From Myotragus to Metellus

Mark Van Strydonck

Aerial view of Son Fornés.
Museu Arqueològic de Son Fornés.

# From Myotragus to Metellus

A journey through the pre- and early-history of

## Majorca and Minorca

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Cover Front:
Above: Cova de na Dent (Majorca). Photo Mark Van Strydonck
Below: Myotragus balearicus. Adapted by Katja v. Ruville from a drawing by J. P. Brinkerink
Cover Back:
Necklace made of glass paste. Photo Museu d'Història de Manacor.
Statuette of a bull. Photo KIK-IRPA, Museu de Menorca.
Lead pectorial. Photo Mark Van Strydonck, D.A.M.A.R.C.
The Chalcolithic vessel of Son Matge. Museu de Mallorca.



# Contents

The bay of Deià in the Serra de Tramuntana (Majorca). (photo Mark Van Strydonck)

# Preface

Although most tourist guides use the name “Balearic Islands” for the entire archipelago off the Catalan coast, originally this group of islands was split into the Gymnesiae (Majorca and Minorca) and the Pityusae (Ibiza and Formentera). In (proto)historic times the name Gymnesiae was replaced by Illes Balears (Catalan), while the name Pityuses remained for Ibiza (Eivissa in Catalan) and the small island of Formentera. This book only deals with the Gymnesiae. The typical prehistoric cultures I want to describe are best studied on both those islands. Nevertheless, the so-called Talayotic culture was probably of no significance on Ibiza, the largest island of the Pituyses. That island is mostly known for its Punic past. While this is certainly not unimportant, it has never been the intention to include the Punic world into this study. It would take us too far away, geographically and otherwise, from the Balearic Islands. Where necessary for the sake of completeness, I will refer to that culture as well as to the Roman invasion that brought about the end of the Talayotic Culture.

The reader must consider this book no more than an introduction to the prehistory of the islands. It was written with the intention of showing to the visitor interested in history and archaeology that the Balearic Islands have more to offer than the beach resorts featured in the tourist guides.

Before we start our exploration of the prehistory, the reader has to be warned for the Babel-Like-Confusion that prevails in the islands. Names of places and designations such as for instance cave can be written in Castilian (cueva) or in Catalan (cove). Especially on the largest island, the Majorcan variant of the Catalan language is considered as a proper language. Even (archaeology) books are published in this local variant. Recently the government has tried to impose uniformity on the use of site names, but this has not been of great help, because now we find different names for the same site in older and newer publications, such as Curnia Nou and Cornia Nou. In most cases there is only little confusion and for the tourist or would-be archaeologist it will be clear that the town of Mahón and Maó is the same.

It is particularly in the use of prepositions, apostrophes and accents that confusion arises.

Chronology will be the thread throughout this book. But from time to time the diachronic plan will be interrupted by a "intermezzo" in which I will discuss sites that were important in more than one period. These intermezzi will allow us to go somewhat deeper into important evolutions and transitions.

# 1. Introduction: Majorca and Minorca, from Myotragus to Metellus

The prehistory of the Balearic Islands is still veiled in an atmosphere of mystery and uncertainty. Over the last thirty years at least five different chronologies have been proposed for the prehistory of the islands. Although they are all strongly related to each other, they also differ considerably on some fundamental issues. The reason for this is that systematic, scientific archaeological research is relatively new on the islands. Often, even in the second half of the last century, excavations were clandestine and executed by amateur archaeologists and treasure hunters, or rescue excavations were carried out because of the ever-expanding tourist infrastructure. Most prehistoric constructions were only examined in the hopes of finding valuable artefacts or in connection with restoration works to encourage tourism. In many cases, archaeological layers were merely considered obstacles to 'cleaning' the monument. This led without any doubt to only partial investigation of the archaeological sites. Fortunately the tides have changed and nowadays archaeological investigation is conducted in a scientifically proper manner.

Very cautiously one can say that the prehistory of the Balearic archipelago can be divided into some five stages depending on which chronological framework one accepts:

— Some people still believe that the first visitors arrived on the islands in a period before 5,000 BC although the evidence for this is very doubtful.
— The same is true for what has been called the 'first settlement period', the first, that is, with a permanent habitation on the islands. This period covers a timeframe between 5,000 BC and the middle of the 3rd millennium BC.
— All investigators agree on the fact that the islands were inhabited in the third millennium BC. The so called pre-Talayotic period comprises,

besides a possible very short part of the late Neolithic phase (New Stone Age), the Chalcolithic or Copper Age and a large part of the Bronze Age. This period does not represent a cultural entity. The name was originally introduced to make a distinction between the Talayotic period, in which most investigators were interested, and everything that happened before. In more recent publications the pre-Talayotic period is often divided into different periods named after the most characteristic feature of that period. Consequently some researchers mention a Neolithic phase, a Bell Beaker phase, a Dolmen phase and a Naviform phase.

— One of the larger problems in the chronology of the Balearic Islands is the start of the Talayotic culture. Traditionally 1,300 BC was put forward as the start of this culture, but some archaeologists put it as early as 1,550 BC, while others do not believe that it started before 1,050 BC. In due course the difference in reading and interpreting the archaeological records which give rise to this discrepancy will be explained.

— Some authors also believe that a large part of the Iron Age strictly defined does not belong to the Talayotic culture because from that period onwards a strong cultural influence from overseas is noticeable. For that reason they call that period, running from ca. 600 BC till the Roman invasion, the post-Talayotic culture. Others consider this period only as a later phase of the Talayotic culture. They argue that although the influences from other Mediterranean cultures are quite visible, the typical manifestations of the Talayotic culture remain until the Roman invasion.

It is clear that this chronological model was built around the Talayotic period. This is not strange. The spectacular architectural constructions and the homogeneity of the finds contributed to the idea of a highly developed local culture. Everything that happened before or afterwards was much more subject to exterior influences.

# 2. Geographic Information

## 2.1. Names and figures

Illes Balears (Catalan): this archipelago, formerly called the Gymnasiae, consists of Menorca or Minorca (702 km$^2$) and Mallorca or Majorca (3,640 km$^2$) and some small islands such as Cabrera (Goat Island) and Dragonera (Dragon Island). The names Majorca and Minorca refer, as one would expect, to the bigger and the smaller island.

Majorca: 167 km from the coast of Alicante, 315 km from the French coast and 310 km from the African coast.
Geographical coordinates
39°57' N; Cap de Formentor — 39°16' N; Cap de Ses Salines.
03°28' E; Cap de Pera — 02°20' E; Sant Elm.

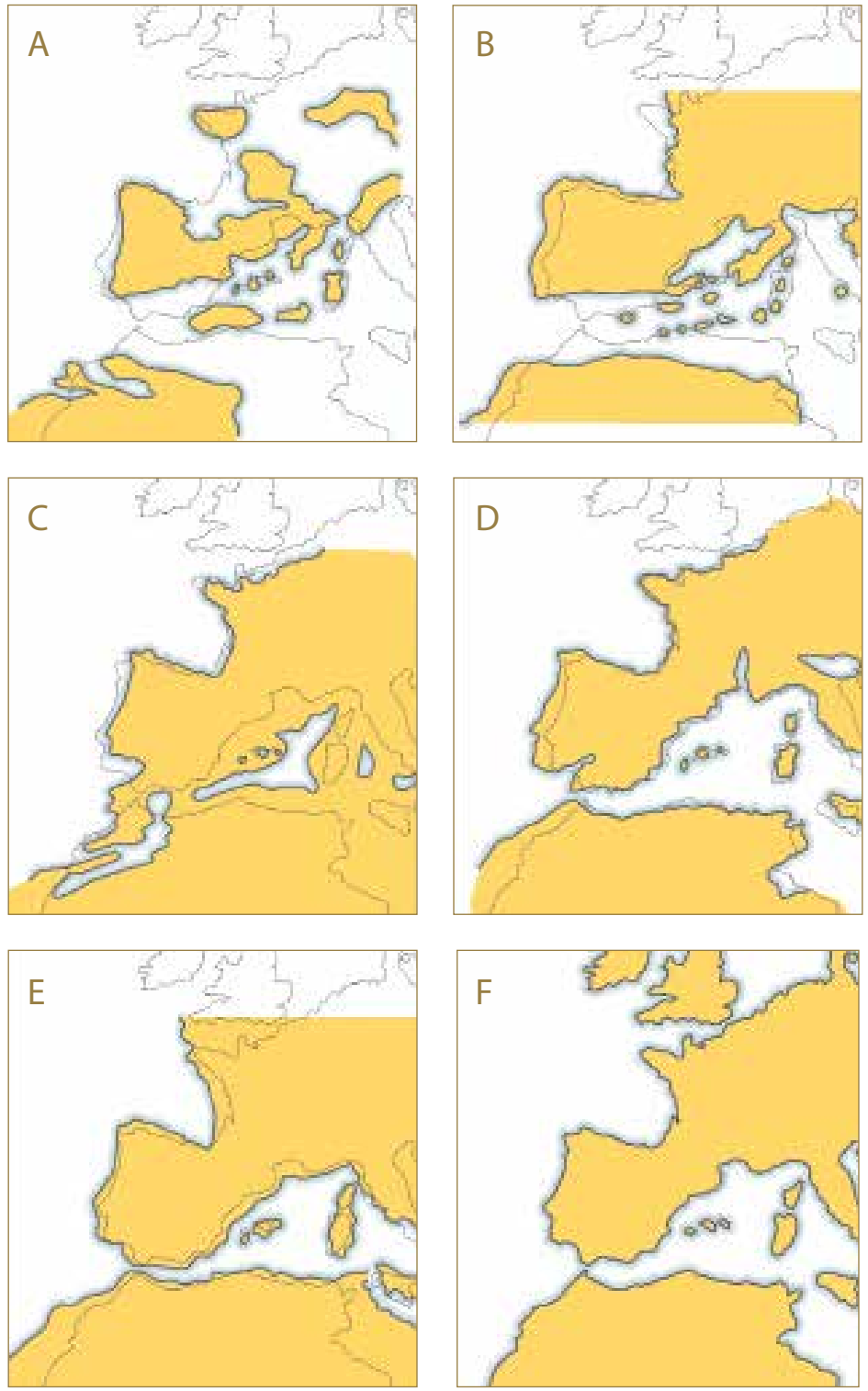
Minorca : 200 km from the coast of Alicante and 340 km from Sardinia.
It is the most eastern part of Spain.
Geographical coordinates
40°05' N; Cap de Cavalleria — 39°48' N; Punta Prima.
03°47' E; Cap de Bajolí — 04°19' E; Punta de s'Esperó.

The Pityuses: the name originates from the Greek nesi pituoussai (islands of the pines). This archipelago consists of Ibiza (Eivissa, Iviza) (572 km$^2$), Formentera (115 km$^2$) and some smaller islands such as Conejera (rabbit island).
Formentera: the name derives from the Roman designation res frumentaria which refers to the word frumentarium or granary.
Ibiza: 92 km from the coast of Alicante. The Carthaginians called it the island of goddess Bes. This evolved to Ibiza.

## 2.2. The genesis of the archipelago

During the Jurassic (213–144 million years ago) the Mediterranean was a part of a big ocean called the Tethys Sea. On the bottom of this ocean sediments and remains of plants and sea organisms were deposited. The compaction of these sediments formed stratified limestone rock formations. During the Oligocene (ca. 35 million years ago), due to tectonic movements of the African and European plates, these formations were elevated, which gave rise to the Andalusian fold mountains (Cordillera Penibética). Majorca and Ibiza can be considered as the foothills of this mountain range that extends as far as Cadiz. The islands are situated on a submarine platform separated from the east coast of the peninsula by a 1,000 m deep channel, the Valencia trough. The islands have a relatively young structure, hence their fanciful alpine rocks, cliffs and valleys. During that period Minorca moved about 75 km in a south-easterly direction and positioned itself north-east instead of north from Majorca.

The different phases in the evolution of the Mediterranean Sea.
A: 200 million years ago
B: 35 million years ago
C: 5 million years ago
D: 4 million years ago
E: from ca. 1.6 million years ago
F: from ca. 12 thousand years ago




At the end of the Miocene in a period called el Messinià (6.35–5.7 million years ago), the European and African plates were coming closer due to the continental drift, so that the connection between the Mediterranean and the Atlantic Ocean was cut off. The Mediterranean Sea dried out and almost the entire basin became a large salt wasteland. In this way the islands became connected to each other and to the Iberian Peninsula. Due to the continuing movements of the continental plates the area around Gibraltar broke open during the Pliocene (ca. 5.35 million years ago) and the Mediterranean basin was again filled with water. From that period onwards, due to a rise in the sea level and a lowering of the seafloor, the islands became detached from the continent. First the archipelago was separated from the peninsula, later Minorca and Majorca, called the "greater Gymnasia", separated from Ibiza. Finally Minorca and Majorca were split up. During the Quaternary (the last 1.4 million years) the climate went through abrupt and radical changes. Ice ages caused the freezing of large quantities of water, resulting in a lowering of the Mediterranean sea level by more than 100 m. The geomorphology of the islands shows that

Fossil from an ammonite found in the Tramuntana Mountains. © KIK-IRPA; collection H. Borms

there was no glacial activity on the archipelago. But the lowering of sea level caused a temporary reunion of Majorca and Minorca. Finally after the last ice age (the so called Würm or Weichselian ice age) the sea level started to rise for the last time.

## 2.3. The islands

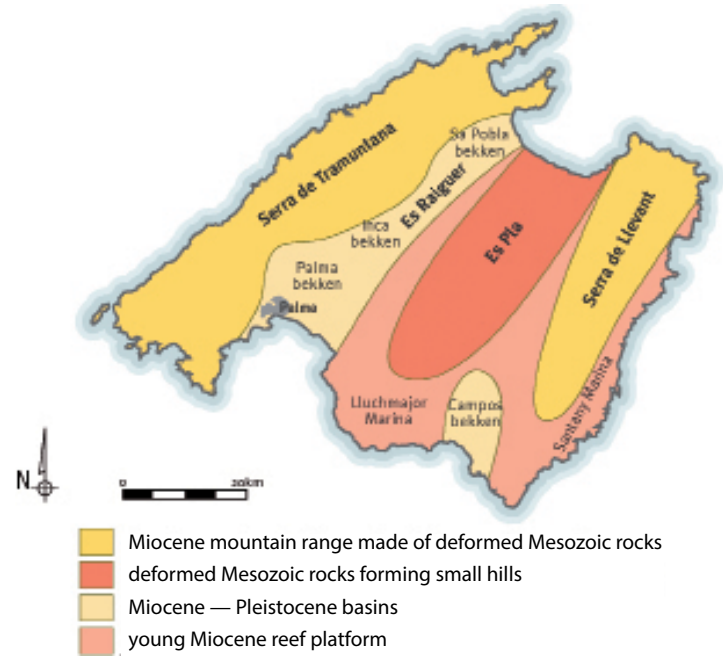
The islands of the archipelago are small compared to the larger Mediterranean Islands like Corsica, Sardinia and Sicily. Due to the way they were shaped they are formed like a series of stepping-stones running from the south-west to the north-east in the western Mediterranean Sea.

### 2.3.1. Majorca

The north-west coast of Majorca is dominated by a mountain range called the Serra de Tramuntana or mountains of the northern wind. Although the word tramuntana means from over the mountains the name refers to the North or to the northern wind. This idiom comes from north Italy were it refers to the wind that blows over the Alps.

The summits of this limestone mountain range have a central position with the Puig Major (1,445 m) and the Puig de Massanella (1,349 m) as highest peaks. The range was formed during the Miocene (25–5 million years ago) and is made of Mesozoic sediments, especially from the Jurassic, in which caves and gorges are eroded. This makes the coastline very irregular with steep cliffs (300–500 m high) gorges and torrents (Torrent de Pareis). In some places in this steep coastline one can find small bays (cala), inlets and creeks giving shelter against the sometimes very rough sea (Cala Sant Vincenç, Cala de Deià). One exception in this very rough coastline is the large bay of Port de Sóller.

Due to rain and erosion there is hardly any soil development in the mountains. The Moorish terraced agriculture was an answer to that problem. Only in the higher situated valleys (Escorsa, Cuber, the monastery of Lluc, Pla del Rei), formed between the maximal five parallel mountain ridges, was soil development and a rich vegetation




The simplified geological map of Majorca.

possible. The mountain range also protects the central plain from the sometimes very strong north wind coming from the Golfe du Lion.

The Serra de Llevant, although less high (Puig Morey, 562 m), forms the counterpart of the northern range. These deeply eroded low mountains consist of Jurassic limestone and dolomite and were formed during the Oligocene (38–25 million years ago) crust movements. On one of the highest

Gaillard pass in the Tramuntana Mountains. Photo Mark Van Strydonck

The sandy bay of Palma in the in the south-west of the island. Photo Mark Van Strydonck.

peaks, the Puig de Sant Salvador (510 m), an impressive monastery is built. Due to marine erosion many sea-inlets, small bays and caves (Artà, Hams, Drach) were formed in the south-east hills of the island. These caves are the result of the impact of rainwater, coastal erosion and sea level change on the limestone rock. In one of these caves Dorothea Bates (1909) found the first remains of the Myotragus balearicus (see chapter 4). The cave-forming-limestone has contributed to the fact that the island has plentiful fresh water resourses. This supply, however, has diminished considerably due to intensive pumping for agriculture and even more importantly for tourism. The Pleistocene (2 million till ca. 10,000 years ago) sea level changes have left very clear traces on the Miocene limestone formations. Old beaches and eroded plateaux form beautiful relicts of the old coast line — a phenomenon that is also visible at some places in the Serra de Tramuntana. The Miocene limestone hills with an elevation till 549 m around Llucmajor accommodate very important prehistoric settlements such as Capocorp Vell and Es Mitja Gran. The hills in the north-east have a maximum elevation of 562 m. Here, the oldest petrified remains of myotragus were found (top of Cap Farrutx). This area is also rich in open-air settlements such as Ses Païsses, S'Illot and Sa Canova. The cliff coast has many protected inlets that served as small harbours.

The so-called central plain is situated between the two mountain ranges. It consists of a limestone platform covered by an erosion layer, more precisely a Quaternary infill (subduction zone) clay and loam coloured brownreddish due to the presence of iron oxide.

Humus and decomposition products of the mountains have filled the plain but at some places due to erosion the underlying limestone has surfaced. The so-called terra rossa is widespread over the plain where it has not been removed by human activity. The plain is very fertile although the humus layer forms only a thin cover on the top of the underlying limestone (marés). Due to the fertility of the plain numerous prehistoric settlements are found in this region. If one looks closer at the geomorphology of the area between the two mountain ranges, five different regions can be distinguished. 1) Es Plá: consisting mainly of deformed rocks of Mesozoic to Oligo-Miocene age; 2) Es Raiguer: an area that subsided during the late Miocene-Pleistocene; 3) the Campos basis, subsident during the middle Pleistocene; 4) the Llucmajor Marina, an area characterised by a platform produced by progradation of a Miocene reef across a deformed Mesozo-

The 'red earth' (Majorca). Photo Mark Van Strydonck

S'Albufera (Majorca). Photo Mark Van Strydonck.

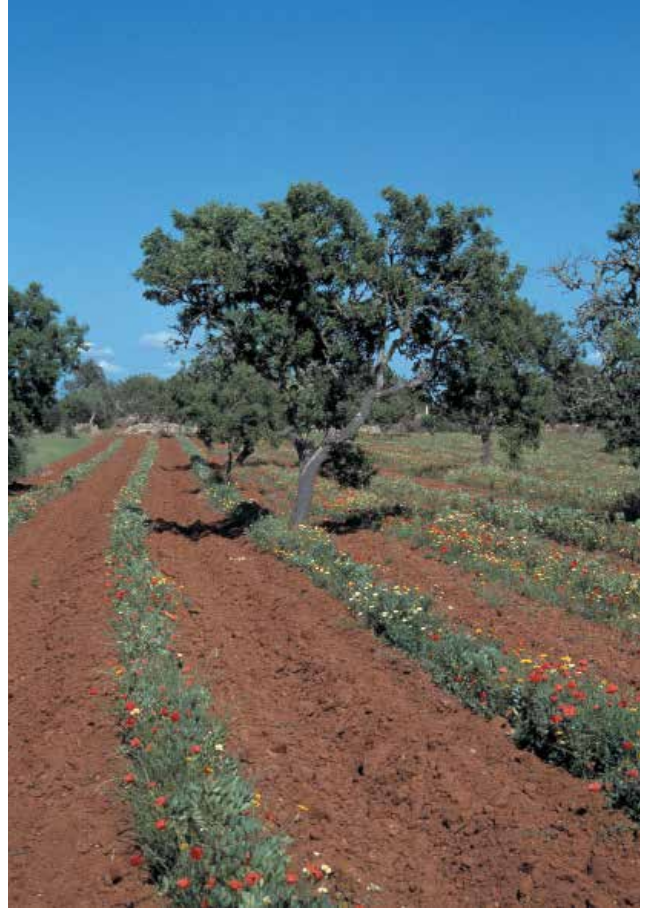
Salt winning at Ses Salines (Majorca). Photo Mark Van Strydonck.

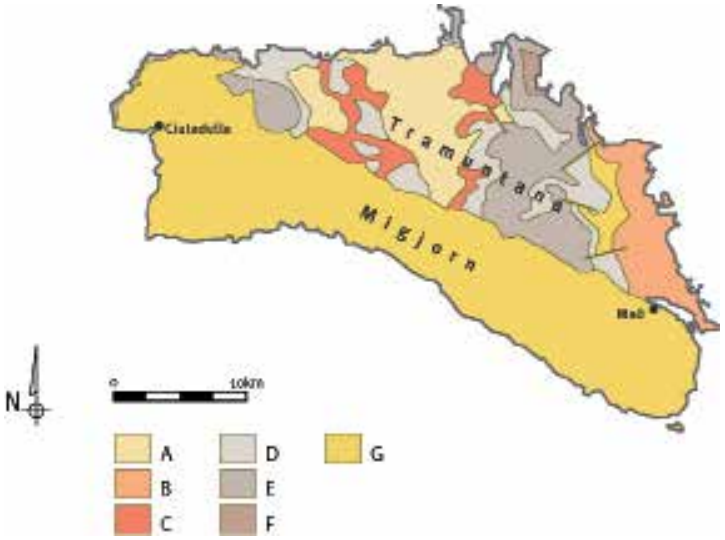
ic-Oligocene substratum; 5) the Santanyi Marina, characterized by a reef platform and later sediments. In the north-east and the south-west the large sandy bays of Alcúdia and Pollença on the one hand and the large bay of Palma on the other enclose the central plain. They provided very easy access for early colonists. In the hinterland of Alcúdia, behind the dunes, a wetland can be found. Its name, S'Albufera, derives from the Arabic name Al-Buhayra, meaning lagoon or lake.

Over time this marshland was embanked and several, albeit not very successful, attempts were made to reclaim it. In the eastern part of the plain a peaty marshland can be found and salt is extracted from the seawater, an industry that goes back to the Roman period.

The subterraneum of Majorca is very poor. Some low quality coal is present that was used for gas production. Copper is found in limited quantities in the mountains along with lead that was exploited until the 19th century (Bunyola).

Except in winter the rivers in Majorca are dry. Nevertheless there is a lot of water in the underground aquifers as is testified by the remaining windmills in the plain. These windmills, originally an Arab invention, served to pump the water into the irrigation channels. Originally, however, these mills were introduced to reclaim wetlands.






The simplified geological map of Minorca:
Paleozoic:
A: Devonian — Carboniferous
B: Carboniferous
C: Permian
Mesozoic
D: Triassic
E: Jurassic
F: Cretaceous
Tertiary
G: Miocene

## 2.3.2. Minorca

Majorca and Minorca are separated by a ca. 40 km long straight, that is seldom deeper than 100 m.

Minorca, with still some primary rock formations, belonged to the disappeared Tyrrenide continent that originates from the Orogenic folding responsible for mountain formation running from Catalonia in the north (Ampurdan Mountains) to the south of France.

