first evidence of the occupation would have been deposited in a historical context where the development of agricultural communities had already begun in the area. Consequently, it is appropriate to place this location in the context of the beginnings of Recent Prehistory in the Andalusian area.

However, at present, trying to include the occupation of Cueva de El Toro within the framework of a wide network of settlements in southern Iberian Peninsula is a complex task. The problem arises not only from the difficulties posed by the theoretical debate about the conditions and circumstances of settlement and the processes of animal and plant domestication, but from a total lack of some minimal levels of empirical data. A lack of systematic field work – filed surveys and excavations – the absence of well-recorded collections and of datings, analytical problems of sediment samples to determine the duration of the *hiatus* in the occupation of the different places, inadequacy of analytical techniques, etc. In addition, in the region of Málaga many sites have been destroyed by looters.

There has also been a misguided tendency to recreate standardised archaeological and geographical representations, which has severely constrained analysis of the region's first agricultural societies. This has created an interpretative flaw which, nowadays, and considering the importance of geographical determinism and the fact that each site is interpreted as an independent and isolated analysis unit, is difficult to maintain.

As result, the standard interpretation is that the development of these societies was determined by the changes produced by new, external factors, by influences from outside the peninsular region. These would have given a new character to the local societies, defined by a significant economic value, but mainly determined by "type fossils", especially pottery, such as the cardial in the oldest periods, red slips (*almagra*) for the intermediates, and ornamented and large receptacles in the final stages. In these later periods, a certain developmental level had al-

ready been reached, which has been interpreted, among other factors, from the establishment of the first outdoor settlements – provided the last two periods were not integrated into one, called the mid-end Neolithic.

It is not for us to discuss in this article the origins of the first sedentary formations and of the development of the first agricultural communities, which is the subject of future studies, but it is appropriate to point out that, according to the new evidence being generated in the whole southern region of the Peninsula, and especially in the south-western area, the dynamics of these societies is more complex and diversified than has been traditionally inferred.

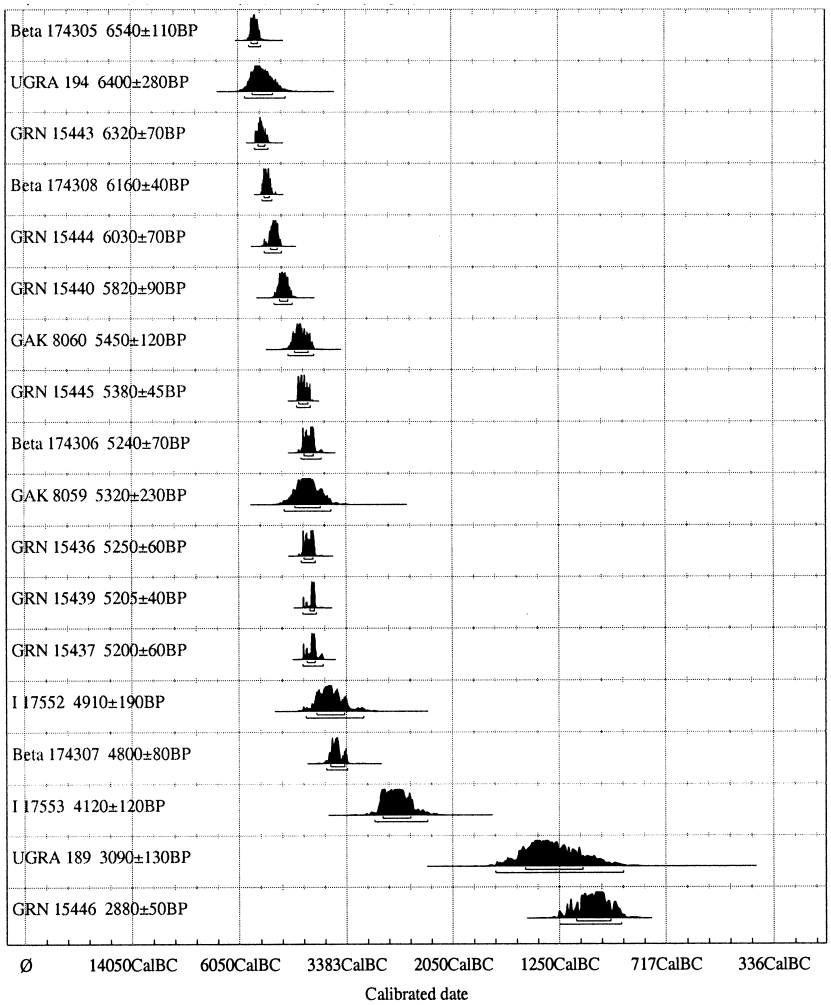

Fig. 3. Cueva de El Toro. Distribution plot of radiocarbon dates.

Indeed, the studies and datings of menhirs from different settlements in the south of Portugal (*Calado et al. 2003a; Gomes and Cabrita 1997*) seem to demonstrate that their development began from the mid-seventh millennium BC, that is to say, before the first signs of cultivated cereals and domestic animals were identified in the Iberian Peninsula (*Calado et al. 2004*).

Although it is true that more evidence is required, the current data implies this, which creates the need to revise the traditional models and the interpretation of the transformation process from complex hunter-gatherer societies to the first agricultural communities. At the same time, there would have been, at least for this area (although this is most probably a common phenomenon and not unique to this zone), the independent development of the sedentary/settlement process and all its consequences, including the first attempts at cereal production or herding animals. This would have taken place in this region around the mid-end of the seventh millennium BC at the latest.

For this last case there is a controversy concerning the chrono-cultural evaluation of the initial period of food production in the region, since the dating results have yielded extremely old dates at several sites; these include La Dehesilla (Cádiz) (GAK 8953: 7670 ± 400 BP, cal 7574–5742 BC, with a correction that would place the site in the first quarter of the eighth millennium) (*Pellicer and Acosta 1982; Acosta 1987; Acosta and Pellicer 1990*). This was why the researchers proposed an autochthonous development process in the western area for this period. According to these authors, the pottery is the main indicator, and its development was interpreted as a result of a process of internal evolution of the epipaleolithic substrate of the region, prior to the expansion of the cardial horizon which originated in the Levant. Among the critics, Fortea and Martí (*1985*) stand out with their refusal to accept either such an old dates or the explanatory model.

The problem of this proposal, apart from the aforementioned duality between the settlement process and the beginnings of food production, is that the findings in a large group of Neolithic sites in the re-

gion contradict this hypothesis, and reconfirm the interpretation of the arrival of farming and cattle-herding communities, or, at least, some of its knowledge (*Zilhâo 1997; 2000*), sometime after its appearance in the Levant. This would be in accordance with the consolidation and southern expansion of these communities which would finally reach the Atlantic coast, from the first half of the sixth millennium, in calibrated dates.

As has already been pointed out, one of the main problems with the current evidence is that the number of sites studied systematically is very low, but also, of those published, some present dilemmas in their interpretation, whilst other unpublished works have only been explained partially or superficially. Thus it is easy to understand the current confusion. In the caves of La Carigüela (Granada) (*Pellicer 1964; 1979*), Nerja (Málaga) (*Pellicer 1963; Pellicer and Acosta 1982; 1986; 1995; 1997*), as well as in the latest studies of the settlement at Los Castillejos (Granada) (*Pérez Bareas et al. 1999*), it has been possible to contrast the evidence and to confirm that, in the sequences, the lower levels of production were characterized by the presence of indicators such as geometric microliths and impressed ceramics, either cardial or made with dentated matrix, associated with others that feature the signs of what has conventionally been considered the initial moments of the Middle Neolithic.

