

FOREIGN INFLUENCES AND CONSEQUENCES ON THE NURAGIC
CULTURE OF SARDINIA

A Thesis

by

MARGARET CHOLTCO

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

December 2009

Major Subject: Anthropology

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Approved by:

Chair of Committee,	Shelley Wachsmann
Committee Members,	Deborah N. Carlson
	Steven Oberhelman
Head of Department,	Donny L. Hamilton

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ABSTRACT

Foreign Influences and Consequences on the Nuragic Culture of Sardinia. (December 2009)

Margaret Choltco, B.A., The Pennsylvania State University

Chair of Advisory Committee: Dr. Shelley Wachsmann

Although it is accepted that Phoenician colonization occurred on Sardinia by the 9th century B.C., it is possible that contact between Sardinia's indigenous population and the Levantine region occurred in the Late Bronze Age (LBA). Eastern LBA goods found on the island are copper oxhide ingots and Aegean pottery. Previously, it has been suggested that Mycenaeans were responsible for bringing the eastern goods to Sardinia, but the presence of Aegean pottery shards does not confirm the presence of Mycenaean tradesmen. Also, scholars of LBA trade have explained the paucity of evidence for a Mycenaean merchant fleet. Interpretations of two LBA shipwrecks, Cape Gelidonya and Uluburun, indicate that eastern Mediterranean merchants of Cypriot or Syro-Canaanite origin, transported large quantities of oxhide ingots from the Levant towards the west. It remains possible that similar itinerant merchants conducted ventures bringing eastern goods to Sardinia while exploring the western Mediterranean. Trade in eastern goods may have stimulated the advancement that occurred in Nuragic culture in the LBA, resulting in the emergence of an elite social stratum in the Nuragic society. Archaeological evidence, such as elitist burials and increasingly complex architecture, supports the idea of cultural change due to internal competition. This 'peer-polity' effect may have been incited because of limited accessibility to the exotic eastern goods and the 'ownership' to the rights of this exchange.

DEDICATION

To My Parents:

Betty Jane Heid and Victor N. Choltco Sr.

For their encouragement, generosity, and unconditional love

And in Memory of my Heros:

Nan (Georgianna Little Heid), Pop Pop (Victor G. Choltco), and Dr. James Hatch

For their wit, integrity, and twinkle in their eyes. They led exceptional lives, taught invaluable lessons, inspired grand visions, and are missed greatly.

If you hold on to the handle, she said, it's easier to maintain the illusion of control.

But it is more fun if you just let the wind carry you. – Brian Andreas

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This project has been a work in progress for many years and from the very beginning my parents, Aunt Georgia Heid, and Mary Belle O' Brien have been supportive in my decision to pursue a career in archaeology. I owe them many thanks for the years of listening, proofreading, visiting sites, conferences, and most of all, believing in me.

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CHAPTER I

INTRODUCTION

The western Mediterranean island of Sardinia has an alluring prehistory. The enigmatic stone towers covering Sardinia's landscape have perplexed travelers and scholars for centuries. Sardinia has no ancient written history of its own, which leaves our curiosity to be answered by one of two methods: either by ethnohistoric accounts (often written centuries later by authors that never visited the island), or by archaeological research. More recently, scientific archaeological excavations began to reveal the depth to which Sardinia's ancestors reached in the past, and the distance material culture and ideologies traveled to and from the island.

Sardinia's role in the pan-Mediterranean trade networks is often neglected in discussions of seafaring or ancient ship technology of the Late Bronze and Early Iron Ages. Sardinian bronze boat models could serve as a valuable source of information for nautical archaeology academics. More than one hundred whole and fragmented boat models are thought to be of Sardinian origin and recent discoveries have expanded their manufacture between the Final Bronze Age (10th and 11th century B.C.) through the sixth century B.C.¹ Unfortunately, the boat models lack sound provenience, and also, focusing on the details of possible ship construction technique is problematic. The boats show considerable variations and are extremely stylized. Interpreting possible construction features and

This document follows the style of *American Journal of Archaeology*.

¹ Lo Schiavo (2000, 143-4) lists the Monte Sa Idda hoard and the Su Piroso di Santadi complex, dated to the Final Bronze Age, and the sanctuary of Hera boat and the Gravisca boat, dated to the sixth century B.C. at the extremities of the *bronzetti* assemblage.

placing the style of construction along a time line is difficult with Sardinian boat models. This may be due to the rampant colonization and foreign influence during the time that the *bronzzetti* were manufactured, which allowed for a fusion of both native elements and foreign technique. This leads to an important question: Are the Sardinian bronze boat models representations of native vessels, foreign vessels, or a combination of elements from two different cultures?

The bronze boat models were deposited in the archaeological record after the appearance of foreign objects on Sardinia. Eastern imports included copper oxhide ingots, Aegean² ceramics, and bronze figurines from the Levant. It has been suggested that Mycenaeans were responsible for bringing the eastern goods to Sardinia,³ but the presence of Mycenaean or Minoan pottery shards does not necessitate that Mycenaeans personally delivered their wares.⁴ How much effect did the introduction of exotic, or non-native, goods have on the indigenous culture of Sardinia and by what mechanism did these artifacts find their way into Nuragic society?

The earliest date of Phoenician settlement on Sardinia is often debated. The Nora stone is testimony of Phoenician contact with Sardinians by the 9th century B.C. A second

² This thesis does not intend for Cyprus to be included with the “Aegean,” although, the author is aware that the ancient Cypriot culture is sometimes referred to as Aegean.

³ Ceruti et al. (1987) account for Minoan, Mycenaean, and Cypriot goods equaling human representatives of these cultures on Sardinia; Lo Schiavo et al. (1985, 316-7) explain oxhide ingots as an indication of Mycenaean trade; Jones and Day 1987, 257, 269; Jones and Vagnetti (1991, 128, 133, 140, 141) note that Aegean merchants headed west in search of metals and established trade with Sardinia in early 13th century B.C., and that craftsmen from the Aegean were on Sardinia by LH IIIB making Mycenaean wares with local clays; A quote from Acquaro (1999a, 259) reads, “The island (Sardinia) was already familiar with the Near East, having benefited from technological and cultural stimuli coming mainly from the pre-Hellenic Aegean.”

⁴ Manning and Hulin (2005, 283) “Does a lot of Mycenaean pottery in the east Mediterranean mean extensive Mycenaean trade, or rather material traveling—and not necessarily as key items—with Levantine or Cypriot merchants returning from the east Aegean, or west Anatolia, or the Greek mainland?” Papadopoulos (1998, 364) “In addition to providing a false sense of chronological comfort, the occurrence of Greek painted pottery outside the Aegean has, for too long, been taken as evidence of the impact of Greek traders, even colonists. Such a view overemphasizes the role of Greeks, especially, Euboians, while minimizing that of Phoenicians, Cypriots, and others from the eastern Mediterranean.”

engraving was found at Nora, known as the Nora Fragment. Cross believes that the nine letters representing two lines of text on the Nora Fragment are written in “boustrophedon” style, which was practiced exclusively in the 12th and 11th centuries B.C. in Phoenician texts.⁵ The dates of the earliest established Phoenician settlements fall about three centuries after the proposed date of the Nora Fragment, and about a century after the Nora Stone inscription. Due to a lack of sound provenience, the inscriptions could be misdated, and from a later period, but this is unlikely because the script is dated through epigraphy. Second, it is possible that sites have yet to be discovered that date to the period of the 300 year discrepancy between the archaeological evidence.

This thesis suggests another hypothesis: that a discrete amount of trading and prospecting occurred from the appearance of eastern Mediterranean goods until the accepted date of Phoenician settlement of Sardinia. The eastern artifacts found at Nuragic sites are the subtle clues that begin to explain the mystery between the elusive foreign merchants, the pre-colonization stage inferred from the inscriptions, and the established chronology of Phoenician colonization. Supporting this idea, Moscati explained the disparity between the textual and archaeological evidence as the result of a gradual pre-colonial phase, which was a version of Phoenician exploration that did not involve long-term trading posts *or* leave considerable archaeological evidence.⁶

Many new discoveries and publications have emerged regarding Sardinian archaeology over the past four decades. At the same time, nautical archaeology has evolved as a discipline, greatly adding to what was previously known of the ancient Mediterranean

⁵ Boustrophedon style script follows from right to left on one line and left to right on the next, and so forth (Cross 1986, 120-4). This has been referred to “as the ox ploughs”; Scheuer 1990, 60. Boustrophedon style script is known from archaic Greek texts as well (Threatte 1980, 54-5).

⁶ Moscati 1968, 98-100; Moscati 1982, 5-7.

world. The goal of this research is to attempt to bridge the expanse between these two fields by illustrating a different perspective using archaeological data and theoretical models. This information suggests that contact with Syro-Canaanite or Cypriot traders occurred at an earlier date than was previous thought, and, subsequently, had archaeologically visible effects on the indigenous Nuragic culture of Sardinia, beginning in the Late Bronze Age (LBA).

CHAPTER II

THE PHYSICAL ENVIRONMENT OF SARDINIA

The focus of this study is a theoretical analysis involving the human occupation and colonization of a large insular space in the ancient Mediterranean. In the tradition of processual archaeological methods, it is necessary to begin with a thorough examination of the physical environment that Sardinia had to offer prospective inhabitants. This being mentioned, it is not intended as a tool of ‘environmental determinism’ but more for highlighting the natural constraints and resources to be used as a foundation to better explain the human elements of development, interaction, and cultural change described in subsequent chapters.

Geological Aspects

Sardinia is a large island centrally located in the western Mediterranean basin (figure 1). It embodies 24,089 square kilometers of landmass, 1335 kilometers of coastline, and is 205 km from mainland Italy.⁷ Thus, Sardinia is the second largest island in the Mediterranean and is situated the furthest from a continent.⁸

Sardinia and Corsica are part of the Tyrrhenides landmass formed during the late Tertiary period.⁹ More specifically, Corsica and Sardinia were separated from the continent,

⁷ Cherry 1981, 56; Godfrey 1945, 511. Sardinia’s coastline stretches further than the largest Mediterranean island of Sicily, having only 1094 km of shores.

⁸ Giardino 1992, 304.

⁹ King 1975, 47-9.

near Liguria and Côte d'Azur, 30 million years ago through plate-tectonic division and drifted counter-clockwise to their current position.¹⁰ During the Late Upper Paleolithic, sea levels were considerably lower, connecting Corsica and Sardinia into a solitary island.¹¹ Today, Sardinia is separated from the geologically contiguous neighbor by 12 km of sea. Corsica is nearly one quarter the size of Sardinia and only 87 km from the mainland.¹²

During the age of hominids, the Sardinian-Corsican massif was always separated from the continent by sea. At glacial maximums, in the Middle Pleistocene, between 170,000 and 160,000 B.P., and the Upper Pleistocene, between 70,000 and 50,000 B.P. and again around 20,000 B.P., the shores were 130 meters lower than today (figure 2).¹³ The open sea between the Sardinian-Corsican island and mainland Italy was only 10 kilometers, providing the easiest explanation for initial island colonization during one of these windows of opportunity.¹⁴

Roughly rectangular, the distance from north to south (270 km) is greater than from east to west (between 95 and 145 km).¹⁵ Sardinia's coastal outline inspired the ancient Greeks to name the island, *Ichnussa*, or *Sandaliotis*, because its terrestrial form resembled a footprint in the midst of sea.¹⁶ Not many of the mountains rise higher than 1000 meters, and much of the Sardinian landscape is considered upland rather than mountainous,¹⁷ however, one is never further than 53 km from sea level, creating an illusion of mountains

¹⁰ Schüle 1993, 401.

¹¹ Sondaar 1998, 47; Tykot 1999, 69.

¹² Cherry 1981, 56.

¹³ Martini 1992, 45, fig. 5.

¹⁴ Sondaar 1998, 48-50.

¹⁵ Godfrey 1945, 511; Guido 1964, 23; Webster 1996, 28.

¹⁶ Pausanias 10.17.1.

¹⁷ Dyson and Rowland 2007, 17.

larger than their reality.¹⁸

Eastern mountains are composed of Silurian schists and granites, covered with Jurassic limestones.¹⁹ The central-east is the most rugged area of Sardinia, and from the highest promontory, the Gulfs of Asinara, Cagliari, and Oristano are visible on a clear day.²⁰ Miocene limestones, sandstones, and marls dominate the landscape throughout the central zone from north to south.²¹ Deep, alluvial plains are present in the Campidano (the lowlands that stretch across the island diagonally from the Gulf of Oristano to the Gulf of Cagliari) and along the Tirso river valley.²² The western face of Sardinia consists of Cambrian slates, limestones, and dolomites (and a concentration of ores) in the south and Triassic-Jurassic limestones in the north.²³ Mount Arci and Mount Ferru, located southeast and northeast of the Gulf of Oristano, are volcanic outcrops and an important factor considering Sardinian obsidian and the earliest inhabitants. A number of Aeolian dunes and coastal lagoons are found in the central and western regions of the island, and also nearly 50 sources of salt are known at both coastal and inland sites.²⁴

Rivers, Harbors, and Currents

The climate of Sardinia is characteristically Mediterranean, with hot summers lacking rainfall and mild, humid winters.²⁵ Summer months often produce severe droughts, winds are strong and the ground is mostly impermeable on Sardinia. This natural situation

¹⁸ Rowland 2001, 5.

¹⁹ King 1975, 47.

²⁰ Rowland 2001, 4.

²¹ King 1975, 49; Rowland 2001, 4.

²² Rowland 2001, 5.

²³ Rowland 2001, 5.

²⁴ Rowland 2001, 4-5.

²⁵ King 1975, 51.

puts a strain on the hydrography of the island. The main rivers on Sardinia are the Cedrino, Cixerri, Coghinas, Flumendosa, Flumini Mannu, Temo and Tirso (figure 3). The rivers and streams of Sardinia are modest in size and even at their peak, most are not navigable.²⁶ “Even the larger rivers have an extremely variable regime of water flow – the Flumendosa for example can vary from a winter maximum of 2,230 cu m per second to a summer minimum of zero...”²⁷ Although much shorter in length than many of the waterways²⁸, the Temo is the only navigable river in Sardinia (figure 4).²⁹ Very few rivers provide entry into the interior of the island, and reliance on natural springs was a necessity for inland populations.³⁰ A survey conducted in the early 20th century discovered that Sardinia had about 26,000 springs, but only 378 of these generated more than a liter a second.³¹ Most springs were located in the Sulcis, Cixerri, Iglesias, Logudoro, Marghine, and La Nurra regions (see figure 5 for regional map) along the western side of Sardinia.³² Sardinia’s only fresh water lake, not created by modern engineering, is the very small Lago di Baratz in the northwest region of La Nurra.³³

Unlike Corsica, which has larger river valleys that welcomed immigrants arriving via the Italian Peninsula, Sardinia’s major channels, the avenues leading into the interior, emptied mostly towards the west, south, or south-west. “Sardinia has its face turned to the Spanish and African main; it turns its back, so to speak, to Italy, and may be compared to a

²⁶ Brandis 1982; Godfrey 1945, 589.

²⁷ King 1975, 49.

²⁸ Rowland 2001, 3. The Tirso river is 159km; The Coghinas is 123 km; the Flumendosa is 122km; Flumini Mannu is 74 km; the Cixerri is 42 km.

²⁹ Ardito 2003, 126; King 1975, 68.

³⁰ Dyson and Rowland 2007, 17.

³¹ Rowland 2001, 4.

³² Rowland 2001, 4.

³³ Webster 1996, 31.

building having its front, doors and windows to the west and south.”³⁴

The 12 km waterway that separates Sardinia from Corsica is the Strait of Bonifacio, was notorious among sailors for its dangerous weather, currents, and shoals. Due to extremely fast surface currents and a torrential wind gap, the straight was avoided and not considered a reliable seaway in antiquity. The dynamic situation of deep water welling, seasonal surface currents, and strong westerly winds, occurring in the Strait of Bonifacio produces the “Eckman pumping” action.³⁵ This causes a strong force of water eastward through the channel.

The more mountainous eastern coast was avoided by foreign prospectors because of fewer natural harbors, strong westerly winds, and seasonally variable currents (figure 6) and eddies.³⁶ Pausanias described the eastern shoreline in this way:

*The northern part of the island and that towards the mainland of Italy consist of an unbroken chain of impassible mountains. And if you sail along the coast you will find no anchorage on this side of the island, while violent but irregular gusts of wind sweep down to the sea from the tops of the mountains.*³⁷

Regardless of the eastern coast’s notorious lack of maritime approaches, there were potential landings at the Gulf of Olbia, Gulf of Orosei (figures 7 and 8), Tortoli Lagoon, and the mouths of the Flumendosa, Cedrino and Posada rivers (refer to map, figure 3). Dangerous surface currents of the Tyrrhenian Sea made the potential anchorages found along the south and west of the island seem more attractive to seafarers.³⁸ Bays, lagoons,

³⁴ Perrot and Chipiez 1890, 11.

³⁵ Marullo, Santoleri, and Bignami 2000, 135-7, fig. 5.

³⁶ Astraldi and Gasparini 2000, 117-21, fig.2.

³⁷ Pausanias 10.17.10

³⁸ Lo Schiavo 1995, 51-4; Marullo, et. al 1994, 139, fig. 2.

and natural harbors were found in abundance along these favored shorelines.³⁹ In addition to potential harbors, Sardinia's landscape boasted bountiful forests, fertile land, and copious veins of metallic ores.

Soil, Flora, Fauna, and Early Occupation

Both the landscape, with varying types of soil (figure 9), and the seasonal water resources greatly affected the vegetation potential of Sardinia. In the Campidano valley, the lowlands surrounding Oristano Bay, and the low-altitude river valleys, the soil quality is the highest on Sardinia and has the most observable modern-day agricultural potential (figure 8). Surprisingly, the highest grade soils did not support many Nuragic settlements.⁴⁰

Nineteenth-century authors wrote of conditions that might have warranted avoidance of the lower altitude valleys, regardless of the fertile soil. Angius listed salty water, few springs, unbearable heat lacking sea breezes, dry rivers in summer and flooded winter river banks, that created bogs and swamps in the surrounding landscape.⁴¹ Also, a northwesterly wind, *maestrale*, and winter drought, *secche di gennaio*, disrupted the rainy season that stretched from late autumn through early spring.⁴²

The middle uplands had the highest concentration of Nuragic settlements. Soils were only of moderate to good quality, but the uplands had more rainfall, cooler temperatures, fewer droughts, an abundance of springs, a wide variety of huntable fauna, ample forest products (wood, acorns, chestnuts), and comparable or better crop yields than

³⁹ Godfrey 1945, 530-49; Guido 1964, 27.

⁴⁰ Rowland 1992, 149.

⁴¹ Rowland 1992, 150.

⁴² King 1975, 52.

the Campidano plains.⁴³

Although significantly deforested following Carthaginian conquest at the end of the sixth century B.C., the ancient forests once abounded in timber.⁴⁴ Giant holm-oaks dominated the landscape, and a combination of Aleppo pine, sweet chestnut, holly, yew and evergreen oaks were present.⁴⁵ A variety of evergreen oaks thrived on Sardinia including cork oaks in the lowland plains and sessile oaks in non-limestone type soils.⁴⁶ Trees that tolerated the higher altitudes of Sardinia were elder, white poplar, wild pear, and wild fig.⁴⁷ Branches of olive (*olea*), lentisk (*Pistacia lentiscus*), and the evergreen holm oak (*Quercus ilex*) used during sacrificial activities at the *tophet* remained in urns found at the Phoenician colony at Tharros.⁴⁸ Ancient Sardinia had a variety of both soft and hard woods, readily available timber for ship construction, or repair of vessels traveling for extended periods away from their homeports.

The topography of Sardinia was covered in a variety of *maquis*, or densely growing trees and shrubs. Some species of plants were of a useful nature, such as olive trees, rosemary or blackberry, for culinary purposes, but often, plants grew so thick with an added tangle of vines and created an impenetrable mess.⁴⁹ In areas lacking established roads or trails, traversing the countryside would have been a challenge.

Before the arrival of man, a wide variety of endemic fauna existed on Sardinia during the Pleistocene, including dwarf elephants, hippopotamus, giant flightless swans,

⁴³ Rowland 1992, 150; Webster 1996, 37.

⁴⁴ Brown 1984, 219-24.

⁴⁵ Godfrey 1945, 550-2; Guido 1964, 26; Massoli-Novelli 1986, 4; Webster 1996, 31, 42.

⁴⁶ King 1975, 56-7; Webster 1996, 31.

⁴⁷ Webster 1996, 31.

⁴⁸ Fedele 1983, 641.

⁴⁹ King 1975, 57.

giant otters, large field mice and voles, and *Prolagus sardus*, or the Sardinian Pika, a large, tail-less rabbit-like animal that was extinct by the late 18th century.⁵⁰ Human remains have been excavated at Corbeddu Cave near Oliena and were dated to 20,000 B.P.⁵¹ Although, not met without controversy,⁵² this evidence correlated with the last glaciation when crossing from the continent to the Corso-Sardinian island was a mere 10 km⁵³ and also could explain the extinction of the endemic Pleistocene species of Sardinia.⁵⁴ Some of the arguments made for rejecting such an early date of human existence on Sardinia is the 4000 plus radiocarbon years between level three at Corbeddu Cave and later pre-Neolithic settlements.⁵⁵ Dawson explained island colonization using terms such as “visitation, utilization, integration, colonization, establishment, abandonment, and re-colonisation” and criticized how archaeologists expect these processes to occur in a linear order.⁵⁶ Based on the archaeological evidence not following a linear order, she reasoned that an island could have been “integrated in an exchange network” through multiple visitations without being permanently colonized or established first.⁵⁷

By the early Neolithic (c. 6000 B.C.),⁵⁸ evidence of domesticated plants and animals, considered important aspects of the ‘Neolithic package’, were present at 25 of the sites excavated on Sardinia.⁵⁹ Throughout the Neolithic, Sardinian obsidian sourced to Mount Arci has been found at contemporaneous sites across Sardinia, Corsica, and on the

⁵⁰ Rowland 2001, 9; Schüle 1993, 402-3, 406.

⁵¹ Sondaar 1998, 49.

⁵² Tykot 1999, 69.

⁵³ Martini 1992, 46-7.

⁵⁴ Rowland 2001, 10.

⁵⁵ Rowland 2001, 11.

⁵⁶ Dawson 2005, 43.

⁵⁷ Dawson 2005, 43.

⁵⁸ Webster 1996, 47.

⁵⁹ Tykot 1999, 70.

continent in Italy and Southern France, and was the possible source for introduction and exchange of domesticated stock and agriculture.⁶⁰ Early Neolithic subsistence left remains of sheep, goats, pigs, a small number of cattle and domestic grains (*Triticum monococcum* and *Triticum dicoccum*), as well as grinding stones for processing the crops.⁶¹ Middle Neolithic sites attested to added variety in diet to include large amounts and variety of mollusks (*Helix*, *Discus*, *Patella*, *Cardium*)⁶², a few species of birds, fish, and *Prolagus Sardus*.⁶³

Mammals that were important to the ancient Sardinian survival and ideology (as seen in many iconographic representations)⁶⁴ included the mouflon sheep/ram, *Ovis musimon*, the fallow deer, *Dama dama*, a dwarfed island species of the European stag or red deer, *Cervus elaphus*, dwarfed island species of European wild boar, *Sus scrofa meridionalis*,⁶⁵ and the wild pigeon, *Columba livia*.⁶⁶ Still present in the mountainous region of Marmilla, are small wild horses known as the *giara*, *Equus caballus Giarae*.⁶⁷ The cattle and sheep that are found on Sardinia in modern times are of a hearty, rustic variety, *Bos taurus sardo* and *Ovis aries sardo*, descendants to the bovines and mouflons kept by the ancient Sardinians.⁶⁸

Metal Resources

Sardinia has an abundance of metalliferous resources (figure 10). Considering the interests and technology of ancient Mediterranean populations, the metals available on

⁶⁰ Tykot 1992, 64-5; Tykot 1999, 71.

⁶¹ Tykot 1999, 72.

⁶² Webster 1996, 32.

⁶³ Rowland 2001, 11.

⁶⁴ Lilliu 1966.

⁶⁵ Webster 1996, 31.

⁶⁶ Webster 1996, 32.

⁶⁷ King 1975, 58.

⁶⁸ Webster 1996, 32.

Sardinia were copper, iron, lead, silver, and tin.⁶⁹ Some of the more relevant outcrops of metallic resources are listed below. Additional locations had existing ores, but when and whether these were utilized cannot always be determined. The quality and quantity of the ores varied, with Iglesiente and Sulcis regions in the southwest having the best concentrations of all the metals of interest.⁷⁰ Lead, copper, silver, and iron was available at La Nurra in the northwest, iron at Mount Ferru north of Oristano Gulf, and copper and iron in the center of the island at Sarcidano.⁷¹

Evidence attests that the Nuragic people were working some of the rich and varied metallic resources before extra-insular contact.⁷² Lead, copper, iron, silver, and possibly tin, were mined on the island from an early date. Indication of lead mining was found from the Sardinian Eneolithic, 3200-2300 B.C., and the Sardinian Late Neolithic, c.4000-3200 B.C., for copper and silver mining.⁷³ Some of the earliest use of metal pertains to using lead for repairing ceramics in the Copper Age.⁷⁴

Cassiterite from Iglesiente was tested, and results showed a possibility of mining in this region from the ore sampled, but the ancient exploitation of tin on Sardinia was not definite.⁷⁵ Others analyzed quartz-cassiterite and quartz-arsenopyrite at the Perdu Cara mine in Flumminimaggiore and found that the deposit was scattered in small patches, and of poor mineralization quality, thus making it “difficult to exploit by Bronze Age

⁶⁹ Valera, Valera, and Rivoldini 2003, 128-32.

⁷⁰ Gale and Stos Gale, 1987, 151, fig. 7.12; Rowland (2001, 8) includes iron, lead, silver, and tin in his discussion without mentioning the numerous copper mines in this region (see Gale and Stos Gale, 1987, 151, fig. 7.12).

⁷¹ Rowland 2001, 8.

⁷² Metalworking implements have been found in and around Nuragic sites predating the colonial period: at Zuighe, nearby Nuarghi Funtana see Webster, 1996, 117; for Nuarghi Santa Barabra see Gallin and Tykot 1993, 335-6, 339-344; for Ortu Comidu see Balmuth and Tylecote 1976, 196.

⁷³ Giardino 1992, 304-5.

⁷⁴ Tylecote, Balmuth, and Massoli-Novelli 1986, 125-6.

⁷⁵ Tylecote, Balmuth, and Massoli-Novelli 1986, 129-30.

technology.”⁷⁶ If tin was not locally exploited, the next closest tin source to Sardinia was either at Monte Valero on mainland Italy or the Castilla y León region on Spain.⁷⁷

Hoardings of locally made bronze tools, weapons, votive objects, and related metallurgical tools (stone molds, crucibles, and shovels) were excavated at Nuragic sites, some of which pre-date the colonization period.⁷⁸ “The Nuragic culture flourished in the Bronze Age with an intense development of mining and metallurgical activity. Lead Scraps are found everywhere from a number of different uses: pottery repairs, clamps connecting stone blocks, and casts for fixing bronze figurines and swords.”⁷⁹

Some have claimed Sardinia’s rich and diverse potential for mining precious metals as the fundamental reason for inclusion in the pan-Mediterranean trade of the Late Bronze and Early Iron Ages.⁸⁰ Although recognizing the importance of metallurgy in ancient Cyprus, the Aegean, and Sardinia, Manning and Hulin point out that “the assumption that the metals trade was the driving force behind economic development is both simplistic and particularist.”⁸¹ Aptly stated, as even the material record supports this idea, the agencies of exchange and economic development in the LBA were complicated and interwoven.

Even if the initial utilization of Sardinia was as a way station or stepping stone to aid in the exploration of the western Mediterranean, pioneers had a variety of natural resources to exploit on the island. Interaction with the indigenous Nuragic culture would have been advantageous to explorers. To foreign prospectors and colonizers, the Sardinian population was potentially a valuable trading clientele and source of labor.

⁷⁶ Valera, Valera, and Rivoldini 2003, 132.

⁷⁷ Valera, Valera, and Rivoldini 2003, 128.