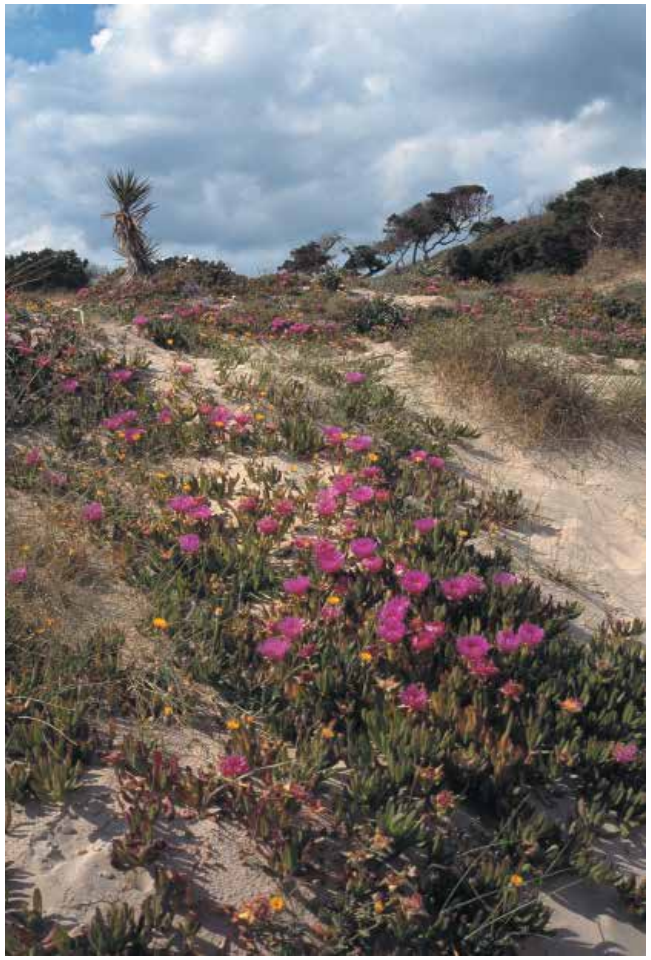
The island shows a striking contrast between the old, mainly Devonian, limestone formations in the north and the younger Tertiary, Miocene limestone, platform that to the south covers almost half the island. The Devonian limestone (ca. 400 million years old) around Fornells is the oldest formation on the Balearic Islands. Furthermore some remnants of the Tyrrenide continent are still visible near the cape of Favaritx.

Due to erosion the island is much flattened. The highest point, the central hill of Monte Tore, is only 358 m high.

The Minorcan coastline is very diverse. This can be observed very easily if one compares the situation of Minorca's two largest cities. The old harbour of Ciutadella, in the western part of the island, is situated at the end of a narrow inlet more than a kilometer long. This narrow marine erosion channel is in sharp contrast with the enormous morphologic fault (500 m wide and 6 km long) at the other end of the island, forming the harbour of Mahón or Maó.

A view of Minorca from the Monte Toro. Photo Mark Van Strydonck.

The red coast of Cala Pilar (Minorca). Photo Mark Van Strydonck.



A Minorcan ravine or barranc. Photo Mark Van Strydonck.

The dunes at Son Bou (Minorca). Photo Mark Van Strydonck.

The north-eastern part of the island is less inhabited and developed for several reasons but mainly because between the coastal hills and the interior part of the island a large marshland existed. Nowadays most of it is dry land because of drainage works started in the Middle Ages, but a relic of this still exists as the coastal marshland of S'Albufera des Grau, which in many aspects resembles his Majorcan counterpart.

In this salty marshland potable water was scarce. Furthermore the sometimes strong northerly wind and the lack of good soil made this northern part unattractive for prehistoric people despite the fact there are some bays such as Cala Pilar and the large bay of Fornells. Upon this, Cala'n Morell (in the north-west) is a major exception with a rich archaeological past.

In the southern part of the island the coastline shows large cliffs and U-shaped ravines or barrancs. These barrancs were formed when cave roofs collapsed due to the continuous erosion of the cave walls by rainwater. About thirty of these barrancs have been incised into the soft rolling plateau of south Minorca.

They cut through the Miocene limestone and form very beautiful small bays and inlets, sometimes with sandy beaches. They can be several kilometers long and contain many natural caves that almost all were used in prehistoric times (Cova des Pas, Cova de Càrritx, Cova dels Tancats). Beside these natural caves also a lot of man-made caves were cut out from the cliff walls and used as burial chambers (Calas Coves).

The soft rolling terrain of south Minorca brings some protection against the north wind and holds about 90 % of all open-air settlements. Water was to be found in natural springs, but also in very deep cut wells that descended to the groundwater table. Furthermore, the prehistoric people collected water in manmade reservoirs (Torre d'en Galmés, Torralba d'en Salord).

Also on Minorca remains of the Myotragus balearicus were found. The animal arrived from Majorca in a period of low sea level. Its arrival on the island of Minorca caused the extinction of local indigenous species like the giant rabbit Nuralagus rex (see also chapter 4). Besides the myotragus, Dorothea Bate also discovered on Minorca the remains of a Pleistocene turtle: Testudo gymnesicus.

### 2.3.3. Ibiza and Formentera

The mountain range of Ibiza is the continuation of the northerly mountains of Majorca, while the limestone platform of Formentera is the continuation of Majorca's central plain. The highest summit on Ibiza is Atalayas (475 m). This island is rich in natural recourses. The coastline is made up of bays, but deep inlets are rare. The best anchorages are Santa Eulalia, San Antonio and Ibiza (the capital). The sea between the coast of Valencia and Ibiza, notorious for very heavy storms, is up to 1,000 m deep, much deeper that the strait between Majorca and Minorca. Formentera is very flat and has a swampy coast. Some parts of the island resemble a sandbank with dunes and beaches.

## 2.4. Climate and vegetation.

Since the last Ice Age the temperature on the islands has increased gradually. Around 10,000 years ago started a period known all over Europe the Boreal. This is a period of high precipitation on the islands, after which little by little the climate became more and more arid. This aridification, which is still going on, didn't happen in a continuous way but in stages. A first important dry period started around 8900 years ago during a period called the Atlanticum. Some archaeologists claim that in this period the first humans visited the islands.

At the end of the Boreal, and beginning of the Atlanticum the islands must have been covered by large closed forests with a dominance of Holm oak (Quercus ilex). On higher and wetter grounds on the other hand the Aleppo pine (Pinus halepensis) was dominant. Beside those, deciduous trees such as hazel (Corylus) and oak occurred. Brushwood was represented by a local variety of box (Buxus balearica) and juniper (Juniperus). Of course there were large local differences. Juniper and Ephedra were found merely on or near the coast, while hazel and alder bushes were found in marshland and beside springs. Along the entire coastline a great deal of Apiaceae and bulrush (Typha) was found, an indication that much more marshland existed in those days.


The same dirt road in the Pla del Rei in the Tramuntana Mountains (Majorca).
In summer the valley is very arid while in winter the soil hardly ever dries out.
Photo Mark Van Strydonck.

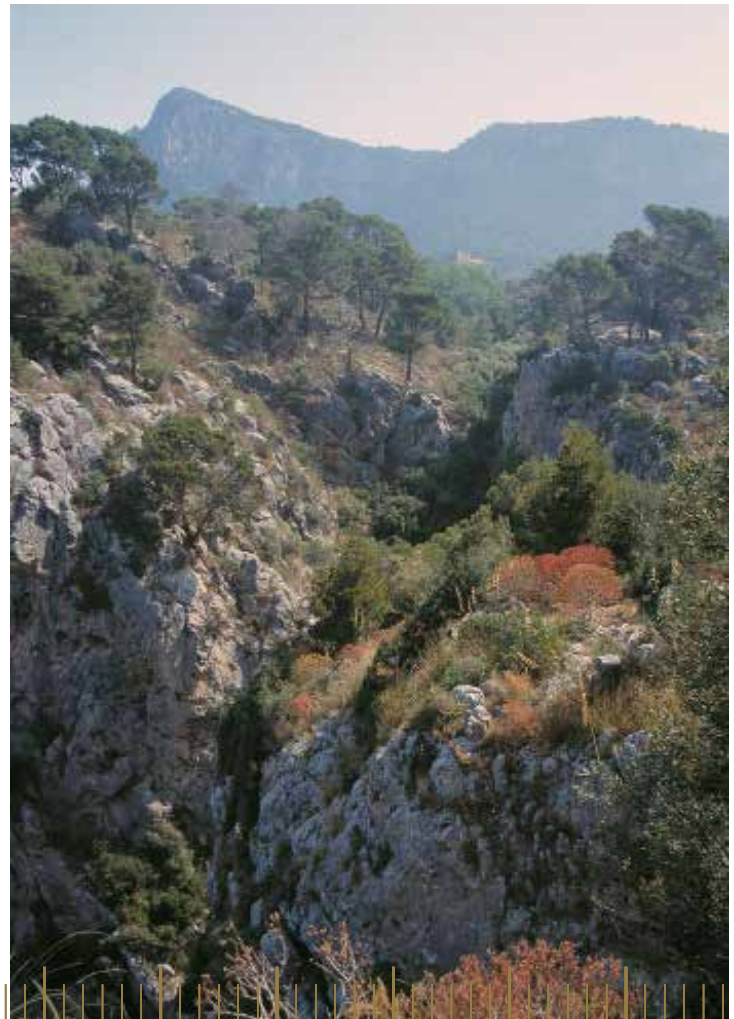
From 5,000 BC onwards, during the Subboreal, a dryer and colder phase, the deciduous plants were gradually pushed back. A bush vegetation with of wild olive trees (Olea europea subs. sylvestris or oleaster), ullastre in Catalan, and ericaceous plants began to appear. In the course of time deciduous plants gradually lost terrain in favour of arid plants.

Pollen analyses have shown that during the 5th millennium the local palm variety (Buxus balearica) disappeared almost completely from the islands and that hazel retreated dramatically. Only in the wetter mountain regions could such vegetation survive.

Even nowadays patches of the early more moderate vegetation still exist in the Tramuntana Mountains. Due to the long isolation in the mountains indigenous plant species could emerge such as the Cyclamen balearicum and the Brassica balearica. According to some researchers the almost complete disappearance of the Buxus balearica is to a certain extent responsible for the extinction of the indigenous Myotragus balearicus, a problem that will be discussed in chapter 4.

The transition from the Subboreal to the Subatlanticum around 800 BC is linked to a wetter and colder period in north-west Europe and to a drier, more arid, phase in Africa. This instability in the climate was caused by a change in solar activity in the same way as the European Little-Ice Age from the 17th century AD. According to some researchers this sudden climatic instability is one of the underlying causes of migration and cultural change as elsewhere, so too on the Balearic Islands.

With the arrival of the first human settlers, the first cereals also appear in the sediments, albeit marginal. Although the deforestation in favour of agriculture starts rather early, it is only clearly observable from 460 BC onwards. Progressive deforestation goes along with the appearance of pistachio (Pistacia lentiscus and Pistacia terebinthus) and heathy plants (Ericaceae). Human activity certainly lies behind the arrival of these plants as they could be observed in pollen spectra, besides cereals, grape vine (Vitis vinifera) and walnuts (Juglans regia). Also a wider dispersion of the olive tree is noticeable, especially the cultivated form (Olea europea subsp. europea).

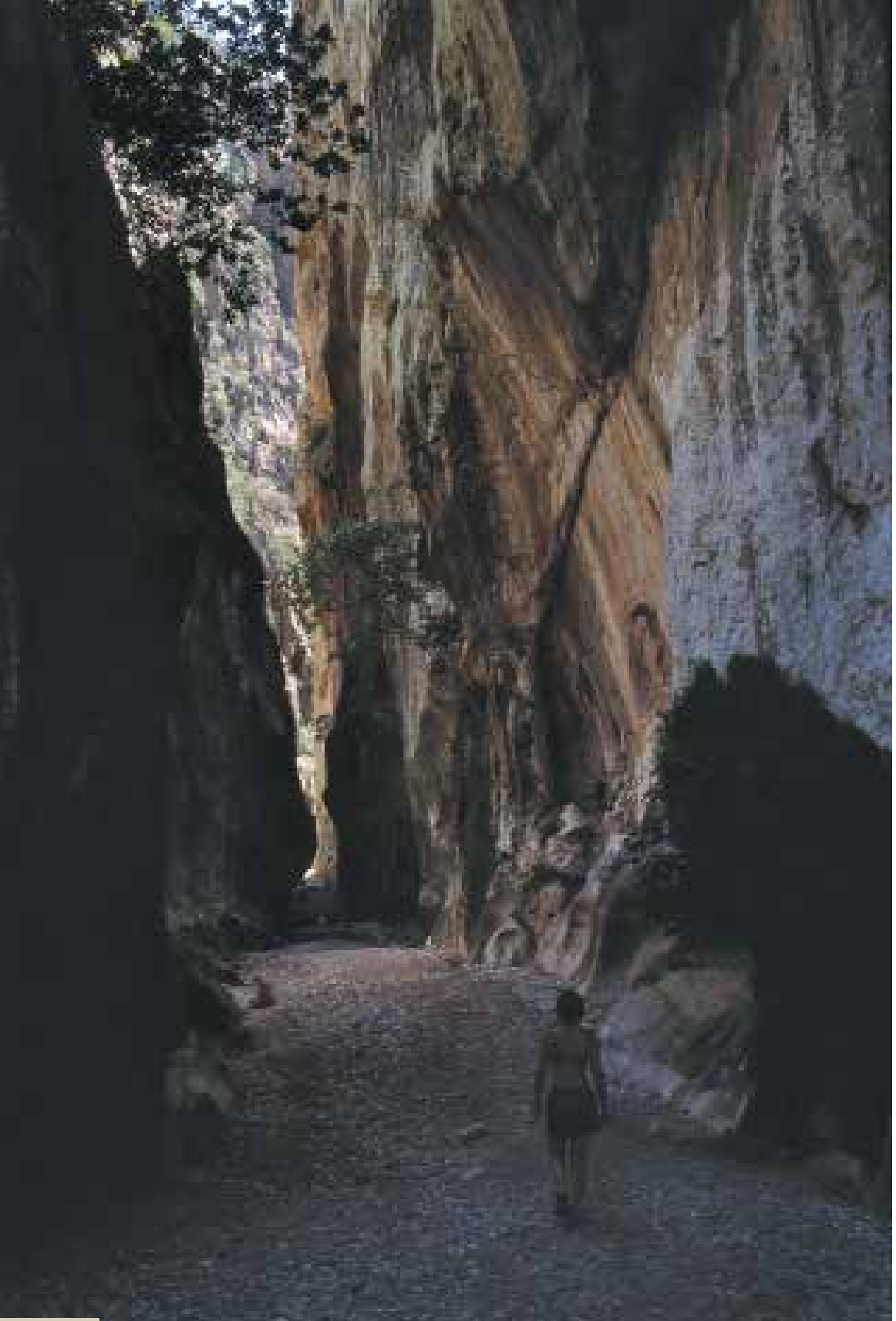


Arid vegetation at the foot of the Tramuntana Mountains. Photo Mark Van Strydonck

The situation on Minorca is completely different. Nowadays Minorca is merely grassland, but originally the island must have been covered with large forests just like Majorca. Evidence of this is found in the large wooden beams one can find in the Talayotic monuments. Because the landscape is much more uniform than in Majorca and there are no mountains, but just some hills in the centre, no vestigial vegetation from the past climate optimum has survived on this island. Nevertheless, this vegetation must have existed until relatively late in prehistory because artefacts made of box were found in burial places until the last millennium BC. It was completely cleared in favour of animal husbandry.

The present day climate is moderate subtropical. The average yearly temperature on Majorca is 16° C, the average January temperature is 10° C and the average temperature of August is 25° C. Still, on the slopes of the mountains some snow can be seen in winter and the January temperature on top of the Puig Major is just below zero (–1° C). The average yearly rainfall on Majorca is estimated at 477 mm, with July the driest and October the wettest month. There are however very strong differences between the mountains (ca. 1,400–1,500 mm) and the plain (ca. 300–350 mm). This difference arises partly because of the north wind which pushes up air masses from the sea against the Tramuntana mountains, activating cloud formation and precipitation in the mountains. On the other side of the mountains the air descends and often the clouds disappear completely. Precipitation can be very heavy. Mountain Rivers (torrents) evacuate the water to the sea or the plain, and by erosion created the sometimes very steep and narrow canyons in the mountains (Torrent de Pareis).

On Minorca there is hardly any protection against the northerly wind, so the north part of the island is open to the wind coming from the Golfe du Lion. During bad weather the north coast can hardly be reached and the climate during winter is rather inclement. The average yearly precipitation is 599 mm with maxima in October and November. This is a little higher than on Majorca. January is the coldest (7.5° C) and August (25° C) the hottest month of the year. In contrast to the North wind during winter, in summer a strong wind blowing from Africa can cause very high temperatures. The winds in general were a very prominent part of daily life on the islands. They were not named after the geographical orientation but have



their own names. As mentioned before, the north wind is called the Tramuntana; the north-west wind is called the Mestral, the west wind or Ponent, the south-west wind or Llebeig, the south wind or Migjorn, the south-east wind or Xaloc, the east wind or Llevant and finally the north-east wind or Gregal.

The Torrent de Pareis in the Tramuntana Mountains is 4,5 km long and is formed by the Torrent de Lluc and the Torrent de Sa Fosca. During periods of heavy rain this otherwise very calm gorge becomes, due to the enormous water drainage, one of the most dangerous place on Majorca. Photo Mark Van Strydonck.

# 3. Island colonization

## 3.1. Colonization mechanisms

Islands are isolated places, limited in size and therefore not the most sought-after habitats for animals or humans. Larger islands are more favoured for inward migration than small islands, but an archipelago of smaller islands can represent itself a unit. So if animals migrate, the reason for this must be looked for at the place of origin. Changes in climate, habitat or food supplies can be a reason for migration. But also the composition of the local animal population or the presence of predators or competitors can cause migration. But very often population pressure is the driving force behind migration.

Not all species are able to colonize islands. They must be able to travel and the distance to the island to be colonized must be within reach. The possibility of travelling can be anatomically built in. Transport can be by air, flying like birds or simply by the wind like plant seeds. Some animals, such as grass eaters, can float and swim long distances. The possibility of travel can also be a cultural facility as for humans who can build rafts or even ships.

The number and variety of plant and animal species that live on an island forms a dynamic equilibrium between immigration and extinction. The natural environment affects also the possibility of colonization. Because of their limited size the natural resources of islands are also limited (availability of food, the presence of arable land, ores, etc.). A restriction in habitat variety is a limited factor for the diversity of the migrating species. The limitation in potable water and mineral sources in general may be a problem. Furthermore isolated groups are much more vulnerable to natural disasters and changes in the ecology of the island because the possibilities of finding a new habitat are very limited. Very dramatic disturbances, such as volcanic eruptions, as well as very small changes in the ecosystem may cause in the long run profound changes and even extinction. The diversity of the topography of an island can have a positive impact on the habitat diversity. Generally mountainous islands have more diverse habitats and also a higher precipitation than islands with flatter terrain. Islands have also the advantage of a more stable climate. Due to the high percentage of coastal area the climate is mostly milder, more humid and windier than on the mainland.

After a while differences will arise between the group that remained on the mainland and those which migrated to the islands.

## 3.2. Phases in island colonization

A species can only be successful in colonization of an island if the migrating group is large enough. The first phase in the conquest of a new Island is called the genetic re-adaptation phase or 'founder effect'. The adaptation to a new environment causes the creation of genetically diverging groups, which, due to their isolation, will split up into different species. If a species can survive long enough on an island an endemic species will arise, that is,a species that only exists on that island and nowhere else. A typical result of such an evolution is the so-called 'dwarfism' and 'gigantism'. In this way the Balearic giant dormouse (Hypnomysor Eliomys, with two subspeciesH. waldrenii en H. morpheus), the giant shrew (Nesiotiteshidalgo), the Minorcan giant rabbit (Nuralagusrex) and the dwarf bovid Myotragus with several subspecies (M. pepgonellae, M. antiquus, M. kopperi, M. batei and M. balearicus), came into existence.

It is difficult for predators to survive on an island because they need a large population of prey (herds) for their sustenance. If a group of carnivorous animals kills more prey than that their prey can procreate, the species will die out. So carnivores are often completely absent on islands.

After some time an immigrant species will adapt to its new environment. This adaptation phase is normally characterized by a rapid increase in the population.

Then follows the expansion phase characterized by the use of the entire, albeit limited, territory of the island and a further expansion of the population. This is however limited by the productive capacity of the environment.

Overpopulation is countered by natural selection and a decrease in fertility. Also a regularisation mechanism for the use of the natural sources will be created.

A flourishing period is followed by a phase of decline. The population diminishes and extinction may follow. The arrival of newcomers must be compensated by the extinction or retreat to a limited number of stable habitats by the local population. In other words, there is always a dynamic equilibrium between arrival and extinction of species.

## 3.3 Humans as island colonists

Mostly humans respond much faster to changes than animals or plants. But this change is more cultural and economic than genetic, although there are exceptions like the Flores Man (Homo floresiensis) who lived some 18,000 years ago on the Indonesian Island of Flores. He was only 1 m tall and had a brain size of only ca. 380 ml.

Human migration to islands is a relatively late phenomenon in prehistory and is characterized by three phenomena.

1) Stress on the food production due to a higher population pressure. People look for marine sources to compensate this stress and develop new tools and aids such as boats and seafaring skills.

2) Knowledge of the existence of islands is not the same as colonization. Mostly islands are discovered by chance, whereas colonization is planned.

3) As long as the mainland can support the population, as long as the demographic pressure is limited, no colonization will take place. Rather than emigration, second-rate resources will be exploited, existing resources will be exploited more intensively and the population will be dispersed. Before colonization a period of exploitation exists with seasonal visits to islands to gain natural recourses. Those temporary visits will only at a later phase be consolidated. One can only speak of a permanent occupation or habitation if there is proof of, in whatever context, local food production, burial sites and architecture.

One can find out about the origin of a migrated population by looking at resemblances between the environment of the colonized island and the possible source area, the distance between the continent and the island, the known trade routes and the bio-geographical conditions of the island. This means the presence of highlands, valleys, coasts, etc., and in the light of geology, climate, water supplies, fauna and flora, the possibility of agriculture and husbandry.

Because migrants will look in the first place for areas that are ecologically comparable to the source region, those parts of the island that resemble mostly the place of origin will be utilized first. Due to changes in the living conditions of the immigrants, it will become impossible to reproduce or maintain the original culture entirely and very soon a new culture will arise. The more difficult it is for newcomers to adapt to the new conditions, the more radical the cultural differences will be. Isolation is an important factor for cultural differentiation because a barrier exists for the exchange of goods as well as for thoughts.

Also the equilibrium of the local ecosystem is broken when people arrive on an island. Not only as a result of the appearance of the humans themselves, but also because of the arrival of domesticated fauna (goat, sheep) and flora (cereals) and incidental concomitants (rats). This causes the extinction of species that cannot adapt to the new situation and are vulnerable to new diseases (due to a lack of immunity) that come with the newcomers. Human activities that bring about changes in the local environment (deforestation, agriculture, drainage) will accelerate this process.

Human colonization also goes through different phases. The adaptation phase is characterized by fast growth resulting in an increasing demand for products. This can lead to overproduction and the extinction or adaptation of local species. During the expansion phase the entire ecosystem is affected by human activity and a majority of local species are replaced by species controlled by humans. Finally there is an intensification phase, characterized by optimisation of productivity and exploitation of the natural resources.

The continuous intensification of the productivity finally leads to use of even marginal areas of the island. A social and political organisation emerges and competition over the natural resources. Finally a restriction in the population rate must be enforced. Completely different to the animal population the idea of insularity, the perception of living in on an isolated island is in most cases created by the humans themselves. Already in the Neolithic period straitswere not insuperable barriers anymore. Yet it can be noticed that island populations during certain periods close them-

selves off from the outside world and to a certain extent isolate themselves. Archaeological finds very clearly demonstrate periods with plentiful import products and cultural exchange, with or without the arrival of newcomers, alternating with periods in which the crossing forms a real barrier.

# 4. The Myotragus balearicus and the first colonists

## 4.1. The Myotragus balearicus or mouse-goat

The Myotragus balearicus is an extinct animal that only lived on the Balearic Islands. Its first known skeleton was discovered by Dorothea Bate (1909) from the British Museum (Natural History). She thought that the animal died out about 40,000 to 20,000 years ago during the last ice age, like so many Pleistocene animals. It was a bovid and recent DNA investigation has indicated that Myotragus was genetically close to the sheep (Ovis) group. An important question is of course the time of arrival of the ancestors of Myotragus on the islands. For a long time this question could not be answered. Most obviously this is of course during a dry phase (desiccation) of Mediterranean. But some scientists believed that the animals could have reached the island by swimming. Grass eaters are good floaters and can cross relatively large distances of water (like elephants). Recently this discussion has come to an end. DNA dating has proven that the isolation of the Myotragus lineage in the Balearic Islands started during the Pliocene (ca. 5.35 million years ago) when the Mediterranean basin was filled with water again and the animals became stuck on the islands.