In the same way, through the traditional sequence pattern for the Andalusian communities associated with the cardial pottery, these were interpreted as troglodytic, their development being restricted essentially to the eastern area and rarely in the inland regions (*Navarrete Enciso 1976*). However, and in spite of the problems that the reliability of the published information poses due to the inconsistency of the methods used during its analysis (*Pérez Bareas et al. 1999*), in the last few years there has been new evidence which offers a different panorama. This new theory does not lack problems either, because of a relatively wide variability in the types of settlements, both in the coastal areas (i.e. Cabecicos Negros) (*Goñi et al. 2003*) and inland – whether in valleys, on hill tops (i.e. La Esperilla) (*Gutiérrez et al. 1996*), or in mountain areas (i.e. Los Castillejos) (*Arribas and Molina 1977; Sánchez 1999; Afonso et al. 1996*), and across the whole region.

In general, and considering the large sedentary settlements that are found in southern Portugal (*Calado et al. 2004*), these seem to coincide with smaller camps in the Andalusian region, usually located in small elevations and next to water courses, which reveal settlements of seasonal and periodic timing typical of small communities (although their real dimensions are difficult to determine). These communities, which maintained a close association between the number of their members, their mobility and the potential use of their environment, are characteristic of the social formations in these initial periods.

Their location must be understood as being directly related to a subsistence economy, that is to say, an agricultural system derived from the available resources. Territorial expansion was widespread for these social formations that, little by little, consolidated and enlarged their production structures, at the same time as they took control of the whole territory. In this sense, they generated new strategies, which had the tendency to diversify the use of subsistence and primary resources. However, in spite of their widespread distribution over the region, the existing information is very scarce, fragmentary and impossible to contrast in a reliable way. In addition, the evidence is centred fundamentally on the results obtained in cave locations, in inland regions, and in mountainous environments. In consequence, they present an image based on the almost absolute prevalence of cattle exploitation, due to the presence of some differential features that are traditionally found for these populations in the other regions of Iberia, which does not necessarily have to correspond to the general norm for all Andalusia.

The reason for this interpretation is largely because the evidence published on carpological remains for this initial period is very thin and refers exclusively to cereals, although the possible existence, in the final periods, of leguminous cultivation should not be discounted. The presence of hand mills, axes and adzes, as well as of sickle blades with cereal remains, indicate the practice of subsistence and complementary agriculture, which accords with the mountainous character of most of the locations published up to now. On the other hand, it is inferred that this agricultural system was supplemented by some other activities.

However, and in spite of the poor data, it seems that the activity of the communities located in the plain areas or in the lowlands was primarily agricultural, cereal-based, perhaps of short-cycle rotation, where gathering wild foods and raising cattle would have been complementary strategies.

The subsistence economy is, in general, an agricultural system derived from the various resources found at the locality, complemented with the continuity of previous traditions, such as hunting and gathering. In some areas, for example, the coastal regions due to their particular features, there was a tendency towards the use of marine resources, especially molluscs.

On the other hand, and although the identification of the locations of the first agricultural social formations has been carried out by the presence or absence of the type fossil of the recipients with cardial ornaments, we know that in this region the different technical and ornamental expressions would have been gradually incorporated from the mid-sixth millennium BC. The rest of the tool finds were thin sílex blades of micro-laminar thickness, stone axes, and a few ornaments that, on occasion, were not from the same area. Up to now, it is not known whether the separate origin of these ornaments was due to the mobility of these semi-sedentary communities, or if they came from a short distance, via intra-regional exchange, either inland or in the coastal zones.

The pressure that these activities exercised on the environment has always been overestimated. This is why the traditional hypothesis is that the introduction of agricultural production in Andalusia did not significantly transform the vegetation. This would have been more substantial during the Copper Age and, especially, during the Bronze Age. In turn, this would have generated a process towards aridity in some areas and of desertification in others, the main example being the changes in the southeast. However, research is demonstrating that the effects of the strategies related to the origin, development and consolidation of farming and/or herding in Andalusia begin to show from the middle of the sixth millennium BC, since it has been verified that this occurred in the surroundings of the Cueva de los Murciélagos (Zuheros, Córdoba) (*Rodríguez 1996*).

Thus it would have been by the middle of the sixth millennium BC that the first occupation of the Cueva de El Toro had begun.The stratigraphy of the phase IV is characterized by a series of sediments deposited on the cave's base which are formed by a great quantity of collapsed flagstones, typical of this type of karstic formation.

Taking into account the features of the different sedimentary units, a series of successive thin coal and ash strata were recorded. In some cases these were associated with large shallow pits, probably related to the use of fire, which unevenly affects the distribution of the occupation of the space. From their characteristics, and given the results obtained for diverse studies, the hypothesis is that they correspond to combustion areas related to the smoking of meat products in order to generate a surplus. There was also an outstanding quantity of burnt and dismembered human remains, in particular a jaw.

In conclusion, this community corresponds to a society with some productive activities based on the raising of livestock, from which primary and secondary products could be obtained, such as meat and skin-based products. Hunting and obtaining plant resources would have contributed to stabilizing and supplementing the diet and to providing raw materials for the making of some products.

Moreover, handicrafts did not develop significantly in this area, with the exception of leather working. Indeed, the signs on these items suggest that they were carried out preferably as repairs on tools manufactured elsewhere. Of smaller importance, the carved lithic tools reflect their use in the transformation of wood and plant fibres and clay or minerals.

Therefore, the Cueva de El Toro was initially occupied by a community with a subsistence economy based on livestock exploitation integrated with the mountain environment as is that of Sierra del Torcal. However, at present, the presence of different types of oak woods denotes an important forest environment, although this has no anthropic influence, which implies that in the initial stages of occupation of this territory there were no woods (Fig. 4). On the other hand, in the Cueva de los Murciélagos (Zuheros, Córdoba), the thicket woods denote both a humid and thermophile atmosphere, and also the first stage in the degradation of the vegetation.

This importance of livestock management is clearly reflected by the faunal sequence, which is possibly typical of the pattern of livestock exploitation in Andalusia during this period, with a marked presence of the caprines. Sheep would have been more abundant than goat by a proportion of 2:1, and pig would have been next in importance. The pattern of the mortality profile indicates that this was subsistence strategy directed to the consumption of meat rather than to the production of other products such as milk or wool. As for the contribution of the hunting activity in the meat diet, it would have probably been small and mainly comprised of hares and rabbits.

This exploitation regime, basically oriented towards the generation of a meat surplus, through the and smoking of the meat (Fig. 6.1) to conserve it, steaking apart from the uses of the hide (Fig. 6.6), is suggested by the carved lithic toolkit production.

The carved lithic toolkit production shows a high degree of technical skill, but it is also clear that the finished products were not manufactured in the cave, but arrived ready for use, which explains their continuous re-use (Figs. 6.2–5, 7; 7.2–3), and, also, that some were reserved for later use.

This panorama is not exclusive to carved lithic tools, but can be extended to other items, such as the bracelets of various rock, or the malacological industry, for which there are no signs of on-site production. The same pattern can be recognized in the quantity and types of processed carpological products.

