

NURAGIC TERRITORY AND ANCIENT LANDSCAPE. THE PRANEMURU PLATEAU (SARDINIA) DURING THE BRONZE AGE¹

ABSTRACT

Preface. Marisa Ruiz-Gálvez. Universidad Complutense

This book is the result of the project *Nuragic Territory and Ancient Landscape in the Pranemuru Plateau; a research and heritage project in the Nuoro Province (Sardinia)* sponsored by the Spanish Ministerio de Educación (project DGES PB98-0840), the Universidad Complutense (Proyecto Multidisciplinar Complutense PR269-98/196) and the Instituto del Patrimonio Histórico Español (*Ayudas a Misiones Arqueológicas Españolas en el Extranjero* 1999-2001). It also had the valuable support of Ph.D. Fulvia Lo Schiavo, Soprintendente Dirigente for Archaeology in the Sassari and Nuoro Provinces until 2000, the person responsible of the research project in the Arrubiu nuraghe in Orroli.

This project emerges from the team's diverse interests as regards the study of the commercial relations in the Bronze Age Mediterranean region, the analysis of landscape in past farming societies' identity formation, and the causes, contexts and times of the Greek – Phoenician colonisation in the Mediterranean.

The multidisciplinary project paid by the Universidad Complutense allowed the incorporation of geographers, who performed the GIS modelling used in the landscape study, as well as some rural development specialists who discussed the ways of making public and exhibiting the archaeological heritage in the study territory.

The project team members are sincerely grateful to the Spanish institutions and Italian authorities that sponsored this work, especially Ph.D. Lo Schiavo.

Survey design. Marisa Ruiz-Gálvez. Universidad Complutense

The study took place in the eastern half of the Sardinian Island, in the counties of Orroli, Nurri and Escalaplano in the Nuoro Province. In Orroli, Arrubiu was the site intensely excavated and studied at the beginnings of the '80s, being the only nuraghe with a central tower and five lateral towers. Moreover, it seems to be the most ancient evidence of Mycenaean trade in Sardinia.

The nuraghe rises over the Pranemuru Plateau, a well defined geographic unit of basaltic formation with a Plio/Pleistocene origin. It controls the middle course of the Flumendosa River, one of the five rivers of the island that runs between high walls producing narrow gorges. The average height of the Plateau is 600/650 m.a.s.l.; nowadays the sea is no more than 50km, producing a sharp altitude change in a short distance, and an abrupt and uneven landscape. In the past, the fords determined the crossing-paths and communications between the territories of Nurri and

¹ Traducción: Aixa Vidal y Paula Campo

Orroli, on the one side, and Escalaplano, on the other, in the same way bridges do today. The main river ford -which was crossed by boat until a reservoir was built up in the '60s-, is located only 1 km from the Arrabiu nuraghe.

The river segregates the Pranemuru Plateau, on the left side, from the mountains of the Escalaplano county, on the right side. In both sides there are large quantities of archaeological remains.

Due to the finding of a Mycenaean item at Arrubiu and its control of the main river ford, we suggested the hypothesis that the monumentality of this place may be explained by its function as a *gateway community*, hierarchically ranking its hinterland. In order to determine its possible influence area, a survey model with drills was performed.

The territory in the neighborhood of nuraghe Arrubiu (part of the counties of Orroli, Nurri and Escalaplano), covering a 10km-radius area, was studied using 1:25000 cartography, a geologic map in a 1:100000 scale, and a landscape use map in a 1:100000 scale. Furthermore, some digital topographic maps in a 1:10000 and 1:25000 scale of some of the analysed areas were added. A survey report was designed and an ACCESS file later derived from it. The paper titled *Progetto I Nuraghi* (1990) was the starting point, as it recorded information of archaeological sites from Chalcolithic times to the 19th century in the Orroli and Nurri counties, neglecting the Escalaplano, whose UTM coordinates were sometimes wrong and we corrected using a GPS.

In February 2000, we intensively surveyed a 5km-radius area round Arrubiu with total cover, leaving for a second phase, consequently with the previous results, a more selective survey of the territory comprised between a 5 and 10km-radius. In October 2000, we decided to change the survey strategy to a selective one in order to cover the area between 2 and 5 km, and between 5 and 10 km from nuraghe Arrubiu, due to the difficulty to identify minor sites in the dense Mediterranean bush landscape. Between both field seasons, 310 points of different chronology were found, being 181 not recorded in the book *Progetto I Nuraghi*. This information in an ACCESS file was crucial for a further design of the GIS model.