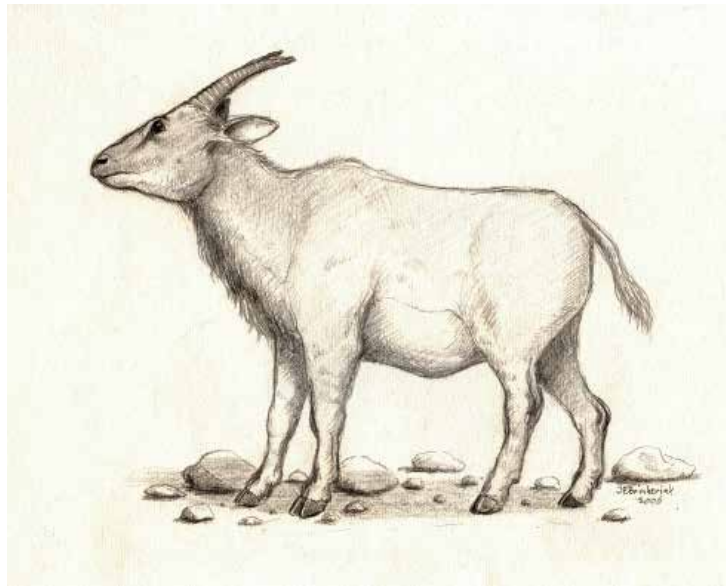
Myotragus balearicus.
Photo Mark Van Strydonck,
D.A.M.A.R.C.

Myotragus is a very good example of the genetic adaptation that an animal can go through because of isolation. Because there are no predators (carnivores, except birds) on the Balearic Islands, the animal had no natural enemies. Ready mobility and panoramic eyesight were not necessary anymore to survive. So the eyes moved to a frontal position, giving the animal a stereoscopic view, much more favourablein the mountainous region of Majorca. Shortening of the limbs and the tarsal fusion made the animal shorter

and less mobile, but gave it better stability on the steep hills and mountain rocks. Furthermore considerable modification of jaws and teeth took place. Instead of having three pairs of incisors in their mandibles the animal possessed only one robust ever-growing incisor, just like a rodent. That's how it got the name Myotragus or "Mouse-Goat". This change is undoubtedly related to the special conditions in which it had to find food, conditions being less favourable than before. The robust jaw and the ever growing incisor were very efficient in unearthing plant roots, gathering shoots of trees and shrubs. The isolation and adaptation on the new environment caused also a reductionof the brain and sense organs. Finally the animals enjoyed longevity. They lived almost twice as long as their continental counterparts. Longevity and a delay of senescence are a consequence of living in an environment with few external elements that can cause death (such as predators).

The Myotragus balearicus is the last and most evolved form in an evolutionary series of ancestors that adapted to a life in isolation on the islands. Finally an animal arose that weighed some 50 kg, was about 45 to 50 cm tall, moved in an inelegant and slow manner, and had a plump body and a heavy head.

Our knowledge of this animal comes from remnants found in different caves such as Cova Estrata (Pollença) and Cova des Moro (Manacor) and the Cova de Moleta (Sóller). This last, situated not far from the tourist village of Port de Sóller, was discovered in 1962. This cave consists of two horizontal levels connected by a vertical chimney that worked as an animal trap. The eyes of the animals were not adapted to the darkness when they entered the cave and they fell down the vertical shaft. For thousands of years sediments and animal remains were piled up in this shaft. The investigators collected 14,135 kg of sediment and 2,000 skeleton remains from animals deposited over a period of more than 30,000 years. Later another shaft was found somewhat more westerly and higherup the hill. Investigations revealed that the sedimentation in that part of the cave started most probably in the Riss Glacial (ca. 230,000 years ago).



Myotragus balearicus.
Drawing J. P. Brinkerink.

## 4.2. The first newcomers

### 4.2.1. A story to believe

Until the later part of the 20th century archaeologists believed that people arrived on the Balearic Islands more than nine millennia ago. Looking for proof of this early arrival, they dated charcoal from de Cova de Canet (Esporles) and the result confirmed their belief. The second oldest material however that one could find was already much younger. Samples from the Muleta cave and the rock shelter of Son Matge gave dates around 5,000 BC. But once again between those dates and the 3th millennium BC no material was found. A similar situation was found on Minorca where only one sample, coming from Cova Murada (Ciutadella), was dated to the 5th–4th millennium BC. This situation is hardly acceptable in the light of island colonization, and a recent reassessment of the conditions in which the samples were found revealed that either the samples were contaminated or that the relationship between the dated material and the archaeological remains was very uncertain. Does this mean that the 20th century archaeologists were being too fanciful or that they were not skilled? Certainly not! One would expect an earlier colonization than the 3rd millennium BC just as on Cyprus, Corsica, Malta and Sardinia. A pattern of colonization that supposedly started in the Neolithic is quite acceptable, but not before. The Balearic Is-

Cova dels Tancats (Minorca).
Photo Mark Van Strydonck.

lands are too small to sustain a group of hunter gatherers large enough to procreate without inbreeding. Just like animal predators the humans would destroy their food supply in no time. Although navigation is recorded in the Mediterranean since the beginning of the Holocene, the Balearic Islands seem to remain outside the Neolithic trade route of obsidian (volcanic glass). Next to that there is the radical development of analytical techniques over the past decades. Single-entity datings of some small charcoal pieces from the Cova dels Tancats on Minorca have demonstrated that Myotragus skulls, dating from several millennia BC, were found on the same level as charcoal from a fireplace of the Iron Age and charcoal from a medieval torch. These single-entity datings were technically impossible before the last decades of the 20th century.

For long time the Balearic Islands must have been an isolated region in Western Mediterranean Sea. This changed in the 3rd millennium BC. In spite of all the modern analytical techniques it remains impossible to determine the exact period of the arrival of humans on the islands. At the beginning of the 3rd millennium the autochthonous fauna and flora is still present but by the end of it most endemic species have disappeared and a lot of the autochthonous vegetation is under stress. Also the first real proof of human occupation is found by archaeologists during the late 3rd millennium BC. According to the latest hypothesis humans arrived on the islands around 2,300 BC. It seems that this first evidence of human occupation corresponds indeed with the first settlers. If this is true, than we have to deal with a rapid colonization by a significant group of people. One is tempted to call it "blitzkrieg" colonization. In the records we miss the remains of an exploration phase and are immediately confronted with a settled community.

A consequence of this would be a very rapid use of the territory with a fast decline of the natural environment. Forests would be cleared for agriculture and grassland. Sheep, goat and cattle would be brought over. These animals will be competitors to the endemic species. As discussed before the newcomers carry diseases and parasites unknown to the animals on the island, and which have no immunity against them. This 'massive' invasion would cause a fast extinction of the endemic species as has been demonstrated on Majorca.

Although this "late arrival" model seems to work, it has also its weakness. Most of the evidence comes from Majorca and much less from Minorca, and although both islands resemble each other, their past is not identical. Also the fact that until now no archaeological evidence of an exploration phase is found remains strange. Is this "an evidence of absence" or "an absence of evidence"?

# 5. The Chalcolithicum and the Early Bronze Age

The chronological interpretation of the prehistoric phases called Chalcolithic (Copper) Age and the Early Bronze Age depend on the local technological developments in metal processing and with these the changes in the local society. For the Balearic Islands these are the first stages in the occupation of the archipelago. Although numerous stone tools are found, there does not seem to have been a Neolithic period. Metal artefacts, especially in the Early Bronze Age, were prestige items and not used in daily life. Even in the Bronze Age many tools were still made of stone.

## 5.1. The origin of the new settlers

Where did the people that arrived on the Balearic Islands came from? At first sight one would suppose from the Valencia region. Immigrants coming from there would first arrive in Ibiza, than in Majorca and later in Minorca. This is the most logical route because of the short sea-crossings and because the islands are within sight. Unfortunately, however, a heavy sea current makes it almost impossible to reach Ibiza. A small vessel leaving the Valencian coast would float off towards Gibraltar. So it is much easier to reach the islands from a more northerly direction. Although there is still much debate about the origin as well as the cultural background of these migrants, at least it is clear that in Majorca one group of settlers arrived from the Languedoc in France. A correlation with the late Fontbouisse group of the south of France has been demonstrated without any doubt. Is this the only group that arrived on the Islands? This is not clear. Some archaeologists see an identifiable influence from Sardinia on the island of Minorca. Anyway, all investigators agree upon the fact that people came from a northerly direction and that there is no relationship with the Iberian cultures of the Early Bronze Age.

## INTERMEZZO: The rock shelter of Son Matge

At the narrowest section of the pass that connects the central plain around Palma with the village of Valldemossa in the Serra de Tramuntana there is a location called S'Estret. It is a crevice of about 20 m wide by which a small river runs and a modern road connects Palma with Valldemossa. Those who controlled this pass in prehistoric times, controlled the entire territory up to the sea that lies behind it, including the Pla del Rei (see intermezzo: Son Ferrandell-Oleza). About ¾ km south of this pass the rock shelter of Son Matge was situated against the flank of the Puig de Boixes (555 m high). This shelter was formed by a displacement of part of the north face of this mountain, creating a natural overhang up to 10 to 30 m high. Tectonic debris and erosion formed a natural platform. Later this platform was enlarged and a wall was built to avoid further erosion. In this rock shelter material evidence of the entire prehistory of the island was found. The first colonists must have chosen this area not only because of the fertile land and the abundant vegetation of the mountain basins around the present day village of Valldemossa, but also because there is always plenty of water in this mountainous region.

The fact that this location has an archaeological record that starts with the first settlers and continues until the Roman period does not mean that archaeological records are easy to interpret. It used to be thought that the first settlers arrived at the site in a period between 5,000 and 4,000 years ago, tried to domesticate the Myotragus balearicus and turned Son Matge into a corral. Proof of this were the so called trimmed horns. It was thought that the horns were trimmed by shepherds to prevent the animals from injuring each other when placed in the corral. New research however has proven that the presumably clipped horns were in fact the result of living animals chewing on the horns of the skeletons for minerals (like birds of prey). Furthermore radiocarbon dating analysis performed more than 40 years ago, has turned out to be unreliable because of poor sample quality. After more than a quarter of a century of debate, almost all researchers nowadays accept that the lowest levels of Son Matge are natural and that the accumulation of Myotragus bones is not due to a human attempt to domesticate them. Understanding of this phenomenon points to a late date for the colonisation of the Balearic Islands.

The Chalcolithic vessel of Son Matge (Valldemossa, Majorca). Photo Conselleria d'Educació, Cultura i Esports (Govern Balear), Museu de Mallorca.

Incised Bell Beaker comb, most likely from elephant ivory, of Son Matge (Valldemossa, Majorca). Scale 5 cm. Photo KIK-IRPA.

'Dame of Son Matge' (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

Pottery from the rock shelter of Son Matge (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

From the second half of the third millennium BC the archaeological record comprises, besides common ware, the very typical prismatic and pyramidal bone buttons with a V perforation, shells from necklaces, bronze awls or needles implanted in the metacarpus and metatarsus of young goats. These needles appear in different stages of finish, establishing that these artefacts were produced locally. A large undecorated vessel with small handles and borders was also found at the site.

In the central part of the rock shelter a Bell Beaker shard was found with a drop of copper oxide deposited on it. This and also the so-called stone 'archer wrist guards', objects related to metal processing, are without any doubt proof of some metallurgic activity on the site. The fact that the copper deposit was found on a piece of prestigious pottery and not on common ware put the process of metallurgy in a religious or at least a communal atmosphere. Most metal objects from that period are prestigious and not meant for daily use. To cap it all a remarkable ivory comb with geometric incisions was found.

In the central area no domestic waste was found. All domestic activity seems to have been located in the Eastern part of the site. All of this leads to the conclusion that in this oldest period the central part of the rock shelter was a workshop where metal objects were made and probably also traded. In the easterly part the living quarters were situated. This arrangement may have lasted for several centuries. Nevertheless, there was probably no permanent occupation of the site, but a more seasonally related encampment.

From the middle of the second millennium BC the rock shelter became a burial site instead of a living and crafts area probably because of a cultural shift. The archaeological layers of this phase are very shallow and are enclosed between the voluminous layers of the previous phase and the lime layers of the next phase. The tombs of that period are individual graves. Around the burial ground a wall was erected that covers the older levels. The graves as well as the funeral gifts are placed tidily on top of the older levels. No graves are cut out in the underlying layers but are disposed on the surface and covered by earth. Pottery was arranged against the wall, leaving the central zone open for the graves. At this level also a large (food) jar was recovered. In the western part of the rock shelter a kiln was found and in the middle of the site a small room, probably a shrine, was noticed with an anthropomorphous (suggesting human form and appearance) small figurine that was named 'Dame of Son Matge'.

Sample from the Son Matge quicklime burial. The picture shows a block of lime, some 10 cm high, with human bones and part of an iron hair ring (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

Probably at the transition from the Bronze Age to the Iron Age (ca. 800 BC) a unique burial rite starts at the rock shelter: the so-called interment in 'quicklime burials'. For long time it was thought that people were buried, inhumed, in quicklime, in the same way as during the Medieval plague. It was believed that the chemical action of the quicklime would destroy the bodies and deform the bones. Recent laboratory experiments have however demonstrated that the quicklime protects the body from decaying and that the bone shows no deformation. This can be explained by the high alkalinity of the quicklime that sterilises the body. The bones from the quicklime burials in contrast show important deformations and plenty of cracks. In fact they look like incinerated or cremated bones. Laboratory experiments have indeed proven that they are incinerated bones, but of a special kind.

During cremation the body of the deceased is burned on a pyre. The fuel of the pyre is normally wood. The heat burns down the body tissue but also the bones. When the fire has gone out and the remains are cooled down only some charcoal, calcined bones and burned grave goods that were put on the pyre are left. The left over bones are more or less white, full of cracks and brittle, depending on the temperature and duration of the cremation. The bones from the quicklime burials however show all the degrees of combustion, from being barely touched by the fire, through charred black to ashen whiteness. Chemical analyses have proven that this was because the body on the pyre was covered by a layer of very fine crushed limestone powder. When the pyre is lit the heat will be absorbed by the limestone, slowing down the burning and calcination process of the bones. So the degree of calcination depends partly on the coverage of the different body parts by the limestone powder. At the same time the heat decomposes the limestone and quicklime is formed. When the fire has died out the quicklime and the bones are washed out and deposited at the burial site without the use of urns or any other type of container. In time the quicklime will harden and transforms into lime. This explains the observation that the bones are broken, that it is impossible to reconstruct the body or even recognize an individual deposit and that there is hardly any charcoal left in the lime. After several centuries the burial site looks like a large thick layer of lime full of bones in which no individual graves are recognizable. Within the lime burial of Son Matge some cist-like formations were noticed. It may be the case that sporadically an inhumation (without quicklime) took place. This explains the presence of an almost intact vertebral column in the burial. The presence of these inhumation graves may have led to the wrong interpretation of the lime burials as inhumation burials. The lime of Son Matge contained a lot of artefacts such as pottery and metal objects. Amongst them also the very typical lead pectorals (see intermezzo: Son Mas sanctuary site)

The quicklime burial of Son Matge is very large: about 480 $m^3$ of lime were recovered during the excavation, and lasted until the Roman Period. It is probably the cemetery for an entire village situated not far from the site.

In historical times the site was only used as a stable. At one location a large smuggler's hole was dug out of the archaeological layers. The site was under investigation for many years, but recently a large rock broke off from the roof of the rock shelter and destroyed the site completely.

Lead pectorial from the Son Matge quicklime burial (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

## 5.2. The Bell Beaker phenomenon

During the first half of the 3rd millennium BC an important cultural change took place all over Europe. For the first time the individual person is gaining importance over the group. A social system is emerging that focuses more on individual freedom and personal property. Before that the group identity prevailed. It is striking that for the first time a so-called European culture developed with a more or less uniform religion in large parts of the European continent. Also the material culture shows an important homogeneity. The name Bell Beaker is derived from a special type of pottery that resembles an upside down bell. It is a type of very fine pottery decorated with incised geometric patterns with, most probably, a symbolic meaning. But as, noted before, it is a complex and pervasive cultural phenomenon and thus much more than a pottery style. Although archaeologists believe that one of the oldest phases in the Bell Beaker culture is to be found on the Iberian Peninsula, from which it spread out over Europe, several groups within the archaeological community have not been keen to incorporate the Balearic Islands in the Bell Beaker sphere of influence — not only because it took a long time before clear, recognizable material was found, but also because it was difficult to believe that a local variant of this culture, a rare phenomenon within the Beaker world, existed on Majorca.

People lived all over the island of Majorca. Although not always very visible, stone hut foundations were found in different locations like at Son Ferrandell-Oleza and Ca Na Cotxera (Muro). The huts themselves were made of perishable materials such as straw, ropes, timber, etc. After centuries of decay only a stone circular wall of less than ½ m high remains. The fact that we are dealing with a construction in the domestic sphere and not in a burial context is proven by the absence of human bone and the presence of many bones of domesticated animals within the perimeter of these circles. Next to this archaeologists discovered at S'Arenalet de Son Colom an early type of naveta or naviform (a dwelling in the shape of a turned over boat). This partly destroyed form of construction near the sea has the shape of the later naviform buildings, but its walls have not yet evolved into cyclopic walls typical of the middle and late Bronze Age.

Beside these permanent settlements numerous seasonal campsites are recorded in the mountains. The rock shelter of Son Matge is such a site. From the spring through to autumn this rock shelter gives sufficient protection to shepherds and farmers who work the fields in the rich valley at the foot of the mountain. But in winter the place is cold and damp and gives insufficient protection against the vicious north wind. Another of these seasonal camps is the Cova de Son Torrella. This cave is situated, along with other traces of habitation, in a mountain valley 1,000 m above sea level. In winter the temperature in this valley is hardly above freezing point and the valley is certainly uninhabitable. It is however not correct to associate these temporary campsites with an economy based on hunting and gathering. These camps only exist because sites high in the mountain are not accessible all year round. The use of summer camps in the mountains was a practice that continued until the mid-twentieth century. During summer complete families of charcoal burners moved into the mountains to produce charcoal. At the onset of autumn they returned back to their villages to spend the winter.

High in the mountains also evidence was found for local copper smelting. The production of copper was long disputed because no traces of copper mining were found and finds of slag were addressed as obsidian. It must be admitted that the amount of slag that could be recovered was very limited; only a few kilograms. On the other hand in at least 25 sites (such as Cova Estretreta, Coval Simó, Coma de Mortitx) dispersed in the Tramuntana copper smelting was attested. Those sites yielded few artefacts and no evidence of habitation was found. The metal was extracted in a reduction furnace from limestone and dolomitic rocks containing copper. High in the mountains such primitive furnaces could reach high temperatures thanks to the heavy north wind that stirred up the log fire.

Evidence of the burial rites in this part of the pre-Talayotic period is scarce and limited to a few sites. The burial site at the rock shelter of Cova des Morts de Son Gallard (Deià) in the northern cliffs of the Tramuntana is without any doubt a typical burial ground that can be associated with other Bell Beaker sites in Europe. Although much damaged by later phases of habitation, archaeologists could identify two 'cist-like' burials. These were certainly individual small burial chambers or sarcophagi and not collective tombs. It could be demonstrated that one of the skeletons was a man of about 35 years old. In the same grave also fragments of Bell Beaker ware were found.

About 50 m from the rock shelter is situated the very small cave (ca. 8 m long and 4 m wide) of Son Marroig. In that cave eight secondary burials were

situated. In a secondary burial the remains of the deceased are collected after the decomposition of the corpses, probably by laying them outdoors on a special locality until only the bones remain. The bones are not redeposited in anatomic order, but in groups. Small bones are hardly found in a secondary burial. In Son Marroig the skulls of the individuals were placed at the western side of the cave, the long bones carefully stacked in the central area. This is very typical for a secondary burial. After decomposition of the body, the bones are gathered and put in an orderly fashion in the tomb. The site is younger than the Bell Beaker layers of Cova des Morts de Son Gallard. Unfortunately the cave has never been fully investigated.

We have even less information about the religion of these people, although indications are found for an astral religion. (see intermezzo: The Son Mas sanctuary site) in which the Southern Cross played an important role. Around 1,700 BC Bell Beaker pottery disappears from the archaeological records and this would indicate the transition to another period.

The presence of early tin alloys on Beaker pottery, the type of decoration of these pots, and evidence of an egalitarian society with low levels of socio-political complexity, all suggest a close relationship between the early settlers and the Languedoc. In this period contacts with the source region still exists. The idea of insularity seems to be a slow growing process.

## 5.3. The first Minorcans and the megalithic tombs and dolmen

The first colonists of Minorca arrived probably a little later than their Majorcan neighbours. The oldest dated human remains so far found come from one of the two burial rooms of Biniai Nou and are dated at the end of the 3rd millennium BC.

Together with the human bones a pot of the Horgen type was found.

The Horgen culture descends from the Alpine foothills and is dated between 3400 and 2800 BC. Probably those people moved down the Rhône valley to the south and from there made contact with Minorca. At the same site also pottery is found that probably could be related to Sardinia. On the other hand no Bell Beaker is found on Minorca. This demonstrates once more how complex and difficult it is to understand the colonization of the islands. The immigrants to Minorca probably ventured the crossing from the north (Golfe du Lion) to the north-east/east (Sardinia).

Monuments such as Biniai Nou belong to the megalithic tradition. This is a somewhat misleading term. The word 'megalith' simply means 'big stone'. It is a composition of the Greek words 'mega' and 'lithos'. So one would expect that all constructions made up of large blocks of stone would be called megaliths. This is however not true. The idiom was introduced in the 19th century as a generic name for all stone monuments from the

Burial chamber of Biniai Nou (Minorca). Photo Mark Van Strydonck. Museu de Menorca

Neolithic and the Early Bronze Age. Monuments such as dolmen, Hunebedden (The Netherlands), Menhirs (France), stone circles etc., which are found all over Europe, belong to this group, but equally, cult sites such as Carnac in France and Stonehenge in the U.K. are part of the megalithic culture. The monument of Biniai Nou is built in this megalithic tradition and stands midway between a dolmen and a hypogeum. It consists of a rock-cut burial chamber with an almost circular floor plan and a corridor built in front of it. The corridor is made of large stone slabs and is covered by earth. The burial chamber was not cut out down into the bedrock but horizontally into an outcrop. In the middle of the burial chamber the archaeologists discovered a small pit were the, till now, oldest human bones of Minorca were found.

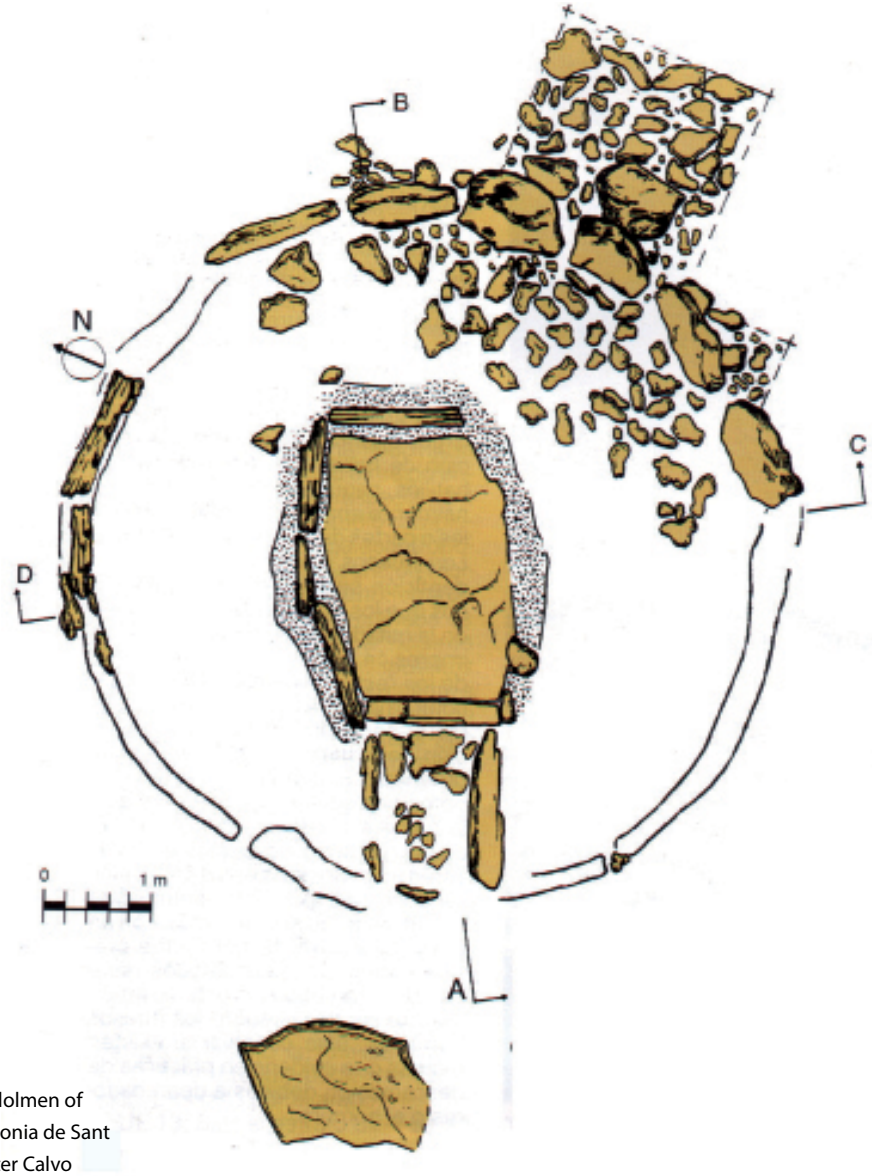
For the moment the second oldest artefacts on Minorca come from funerary constructions called dolmens. Dating analyses performed on material from the dolmens place these Minorcan, but also Majorcan, monuments in a relatively short period from the first quarter of the second millennium BC until the mid-second millennium BC. These are rather recent dates for this type of construction. Dolmens are part of a funerary tradition used by several cultures over a long time, but mostly attributed to the 4th and 3rd millennium BC. So the Balearic dolmens can be considered late. Their geographic distribution on both islands is remarkable. On Majorca they are only found in the north-east part of the island, around the bay of Alcúdia (Son Bauló de Dalt, S'Aigua Dolça) and on Minorca only in the south-eastern part of the island (Ses Roques Llises, Montplé, Alcaïdus). It looks as if the sea played an important role for the people who build these burials. This is particularly striking if one looks at the positioning of the Majorcan ones. Son Bauló was built right behind the sand dune belt and S'Aigua Dolça is erected on a fossil coastal dune about 20 m from the present day coastline.