It is evident that there was a level of dependence on external communities for the production of goods, which implies an exchange regime that, considering the possible origin of the primary resources, is probably connected in most cases with other communities in the same region. The marble bracelets (Fig. 8. 2–3) and malacological records (Fig. 8.1, 4–10) could be examples of this. However, there is proof of the production of tools from bone (Fig. 7.1), wood (Figs. 6.3; 8.2, 4–5) and vegetable fibres, although it has not been shown to be production intended to generate a surplus.

The indicators of the Cueva de El Toro in phase IV do not seem to show the existence of a conventional exchange regime of inter or intra-regional character. It could be assumed that activities allied to the butchering, tanning of hides, and smoking of meat were to generate a surplus that overcame the necessities of the community that inhabited the cave and, therefore, that they were also exchange goods. It would then be necessary to accept that the connections recognized in other sites, where certain socio-economic situations and similar technical activities are observed, point to some social formations of tribal character whose mobility gave them a clear territorial control over the whole region. At the same time, this would imply a chain of product circulation, which has not still been well defined, but that seems to encompass large distances and where, undoubtedly, there would be an explanation for the significant development of the specialized handicraft products. This evolution would serve as a starting point for the important transformation that took place from the middle of the fifth millennium BC.

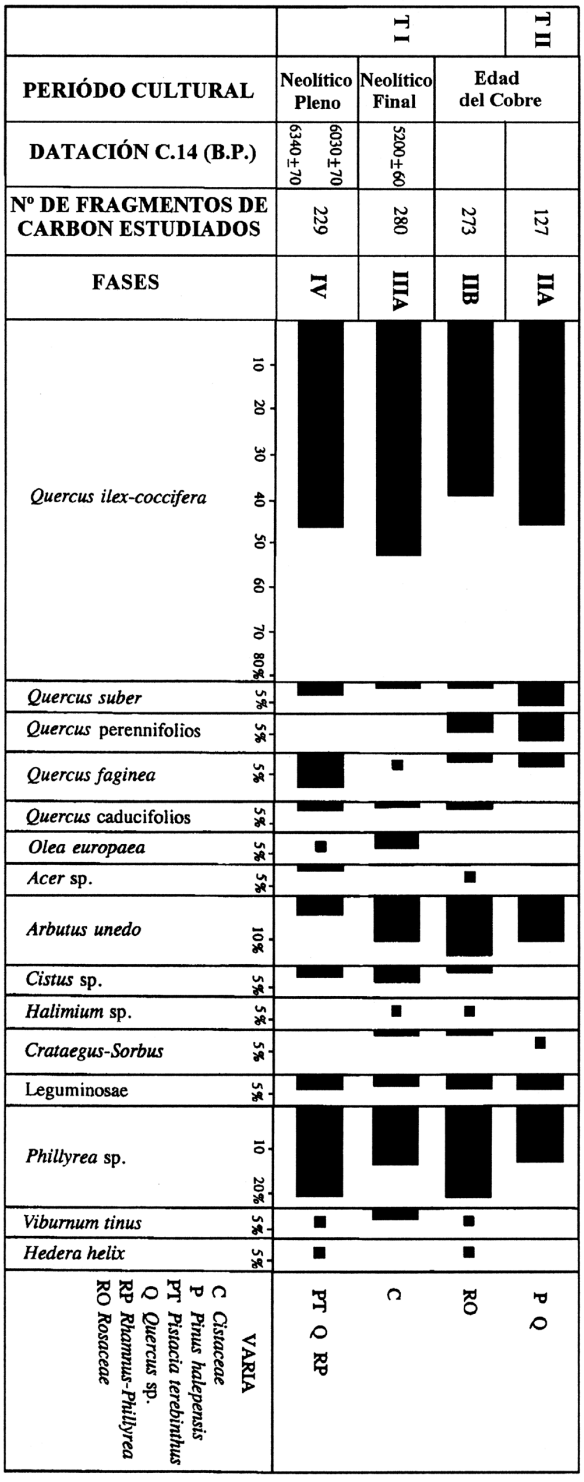

Fig. 4. Cueva de El Toro. Antracological diagram.

Indeed, this situation would have changed considerably, particularly during the last quarter of the fifth millennium, as can be seen from the fact that it was the moment of highest human occupation of the Cueva de El Toro. At the same time this process of demographic aggregation was happening in general in the whole region, together with a division of labour and a hierarchization phenomenon that somehow eliminated the previous organizational model.

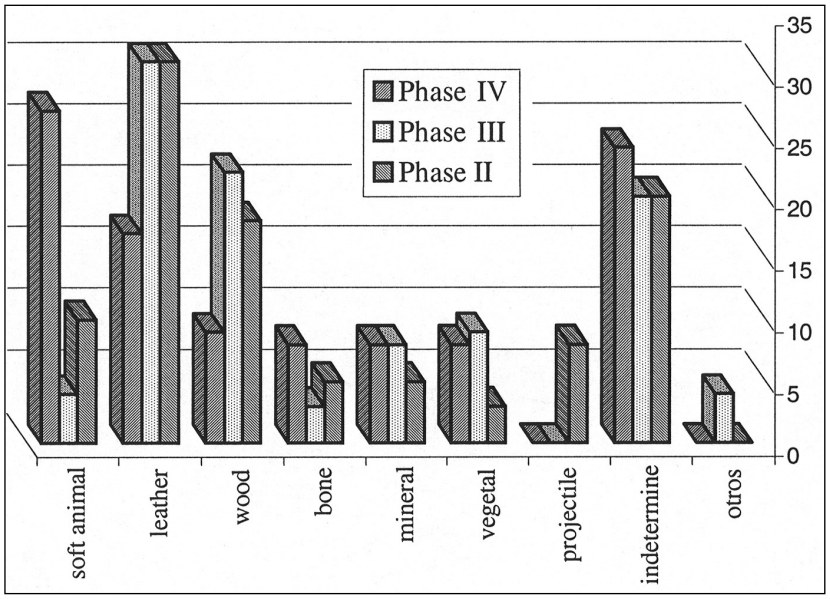

Fig. 5. Cueva de El Toro. The raw materials and handicrafts.

The first consequences of this change are seen in palaeo-ecological indicators at the Sierra del Torcal.

Thus, in Toro it is observed that, after a hiatus in its occupation, the cave was again inhabited from the mid-fifth millennium BC, in Phase III.

As a result, there is a greatly differentiated stratigraphic development in the sedimentary units with respect to the previous phase, by a level of loamy, granulated, reddish clay, the *terra rosa*. This was not part of the cave's material structure, but was introduced from the nearby exterior zones in order to condition and to level the floor. This conditioning of the living space, in opposition to that in phase IV, extends to the whole of the platform that became independent as sector one.

Directly over this level, six combustion structures are found. From their disposition, it can be said that they were organized in relation to the original access to the cave. Of these, five are defined by small spaces delimited by stones and forming irregular plans, although the main tendency is a circular or oval shape. The remaining one is determined by the construction of a small pit.

In this phase, two clearly defined situations can be recognized in differentiated uses of the cave, which would have had clear effects on the organization of the space.