From the survey results, a group of sites in a 2km-radius area round Arrubiu was chosen to be worked in autumn 2000, and a second group in the area between 5 and 10km for the following year.

Drills. Alfredo González, Stanford University (visiting scholar); Marisa Ruiz-Gálvez, Mariano Torres, Universidad Complutense; and Oscar López, Reading University.

During 2000 and 2001, nine sites were drilled into for paleoenvironmental and chronological data. Due to the impossibility to drill the towers, the works were restricted mainly to the adjacent huts near the nuraghi. In most cases, radiocarbon and materials offered chronologies linked to the nearby nuraghi, *i.e.* Sutta e'Corongiu (Middle Bronze Age), Is Cangialis (Middle and Late Bronze Age), Gasoru (Late and Final Bronze Age), Martingiana (Late Bronze Age and Late-Final Bronze Age transition) and Perda Utzei (Final Bronze Age). The drill adjacent to Fonte Fossada nuraghe just offered bad preserved Roman occupation remains. Only two drills were made directly into a nuraghe: drill A in Gasoru and the drill in Pranu Illixi (a corridor nuraghe), whose recovered materials belong to a ritual reutilization of this monument at the beginning of

the Iron Age. At the nuragic settlement of Su Putzu several drills were conducted; one of them provided important data and a prehistoric chronology (Final Bronze Age). Moreover, a systematic looted Giants' tomb (Stessei) was excavated, recovering materials only from the robbing mound (Final Bronze Age).

-At nuraghe Sutta e'Corungiu, located in the edge of the Flumendosa gorge, no structures were found, although some charcoals and diagnostic materials dated the settlement in the Middle Bronze Age.

-At nuraghe Is Cangialis, a hut with a round plant was chosen. It was perceptible from the surface and adjacent to one of the nuraghe's towers. Around the drill, some Middle Bronze Age and Roman Republican materials appeared; inside the drill, two levels were documented inside the hut –one with a long sitting bank- belonging to the Middle and Late Bronze Age respectively.

-At nuraghe Gasoru, some drills were made in the nuraghe's entrance and a near round hut. The entrance's drill (Gasoru A) showed two levels: a Late Roman reoccupation and a Nuragic level belonging to Later Bronze Age. The hut (Gasoru B) had two use levels. The upper one, with a long sitting bank and a rubefacted clay pavement, belongs to the Final Bronze Age, whereas the lower one, with a pebble and treaded-earth floor, chronologically corresponds to the Nuragic level of drill A (Later Bronze Age). Over the pavement, a heap of crushed pottery in primary position appeared.

-Near the Martingiana nuraghe, a round hut with a large ortostato wall and a long sitting bank was drilled into. This structure also showed two occupation episodes, the more ancient one chronologically dated to the Later Bronze Age and the upper one to a transitional moment between the Later and Final Bronze Age.

-In the surroundings of the Stessei nuraghe, located in the Flumendosa basin, a Giants' tomb was excavated, but it had been intensively looted to base-rock. In the robbing mound some pottery fragments belonging to Final Bronze Age were recovered.

-Perda Utzei is a complex nuraghe with a large village enclosed by a wall. A hut with a typical ortostato round structure and a storage chamber close to the entrance, similar to the one in Su Putzu, was drilled into. The chronology for the only occupation level is Final Bronze Age. Perda Utzei and Pranu Illixi are the only sites recovered on the other side of Flumendosa, in Escalaplano.

-Su Putzu is a settlement located in the nearby area of Arrubiu. It has a small single-towered nuraghe and a sacred well excavated decades ago by Lilliu. Several huts were drilled into offering either atypical Roman or amorphous Nuragic materials. The surroundings of the well were also excavated without further results. The drill in a complex plant hut found in the village limits, however, offered enough materials and charcoal to date this only level as Final Bronze Age. The hut showed an ortostato wall –like the ones in Martingiana and Perda Utzei-, a storage chamber and a niche in the wall.