⁷⁸ Gallin and Tykot 1993.

⁷⁹ Valera, Valera, and Rivoldini 2003, 128.

⁸⁰ Gallin and Tykot 1993, 335; Rowland 2001, 54.

⁸¹ Manning and Hulin 2005, 288.

CHAPTER III

THE NURAGIC CULTURE

The Bronze Age began around 2300 B.C. on Sardinia, and during this period, a newly defined culture developed (figure 11). The Nuragic culture is named for a style of megalithic architecture unique to Sardinia, the nuraghi. A homogenous culture is symbolized by the distinctive Nuragic towers, which are the starting point for archaeologists in determining the socio-political systems, subsistence methods, ideological practices, technological advances, and trade mechanisms of the Late Bronze and Early Iron Ages. As nuraghi represent everything ancient about Sardinia to the modern observer, a nuraghe represented something far more significant than a mere shelter to the ancient people of Sardinia. The nuraghi were constructed between the Middle Bronze Age and Early Iron Age (about 1800 to 900 B.C.),⁸² but some remained occupied well after 1000 A.D during the Medieval period.⁸³ Nuraghi are unique to Sardinia, as no parallels have been found of this architecture from any other existing culture.

Definition and Chronology

In the 4th century B.C., the Greeks believed the term nuraghe was derived from the Phoenician colony at Nora, named for its founder, Norax.⁸⁴ It has also been postulated that the term originated with the Phoenicians, by taking the contemporary Sard word *núragh* and

⁸² Holloway 2001, 1.

⁸³ Webster and Webster 1998, 183-4, fig. 2, 199.

⁸⁴ King 1975, 34.

explaining its ancient connotation as the Arabic *nur* for ‘light’ and the Hebrew *gâg* for ‘roof’ or ‘house.’⁸⁵

The first Nuragic period structures are known as proto-nuraghi, gallery or corridor nuraghi.⁸⁶ Nearly two hundred proto-nuraghi remain and constitute the most prevalent architectural style of the Early Bronze Age on Sardinia, with a higher concentration of sites in the west-central uplands.⁸⁷ Proto-nuraghi were either irregularly shaped or roughly rectangular, built low to the ground, and blended into the surrounding landscape. The majority were built with a single story covered with lintels and large, flat stones creating a level roof, but some also exhibited remnants of smaller stone huts on the second level.⁸⁸ This style of architecture supported a domestic usage and was not considered defensive, despite the construction with resistant building materials.⁸⁹

As Sardinian architecture evolved into the Classic Nuragic style, internal living space slightly increased, the walls thickened up to five meters⁹⁰, and the height of the structures towered to about 15 meters above ground level. Moravetti considers this architectural change to be a revolutionary conception, born from a need for protection, and not a gradual evolution.⁹¹ However, examination of Nuraghe Santu Antinu ‘e Campo (see figure 12 for sites mentioned in Chapter II) demonstrated a convergence of styles,⁹² with typical features found in a proto-nuraghe, but instead of having a flat roof, the ceiling was a tall, corbelled,

⁸⁵ Perrot and Chipiez 1890, 21. Although described as above, the authors disagreed with this idea proposed by La Marmora in *Voyage en Sardaigne*, Part II, page 36.

⁸⁶ Balmuth 1984, 25; Blake 2001, 146; Rowland 2001, 30.

⁸⁷ Webster 1996, 68.

⁸⁸ Lilliu 1988, 181-2.

⁸⁹ Moravetti 1992, 195.

⁹⁰ Balmuth 1984, 25.

⁹¹ Moravetti 1992, 192-5.

⁹² Rowland 2001, 31.

and domed, like the classic *tholos* (vaulted ceiling) nuraghe.⁹³

The first true nuraghi were built around 1800 B.C.⁹⁴ More than 7,000 nuraghi dot the Sardinian landscape (figure 13),⁹⁵ and it is unknown how many others were dismantled over the past four millennia due to the reuse of building materials or clearing fields for agriculture. Thus, their construction, although varied in size and complexity, was widespread across Sardinia for many centuries.

At first, it appeared that the Nuragic structures were built for defensive needs, especially when compared to the proto-nuraghi. The nuraghi were tall, maintained so-called guard niches, and usually occupied the high ground.⁹⁶ Contrary to the bellicose appearance of the towers (figure 14), archaeological evidence supported domestic use for their primary function. Data gathered from scientifically excavated Nuragic settlements indicated that these communities enjoyed a fairly simple agro-pastoral existence.⁹⁷ Floral and faunal remnants revealed a reliance on animal husbandry supplemented with wild game and cereal agriculture.⁹⁸

The Duos Nuraghes site in Borore, Marghine region, had two classic tholos nuraghi with well-documented Middle Bronze Age (MBA) dates signifying the earliest occupation. Tower A was a single story nuraghe made with archaic styled construction. Impressed ware ceramics from the nuraghe's earliest strata were calculated to 1881 B.C. by radiocarbon dating.⁹⁹ Tower B (figure 15) was built around 1500 B.C. with more sophisticated

⁹³ Balmuth 1984, 28.

⁹⁴ Blake 2001, 146; Webster 1996, 87, 91-4.

⁹⁵ Gallin and Tykot 1993, 335; Webster 1996, 85, 91.

⁹⁶ Webster 1996, 92.

⁹⁷ Rowland 1987, 148-65; Webster and Teglund 1992, 451-4.

⁹⁸ Webster 1996, 100-2, 133-4; Webster 2001, 43, 48; Webster and Teglund 1992, 451.

⁹⁹ Webster 1996, 93.

techniques that included a guard's niche, two stories, and three interior wall niches.¹⁰⁰ A village of small, circular huts was built around the two towers in the LBA c. 1250 B.C. and a stone wall encompassed the entire site in the EIA by 900 B.C. (figure 16).¹⁰¹

Artifact distribution suggested that areas inside the structures were task specific, for cooking/eating, grain processing, keeping animals, etc.¹⁰² Faunal remains included domesticated caprines, swine, cattle, deer, rabbits, and small percentage of birds.¹⁰³ Hearth materials, baking ware, bread-pans, serving cups, bowls and pots¹⁰⁴ were recovered from each stratigraphic level, indicative of a continual domestic use inside both Tower A and Tower B at Duos Nuraghes.

Webster has postulated that Duos Nuraghes and the 40 other Nuragic settlements in the Borore-Birori region of the Marghine were part of a larger socio-political organization. He suggested that the 'peer-polity' interaction of the communities was of a fragile and hostile nature, and from this situation, a hierarchical system of regional-level alliances arose.¹⁰⁵ This interpretation was largely dependent on an environmentally constrained processual model combined with ethnographic parallels to patrilineal socio-political organization.¹⁰⁶ Considering that male representations dominated amongst the *bronzeetti*, and many of the figures fully equipped with weaponry, the observations made by Webster correlated well with the powerful bronze imagery.

Gallin concluded with similar results in a study conducted in the Sedilo region,

¹⁰⁰ Grele 1992, 271.

¹⁰¹ Grele 1992, 271; Webster 1996, 93.

¹⁰² Webster 1996, 93.

¹⁰³ Webster 1996, 100-1; Webster and Webster 1998, 188-9.

¹⁰⁴ Webster 2001; Webster and Webster 1998, 186-91

¹⁰⁵ Webster 1996, 93, 98-9.

¹⁰⁶ Webster 1996, 150-2.

located on a basalt plateau near the center of the island. She believed that the increased population density (41 nuraghi in 19 square km)¹⁰⁷ in an agro-pastoral economy created higher tensions, due to the amount of land needed for sufficient crop rotations and stock raising.¹⁰⁸ Gallin attributed the development of social hierarchy, reflected in the Nuragic architecture, to local competition of natural resources depended on by a growing population. “Because settlements in areas of high population density tend to impinge on one another, defensive and offensive alliances are more apt to develop.”¹⁰⁹

However, as most excavations have revealed, the architectural remains have not yet reflected constant hostility between the Nuragic communities, or a need for perpetual resistance from warring neighbors. Construction using materials resistant to force or fire, symbolized permanence and security,¹¹⁰ but did not necessarily entail active defense. Instead, the Nuragic towers represented the *nucleus* of domestic villages, and were often surrounded by a number of smaller huts, workshops, and ritual structures. In this way, the nuraghi could be seen as passive defense, used for shelter, cooking, storage, meetings, on an everyday basis, and in rare times of distress, the nuraghi served as added protection for valuables and extended family that normally did not stay within its walls, like the known usage of Greek (*pyrgos*) towers.¹¹¹

Perrot and Chipiez also noted that during the Middle Ages, Italian families in the Romagna and Tuscan regions flaunted their status by erecting large, stone towers on their

¹⁰⁷ Gallin 1991, 65.

¹⁰⁸ Gallin 1991, 71.

¹⁰⁹ Gallin 1991, 71.

¹¹⁰ O’Connell and Airey 2006, 84.

¹¹¹ Perrot and Chipiez 1890, 42-3.

property.¹¹² Trump believes that the buildings reflected status, or established ‘ownership’ at the village and community level.¹¹³ The idea that the construction of the megalithic towers was a display in a settlement’s wealth in labor, or kin, seems plausible. It took approximately 3000 boulders, each averaging 450 kilograms, to construct a typical classic nuraghe.¹¹⁴ This estimate included consideration that many nuraghi were built with materials found close to the site, as indicated at Duos Nuraghes, Nuraghe Urpes, and Nuraghe Toscano with evidence of scarred bedrock from quarrying the basalt boulders.¹¹⁵ Total amount of time needed to quarry and haul the boulders, level the bedrock, lay and dress the stone, was calculated to take 3600 days, or about 12 years to construct a classic nuraghi through the labor of ten related households.¹¹⁶

Russo concluded her analysis of the early Nuragic culture by explaining that the ‘difference of architectural scale and complexity’ of the nuraghi themselves was the primary status symbols of the ancient Sardinians because, “There is not the clear differentiation in Nuragic burials, nor meaningful differences in the furniture, fittings and finds from hut as against nuraghi that might have been expected of a society divided on the basis of wealth.”¹¹⁷

Because the Nuragic towers represented a culturally continuous idea distributed over the entire island, this explanation for island-wide popularity of the nuraghe is similar to the saying, “keeping up with the Joneses,” or, in other words, one settlement’s desire to

¹¹² Perrot and Chipiez 1890, 42-3. Translator added an old Italian saying in the footnote, “The higher the tower, the greater the family.”

¹¹³ Trump 1992, 198-9.

¹¹⁴ Webster 1996, 96.

¹¹⁵ Webster and Webster 1998, 189.

¹¹⁶ Webster 1996, 96.

¹¹⁷ Russo 1999, 218.

appear socially and economically equal to the neighboring community.

Evolution of Nuragic Architecture, Technology, and Society

The architectural evolution continued into the Late Bronze Age. This transformation is most obvious in the Nuragic architecture and surrounding villages. Complex Nuragic structures were elaborate in design and intimidating in their presence. At some sites, additions were made to the once simple tholos nuraghe, expanding the structure to include three to five towers, all of which were architecturally merged. Turreted towers were placed on the corners of large, encircling walls. Smaller structures, which were mostly domestic huts and workshops, were constructed around the elaborate centers. A final wall often enclosed the entire settlement. It is difficult to deny the defensive appearance of the Complex Nuragic settlements.

The three levels of Nuragic structures have been categorized as Class I, Class II, and Class III. By Lilliu's estimation, 71% of nuraghi were simple farmsteads centered around classic nuraghi¹¹⁸ and would be considered Class I settlements, much like the site already described at Duos Nuraghes. Class II structures accounted for 28.6% (or less than 2000) of the 7000 nuragic sites included in Lilliu's analysis.¹¹⁹ The complex nuraghi were LBA additions to already established classic tholos nuraghi, and the manner and variety in which the one to four supplementary towers were joined was never the same from site to site. "Class II settlements were generally larger than Class I...containing some 40 huts around a centrally located complex-nuraghe. They would thus have supported populations of about

¹¹⁸ Lilliu 1988, 357.

¹¹⁹ Lilliu 1988, 357.

75 people.”¹²⁰

The largest Class II settlement was Santu Antine in Torralba, with its three-storied central tower, is estimated to have once measured 21 meters in height (figures 17 and 18).¹²¹ Domestic remains were discovered in most chambers of the bastion, which included the central classic nuraghe, a courtyard, well, and three auxiliary towers all enclosed together with the typical megalithic architecture (figure 19).¹²² Reconstruction details have been aided by the discovery of numerous nuraghe models in bronze and stone (figure 20), which have helped archaeologists envision the upper levels of the nuraghi before ruin.

Nuraghe Funtana was a Class II community located in a mineral rich area near Ittireddu. This region had 40 complex Nuragic settlements of the known 118 concentration of Nuragic sites.¹²³ The site expanded around a MBA two-storied central tower; during the LBA, two additional towers were merged on either side of the central nuraghi’s entrance.¹²⁴ Archaeological evidence found at the outer courtyard entrance, stair niche, and central chamber is suggestive of ‘rapid destruction’ at the transitional period between the LBA and EIA.¹²⁵ There was ample evidence in and around Nuraghe Funtana for metallurgical activity, as well as native ores and foreign deposits that will be discussed in greater detail in Chapter V. Evidence of LBA plow-aided agriculture at Nuraghe Funtana was attested by the discovery of a leather yoke-cushion at the site.¹²⁶ Domestic use of the nuragic complex was evident in finding a hearth and numerous bread-pans, jars, bowls and cooking stands, and it

¹²⁰ Webster 1996, 113.

¹²¹ Balmuth 1984, 25; Webster 1996, 117.

¹²² Webster 1996, 117.

¹²³ Webster 1996, 115.

¹²⁴ Webster 1996, 115.

¹²⁵ Webster 1996, 115.

¹²⁶ Webster 1996, 116.

was estimated that the bastion had less than 70 square meters of living space, enough for only seven inhabitants.¹²⁷ Definitive evidence of metallurgical activity was found at Nuraghe Funtana and a nearby hill at Zuighe, including crucibles, steatite molds, slag and the possible remnants of a stone furnace.¹²⁸ Close proximity to copper mines (within 10 km)¹²⁹, knowledge of metallurgical practices, trade in foreign goods, and increased security measures either from close competition or colonizers, were all factors in the increased architectural complexity seen at Nuraghe Funtana.

Faunal remains from Nuraghe Santa Barbara near Macomer reflected an almost exclusive reliance on domesticated stock (97%), such as cattle, swine, sheep, mufflon, and goats, during the Late Bronze and Early Iron Ages.¹³⁰ The five acre settlement, enclosed by a stone wall, was inhabited by a Nuragic population between the 12th and 8th centuries B.C.¹³¹ The central tower had a 5-meter diameter room with three niches and was greater than 10 meters in height with an unknown number of stories. Four additional towers were added to the central nuraghe, as well as, a substantial village surrounding a large paved courtyard. Specialized craft areas were well documented at Nuraghe Santa Barbara, with material remains that indicated spinning and weaving, cooking, butchery, pottery repair, and metallurgy activities. Terra cotta molds used for lost wax casting of bronze items were also discovered at Nuraghe Santa Barbara. There was no evidence of violence as the site was abandoned quietly, and the occupants left with their valuables.

Class III Nuragic settlements were further fortified by the addition of multi-towered

¹²⁷ Webster 1996, 116-7.

¹²⁸ Webster 1996, 117.

¹²⁹ Webster 1996, 117.

¹³⁰ Gallin and Fonzo 1992, 289.

¹³¹ Gallin and Fonzo 1992, 287.

barbicans, or antemurals, that surrounded the original Class II bastions (figure 21). Lilliu described these sites as ‘proto-castles’¹³² with sizable villages, comprised of 60 to several hundred stone huts, conglomerated around its protected walls.¹³³ Fourteen Class III Nuragic sites (figure 22) have been identified (only about .002% of known Nuragic architecture), and two sites, Su Mulinu and Antigori, began their history not as the usual classic tholos nuraghi, but instead as archaic corridor nuraghi.¹³⁴

The UNESCO World Heritage site of Su Nuraxi, in the once densely settled Marmilla uplands, was a Class III settlement with an antemural, composed of seven multi-level towers, encompassing 1600 square meters.¹³⁵ Three phases of construction were apparent from the remains. The single, three-storied *tholos* nuraghe was built during the MBA.¹³⁶ During the LBA1, a two-storied bastion and an additional four corner towers encompassed a courtyard and well, and was immediately followed by the construction of the first antemural with three towers that surrounded the emergent village (figure 23).¹³⁷ An estimated 20 people inhabited the 200 square meters inside the 18 room bastion, and an additional 90 people lived in the village huts, each averaging 16 square meters in size.¹³⁸

¹³² Rowland 2001, 38.

¹³³ Webster 1996, 117-122.

¹³⁴ Webster 1996, 117.

¹³⁵ Webster 1996, 117-9.

¹³⁶ Webster 1996, 119.

¹³⁷ Webster 1996, 119.

¹³⁸ Webster 1996, 121-2.

CHAPTER IV

LATE BRONZE AGE MEDITERRANEAN MARITIME TRAFFIC

The eastern Mediterranean is not lacking in evidence of interregional trade during the Late Bronze Age (c. 1700-1200 B.C.).¹³⁹ The archaeological record is resplendent with sites, and textual and iconographic references are well studied in each region, from mainland Greece, Cyprus, the Syro-Canaanite Littoral, to Egypt (refer to figure 24 for map of sites).

Recognized as a period of great development and cultural change, the LBA is a battleground for archaeological theory, especially regarding agencies of trade. Childe and White considered that the development of agricultural practices increased stores, and then surplus enabled specialized skills, such as metallurgy or textile fabrication; thus explaining the increasingly complex social and political systems that arose during the LBA.¹⁴⁰ Renfrew postulated that it was mainly the interaction between regions that provided the stimulus for social change, creating an elite division of the populace that regulated and intensified the specialized production.¹⁴¹

The Problem of the Ubiquitous Mycenaean Ceramics

The LBA witnessed exchanges of large quantities of raw materials and finished products across long distances. Provenance studies, such as lead-isotope analysis of metals or petrographic studies of ceramics, have helped by revealing where a raw material was first

¹³⁹ Manning and Hulin 2005, 270.

¹⁴⁰ Childe 1951; White 1959.

¹⁴¹ Renfrew 1972, 473; Knapp 1993, 339-42.

exploited, but once in human hands it was possibly transported to another location before its manufacture into a finished product. Stylistic comparisons have also aided our understanding of inter-regional trade and extra-regional influences. As with the example of ceramics, maintaining an “exaggerated importance,”¹⁴² found littered throughout the archaeological record because of the material’s ability to resist decay, we are reminded by Georgiou, “While the presence of foreign objects is testimony to contacts, it cannot tell us much about trade and certainly less about trade routes.”¹⁴³ An artifact can prove contact existed between regions, but not explain the nationality of the transport, nor if it was intentionally imported or exported.¹⁴⁴ Also, a great extent is lost in the true nature of trade, as not all materials are preserved equally over time. For example, there are relatively few products of Syro-Canaanite origin on the Mycenaean mainland when compared to the hundreds of Mycenaean goods found in contexts outside the Aegean. This does not necessitate that the Mycenaean ceramics were more widely traded, or that they were traded by the Mycenaean. As the artifacts from the Cape Gelidonya and Uluburun shipwrecks illustrate, Syro-Canaanite commodities were mostly raw materials and perishable goods. This type of cargo is often invisible in the archaeological record because it was either modified by the receiving culture or disintegrated from the sites. “The absence of greater amounts of Near Eastern pottery in Greece is explained by the nature of this merchandise, for metals and cloth and ivory do not require pottery containers.”¹⁴⁵

Knapp explained four categories of trading systems to account for the expansive amount of artifacts created and exchanged in the Aegean and eastern Mediterranean during

¹⁴² Papadopoulos 1998, 363.

¹⁴³ Georgiou 1997, 122.

¹⁴⁴ Wachsmann 1987, 109.

¹⁴⁵ Bass 1967, 165.

the LBA as the following: (a) Centralized socio-political monopolies, (b) Restricted dominance with emissaries linking localities, (c) Independently commercial ‘tramping’ (d) royal ‘gifting’.¹⁴⁶

Type A exchange was based on a ‘thalassocracy,’ or supremacy of the seas, involving a national dominance over maritime trading networks. It is not clear whether true thalassocracies existed during the LBA.¹⁴⁷ Considering marine themed ideologies and iconography, vast networks of coastal colonies, and evidence of interregional ‘visitation,’ some believed Crete wielded a centralized political control, or a Minoan Thalassocracy.¹⁴⁸

Examples of Minoan styled frescoes at Tel Kabri and Tell ed-Dab’a and the *Keftiu* portraits in Thebes indicated a possibility of direct contact between the Aegeans and both the Levantine littoral¹⁴⁹ and Egypt.¹⁵⁰ While the scale and scope of the frescoes in the Levant were more attributable to Minoan artists abroad, the Theban tomb reliefs were not as widely accepted as proof that Minoans were physically in Egypt. The latest visible evidence of Aegeans in Egypt, dated to LM IB-LM II, was depicted in the Theban reliefs of Rehmire’s Tomb.¹⁵¹ Wachsmann concludes that after the collapse of Minoan society c. 1450 B.C., Aegeans were no longer represented in Egyptian reliefs, instead, Libyans were symbolized giving tribute as the representatives of the West.¹⁵²

There has been a perception that the Mycenaeans assumed the role of interregional

¹⁴⁶ Knapp 1993, 332.

¹⁴⁷ Knapp 1993, 333. This may be an anachronistic use of the terminology, based on classical historians’ descriptions of Athenian thalassocracies (definition and first use of the word well after the Bronze Age).

¹⁴⁸ Sakellarakis and Sakellarakis 1984, 202; Wiener 1990, 128, 142-5, 150-4. This idea is based mainly on ethnohistoric accounts by Thucydides (perhaps taken from Herodotus), increased wealth and complexity during LMIA, and the interregional distribution of ‘Knossian-inspired cultural traits’ throughout a large area in the Aegean (ie. Akrotiri, Phylakopi, Ayia, Irini, Trianda, Kastri, etc.) (Wiener 1990, 152).

¹⁴⁹ Cline 1995, 282; Niemeier 1991, 198-9.

¹⁵⁰ Cline 1995, 281.

¹⁵¹ Wachsmann 1987, 105.

¹⁵² Wachsmann 1987, 110.

merchants after the demise of the Minoan civilization.¹⁵³ This is due to the abundance of Late Helladic ceramics found throughout the Mediterranean, and misinterpretation of evidence, such as iconography found in the Theban tombs.

Much of the misconception of a Mycenaean merchant fleet can be attributed to the ubiquity of Helladic wares excavated on Cyprus, in the Levant, and in Egypt. Wijngaarden analyzed Mycenaean ceramics from 348 sites outside of the Aegaen (dated LHI-III B, or 1600-1200 B.C.) and found more than 70 percent of the sites included less than ten Helladic-styled pottery items, and just over ten percent of the sites had more than 50 Mycenaean imports.¹⁵⁴ Also, based on an analysis of 616 Mycenaean ceramics from Ugarit, Winjgaarden determined that only 2.5 Mycenaean objects were imported a year, by considering the temporal range (LH II/III A1-LH III B, or c. 1600-1200 B.C.) and space of two archaeological sites (27.4 hectares).¹⁵⁵ Working out the distribution average, this study illustrated a concentration of one Mycenaean import per 92.5 square meters of excavated area in the LBA Levant.

Collections of tablets containing Linear B script are found in great numbers at Knossos and Pylos, and more modest numbers are known from Mycenae and Thebes.¹⁵⁶ Albeit numerous mentioning types of ships, lists of oarsmen, coastal towns, sailing seasons, captives from foreign lands, the Linear B palatial records do not specify a single, direct reference to overseas, long distance trade, or names of merchant marines.¹⁵⁷ Many of the Mycenaean concerns of the sea were written to assemble fleets of rowers, drafted

¹⁵³ Kantor 1947, 53; Immerwahr 1960, 12.

¹⁵⁴ Wijngaarden 2002, 10, fig. 2.1.

¹⁵⁵ Wijngaarden 2002, 37-73, 330-42. Artifacts were from excavations at Ras Shamra and Minet el-Beida.

¹⁵⁶ Wachsmann 1998, 123.

¹⁵⁷ Palaima 1995, 629-30; Wachsmann 1998, 123-8.

presumably for military duty.¹⁵⁸

Before proceeding, it is necessary to explain the terminology of the Levantine society described in the following chapters. The current usage of the term Canaanite refers to the Bronze Age people living in Syria and Palestine (unified historically, geographically, culturally, and linguistically) until 1200 B.C., when severe geo-political changes occurred in the eastern Mediterranean. The Iron Age people living in parts of this same region are then known (in our modern lexicon) by their Greek name, Phoenicians, after 1200 B.C., a date established by historians to separate the Canaanite Bronze Age from the Phoenician Iron Age.¹⁵⁹

Excavated Bronze Age Ships

Often in archaeology, problems of accurately dating artifacts and typologies exist, even in carefully controlled excavations. For example, an artifact could be an heirloom, passed down for centuries before it ceased to be useful (or was lost). Shipwrecks are frequently described as archaeological ‘time capsules’ and have been of great use in determining temporal associations of artifacts and also providing examples of trade mechanisms caught in mid-stride. The five Mediterranean shipwrecks summarized below offer an enhanced view of the agents of exchange during the Bronze Age.

East of the Argolid peninsula, a shipwreck off the island of Dokos revealed a cargo with over 4000 artifacts, including hundreds of ceramic vessels dated to the Early Helladic II, or 2200 B.C.¹⁶⁰ The excavators believe the wreck occurred in a natural harbor adjacent

¹⁵⁸ Chadwick 1987, 77-9, 83; Killen 1983, 72-6.

¹⁵⁹ Aubet 2001, 12.

¹⁶⁰ Papathanasopolous, Vichos and Lolos 1995.

to an active trading depot.¹⁶¹ The ceramic assemblage contains a variety of table wares (bowls, jugs, cups, saucebowls, plates, utensils, askoi, etc.) and some have parallels to specimens found at Askitario in Attica, Lerna in Argolid, and Lithares in Boeotia. In absence of hull remains, the cargo gave an estimated size of the ship, conjectured to founder because it was too large a vessel to be equipped with only two small, lightweight anchors.¹⁶²

A shipwreck found off Şeytan Deresi was excavated about 100 meters off the Anatolian coast, east of Bodrum. As seen at Dokos, no wood was recovered from the site, and the small hull was determined from the amount of cargo remaining on the seafloor. The ceramic assemblage, consisting of lower quality pithoi, kraters, and jugs, was dated to the first half of the 16th century B.C., or early Late Minoan I.¹⁶³ The containers most likely were full (165-235 liters) and contained wine, oil, victuals, alum, or other types of perishable materials.¹⁶⁴ Items such as cooking wares or lamps, were not found among the artifacts of the Şeytan Deresi wreck. This suggests that the vessel was not traveling long distances. “The relatively small number of extant pots from the wreck indicates that their carrier was a modest coastal trader running small consignments of local commodities along the routes between the Anatolian coast and adjacent islands of the Dodecanese.”¹⁶⁵ It remains a possibility that the ship found at Şeytan Deresi was part of a localized trading network, controlled by a polity such as Knossos, (Knapp Type B), although, it is more likely that was

¹⁶¹ Papathanasopolous, Vichos and Lolos 1995, 19.

¹⁶² Papathanasopolous, Vichos, Hadzidaki, and Lolos 1992, 18.

¹⁶³ Margariti 1998, 51.

¹⁶⁴ Margariti 1998, 61. In the event of capsizing, if the containers were empty, they would most likely have floated away, and not been found among the wreckage.