Their structure is related to the dolmens found in Catalunia, the Languedoc in France and those in Sardinia. But the Dolmens on the Balearic Islands are all more or less oriented to the south-west. This could be an indication that the Languedoc is the source region of the dolmen builders. The dolmens on the Balearic Islands consist of a large overground chamber made of large stone slabs or orthostats and covered by a roof. Probably the roofs of the Minorcan dolmens are made of stone

Horgen pottery from the burial chamber of Biniai Nou (Minorca). Photo Museu de Menorca. Museu de Menorca.

Dolmen of Alcaïdus (Minorca). Photo Mark Van Strydonck.

Dolmen of Ses Roques Llises (Alaior, Minorca). This dolmen is built with six flat stones of more than 2.5 m high. The burial chamber is entered by a hole ca. 60 cm high and 50 cm wide, cut out of the port-hole slab. The chamber is almost 3.4 by 1.8 m large. Inside the room pieces were found of the stone slab that served as a roof. Around the dolmen an oval ring of stones was found. These stones were probably laid down to keep the earthen mound that was put over the monument in place. Photo Mark Van Strydonck.




Floor plan of the dolmen of S'Aigua Dolça (Colonia de Sant Pere, Majorca). After Calvo Trias, Coll Conesa & Guerrero Ayuso).

slabs, while on Majorca it seems that the roof, made of wooden beams, small stones, mud and plant material, was supported by wooden poles. On the shorter side of the monument, a hole was made in the stone slab creating a passage between the funerary room and a short corridor. The cut out hole is typically about 45 cm large and has a groove or lowered border of about 5 cm deep so that the entrance could be sealed off with a keystone. The entire monument was covered by an earthen mound or tumulus.

While the site of S'Aigua Dolça was being excavated the delineation of the round tumulus became visible. A round stone circle of 6.75 m diameter was unearthed. The stones were imbedded in a 20 cm wide and 8 to 11 cm deep trench cut out of the bedrock. About 50 cm of the stones protruded from the trench; unfortunately they were badly damaged by later activities on the site. At the south-west the circle was interrupted by a corridor of 1.65 by 1.3 m. Also at the dolmen of Son Bauló remnants of this type of stone circle were found. The chamber of the dolmen has an almost rectangular outline, with a length between 3.5–4 m and is between 1.5 and 2 m wide. The chamber is made of large stone slabs embedded in a small trench also cut out of the rock. At S'Aigua Dolça these trenches were about 25 cm deep and 64 cm wide and the stability of the orthostats was secured by filling the trenches with pebble stones. The floor consisted of the natural rock, in some places lowered and smoothed. The dolmen served as a collective secondary inhumation. Inside the chamber of S'Aigua Dolça the excavators found eight human skulls, six of which were lined up. Along with the skulls small bundles of human bones were discovered. These bundles consisted mainly of long bones. Smaller bones and fragments of shoulder and hip bones were found scattered, none of them in anatomic order.

Dolmen van Son Bauló de Dalt (Majorca). Photo Mark Van Strydonck.

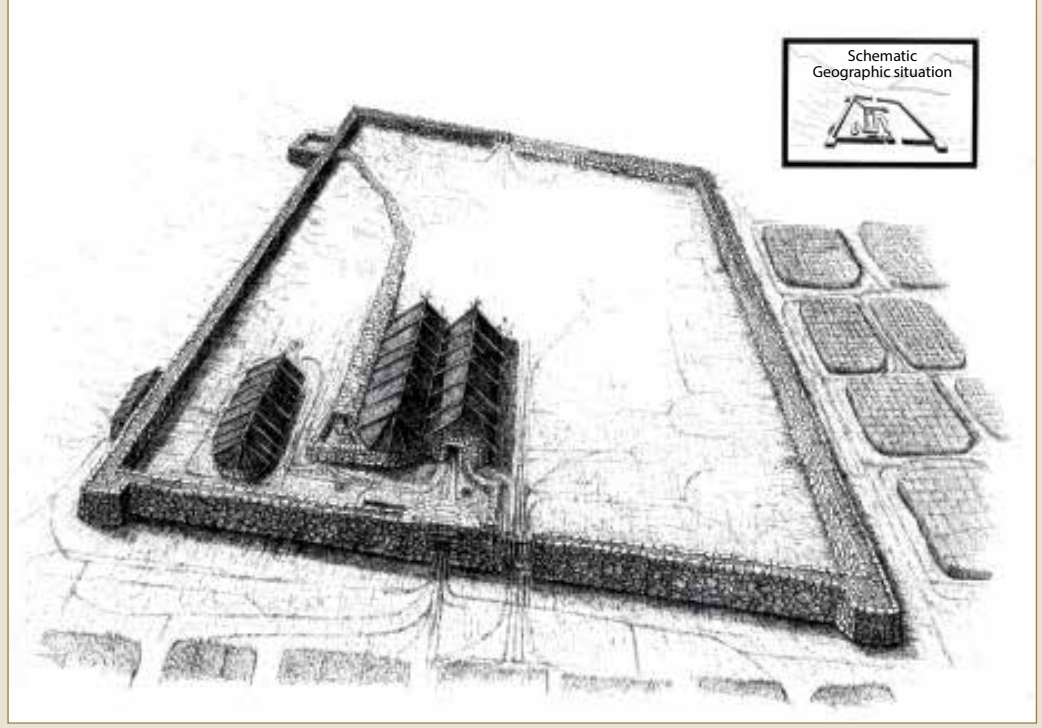
The grave properties found in the dolmen are very typical for the first half of the 2nd millennium BC. Since the number of dolmens is rather limited, the community associated with these burials must have been small. How the people lived is not documented. They were probably herdsmen and practised a slash-and-burn agriculture. This is an agriculture in which a terrain is cleared from vegetation by cutting and burning the natural vegetation, whereafter it is used for agriculture for several seasons. Then the land is left to return to forest. Chemical investigations have shown that fish was never, or hardly ever, part of their diet. This is remarkable in the light of the fact that the population lived on relative small islands, especially on Minorca, and that the sea was never far away.

## INTERMEZZO: Son Ferrandell-Oleza, a pre-Talayotic farmhouse

The pre-Talayotic settlement of Son Ferrandell-Oleza as well as the Son Mas sanctuary, which will be discussed later, and many other archaeological sites, are situated in Pla del Rei, the valley of the king, on Majorca. This valley is situated in the mountain range near the modern village of Valldemossa, known to all tourists because Frédéric Chopin and George Sand resided in the local monastery one winter. The valley is surrounded by the mountain chain, except to the north, where the valley, just behind a small ridge, called Puig de la Moneta, is cut off by a 400 m deep cliff overlooking the sea. There is one road, a pass through the mountain range that runs along the small village of Valldemossa and the previously discussed Son Matge site to join the Central plain a few kilometres further on.

The oldest layer of the site (ca. 2,300 BC) contains the remains of huts made of plant material based on a foundation of rock cut stones and hearths. The site is very rich in Bell Beaker ware. The inventory comprises pieces that can be related to the Bois Sacré typology from the south of France as well as to the younger Arboli style. Also Boquique ware was found, a later variant of the Bell Beaker culture. Petrographic analyses have identified mica in the shards. This proves that the pot was imported because mica is not found on the island of Majorca.

The Pla del Rei in the Tramuntana mountain range.
Photo Mark Van Strydonck.




Reconstruction of the pre-Talayotic site of Son Ferrandell-Oleza (Valldemossa, Majorca). On the drawing the wall of the enclosure, the naviform houses and the water channel can be recognized. (Drawing: W. Waldren; D.A.M.A.R.C.)

On a more recent stratum above these huts, in a second phase of use of the site, a farm with monumental proportions was built. It is a rectangular open air site of ca. 3,600 $m^2$ surrounded by a large rectangular shaped compound wall about 2.5 m large at its foundation. This dry stone double faced wall consists of a double row of stone blocks with an infill of rubble, earth and dust. This kind of wall construction is typical for the prehistory of the Balearic Islands and can be observed until the post-Talayotic period. At two of the corners small buttresses are built to support the walls, which are built on a gentle slope. The southern entrance has a tower-like structure with a stone-covered passage and a small porch or guardroom. There is no such tower-like construction at the northern entrance. Within the compound wall one can distinguish, next to an undetermined structure, two dwellings in the shape of an overturned boat, the so-called naviformes. The walls of these houses are up to 2 m thick at their foundation. In the western part of the compound one can find a ca. 60 m long water channel that was originally covered with stone slabs and clay to avoid leakage and evaporation. This channel led the water from a ca. 40 $m^3$ large reservoir into a catch basin in the settlement.

Despite the thick walls and the tower-like entrance a defensive purpose of this compound wall has to be ruled out. On the entire site not a single object that even looks like a weapon has been found. But much more important is the fact that from a defensive point of view it would be completely meaningless to build a water reservoir on the outside of the compound wall. A besieger would be able to cut off the inhabitants of the farm from their water supply without striking a blow. But, if animals were kept inside the compound area, than it was better to have the water reservoir in a place where pollution by animal excrement is avoided. Furthermore the fact that only the southern entrance is fortified and the northern is not, argues against a military purpose to the design. Rather, the walls surrounding the settlement have to be considered as a manifestation of social prestige and differentiation fitting within the framework of a social organisation based on extensive occupation.

There is certainly a clear organisation of the space within the settlement, with a western part used as a living and working space and the eastern part where the animals were kept. In that section numerous animal bones were excavated, mostly (about 85 %) of goats and sheep, the rest cattle and pigs. All

Boquique shard from Son Ferrandell-Oleza (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

Cheese mould originating from Son Ferrandell-Oleza (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

Reconstruction of a sickle made with silex flakes originating from Son Ferrandell-Oleza (Valldemossa, Majorca). Photo Mark Van Strydonck, D.A.M.A.R.C.

pig bones were from young animals, meaning that they were kept for meat consumption. Most of the goats and sheep were kept alive much longer, because they were kept for milk and wool. Cattle bones were rather exceptional. This is quite logical if one assumes that they were only used as beasts of burden. Amongst the large quantity of ceramic finds on the site vessels used to make cheese were found. This implies that the agricultural products were locally processed.

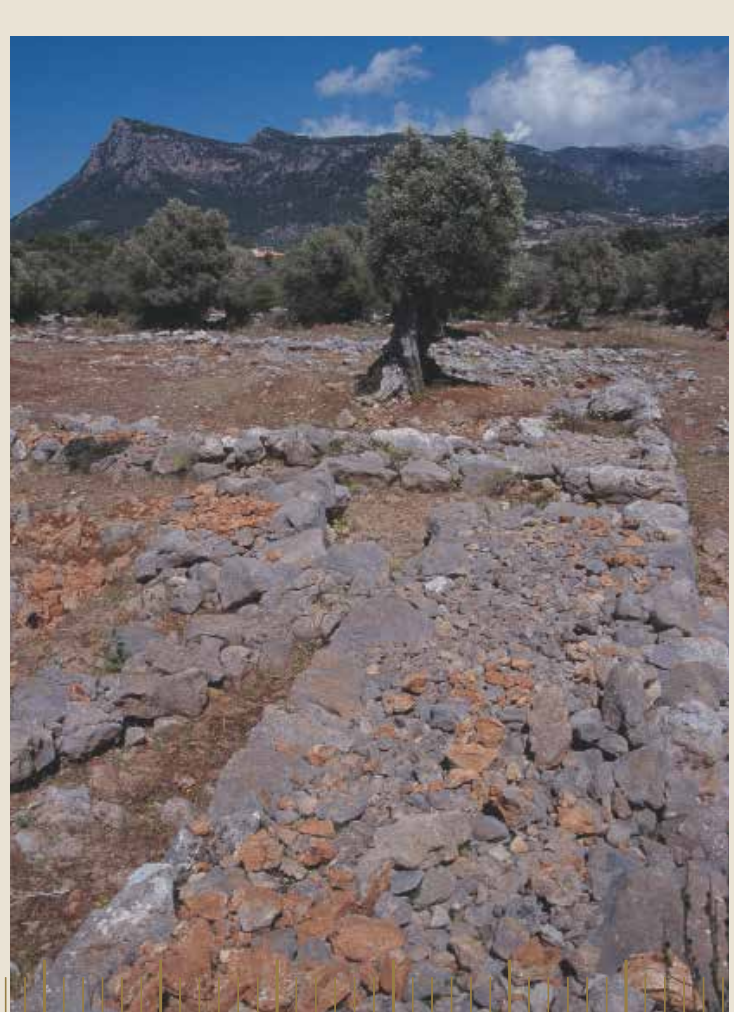
About 700 pieces of serrated flint flakes, parts of a sickle, were excavated. The large quantity of these objects is, on the one hand, an indication of the high quality lithic industry and, on the other hand, proof of the agricultural activity on the site. Most probably wheat and barley were grown.

Besides globular and conical pottery the artefact ensemble comprises numerous examples of the typical V-shaped perforated bone buttons. Sometimes they are pyramidal, sometimes they are flat cut pieces of bone in which a V-shaped hole is drilled. They are most probably buttons for a mantle or a hood. Ivory and shell necklaces were also found on the site. Other arts and crafts are also attested, besides the previously mentioned cheese mould, loom weights and crucibles have been found. Local copper production was demonstrated by primitive ovens and sprues. This is the piece of hardened metal that remains in the runner of a mould. Because these pieces are thrown away when the object is removed from the mould, they are an indication of local production (see also intermezzo: Son Mas sanctuary site). Indeed, copper ore is found at the coast down from the settlement.

This settlement must have been inhabited by an extended family of about twenty persons. How these people were interrelated and what kinds of contact they had with other groups is hard to know.

In the Iron Age, just a few 100 m from the pre-Talayotic farm, a Talayotic village was built. Four talayots on a row and houses were discovered. Although only partly excavated, this settlement has the typical outline of a Talayotic village.

It is clear that this settlement, in all its successive phases, was inhabited for more than 1,000 years. Traditionally, land erosion is indicated as the cause of abandonment of the site. This is a reasonable assumption. Due to extensive agriculture and deforestation the soil not only becomes impoverished, but the occasionally very heavy rains will cause considerable erosion of the terrain.



The remaining wall basis of the Son Ferrandell-Oleza compound wall (Valldemossa, Majorca). Photo Mark Van Strydonck

# 6. Middle and Late Bronze Age

Bronze knife (1600–1400 B.C.) from s'Alova (Sóller, Majorca). Photo Museu de Sóller.

Pottery from Trebalúger (Es Castell, Minorca) (15–14th century BC). Photo Conselleria d'Educació, Cultura i Esports (Govern Balear).

During the Middle and late Bronze Age a gradual evolution leading to a more indigenous culture can be seen. This does not mean that the islands became completely cut off from the outside world. Objects made of bronze, a mixture of copper and tin, are found in archaeological sites on both islands. Tin ores are not present on the island, so tin as a raw material, or unprocessed bronze alloy, or the bronze objects themselves must have been imported.

## 6.1. Naviform buildings

In the middle Bronze Age caves fell into disuse for habitation. Funeral practices on the contrary made use of natural as well as artificial caves called hypogea. The most common dwelling in this period is the naveta or naviform building. The typical naviform is an elongated building with on one side an apse that stands midway between an oval and a point. The entrance is on the opposite shorter side. The double faced walls are very thick and become even thicker near the apse. The walls are made of large stones and the space between them is filled with rubble. This type of wall is typical for all Balearic constructions until the Roman invasion. In most cases the roof of the building is made of perishable materials such as wood and branches. The presence of dried clay lumps (Closos de Can Gaià) inside the naveta is an indication that the roof was finished with a clay layer that made it impermeable. In what shape the walls were constructed is not very clear, but it looks as if they were made oblique and that the roof had the shape of a false cupola; but other shapes such as a saddle roof are not impossible. The arrangement of the inner space and the division between activity- and residential zones is very uniform for all naviform houses. Near the entrance, where there is most daylight, one can find the workshop zone. In the middle the hearth is situated and at the end, in the darkest part of the construction, probably the residential or sleeping zone. Left and

The very large naveta or naviform dwelling from Closos de Can Gaià (Felanitx, Majorca). Photo Mark Van Strydonck.

The habitation naviform of Cova de Moro (Son Mercer de Baix, Ferreries, Minorca) is built near a cliff that overlooks the canyon or Barranc de Trebalúger and Son Fideu. This dwelling is exceptionally constructed with a stone roof supported by several very heavy columns. Photo Mark Van Strydonck.

right, along the walls, benches are found. The hearths, benches, querns, bone, stone implements, pottery for consumption and storage, food remains and metallurgical production residues, all are an indication of the many activities associated with the craft production that took place in the naveta. The naveta is the economic and social unit, and only a moderate development of the division of functions between buildings has been noticed in this period. This implies that no politico-economic centralization or hierarchy existed. Pre-Talayotic society was organized in units that were basically autonomous.

Most of the naviforms are freestanding, alone or in a group, but sometimes they are connected and have one common wall. Surveys on Majorca of about 70 buildings have revealed that they were preferably built in the plain. Preferred locations were amid fertile land and calcareous depressions suitable for agriculture. Nevertheless, they appear in all eco-systems, even in the mountainous areas (such as the hills around Pollença), but apparently never on an elevation higher than about 200 m above the plain. So they are also to be found on low slopes near torrents or other fresh water sources. Although most navetas are built in a loose conglomerations rather than in real villages, it has been noticed that at some sites, especially coastal sites built on a promontory (Cala 'n Morell in Minorca and Sa Ferradura in Majorca), a group of navetas is protected by a large wall built perpendicular to the promontory.

There were never even one tenth as many naviform buildings on Minorca, even during the most intensive phase of this building style (1400–1200 BC), as can be seen on Majorca. They mostly appear on the western part of island. This implies that on the western part of this small island people had a sedentary live based on agriculture. Excavations (naviform of Clarina, Son Mercer de Baix) showed that they were inhabited all year round. The naviform of Cova des Moro (Son Mercier de Baix) is the only one with a roof of stone slabs supported by columns. These columns are built with stone blocks smaller at the base of the column and larger near the top. This type of column is very typical for the Balearic Islands and was used in the Bronze as well as in the Iron Age.

One of the naviform buildings at Cala 'n Morell (Minorca) with the double faced walls, the central hearth and the benches. Next to the entrance a niche is built. Photo Mark Van Strydonck.

Bone Plate (ca. 4 cm long) with circular incisions from the naviform building at Ses Roques de Son Baduia (Valldemossa, Majorca. Photo KIK-IRPA, D.A.M.A.R.C.

Bone triangular bone perforated button (ca. 1.5 cm long) from the naviform building at Ses Roques de Son Baduia (Valldemossa, Majorca. Photo KIK-IRPA, D.A.M.A.R.C.

Bone awl from the naviform building at Ses Roques de Son Baduia (Valldemossa, Majorca. Photo Mark Van Strydonck, D.A.M.A.R.C.

Niche at the naviform of Cala 'n Morell (Minorca) with a grinding stone or quern. Photo Mark Van Strydonck.

Somewhat later, a little after 1200 BC, a new element arrived in the organization of the Majorcan naviform settlements. For the first time on Majorca a building is found that implies a social hierarchy. On the site of Es Figueral de Son Real between the naviform buildings, a construction was built on higher ground. The building has a somewhat irregular floor plan, but resembles a naviform with an apse to the north. The entrance was situated to the south east. It was built on a platform and could only be reached by some stairs. It is obvious that that this structure was built in a prominent place within the agglomeration and that its erection called for an extra effort for the local naviform community. Inside the building three fireplaces, handmills and grindstones were found. It looks as if this building had a social function. Regardless of the real social meaning of this building, it becomes clear that this settlement starts to resemble more a real village in the modern sense.

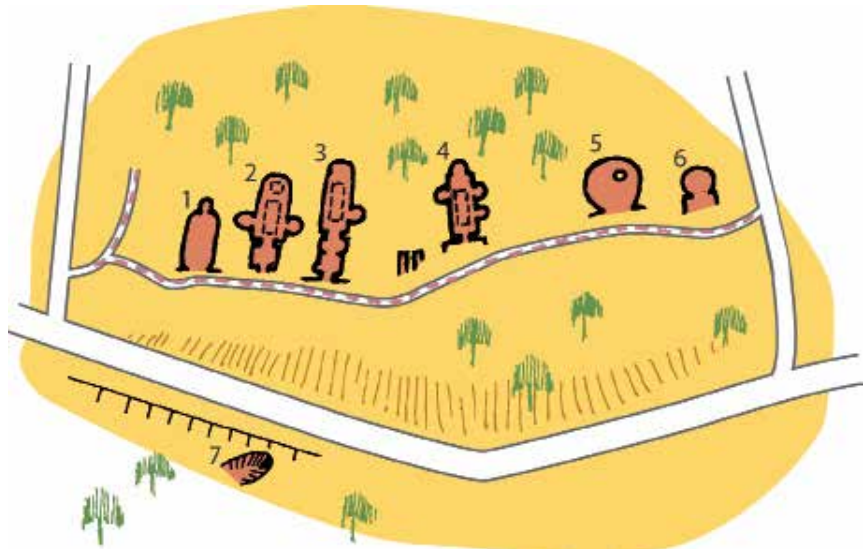
## 6.2. East Minorca

About the people living in the eastern part of Minorca little is known. Our knowledge is limited to the sites that survived destruction from Talayotic settlements built over them (as was in the case in Trepucó, Torralba d'en Salord, Torre d'en Galmés). The impression the archaeologists derived from these constructions is that of a dwelling of irregular walls built with small stones and finished with perishable plant materials. The relatively large size of the buildings give the impression of an economy based on animal husbandry. So the people living in eastern Minorca are probably herdsmen having a less sedentary life than those of the west of the island.

## 6.3. Hypogea

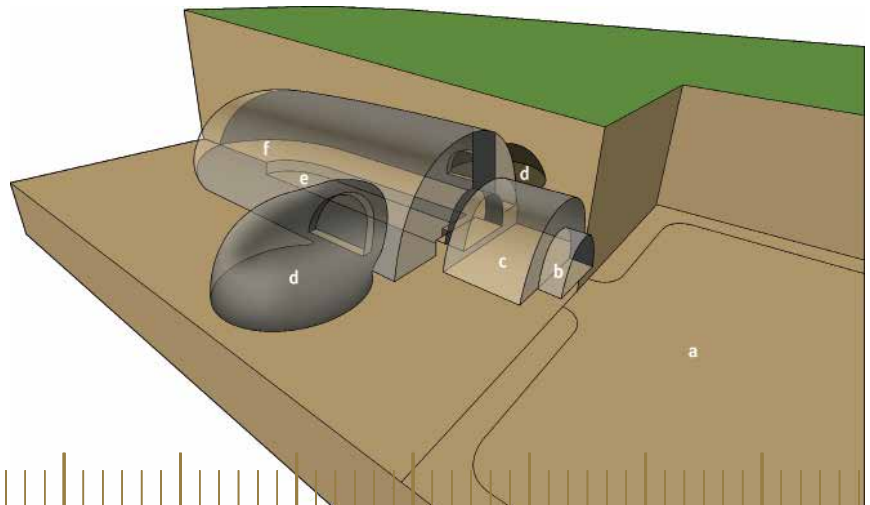
During the initial phase of the naviform building tradition, a gradual transition from interments in caves and dolmens to hypogea can be observed. A hypogeum is a burial chamber cut out from the rock with a very typical structure. Basically it is a round or oval chamber with an entrance. The most common type however has different elements. An open ramp or stairs (Torre del Ram on Minorca) leads to an entrance with a copestone and a vestibule or antechamber. Behind this vestibule one can find an oval chamber with a barrel vault. Along the walls benches are cut out of the rock (Na Fonda, Son Amer on Majorca). More complex caves have vestibules with small niches. Some monuments show remnants of an above-ground construction built around an open ramp that leads to the entrance. This type of burial chamber can be found separate or in groups as in the case of the Majorcan necropoles with five (Cala Sant Viçenc), six (Son Toni Amer) or up to eight (Son Sunyer) caves. The degree of complexity of the caves is certainly not a dating criterion, but is related to the social status and the size of the community that has cut out the hypogeum.