The first, or oldest, sub-phase IIIB, would have been, according to the datings of available calibrated ^{14}C data, between the middle and end of the fifth millennium BC. This phase is established by the use of the interior of the cave as a stable for livestock, which would explain, on the one hand, the distribution of the combustion structures directly related to the sector of the access area. On the other, it explains the continuity of that disposition, in such a way that the remaining combustion structures recorded in the vertical development of this subphase are placed directly on the previous ones. In addition, there is the fact that certain tools related to crafts such as pottery or textile manufacture have been found in the same zone (Fig. 11).

As has been pointed out, from the end of the fifth millennium BC the moment of maximum development in the Cueva de El Toro took place, leaving an imprint on the paleo-ecological record of the Sierra del Torcal. It would have been in this period, especially the end of the fifth and the beginnings of the fourth millennia BC, when the first evidence of the impact of people's activities can be observed on the vegetation. This phenomenon is also identified in the results obtained in the Cueva de los Murciélagos (Zuheros, Córdoba) and in the Polideportivo de Martos (Jaén), where the first evidence of human impact already appear on the vegetation, generating a first degradation stage, as bush and heath species become widespread.

It has been proven that the raw materials used for combustion were the same as those used for the byre: *Quercus ilex* L., *Quercus coccifera* L., and *Phillyrea* sp., which are very abundant species in this mountainous area. Nevertheless, the presence of other plant remains such as heaths (*Erica* sp.), lentisk (*Pistacia lentiscus* L.), and Pistacia sp. indicate a wider gathering of plants that were not located in that same environment, but grew on decalcified substrates, as in the case of the heath, or in areas warmer than that of the mountains, such as in the case of the lentisk, which would have been brought from the lowland zones.

There are also some species such as *Quercus faginea* Lam., the olive, and other hard woods that re-

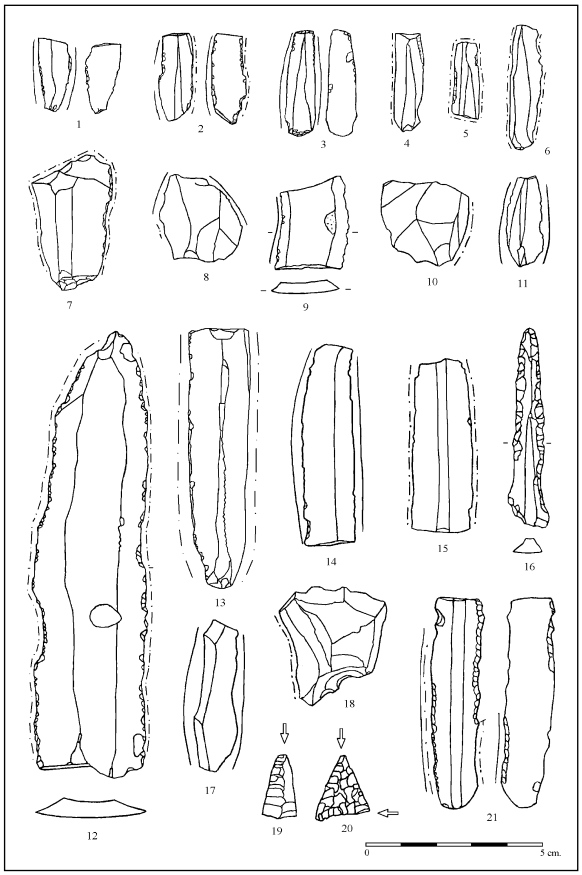

Fig. 6. Cueva de El Toro. Stone tool assemblage. 1–8: Phase IV; 9–12: Sub-phase IIIB; 13–18 and 21: Sub- phase IIIA; 19–20: Sub-phase IIB.

sist combustion and burn slowly. In the case of the olive (*Olea europaea* L.), and that of the holm oak (*Quercus ilex*), their presence in living areas could have been due to two particular activities. On the one hand, the bush branches were gathered as food for domestic livestock and, on the other, the spare remains were used as firewood.

It can be deduced that the landscape was beginning to be altered by human action, resulting from new economic strategies which would in time develop even further. These were characterised by specialized production, such as rearing livestock and growing cereals that would lead to a significant reduction of the vegetable cover (either that of herbaceous plants or of bush formations; simultaneously, species such as arbutus developed). Evidence of these activities is found in substantial quantities in most of the sites, from then onwards. This would have created a landscape of open areas, where bushes and heaths cohabit, dense forest areas, and enlarging arable land.

Both lithic and bone production (Figs. 6.9–18; 9. 5–8; fig. 7.5–12) continue to be important in understanding changes in the dynamics of the montane society, which has been observed in the strong development and diversification of handicrafts in relation to the small amount of evidence of those activities that would correspond to the gathering of subsistence resources. This growth is manifested, fundamentally, by the exceptional evidence of specialized handicraft production, such as textiles (Figs. 7.5, 8, 11–12; 11.2), skin (Fig. 6.10, 13, 17), woodcrafts (Figs. 6.9, 15, 21; 9.6, 8), or pottery (Figs. 6. 12; 7.9–10; 12.1–3), that seem to have been carried out in within the cave or its surroundings.

This situation is not general for the whole period, since in its first stages a part of the cave was used as a byre marking a radical change from its previous function.

The changes that can be observed from the beginnings of this period in connection to the fauna are a distinct reflection of the functional modification of the cave, which, in turn, is a result of the transformation of the economic system prevailing until then in the whole region during the Recent Neolithic.

This can be determined by, among other factors, changes in animal management, where caprines were prevalent relative to pigs. This is already a development with regard to the basic level of subsistence and meat or milk consumption. Indeed, there is an important change in the pattern of the goat mortality profile: a high proportion of very young, new-born and fetal animals appear, such that approximately half the animals died under a year old, while half of those that survived were sacrificed before three years. This evidence assumes that the animals were not slaughtered and then brought to the cave to be consumed, but rather that there was systematic occupation by the living animals, which has been confirmed by the presence of a disproportionate number of milk-teeth fallen during their lifetime. In addition, the fauna sequence shows a slightly higher presence of goats over sheep.

It is difficult to specify how many of the young animals were slaughtered rather than dying from natural causes, which could give an idea of milk production. Anyway, the evidence seems to indicate that the sacrifice of most animals would have been prior to the period in phase IV.

On the other hand, the presence of a very specific butchery pattern for the caprinos, marked by a parenthesis in the mortality rate between the age of

approximately two and five months, constitutes the most interesting phenomenon in sub-phase IIIB. Pérez Ripoll (*1999*) defines it as a pattern of meat production, although in El Toro it is necessary to add wool production, which has two possible explanations: on the one hand, that the mortality rate ceased or decreased as the animal grew or, on the other, that the animals were not in the cave during that period. With respect to the first of the possibilities, there is evidence that the mortality of young animals was high just after birth and in the first weeks, and although mortality is much lower after the first months, it does not cease completely. For this reason, the gap in the mortality of the young caprines of the Cueva de El Toro suggests that the animals were intermittently in the cave, possibly during certain seasons. This is confirmed by finds of worn teeth of individuals of nine to thirteen months of age.

As for determining seasonal occupation, it is known that the lambing season can vary depending on the climate and livestock practices. If one keeps in mind what happens at present in the area, lambing can occur between August and March, although more usually between November and February. As for goats, in the mountains, the *malagueña* produces kids in November or December. Data from the Roman period indicates that the most favourable time for lambing is from mid- October until the end of December, while for goats the main season would be the spring. The reason for early autumn births would be that this would allow the small animals to take advantage of autumn pasture and become stronger before the winter.