¹⁶⁵ Margariti 1998, 60.

a freelance trader (Knapp Type C).¹⁶⁶

The Point Iria shipwreck was excavated in the Argolid Gulf and dated to c. 1200 B.C.¹⁶⁷ The cargo consisted mainly of a large assortment of ceramics, and in absence of direct hull remains, the vessel was estimated to be 7 meters in length on the projected weight of the cargo.¹⁶⁸ The eight transport containers assigned to Late Cypriot IIC, eight Late Minoan IIIB2 stirrup jars, and nine Late Helladic IIIB2 were part of the varied assemblage.¹⁶⁹ Petrographic investigation revealed that Cypriot pithoi were made from clays found on south-central Cyprus, the stirrup jars were from central Crete, and either an Attica or Peloponnese origin was possible for the LH IIIB2 two-handled jars.¹⁷⁰ Without more evidence of personal items (a single cooking pot is attributed to the Saronic isle of Aegina)¹⁷¹ the ship's home port was merely speculative, but the LBA ship wrecked at Point Iria was most likely involved in local trade due to its smaller size and limited cargo (Knapp type B or C).¹⁷²

A ship wrecked off Cape Gelidonya along the Anatolian peninsula was dated to c. 1200 B.C.¹⁷³ Only a few fragments of wood remained from the hull, indicating that it was built shell first with mortise-and-tenon joinery and was about 11-12 meters in length.¹⁷⁴ The cargo was greatly varied, including raw materials such as a variety of copper and tin ingots, scrap bronze in metal-working and agricultural tools, and ceramics of Mycenaean,

¹⁶⁶ Knapp 1993, 332, 338-9.

¹⁶⁷ Agouridis 1999, 26-9.

¹⁶⁸ Vichos 1999.

¹⁶⁹ Lolos, 1999.

¹⁷⁰ Day 1999.

¹⁷¹ Day 1999.

¹⁷² Knapp 1993, 332, 338-9

¹⁷³ Bass 1967, 163-4; Bass 1997, 5; Bass 1998, 188.

¹⁷⁴ Bass 1997, 5; Pulak 1999, 219-26.

Canaanite, and Cypriot styles.¹⁷⁵ Thirty-four copper oxhide ingots with primary and secondary marks, 20 bronze bun ingots, 19 slab ingots, and three possible tin ingots, as well as a variety of scrap metal and miscellaneous bronze tools and weapons, were found at Cape Gelidonya.¹⁷⁶ Artifacts key to identifying the nationality of the crew or the ship's home port were the Cypriot/Syro-Canaanite style anchor, the Syrian cylinder seal, the Syro-Canaanite ship's lamp, Syro-Canaanite imitation scarabs, and also most of the merchant's weights were of Near Eastern standards.¹⁷⁷ The Cape Gelidonya ship was most likely originated along the Syro-Canaanite littoral or on Cyprus¹⁷⁸ and was involved in modest freelance trade, or tramping, considering the "weights would have allowed the ship to trade in almost any port in the Near East or the Aegean."¹⁷⁹ The LBA shipwreck found at Cape Gelidonya was the best example of Knapp's Type C of maritime trade.¹⁸⁰

Without a doubt, the best parallel evidence for Knapp's Type D in maritime trade, or a royal 'gifting,' is the Uluburun shipwreck. Bark remaining on some dunnage from the shipwreck was dendrochronologically tested and determined that it foundered off the Anatolian coast around 1300 B.C. With an estimated length between 15-16 meters, the Uluburun hull was constructed with deep set and pegged oak tenons, spaced widely in planks of cedar.

Eleven tons of unworked metal in the form of 354 copper oxhide ingots from Cyprus and approximately one ton of tin ingots were transported on this vessel. Nearly 150 Canaanite amphoras containing terebinth resin, beads, and olives were recovered from

¹⁷⁵ Bass 1997, 7;

¹⁷⁶ Bass, 1967, 60-78, 163.

¹⁷⁷ Bass 1967, 164; Bass 1998, 188; Pulak and Rogers 1994, 21.

¹⁷⁸ Bass 1998, 188.

¹⁷⁹ Bass 1967, 164.

¹⁸⁰ Knapp 1993, 332, 338-9.

Uluburun. Luxury items included African blackwood, elephant and hippo ivory, ostrich eggs, faience cups, gold pendants and Nefertiti scarab, and Cypriot fineware stored in a large pithoi. Seven complete sets of weights, in standards that corresponded with the Ugaritic shekel, indicated that at least three Syro-Canaanite merchants were onboard the ship wrecked at Uluburun. Two Aegean swords, a bronze cloak pin (fibulae), and two Mycenaean seals were suggestive of Mycenaean officials on the ship, perhaps to accompany the royal cargo to its destination. The ship's lamps and deity were of Syro-Canaanite origin, which also suggests that this was the nationality of the crew. Natural resources from the cargo of Uluburun, such as the stone anchors' sandstone and galley ware's clay, were found to originate from the Caramel coast.¹⁸¹ Also, Pulak hypothesized that much of the inland trade filtered through the coastal town of Tell Abu Hawam, an entrepôt for the region's long-distance trade, and, thus, the best candidate for the home port of the ship wrecked and excavated at Uluburun.¹⁸²

¹⁸¹ Pulak 2008, 299.

¹⁸² Pulak 2008, 299.

CHAPTER V

LATE BRONZE AGE EXCHANGE ON SARDINIA

The discovery of Aegean artifacts, combined with the presence of oxhide ingots on Sardinia, resulted in the assumption that Mycenaean merchants had established direct trade with the Sardinians. Considering that archaeological, iconographic, and textual evidence does not support the existence of a Mycenaean merchant fleet,¹⁸³ interpretations of the Aegean wares on Sardinia in the LBA must be made with caution. The presence of Mycenaean goods on Sardinia does not require that Mycenaean merchants delivered them.¹⁸⁴

The Copper Oxhide Ingots

Late Bronze Age trade between Sardinia and the eastern Mediterranean was signaled by the appearance of copper oxhide ingots and Aegean ceramics in Nuragic contexts. Oxhide ingots were in production between 1550 and 1200 B.C.¹⁸⁵ As of 1992, only 130 oxhide ingots had been found on land sites, the majority were found on Sardinia, which also represents the western most distribution of these items.¹⁸⁶

¹⁸³ Bass 1967, 164-8; 1973, 36; 1991, 73-4; 1997, 153-70; 1998, 184-7; Wachsmann 1987, 112-3.

¹⁸⁴ Papadopoulous 1998, 363; Georgiou 1997, 122.

¹⁸⁵ Bass 1973, 31-33; Gale 1991, 197.

¹⁸⁶ Gale and Stos-Gale 1992, 320; Lo Schiavo (1998, 99-112) states that 55 fragments have been found on Sardinia between 1995-97, but it is not sure how many whole ingots they represent (50+ 7 (new sites) = 57 min. to 50 + 55 (new fragments) = 105 max. total for Sardinia), or if a substantial number of ingots or fragments have been found on the other islands or Greek mainland since 1992.

Fifty oxhide ingots were more recently recovered from 26 sites and support a pattern of widespread distribution on Sardinia (figure 25).¹⁸⁷ Some of the intact oxhide ingots found on Sardinia are the narrow-waisted Buchholz's Type II, made in the 14th and 13th centuries B.C. (figure 26).¹⁸⁸ Most of the oxhide ingots found on Sardinia were fragmented, although, four are complete with incised marks similar to those known from the Cape Gelidonya shipwreck.¹⁸⁹

Gale and Stos-Gale conducted lead isotope and trace element analysis on 22 Sardinian oxhide ingots and compared the results with analyzed Sardinian ores, Nuragic bronzes, and Cypriot copper. The Sardinian ingot data correlated with Cypriot copper in both tests, unlike the Sardinian ores and Nuragic Bronzes.¹⁹⁰ Sardinian oxhide ingots were made from Cypriot copper ores, and are attributed to post 13th century B.C. production.¹⁹¹ The associated ceramics, in which the oxhide fragments were hoarded, were attributed to the Nuragic Late and Final Bronze Ages (13th-11th century B.C.)¹⁹² Why are the Nuragic bronzes and tools not made from Cypriot copper? Why had the oxhide ingots not been used? Perhaps the oxhide ingots were considered too valuable to be melted, and thus lose their unique foreign shape, and were hoarded, instead of being used to make tools, weapons or statues.

At the Class II Nuraghe Funtana, a 20 kilogram hoard was excavated in proximity to the guard's niche at the entrance to the bastion.¹⁹³ Both native Sardinian copper ores were

¹⁸⁷ Lo Schiavo 1998, 99, fig. 1, 109-10; Kassianidon 2001, 104.

¹⁸⁸ Buchholz 1959, 1-4; Bass 1967, 52-62.

¹⁸⁹ Vagnetti 1999, 189.

¹⁹⁰ Gale and Stos-Gale 1992, 323-34.

¹⁹¹ Gale 1999, 115, 118.

¹⁹² Vagnetti 1999, 189.

¹⁹³ Webster 1996, 115.

found together with 27 fragments of copper oxhide ingots and pieces of votive bronze swords in a large four-handled, lidded ceramic jar.¹⁹⁴ These items were considered valuable, and hidden away. The metal was left behind as a hoard not for reasons that it was considered scrap and unusable, but as a result that the settlement was attacked and the inhabitants left, or were forced from, the building in haste (as explained in Chapter III). Also, in one of the three niches in the central tower, two bronze boat models were found with a geometric *askos*.¹⁹⁵ The niche was partially enclosed with a makeshift mud and stone wall. A second niche off the central tower had traces of iron.¹⁹⁶ More than a third¹⁹⁷ of the 118 Nuragic settlements in the region were complex nuraghi, and the destruction of the Nuraghe Funtana around the end of the LBA and EIA is indicative of the increased competition over both the mining resources and foreign trade relations.

Presumably, copper oxhide ingots were transported primarily by sea, as nearly all ingots of this type have been found either on shipwrecks, coastal sites, or on islands.¹⁹⁸ Lead isotope and trace element analyses were conducted on fifteen samples from the Cape Gelidonya shipwreck and ten from the Uluburun shipwreck.¹⁹⁹ With only one exception, all fall within the range of Cypriot copper ores.²⁰⁰ The two ships had 388 copper oxhide ingots combined²⁰¹ and due to cultural identification of personal effects and Levantine origin for

¹⁹⁴ Webster 1996, 115.

¹⁹⁵ Webster 1996, 116.

¹⁹⁶ Webster 1996, 116.

¹⁹⁷ Webster 1996, 115.

¹⁹⁸ Gale 1991, 200; Stos-Gale and Gale 1992, 318.

¹⁹⁹ Bass (1967) reports that Cape Gelidonya is dated to c. 1200 B.C.; Pulak (2001) accounts that Uluburun is dated to c. 1300 B.C.; Gale (1991, 227-28) notes that the samples from Uluburun consisted of four oxhides ingots, five plano-convex ingots, and one slab ingot. The exception of a non-Cypriot copper sample was taken from a copper bun ingot.

²⁰⁰ Gale 1991, 228-9.

²⁰¹ Bass (1967, 52) explains that Cape Gelidonya had a total of 34 oxhide ingots; Pulak (2001, 18) notes that Uluburun had a total of 354 rectangular slab copper ingots (317 of “typical” oxhide type).

much of the cargo, it is supposed their home ports were in Cyprus or the Syro-Canaanite region.²⁰² Through careful analysis of both the assemblages of the Cape Gelidoyna and Uluburun shipwrecks and an ethnohistoric investigation, Bass asked a similar question that is posed in this thesis:

Albright, Lorimer, Page, and others believed that Phoenician activity on Sardinia began no earlier than 1000 B.C., at the earliest. Late Bronze Age Cypriot pottery, however, is now being found on Sardinia, where ox-hide ingots are plentiful. Perhaps they were transported by Mycenaean seafaring merchants, but now that a Mycenaean maritime monopoly has been disproved, could these ingots not have arrived on *proto*-Phoenician ships that also carried export pottery from Cyprus?²⁰³

Discounting the Mycenaeans as long distance traders of the oxhide ingots, and accounting for the evidence excavated from the LBA shipwrecks, especially of Cape Gelidoyna and Uluburun, the answer to this question is nearly obtained.

Mycenaean Ceramics

Late Helladic III B–C wares have been found at 12 Nuragic sites, dating between the 13th and 12th centuries B.C., in numbers ranging from a single shard to over 50 Mycenaean shards at Antigori.²⁰⁴ Chemical and petrographic studies have determined the origin of the ceramics.²⁰⁵ Some have been stylistically and chemically matched to wares from Knossos and Chania in Crete, while others have been determined to be local copies,²⁰⁶ such as a Geometric vase discovered at the Phoenician colony at Sulci.²⁰⁷ Another

²⁰² Pulak 2008, 299.

²⁰³ Bass 1997, 16.

²⁰⁴ Re 1998, 287-8.

²⁰⁵ Ceruti et al. 1987, 7-12; Jones and Vagnetti 1991, 128, 131-4; Re 1998, 287-90.

²⁰⁶ Jones and Vagnetti 1991, 133-4; Jones and Day 1987, 258-62.

study claimed that the imported ceramics were chemically matched to Rhodes and Cyprus.²⁰⁸ Also, similar to pithoi found on the LBA shipwrecks at Uluburun and Point Iria, were the shards of a Cypriot pithos discovered at Antigori.²⁰⁹

Lo Schiavo explains that the Sardinian chronology was a work in progress, due to recalibration according to the latest dendrochronology records and the latest associated Mycenaean ceramics (figure 11).²¹⁰ She stated that the Recent Bronze Age on Sardinia (refer to figure 11 for Chronology) was assigned by absolute dating (calibrated C14) between 1350-1150 B.C. and should have corresponded with Late Helladic IIIA2, Late Helladic IIIB, part of Late Helladic IIIC also Late Cypriot IIB, Late Cypriot IIC, and part of Late Cypriot IIIA.²¹¹ Lo Schiavo added that this fine-tuned chronology was partially attributed to the angular alabastron (Late Helladic IIIA2) excavated at the foundation level of Nuraghe Arrubiu near Orroli.²¹² Thus, the final stage of the Middle Bronze Age, or MBA3, on Sardinia was contemporaneous with Late Helladic IIA2.²¹³ Considering that it is difficult to build a chronology around Nuragic ceramics, because of their often simple, undecorated shapes, ceramics of foreign association have assisted in this dilemma. However, as Papadopoulos pointed out, assuming that the Aegean ceramics sequence was a ‘chronological yardstick’²¹⁴ gives archaeologists relatively dating Aegean ceramics outside the Aegean a “false sense of chronological comfort.”²¹⁵

Two of the village huts (number 17 and 23) at Su Nuraxi, a Class III Nuragic site in

²⁰⁷ Boardman 1999, 212, fig. 251; Barreca 1986a, 23, fig 7.

²⁰⁸ Tykot 1994, 70.

²⁰⁹ Vagnetti 1999, 190.

²¹⁰ LoSchiavo 2001, 133.

²¹¹ LoSchiavo 2001, 133.

²¹² LoSchiavo 2001, 133.

²¹³ LoSchiavo 2001, 133.

²¹⁴ Ridgway and Serra Ridgway 1992, 357.

²¹⁵ Papadopoulos 1998, 364.

the Marmilla uplands, revealed LHIII C shards.²¹⁶ The Su Nuraxi fortification system showed signs of renovations in LBA1 following either an earthquake, or an attack. The bastion had been re-sheathed and a new entrance to the inner courtyard was constructed after redesigning the entrance to the antemural.²¹⁷

Cultural Change in Nuragic Society

At the time when foreign goods appear in Sardinia's archaeological record, the architectural evolution was taking place in LBA Sardinia (1300-900 B.C.). Nuragic culture became stratified and all aspects of life became more complex.²¹⁸ This transformation is most obvious in the architecture. "The scale and sophistication of the so-called *tholos nuraghe*, whether simple or complex, suggest they were meant to impress, both the populace and outsiders..."²¹⁹

Complex Nuragic structures were elaborate in design and intimidating in their presence. Many sites resembled medieval fortresses. Trump asserted that it was not necessary to assume that the Complex Nuragic centers were defensive units against encroaching foreigners. Instead, he explained that the formidable architecture could have been focused towards fellow Sardinians, through local competition of land in times of drought or famine.²²⁰ Gallin proposes that although the original use of Classic Nuraghi may

²¹⁶ Webster 1996, 119.

²¹⁷ Webster 1996, 121-2.

²¹⁸ Webster 1996, 108.

²¹⁹ Russu 1999, 218.

²²⁰ Trump 1992, 200-1.

have been as territorial markers, homesteads, or symbols of prestige, that fortification of Complex Nuraghi occurred due to the rising affluence of some sites.²²¹

Trump also notes that “the Phoenicians were traders rather than empire builders, and did not threaten the independence of native peoples inland.”²²² I agree that the Complex Nuragic sites were not built as a defense from colonizers, but that the foreign presence created local competition through trading. Traffic in exotic goods brought to Sardinia by eastern seafarers provided a platform from which a stratified society could develop. The interactive commerce thrown open by the eastern contacts provided wealth previously unknown to the chiefdom-level²²³ economy of the Sardinians.

In Wright’s study of LBA Aegean cultural exchange, he explains the importance of foreign goods on the socio-economic system of chiefdoms. Due to the fluid and fragile nature of this level of society, the chief ensures his position by distracting commoners and neighboring leaders with prestige goods, through “owning” the gateway to non-native resources.²²⁴ As Wright notes, “A competitive cycle is built into this form of political organization that is highly dependent on display of the exotic and foreign and is wholly focused on the individual.”²²⁵ It is this sort of competition that is reflected in the Nuragic architecture and the later Nuragic *bronze* that allowed a variety of exchange between the native Sardinians and the prospecting foreigners.

There is archaeological evidence of reciprocal trade between a Phoenician outpost on Crete at the harbor-town, Kommos and the western Mediterranean. Shaw reports that

²²¹ Gallin 1991, 69.

²²² Trump 1992, 201.

²²³ Webster 1996, 62.

²²⁴ Wright 1995, 66-9.

²²⁵ Wright 1995, 68.

47 ceramic artifacts from Italy and Sardinia were found at Kommos and date to the later Late Minoan IIIA1 period.²²⁶ Because the Sardinian containers were plain wares and closed jars, Waltrous proposes that the content of scrap metal was the item most valued in the trade, not the ceramics.²²⁷ Most traffic of Sardinian material goods occurred during the LM IIIA2/B at Kommos with the height of trade with Cyprus during LMIIIA1.²²⁸ Also, two Levantine styled stone anchors with three holes weighing 75 kilos each, were found at Kommos in LMIIIA2 association, suggestive of a medium sized vessel.²²⁹

Similar to Syro-Canaanite products, the items that Sardinians were trading for exotic eastern imports were mostly raw materials, invisible to the archaeological record. Most likely, items such as unworked metals, alum (used for dyeing textiles), timber, animal by-products, such as hides and fabrics made from wool, cork, barley, or other various necessities that seafarers would need to re-supply ships would have been bartered in the LBA during the pre-colonization period.

²²⁶ Shaw 1998, 15.

²²⁷ Waltrous 1992, 182-3.

²²⁸ Shaw 1998, 21.

²²⁹ Shaw 1998, 15.

CHAPTER VI

THE IRON AGE AND PHOENICIAN COLONIZATION

The use of the term ‘Phoenician’ has been attributed a Greek word, *phoenix* used during the 9th to 7th centuries B.C., and was based on the original term *phoenix* meaning ‘red’, or the color of a dye used to create the purple textiles for which the Phoenicians were famously known.²³⁰ Mazza describes numerous historic accounts attesting to the skills of Phoenician craftsmen, especially in creating purple textiles, “...these fabrics were enormously popular for many centuries all over the Mediterranean, becoming – as we would say today- a status symbol, a sure sign of wealth and refined taste.”²³¹

Another suggestion for the origin of the term Phoenician is deriving it from the Mycenaean words *po-ni-ki-jo* or *po-ni-ki*, which are thought to refer to an eastern aromatic herb, used in Linear B texts from Knossos and Pylos.²³² The Iron Age people, originally from the coastal plain north of modern Israel, did not call themselves Phoenician, but *can’ani*, or Canaanites, a word that in Hebrew (*cana’ani*) that also means merchant.²³³ Thus the land occupied by the merchants was called Canaan. This term was used in the Bible, Egyptian inscriptions (*kn’nm*), Ugaritic texts (*kn’ny*), from Alalakh texts (*kn’nm*), and texts recently found at Elba in Syria (*ca-na-na-um*, *ca-na-na*) describing a location called as such (Canaan) beginning in the middle of the third millennium BC.²³⁴

²³⁰ Aubet 2001, 6-7.

²³¹ Mazza 1999, 636-7.

²³² Aubet 2001, 9.

²³³ Aubet 2001, 6-10.

²³⁴ Aubet 2001, 10-11.

Being famous for their seafaring abilities, superior ship construction, and shrewd trading skills,²³⁵ the Phoenicians were thought to have traveled west in search of metals such as copper, silver, and the most elusive, tin. Through the process of exploration, trading depots were established along the way, in Cyprus, Crete, Sicily, Sardinia, Spain, and etc., not only to conduct trade and increase wealth, but also to restock food and water or repair ships. “They established trading posts at many of these sites that together formed a chain throughout the Mediterranean, enabling the Phoenicians to send ships to sea for very long journeys.”²³⁶

To colonize means to settle outside the boundaries of the homeland. Colony is defined as, “a group of people who leave their native country to form in a new land a settlement connected with the parent state.”²³⁷ The use of force, or politics, need not be involved, just a long term plan. This should not be confused with the term *colonialism*, defined as “the policy of a nation seeking to extend or retain its authority over other peoples or territories.”²³⁸ Over the centuries, many foreign nations settled, and some did try to control the native population of Sardinia by force. Lawrence captures the perception of the Sardinians’ steadfast determination not to give up their land or identity. “They say neither the Romans nor Phoenicians, Greeks, nor Arabs ever subdued Sardinia. It lies outside; outside the circuit of civilization.”²³⁹

²³⁵ Mazza 1999, 639-45.

²³⁶ Scheuer 1990, 55.

²³⁷ Barnhart 1966, 238.

²³⁸ Barnhart 1966, 238.

²³⁹ Lawrence 1965, 3.

The Nora Stone

The discovery of the Nora stone in 1773, and its subsequent decipherment, was testimony of Phoenician contact with Sardinia by the 9th century B.C. When found, it was serving as a segment in a vineyard wall, near ancient Nora.²⁴⁰ Believing that the stone was intact, Peckham translated the eight lines of text in this earlier transliteration:²⁴¹

1. *From Tarshish*
2. *he was driven;*
3. *In Sardinia he*
4. *found refuge;*
5. *his forces found refuge*
6. *Milkuton, son of*
7. *Subon, the commander.*
8. *To (the god) Pmy.*

Peckham also suggested that this was a dedicatory stone, commemorating a chance occurrence of Phoenicians landing on Sardinia. He believed the inscription referred to an unsuccessful colonization of the Spanish Tartessos, famous for its silver mines in antiquity.²⁴² His reasoning stems from the Biblical description of Tarshish ships, making round trips from the Levant to Spain for trade in rich and exotic goods.²⁴³ From Peckham's translation it seems possible that Nora was a way station for the Tarshish ship trade route, but the following interpretation by Cross reads differently.

²⁴⁰ Gibson 1982, 26. The Nora Stone was not moved from Pula until 1830 when it was transferred to the Cagliari museum. The broken portion that Cross believes is missing, was probably caused by a chisel while fitting the stone for the wall.

²⁴¹ Peckham 1972, 459, 468.

²⁴² Peckham 1972, 487.

²⁴³ Kings 1.10.2; Jonah 1.3; Ezekiel 27.12: *Tarshish was thy merchant by reason of the multitude of all kind of riches; with silver, iron, tin, and lead, they traded in thy fairs.*

Cross and Gibson were convinced that a portion of the stone was indeed missing, thus Cross changed the text to read as the following:²⁴⁴

- a. *[He fought?]*
- b. *[With the Sardinians?]*
 - 1. *at Tarsis,*
 - 2. *and drove them out.*
 - 3. *Among the Sardinians*
 - 4. *he is (now) at peace,*
 - 5. *(and) his army is at peace:*
 - 6. *Milkaton son of*
 - 7. *Subna (Shebna), general*
 - 8. *of (king) Pummay.*

Cross believed that Pummay was Pugmilion, ruler of Tyre from 831-785 B.C., and was responsible for placing an army on Sardinia around 825 B.C. to control the indigenous populace and secure his hold on the mines of the island.²⁴⁵ Other scholars agreed that the script was typical middle of 9th century B.C. Semitic text, but some disagreed with the previous explanation. Aubet accepted this date, but added that the inscription was a plaque to commemorate construction of a temple to the god Pumay, and served as a message to subsequent Phoenician seafarers visiting Sardinia.²⁴⁶ The god Pumay also had strong connections with the Phoenician settlement of Kition, on Cyprus.²⁴⁷

Negbi offered yet another interpretation. She disagreed that the stone was referring

²⁴⁴ Cross 1984, 56; Gibson 1982, 26-27.

²⁴⁵ Cross 1984, 57.

²⁴⁶ Aubet 2001, 206, 241-2.

²⁴⁷ Aubet 2001, 207.

to the Iberian Tartessos, or to Tarsus in the Cilicia region. She concluded that the stone most likely pertained to Sardinia's Tharros (also a Phoenician colony).²⁴⁸

An inscription contemporaneous to the Nora stone was discovered at Bosa, located along the western coast of Sardinia, 161 kilometers separate from Nora.²⁴⁹ Only four diagnostic letters have survived on the fragment. Cross dated this inscription to the 9th century BC, but from the few letters it is difficult to translate and the message remains illusive.

On the second engraving, known as the Nora Fragment, Cross believed that the nine letters, representing two lines of text, were written in 'boustrophedon' style, which was practiced exclusively in the 12th and 11th centuries B.C.²⁵⁰ Boustrophedon style script follows from right to left on one line and left to right on the next, and so forth. The term means 'as the ox ploughs.' Röellig did not accept Cross's dating of the Nora fragment,²⁵¹ and some disagreed with the interpretation. Other scholars felt the 12th or 11th centuries B.C. could not be accepted without additional archaeological evidence to support the idea of an earlier Phoenician settlement on Sardinia.

Given the appearance of LBA eastern Mediterranean artifacts on Sardinia in stratified Nuragic contexts, it was certainly plausible that the Phoenicians, or *proto*-Phoenicians (Syro-Canaanites from the Levant or colonies on Cyprus), were present on Sardinia by the 11th century B.C., or even prior to that. Before the possibility of earlier Phoenician contacts is ruled out, additional archaeological excavations are needed before the *ex-silentio* deposition is accepted as fact.

²⁴⁸ Negbi 1992, 609.

²⁴⁹ Cross 1986, 120.

²⁵⁰ Cross 1986, 120-4; Scheuer 1990, 60.

²⁵¹ Röellig 1983.

Phoenician Colonies

The first Phoenician colonies on Sardinia were situated on coastal headlands, near salt flats, or on close lying islands.²⁵² This type of location offered multiple docking options, and was useful for two reasons: easy accessibility in calm waters and defensibility.²⁵³ These natural features were common at Phoenician sites across the Mediterranean, and were apparently considered very important to the master seafarers. Thucydides also described these favored conditions amongst the Phoenician colonies on Sicily.²⁵⁴ Sites on the Phoenician homeland shared similar environmental characteristics. Some were constructed on islands to maximize their anchorage options. The city of Tyre in the Phoenician homeland was built in this manner, being situated on an island with many natural harbors.²⁵⁵ The western Phoenician colonies were modeled after this design, but on a smaller scale. The pattern of Phoenician colonization on Sardinia is represented by systematic settlements along the coastline, in which each colony was separated by short distances.

Although a number of sites on Sardinia have been proposed as Phoenician (or *probably* of Phoenician origin),²⁵⁶ only those of undisputed origin will be discussed here. Each of the sites mentioned are characterized by the following signs of settlement: (a) permanent architecture in the Phoenician style denoted by square lines, with buildings opening to courtyards;²⁵⁷ (b) religious sanctuaries; (c) burials or tombs.

²⁵² Acquaro 1999a, 260. This is the case with Tharros, Nora, Bithia (located at headlands), Sulcis (small island, now connected by a narrow isthmus), and Karalis (ancient Cagliari - salt flats); Basch 1987, 303.

²⁵³ Barreca 1986a, 159; Mosciati 1999, 21-2.

²⁵⁴ Thucydides 6.2.6.

²⁵⁵ Aubet 2001, 33.

²⁵⁶ Barreca 1986c, 144, fig. 11.1; Barreca 1986a, 25-30, 26, fig. 8.

²⁵⁷ Nuragic architecture differs from this (usually with circular walls).