This type of burial is very common in the Mediterranean basin and comes about on the Iberian Peninsula as well as on the nearby island of Sardinia. It consists of a primary interment whereby the bodies were deposited in orderly fashion in the burial chamber. In the round chamber of Son Sunyer VII for instance the bodies were radially arranged with the heads towards the outside and supported by a small ledge that ran alongside of the chamber. Some authors claim that the dead were laid down on the benches alongside the wall and that the middle part, the deeper cut out trench, served as an ossuary for the previous interments. Very exceptionally, as at Son Mulet (Llucmajor, Majorca), human remains were found in the lateral parts as well as in the main chamber. In that room up to three levels one upon another were used.




Ensemble of the hypogea at Cala Sant Viçenc (Majorca). After C. Garrido & T. González.

Idealized plan of a pre-Talayotic hypogeum:
A: open ramp or stairs;
B: entrance;
C: vestibule or antechamber;
D: side chambers;
E: central trench;
F: benches at both sides of the elongated chamber with a barrel vault.
After Garrido & González.




On Majorca one can find these monuments dispersed over the Serra de Llevant, around the massif of Artà as far as the most northerly part of the Serra de Tramuntana, but they can also be found in the plain. On Minorca their range is limited to the western part of the island. Investigation of these burial chambers is hampered because unfortunately most of them have been robbed or reused in later times. Exact dating especially of the construction as well as the use of these monuments remains problematic. Dating of these monuments in the early phase of the naviform period is based on comparison of artefacts such as pottery and metal objects, rather than on absolute dating methods.

Pre-Talayotic globular pot with handles from Cala Bota (Manacor, Majorca). Photo Museu de Sóller.

Entrance of a hypogeum at Cala Sant Viçenc (Majorca). Photo Mark Van Strydonck.

Entrance of the hypogeum of Mercier de Dalt (Minorca). Photo Mark Van Strydonck.

## 6.4. The cave burials

Hypogeum of Mercier de Dalt (Minorca). Photo Mark Van Strydonck.

From 1,400 BC onwards interments in natural caves gain importance again (see intermezzo). The cave of Càrritx as well as the Cova des Pas on Minorca are typical examples. The Cova des Pas cave is a karstic cave in the cliffs of the Barranc (canyon) de Trebalúger. It is a small cave only 6.5 m deep, 4.5 m wide and 1.7 m high and is situated about 15 m above the canyon floor. More than 70 burials, in foetal position, were found in this cave. The inventory of metal objects from the cave comprises several bronze bracelets, a needle, some small metal rings and a small spear head. No pottery was found but a remarkable find consists of some tabular tubes in leather or antler, with a top and base made of wood or bone. These tubes contain, just as in Cova de Càrritx, human hair, indicating that the burial rites in both caves are probably the same. According to the archaeological records the bodies were at first disposed near the entrance of the cave, later on in deeper parts. No orientation in the depositions could be noticed. To keep the bodies in the foetal position they were tied up with ropes. The bodies were wrapped in a bovid skin and placed on a wooden bier. This would facilitate the climb to the cave entrance. Under the deceased, small branches and leaves were deposited. This type of burial rites stops completely at the beginning of the Iron Age (800 BC).

## 6.5. What's in a name?

According to one school of thought, this period marks also the beginning of the Talayotic Period. This creates an odd situation because according to other archaeologists the received concept (see further) of a talayot did not exist at that time. Scholars are divided, and every new discovery produces a new arguments pro or contra. The arguments of both groups are basically as follows: some argue that there is a substantial difference between the classic talayot prevalent especially on Majorca and the earlier constructions on Minorca. Others claim that one cannot speak of a Talayotic culture if there are no talayots. This is a simple and clear argument. So the most important question is: what is a talayot? A talayot in its most simple description is a

dry stone conical tower. In that respect it resembles the Nuraghe from Sardinia and the Torre from Corsica. Does this mean that there is a relationship between those monuments? Not necessary, a conical construction with a round floor plan is the most obvious way to build a tower without the use of mortar or cement. Furthermore not all talayots look alike, even the talayots supposed to have been built in the same period (see further) can differ in size and shape. Especially the differences between the Minorcan and the Majorcan examples is striking. But the name talayotic is also the name of a culture. One can feel immediately the difficulties arising from the use of this double meaning for the same word. Are all talayots from the Talayotic period? Is there a Talayotic period without talayots? Is the Talayotic period on Minorca the same as on Majorca?

The name talayot (watchtower) was given in the 19th century because of the outstanding monumentality of these buildings. The question was never asked if they all dated from the same period, were built for the same purpose or even belonged to the same cultural phase. This situation can be compared with what is known in Western Europe as a Donjon. A Donjon is a heavily fortified central tower or keep of a mediaeval castle. It was used for protection and therefore built as a very massive construction, but over the centuries it lost its military significance and became a prestige possession, a manifestation of social prestige. So the donjon changed function and survived the Middle Ages. It is not impossible that such an evolution took also place during the prehistory of the Balearic Islands. Later in this book it will be shown that all Majorcan talayots are of Iron Age origin, and all have similar functions; but that this is different in Minorca, where unfortunately not many talayots have been excavated. An exception is the two talayots found on the site named Cornia Nou. The excavations at Cornia Nou have shown that the talayot must have been built before ca. 1,000 BC.



## INTERMEZZO: The talayot of Cornia Nou

The site of Cornia Nou comprises an eastern sector of a small talayot with an inner corridor, interpreted as a monumental entrance gate to a walled hill where the early nucleus of the village could have been, and an immense west talayot, one of the largest in Minorca. Before excavation, only the tower was visible and the complete south building attached to the talayot was covered by earth.

After excavation, the south building (ca. 13 m long) became visible, as well as a series of structures attached to the east wall of the building and the talayot. There are probably talayotic structures attached to the west side of the building too, but this part is still under investigation. The site has a long building history. At first there was only the tower. On the east side of the tower, there is a small opening at ground level that must have offered access to a tunnel or staircase leading to the roof of the building. Nowadays, this tunnel or staircase is collapsed, but both entrances, one at ground level and one on top of the talayot, are still visible. It is unclear if the monumental stairs at the south face of the building are part of the original construction. The fine finish of the staircase with

The west talayot of Cornia Nou before excavation. The south building is covered by earth. Photo Mark Van Strydonck (Museu de Menorca).

The west talayot of Cornia Nou after excavation, view from the south to the north. Photo Antoni Ferrer (Museu de Menorca).

accurately aligned large stones suggests that the staircase is original, but the monumental staircase is at odds with the existence of the small entrance on the east side of the building. The size of the entrance and the tunnel to the top of the building look as though they were intended to hamper access to the top of the talayot, either for protection or because access was limited to a small or elite group of people. The big stairs, however, invite people to go up.

Next, the south building was attached to the tower. One can recognise several construction phases. Initially only the perimeter wall with a slightly concave façade and a central entrance was built. The interior organisation of the south building at this stage is unknown due to later redevelopments. During the next construction phase, the south building was divided in two. The north half of the room was completely filled with stones, except for a corridor which connects to the platform created by filling up the north half of the building. During a fourth building phase, the south part of the south building was modified and divided into smaller rooms. A central hearth was laid out in the corridor. Some modifications, like a pavement in the easterly room, were made slightly later. The sixth and final phase consists of new conversions and the paving of the west room. The room was abandoned in the 6th–5th century BC. In an area attached to the south building, two human burials were found, one dated to the late Iron Age and one Roman. This is an indication of a reuse of the site after its abandonment.

The first chronological information comes from a radiocarbon date of some material from phase 4 and places this construction phase around 1,000 BC. This implies that the big tower is older than its Majorcan counterparts and must belong to the Bronze Age. The artefacts found in the south building indicate that, at least in that chronological phase of the site, it was used as a centre for the product processing, storage and redistribution, just like the Majorcan talayots. The purpose of the original tower is still unknown.

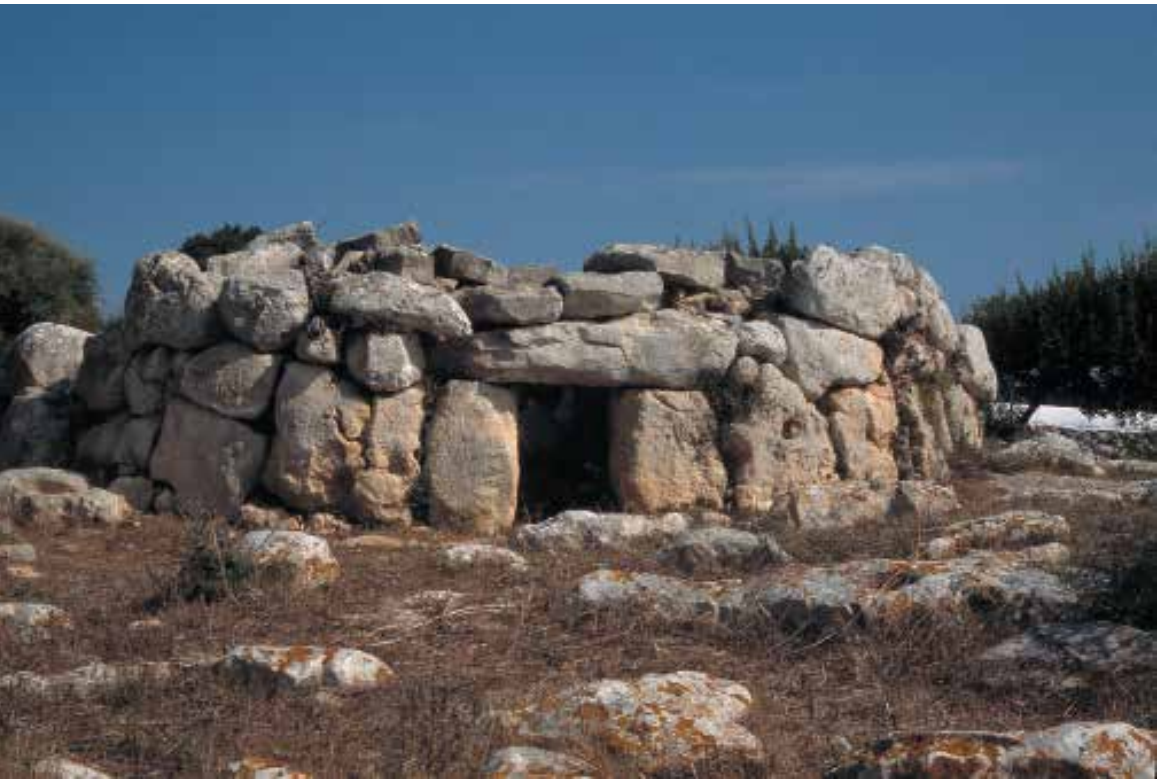
## 6.6. Burial Navetas

Towards the end of the second millennium BC a new type of building appears on the island of Minorca: the Naveta. Just like the naviform houses the building resembles an overturned boat, but it has a completely different function. Navetas are collective tombs. Apparently they appear out of the blue, but archaeologists now assume they evolved from the dolmens of the south easterly part of Minorca. In a first phase the building looked like a cyclopic construction with a circular or oval floor plan (Biniac-L'Argentina, Torrellisà, Torralbet, Cotaina, Llumena d'en Montanyés). They resemble dolmens with a more or less rectangular chamber a perforated stone slab that separates the chamber from the short entrance passage, and the earthen tumulus is replaced by a stone construction. They evolved steadily to the elongated burial navetas, so typical for the end of the 2nd millennium BC on Minorca. At that time the resemblance with the dolmen is completely lost.

Navetas consist of two rooms, one on top of the other. Bodies of the deceased were buried in the lower chamber. After the bodies decayed the bones were collected and deposited in the upper room which served as an ossuary. These monuments contained many funereal offerings, alongside earthenware-like bowls and dishes, also daggers and awls, copper discoid bone objects, the omnipresent perforated bone buttons and stone tools such as grindstones and arrowheads.

The most evolved, probably also the most recent, and without any doubt the most beautiful, naveta is the building of Es Tudons. This naveta lies in the territory of Ciutadella, the second largest town on Minorca, near the road that connects Ciutadella with Mahón (Maó). This monument was restored in all its glory in 1975. Obviously this building has the typical naviform structure with an apse at the one end and a flat to

Burial naveta of Argentina Occidental (Alaior, Minorca). Photo Mark Van Strydonck



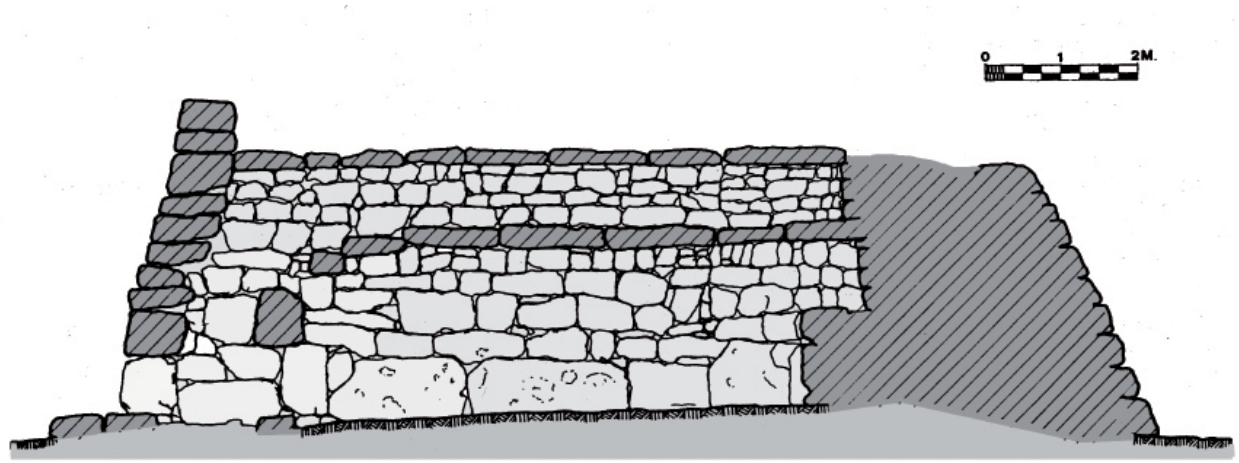
Burial naveta of Rafal Rubí (Alaior, Minorca). Photo Mark Van Strydonck.

slightly concave façade. In front of the entrance originally there must have been a platform in a semi-circular form. The wall basin is made of cyclopic stones of progressively slenderer dimensions. The walls lean gently over to the middle of the building, which is covered by a flat roof. The building is accessed by a very low square door. This opening is bridged by a very heavy lintel. Through this opening a square porch is entered that gives access to ground level as well as to the upper room. The lowest room is about 7.25 m long and is entered by a second door opening. From the porch one can also enter the upper chamber which is about 7 m long. Very heavy flat stones separate the lower from the upper room. The upper room is without any doubt an ossuary. During excavations in the middle of the 20th century, bones from several hundred individuals were discovered.

Recent dating analyses have shown that the first proto-navetas (like Ses Arenes de Baix), appear when the use of dolmen is in decline, around 1,600–1,500 BC. The navetas were in use for a long period until this form of burial fell into disuse around 800 BC, apart from accidental reuse. The observation that navetas, and this in contrast to the naviform dwellings, are only present on Minorca points strongly to the theory that the islands' cultures developed separately.

Burial naveta of Es Tudons (Ciutadella, Minorca). This burial monument is 13.6 m long and is 6.4 m wide. It has a concave front and the shape of an elongated horseshoe. Photo Mark Van Strydonck.

Drawing of the naveta of Es Tudons (Ciutadella, Minorca). After Plantalamor-Massanet.



## INTERMEZZO: The Caves of Càrritx and Mussol

It is always a difficult task for archaeologists to picture the daily life and religious rites of ancient civilisations starting from the material remnants that survived over time. But sometimes archaeologists are lucky and the material remains are so overwhelmingly clear that it is possible to reconstruct the past in all its details. Speleologists had such luck in the 1990s when they were exploring two caves on Minorca. The objects that the archaeologists discovered were without any doubt spectacular and are unequalled in European prehistory. The find encompasses the sites of Cova de Càrritx in the Barranc (canyon) d'Algendar in the southern part of Minorca and the Cova des Mussol, a karstic cavity in the middle of a steep coastal cliff somewhat north of Ciutadella. Both caves give an insight into rites of passage and burial rites for a period spanning several centuries. The objects retrieved show very well how the prehistoric society of the island changed in the middle and Late Bronze Age.

Wooden horned figurine from the Cova de Mussol (Minorca). Photo Peter Witte; Universitat Autònoma de Barcelona.

The oldest finds in either cave go back to about 1,600 BC. Deep in the cave of Càrritx, the explorers found human bones from hands and feet in particular, as well as pieces of manipulated stalagmites in crevices of the cave wall. In one particular place, three metatarsal and one metacarpal bone had been laid down, pointing to a hearth. Even deeper, near the end of the cave, an earthenware pot with two bulges shaped like nipples pointing to the visitor was found in a space cleared by breaking off the stalagmites. The space where this pot was found was very small; only a few people could have entered the chamber. Undoubtedly, subterranean ceremonies of a belief in underground forces, responsible for the renewal of life must have taken place in this cave. All life comes from the earth, symbolised by the female sex. This fertility rite contrasts sharply with the rites that took place in Cova des Mussol, a few hundred years later, between 1,200 to 1,000 BC. After a laborious climb from a boat moored to a cliff wall, the Bronze Age people must have reached the entrance of the cave. The speleologists found oil lamps far into the cave which must have led the way more than 3,000 years ago. In the deepest and least accessible section of the cave, a sanctuary was found through an antechamber, protected by a flat stone. The space was very small and only a few people could have entered. High, on a flat part, as on an altar, a zoomorphic figurine made of wild olive (Olea europaea) had been placed. It overlooked the entire room. The face displays a hooked nose, a horizontal groove as a mouth and had no ears but two horns, like those of a young deer. This is highly remarkable, because deer are not found on Minorca.

Several pieces of worked wood were found on the cave floor. One of them could be identified as an anthropomorphic carving. It represents a human head, probably male, also made of wild olive. The head is looking up with an open mouth, singing or worshipping. Archaeologists see a precursor to the Celtic god Cernunnos in this horned figure. This deity, of whom the oldest representation was found in Northern Italy, was worshipped all over Europe, up to Denmark and the British Isles. His name means the 'horned God'. Nothing is known of him from literary sources, but he must have been a god of fertility, the regeneration of nature and prosperity. He was however also the God of the underworld. In this capacity, the Catholic Church identified him only too gladly with the devil.

These remarkable finds make two things very clear. There is a fundamental and ideological difference between the mentality of the people who lived around 1,600 BC and those who lived around 1,200–1,000 BC. The first group worshipped an anonymous god of nature, in whom the figure of mother earth held a central position. During the later period, this changed into a more personalized, supernatural male deity. The presence of this horned wooden figure on Minorca also proves that in the later part of the second millennium BC, the island was not completely isolated but rather part of a religious sphere that gave rise to the Celtic religion of the Iron Age.

Wooden anthropomorphic figurine from the Cova de Mussol (Minorca). Photo Peter Witte; Universitat Autònoma de Barcelona.

The caves not only served as sanctuaries for religious services, but during certain periods they were also used as burial places. Around 1,400 BC, the entrance of the Cova de Càrritx was walled. A megalithic wall closed the entrance completely, except for one gateway. The first hall of the cave was paved with flat stones. Bodies of the deceased were brought to the cave on a bier and they were dressed in a cape or mantle, buttoned up with one triangular bone button. They were decorated with the ornaments of

the deceased. Containers for the treatment of the body, as well as for the deposition of the grave gifts, were found in the cave. During the ceremonial rites, all kinds of plants and herbs were used and the meat of domesticated animals was offered. Once the bodies had decomposed, the bones and skulls of the deceased were placed on the cave floor. No particular grouping of particular bone types could be made out.

A cave like Càrritx held the remains of one extended family of a naviform house. Everyone in the group, male or female, except for new-born babies or foetuses, was entitled to the same burial rite. Child mortality was very high, probably over 50 %. The average age of the adults was between 40 and 45 years. The cave contained more men than women (1.4 : 1). This leads archaeologists to believe that female infanticide was used as a means of birth control. This means that female children were cared for less during infancy and consequently fewer women reached adulthood. Chemical analysis of the bone minerals demonstrated that to a large extent, the diet of these people consisted of meat and dairy products from sheep and goats. In addition, they used the yield of some low-intensity farming, supplemented with wild fruits. Just as with the dolmen builders, it could be demonstrated that fish was never an important part of their menu. During the six centuries that the cave was used as a burial site, around 200 people were interred. This corresponds to a family of about fourteen people living in one naviform building using the cave as a family graveyard for about six centuries.

In a side chamber in an almost unreachable place about 80 m deep into the cave, the speleologists made an extraordinary discovery. In a pit dug out from the natural clay and covered with a sheet of clay, a wooden comb in the shape of a bat, three wooden vessels, three spatulae, a knife and wooden or horn containers were found. The latter were mostly tubular in shape, although there were also bi- and trilobed containers. The tubes were closed at both ends with wooden or horn covers. Their content was nothing less than dyed human hair. With these remarkable finds, the burial ritual that took place in the cave could be reconstructed. The hair of the deceased was combed and dyed in the cave. The dye-stuff was prepared in the wooden vessel, using the spatula or spoon. The knife served to cut off the hair, after which it was put in the tubes.

At some point, society changed in such a way that that these rites could no longer be performed. Thus, the ceremonial objects, as well as the ancestors'

Wooden comb (Buxus balearica — 1,100–800 BC) from the Cova de Càrritx (Minorca). Photo Peter Witte; Universitat Autònoma de Barcelona.

Wooden vessel and spatula (Buxus balearica — 1,100–800 BC) from the Cova de Càrritx (Minorca). Photo Peter Witte; Universitat Autònoma de Barcelona.

Tubular container with human hair (1,100–800 BC) from the Cova de Càrritx (Minorca). Photo Peter Witte; Universitat Autònoma de Barcelona.

hair were stored away in a well-protected space for later times. Archaeologists estimate this must have happened around 800 BC.

A little after the year 1,000 BC, the Mussol cave also became a burial place. Only poorly conserved bones were found in this cave. The excavators also discovered bronze mirrors decorated with engravings and ivory discs from North Africa. For the first time, bronze weapons were encountered too. It is possible that only the elite were buried in this cave.

The archaeological wealth of both caves provided the archaeologists with a great deal of information. But at the same time, it gives rise to many new questions. The most pertinent question is without any doubt that of the relationship between these cave rituals and the known burial monuments from the second half of the 2nd millennium BC, like the burial navetas? Do we have to conclude that different groups, even different cultures were established on the island? Or can these differences be reduced to practical solutions to differences in the natural environment of the space were people erected their homes (near a canyon, on a plain, near the sea etc …)?



# 7. Complex and diverse: an overview of the pre-Talayotic period

Although archaeological investigation of the Balearic Islands has revealed a vast amount of information, it remains difficult to draw any detailed picture of the Balearic Chalcolithic and Bronze Age. The lack of well-structured excavations and the clearing and robbing of burial monuments in the past leaves us with unanswered questions. New excavations can sometimes answer these old questions, but also raise new ones. In many cases the reading of the sites is already problematic.

In the caves of Mussol, Càrritx and Cova des Pas time seems to have stood still: these cases are very rare. Most sites have been in use for several centuries and were later reused as stables or hiding places for contraband. This means that dwelling areas were regularly cleaned and emptied so that artefacts are found out of context or even that contexts are mixed. It must not be forgotten that most part of the islands are bedrock covered with only a thin layer of soil and that the occasionally heavy rains can cause quite some erosion and mixing of artefacts from different periods. It has also been shown that several monuments have been altered during their very long period of utilisation. This is of course not only true for the pre-Talayotic Bronze Age, but because of the heterogeneity of this period all the more problematic. Finally there are still monuments that are not very well studied, such as the Minorcan talayots.

It is still unclear if the immigrants came in one wave or in several and if they all came from the same region or from a larger area comprising eastern Catalonia, the south of France and Sardinia. Present archaeological research favours a sudden occupation, but it is possible that the remains of the first settlers are so faint that they may have been overlooked till now. Although the artefact inventory of the different sites looks pretty homogeneous, it re-

mains difficult to understand why different types of burial rites were in use at the same time, why burial practices changed and why monuments, like dolmens, are only found concentrated in one part of each island. During the earlier phase contact with the mainland must have remained. It remains however unclear if trade was accompanied by the arrival of new people. In the case of Boquique ware it is clear that it was the pot and not the potter that was imported because the clay contains mica, a mineral absent on the islands. It is also evident that the tradition of the double faced wall that started with the early naviform buildings remained the typical means of wall construction throughout the Iron Age. Most probably periods of contact and periods of isolation alternated, but with a gradual shift towards a greater insularity in later times.