-Pranu Illixi is an Early Bronze Age corridor nuraghe with later added structures. In the main structure, near a looted pit, a drill was made discovering a ritual deposit. The ritual activity included food and drink consumption, perhaps perfume burning, the depreciation of materials and a bonfire. The use of fire, the banquet and some materials (lucernae) reveal the existence of

an oriental influence in this rite. Together with a large quantity of pottery, some of them imported from the Phoenician colonies, high amounts of donkey and pig bones were documented.

-In Fonte Fossada, the drill made close to the nuraghe only recovered a badly preserved quadrangular structure with atypical Roman materials (teguli, amphorae walls and ordinary pottery). In the surface, similar materials appeared. There are no remains from earlier times.

Paleovegetation study. Pilar López, José Antonio López, Rosario Macías, Archaeobotanic Laboratory CSIC.

At nuraghe Arrubiu (Orroli), ten samples were taken, nine from the central Tower or A, with a chronology between the end of the Middle and Final Bronze Ages, and the tenth (sample 7 - sterile) from a Roman stratum from hut 1. The results from the palynologically fertile samples are shown in figure 1. It reflects the transition from a dense forestry landscape in the base level to a much degraded forest in the upper samples, consequences of anthropic activities –*i.e.* deforestation and burning for cereal crops' cultivation– that is reduced or absent in the final samples, and a development of pasture areas. In Gasoru, three samples from the nuraghe drills and four from the hut were analysed. The first two correspond to a Later Bronze Age occupation; the third to a Late Roman reoccupation; the following two to the lower pavement from the Later Bronze Age and the last two to the upper pavement in the Later-Final Bronze Age transition. Figure 2 shows a well preserved forest in early times that was degraded to bushes with intense cereal crop and animal herding in the area at the Final Bronze transition. The Late Roman landscape is similar, but with a more intensive cereal crop cultivation. The samples from hut 4 in Su Putzu, from the Final Bronze Age, show a very strongly degraded landscape. On the other hand, the only sample from the *Stessei Giants' Tomb* differs from the former ones, showing a well-developed forest without cereal pollen or burning evidence related to herding. It may be due to its probable location in the Nurri territory, rather than to Orroli, in a steep place with a visual control of the river area.

The results from the 2001 field season showed scarce palynomorphs, and some samples were even sterile. This scarcity may reflect the original sediment composition, postdepositional processes or a strong landscape anthropisation originating deforestation of settled sites.

Anthracological Analysis of Gasoru and Su Putzu Sites. Paloma Uzquiano

Four samples from burnt beams from the roofing and walls of a collapsed hut in the Later-Final Bronze Age transition in Gasoru were analysed. Most fragments are holm oaks but there are also larger pieces from buckthorn.

Furthermore, three samples from beams in hut 4 (Final Bronze Age) in Su Putzu were studied. Two of them correspond to *Olea europea*, probably wild olive tree, and the third one to holm oak.

The Results of Phytolith Analyses from Several Ceramic Fragments and Grinding Stones.
Rosa Albert and Marta Portillo. I.C.R.E. & Universidad de Barcelona.

Ceramic vessels and milling stones are important components of the archaeological record in several nuraghi from the Pranamuru Plateau (Sardinia). For information on the possible uses of the milling stones and content vessels it is of great interest to understand the economical activities carried out in these sites by the populations. One of the approaches to obtain information on the plant uses was the phytolith analyses of the sediment adhered both to the surface of the milling stones and to the surface of the vessel content. In the whole, we analysed eleven archaeological samples and two control samples collected from five different nuraghi in the Pranamuru Plateau (Nuoro Province, Sardinia). The nuraghi were located in an area of 10 km and were chronologically ascribed to the Bronze and Iron Ages.

The phytolith morphological analyses are characterised by two different results. The absence of multicellular structures, which on the one hand, suggests that the plants identified have undergone a grinding process -both the ones recovered from the milling stones and the vessels- and on the other hand this absence did not allow us to identify the type of grass represented in the phytolith record. The second important result is the dominance in the samples of phytoliths formed in the bark of dicotyledonous plants (probably small branches). According to these results, the plants identified could have been used as vegetal temper to prepare the ceramic.