Although the Nora stone testifies to a Phoenician presence on Sardinia by the 9th century B.C., archaeological evidence at the Nora site itself does not predate early 7th century B.C.²⁵⁸ The Phoenician colony was located on a narrow isthmus, and maintained three working ports located at the northeastern, northwestern, and southwestern coasts.²⁵⁹ During the 6th and 5th centuries the city was fortified and the *tophet* constructed.²⁶⁰ Like other early Phoenician settlements on Sardinia, there was not much interest in civic expansion from Nora into the hinterland.

The ancient urban settlement of Tharros shows evidence of an intensive Phoenician presence starting in the 8th century BC.²⁶¹ Featuring two sheltered ports, close proximity to bountiful lagoons, and access inland via the Tirso river valley, this site was easily defended and obviously attractive to the Phoenicians.²⁶² The earliest settlements were located on Capo San Marco, which is connected to the surrounding area to the north by a narrow isthmus. Two burial grounds were established after the end of the seventh century B.C. Located in the northern sector of the settlement a Phoenician *tophet* was built directly over the remains of a Nuragic village.²⁶³ The other sacred site was situated further south towards the Phoenician acropolis.

The specific spatial arrangement of the buildings suggested that the Phoenicians subjugated the indigenous population before claiming the domain for their own, but, according to Aubet, there was no indication that the colony at Tharros used force to

²⁵⁸ Acquaro 1999a, 264; Aubet 2001, 242; Barreca 1986b, 25.

²⁵⁹ Barreca 1986c, 148, fig. 11.4.

²⁶⁰ Aubet 2001, 242. A *tophet* is a sacred building that housed the charred remains of child or animal sacrifice.

²⁶¹ Barnett 1987b, 39-41.

²⁶² Barreca 1986a, 25, 29, 33, fig. 13; Barnett 1987a, 21-4.

²⁶³ Barnett 1987a, 26.

strengthen their territorial rights to the surrounding fertile region, as seen at Sulci.²⁶⁴ The village could have been abandoned preceding Phoenician occupation, but this does not seem logical given the exceptional location of the site.

Three bronze items found in a Phoenician tomb were dated to the late 8th century B.C. and attributed to Nuragic manufacture.²⁶⁵ This is an affirmation of early interactive trade with the Nuragic population. Items of Phoenician design were also found in the cemetery. Rich grave goods are typical during the height of Phoenician settlement, and Tharros had an extremely active market in this region, specializing in the production and trade of luxury goods.

Artifacts excavated from the *tophet* at Sulci indicated the earliest archaeological evidence for Phoenician settlement on Sardinia, with a middle 8th century B.C. date.²⁶⁶ Most likely, Sulci was a economic and political center for protecting their claim of the nearby lead and silver mines in the Iglesiente.²⁶⁷ Conveniently located, Sulcis would have also facilitated the task of loading docked ships with metal from the nearby mines. This area featured multiple natural harbors, and there is evidence that two ports, one on the south and one on the north, were used in antiquity.²⁶⁸ Early in the seventh century B.C., the inhabitants at Sulci constructed an intensive system of fortifications, possibly to gain supremacy over the silver and lead mines located further inland. Aubet believed that Sulci was representative of the western Phoenician expansion “...to establish economic and territorial autonomy in relation to the interior and to guarantee peaceful exploitation of the agricultural land and

²⁶⁴ Aubet 2001, 243.

²⁶⁵ Barnett 1987b, 39.

²⁶⁶ Aubet 2001, 237-8.

²⁶⁷ Aubet 2001, 238-40.

²⁶⁸ Aquaro 1999a, 266-8; Barreca 1986a, 21-2.

metal deposits.”²⁶⁹ From its beginnings, Euboean pottery was used and Cypriot *métier* was alive at Sulci, so much, that it has been suggested that Cypriots had a hand in founding the colony.²⁷⁰

Just inland from Sulci, a site resembling a military base with multiple barracks and a series of walls was found at Monte Sarai.²⁷¹ The Phoenician outpost was built over the remains of an abandoned or destroyed Nuragic village that showed traces of fire. This evidence at Monte Sirai is suggestive of hostility towards the indigenous population, and dates to the time of Phoenician expansion.²⁷² Aubet believes the purpose of the site was to mark territorial dominance over the indigenous population.²⁷³ The cremation necropolis dates from the 7th to the 6th centuries BC, but the *tophet* was not constructed until the 4th century, showing a dependency on its founding colony at Sulci until this time.²⁷⁴ Differing from the coastal settlements, both civil and religious areas were located inside the walls of this site, allowing the citizens to conduct business within the confines of a secure environment.²⁷⁵ This apparent strife between the two cultures in the Sulci’s territory, proves that the Nuragic inhabitants were aware of the value that the natural resources that the Southwestern region of Sardinia had to offer, if controlled. A concentration of established Phoenician settlements in the southwest, an area known for its good quality ores, indicates the primary reason for Phoenician permanence in Sardinia over many centuries.

As noted earlier, the dates of the earliest established Phoenician settlements were

²⁶⁹ Aubet, 2000, 241.

²⁷⁰ Acquaro 1999a, 268; Barreca 1986a, 23.

²⁷¹ Barreca 1985, 317.

²⁷² Barreca 1986a, 29.

²⁷³ Aubet, 2001: 240.

²⁷⁴ Aubet, 2001: 240-1.

²⁷⁵ Barreca, 1986c: 154.

about three centuries after the proposed date of the Nora Fragment, and about a century after the Nora Stone inscription. What could be the reason for this ‘gap’ between the textual and archaeological record? The following ideas address possible answers to this question:

- (a) Due to a lack of sound provenience and therefore, dating, the inscriptions could have been misdated, and from a later period, but this is unlikely since the epigraphic and transliteration techniques used were fairly established.
- (b) Sardinia’s archeological record may not be complete. Sites that date to this gap have yet to be discovered.
- (c) A discrete amount of trading and prospecting occurred from the time of the oxhide ingots and Mycenaean ceramic’s appearance until the official Phoenician settlement of Sardinia. Subtle clues of foreign influence found at Nuragic sites begin to fill this time gap between the elusive foreign merchants, the pre-colonization period inferred from the inscriptions, and the established chronology of Phoenician colonization.

Foreign influences in Nuragic contexts have been discovered in proximity to the later established Phoenician colonies, and may be indicative of active trade of both material goods and ideology during the pre-colonial phase.

Moscatti explained the gap as the result of a gradual pre-colonial phase, which was a version of Phoenician exploration that did not involve long-term trading posts *or* leave

considerable archaeological evidence.²⁷⁶ I believe that the Phoenicians had already established a trading network prior to 1000 B.C., following the Late Bronze Age voyages of Syro-Canaanite merchants. The period between the 14th and 10th centuries B.C. was one of great change for the Nuragic villages. The complex Nuragic centers exhibited signs of increased wealth, and wariness. Trading contacts with the East had already been set in motion by the end of the 11th century B.C., and the permanent establishment of the Phoenician centers beginning in the 11th century B.C. was a continuation of this trend, increasing in magnitude with time.

Liverani discarded the idea of foundation dates, based on the conceptual non-existence of founding colonies between the 12th to 10th centuries B.C.²⁷⁷ He argued the initial western Mediterranean Phoenician colonies most likely did not stem from a centralized political plan to control native populations and their resources. Instead, the discovery of the island was, first, a way station during extended voyages in the western Mediterranean, and second, a commercial venture that was a link in a chain of trading centers used by 'private merchants'.²⁷⁸ By the 9th century B.C., it is certain that the Phoenicians had set foot on Sardinia, but accepted dates for initial colonization have yet to be determined.

²⁷⁶ Moscati, 1968: 98-100; Moscati, 1982: 5-7.

²⁷⁷ Liverani 1987, 73.

²⁷⁸ Liverani 1987, 72-3.

CHAPTER VII

NURAGIC IDEOLOGY AND THE EASTERN CONNECTION

Subtleties that are found in Nuragic archaeological contexts lend support to an earlier date for Phoenician settlement on Sardinia. Evidence that Near Eastern colonizers shared their metallurgical technologies, religious rituals, and artistic expressions with the Nuragic communities is found in many cases.

The small bronze models, or *bronzettì*, of Sardinia were made with lost-wax casting methods.²⁷⁹ This technique was applied in the Levantine region to cast bronze statuettes for many centuries before the first appearance of bronze artistry on Sardinia. For this reason it has been suggested that the eastern mariners shared lost wax casting methods with the Sardinians. The earliest examples of bronze statuettes on Sardinia are attributed to Phoenician origins.²⁸⁰ The introduction of eastern styled bronzes and techniques was followed by local production of Nuragic *bronzettì*, made from Sardinian copper. Almost as much a symbol of ancient Sardinia as the Nuragic towers, the distinctive *bronzettì* most likely shared aspects of the ideology that went along with the original iconography.

The Syro-Canaanites and their Iron Age descendants, the Phoenicians, maintained a complex ideological system that included a specialized maritime category.²⁸¹ Being masters of ship construction, navigation, and keen merchants did not make the Phoenicians immune to the unpredictable dangers at sea. To better prepare sailors for the long and difficult journeys, special maritime deities were worshipped, tributes were made at sacred wells, and

²⁷⁹ Atzeni et. al. 1992, 347-8, fig.2.

²⁸⁰ Balmuth 1992, 218-9; Barreca 1986b, 131-2.

²⁸¹ Brody 1998, 1-8.

the idea of ship divinity were some of the ways mariners overcame fear.²⁸² An examination of Sardinian sacred sites, the Near Eastern iconography found at Nuragic sites, and development of the varying *bronzeetti*, with particular attention to the bronze boat models, will be discussed in order to have a more complete understanding of the significance and symbolism of the Nuragic ideologies.

Sacred Wells

With the infiltration of the eastern oral traditions, it was possible that cultic practices were also adopted by the Nuragic culture. Frizell explained that through a long term exposure, such as with the Sardinians and Phoenicians, ‘cognitive acculturation’ occurred, meaning ‘a more enduring presence which slowly penetrates into the individual and collective mind.’²⁸³

An overhead view of the sacred well at Santa Cristina, near Paulilatino (figure 29) reveals that the outline of the structure was reminiscent of the symbol of Tanit (figure 30). The Phoenicians worshipped the goddess Tanit, and is connected with the Syro-Canaanite goddess Asherah. Both goddesses were specialized deities associated with seafaring, as protectors of sailors.²⁸⁴ Frizell takes the maritime idea one step further. He believes that the curvature of the inward sloping walls of the well at Santa Cristina represented the interior curves of a ship’s hull.²⁸⁵ The sacred well is dated to the 11th century B.C., whereas the adjacent nuraghe is dated to the late 16th through 13th centuries. Seaside temples were

²⁸² Brody 1998, 1-8.

²⁸³ Frizell 1992, 262.

²⁸⁴ Brody 1998, 26-33.

²⁸⁵ Frizell 1992, 267.

often constructed at fresh water locations throughout the Syro-Canaanite and Phoenician trade routes. Excavations have revealed coastal shrines at Ugarit, Byblos, Kition, and beyond the Phoenician homeland, such as at Kommos in southern Crete.²⁸⁶ Wright explains that, “Just as a chief acquires powerful practical knowledge through his proprietary access to the artifacts of the prestige exchange network, he also acquires powerful conceptual knowledge through his access to the differently constructed belief systems and rituals of foreign societies.”²⁸⁷ It cannot be a coincidence that so many of the *bronzettii*, of known provenance, have been found at sacred wells. Offerings made by the Nuragic people at sacred shrines may have had a deeper meaning than to simply insure rainfall for thirsty crops.

Eastern Mediterranean Bronze Statuettes and the Sardinian Bronzetti

The origin of this eastern style of bronze statuettes is attributed to Syrian smiting god statuettes (figure 31). This type appeared in the Levant by the 17th century B.C., and was made for nearly a millennium.²⁸⁸ Bronze statuettes were also found on Cyprus, and the so-called ingot god from Enkomi (figure 32) is dated to the 12th century B.C.²⁸⁹ The figure is standing upon what looks like an oxhide ingot, with a raised spear in a smiting gesture. Negbi believes that the figurine resembles the style of Syro-Canaanite bronzes. It may also represent a Syro-Canaanite dominance of shipping the Cypriot oxhide ingots throughout the Mediterranean.

The first materialization of bronze models found on Sardinia is attributed to

²⁸⁶ Brody 1998, 43-60.

²⁸⁷ Wright 1995, 70.

²⁸⁸ Acquaro 1999b, 472-82.

²⁸⁹ Negbi 1976, 39.

Phoenician manufacture and made with lost wax casting techniques. Two bronze statuettes deposited as offerings at the sacred well of Santa Cristina and Nuraghe Flumenelongu (near Alghero in the La Nurra region), are dated to the 11th century B.C. and represent the earliest appearance of bronze statuary on Sardinia.²⁹⁰ Barreca describes the first model as a ‘walking male’ (figure 33), because, even though the statuette is absent below the torso, the left side of the body was positioned at an angle that suggested forward motion.²⁹¹ The model was most likely holding a rod-like object in its left hand, but now only a fragment remains just above the left hand. The imagery represented by this figurine is similar to images of the smiting god Milqart, or Ba’ al of Tyre, often represented with a tall, conical cap and holding a weapon in one hand.²⁹² Milqart is believed to be a protector of commerce or guard of mariners because his imagery is found from Tyre to the Atlantic coast, often at promontories or Phoenician ports.²⁹³

A second bronze figurine found on Sardinia, attributed to Phoenician origin, and dated to the 11th century, is the ‘seated goddess’ (figure 34), or ‘seated female’ as described by Barreca.²⁹⁴ The model features a long narrow body, large nose, deep set eye sockets, narrow head, and clasped hands reaching forward. A crest stands on her head, reminiscent of a crown or tiara, and a twisted rope-like necklace hangs braided, low on the torso.

The third statuette attributed to Phoenician manufacture was found at Santa Cristina and dates to the early 9th century B.C., described by Barreca as the ‘standing male’ (figure

²⁹⁰ Barreca 1986b, 131.

²⁹¹ Barreca 1986b, 135, fig. 10.5. The model is 9.45 cm in height, 5.1cm in width, discovered in 1882, or 1883.

²⁹² Brody 1998, 34-8, figs. 24, 25-27.

²⁹³ Brody 1998, 34-8.

²⁹⁴ Barreca 1986b, 134, fig. 10.1 The figurine is 8.6 cm in height and 2.55 cm in width, excavated in 1967.

35).²⁹⁵ The figurine has a small, round head, a low, triangular nose, almond-shaped eye sockets and tiny lozenges, faint beard, an exaggeratedly long torso, short skirt, left leg stepping forward, arms parallel to body, but missing below right wrist and left shoulder, so unknown if wielding an object, such as seen in the smiting god figurines.

The themes present in the Nuragic *bronzetti* are undeniably similar to the traditions found in the Near Eastern icons. Bernadini suggests that the Nuragic *bronzetti* not only imitated the eastern statuettes, but signified a “deeper understanding of a foreign iconography and style, and probably of legends, myths, and other aspects of eastern Mediterranean culture.”²⁹⁶

There is a plethora of *bronzetti*, but unfortunately, many early discoveries were not from controlled archaeological excavations and lack provenience of any kind. Also, since the early 19th century, their popularity made their value marketable, and consequently, many have been lost to private collections. Regardless, there are over 500 *bronzetti* in Sardinian museums alone, and with this large collection, stylistic and symbolic comparisons can be made, as well as metallurgical investigations, to determine sources of ores and percentages used in their manufacture.²⁹⁷

In 1966, Lilliu published an extensive catalogue of the Nuragic bronzetti in which 370 whole or fragmented artifacts were pictured and described. Of these, 190 were human figurines, the group most highlighted in his book. Two styles are discussed throughout, as Lilliu describes the more free-style bronze models as ‘Barbaricino-Mediterraneizzante’

²⁹⁵ Barreca 1986b, 136. The statuette dimensions printed in this chapter did not seem logical (2.5 cm height, 3.55 cm width, bust thickness 1.2cm, base 2.2 x 2.3 cm). Upon looking at the figure, it is obvious that the model had to be taller than 2.5 cm if the width was 3.55 cm.

²⁹⁶ Bernadini 1992, 406-9.

²⁹⁷ Balmuth and Tykot 1996, 19-20.

thought to be closer in form to the earlier Phoenician bronzes, and the second style as ‘Geometric’ with their rigid, clear compositions.²⁹⁸ The ‘Mediterraneanizing’ forms are identified by their “similarity to some eastern styles, with a sketchily rendered head and face; fluid, unarticulated limbs; and emphasis, by disproportion, on head and hands.”²⁹⁹

One theme present in many *bronzetti* is their use as symbolizing sacrifices, offerings for the sake of their religious beliefs. A figure found at the sacred well of Camposanto in Olmedo is attributed to the 8th century B.C. and described as ‘Barbaricino-Mediterraneizzante’ by Lilliu (figure 36). This Sardinian bronze model shows many similarities to the 9th century bronze model found at Santa Cristina (figure 35). Both figurines are stepping forward with the left leg, wearing short skirts and bare midriffs, have a small pointed beard, and have a similar shape of head and facial features. The Nuragic bronze’s arms are intact, and the figure presents a universally known gesture of tribute, with a raised open right hand and a small bowl or bread held in left hand as an offering up to the gods.

Animal figurines represent a large portion of Lilliu’s catalogue of Sardinian bronzes.³⁰⁰ These are thought to represent the victims of sacrifice made to honor the gods, and the *bronzetti* commemorate this idea.³⁰¹ Often human figures are depicted with a ram or sheep, the supposed sacrificial animal, slung around their shoulders (figure 37). Lilliu describes the bronze figurine in figure 37, discovered in the region of Ogliastra, with an exact provenance unknown, as a transitional style between the ‘Mediterraneizzante’ and the

²⁹⁸ Lilliu 1966, 16-20.

²⁹⁹ Balmuth 1992, 220.

³⁰⁰ Lilliu 1966, 313-71. About 60 of the bronzetti in this catalogue are focused solely on an animal, although, most of the bronze boats include an animal form as well.

³⁰¹ Perrot and Chipiez 1890, 81-2.

‘Geometric’ forms.³⁰²

The human forms identified as ‘Geometric’ style have a great amount of detail and are stylistically very unique to Sardinia. A wide variety of themes were depicted by the ancient artisans, but the majority of this style were celebrated warriors and holy men. The *bronzetti* from either Santu Teru or Bintergibas in the region of Senorbí was dated to 8th century B.C. (figure 38).³⁰³ The figurine is 24 cm in height, about a third of which is the long horns curving upward from the helmet.³⁰⁴ A second example of a ‘Geometric’ *bronzetti* was found at the sacred well at Santa Vittoria, but lacks an attributed a date (figure 39).³⁰⁵ The figure is cloaked, armed with a dagger prominently displayed across his chest, holding a crutch-like staff off the ground in his left hand, and is gesturing a sign of ‘peace’ with his open right hand. Criticized for their interpretation of *bronzetti* that were well endowed with, swords, bows and arrows, shields, daggers, etc. but offering the ‘universal’ gesture of peace with a open outstretched palm, Baux and Goin described this as “Watchfulness and armed peace” also including the Nuragic settlement at Teti into this symbolism with, “The city of the watch.”³⁰⁶ Perrot and Chipiez commented that Baux and Goin’s interpretation of the *bronzetti* and nuraghi as “I wish for peace, but am ready for war,” was an example of Occum’s razor, too complicated of an explanation.³⁰⁷

Because of the rigid, controlled composition found in ‘Geometric’ styled bronzetti, the observer is granted a great amount of detail clothing armor, and weaponry.

Disregarding aspects such as an impractical and exaggerated horned headdress, due to the

³⁰² Lilliu 1966 264-5, n.153.

³⁰³ Lilliu 1966, 182.

³⁰⁴ Anati 1984, pl. 118; Lilliu 1966, 182-3, n.96.

³⁰⁵ Lilliu 1981, 217, fig. 214.

³⁰⁶ Perrot and Chipiez 1890, 80, footnote 2.

³⁰⁷ Perrot and Chipiez 1890, 80, footnote 2.

intricacies ‘Geometric’ *bronzetti* give modern scholars a more accurate image of the Sardinians and a better understanding of what symbols were important to the Nuragic culture.

An Analysis of Selected Sardinian Boat Models

More than one hundred whole and fragmented boat models are thought of Sardinian origin. More recent discoveries have expanded the chronology of possible manufacture between the Final Bronze Age (10th and 11th century B.C.) through the sixth century B.C.³⁰⁸ However, as with a fair percentage of the Nuragic *bronzetti*, many of the boat models lack sound provenience. Although it may not be possible to reconstruct exactly how the ancient boats appeared through an analysis of the boat models, or to have an absolute chronology of the artifacts, there is still an ample amount of information to gain from the Sardinian *bronzetti*.

The Sardinian bronze boat models have a wide variety of shapes, styles, and details, but one thing was always part of the design, the animal figure head. Even the simplest hulls had an elaborate prow (figure 40 and 41).³⁰⁹ Only a few things could be said about these two vessels, as far as seafaring analysis goes. Both models have a slightly oblique, oversized bovine figure head, a very shallow and round hull form, and perhaps a representation of a gunwale or sheer strake. There is no detail given regarding the propulsion of these vessels. Both figures are flat bottomed, like most Sardinian boat models (for functional purposes as lamps or incense burners, most likely not direct representations of the actual ships’ lines).

³⁰⁸ Lo Schiavo (2000, 143-4) lists the Monte Sa Idda hoard and the Su Piroso di Santadi complex, dated to the Final Bronze Age, and the sanctuary of Hera boat and the Gravisca boat, dated to the sixth century BC as the latest extremities of the *bronzetti* assemblage.

³⁰⁹ Lilliu 1966, 388-9, n. 271-2.

So, if we were to remove the figure head and suspension ring, we would be left with an oblong, shallow bowl. Could it have been possible that the boat model was used for an additional function in connection to the sacrifices made to oblige their deities, such as a libation bowl?

The meaning of the various animals found at the prow of the Sardinian boat models could signify a few things. First, it could signify the type of animal sacrificed during a particular ceremony or season. Many animals are regarded as universal symbols, usually because of their importance to the subsistence of a culture. A bull for example can be a symbol of masculine virility, but also, because of the curvature of the horns, represents feminine procreation.³¹⁰ Second, the type of animal used as the figure head could have signified the type of vessel it was, for example, if it was a merchantman, warship, riverine boat, ferry, coaster, etc. Finally, the animals chosen as figure heads for the boat models could have held a deeper religious connection, signifying a particular deity or force, for each type. Similar to the shape of a waxing moon, a symbol for female or silver,³¹¹ the crescentic shape, found on the majority of Sardinian boat models in bovine figure heads, was also an important significance in Syro-Canaanite and Phoenician religious beliefs as it represented the deity of Aserah, or Tanit.³¹² Although the exact meaning of the inherent symbolism known to the Nuragic civilization is elusive to modern day definition, some symbols are universal.

The Sardinian boat model in figure 42 is unique for both its possible ship construction method, and also its symbolism. The model lacked relative dating, for the only

³¹⁰ O'Connell and Airey, 2006, 179.

³¹¹ O'Connell and Airey 2006, 234.

³¹² Brody 1998, 26-33, fig. 8.

provenance was “found on Sardinia.”³¹³ It is fairly large, 25 cm in length, and features an oblique bovine figure head, attached with a material that resembles cordage (see also figure 43). This implies that the ship could have been built using laced construction, at least at the extremities. A ring is shown about a third of the way down the gunwale on the port side. Could this be a representation of an oarlock? The boat model also shows sign of having a sturdy gunwale and a wale at the waterline. Wales are needed to add strength to a boat laden with heavy cargo, such as ferrying livestock. The oxen appear to be attached to a yoke and possibly represent an agricultural scene, such as plowing or clearing a field. Perhaps the significance of this model was to make an offering connected to a successful harvest.

The boat model found outside the modern village of Tula in northeast Sardinia was attributed to the ‘Geometric’ style by Lilliu, and dated to the end of the 8th beginning of the 7th century B.C. (figure 43).³¹⁴ The hull is beamy, and appears to be a sturdy craft, perhaps representative of a cargo ship? At least three wales are represented, as well as a small ram figure head attached with cordage. A portion of the hull is missing from the stern, so it is unknown if any details are lost here. Instead of a suspension ring, an arched handle, with small swirl details, is riveted below the gunwale. Also, as seen in figure 42, a single ring, possible oar lock, is apparent on the port side, this time closer to the stern of the vessel.

Located near Orulú in the Orgòsolo region, was a 28cm long bronze boat model with a nearly vertical stem post and deer figure head. The large hull is deep and rounded, but most significant is the angle of the stem post. It is similar to the 8th century B.C.

³¹³ Lilliu 1966, 401-3, 289.

³¹⁴ Lilliu 1966, 423-4, n. 316.

Phoenician vessels depicted at the palace of Sargon II (figure 49).

Similar in basic hull form to the model in figure 42, the bronze boat model in figure 45 was discovered in the region of Feronia di Posada. This *bronzetti* is only 14 cm in length and has a small bovine figure head. A significant wale is visible midway between the gunwale and water line, where just a ridge of a wale is noticed. Most interesting is the hint of the stem post jutting out externally. Portions of the hull are missing from the stern and amidships below the sheer strake, and it is unknown if any additional detail has been lost.

The Nuragic bronze boat models were thought to have been votive offerings, but also seemed to have an added function, perhaps as oil lamps.³¹⁵ Most of the boat models were equipped with either a ring used for suspension (figures 41, 47, 48) or feet used to raise the vessel from a surface (figures 45, 46 – may have had ring as well, but fragmented and unknown), or both (figure 42). In order to be used as a lamp, many of the Sardinian boat models had a flat base. This does not necessarily mean that the ships represented by the models were flat hulled ships, with extremely hard chines and thus, less sea worthy. It is likely that the base-line depicted on the models represented the waterline of the hull interpreted, and the hull below the waterline was lacking in many of the models (figure 46).

One aspect that suggests that some of the ships represented by the Sardinian boat models were seagoing vessels is the appearance of a possible mast in some of the models (figures 47 and 48). Models equipped with a central pole, topped with an interpreted ‘crow’s nest’ and a more decorative ring, are less frequent than the simpler models, but often wield other aspects that suggest sea worthiness. The bronze boat model, with a bovine figure head, found in the region of Orroli is comparatively large at 21 cm in length,

³¹⁵ Basch 1987, 404.

7.8 cm in width (2.69: 1 Length to Beam Ratio).³¹⁶ It featured weather fencing stretched between sturdy stanchions, and is fragmented at the stern (see also figure 43, 45, and 48). Could the missing section of the hull at the stern of some of the *bronzzetti* have been where a tiller was attached?

Another Sardinian boat model (figure 48), that was possibly representative of a seagoing craft, has no known provenance other than it was found on Sardinia.³¹⁷ It has a forward placed ‘mast’ topped with a ‘crow’s nest’ and also possible aspects of rigging. Measurements were not given in Lilliu’s catalogue, but it also has a narrower beam like figure 47. Also, as with figure 47, the vessel shown in figure 48 has doves placed prominently at the top of the suspension ring, and on this model, at the gunwale facing aft. Figure 47 displays a total of nine doves, mostly perched along the weather fencing and stanchions. This is another clue that both of these models were depictions of seagoing vessels. During the LBA, birds that were unable to land on water (like doves) were kept onboard ships to help sailors locate the nearest shores out of their view, by releasing the birds, that were able to sight land while flying to a greater height than sea level, and following their direction.³¹⁸

A parallel can be made between the Sardinian bronze boat model in figure 48 and the Phoenician ships depicted in the relief at the Palace of Sargon II in Khorsabad from the 8th century B.C. (figure 49).³¹⁹ Both vessels have a mast with a crow’s nest and a stay running from the mast attached to the figure head. There is a portion of the Sardinian model missing at the stern, which could have yielded more parallels if there were any remnants of a

³¹⁶ Lilliu 1966, 411, n. 298.

³¹⁷ Lilliu 1966, 406-7, n. 294.

³¹⁸ Wachsmann 1998, 300.