In the beginning of the pre-Talayotic period the islands were certainly not very densely populated. The family, or rather the extended family, consisting of about 14–21 persons was the nucleus of the economic and social life. Due to the low density of the population and the social structure, conflicts between families must have been marginal. Defensive structures and weapons are rarely found, especially in the earliest phase of the pre-Talayotic period. It must have been a more or less egalitarian society with nature worship. Stars and constellations played most probably an important role in this religion.

People worked the fields, cultivated cereals and herded goat and sheep. Those animals supplied cheese and wool. Pigs, running freely in the woods, were kept for their meat while cattle served as a working animal. They must have collected natural fruits and nuts as well, but hunting and fishing was not practised. Regarding hunting this is understandable because pray animals would become extinct very rapidly. But the fact that also fish was not present in the diet indicates that hunting and fishing were omitted for cultural reasons and not for practical ones. Part of the economic activity was season related with temporary encampments in the Tramuntana, a tradition that survived for millennia.

The different families must have had mutual contacts. To avoid inbreeding men and women must have had inter familial relations. This explains why certain artefacts, such as the pyramidal bone buttons with a V-shaped perforation, are found in all contexts. Marriages between groups supported the exchange of ideas and techniques. Anthropological studies have shown that such contacts probably were made by a shaman, a spiritual leader or a medicine man. Proofs of the existence of seers are the finds of perforated skulls. Some of the injuries show a regeneration of the bone, meaning that the individual survived the intervention. This is without any doubt a ritual operation made by a shaman or medicine man. But in spite of these contacts clear evidence of social architecture is missing. Small necropolis like the one of Cova de Càrritx and Cova des Pas must have been the cemetery of one family over a long time.

Later in the 2nd millennium BC the first Minorcan talayots must have been built. The real purpose of these buildings, defence or prestige, is still unclear. At this time no such buildings exist on Majorca. Typical for the period starting around 1,400 BC is that the potter adds carbonate containing additives to the clay. According to some archaeologists this is a mark of the start of the Talayotic culture on Minorca.

# 8. A new millennium a New Age

## 8.1. The genesis of an island culture

### 8.1.1. Fiction and facts

#### 8.1.1.1. The Sea Peoples

For quite some time the genesis of the Talayotic culture has been linked to the political and economic crisis in the eastern Mediterranean that resulted in a series of invasions and migrations. This very important stage in European proto-history is dated around 1,300–1,200 BC. In that period traditionally the Trojan War as well as the raids of the Sea Peoples are situated. This phase of the Late Bronze Age is also, according to some archaeologists, the period in which the Talayotic Culture began. The Sea Peoples were a group of seafaring people who carried out raids in the Eastern Mediterranean. Contrary to what has come to us by traditional accounts, researchers believe that they were not pirates, but groups of migrating people looking for new territory in which to settle. This should be clear from the fact that they travelled with all their belongings, livestock and family. They assaulted the coastal regions of the Hittite Empire and the Levant, and are documented by pharaoh Mineptah (1232–1220 BC) and Ramses III (1185–1154 BC). The Egyptian bas-relief of Medinet-Habu represents them with helmets with two horns and decorated with feathers. They sway with swords that resemble closely those found on Majorca, at for example Son Matge. But what could have been the link between the Sea People and the Talayotic culture? As mentioned before, it is striking how closely the talayots resemble the Torre of Corsica and the Nuraghe of Sardinia, as if they all are derived from the same basic model. According to some archaeologists the dominant Bronze Age culture of Sardinia must have been the cradle of the Talayotic culture. Some go even further and identify Malta as the cradle of this culture. Although much older, the poly-lobed structure of the Maltese temples resembles the floor plan of the Minorcan taulas (see further) and sanctuaries such as So Na Caçana, Torralba d'en Salord and others.

Actually it is not at all surprising that the Balearic Islands would have come under influences from further east. The presence of Mycenaean pottery in the provinces of Cordoba and Granada on the Spanish peninsula indicate that maritime trade routes passed by the Balearic Islands and that tin and bronze ingots were probably imported from Sardinia.

This model cannot however explain the differences between Majorca and Minorca, and the fact that this culture cannot be traced on the Pityuses.

#### 8.1.1.2. The Trojan Diaspora

In the same period of instability also the Trojan War is traditionally dated. After a siege of ten years the Greek alliance took the city of Troy, also named Ilion, on the Anatolian coast. After the war, according to the story, the Greek hero Odysseus returned home. The story of his wanderings before he finally, after another ten years, arrived safely home came to us through Homer's Odyssey. But also the Trojans knew their Diaspora. The Trojan hero Aeneas arrived in Italy where he, according to Virgil's Aeneid, written in the 1st century AD, settled at Alba Longa. These stories are part of mythical cycle called the Nostoi, the Greek word for "homecomings". These stories also mention that some Trojan warriors settled down on the West Mediterranean islands that only much later were called the Balearic Islands. The warrior people dominated the local people and changed the existing social order in a hierarchical structured society of which they became the elite.

Although in this case the mythical stories make again the link with the instability in the Bronze Age society, and the Balearic society became more hierarchical at the beginning of the Iron Age, this is not a proof of the authenticity of the story. In north-western Europe for instance there are numerous mythical foundation stories of old cities related wholly fictitiously to the Romans. Obviously dramatic historical facts have a lasting effect on the collective consciousness and rulers are often keen to use them to boost the national identity.

Typical column built with stone blocks smaller at the basis of the column and larger near the top (S'Hospitalet Vell, Manacor, Majorca). Photo Mark Van Strydonck.

## 8.1.2. Diffusion versus evolution

Although the diffusion theory, according to which the Talayotic culture originates from the instability of the Bronze Age and the arrival of new people on the islands, stood firm for many decades, during the last twenty years a new theory has gained support. Nobody denies the cultural influences that reached the islands from the east, but researchers increasingly question the occurrence of a dramatic turn caused by a supposed invasion from the east.

Rather they believe in a gradual evolution of the local people that will lead to the Classical Talayotic Culture with the extraordinary constructions such as the Majorcan talayots and sanctuaries and the Minorcan taulas. In this new theory events in the eastern Mediterranean play only a marginal role. There are good reasons to accept this new theory. The use of cyclopean double faced walls in the constructions, the typical shape of the columns, the use of false cupolas and large lintels are architectural features from the Iron Age that were already in use in the pre-Talayotic — Bronze Age period, before the appearance of the sea People.

In the previous chapters it was already pointed out that from the mid-2nd millennium BC onwards important changes took place. On Minorca the first impressive and massive talayots were built in a period when none of the classic talayots of Majorca existed. This all points to an evolution and not to an invasion of new people. But then, suddenly, at the beginning of the Iron Age a dramatic change in the political and social structure can be observed.

# 9. High days of an island culture

## 9.1 Land organisation and population pressure

The transition to the last millennium BC is marked by an increase in the population on Majorca as well as on Minorca, deducible from the complete land use on both islands. The existing, older settlements expand and at the same time new residential nuclei are created. During the high days of the Talayotic culture, from the mid-9th till the mid-6th century BC, both islands comprised about 250 settlement complexes. Some computation shows that, not taking into account inhospitable mountaintops and crevices, each community controlled an area of only about 10 $km^2$. Due to increasing demographic pressure and the limited resources on the islands it is surmised that tensions were created between the different communities. These tensions made a change to a more structured and organised society inevitable. To avoid conflicts an agreed partition of the available land between the different settlements is absolutely necessary. One of the functions of the talayot is that of a landmark, a sign to mark the territorial limits of one village. It will be demonstrated that the people put a lot of effort in the communal and social architecture. Buildings were constructed much larger than was necessary for their functionality because they had to emanate social prestige. It is clear that the profane as well as the religious architecture is intrinsically related to the political and social organisation of both islands. Thus the local architecture provides an insight into the way of life of these island communities.

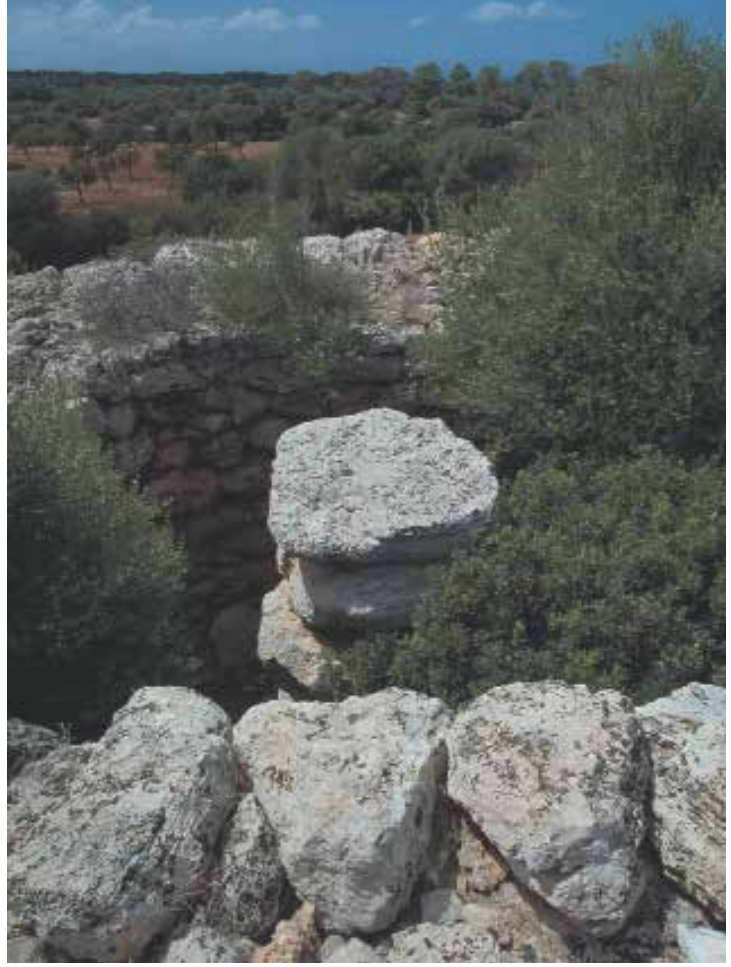
## 9.2. The buildings of an island culture

### 9.2.1. The talayot

The talayot is without any doubt the most representative type of monument of this island culture. There are more than 200 registered talayots and probably several more have been destroyed. The name is derived from the local Arabic word Atalaya, meaning watchtower. But the traditional characterization of this building is wrong. Talayots are not primarily watchtowers and are not Arabic. So what are they? The different construction types probably respond to a different function or construction period. It looks as if the oldest, Minorcan, constructions have some defensive purpose. They have an irregular internal structure like the talayot of Trebalúger (Es Castell, Minorca). This building was built on a rock that was already inhabited in the pre-Talayotic period. Later in the Talayotic period it was abandoned and used as a stable. The internal irregular lobed structure of this talayot resembles, according to some archaeologists, the Nuraghe of Sardinia.

Except for the general outline the Minorcan and the Majorcan talayots have not much in common. On Majorca there is no ta-

The massive talayot of Torrelonet Vell (Minorca). Photo Mark Van Strydonck.



Central post of the talayot of Sa Canova (Majorca).
Photo Mark Van Strydonck.

layot with a diameter at the base of more than 20 m, but on Minorca there are, furthermore the upper level of the Minorcan (talayot of Torrelonet Vell) ones is by far the most important part of the building.

Besides the difference in sturdiness of fabric, one can distinguish constructions with a round or square floor plan, with or without a central pillar, with a second floor (with stairs) (Es Migjorn Gran, Minorca), and a stepped construction (Son Ferrer, Majorca). As far as is known, these typological differences (except for the robustness) have no chronological significance.

The talayots with a circular floor plan (like the ones at Sa Canova or Son Fornés, Majorca) are the most common. They have the shape of a truncated cone. On Majorca most typically they are about 6 m high and have an outside diameter of about 12 m. They are dry stone constructions made of large stone blocks, sometimes irregular in shape. The entrance is always very small and is made of two or more monolithic stones and a monolithic lintel.

A narrow gallery, sometimes only 1 m high, leads to the inner chamber. The room inside the talayot has a diameter of not more than 7 to 8 m. Compared to the outside diameter of the building, the usable space is very limited. The diameter of the chamber is of about the same size as the thickness of the walls. This is because of the voluminous double faced walls that had to give prestige to the building. Some stones of the outer wall weigh more than 1,000kg. The stones from the inner wall are much smaller. In the middle of the room stands a column built with stone blocks that are smaller at the basis of the column and larger near the top.

The roof is made of large stone slabs that at one end rest on the centre column and are fixed to the wall of the building. Sometimes olive tree trunks were used as beams to support the roof (Capocorb Vell, Majorca). It is almost certain that the classical talayot had a second floor supported by the flat stones and the central pillar. In some cases remains of a roof made of clay and twigs have been found. Unfortunately not one of these classic Majorcan talayots has survived intact, so it is a complete guess how the second floor was finished. The same is true for the Nuraghi of Sardinia, but on that island people made small replicas of the Nuraghi, probably votive objects, showing that the towers were finished with merlons. None of this is found on the Balearic Islands; not even in the layers of debris and rubble have remains of second floor construction been found, probably because it was built in wood and perishable materials. It has been calculated that it must have taken 50 people of a Talayotic village about two months of uninterrupted labour to build one talayot and that about 2,000 tons of rock was used.

Talayot of Sa Canova (Majorca).
Photo Mark Van Strydonck.

The central plain seen from the talayot of Antigor (Majorca). Photo Mark Van Strydonck.

Circular talayots can be found isolated in the landscape as well as part of a Talayotic village. They can be found integrated in the village rampart (Es Pedregar, Majorca) or as prominent features inside a residential nucleus. When placed outside a village, the entrance is often orientated to a nearby Talayotic building. In many cases they appear near a well or at strategic points to show that a certain area was under the control of a nearby community.

The number of these classic talayots, especially on Majorca, is astonishing. Most of them are very similar and archaeologists think that they all were erected in a very short period around 800 BC. This does not mean that there are no variations. Beside circular, there are square and rectangular talayots. These are mostly found outside of the settlements and they all have almost the same dimensions and an entrance to the south-east. So presumably some conservatism and tradition are involved in the erection of these buildings that probably all have the same function. Also step-talayots were built. They consist of concentric rings decreasing in diameter towards the top, such as the one at Es Rossells near Felanitx and Es Mitja Gran near Ses Salines in Majorca.

The excavations at Son Fornés have given a clear view of the function of the talayot within the settlement. There, two circular talayots were excavated (see also aerial photo on page 2). The first is one of the largest excavated so far on Majorca with a diameter of 17 m and walls 5 m thick, leaving space for a room of 31.5 $m^2$. The building has a very small and low entrance followed by a 5 m long corridor that leads to the central room. Next to the entrance there is also a very small room embedded in the wall. The talayot includes a typical central column, but no roof any more. Only 3.5 m of the height of the talayot has survived over time, but originally it must have had a flat roof that served as an upper floor. The roof was made of wood (wild olive) and clay mixed with small stones. From the roof one had a panoramic view, and communication with other settlements was possible. Standing inside the room at ground level one has the impression that the inner part of the double faced wall is a little concave. This talayot had without any doubt a communal function. Analyses of the animal bone remains found inside the talayot in comparison with the bones found in the houses of the settlement has revealed that the lower floor of this building was used to quarter some cattle, but mostly pigs, and that the meat was shared between the villagers. Some parts of the animals were consumed inside the talayot during festivi-

Special drinking cups from the second talayot at Son Fornés (Montuïri, Majorca). Photo Francesc Ferreri, Museu Arqueològic de Son Fornés.

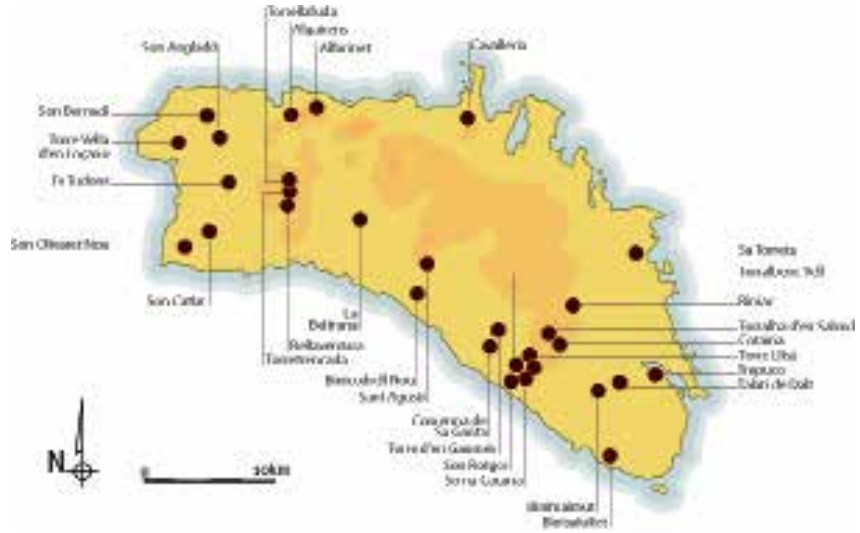
ties that must have functioned to improve social cohesion, while other parts were distributed among the inhabitants of the settlement and consumed inside their houses. It is clear that this is a ceremonial act of redistribution of the meat from cattle that was probably communal property.

The second, and much smaller talayot, is situated about 28 m farther on. This building has a diameter of 12 m and no access at ground level. To enter the building one had to climb up the terrace, probably by an external stairway — nowadays missing — and descend by means of a spiral stair whose steps were built into the chamber's inner wall. This means that only a few people at the same time could enter the building. Inside the talayot only drinking cups and pottery not found elsewhere in the settlement were found. No animal bones or common pottery were found. This suggests that this second talayot was probably a meeting place for the leaders or the elite of the community.

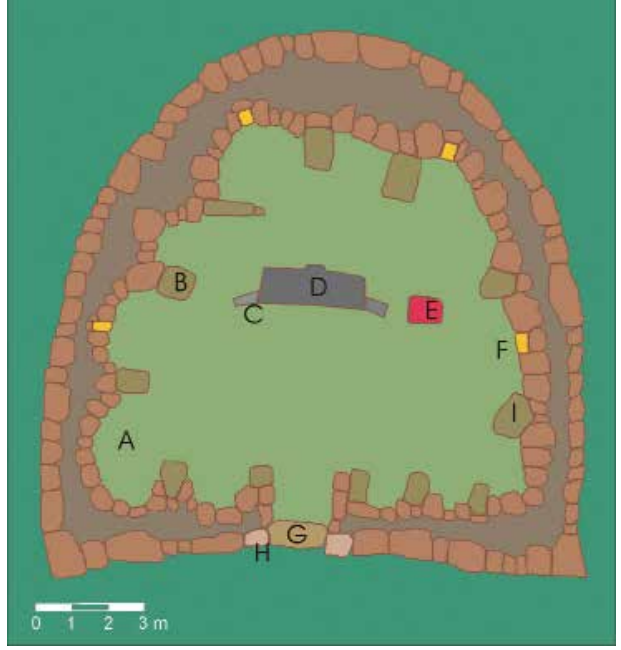
## 9.2.2. The taulas of Minorca and the sanctuaries of Majorca

Although the talayot is without any doubt the most representative monument, the Minorcan taula constructions are by far the most remarkable monuments on the Balearic Islands. Taula in Catalan means table and refers to the central T-shaped construction. Minorca has 37 of these constructions that can vary considerably in size, with a maximum height of about 3.7 m. The best conserved are those at Torre Trencada, Torre Llisá Vell, Talatí de Dalt, Torrellissá Nou, Trepucó which is far the largest, Torre d'en Galmès (or Torre d'en Gaumes) and Torralba d'en Salord which can be considered as the apogee in taula construction. Given the varying state of ruin of these monuments it is supposed that originally there must have been many more of these constructions. It is probably not unrealistic to state that each settlement of importance had his own taula (only So Na Caçana has two). It is without doubt a very specialized religious building. The taula enclosure is made using the same technology as was used for other constructions on the Balearic Islands. The two-faced wall is also here the standard. They are erected on a central or dominant position, close to a talayot or another public or communal building.

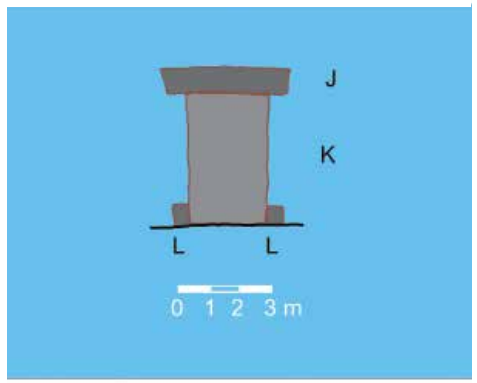
Distribution map of the Minorcan taulas.



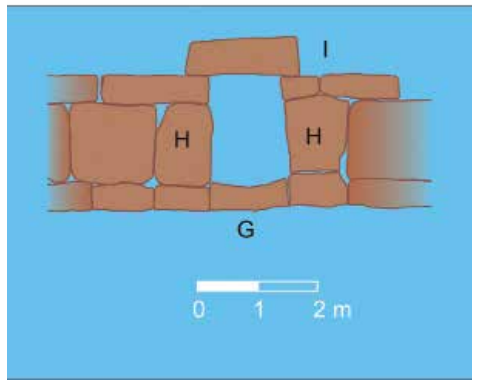
Idealized floor plan of a Minorcan taula. Although all taulas are different some architectural features are common to all constructions:
A: different absides forming a poly-lobed interior
B: pillar,
C: two stone 'wedges' that clasp the T-stone in a groove in the bedrock,
D: taula,
E: freestanding column,
F: niche,
G: threshold,
H: standing stones that form the entrance.




1 — Taula




2 — Entrance




1 — Taula:
J: horizontal stone. At the base of this stone a groove has been incised so that it can slide over the vertical stone K.
L: stone 'wedges'.

2 — Entrance:
I: lintel,
G: threshold,
H: standing stones that form the entrance.
after Peter Hochsieder and Doris Knösel.

The central construction consists of a vertical flat monolith pillar with a horizontal stone lying on it. The whole looks like a large capital T. The vertical monolith is mostly rectangular and is 2 to 7 times wider than thick. The face orientated towards the opening in the enclosure is very carefully fashioned while the back side is rough and often finished with a ledge in the middle. The monolith is placed in a slot, cut out of the bedrock. The horizontal stone is very well finished and trapezoidal in shape. Sometimes a groove is visible to mount it on the vertical monolith. This ensemble is not placed centrally in the enclosure, but somewhat closer to the entrance. The façade of the horseshoe-shaped enclosure is straight or slightly concave. The entrance of this monument, situated in this wall, is delimited by a threshold stone, two vertical stones and a lintel. The status quo of the archaeological research doesn't allow a conclusion as to whether the entire monument was covered with a wooden roof or not. The inside of the horseshoe shaped enclosure is divided in different absides resembling half-open rooms separated from each other by a large pillar. In several of these absides niches were left open in the enclosure wall. The absides divide the inside space into poly-lobed areas with a different functionality and benches put against the wall were used to deposit offerings. Next to the en-

View of the sea from the taula of Torre d'en Galmés. The flat stone of the T-shaped construction has fallen off the vertical stone. The groove is clearly visible. During the Roman epoch this stone was used as a sarcophagus. The settlement of Torre d'en Galmés is the largest on the Balearic Islands (62,000 $m^2$). It is built on a 125 m high hill and encompasses besides one taula, three talayots, houses, hypostyle courts, a water catchment system, cisterns and storerooms. Photo Mark Van Strydonck.

Horseshoe shaped enclosure of So Na Caçana (Alaior, Minorca). Photo Mark Van Strydonck.

trance, inside the enclosure, a fireplace is found in most monuments, a hearth bordered by stones. Among the ashes of the hearth a lot of pottery fragments even wine amphoras have been excavated. Stratigraphic investigation has shown that the quantity of imported ware increases in the younger layers. This demonstrates very well the increasing external contacts during the end phase of the late- or post-Talayotic culture. Even during the Roman period some places were still used for cult purposes, to judge by the finds of Roman lamps. Also at other places inside the enclosure hearths were found containing incinerated animal bones. Some distance behind the T-stone an altar made of a monolithic stone can be found.