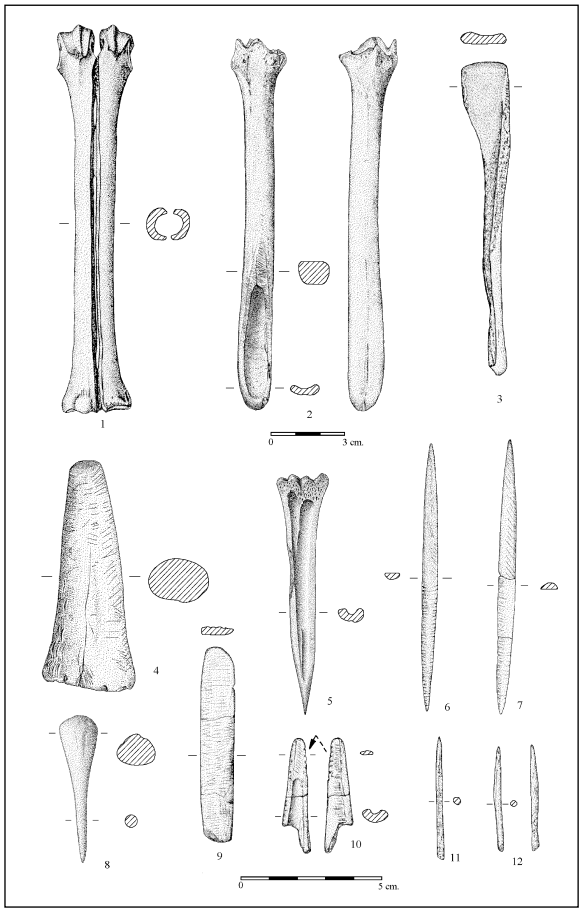

Fig. 7. Cueva de El Toro. Bone tools set. 1–4: Phase IV; 8: Sub-phase IIIB; 5–7 and 9–12: Sub-phase IIIA.

If the animals were present in the Cueva de El Toro a couple of months before the birth season and a couple of months afterwards, as the bone deposits seem to indicate, the cave would have been occupied during the autumn and in the middle of winter. This phenomenon can also be confirmed by the plant records of this period.

The study of this change in the management of the scale of animal exploitation should consider the factors that affect it, such as climatic conditions, the duration of the photo-period, the type of vegetation, and consequently, the state of the grass. This will allow for an evaluation of those parameters that at present are evaluated in the analysis of this activity, such as the length of a shepherding day, the distance of itineraries, and possible speed, always as a function of the different seasons.

In accordance with the current data for mountain *malagueñas* (*Blanco 2002*), there is a clear relationship between the intensity of solar radiation, temperatures, quality and quantity of grass and the duration of a shepherding day. In autumn and winter these are characterised by an increase in rainfall, a marked reduction in the hours of sunlight, 5-hour shepherding days, and the fact that the average travelling speed is around 0.95 to 1 km per hour.

This means that there would have been full mobility for a certain number of animals in the mountains of El Torcal, which would explain the effects of the first degradation stage of its vegetation. This is demonstrated by an anthracological diagram, confirming a process that has also been observed in the Polideportivo de Martos (Jaén) (*Rodríguez 1996*), where pastoralism was the economic base.

The fact that livestock were kept inside the cave in the initial period is confirmed by a decrease in the amount, variety and quantity of carved lithic tool kits. Moreover, there was ovicaprine excrement in some of the associated living places. On the other

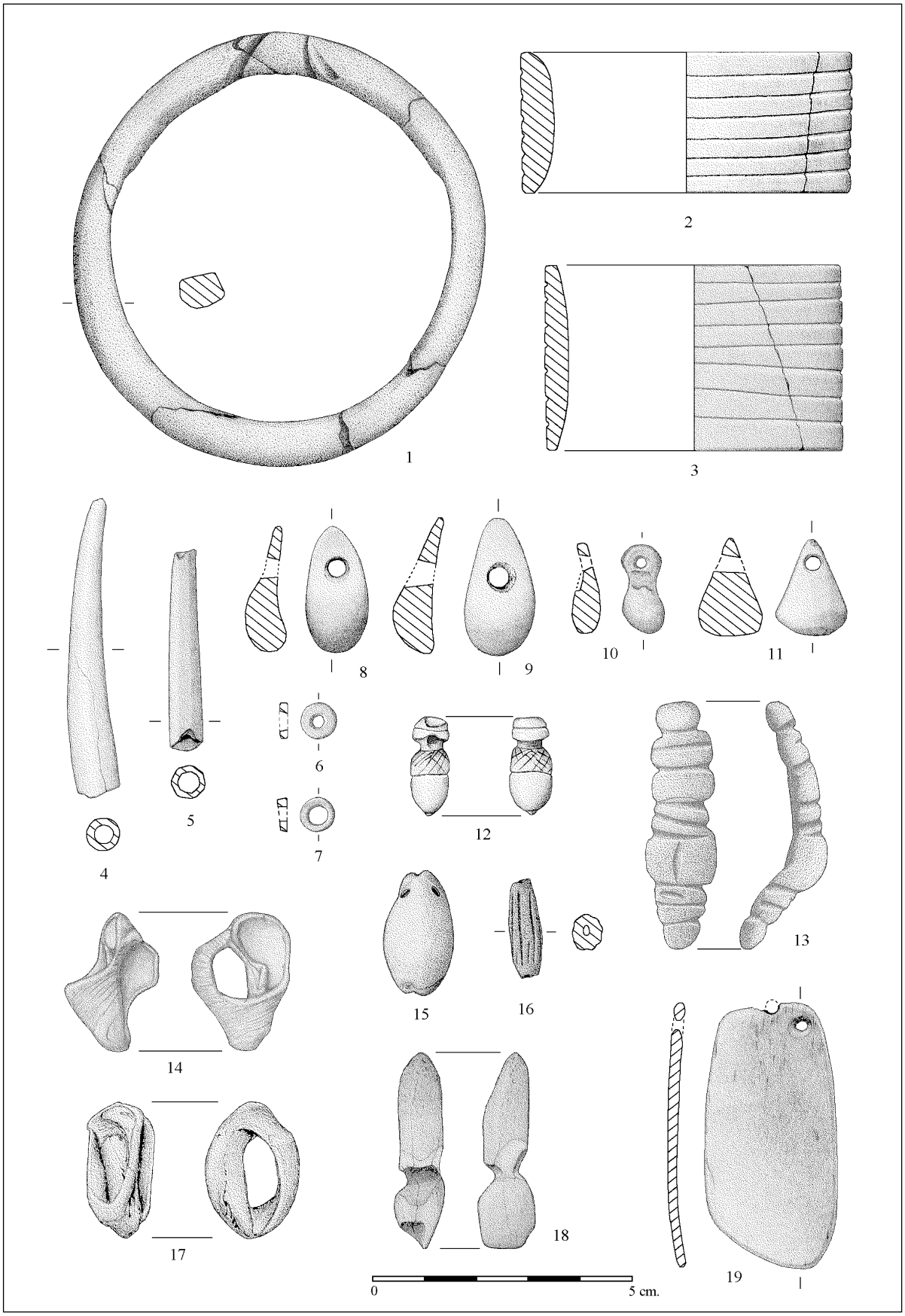

Fig. 8. Cueva de El Toro. Items personal adornment 1–13 and 15–16: Phase IV; 14 and 17–18: Sub-phase IIIB; 19: Sub-phase IIIA.

hand, the older age of slaughtered animals in the latest period implies the development of greater control over the livestock, and increased variety in the type of production. The use of the derived products, mainly wool, became more widespread and, consequently, textile production also prospered. Thus, before and after slaughter, the animals would provide secondary products of outstanding importance, judging by the evidence.