³¹⁹ Basch 1987, 306-8, fig. 650; Casson 1995, fig. 92.

stern post. Basch believes that the oversized nature of the crew on the Phoenician vessel meant that in reality there were more men onboard than was depicted, and that the artist omitted oarlocks to simplify the nature of the artwork.³²⁰ Therefore, the crew would have been rowing, not awkwardly standing and paddling, and more akin to a Phoenician ship capable of towing large cedar logs and traveling the seas. For these discrepancies made by the artist, Basch believed that “Assyrian artists were charged to represent a scene they had never seen.”³²¹

A model that does show crewmen in acts of boat propulsion is a bronze boat model from the 6th century site at Isthmia, Greece (figure 50).³²² Four human forms are present: two oarsmen facing the stern, holding their respective oars hanging over the gunwale, one man at the prow facing aft with arms crossed at chest, and one man at the stern with left arm across chest and right arm “up, ostensibly gesturing.”³²³ Quite possibly, not only is the man at the stern’s lower arm absent, but also the tiller or punt, for he seems to be the helmsman. Despite the missing extremities and heads of the crew, this bronze boat model offers a clear understanding of the type of ship represented and how it was maneuvered. Basch reaffirmed my initial thought that this model seemed out of place in Greece, by stating that this model had two features that were out of character for Greek ship iconography: that it was made from bronze (Greek models were mostly terra-cotta at this time), and that a figurehead in the shape of a deer was completely foreign in the Greek tradition.³²⁴ Also noticing that the bronze model shared features known from the Sardinian

³²⁰ Basch 1987, 309.

³²¹ Basch 1987, 309.

³²² Johnston 1985, 70, arch.46.

³²³ Johnston 1985, 70-1.

³²⁴ Basch 1987, 237.

bronzetti contemporaneous to the date of the site at Isthmia,³²⁵ Basch believes that the ship was either of Sardinian manufacture, or was offered by a Sardinian.³²⁶

Considering a Cypro-Phoenician influence in the origin of the style and technique of the *bronzetti*, is it possible that certain features of the Sardinian boat models reveal aspects of eastern ships that plied their waters? Most information of Early Iron Age Phoenician vessels has been gathered from iconographic representations, such as the relief from the palace of Sargon II (figure 49) and bronze bas-relief from Balawat (figure 51).³²⁷

Phoenician vessels depicted in the bronze bas relief from the gates of Balawat, are dated to the ninth century B.C. (figure 51).³²⁸ The Assyrian ruler Salmanasar III reigned between 858 and 824 B.C. and covered the large doors with scenes of tribute from Tyre and Sidon, artfully crafted in bronze.³²⁹ The Phoenician ships were drawn out of proportion, as the figures inside the vessels are comparatively large. The figure heads are, fittingly, horses, as the often described Phoenician cargo vessel were known in Greek as “hippoi” or horses.³³⁰ In view of the perfect symmetry of the ships’ low profile, crescentic sheers, are horses at both the prow and the stern. This contrasts with all Sardinian *bronzetti*, which never show signs of a raised stern post, not to mention, an animal form at the aft of the vessel. However, when compared to contemporaneous ship iconography, the Phoenician ships represented at the relief from the palace of Sargon II and the bronze boat model from Isthmia (possibly of Sardinian origin) have the most affinities with the Sardinian boat

³²⁵ The 6th century is rather late in the Sardinian bronzetti chronology, but could have been an heirloom, or fashionably vintage.

³²⁶ Basch 1987, 237.

³²⁷ Aubet 2001, 37; Basch 1987, 307-8, figs. 650-1; Casson 1995, 56-60, figs. 92.

³²⁸ Aubet 2001, 37.

³²⁹ Basch 1987, 305-6, fig. 648.

³³⁰ Casson 1995, 66.

models than any other example in the ancient Mediterranean.

Phoenicians worshipped a deity, thought to provide protection and guidance from the dangers of the sea, called ‘Hippokamp’ and is known from depictions on Tyrian coins, shown as a winged sea-horse riding the waves below a Phoenician vessel.³³¹ It was an appropriate representation for the Phoenicians, as the horse is universally regarded as the symbol for travel and has been associated with wind, storm, waves, and running water.³³² O’Connell and Airey add that throughout time horses have signified wealth and power, because the sound of hooves against the ground resonates like thunder.³³³

In summary, the Sardinian *bronzetti* have a shared history with the eastern Mediterranean bronze statuettes, made for votive offering. It is apparent that the imported objects from the Levantine region influenced the technique used in the Sardinian bronze model manufacture (refer to Chapter III, pg. 25: terra cotta molds found at Nuraghe Santa Barbara), the style (‘Barbaricino-Mediterraneizzante’) and subject matter of iconography, and possibly, the ideological beliefs that surrounded the images (Tanit, Asarte, water as sacred).

The Sardinian bronze boat models were made in the same stylistic vein. To what extent the models represented the inspiring craft cannot be determined. Many of the models lack seafaring details, such as tillers, oars, rams (not animals), sternposts, keels, frames, mast steps, or representations of crewmen. Details such as these are usually found in iconography from marine savvy cultures. It seems as though the models were made by artisans that had seen the ships they were depicting, but were not intimately familiar with the mechanics of ship construction or manning these vessels (by sailing, rowing or steering).

³³¹ Brody 1998, figs. 21-3.

³³² O’Connell and Airey 2006, 88, 288.

³³³ O’Connell and Airey 2006, 88.

It remains a possibility that the models were created to give tribute to the mariners responsible for bringing exotic commodities to Sardinia, and that their foreign ships were the inspiration for the models.

CHAPTER VIII

CONCLUSION

The goal throughout the preceding chapters was to relate the terrestrial archaeology of Sardinia to the field of nautical archaeology. Through an illustration of archaeological data and theoretical models, the evidence suggests that contact with Syro-Canaanite or Cypriot traders occurred at an earlier date than was previous thought, and, subsequently, had archaeologically visible effects on the indigenous Nuragic culture of Sardinia, beginning in the LBA.

With its central location in the western Mediterranean basin, Sardinia acted as a ‘natural stepping stone’ for ancient seafarers.³³⁴ Natural resources utilized throughout Sardinia’s prehistory were highlighted in Chapter II as a foundation for the development of the Nuragic Culture and also an attraction for foreign traders and subsequent traders. Settlement patterns in the pre-Neolithic through the Nuragic periods are indicative of the regions that afforded a healthier human population stability and growth, such as the middle range uplands with moderate to good soils and more reliable water resources of central west Sardinia.

The island of Sardinia supported a unique and successful tribal-level society at the beginning of the Late Bronze Age. There is no doubt that the concept of the nuraghe was developed from the indigenous populations of Sardinia. The expansion and stratification of their society towards the end of the Late Bronze age can be attributed to a combination of

³³⁴ Giardino 1992, 304.

factors. Local competition and accumulation of wealth (such as represented by hoards of metallic objects) through garnering surplus resources is one example. Barley farmers were able to plant later, harvest earlier, with a possible second crop, while neighboring wheat farmers were vulnerable to idle attacks from their barley farming neighbors.³³⁵ Creating surplus (“improving subsistence production”) is a classic example of emerging hierarchy in chiefdom level societies.³³⁶ Areas such as Marghine (which had been densely settled in proto-nuraghi times, were more vulnerable to local completion factors and alliances created through gifts or circumscription.³³⁷

Local competition was also intensified on Sardinia through trade in foreign objects. Earle lists two important ways elites gain power in chiefdom-level societies, by “Seizing control of internal wealth production and distribution” which could explain the Class III settlements densely nestled around productive ancient mines (refer to figure 22), and by “Seizing control of external wealth procurement,” which could explain any Class III settlements that had clustered around direct access (such as the group around Su Nuraxi, upstream of the Flumini Mannu river) to the foreign trading posts or later settlements (refer to figure 22).

Archaeological, iconographic, and textual evidence does not indicate that the Mycenaeans were involved in long distance exchange or that they supported a merchant fleet. Exotic foreign commodities were most likely brought to Sardinia by *proto*-Phoenician colonizers. Phoenician colonies were established at ideal locations considering mineral resources, harbors, and access to the interior, which indicates a period of *pre*-colonization to

³³⁵ Rowland 1992, 152.

³³⁶ Earle 1989, 85.

³³⁷ Earle 1989, 85; Webster 1996, 97-8.

explore the island. The Sardinian iconography, or collective *bronzetti*, was inspired by Phoenician metallurgical techniques and style as illustrated in Chapter VII. Considering the use of bronzetti in cult practices, figures chosen as symbolism, and connections to sacred wells, it is suggestive that ideological beliefs were also exchanged from the Eastern Mediterranean to the Sardinians.

Thus, the development of the unique Nuragic style can be traced through the Near Eastern bronze statuary history, and has connections to the symbols used in the Levantine based religions. This is yet another example in which a chief acquires power through political strategy. Earle explains that incorporating a foreign ideology into an existing chiefdom religious system, “Equally important is competition for ties to a new ideology from outside, often associated with an ‘international style’ that is used to set off the ruling elite as a separate order...Elites justified their positions with reference to external sources of power inaccessible to others.”³³⁸

Modern maritime heritage is found only around the Gulf of Oristano, in the continued use of primitive reed boats for fishing (figures 52 and 53). Each August, a festival takes place celebrating the tradition of *is fassonis* of Sardinia, but even these simple rafts are attributed to Phoenician origins.³³⁹ After describing the bronze boat models found a hoard at Teti, in a ‘hilly district, far removed from the sea’, Perrot and Chipiez explained the disparity of boat symbolism, that the boats were the only hint of a maritime symbolism or evidence in the Nuragic society. “The only allusion to Sardi mariners is found in Strabo. According to his testimony, Sardi pirates, in his time, would land on the Etruscan coast,

³³⁸ Earle 1989, 85.

³³⁹ Ardito 2003, 136.

committing acts of rapine as far inland as Pisa (5.2.7). They may have been Corsi who occupied the north of the island.”³⁴⁰

Sardinian rivers are non navigable and the water levels are not predictable throughout the seasons.³⁴¹ Aside from boat models, evidence of maritime activity is not evident in Nuragic culture. Remains of aquatic animals are rarely found in Nuragic contexts and represent only 1% of their subsistence.³⁴²

“In general it is true to say that in spite of the long and indented coastline the Sardinians have not taken to maritime activities, and much of the fishing even to-day is done by immigrants from the mainland, for example, Genoese and Livornese.”³⁴³ King has noted that only three of the 2,400 proverbs of Sardinia’s cultural heritage refer to the sea, and thus the Sards traditionally “turned their backs on the sea.”³⁴⁴

Cultures often adopt ship symbolism when the sea is central to survival and proliferation, for example, maritime symbolism found in southern Scandinavian cultures throughout the Stone Age to Medieval times. Cook explains, “By ‘maritimity’ is meant a reliance on the sea, as an essential component, for numerous cultural activities such as subsistence procurement, exchange networks, communication channels, acquisition of prestige items and group identity.”³⁴⁵ Lack of ‘maritimity’ of the Nuragic Culture supports the idea that the bronze boat models are not simply replicas of their own ships, but, rather, very rudimentary representations of foreign ships crafted by artisans unfamiliar, or uninterested, in representing the crew, propulsion, tillers, or other details often found on

³⁴⁰ Perrot and Chipiez 1890, 82, footnote 1.

³⁴¹ Godfrey 1945, 517.

³⁴² Webster 1996, 133.

³⁴³ Godfrey 1945, 589.

³⁴⁴ King 1975, 12.

³⁴⁵ Cook 2001, 17.

ship iconography in cultures intimate with the sea.

Until we maintain a clearer understanding of the cultural affinities that inspired the manufacture of the Sardinian bronze boat models, whether they represent local riverine boats or aspects of foreign vessels that visited their shores, then the idiosyncrasies of ship construction which the models represent remain less useful to the overall record of the LBA and Iron Age maritime history. It is possible for the bronze boat models to yield details of possible ship construction or type of craft, but an updated typology is needed. For future research, I would suggest a thorough examination of all known Sardinian bronze boat models, involving a catalogue of measurements, photographs, and drawings to aid in determining any nautical construction details that could be missed in the current published data.

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APPENDIX

FIGURES

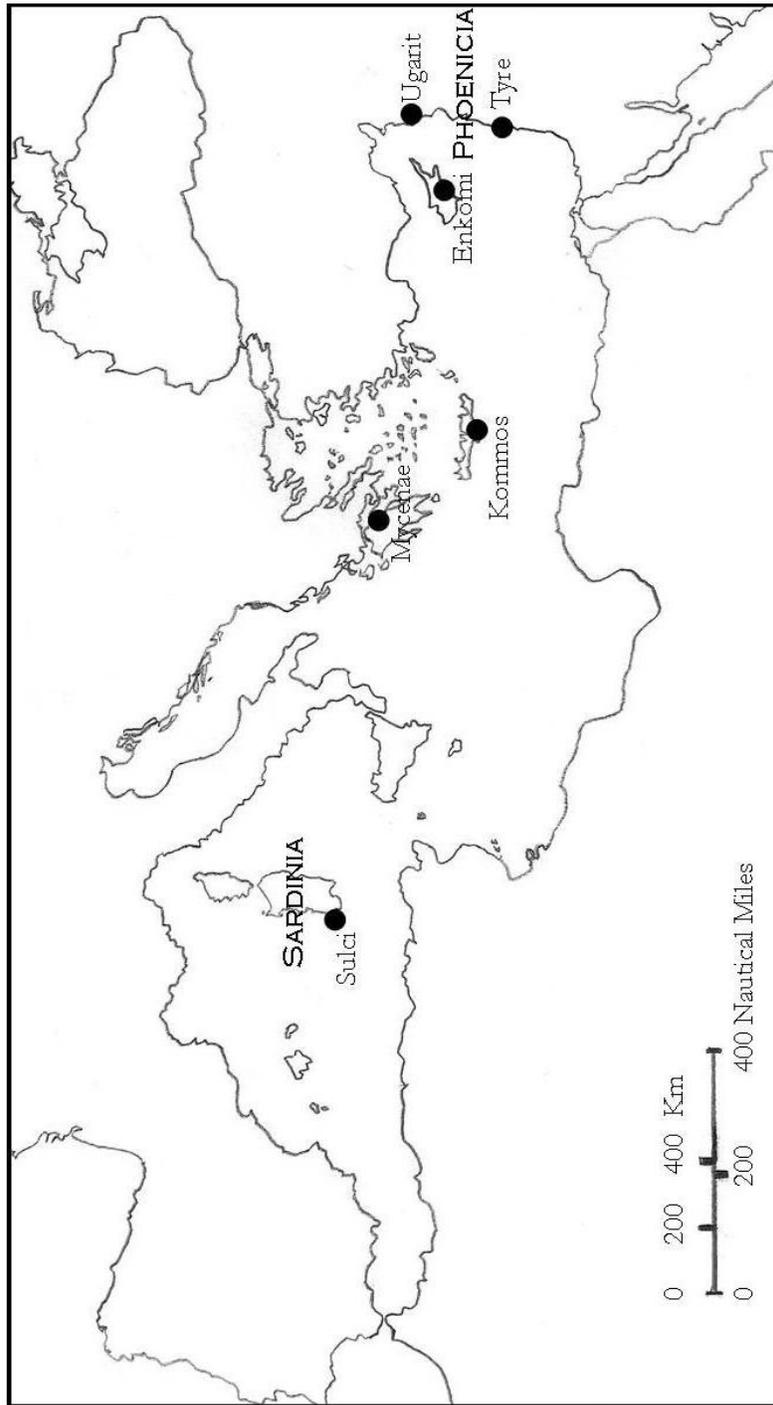


Figure 1 Sardinia in the Mediterranean (Map by Author).

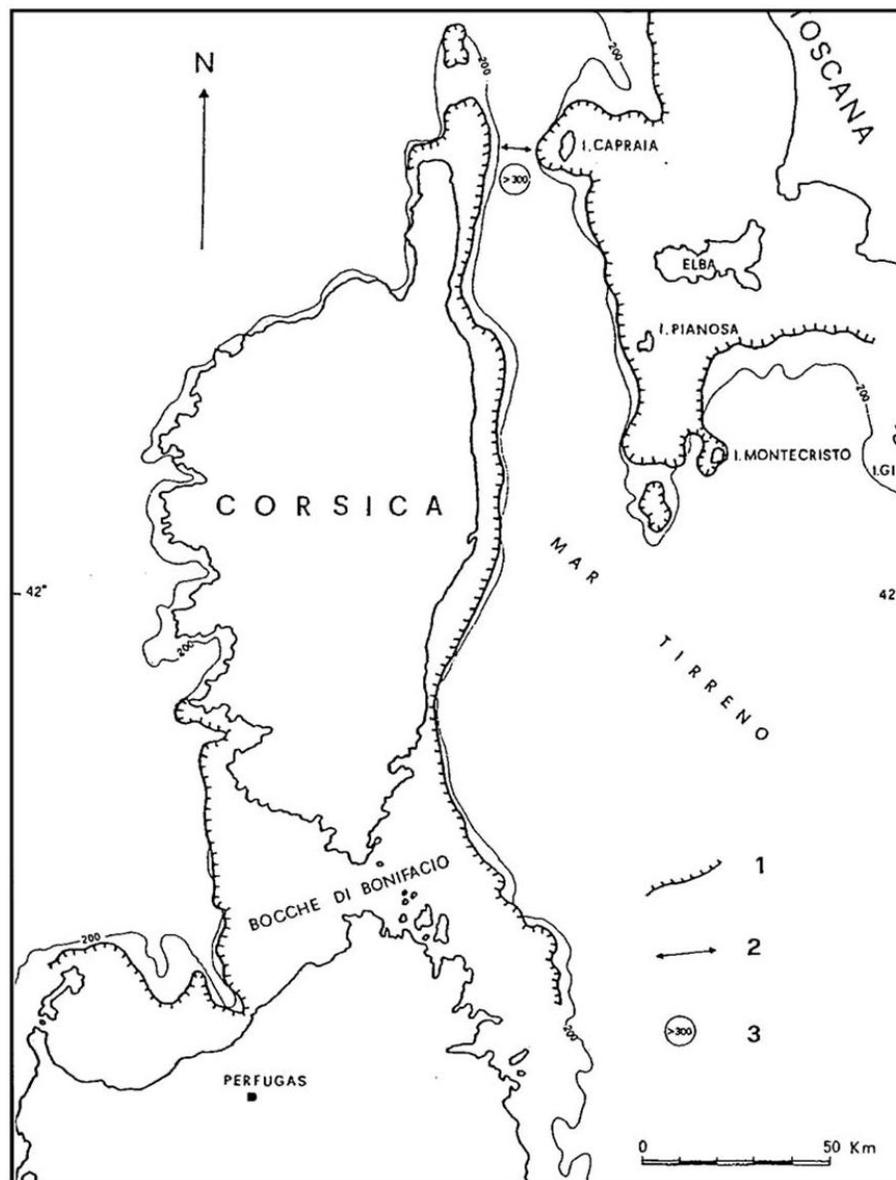


Figure 2 Tyrrhenian Paleogeography – sea level changes. Hatched line labeled '1' is projected coastline at glacial maximums. (After Martini 1992, 46, fig. 5).

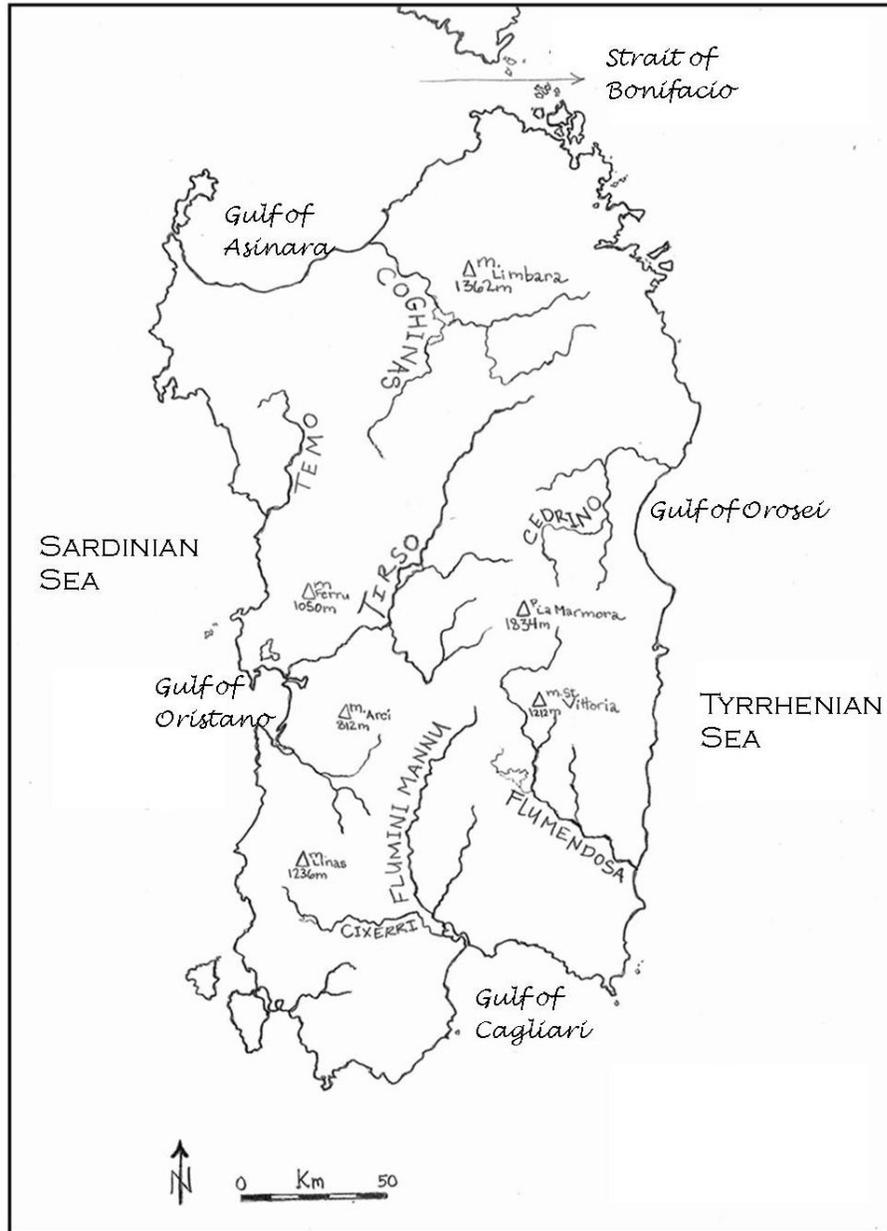


Figure 3 Principal Rivers, Gulfs, and Mountains of Sardinia. (Map by Author).



Figure 4 The Temo River at Bosa. (From Ardito 2003, 113).



Figure 5 Regions of Sardinia. (Map by Author).

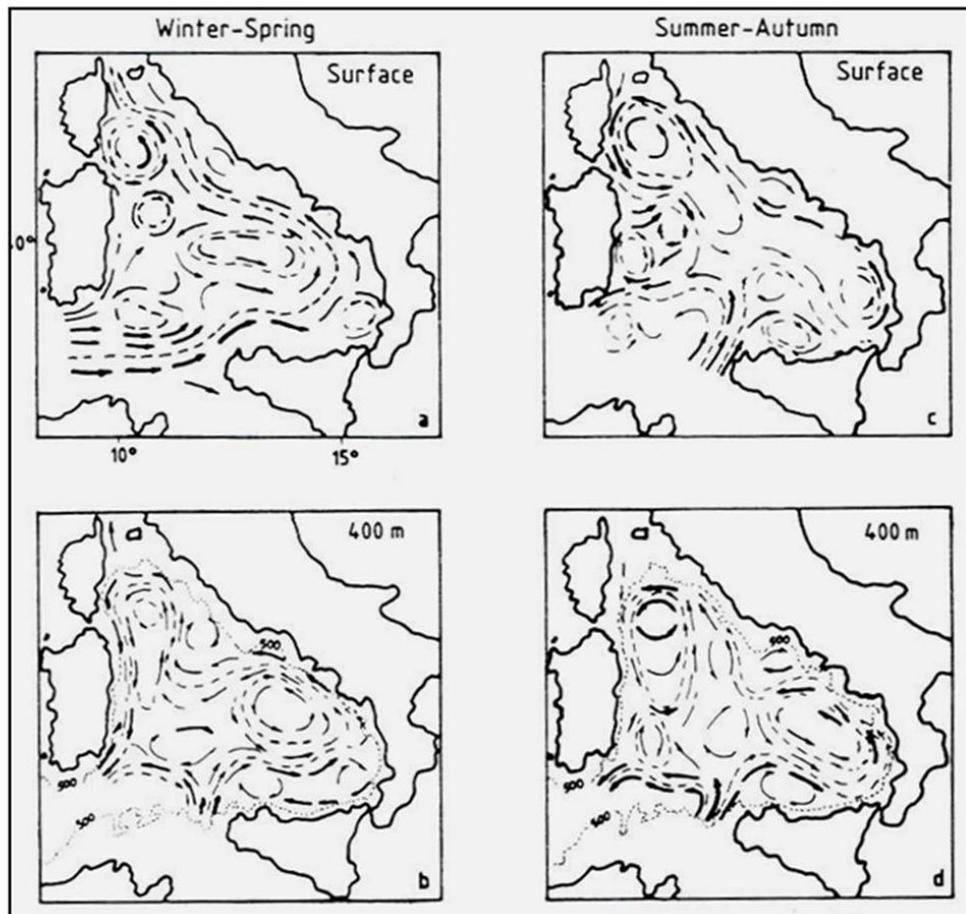


Figure 6 Tyrrhenian Sea Seasonal Currents. (From Astraldi and Gasperini 1994, 119, fig. 2)



Figure 7 Cala Luna, Gulf of Orosei and the Rugged Eastern Coast of Sardinia.
(Photo by Author).



Figure 8 Seasonal Waterway, Cala Luna, Gulf of Orosei (Photo by Author).

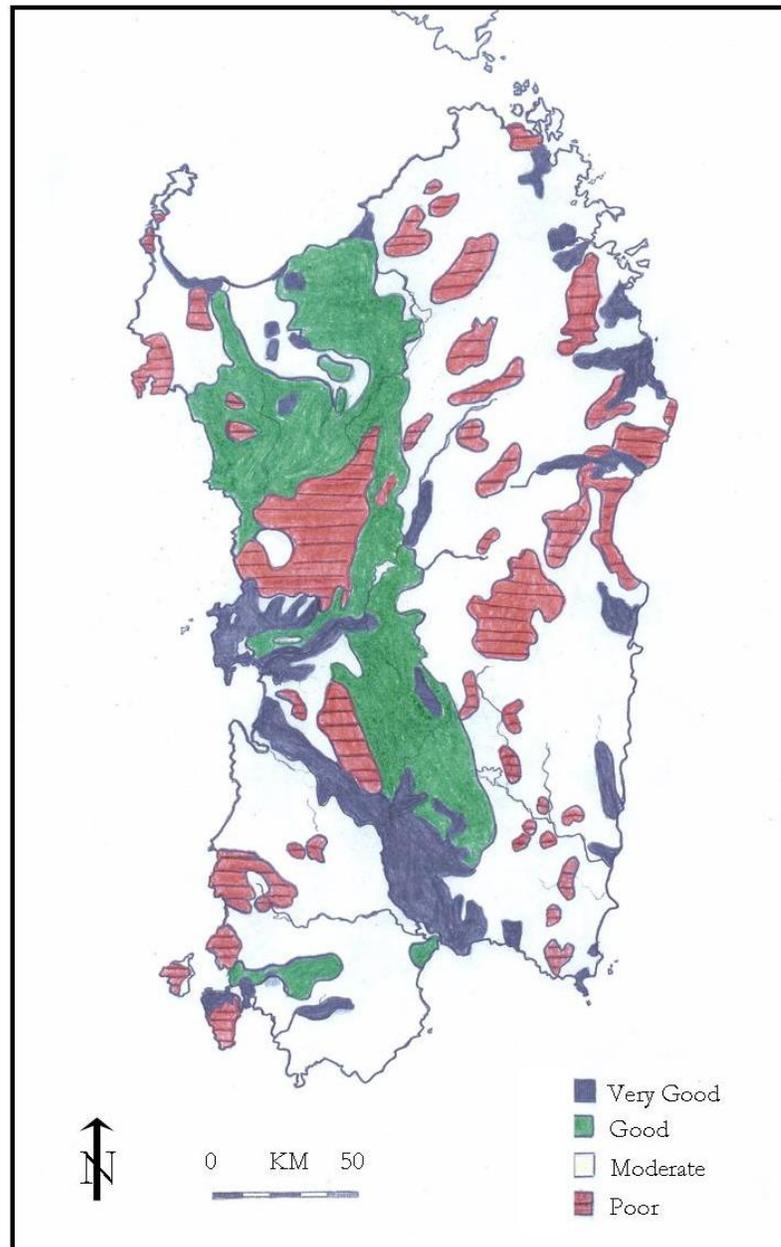


Figure 9 Soil Conditions on Sardinia. (After Webster and Teglund 1992, 452, fig. 3).