It was already known for quite some time and it is very striking that all vertical taula monoliths face southwards and have an uninterrupted view to the horizon. An orientation towards the spot on the horizon were the sun, the moon or the planets rise or set seemed impossible because the T-stones are orientated too much to the south. A prima facie impossible relationship between certain celestial phenomena and the orientation of the taula sanctuaries could only be established after the position of the heavenly bodies in the southern sky was recalculated for the time that these monuments were built. This is necessary because due to the effect of precession, the variation in the orientation of the earth's axis, the position of stars and constellations in the sky changes with time. In other words, the position of the stars in the sky during the Talayotic period had to be redrawn. The taulas of which the orientation could be measured seemed to point to a spot on the horizon were the star Alpha Centauri, or better, where the remarkable succession of the constellation of the Southern Cross followed by Alpha and Beta Centauri, rose and set. This was consistent with the rise and setting of the constellation Centaurus as described in the star catalogue from the 2nd century AD by Claudius Ptolomaeus. The centaur (a horse with the torso of a man) in the constellation Centaurus is, according to Greek mythology, Chiron who was an adept physician. His most important follower was Asclepius, the Greek counterpart of Imhotep. The discovery of a statuette of Imhotep, next to the altar, on the site of Torre d'en Galmés is a neat con-

A votive statuette of the Egyptian god Imhotep, found next to the altar of the taula of Torre d'en Galmés (Minorca). The god is seated and has a papyrus on his knees that reads "Imhotep, son of Ptah". Photo Conselleria d'Educació, Cultura i Esports (Govern Balear); Museu de Menorca.

firmation of this "orientation" hypothesis. The presence of an Egyptian god on Minorca is less improbable than it looks. In the later period of the use of this monument (post-Talayotic phase) close contacts between the eastern and western Mediterranean basin existed and the import of cultural elements by Punic traders or even the arrival of an Egyptian physician cannot be ruled out.

The east-south-east orientation of the taula of Torralba d'en Salord, which along with its cyclopean enclosure wall is one of the most outstanding monuments, differs from the others. Radiocarbon dates of the different construction phases and occupation levels have demonstrated that the monument must have been erected around 900–800 BC, although some architectural elements have been added later such as the benches on the inside of the enclosure wall. During the excavation a statuette of the goddess Tanit, the legs of a bronze horse and a bronze bull were found.

The bronze bull, probably from the 3rd century BC, was found next to the altar. After recalculation of the position of the celestial bodies during the initial period of the monument, it becomes clear that Torralba was orientated towards the point on the horizon were Sirius rose. Sirius is at that moment the brightest star in the sky. Sirius was worshipped in Egypt as Isis. The heliacal rising of this star (this is the moment the star becomes for the first time visible above the eastern horizon for a brief moment in the morning twilight just before sunrise, after it had not been visible for several weeks) marked the beginning of the calendar year in Egypt and the start of the flooding of the Nile. This reappearance is the most striking phenomenon that can be associated with a star. Research has demonstrated that all animals sacrificed at Torralba were butchered either in the second half of the first year of their life or in the second half of their second year of life. 70% of all the offered animals were goats or sheep, and their birth peak is in November. The heliacal rising of Sirius was in those days during the third week after midsummer, thus in the period of the year that most animals were sacrificed. It must be noted that complete animal skeletons have never turned up in excavations. Mostly bones from

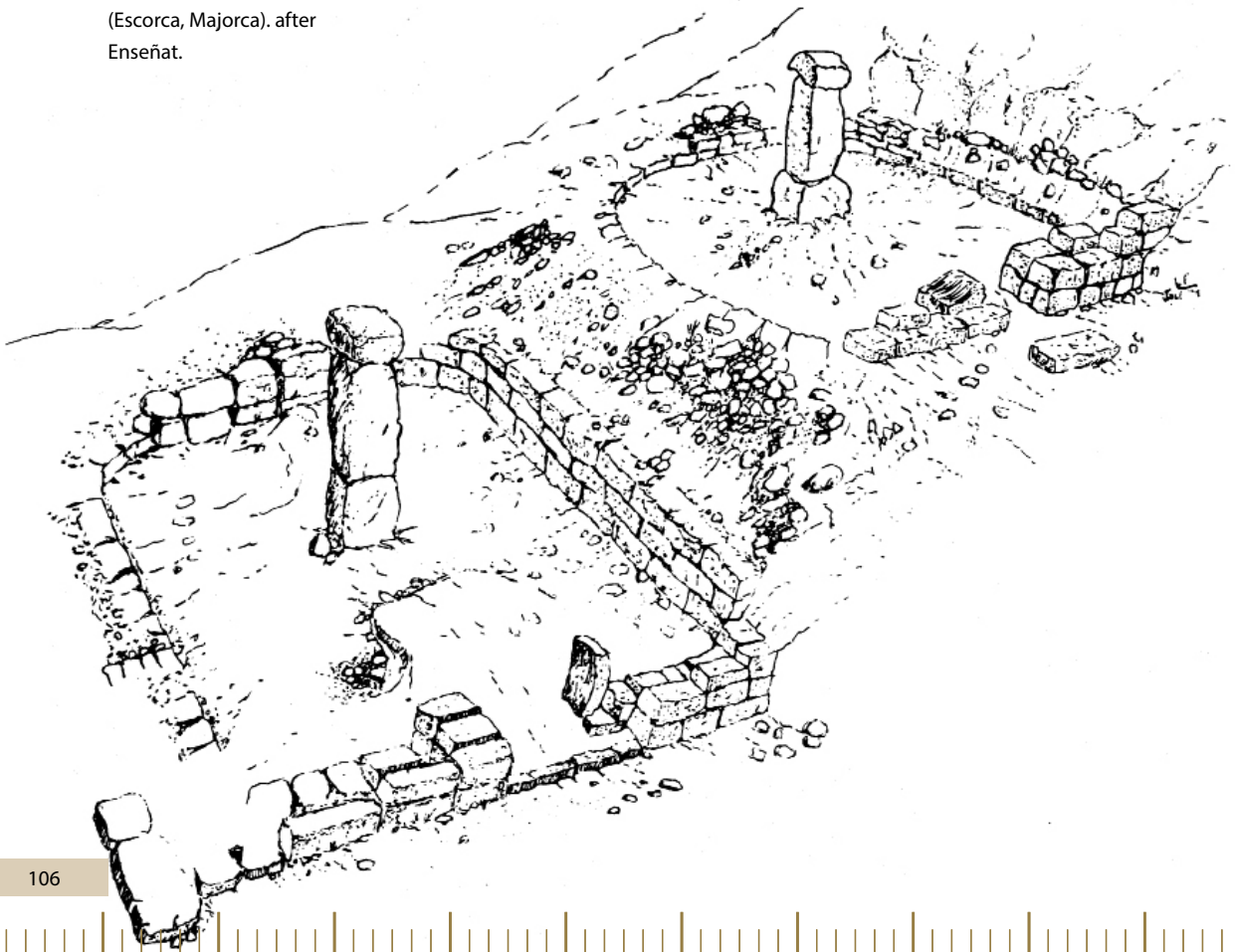
Taula of Torralba d'en Salord (Minorca). Photo Mark Van Strydonck.

Taula and talayot of Torralba d'en Salord (Minorca). Photo Mark Van Strydonck.

Statuette of a bull (about 13 cm high) found within the precinct wall of the taula of Torralba d'en Salord. Although this statuette certainly does not belong to the initial phase of the monument (it has been dated between the 4th and the 1st century BC) it is one of the most interesting artefacts of Minorca and informs us about the prehistoric bull cult of the Balearic Islands. It also gives an explanation of the orientation of this monument. Photo KIK-IRPA, Museu de Menorca.

body parts with a low nutritional value were found. Probably some parts were offered while other parts were consumed. Another not unimportant phenomenon is the fact that the star Rigel, the brightest star in the Orion constellation, appears above the horizon only a short while after Sirius. In Egypt Orion was identified as Osiris, symbolised by a bull. It cannot be excluded that, during a later phase of the monument, Osiris too was worshiped at Torralba as the beautiful bronze statuette of a bull may suggest. The excavated statuette of Tanit is without any doubt a later addition. Probably Punic traders offered a votive statuette of Tanit, their equivalent of the goddess of fertility Isis, to the sanctuary.

It is remarkable that taulas only appear on Minorca. Only in the Tramuntana mountains of Majorca is an ensemble found that resembles the Minorcan taula sites, but the collapsed columns do not have the typical shape of those in Minorca. Some investigators have claimed that the lack of taulas on Majorca is caused by the lack of open landscapes and wide horizons. But this assumption is unsubstantiated. It is much more plausible



Sanctuary of Almallutx in the Tramuntana mountains (Escorca, Majorca). after Enseñat.

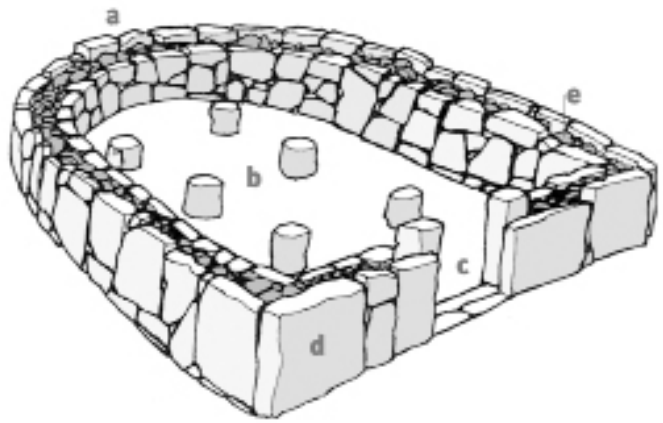
Sanctuary of Almallutx in the Tramuntana mountains (Escorca, Majorca). This sanctuary is located near the artificial lake of Gorg Blau. Photo Mark Van Strydonck.

that the Talayotic culture evolved differently on both islands and that the sanctuaries on Minorca and Majorca represent a different evolution of the same culture.

At present only about eight Majorcan sanctuaries are known, considerably fewer than on the smaller island of Minorca. Some of these cyclopean constructions have a square floor plan but five of them have a horseshoe structure resembling the taula enclosures. Nevertheless there are numerous differences. Not only are there no taulas, but also their internal partition is different. Inside the enclosure there is sometimes a double row of drum shaped small columns, resembling altars or offering places. The sanctuaries probably appeared at the beginning of the Iron Age (around 800 BC) and continued to develop into the post-Talayotic period. During ritual feasts

animals were offered, especially sheep and goats. This explains the presence of ash layers in the monuments. The sanctuaries were built outside the settlements, sometimes together with a square talayot as at Son Ferragut and Sineu.

Many cult objects were found such as statuettes of bulls and birds, most probably ex-votos and statuettes of warriors. But all these objects date from the post-Talayotic period.




Idealised representation of a Talayotic sanctuary of Majorca. Although all sanctuaries resemble each other in reality not two of them are the same.
A: horseshoe shaped enclosure;
B: drum shaped (altar) stones
C: entrance
D: flat or concave front
E: double faced wall
After Garrido & González.

## INTERMEZZO: Son Mas sanctuary site

The Son Mas sanctuary site is located at the far east side of the Pla del Rei (see intermezzo: Son Ferrandell-Oleza). Excavations on that site started in 1987. The complexity of the site and the distribution of the artefacts due to agriculture and land erosion has not only complicated the excavation but also the interpretation of the finds. As a result of this it took the excavators almost 10 years to get a clear picture of the archaeological remains and to understand the genesis of the site.

Although the horseshoe shaped sanctuary, presumably from the beginning of the Iron Age, is the most spectacular architectonical element, the chronology of the site goes back much further in time. The oldest finds go back to ca. 2,200 BC. In this respect the Son Mas site covers almost the same period as the Son Ferrandell-Oleza site and this can be noticed in the artefact inventory.

From the oldest levels relatively large quantities of Bell Beaker material were excavated. Since this material is very prestigious, its presence already suggests that in pre-Talayotic times the site must have had some religious function.

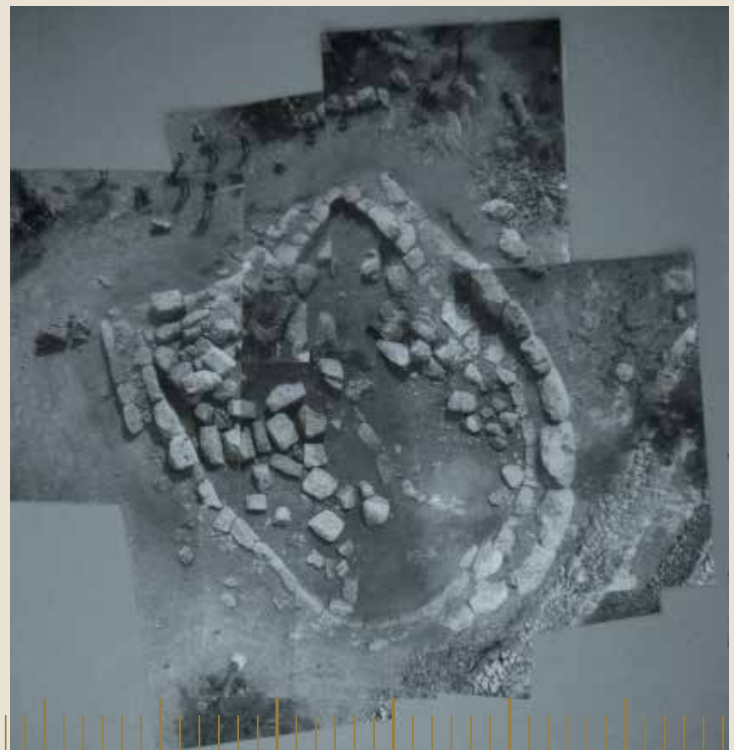
In the vicinity of the sanctuary a large freestanding boulder is placed. This stone has a worn circular groove. This groove points in southern direction toward a V-shaped saddle between two mountains.


Bell Beaker shard from Son Mas (Valldemossa, Majorca). Photo Mark Van Strydonck.

Large rock at the Son Mas site orientated towards a V-shaped saddle between two mountains (Valldemossa, Majorca). Photo Mark Van Strydonck.

For a long time it has been a riddle why that stone, the only free standing rock on the site, was put at that place. It was believed that the groove in the stone pointed to one or more celestial bodies that during the night were visible between the two slopes. Redrawing the firmament to the beginning of the Iron Age (800 BC) when the monument was supposedly built, didn't reveal with any eye-catching star systems or planet visible in the V-shape saddle. Radiocarbon dates however had demonstrated that the site was abandoned between 1,700 BC till 1,300 BC indicating a hiatus of about 500 years in the use of the site. At first, it was thought that this hiatus was caused by a a lack of sufficient analysis, but this turned out to be a wrong supposition. But if the nightly sky from before 1,700 BC was redrawn, one could notice that the southern-cross, nowadays one of the most prominent phenomena of the night sky in the southern hemisphere, emerged from behind one hill and was framed in the valley before passing from sight behind the other hill. A particularly brilliant spectacle would have been afforded by the Southern Cross, which would have been visible throughout the third millennium BC. However, because of the long-term wobble of the earth's axis ("precession") the Southern Cross would have been seen lower and lower in the sky as the centuries passed. Finally from 1,700 BC onwards, first the lowest star in the constellation would not be visible anymore, followed by the other stars. Due to the disappearance of the object of worship, the site lost his religious im-

Composite picture of the Son Mas Sanctuary before excavation (Valldemossa, Majorca). Photo William Waldren, D.A.M.A.R.C.



Drum shaped altar stones from the Son Mas Sanctuary (Valldemossa, Majorca). Photo Mark Van Strydonck.



Concave front wall of the Son Mas Sanctuary (Valldemossa, Majorca). Photo Mark Van Strydonck.

Punic phallus symbol found at the Son Mas site (Valldemossa, Majorca). Photo Mark Van Strydonck.

Lead plaque from a necklace made at the Son Mas site (Valldemossa, Majorca). Photo Mark Van Strydonck.

Glass rings from a necklace found at the Son Mas site (Valldemossa, Majorca). Photo Mark Van Strydonck.

Roman terra sigillata from the last phase of the Son Mas site (Valldemossa, Majorca). Photo Mark Van Strydonck

portance and was abandoned for 500 years until a new group of people made their entree on the site.

The stone sanctuary dated from the beginning of the Iron Age consists of a horseshoe or apsidal-shaped sanctuary with a concave frontal aspect (ca. 13 × 13 m). The foundations are made up of large well shaped, tightly fitted limestone blocks. The double faced wall consists of 2 by 1.75 m large blocks in the exterior and 1 by 1.5 m blocks in the interior wall. The space in between is filled up with rubble.

About central in the concave wall a, to the south-east positioned, 2 m wide entrance is made. A big lime stone threshold is flanked at both sides by two large massive standing stones. Originally a stone lintel must have closed off the entrance. The way the front was built resembles very strongly the construction of the taulas in Minorca.

The construction date of this monument could have been established relatively precisely because at certain places in the wall infill concentrations of pottery, animal bones and charcoal were found giving a radiocarbon date of ca. 800 BC. This construction date is confirmed by the age of a burial that either was disturbed during the building of the wall or was related to its construction. The burial contained the only human skeleton found on that site. With this date the Son Mas sanctuary is the oldest on Majorca. It can however not be excluded that on the same spot there stood previously an older sanctuary. Artefacts as well as radiocarbon dates have demonstrated human activity between ca. 1,300 BC and the construction of the still existing construction around 800 BC.

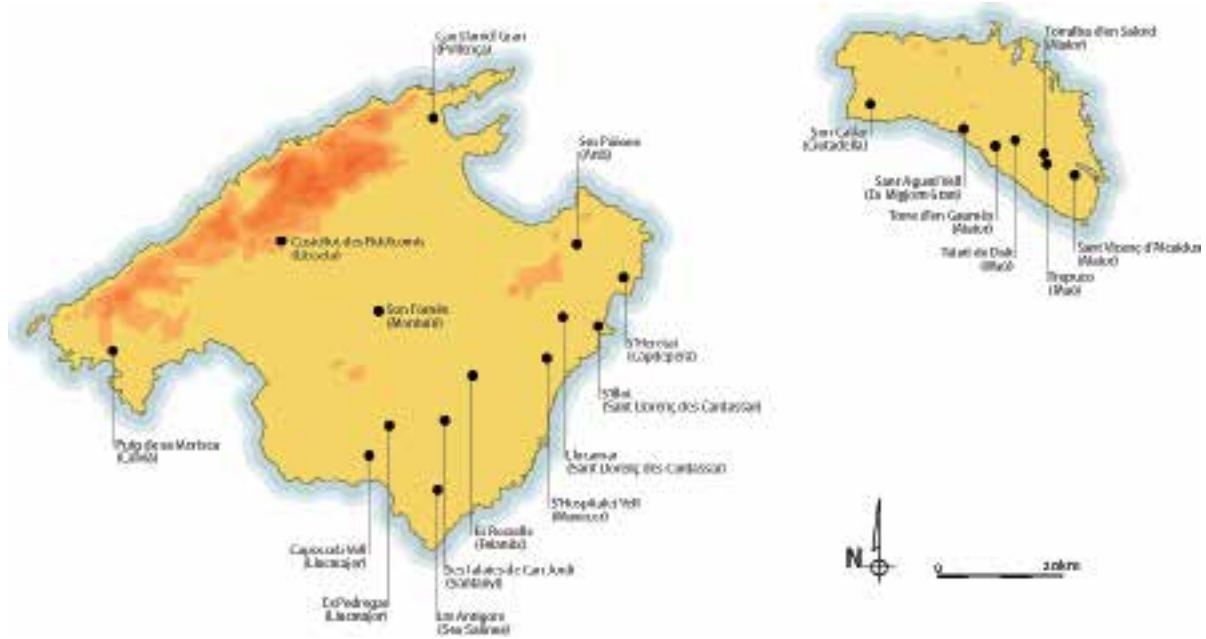
On the same site one can also find the remains of a naviform building and some walls. This construction must be relatively young. In that area of the site Greek Attic ware and Roman Campanian pottery were found. Some locally made pottery of relative bad quality was also found. In some shards a lot of chaff was used as a temper. This implies that the pot could not have been fired at high temperature. Other pieces contained a lot of small lumps of limestone, again an indication of a low quality product. In contrary of what one should expect this is not an indication of an economic crisis but on the contrary it is an indication of a booming economy in which the pottery for daily use was considered as a replaceable product and not as an item for long use.

In and around the apsidal naviform dwelling evidence of a local production of lead cast ornaments was found. This lead ornaments are very unique.

Fragment of an amphora from the younger part of the Son Mas site (Valldemossa, Majorca). Photo Mark Van Strydonck.

They can only be found on the Balearic Islands, although some archaeologists find that one of the eighteen identified types resembles very much an ornament from the Greek archaic period. They are flat and on one side decorated with geometric figures. Such ornaments were produced in the form of pectorals, pendants and necklaces. They are mostly found in funeral contexts and their meaning is unclear. The most spectacular type of lead ornament is the pectoral, not present at Son Mas but at Son Matge and Son Real. Important is that at Son Mas several identical pieces were found. It are parts of a hanger or necklace as can be demonstrated by the four little holes near the extremities of the pieces. Although no moulds were found, sprues, ingots (in the form of small round plates) and miscast pieces show that lead casting was done on site. Lead must have come from mines like in Bunyola, a little place more inland in the mountains. Identical pieces were also found at Cova de'n Alova, Son Matge and Muertos Gallard. This proves once again the importance of the site even in later periods. A dating project has proven that those lead ornaments were made between the 4th and 2nd century BC.

The site was still in use after the Roman invasion but was abandoned soon after.



Distribution map of the most important Talayotic villages.

## 9.2.3. The Talayotic villages

Majorca and Minorca show about 250 Talayotic settlement complexes. Each of them has a surface between 0.5 and 4 ha. This large number of settlements is an indication of the total land use of the islands. The structure of the large Talayotic settlements is rather uniform. The most typical examples are Son Fornés, Ses Païsses, S'Illot, Capocorp Vell and Es Pedregar on Majorca and Son Catlar, Torre d'en Galmés and Trepucó on Minorca. Within the village the residential nuclei stick together in, at first sight, a disorderly way. There were no streets. Inside or outside the residential nuclei large silos were cut out of the bedrock to serve as water reservoir or depots. One or several talayots were erected in the village or near to a well as in S'Illot.

The settlement of Capocorb Vell consists of dwellings in different shapes, but most are rectangular. Remarkably, houses were part of the village wall. This structural pattern is replicated, and also very well preserved, in Son Fornés. The houses of Capocorb Vell have a central pillar that supports a roof. Sometimes the remains of a stair leading to the upper floor are visible. The limited surface that has been excavated comprises besides 12 houses, 3 circular and 2 square talayots. In the vicinity two sanctuaries were built that were completely destroyed during road construction.

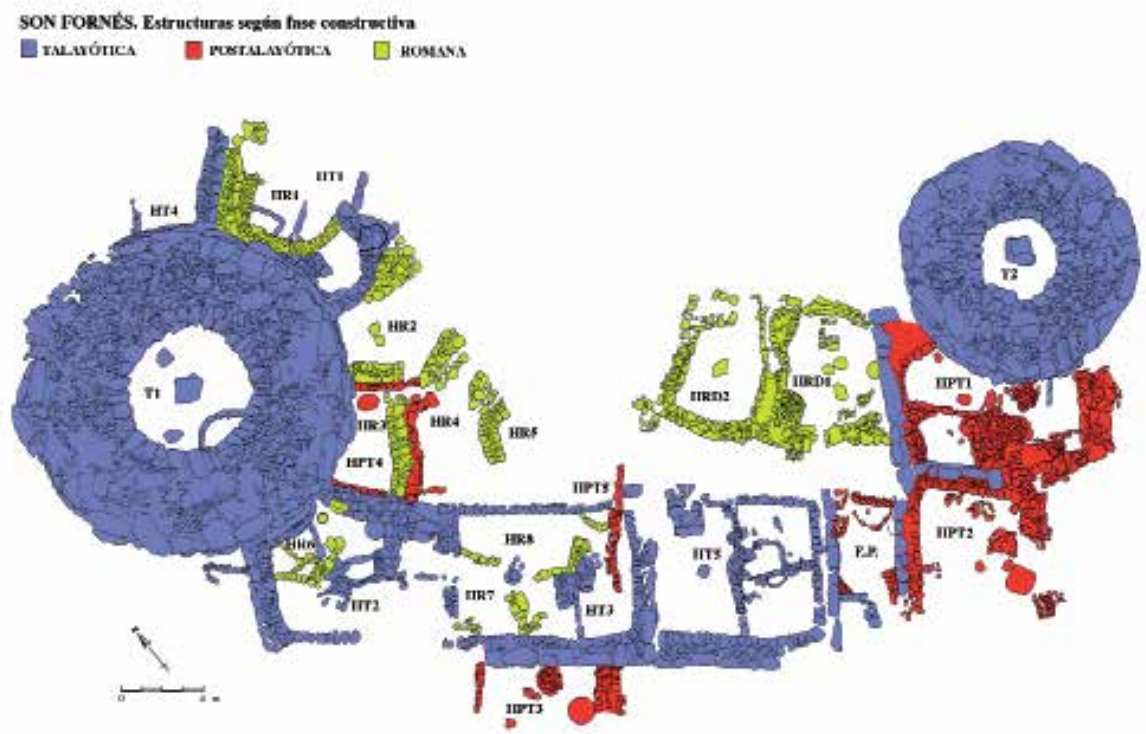
Ses Païsses near Artà lies on a hill near a well. In Ses Païsses, just as in

other settlements like in Son Catlar, a cyclopean wall was built around the village near the end of the Talayotic period (650–540 BC). The wall has four gates and measures 374 m. At its broadest the site measures 94 by 106 m. Then oldest phase of the settlement is from the transition of the Bronze Age to the Iron Age and consists of a talayot with houses grouped around it. The talayot has the shape of a truncated cone of 4.5 m high and has a volume of about 400 $m^3$. A small passage of only 80 cm large runs transverse over the base of the talayot and forms two branches that come together in the centre. Around the talayot large rectangular (about 7.6 by 3.7 m large) and apsidal houses are built, belonging to different construction periods. Excavations revealed three construction phases. The youngest layer contained Roman ware, pottery from Campania and rather coarse local ware. The second layer was dated to between the eighth and fifth centuries BC. Besides pottery, bone tools were also excavated. The oldest layer is from the transition of the Bronze to the Iron Age, so the site was used for quite a long time.