Indeed, the textile production was closely linked to livestock raising, manifested through a group of weaving separators identified in El Toro (Fig. 9.2), as well as in caves at Nerja (Málaga) (*González Tablas 1982*), El Gato (Málaga) (*Mora 1976*), and La Murcielaguina (Córdoba). The use of these was not limited to animal fibres, but also included plant fibres such as esparto, which has been confirmed in different sites, such as the caves at El Toro, Los Murciélagos (Albuñol, Granada) (*Góngora 1868; Alfaro 1980*), or Hoyo de la Mina (Málaga) (*Such 1919–20, Pellicer and Acosta 1986*).

In consequence, it can be said that the community that occupied this cave continued to be primarily livestock breeders and as such, there is an absolute prevalence of ovicaprines over pigs and bovines, species usually linked to an agrarian subsistence system. However, the consolidation of agricultural activities, as much in the production sense as in that of its profitability, justifies the importance that its products had in relation to the other resources developed in El Toro.

Some interesting interpretations can be obtained regarding the plant indicators and their evaluation within the framework of the agrarian subsistence system. Besides the plants already mentioned for combustion purposes, on the one hand there were very few cultivated species, such as naked wheat (*Triticum aestivum/durum*), naked barley (*Hordeum vulgare* var. *nudum*), whole barley (*Hordeum vulgare*), and some leguminous species, such as beans (*Vicia faba*), and lentils (*Lens culinaris*), and on the other, also scarce, there were wild species (only oak (*Quercus* sp.) and olive (spp *Olea europaea*) have been identified). If the cultivated plants were harvested throughout several seasons and taken to the living quarters as clean grains ready for consumption, then their presence cannot be argued as dependent on the season. Moreover, it is evident that acorns are gathered only in autumn and, therefore, their consumption in Toro confirms the winter occupation of the cave.

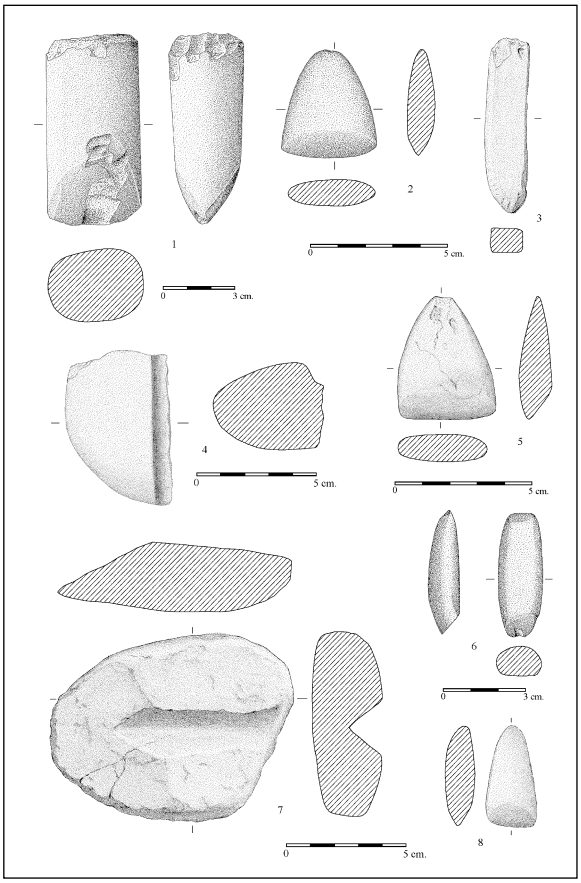

Fig. 9. Cueva de El Toro. Polished stone axes and implements. 1–5: Phase IV; 7: Sub-phase IIIB; 6 and 8: Sub-phase IIIA.

The presence of selected seeds for consumption and grains that were cleaned before their arrival in the cave imply an existing knowledge of the cultivation process. The plant indicators clearly denote this improvement in agrarian methods, particularly in the rotation of winter and spring crops to improve output, as in the case of alternating a winter cereal crop with a leguminous crop. At the quantitative level, the significant presence of closed groups of beans together with winter cereals in Toro can be interpreted as the remains of earlier cultivation of leguminous crops in the same field and, therefore, the remains of a rotation. In slash-and-burn agriculture, where evidence is scarce and where different crops have been grown, we could expect to find some associations such as wheat or naked barley with a leguminous crop, from more to less nitrogen-demanding, and from less to more wild. However, it is a hypothesis that has to be contrasted with an empirical base that at the moment does not meet expectations.

Although leguminous species in El Toro's records are too scarce to consider a regular and systematic