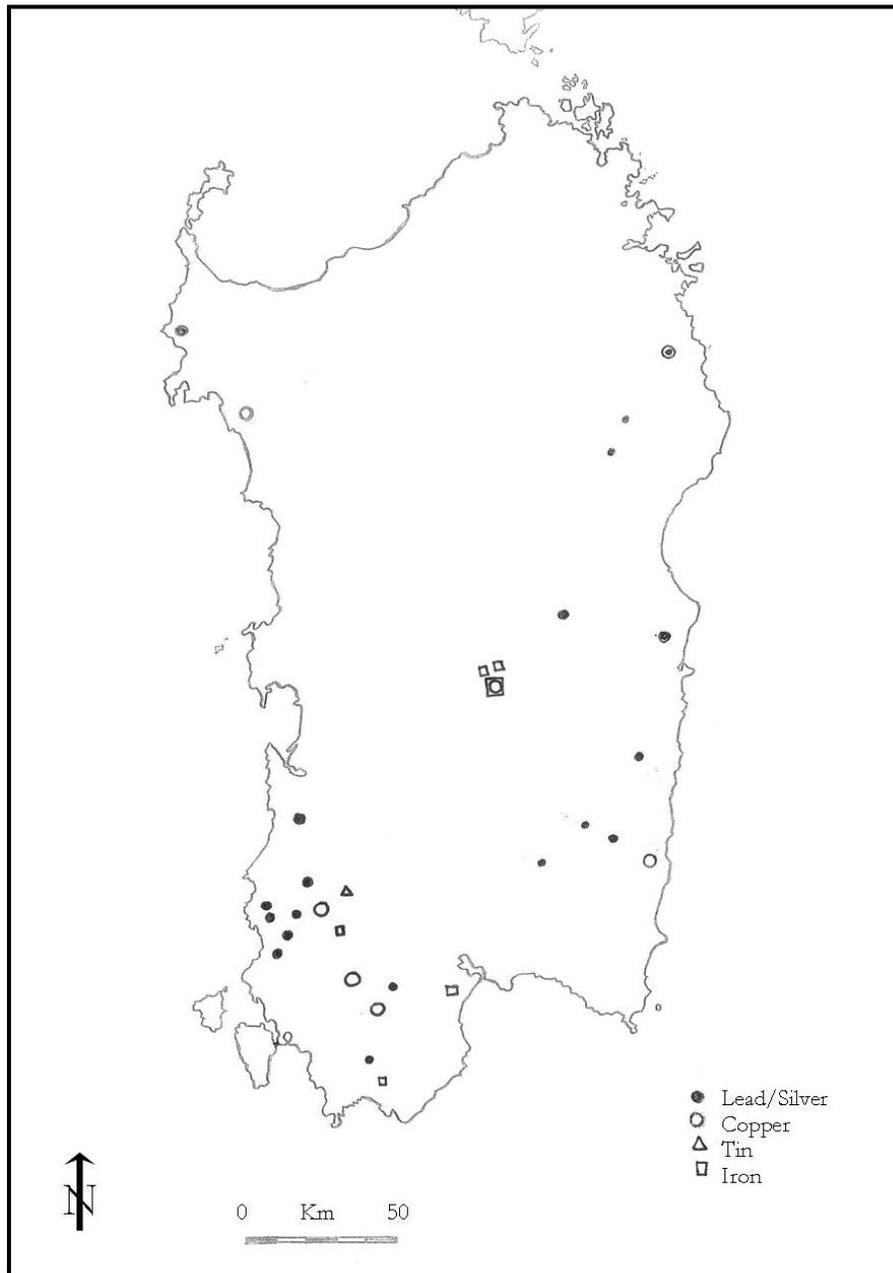


Figure 10. Sardinian Ore Deposits. (Map by M. Choltco) (Based on Gale and Stos Gale 1987, 151, fig. 7.12; Valera, Valera, and Rivoldini 2003, 129-32)

CHRONOLOGY

SARDINIA		(Lo Schiavo) C14/Dendro			CYPRUS	
(Webster)	Traditional	EBA/ Nuragic I Protonuragic MBA Nuragic II	EBA 1 EBA 2 MBA 1 MBA 2 MBA 3	EBA 1 EBA 2 MBA 1 MBA 2 MBA 3	LH I LH II LH IIA LH IIIB LH IIIC	LC I 1650 B.C. LC II 1450 B.C. LC III 1200 B.C.
2300 B.C.	Bonnarato A Corona Moltano	1800 B.C.	2300 B.C.			
1800 B.C.	Bonnarato B S. Iroxi Sa Turricula	1700 B.C. 1600 B.C. 1500 B.C.	2000 B.C. 1700 B.C. 1600 B.C.			
		1400 B.C.	1500 B.C.			
		1300 B.C.	1365 B.C.			
1300 B.C.	LBA Nuragic III	LBA I/ Recente LBA 2/ Finale "A Pettine" Impressed Ware "Grey Ware"	RBA FBA 1	MYCENAEAN/ LATE HELLADIC		
		1100 B.C.	1150 B.C.			
		1000 B.C.	1080 B.C.			
900 B.C.	Iron Age Nuragic IV	Nuragic FBA 3 Geometric IA I/ Geometric IA 2/ Orientalizing Nuragic EIA	FBA 3 900 B.C. 850 B.C.	SUBMYCENAEAN		1050 B.C.

Figure 11. Relevant cultural and chronological sequences. (After Harper and Fox 2008, 10; Lo Schiavo 2001, 132, Fig.4; Webster 1996, 14, Table 1)



Figure 12 Principal Sites in Chapter III. (Drawing by Author).

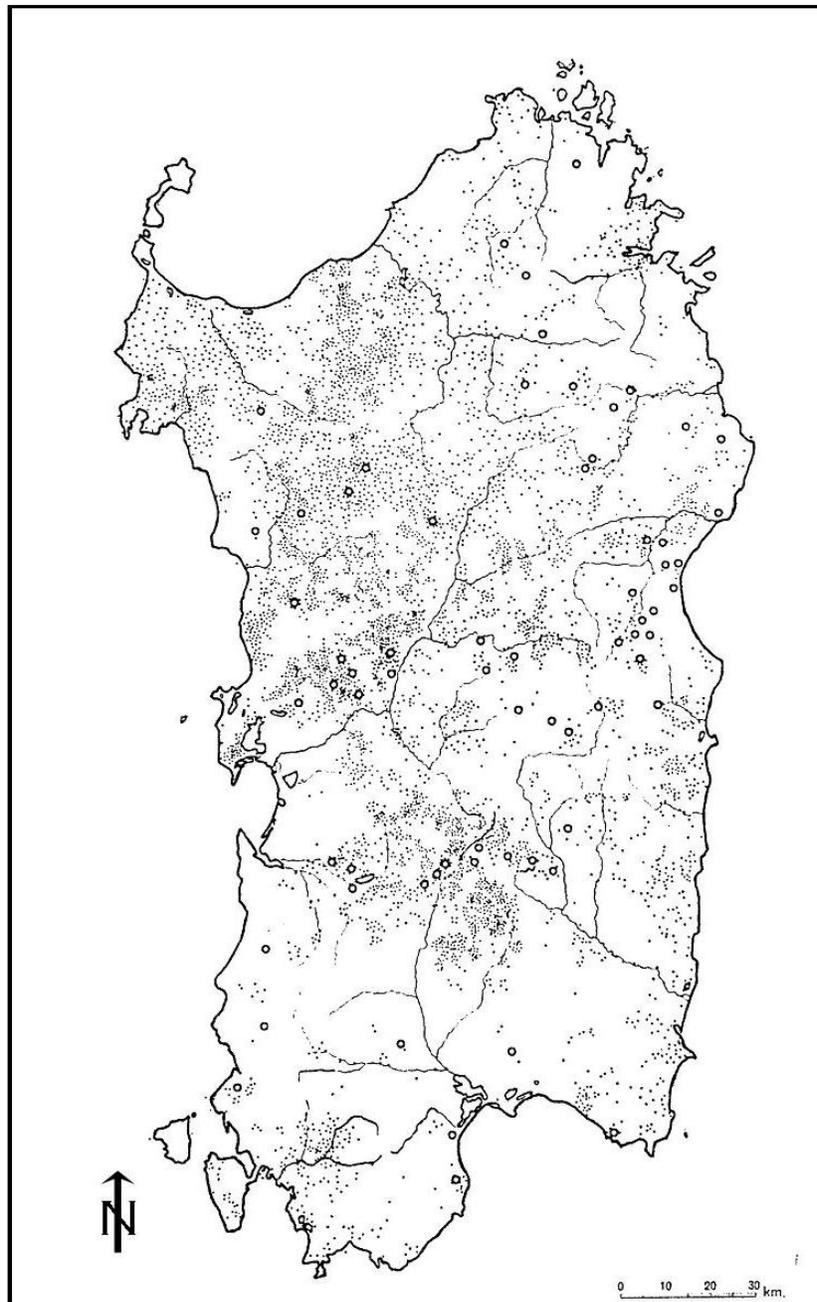


Figure 13 Nuragic Settlement Distribution. (From Webster and Teglund 1992, 450, fig. 2).



Figure 14. A Classic Nuraghe with single *tholos*, Nuraghe Succoronis.
(From Balmuth and Rowland 1984, overleaf)

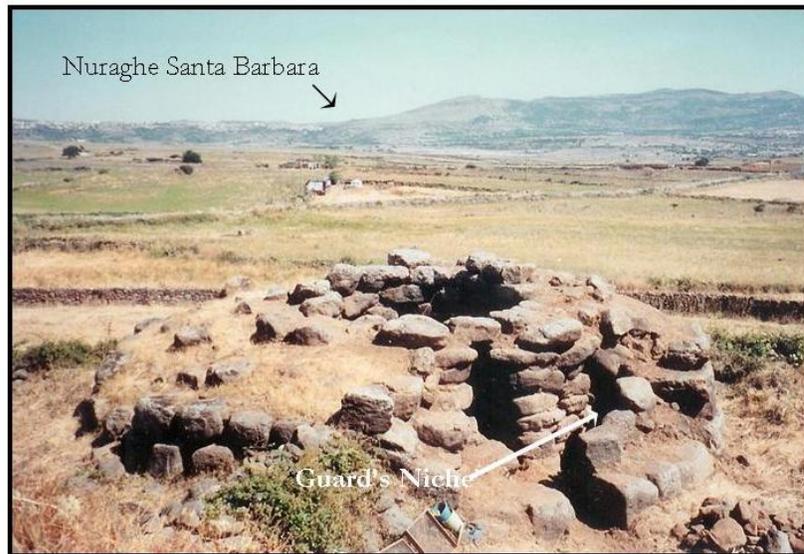


Figure 15 Tower B at Duos Nuraghes, Borore. (Photo by Author).

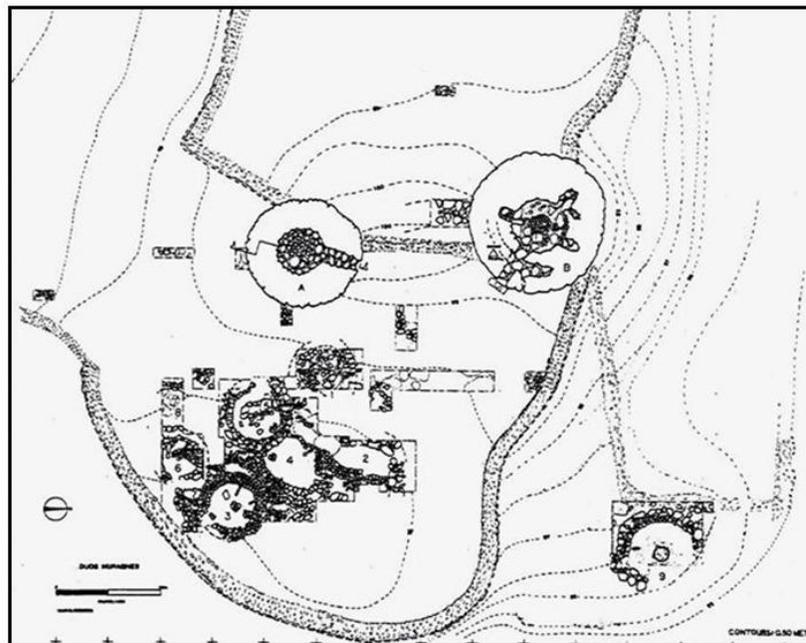


Figure 16 Duos Nuraghes Site Plan. (From Webster 2001, 7, fig. 1.5)

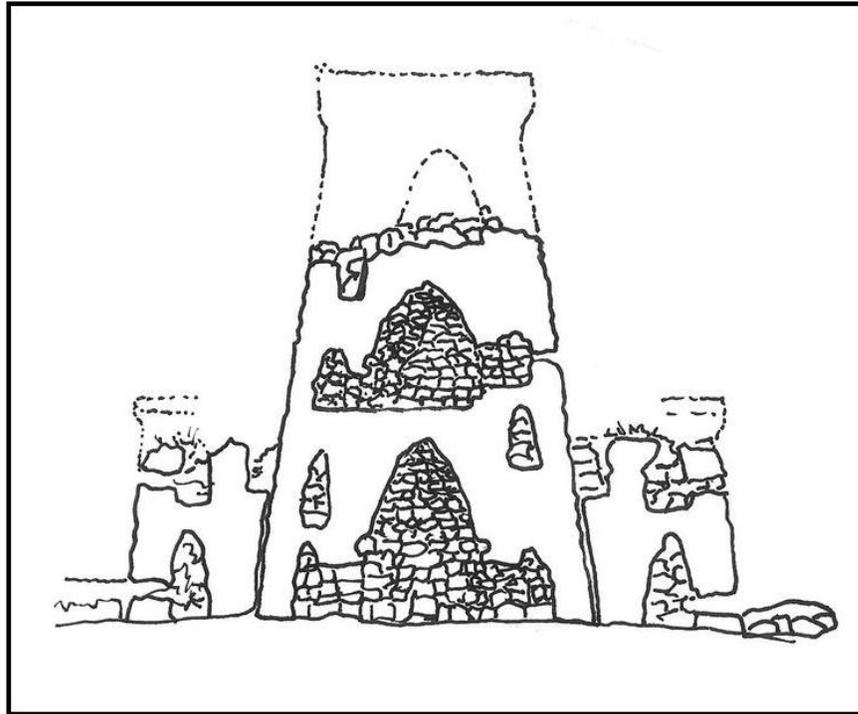


Figure 17 Section Drawing of Nuraghe Santu Antine, Torralba. (Drawing by Author after Mingazzini1947).

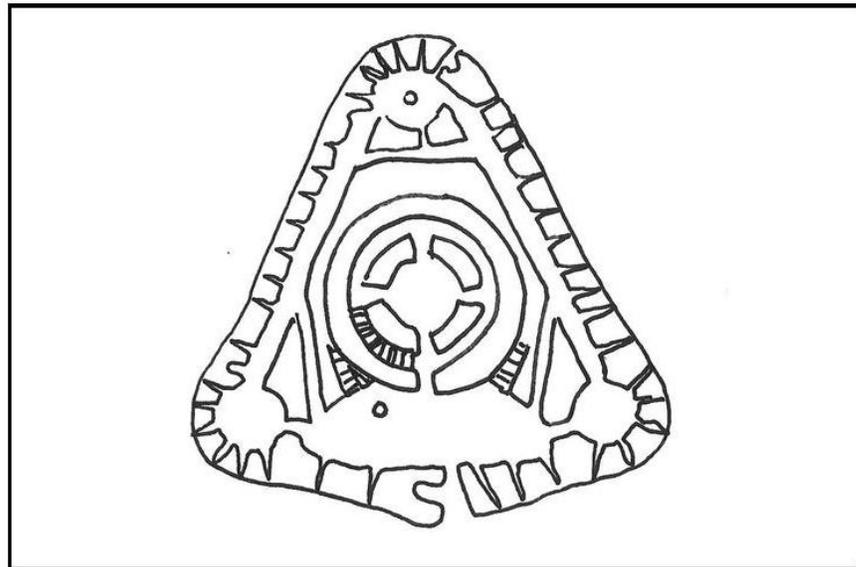


Figure 18 Plan of Nuraghe Santu Antine, Torralba. (Drawing by Author after Mingazzini1947).

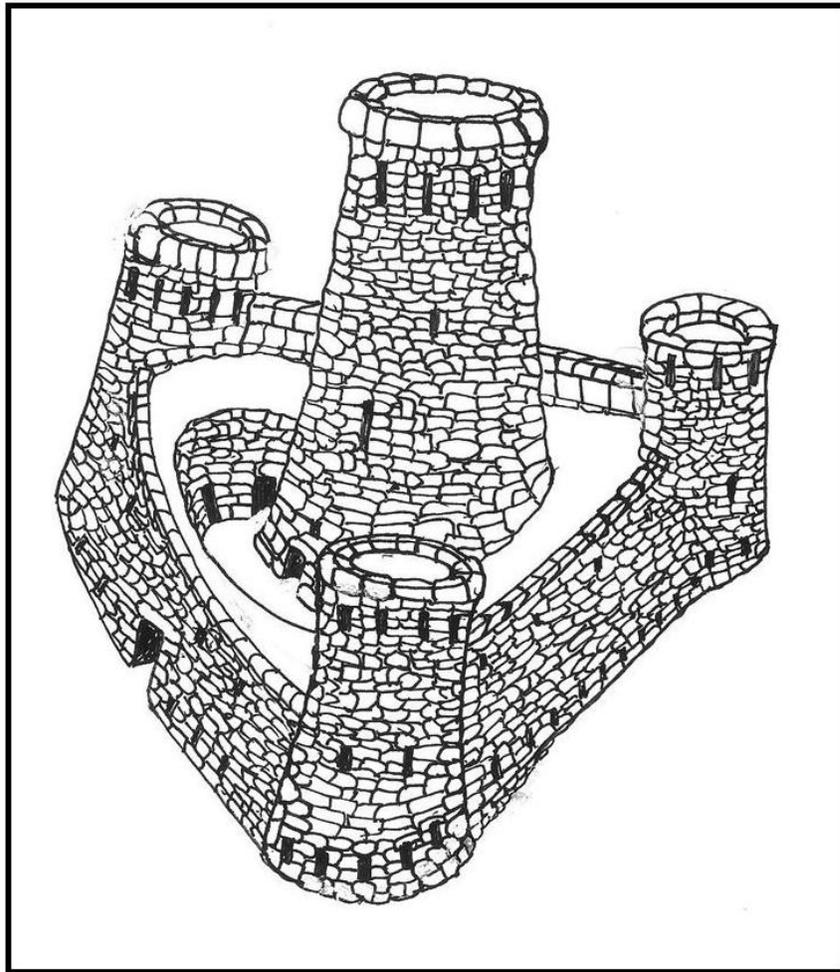


Figure 19 Reconstruction of Nuraghe Santu Antine, a Class II Nuraghe (Drawing by Author, based on reconstructions by Mingazzini 1947 and Contu 1974, Nuraghe Santu Antine site plan and aspects of model nuraghi, see figure 20).

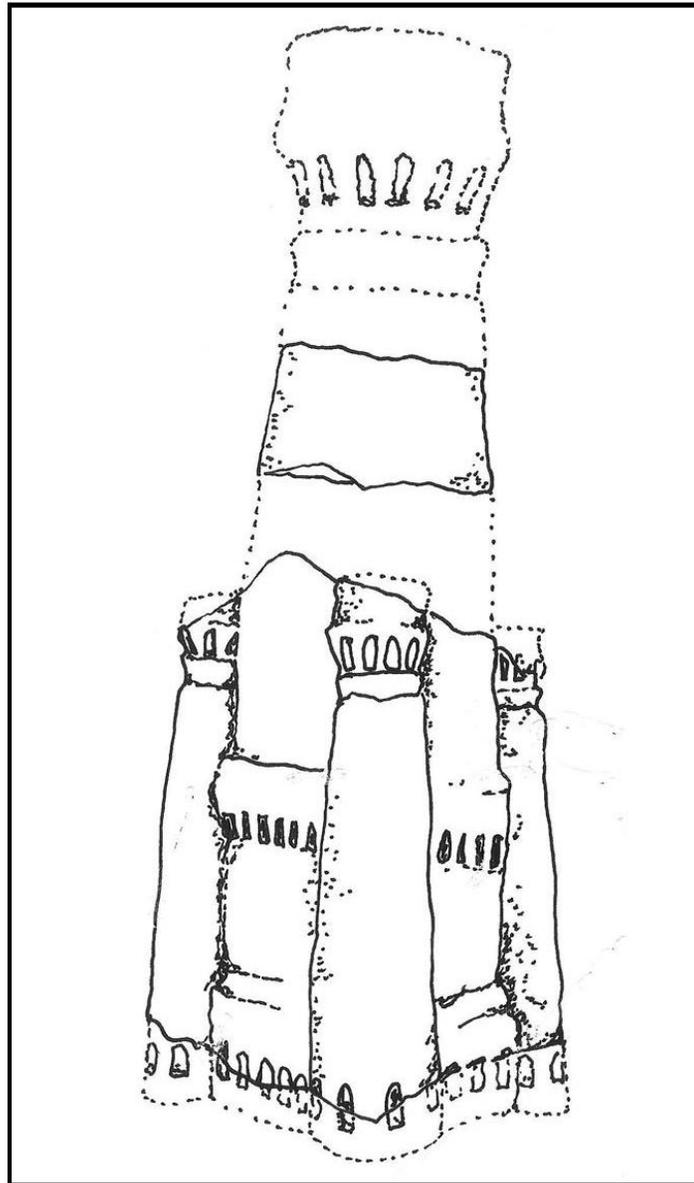


Figure 20 Stone model nuraghe found at San Sperate, Oristano.
(Drawing by Author after Holloway 2001, 4, fig. 3).

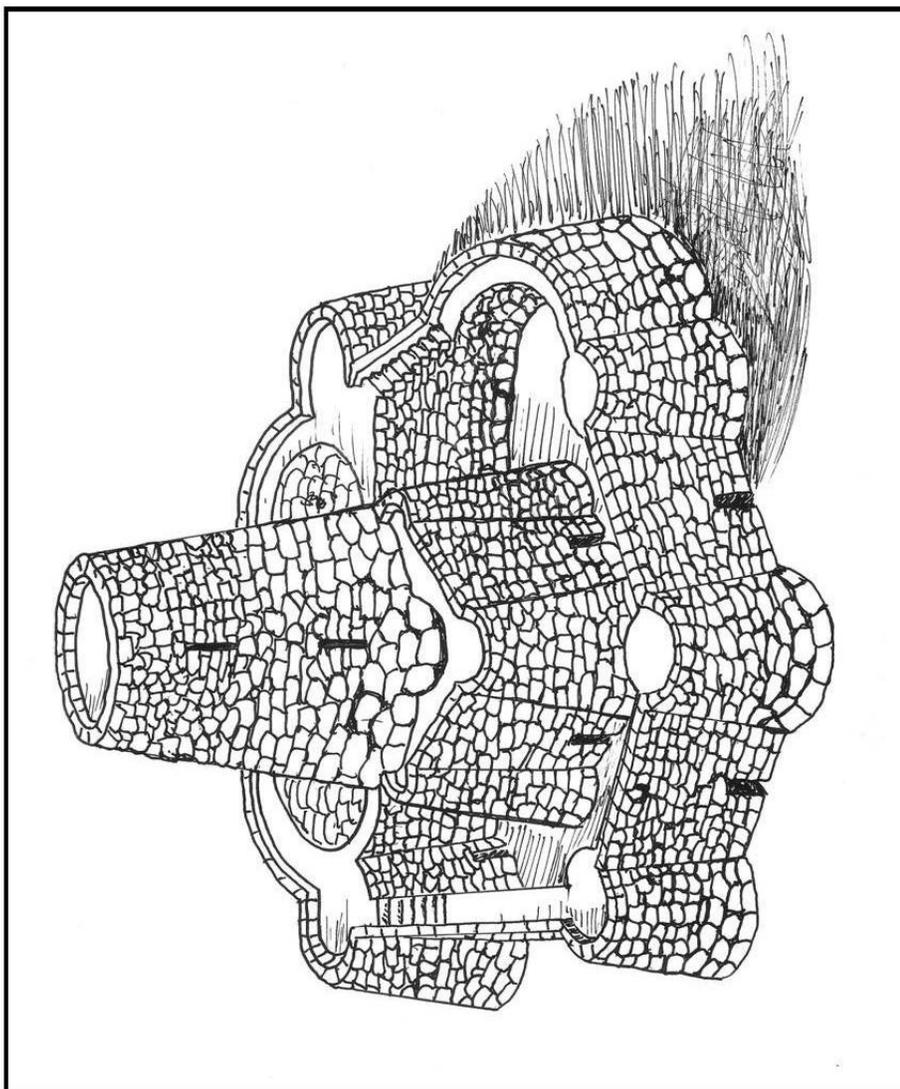


Figure 21 Reconstruction of a Class III Nuragic Settlement. Nuraghe Sa Domu 'e S' Orku, Domusnovas (Ortu nuragh in Perot and Chipiez 1890). (Drawing by Author after Perot and Chipiez 1890, 34, fig. 28).

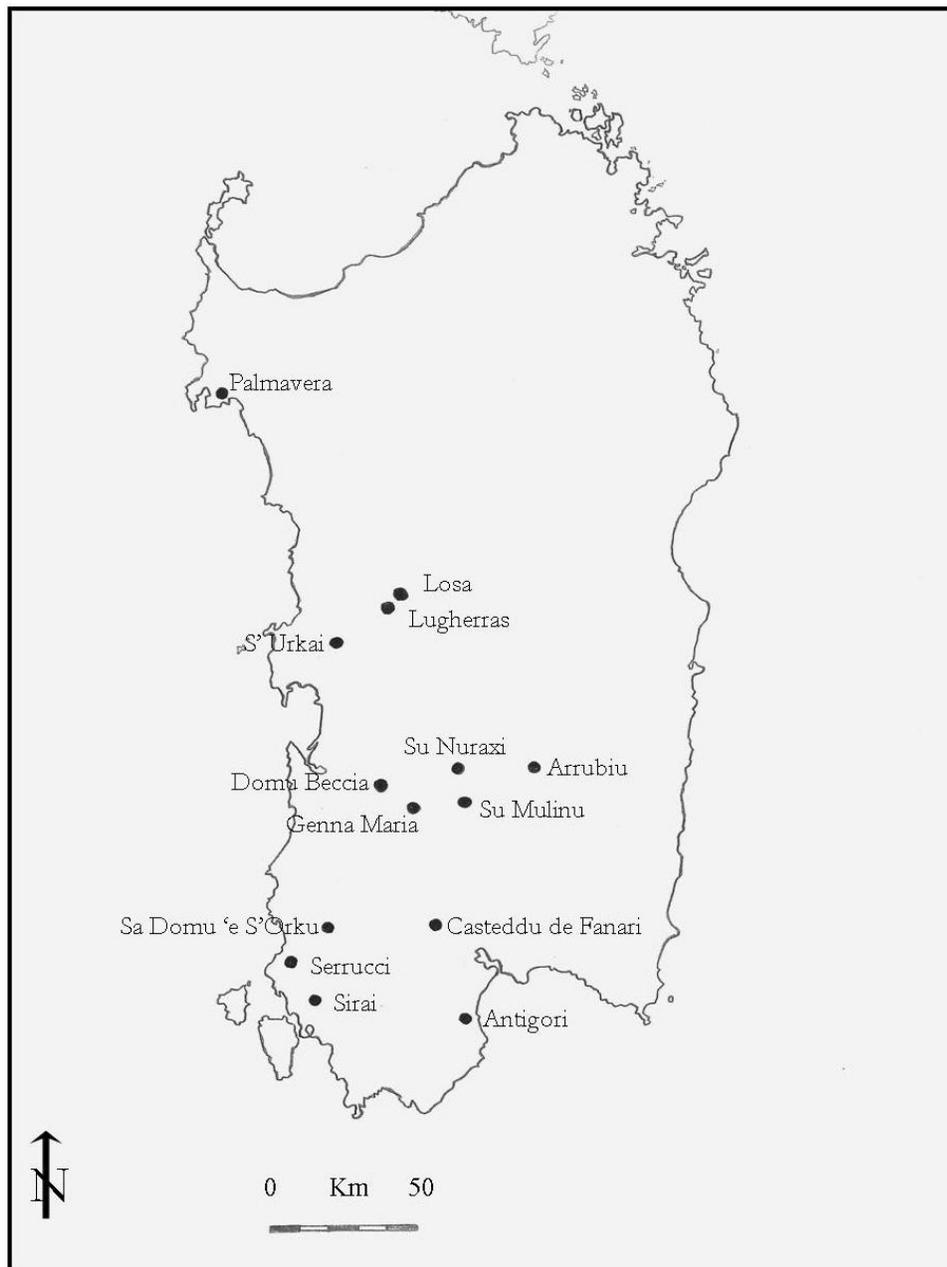


Figure 22 Class III Nuragic Settlements. (Map by Author).