Faunal Analysis. Sebastián Pintos (2000 field season); Manuel Domínguez Universidad Complutense (2001 field season). Comments by Marisa Ruiz-Gálvez (Universidad Complutense).

As a result of the 2000 field season 101 samples from drills *A* and *B* in Gasoru (from hut 4) and *Pozo Sacro (Sacred Well)* in Su Putzu were studied. Their conservation was deficient and extremely fragmented, preventing MNI determinations. However, bovids, ovicaprids and, probably, rabbits were identified.

From the 2001 field season, 124 fragmented samples were analysed. They came from Martingiana, Is Cangialis, Perda Utzei and Pranu Illixi. Due to the bad conservation state in the former three sites, the identification was restricted to species: bovids, ovicaprids and suids. The sample from Pranu Illixi is particularly interesting, showing piglets and donkey. The latter reinforces the Phoenician origin of some materials, as this animal was unknown to this island in the Bronze Age and was introduced -both here and in the Iberian Peninsula- by the Semites. The donkey/piglet association is also evidenced in the Phoenician Doña Blanca site. In spite of being taboo, the presence of pig is clear in other Phoenician sites in Spain, being perhaps raised for sacrifices. It also appears in sacrificial contexts in Monte Papalucio di Oria (Tarento) and Tharros *thofet* (Sardinia), where suckling lambs, as well as piglets, may have substituted stillborn human babies as sacrifices.

Archaeometrical Analysis of some Pottery from Pranu Illixi. Manuel Heras. Centro Nacional de Estudios Metalúrgicos. CSIC.

Four ceramic body sherds were analysed. The first one (M1) is beige, probably wheeled-made

and the rest (M2-4) of a brownish black colour hand- or slow wheeled made. The aim of the study was to identify their local manufacture or importation by their mineralogical composition and manufacture techniques. Thin-section analysis and X-ray diffraction were used, showing a similar mineralogical composition in the whole lot. The only telling difference is found in the manufacture technique, evidencing better-selected fabric and a higher firing temperature for sample M1. The comparison with archaeometric analyses from other sites in Sardinia and Carthage suggests some similarities between M1 and San' Antioco de Sulcis' Phoenician factory.

Geographic Information System Modelling. Rosa Basildo. Comunidad de Madrid. Javier Gutiérrez and Marisa Ruiz-Gálvez. Universidad Complutense.

From survey and drill data a GIS model was design based on 1:10000 and 1:25000 maps in digital format (dwg), using the ArcView software. Furthermore, two Landsat7 satellite images were considered to model vegetation cover, lands use and site catchment areas. A digital model of the landscape in TIN format was created from archaeological data to analyse visibility and visibilisation. The hypothesis to be tested here postulates that the nuraghi acted as a landmark in an originally dense forested landscape, as pollen analyses indicate. The estimation of accessibility to the territory and the possibility of communication among sites considered the strong unevenness of the landscape. The aim was to detect a land use pattern that could explain the high concentration of *grosso modo* coetaneous settlements in short distances. The hypothesis of a possible visual hierarchisation of the space was also tested depending on the nuraghi architectural importance.

Absolute Chronology for the Nuragic Culture and the Beginnings of Historic Colonisation in the Mediterranean. Mariano Torres and Marisa Ruiz-Gálvez. Universidad Complutense. Antonio Rubinos. CSIC.

One of the aims of the field season was to gather enough 14C samples to postulate the Nuragic settlement synchrony/diachrony in the Pranamuru plateau. The result was 19 standard or AMS 14C samples from eight different sites, ranging from Middle Bronze to First Iron Ages. Currently, this record is the more complete collection available for a Sardinia area. Furthermore, it is unique in presenting 14C datings and archaeological data indicating Phoenician presence inland. Due to the scarce 14C datings for the end of the Bronze Age in the colonial central Mediterranean area -as opposed to the western Mediterranean- western samples are analysed, specially the ones covering the end of Mycenaean palaces and Phoenician colonisation, in order to contextualise the final height of the Nuragic Culture. Thus, pre-Phoenician Final Bronze Age dates and contexts in the Iberian Peninsula are discussed, as well as the dates for western Phoenician colonies, the absolute chronology for the first western Phoenician/indigenous peoples and the chronology for the Final Bronze/First Iron Ages in Italy. The authors remark the need to revise the early chronology in the Mediterranean and redefine the causes and contexts of Greek and Phoenician colonisations.