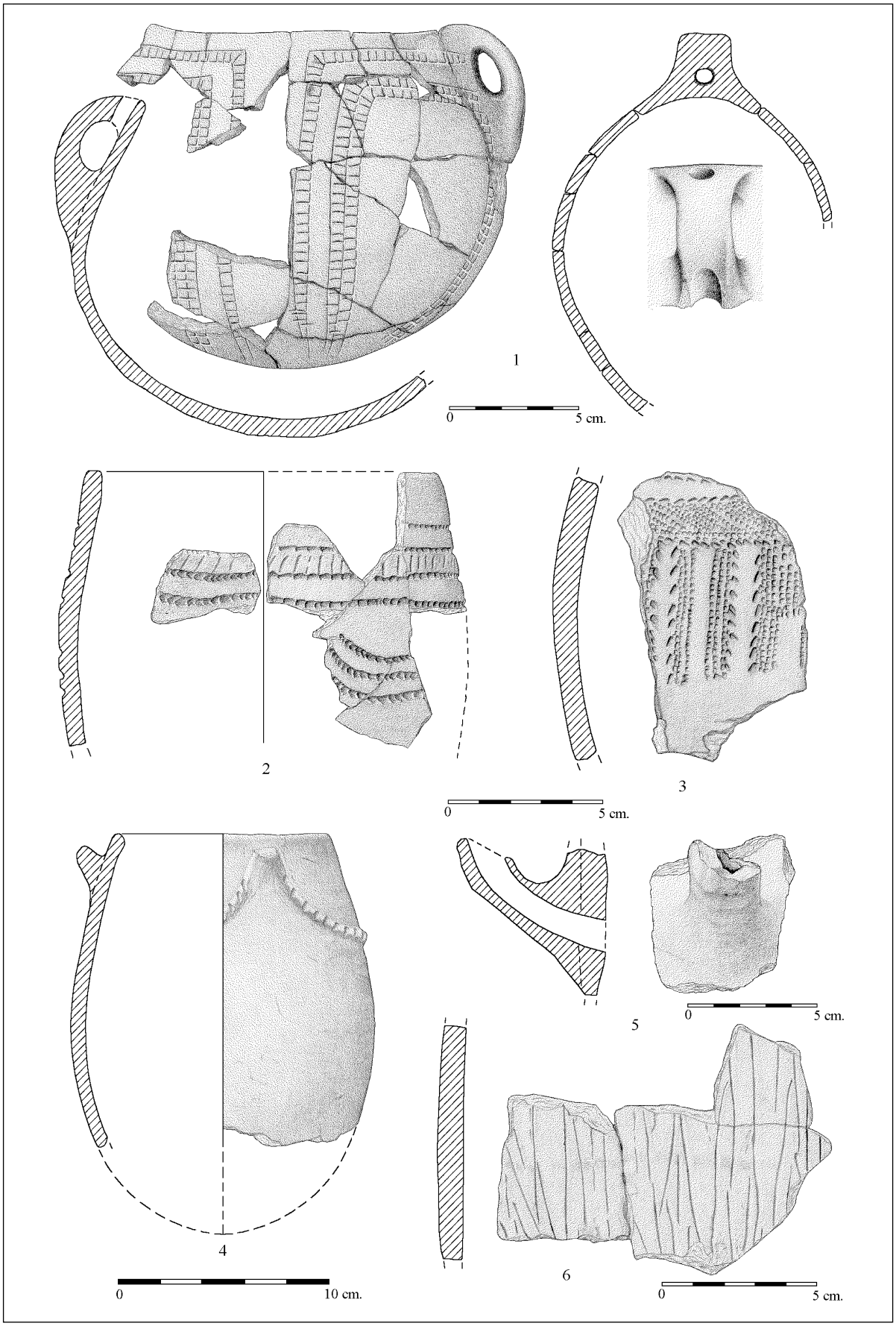

Fig. 10. Cueva de El Toro. Pottery, Phase IV.

rotation in Neolithic cultivation, this does not prevent us from thinking that this agriculture could have developed some rotation pattern in the cultivation of cereals and leguminous spp. The simple and continuous presence of legumes in small quantities at the sites in this period does not necessarily entail a rotation, but it outlines the existence of a cultivation system which somehow included this. If beans, lentils, or peas were sown in a ploughed parcel at the same time as cereals, it is quite reasonable to assume that these products did not have the same importance as the cereals and that their cultivation was closer to a horticulture strategy. If in another parcel legumes are alternated with cereals, the characteristics are the same as in the previous system. Therefore, we admit that the two systems have their own logic and their own dynamics, but they are not mutually exclusive, and, therefore, they would have been able to coexist until the agricultural system had become stable.

Finally, some agrarian practices can be inferred from the presence of weeds, which should be analysed depending on the cleanness of the crops, although their state can be also determined largely by the gathering method. In Toro, most of the weeds are low-lying species, although they are mixed with taller ones. From this, a hypothesis can be proposed that the crops must have been harvested by cutting low down the stem.

Although the evidence for this period from the excavations at Toro is quite outstanding, it cannot be overestimated, since this is an outlying, montane population, and it was a small and diffuse part of the great transformation that took place within the agricultural communities from the beginnings of the fourth millennium BC in the south of the Iberia.

In general terms, this transformation was marked by the consolidation of the sedentary process that should be understood parallel to the considerable division of labour. The economic system would have become more complex, not because of a considerable increase in agricultural activities, especially the production of cereal crops, but also because new and unrelated livestock procedures were adopted. For these, the site at the Polideportivo de Martos (Jaén) is the best known example (*Lizcano et al. 1996; Lizcano 1999*).

The settlement process has to be interpreted as the result of a gradual structural reorganization of these populations, with a tendency to diversify production. This led to an increasing rupture in the previously homogeneous society, generating the mechanisms of power for the development of hierarchies and changes that would be accentuated during the third millennium. This transformation would be represented by a new settlement model, and more particularly with the appearance of new organizational centres, large specialized settlements throughout the whole Andalusian region. It is thus seen that there were signs of an increasing strictness and far-reaching control process, more than has been observed in previous periods. This control was exercised from a power structure, where the settlement locations are determined by visualising the whole economic area and by the domain of the most important communication roads. These routes, which had already been used in the past for the same purpose, were axes of exchange activities and the exploita-

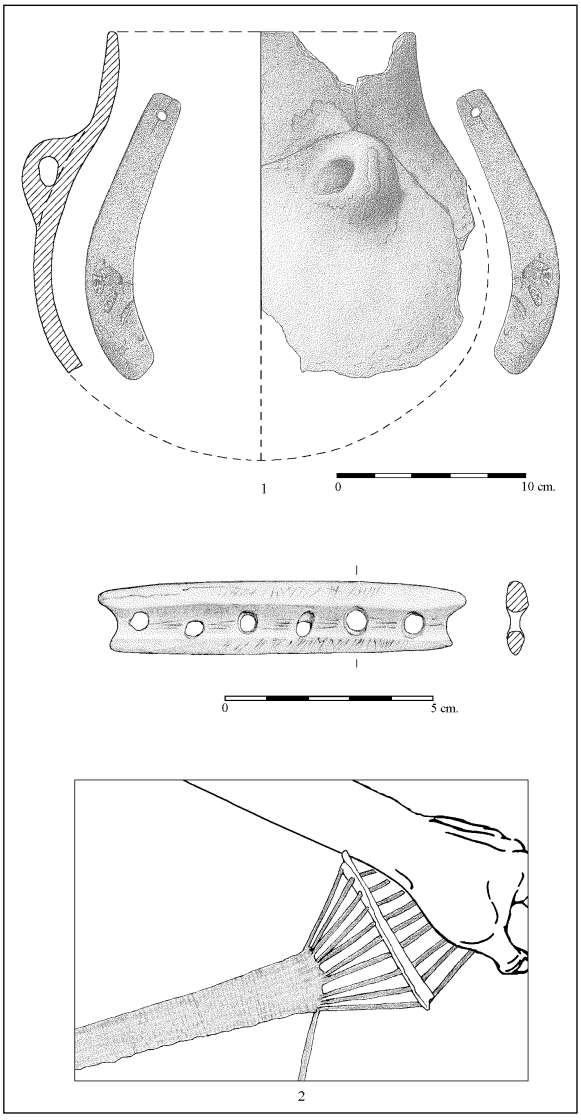

Fig. 11. Cueva de El Toro, Sub-phase IIIB. Pottery and weaving separator.

tion of some specific natural resources, where products and raw materials changed with time. Silex mines and their exploitation have been one of the most important subjects of traditional studies (*Ramos 1986; 1999*).

A more complex and consolidated economic scenario was, therefore, created. This would confirm the current interpretation of the role of the different specialized productions in this period and of the dynamics of an economy with a surplus policy aimed at exchange, at least at a regional level. At the same time, the aforementioned development of social hierarchy outlined by F. Nocete (*1989; 2001*) would consequently have placed cereal production in the third millennium in a dominant position.

These sites are to be understood as a result of the phenomenon of demographic aggregation – such as would occur later, in the second millennium, during the development of the Bronze Age – which would mean, in some cases, the abandonment of settlements of the previous period; and in others, the modification of activities and the occupation regime. Settlements would become only occasionally or circumstantially occupied, particularly in the mountainous areas that would have then become considered as outlying settlements, such as would have been the case of the Cueva de El Toro.

Consequently, a clear general reinforcement of production processes, and of food production in particular, took place from the beginnings of the fourth millennium BC in the Andalusian region. This yielded an important increment in the diversity of cultivated species, both cereal and leguminous. This is a sign of a sedentary life, where there is a strong augmentation of agricultural practices.