Figure 23 Site Plan for Su Nuraxi, Barumini. (After Contu 1981, 88, tav. 7).

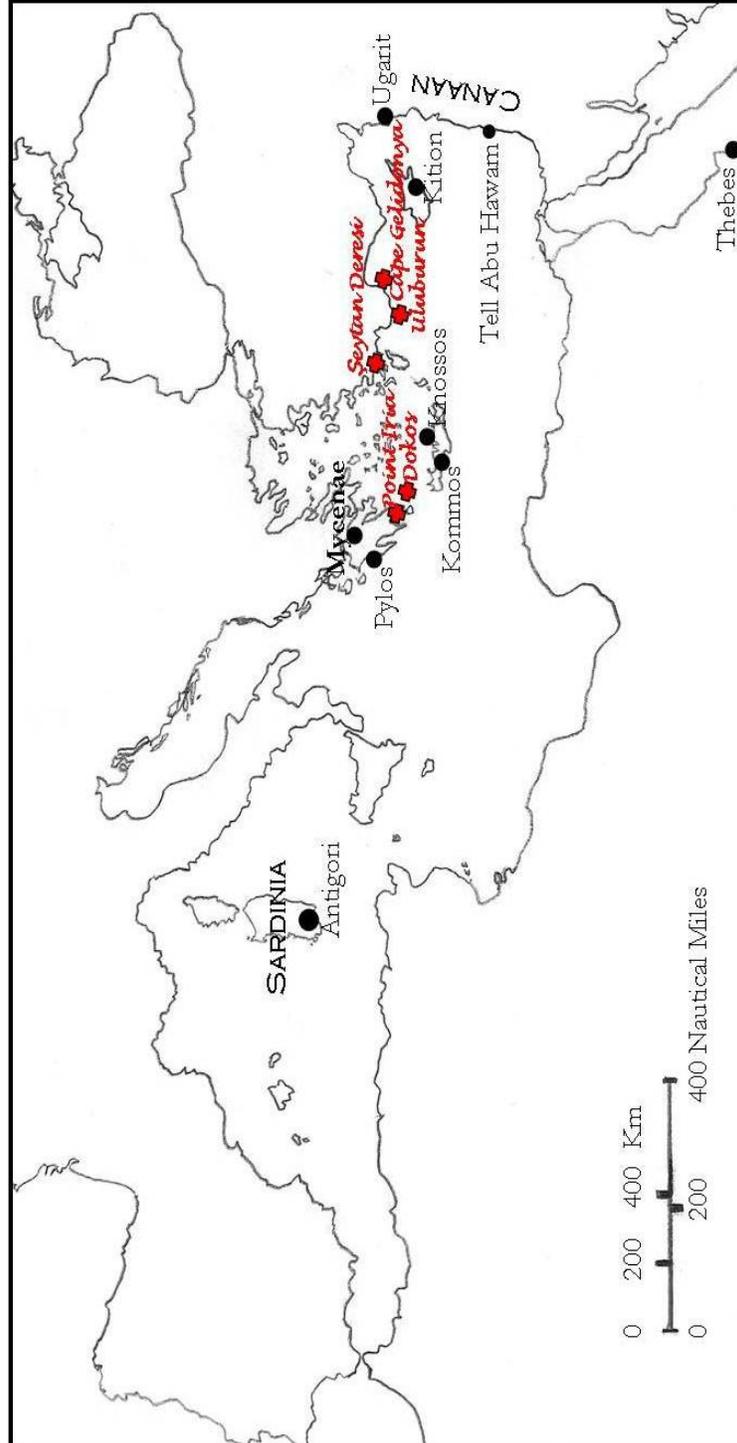


Figure 24 Relevant Sites for Chapter IV. (Map by Author).

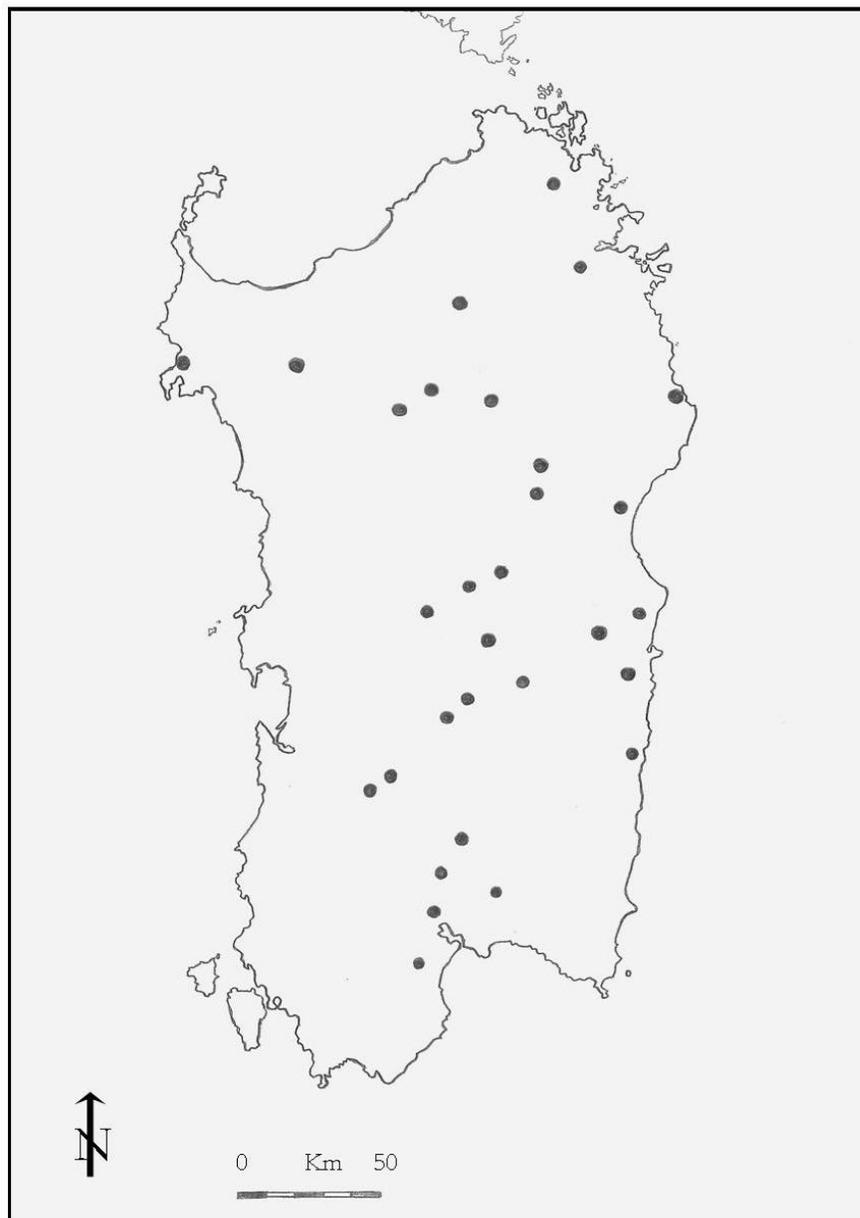


Figure 25 Widespread Distribution of Copper Oxhide Ingots.
(Map by Author. After Lo Schiavo 1998, 99, fig. 1).



Figure 26. Three of the five copper oxide ingots from Serra Ilixi (located northeast of Su Nuraxi). (From LoSchiavo 1981, 279, figs. 278-80)

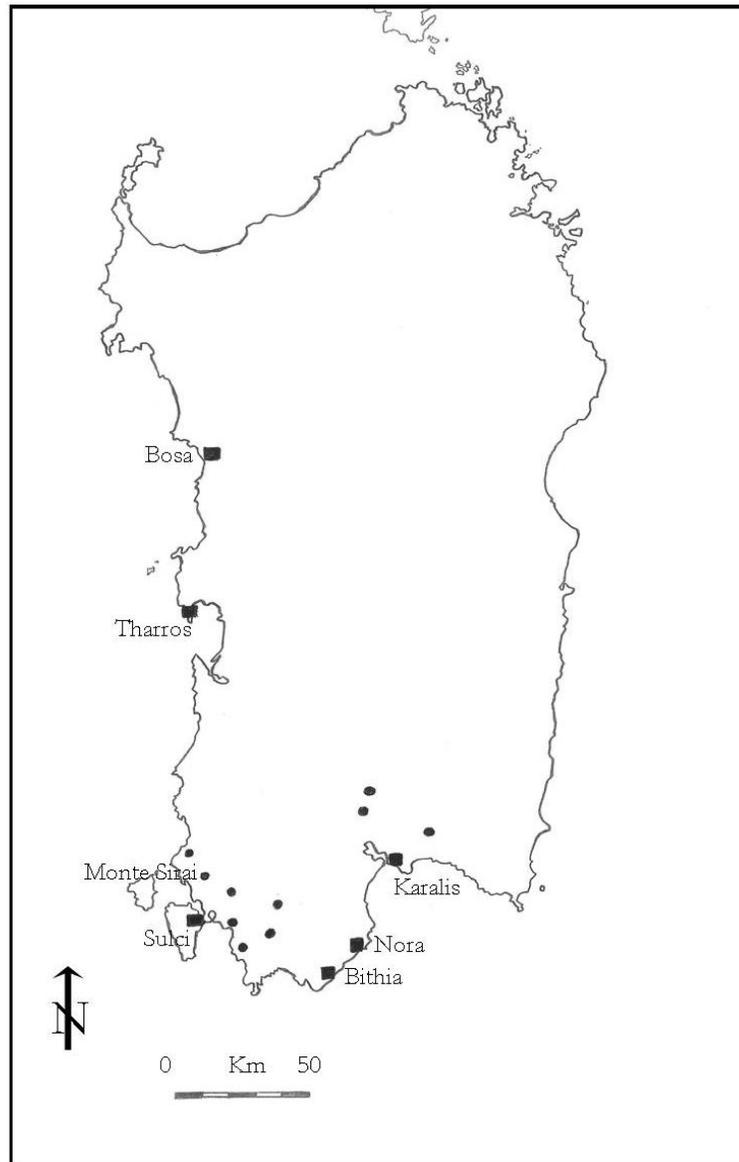


Figure 27 Phoenician Settlements on Sardinia. Earliest established are represented by squares, later colonies are circles.
(Map by Author. After Barreca 1986, 144, fig. 11.1).

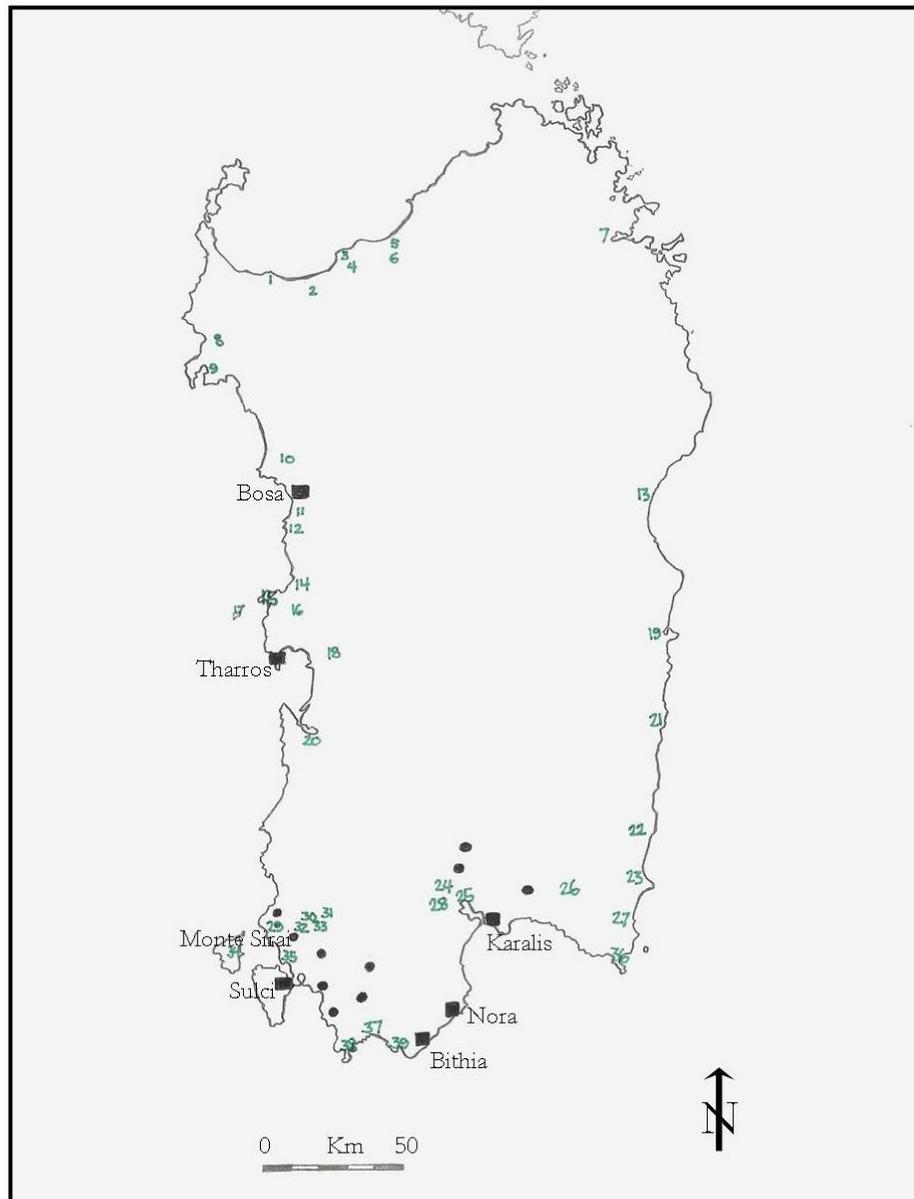


Figure 28 Phoenician Settlements on Sardinia. Earliest established are represented by squares, later colonies are circles, and sites of *probable* Phoenician origin are numbered in green. (Map by Author. After Barreca 1986, 144, fig. 11.1).

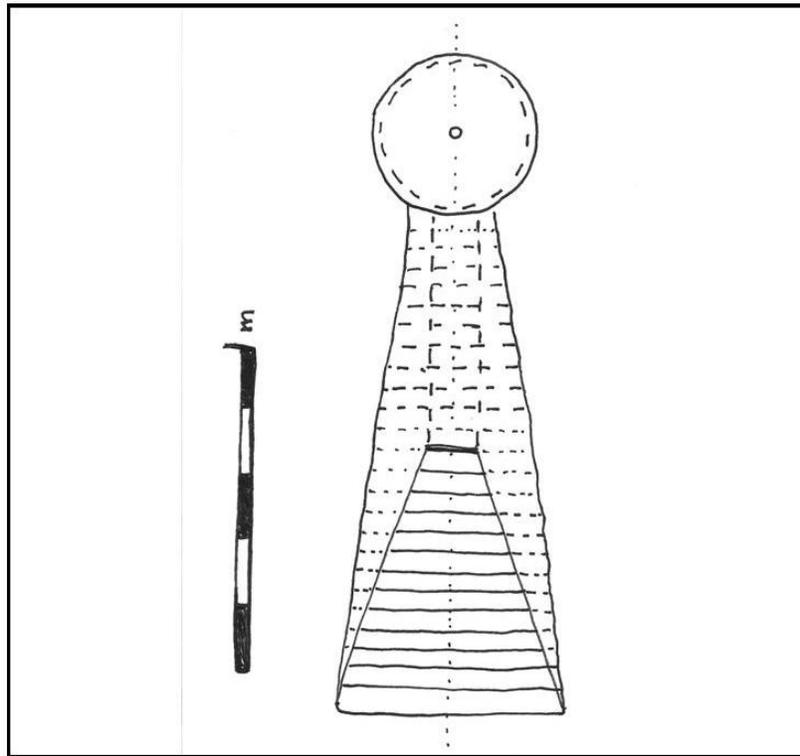


Figure 29 Plan of the sacred well of Santa Cristina, Paulilatino.
(Drawing by Author.; After Frizell 1992, 267, fig. 7).

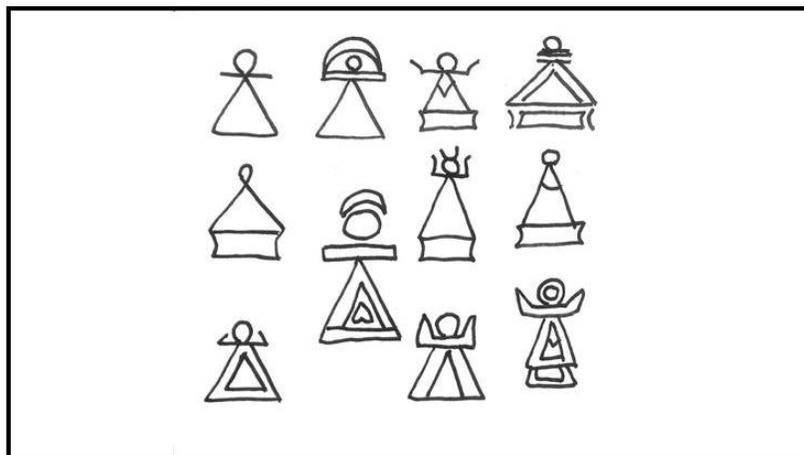


Figure 30 Symbols of Phoenician goddess Tanit (After Frizell 1992, 267, fig. 7).

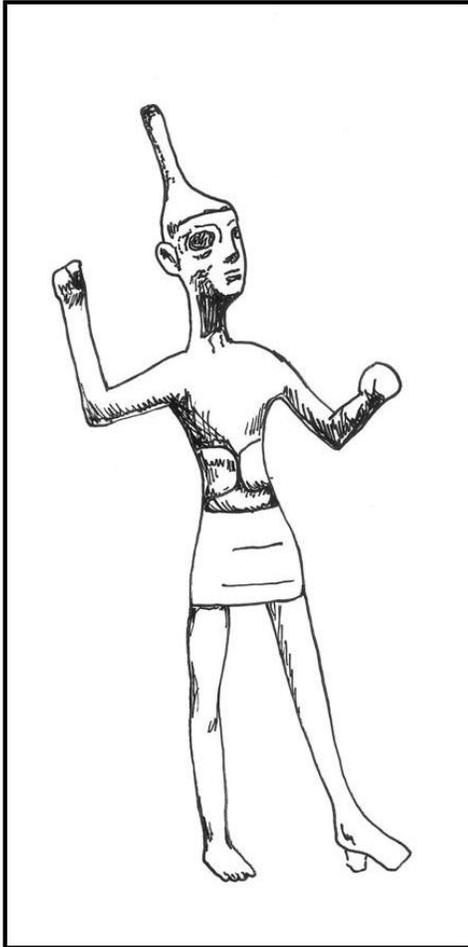


Figure 31 Syro-Canaanite Smiting god from 17th or 18th century B.C. Found at Tortosa. (Drawing by Author; After Aquaro 1999, 482).

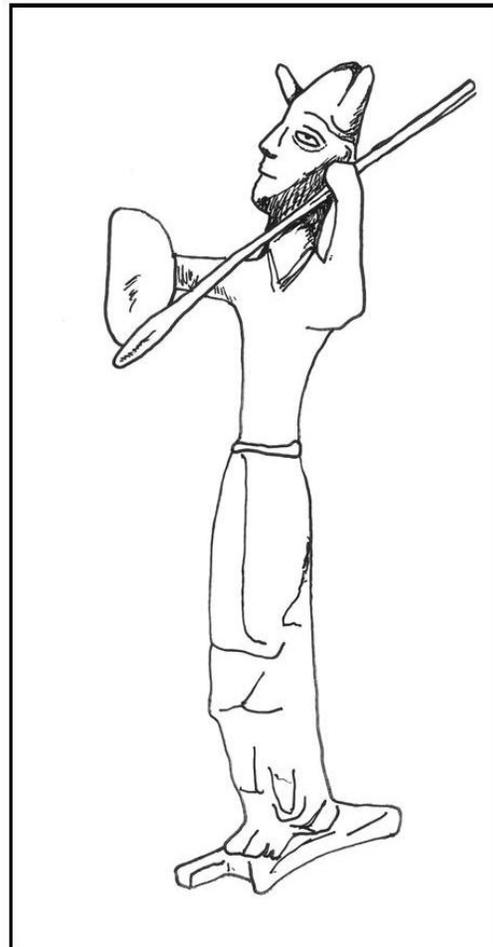


Figure 32 Smiting 'ingot god', from Enkomi, Cyprus (12 th century B.C.) (Drawing by Author; Ater Bass 1987, 701).

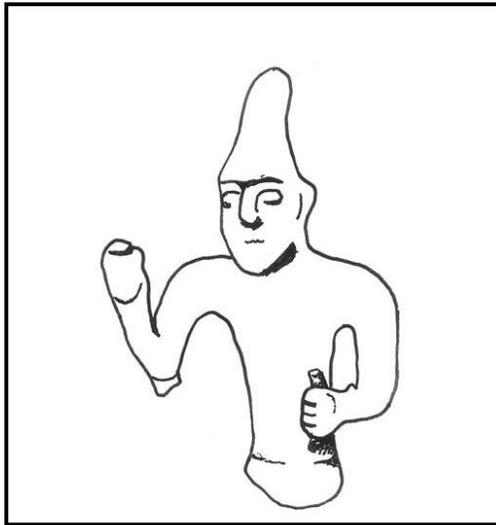


Figure 33 Phoenician bronze statuette found at Nuraghe Flumenelongu and dated to the 11th century B.C. (Drawing by Author; After Barreca, 1986c, 17, fig. 2).



Figure 34 Phoenician bronze model of a 'seated goddess' found at the sacred well of Santa Cristina, Paulilatino, dated to the 11th century B.C. (Drawing by Author; After Barreca 1986a, 18, fig. 3).

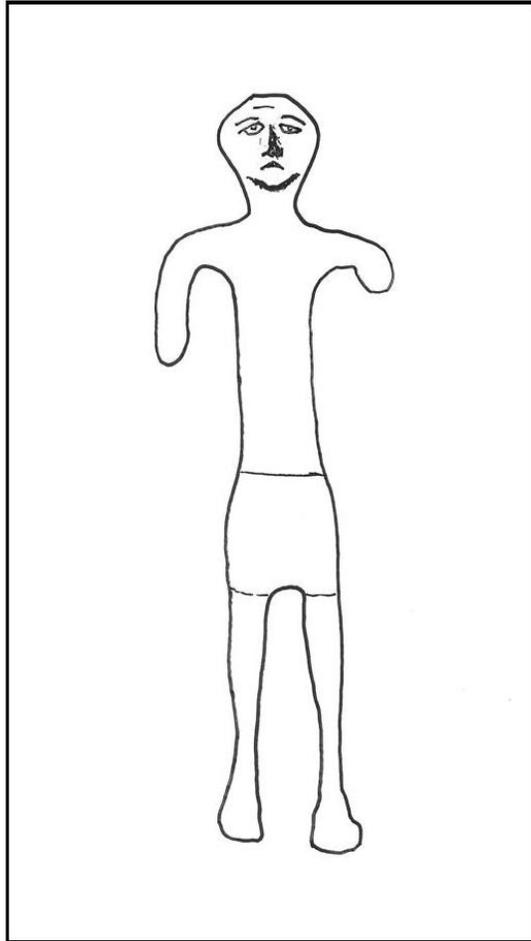


Figure 35 Phoenician bronze model from the sacred well at Santa Cristina, Paulitativo, dated to the 9th century B.C. (Drawing by Author; After Barreca 1985, 316, fig. c).



Figure 36 Nuragic bronzetti of 'Barbarico-Mediterraneizzante' style attributed to the 8th century B.C. found at the sacred well of Camposanto in Olmedo. (Drawing by Author; After Lilliu 1966, 287-9, n.175).

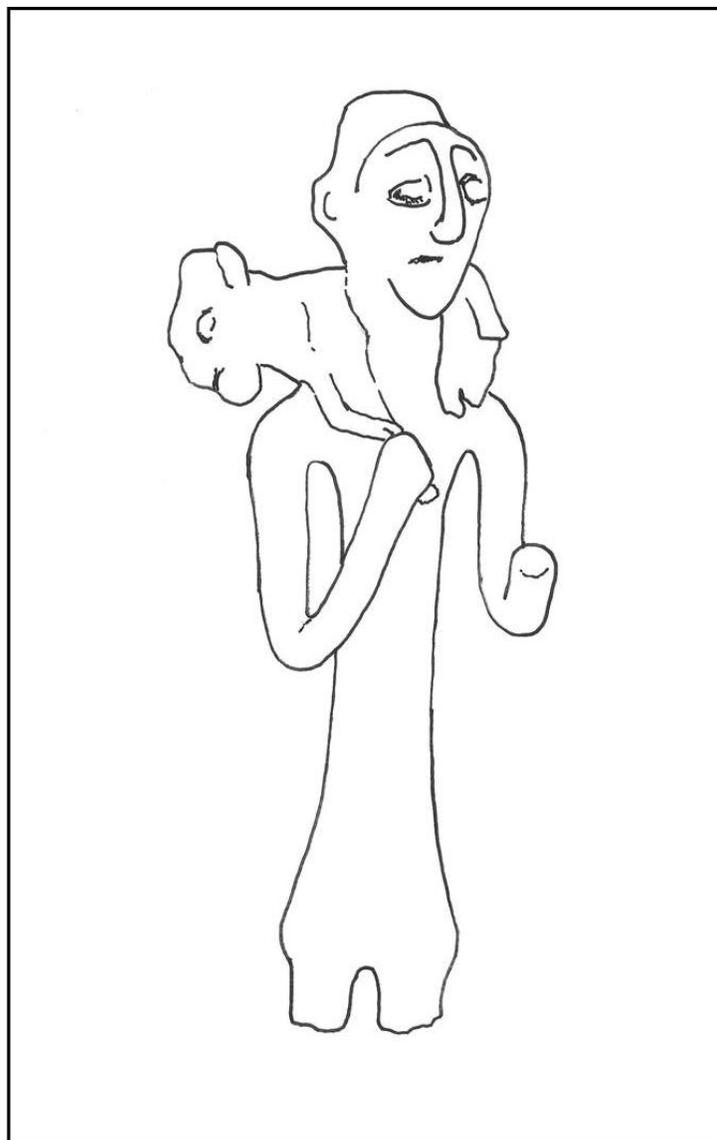


Figure 37 Nuragic *bronze* transitional style between 'Barbaricino-Mediterraneizzante' and 'geometric' found in the region of Ogliastra, provenience unknown. (Drawing by Author; After Lilliu 1966, 264-5, n. 153).