The Arrubiu nuraghe in Orroli: past, present and future. Fulvia Lo Schiavo. Istituto per gli Studi Micenei ed Egeo Anatolici. CNR

The writer covers the history of the Arrubiu nuraghe from its first mention in a research paper written in 1952 by Ercole Contu. However, topographic survey and excavation works started in 1981, when the author was in charge of the Soprintendenza Archeologica of Sassari and Nuoro. The involvement of Montana local population, Townhall and community in the public use of the monument is also considered. She insists on paralleling excavation and restoration with a site management project securing its surveillance and visitation. Consequently, an Interpretation Centre and a guide of the site were created. This paper includes the current academic works and publication of materials from the 1982-1996 excavations, as well as the virtual reconstruction of the nuraghe and the making of its physical model to be exhibited in the Didactic Centre, with the prospective creation of a web page for the nuraghe. All these tend to insert the monuments in a rural tourism project associating many villages in the design of an itinerary visiting the area from Prehistory to Byzantine times, together with the foundation in Orroli of the Laboratory for the Knowledge and Memory.

Research and Patrimonialization of the Nuragic Culture. Consuelo del Canto. Universidad Complutense.

From the 80's the EU's policies favoured the implication of rural populations in the development of local resources. That was the origin of the LEADER and LEADER II programmes. Such policies provoked the increasing social use of the Heritage by means of the promotion of rural and cultural tourism. They originated the Interpretation Centre as a means to coherently present and explain Heritage. In the Pranemuru project, the writer's role consisted in studying Arrubiu nuraghe as an emerging heritage resource. Thus, she developed and carried out a survey to identify the visitor's profile and reach conclusions on the tourist potentiality of the nuraghe and its surroundings. Although its inland location and the difficult connections impair the competition of the Orroli county with the coastal offer, the writer stresses the need to improve the monument's presentation and to develop welcoming infrastructures inviting the visitors to spend more than a few hours in the site.

Conclusions. Marisa Ruiz-Gálvez, Mariano Torres, Víctor Fernández, Universidad Complutense; Alfredo Gonzalez, Stanford University; Óscar López, Reading University.

The aim of the project was to reconstruct the physical landscape, together with the social and symbolic aspect of a Nuragic territory. One of the hypotheses proposed, i.e. a correlation between architectonic complexity and visual/political dominance of the nuraghi, is not clearly backed up by GIS analysis. We asked Prof. Fernández to statistically process architectural, visibility, accessibility and land use data. Using the SPSS v.11 software he analysed main components and the correlation coefficient. They confirmed some aspect already discussed, such as the relations between visibility/distance to the river and better quality of fields/longer distance from Arrubiu. On the opposite, it rejects any link between architectural complexity and better visual

dominance of the nuraghi. Due to their high density and short distances, this would test our hypothesis about the construction and abandonment of the simple nuraghi every 3 to 4 generations. It also evidences that the large nuraghi were not contemporaneous, but rather successive in time. Current published data from Arrubiu excavations suggest so: although this site was settled in the Later Bronze Age, it seems to be resettled in the Final Bronze Age in a different fashion. It would imply its abandonment some time in the earlier period. It is possible that the rapid degradation process in the environment shown in pollen analysis explain this situation, together with the increasing crisis and decadence of the territory, which seems to be scarcely inhabited in the First Iron Age.

This panorama of demographic crisis and disorganisation may affect other areas of the island, explaining the lack of an orientalisating period and the later incorporation of part of the island under Phoenician dominance. It is clear, however, that the idea of the nuraghi as isolated farmsteads have to be neglected. Our drills confirm further data on the existence of villages associated to the nuraghi from Middle Bronze Age. Anyway, the nuraghi monumentality, that is a strongly marked element in the landscape to this day, should have contributed for centuries to local peoples' perception of the space and the creation of their identity. That can be the reason why, when the nuraghi are abandoned, their miniatures appear in ritual and social spheres, allowing the comparison of Nuragic societies with the so-called *house societies* by Levi-Strauss. The fact that only the nuraghi kept their original pre-Roman name testifies the importance of a term that seems to design a web of social and referential meanings rather than just a monument.