An increment is thus observed in grain size and the development of a surplus, a larger volume than that required for subsistence. This would have led to the construction of large storage spaces, the *silos*, and containers, just as observed in different sites along the valley of the River Guadalquivir. This seems to be the axis around which the large nuclei of agricultural exploitation developed, implying that the settlements were located depending on the quality of the soil, both because of higher productivity and for the recovery of the vegetable cover in relation to the humidity indices. They were also located close to water sources, particularly in the outlet zones, and the countryside around Seville, Córdoba and Jaén. The areas beside the Guadiana, Tinto and Odiel Rivers were also occupied; the Morales site (Córdoba) (*Carrilero et al. 1982*) and the Cerro de la Plaza de Armas de Sevilleja (Jaén) (*Contreras et al. 1985; Nocete 1989*). This location shows the new aims that developed, particularly the tendency to settle on the best lands, near water sources, and to develop profitable agricultural exploitation.

At the same time, there was a change in sheep herding. Ovicaprines were still predominant, but their flocks were being controlled by means of folds and the consumption of very young animals. This, together with finds of important quantities of tools used for textile production, like the aforementioned weaving separators, are signs of the exploitation of secondary products, such as milk and wool. This would confirm the hypothesis of a stronger emphasis on livestock profitability, at least of ovicaprines. Thus, settlements like that of Polideportivo de Martos (Jaén) were established in order to control the grass lands. This situation would continue in a similar way throughout the Copper Age, with variations in the proportion of animals: more balance between ovicaprines, pigs, and bovines.

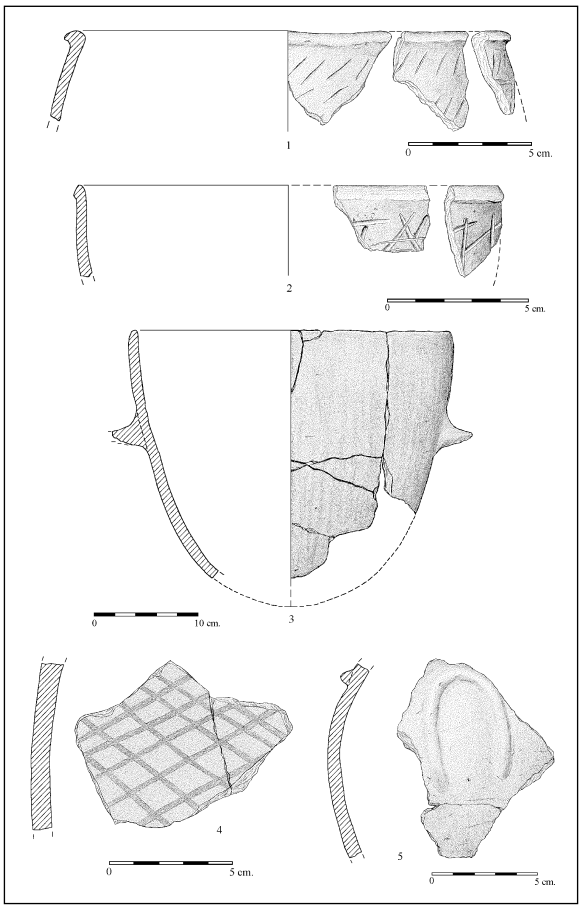

Fig. 12. Cueva de El Toro. Pottery, 1–3: Sub-phase IIIB; 4–5: Sub-phase IIIA.

After this intensive period of occupation and economic impulses, the development of copper working at the beginning of the third millennium did not seem to cause profound transformations in the economic dynamics of these societies. However, a gradual process of demographic centralization began, along with a more exhaustive and hierarchical control of the territory. The result of this was the appearance of the first fortified towns and of small nuclei, specialised in non-subsistence activities, in various areas of Andalusia.

In Cueva de El Toro this meant a less intensive occupation, which is confirmed by the presence of small mammal remains, mainly of nocturnal birds of prey, especially owls. This new socio-historical situation, shown in phase II, began in the middle of the third millennium BC, and is characterised by an important hiatus in the occupation. The formation of this phase reveals a natural sedimentary unit, with clay and a large quantity of small stones.

As in the previous phase, this is divided into two subphases, IIB and IIA, due to its inherent characteristics, which refer not only to the circumstances of its use, but also, as was mentioned before, to the structural change of the cave due to tectonic movements. On the other hand, the actual datings confirm that a long period, about half a millennium, elapsed between the one and the other.

The evidence of these modifications is observed, in the first place, in the displacement of the living space from sector one, which had been dominant until then, towards sector two. Sector two, as has already been pointed out, is where the new entrance to the cavity lies. On the other hand, the evidence also shows that the occupation of Toro became less intense as it was inhabited occasionally and at specific times.

The evidence is fragmentary, but sufficiently complete for several moments of occupation corresponding to the first metallurgic phases – those that in the area's archaeographic sequence are associated with the Copper Age, the Bell Beakers, and the Early

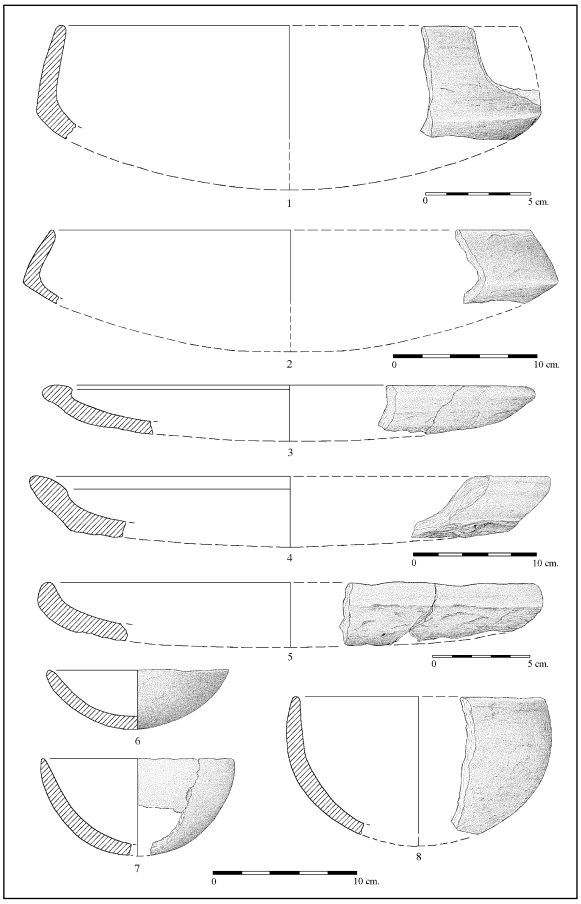

Fig. 13. Cueva de El Toro. Pottery, 1–2: Sub-phase IIIA; 3–8: Sub-phase IIB.

Bronze Age. The material indicators (Figs. 6: 19–20; 12: 3–8) demonstrate that these communities were clearly related to the hierarchical social formations which controlled the valley of the Guadalquivir at around the mid-third and mid-second millennia BC.

Finally, in Roman times, as well as in Hispano-Islamic times, the cave was once again busy, especially in the late periods, as shown by several fragments of identified *T.S.A.D*. Coinciding with the Roman stage, the occupation would have had its maximum development in the riverine area to take advantage of its high agricultural potential. The mountains were, therefore, used for livestock, as well as for the extraction of limestone for construction purposes, as seen in the quarry identified in the northern zone.

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