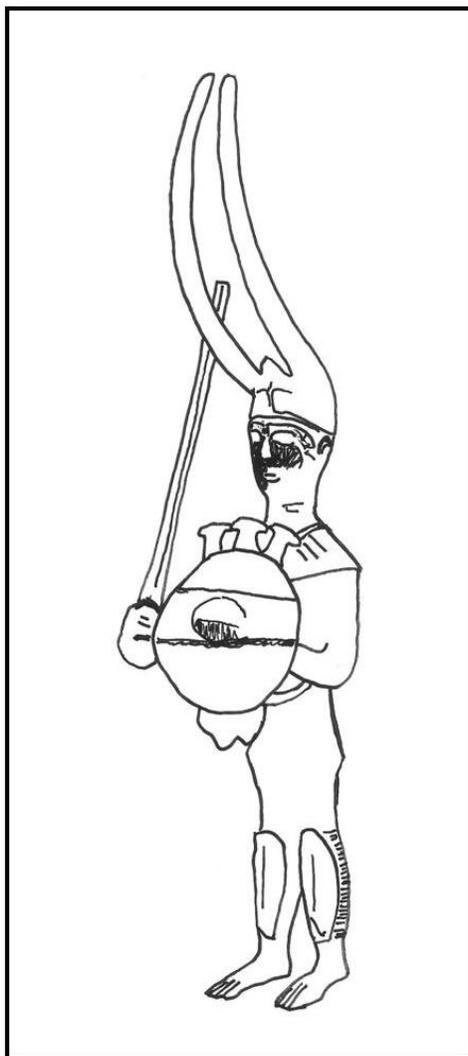


Figure 38 Nuragic Warrior bronzetti in 'geometric' style, from either Santu Teru or Bintergibas in the area of Senorbí. Attributed to the 8th century B.C. (Drawing by Author; After Anati 1984, pl.118).



Figure 39 Nuragic 'holy man' bronzetti in 'geometric' style, from sacred well at Santa Vittoria, date unknown. (Drawing by Author; After Lilliu 1981, 217, fig. 214).

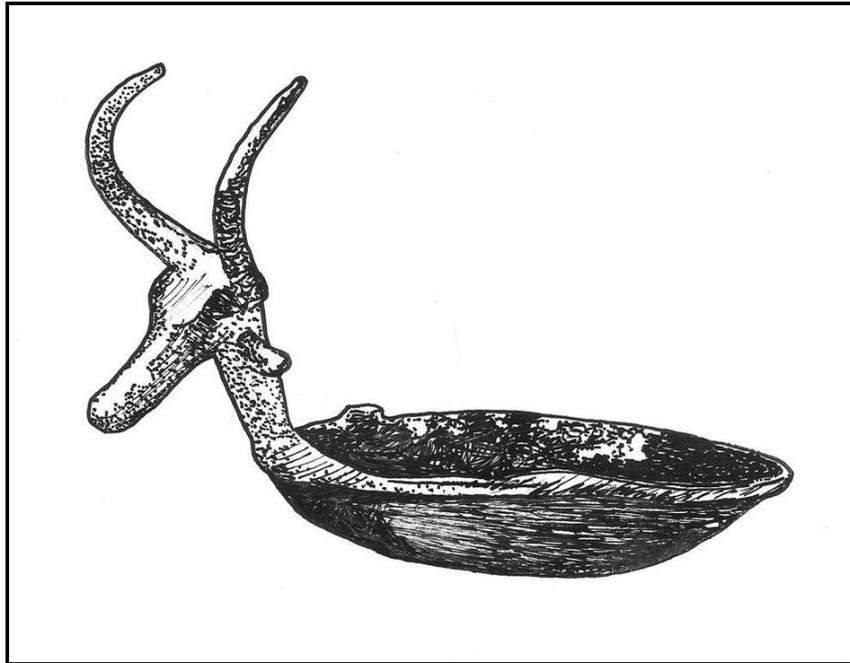


Figure 40 Sardinian bronze boat model with bovine figure head. 17.5 cm in length, 8.8 cm in height, and 5.7 in width. (Drawing by Author. After Lilliu, 1966, 389, n. 272).

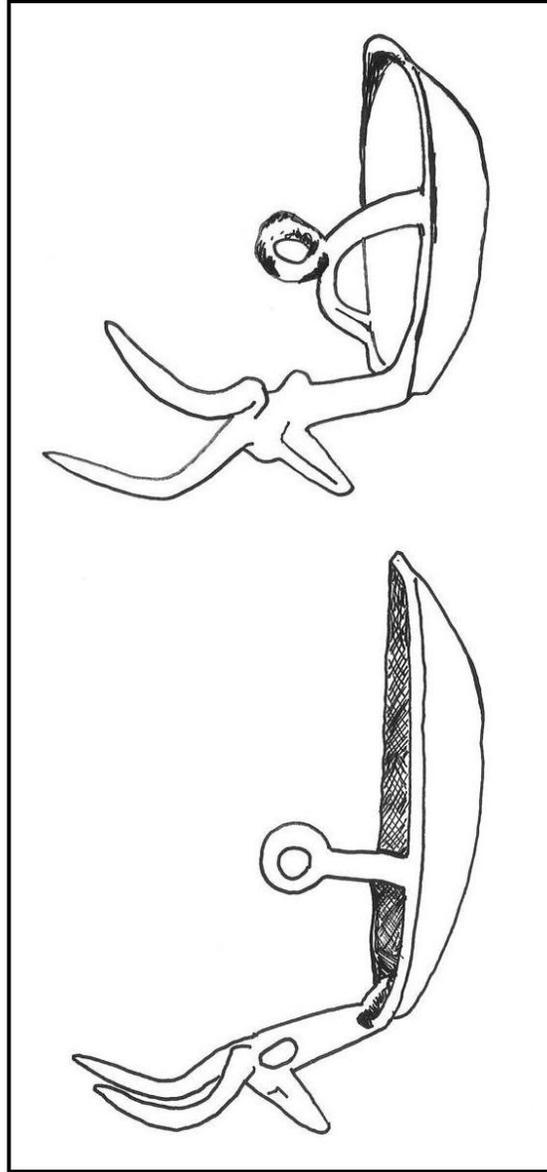


Figure 41 Sardinian bronze boat model with bovine figure head and intact suspension ring. 17.5 cm in length, 10.8 cm in height, and 6.7 in width. Found near Nuraghe Cuggiareddu, La Nurra region in the late 19th century. (Drawing by Author. After Lilliu, 1966, 388-9, n. 271).

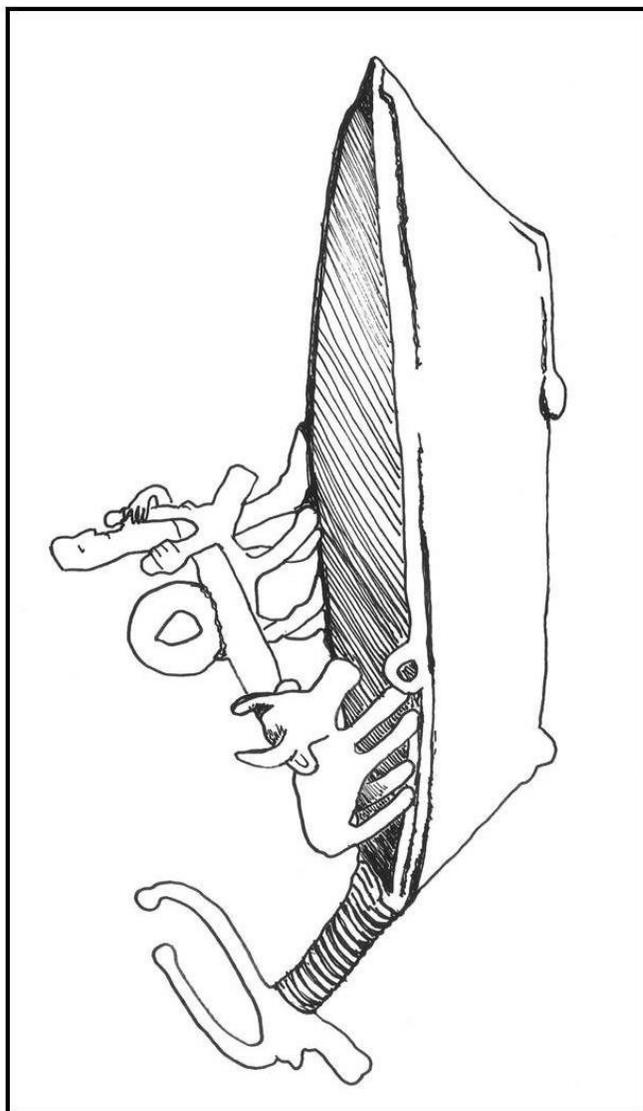


Figure 42 Sardinian bronze boat model with bovine figure head attached with cordage. Two steers are affixed to a yoke and man holds the horns of one of the animals. 25 cm in length, 9 cm in height. Found on Sardinia, exact provenience unknown. (Drawing by Author. After Lilliu, 1966, 401-3, n. 289).

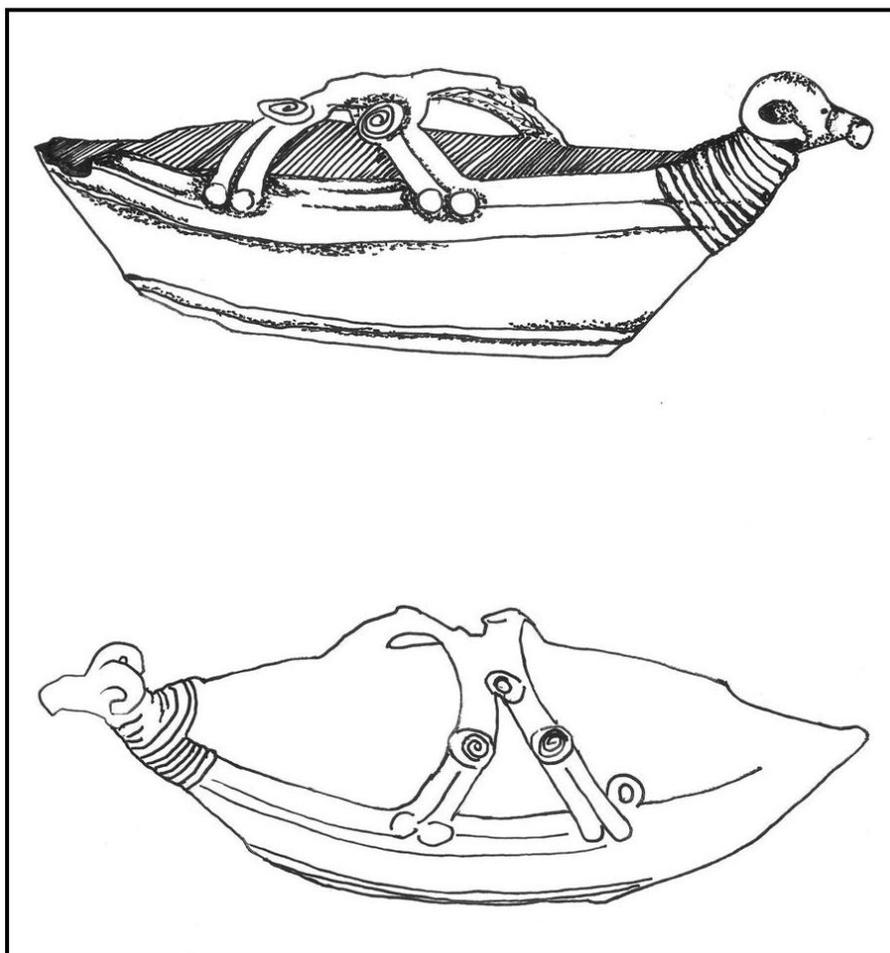


Figure 43 Sardinian bronze boat model with ram figure head attached with cordage. 16 cm in length, 5cm in height. Found in the late 19th century near the village of Tula in the northeast of Sardinia. Lilliu attributed this boat model to the geometric style and dated it therefore to the end of the 8th , beginning of the 7th centuries B.C. (Drawing by Author. After Lilliu, 1966, 423-4, n. 316; Lilliu 1981).

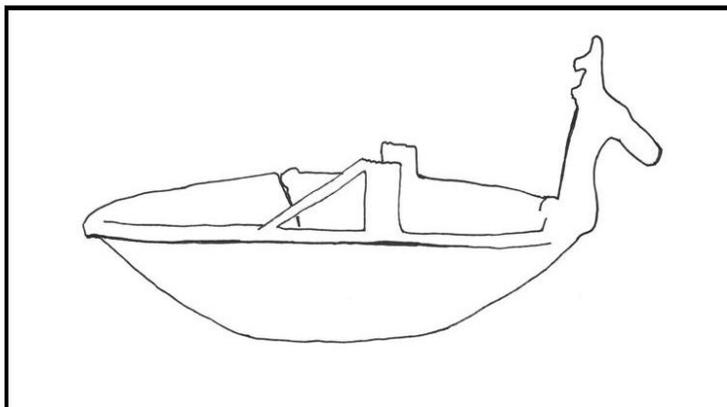


Figure 44 Sardinian bronze boat model with deer figure head and nearly vertical stem post. 28 cm in length. Located at Orulú, in the region of Orgòscolo. (Drawing by Author. After Lilliu, 1966, 424-5, n. 318).

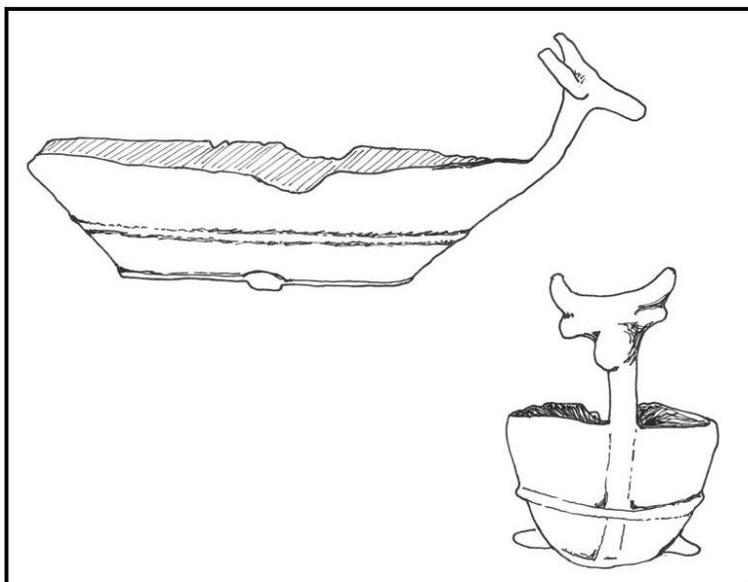


Figure 45 Sardinian bronze boat model with bovine figure head with a possible external stem post. 14 cm in length, 5.9 cm in height (without the figure head). Located in the region of Feronia di Posada. (Drawing by Author. After Lilliu, 1966, 394-5, n. 279).

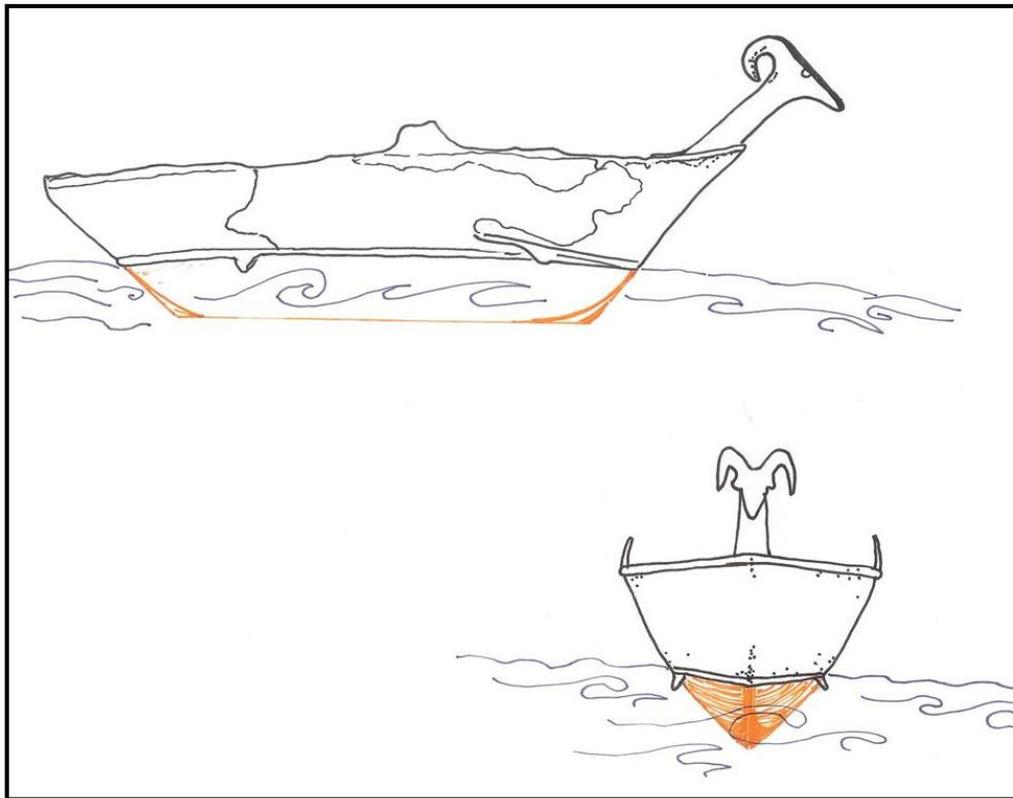


Figure 46 Sardinian bronze boat model with oblique ram figure head. Excavated at the fountain-shrine of Sa Sedda é Sos Carros in Oliena. Orange lines drawn to represent hull under the waterline (which may have been a feature unknowingly omitted by the Sardinian artisans. (Drawing by Author. After LoSchiavo 146-7, fig. 3.1).

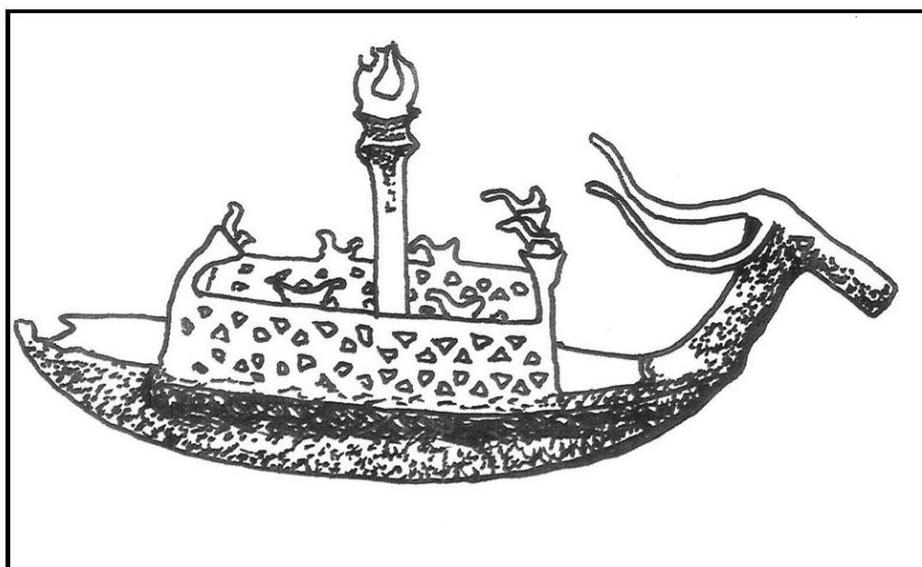


Figure 47 Sardinian bronze boat model with bovine figure head, centrally placed mast, and weather fencing. 21 cm in length, 10 cm in height, and 7.8 cm in width. Located at Pipizu, in the region of Orroli. (Drawing by Author. After Anati 1984, pl.1; Lilliu 1966, 411, n. 298).

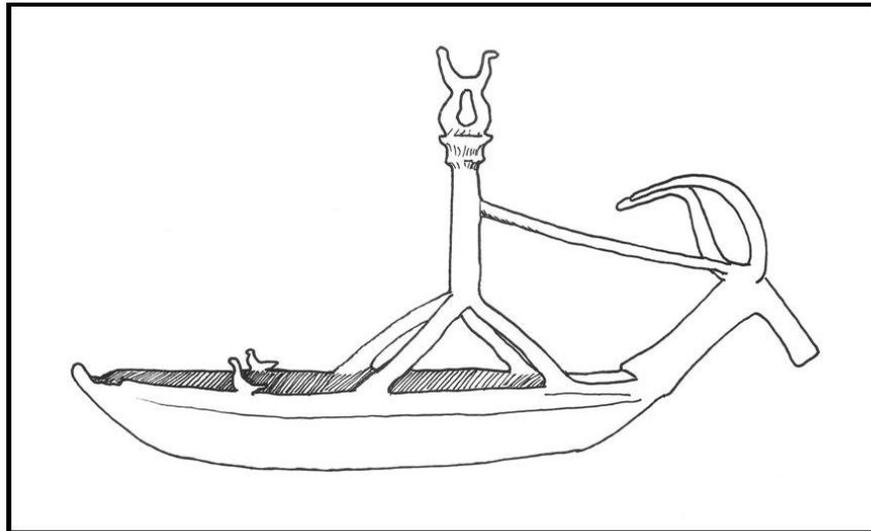


Figure 48 Sardinian bronze boat model with bovine figure head, forward placed mast, crows nest and possible rigging. Located on Sardinia, provenience otherwise unknown. (Drawing by Author. After Lilliu 1966, 406-7 n. 294).

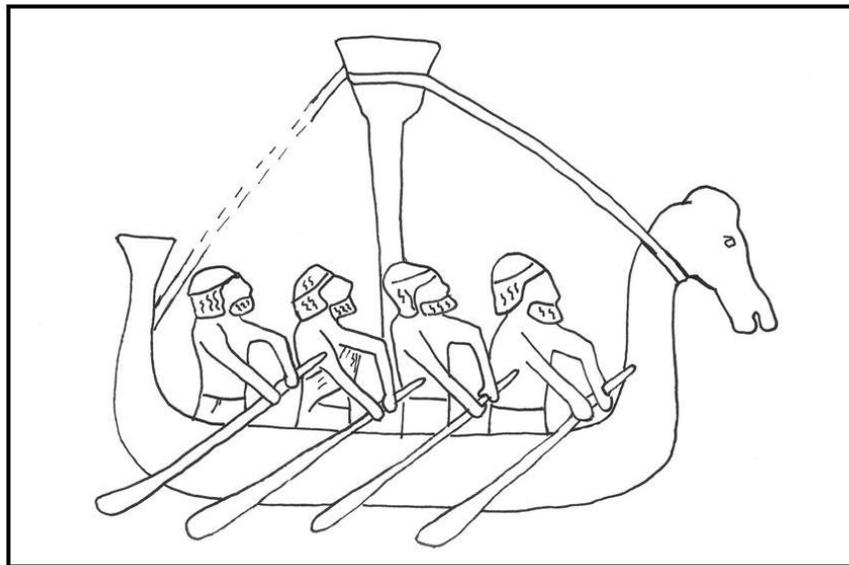


Figure 49 Phoenician 'hippoi' boat from a relief at the palace of Sargon II, Khorsabad, 8th century B.C. (Drawing by Author. After Casson 1995, 66, fig. 92).

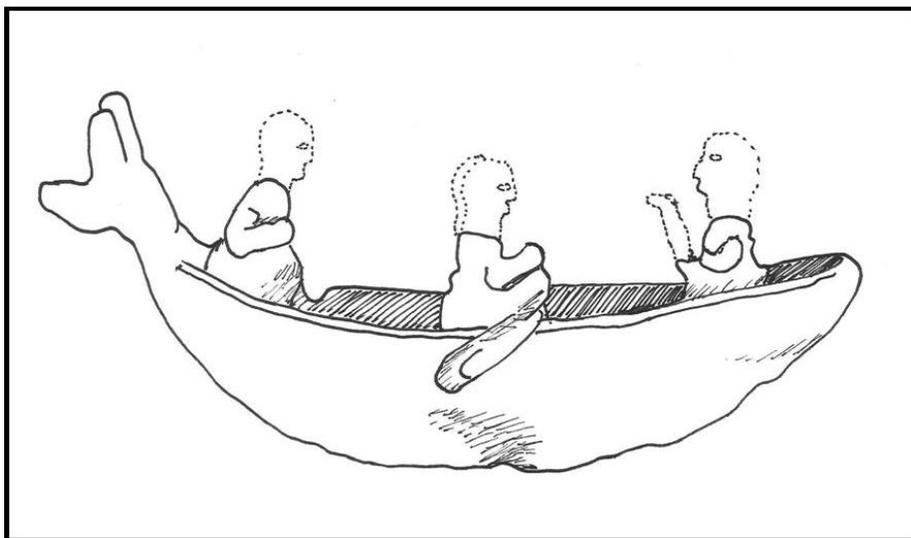


Figure 50 Bronze boat model with four crewmen, rounded hull and (probably) a deer figure head. 9.3 cm in length, 2.8 cm in width. Found at Isthmia, Greece, dated to 6th century B.C. (Drawing by Author. After Johnston1985, 70, Arch.46).

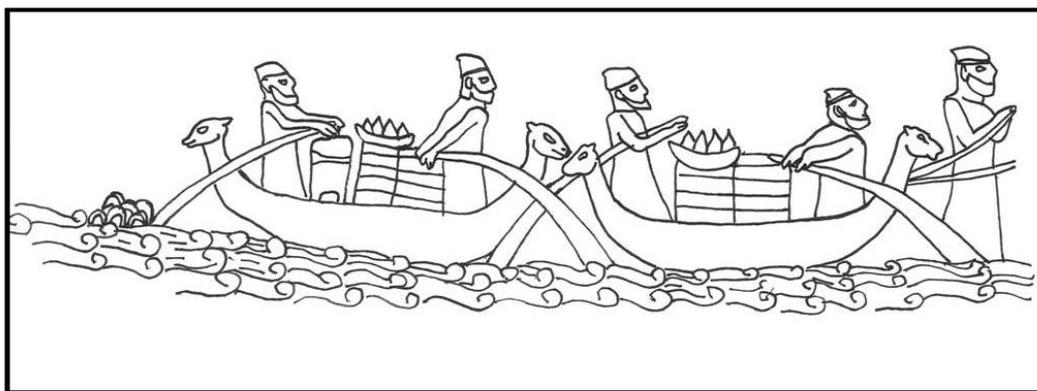


Figure 51 Phoenician 'hippoi' boats from the bronze bas-relief at the gates of Balawat in Assyria., Dated to middle of 9th century B.C. (Drawing by Author. After Aubet 2001, 37, fig. 12).



Figure 52. Traditional reed boats at Stagno di Cabras, north of Oristano.
(From King 1975, 125)

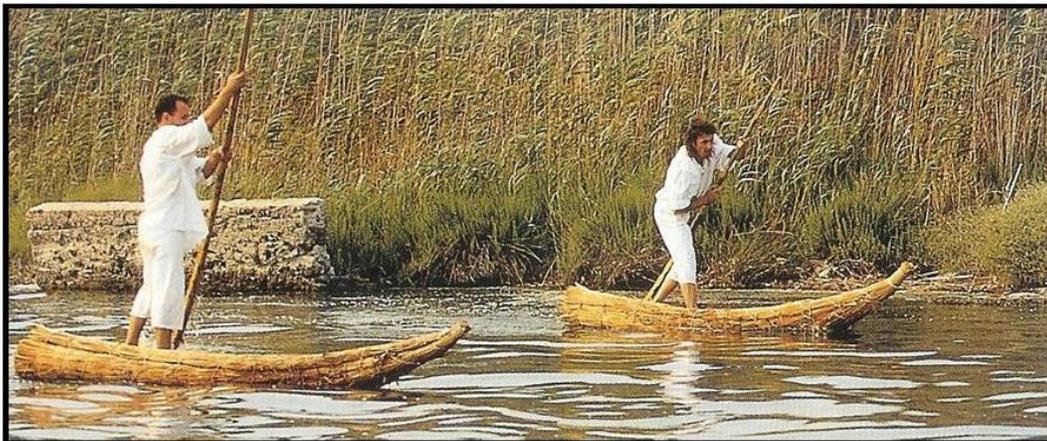


Figure 53. Fisherman using *is fassonis* (reed boats) on Santa Giusta Lake, south of Oristano.
(From Ardito 2003, 136)

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