The site of Son Fornés (Montuïri) is situated on a small hill in the Majorcan plain. The settlement must have been about 2 ha large and must have accommodated about 300 to 400 people. A set of five houses on a row and two talayots (see before) have been studied intensively. These houses were built against the talayot and one wall of the houses forms the village precinct wall. The lower part of the square houses was built of stone the upper part of wood and finished with clay. The floor plan of the houses is rather uniform. By means of a short stair with about four steps one descends to the living area with a central pillar. The kitchen space is situated to the right from the entrance, together with a workshop area and a large hearth in between. The hearth was so large because food-preparation was not its sole function. Next to it a mortar and grinding stones for grain and fruits were found as well as one large vessel to collect potable water.

Goats and sheep were butchered in the houses, but the cattle and pigs were butchered in the talayot. Next to the kitchen were situated a workshop and a sleeping area. Each house was about 40 $m^2$ large and accommodated about five to ten people, probably all next of kin.

The people living in these houses used only about 25 different objects (pots, dishes, etc..) that were, most probably, domestically manufactured, and this explains the presence of the large hearths. None of these objects were made by craftsmen. Accordingly the houses had only a limited storage capacity for food and goods. This all points to self-sufficient households or domestic units, complemented with a social life concentrated in and around the talayot where communal activities and rites were performed.




Plan of the settlement of Son Fornés (Montuïri, Majorca):
A: Talayotic phase (constructions marked with HT);
B: Post-Talayotic phase (constructions marked with HPT);
C: Roman phase (constructions marked with HR);
T1: large talayot;
T2: smaller talayot

On the map, observe at house nr. 5 (HT 5) the entrance stair (upper left of the room), the living quarter with a central pillar (left chamber), a kitchen space (upper right) with a large hearth (middle of the right room) and a working and sleeping space (under right). Museu Arqueològic de Son Fornés.

Aerial view of Son Fornés see page 2.

Entrance of the Talayotic settlement of Ses Païses (Artà, Majorca). Photo Mark Van Strydonck.

At Torre d'en Galmés on Minorca, one of the best examples of a particular architectural phenomenon has survived, namely a covered cyclopic court or hypostyle hall. It is a covered space created by large flat stones resting at one end on buttresses embedded in the wall and at the other on a central pillar. These pillars are about 2 m high and made of one monolith or stacked up stones. Just as with the talayots the columns are smaller near the floor and wider near the top and finished with a capital. The flat stones rest on the pillar in a star-shaped design. From the outside the hypostyle halls often resemble artificial caves because they are partly dug out in the ground and they have to be entered by a small ramp or some stairs. This architectural feature is much more frequent in Minorca than on Majorca and can be found in the settlements as well as in open field. They probably served as warehouses and remained in use until the Middle Ages.

An important difference between Minorca and Majorca is the incorporation of the taula sanctuaries in the villages. The Minorcan villages have a religious (taula) as well as a secular (talayot) centre surrounded by houses.

Hypostyle court of Torre d'en Galmés (Minorca). Photo Mark Van Strydonck.

Taula and talayot are never located far away from each other. This is completely different on Majorca. First of all, there are considerably fewer sanctuaries on Majorca than on Minorca and they are not situated next to a talayot. So some archaeologists are of the opinion that the sanctuaries on Majorca are more recent than the Talayotic villages. This may be true for some of them, but analyses of at least one, the Son Mas sanctuary, have suggested a construction date of around 800BC.

Grinding stones from Son Fornés (Montuïri, Majorca). Photo Francesc Ferreri, Museu Arqueològic de Son Fornés.

Talayotic pottery for daily use at Son Fornés (Montuïri, Majorca). Photo Francesc Ferreri, Museu Arqueològic de Son Fornés.

## 9.2.4. The mystery of the Talayotic burials

Relics of burials and burial rites from the Chalcolithic and Bronze Age of the Balearic Islands are ubiquitous. Very well preserved cave sites as well as impressive monuments of that period are known. Apparently all these burial practices seem to stop around 800 BC, at the beginning of the Iron Age. Information about the way the deceased were buried during the Talayotic culture is very limited. Is this because during the first centuries of the Iron Age burial rites were performed with less care, or because the dead had a less prominent position in their culture? This seems to be the case and is corroborated by the observation that burial sites are less visible in the Balearic landscape. Surveys have shown that people were buried in cliff caves overlooking the sea as in the ones at Torrent d'en Barragot (Cap de Ses Salinas) and Ca'n Gregoria (Valldemossa) on Majorca. It consists of secondary burials. This was very clear at Ca'n Gregoria where long bones were carefully deposited next to one another. Some pottery shards were also found with the bones. Although much investigation remains to be done, it seems that the practice of quicklime burials also started in this period and lasted until Roman times (see intermezzo: The rock shelter of Son Matge). Quicklime burials are found on both islands (as at Cova des Morts de Son Gallard and Cova de Na Dent on Majorca and Sant Joan de Misa and cova de la Prior on Minorca) and lasted until the Roman period. Given that this kind of deposit are often found in natural caves or rock shelters and that they are not very visible, some of them are not catalogued as archaeological sites, but the existence of about a hundred of these deposits can be estimated for Majorca

The lime burial site of Cova de Na Dent is situated on Majorca's west coast in the cliffs between S'Estany d'en Mas and Cala Falcó. The area is rich on karstic cave formations.
It is located in the Area Natural De Cales De Manacor in a cliff wall overlooking the sea. Photo Mark Van Strydonck.

and Minorca. The islands were the only place in the Mediterranean world where during the Iron Age people were systematically cremated in contact with limestone. In the lime sometimes grave offerings are found, such as bent metal objects and/or broken pottery, but others are without any artefacts. The metal objects must have been bent deliberately, because heat cannot cause such deformation. The appearance of some objects resembles those found in Iron Age burials in north west Europe. It is absolutely unknown why people went through such a very elaborate funeral process. The only plausible explanation so far suggested is that we are dealing here with a purification rite. After decomposition the limestone turns into a very white powder, a powder that is still white today, after more than 2500 years! Some archaeologists assume that in the lowest layers of the lime burials cremations took place without lime. If this is true than the lime burials developed from an normal cremation rite such as is known all over Europe.

Fragment of the lime burial of Cova de Na Dent. The human bones are embedded in the lime. Photo Mark Van Strydonck.

## 9.3. Living in an island culture (850–550 BC)

It is striking how much effort the Talayotic people invested in the erection of their prestigious buildings. Some authors claim that this was done at the expense of their own prosperity. According to this view, the grandeur of the constructions contrasts sharply with the poverty and simplicity of their artefacts. Not enough land for too many people should have forced the communities to devote much energy to the protection of their territory. Whether this analysis is correct we do not know. Archaeological knowledge is accruing very fast on the Balearic Islands. In the past it was thought that the economy of the people was primarily based on cattle farming and that agriculture played only a minor role. Recently this model was disputed and this has serious consequences for the interpretation of the land use and the calculation of the maximum demographic pressure that the islands can sustain.

The structure of the Talayotic houses shows that the social organisation of the society was based on the family. Every house was for a large part self-sufficient. This is opposite to an economic system in which specialization plays an important role. In such a system one is either, baker, butcher, potter or smith. The Talayotic house on the contrary provided for all these activities. The limited storage space in each house indicates that the provision of food was a daily task, and the homogeneity of both furniture and houses suggests egalitarian relationships amongst the domestic units. Nevertheless some social inequality most have existed. There must have been some secular (chieftains) or religious (shaman) leaders who organised ritual festivities in and around the talayots and organised communal duties. The large-scale building projects probably took place during the season when there was no work in the fields. This however implies a well-organized society because not only did the construction workers have to be fed, but also everybody directly or indirectly involved with the construction works had to be supported by the community.

The structure and organisation of the settlements served above all a practical purpose. Disputes between different communities living on relatively small and densely populated islands are very problematic. Armed conflicts would without doubt lead to the total extinction and loss of the island culture. Within an orderly society wherein every community knew

their place and property, quarrels between neighbours and other conflicts can be avoided. Hence the enormous symbolic meaning of the talayots scattered all over the islands. Along with the vast building activities, a decrease in the social interest in burial architecture can be observed.

The Talayotic period is also characterized by another remarkable fact. It has already been mentioned that near the end of the 2nd millennium BC the islands' respective cultures appear to have evolved differently. Even more remarkable is the fact that between about 850 and 550 BC both islands were to a considerable extent isolated from the outside world. At the end of the 2nd millennium the Balearic Islands were part of a trade network that encompassed the western Mediterranean. The absence of artefacts from the eastern Mediterranean indicates that there was a trade network excluding the Cypriote and Phoenician traders. The presence of these sailors from the east in the western part of the Mediterranean only starts from the mid-9th century BC. It is surprising that at just that period the Balearic Islands were beginning to isolate themselves from the outside world. The fact that the Balearic Islands in this period were not integrated into the Graeco-Phoenician trade network shows that they were not interested in outside contacts or even that they consciously resisted them. Why they acted like this is still unclear, but it must be more than a mere accident that this period of insularity coincides with the transition from the Subboreal to the Subatlantic (see climate and vegetation). This climate shift caused major changes all over the world, resulting in migrations and cultural changes. Maybe the island dwellers preferred isolation as a response to this change.

# 10. A post-Talayotic window to the world

## (ca. mid 6th century BC till the incorporation in the Roman Empire 123 BC)

### 10.1. Autochthonous or allochthonous?

According to a certain school of archaeologists, this period is no more than a later phase of the Talayotic culture. They correctly state that the culture of the island, which started to emerge during the Bronze Age, continued to evolve until the Roman invasion. Others however argue that a supposed crisis which took place near the turn of the 6th century BC led to changes which gave rise to groups of people who controlled both labour and territory. At the same time, the islands emerged from their isolation and a gradual increase in the import of Punic, Greek and Italic objects can be noted. Thus they prefer to call this period post-Talayotic. The existence of these differences in opinion is understandable because as usual, archaeological records paint a very complex picture.

Excavations have revealed that in the beginning of this period, some talayots were destroyed. The reason for this is still unclear. Was the demographic pressure too big, resulting in fights between the settlements? Was this overpopulation also the reason why people left the Islands to seek their fortune? Furthermore, the expansionism of Carthage, Rome and Macedonia in the 5th, 4th and 3rd centuries BC provoked terrible wars. Although the Balearic Islands were largely spared the turmoil of war, the latter had a large impact on the islands, for example in the recruitment of Balearic mercenaries.

Iberian and Campanian (Italy) black pottery from the Post-talayotic phase of Son Fornés (Montuïri, Majorca). Photo Francesc Ferreri, Museu Arqueològic de Son Fornés.

The foundation of Punic Eivissa (Ibiza) in 654 BC is symptomatic for the changes which occurred in this part of the Mediterranean. It must however be made clear that the Balearic Islands never became a Punic colony. The local elite interacted with the Phoenicians as equals. The Phoenicians only used coastal trading spots like Na Guardis (Majorca) as a seasonal settlement. Goods were merely traded with the local elite of the coastal sites and products only gradually found their way inland. Wine was in demand, but luxury products have not been found in the centre of the island.

## 10.2. Crisis and recovery?

### 10.2.1. Old house - new house

It has been demonstrated archaeologically that talayots were destroyed and new settlements were built on the ruins of old ones at the beginning of this phase. Sometimes, talayots were used as quarries or were incorporated into the walls of houses. However, not all talayots were destroyed: some were modified and survived.

The settlements, however, were organised in a completely different way. The housing complexes in this period consist of rooms built around a paved patio where the rainwater is collected in containers or cisterns. Beside living and sleeping rooms, storage rooms with large grindstones and storage pots were present. These changes are very well preserved in the floor plan of the post-Talayotic phase of Son Fornés on Majorca and in the latest phase of Trepucó on Minorca.

Some houses have more than one level. The hearth is much smaller than in the previous period and in some houses, more than one mill stone was found. This all points to specialization. During this period, it was no longer households but craftsmen who made goods. The economy changed from an evolved subsistence economy into a surplus economy. Still, the local craftsmen did not use the most modern techniques. Handmade pottery and hand mills remained in use till the Roman period. The quality of common wares seems to deteriorate in the post-Talayotic period. This was not interpreted as decline, but as a kind of mass production wherein pottery was considered a disposable product which didn't have to last for a long time.


Late or post-Talayotic house at Trepucó (Maó — Es Castell, Minorca).
A: house entrance
B: stable
C: oven
D: kennel
E: impluvium (place to collect rain water)
F: hearth
G1 & G2: room
H: storage rooms
I: warehouse and mill
After L. Plantalamor-Massanet.

The Cartailhac Circle, named in honour of the eminent French archaeologist Émile Cartailhac, author of "Primitive Monuments on the Balearic Islands" (1892), was inhabited between 250–50 BC. Photo Mark Van Strydonck.

Part of a post-Talayotic house at Talatí de Dalt (Minorca). Photo Mark Van Strydonck.

The town wall of the settlement of Son Catlar (Ciutadella, Minorca). This settlement is one of the largest in Minorca. The site originates from the Bronze Age, but enjoyed its bloom during the Roman period. It has a surface of 3.75 ha and is completely enclosed by a ca. 900 m long wall. This wall was built during the post-Talayotic phase of the settlement and is up to 3 m high and 2.5 m wide. Bastions were added to the wall during a later phase. Photo Mark Van Strydonck.

On Majorca (like at Ses Païsses) as well as on Minorca (like at Son Catlar), the villages became walled. This, together with the frequent appearance of weapons, points to the rise of a hierarchical differentiation. It must have been this elite which led the rituals in the taula and sanctuary sites.

### 10.2.2. The Balearic slingers or sling-shooters

Together with the changes in the island's culture, large groups of men became mercenaries in the Carthaginian army and later in the Roman legions. The reason why so many people left the islands to become soldiers of fortune has probably to do with overpopulation of the islands, in combination with ecological and economic problems. During this period, deforestation for the sake of agriculture was huge, and the pressure on land became enormous. New earnings, on the one hand, came from joining foreign armies, but piracy also became a lucrative activity of the island dwellers. Doubtless the islanders grew famous as slingers and were praised by classical authors for their handiness with the sling.

Beside the sling stones, other metal weaponry found in archaeological records such as Mediterranean and European swords, spear heads, axes and helmets formed the arsenal of the island dwellers.

The mercenaries brought prestige objects to the islands from all over the Mediterranean Sea. Although according to the classical authors, the import of precious metals was not allowed, some rare and remarkable gold and silver objects were found, like the earrings from Alcúdia with a sophisticated flower motive, little female heads and cupids or heads of goats, lions and other wild animals. Furthermore, there are different small statuettes like the ca. 12cm tall archer found in the talayot of Llucmayor (Majorca). It shows the naked figure of an athlete, without helmet, with a quiver but no arch. It can be classified as a Dorian figurine from Sicily or Southern Italy and dates from around 560 BC. A statue of a wild boar was found near Toréllo (Maó), originating probably from Asia Minor and dated around 500 BC. The same date is given to the representation of a running athlete from Rafal de Toro (Minorca). Of course, it remains an open question whether we are dealing with loot or trade products here, given that

Statue of a 'Foner Balear' in Palma de Majorca. Photo Mark Van Strydonck.

the first official record of the presence of Balearic slingers is only from the battle of Selinus in 409 BC .

## 10.3. Bulls, pigeons and warriors

During the post-Talayotic period, some remarkable figurines appear in the archeological records of the Balearic Islands for the first time. They are statuettes of bulls, pigeons and warriors found in sanctuaries and burial places. What is remarkable is that each category of statuettes is stylistically very homogeneous.

### 10.3.1. The bulls

The bull cult is part of a particularly ancient Mediterranean tradition which goes back to the Neolithic period. One of the oldest manifestations of this cult was found in the urban settlements of the Taurus Mountains in present-day Turkey. Around 6,000 BC, there was already a temple on the site of çatal Hüyük, of which the interior was decorated with bull heads and horns. We know from Egyptian culture that the Apis bull was embalmed in the temple of Ptah near Memphis. Further west, on Sardinia, stylized bull heads can be observed on tomb walls — hypogea. The bull also plays an important role in Greek mythology. The best-known story is of course that of the Minotaur in the Labyrinth of King Minos of Crete, killed by the Greek hero Theseus. The Greeks exported their bull cult to their colonies on Sicily, Italy and the Iberian Peninsula.

On the Balearic Islands, the tauromorph statuettes were a rather late arrival. They are dated to the 4th century, but the cult may be older. Some even see a much stylised bull's head in the T-shaped taula. It is not entirely clear whether these objects were made on the islands or whether they were imported as trophies. Either way they are very typical for this period. The bull is the symbol for strength, power and fertility in different cultures and myths and this was no different for the Balearic Islands.



Bronze bull's head from Vilar de Talapí (Buger, Majorca). Photo Conselleria d'Educació, Cultura i Esports (Govern Balear), Museu de Mallorca.

One of the three outstanding Bull's heads of the sanctuary of Son Corró (Costitx, Majorca). They were discovered in 1894. The originals are kept in National Archaeological Museum in Madrid. The horns and eyes (originally filled with glass paste) were made separately. The head is hollow and an iron bar would have been placed through it to hang it. Photo Mark Van Strydonck.

Bronze pigeon figurine from Son Ribut (Majorca). Photo Museu de Sóller.

Although stylistically related, the representation of the bulls can vary greatly, including in size. Sometimes the entire animal is present as a small statuette, sometimes only the head is represented. In other cases, only very large bronze horns represent the bull. In the burial cave of Avenc de sa Punta near Pollença, even wooden sarcophagi shaped like standing bulls were found (ca. 500 BC).

### 10.3.2. The pigeons

The bronze and iron pigeons are found only on Majorca. They all resemble one another and the figurines are placed on a short conical case, holding a wooden stick.

They are all found in a grave context together with bull horns. The animals probably symbolise male and female gods. The pigeon could be the symbol for Astarte, the Phoenician goddess of fertility. Later she became the Punic goddess Tanit. Terracotta female statuettes holding a pigeon are often found on Punic sites.

### 10.3.3. The warriors

The exact moment the warrior figures arrived on Majorca is impossible to reconstruct. Stylistically they form a very homogeneous group. They are all naked male figures, lifting a lance with a raised right arm. The left arm is held before the chest to hold a shield. The figures wear a helmet which is either conical or has a Phrygian model, afforded with a feather or crest. Sometimes, lines carved into the feet of statuettes can be observed, representing the warrior's footwear.

The cult of this war god, the Mars Balearicus, is definitely post-Talayotic: none of the figures is older than the 5th century and they arrived on the island under Punic influence. It was first thought that they came to the islands as loot, but since they are only found in sanctuaries, one is inclined to consider them ex-votos. The statuettes were supposed to give the warriors strength and a safe return.

These three examples show very well that during this period, the local culture is strongly influenced by neighbouring ones. Nevertheless, this was not at the expense of their own culture. It is more an adaptation than a rejection thereof. In spite of the Romanisation, people continued to worship the local gods. At the sanctuary of Son Corró (Costitx) a warrior statuette was found next to a Roman house god from the 1st century AD. Even in the 5th century, a letter of bishop Severo speaks of pagan practices on Minorca.

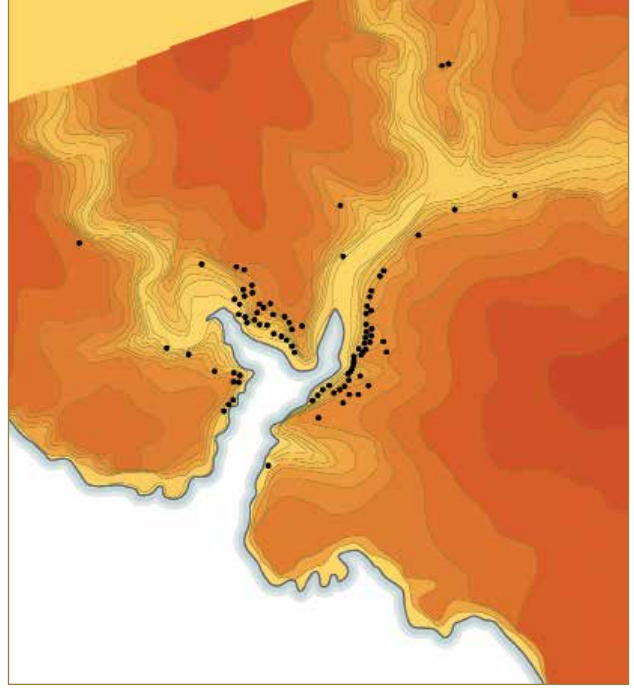
Warrior statuettes from the sanctuary of Son Favar (Majorca). Photo Conselleria d'Educació, Cultura i Esports (Govern Balear), Museu de Mallorca.

## 10.4. A house for the afterlife

During the post-Talayotic period, burial rites played an important role in society. The large number of necropolises, especially on the island of Minorca, are evidence of this. They consist of artificial caves cut out in coastal cliffs or barrancs. The most famous is without any doubt the necropolis of Calas Coves, a series of artificial and natural caves which, until recently, were clandestinely inhabited by would-be-hippies and unorthodox tourists. Less known, but certainly not less important, are the cave complexes from Son Bou, Caparrot de Forma and Cala'n Morell. The constellation of all these necropolises is very similar: a series of artificial caves are cut out from a cliff wall overlooking a bay or the sea directly. The interior of these cave chambers resembles the interior of a house with a central pillar and niches. Each chamber was probably owned by one family. The cliffs where the caves are cut out are close to a possible harbour or landing place. On top of the cliff, on a piece of flatland, there is an area enclosed by a wall. A natural or artificial well is situated at the foot of the cliffs or on top of them. In the latter case, one can descend deep into the well via some stairs. The setting of these necropolises makes it clear that the sea must have had a special meaning to these people. Does it reflect the fact that they originally came from overseas?

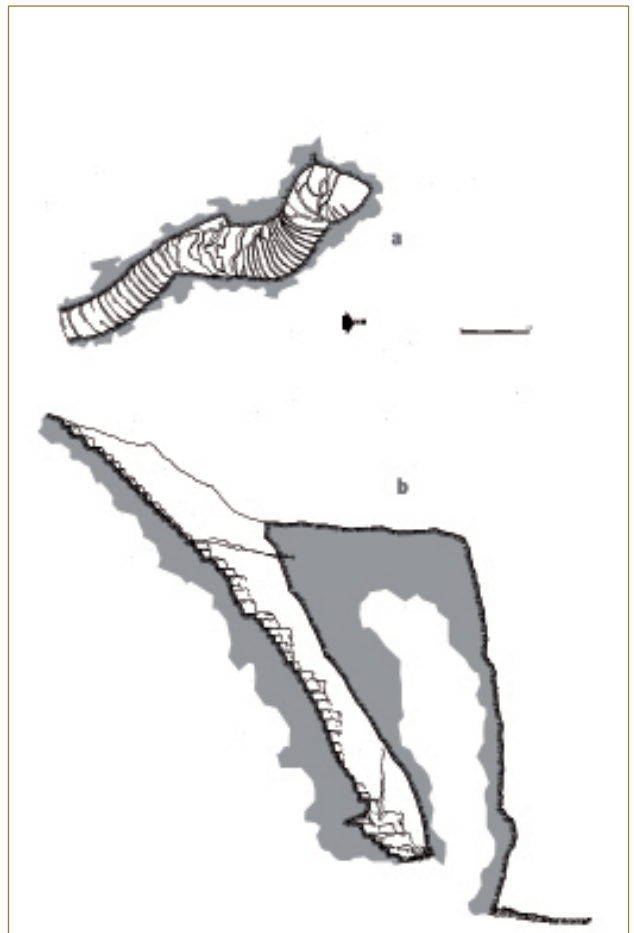
Although the necropolis of Calas Coves and the surrounding area is spectacular, the site at Cala'n Morell gives a better overview of this type of burial site. This necropolis is situated in one of the two branches of the gorge that ends in the bay of the same name, an exceptional natural harbour to the north-west of the island. Geologically, the zone of Cala'n Morell is part of the tectonic fault that divides Minorca in two parts with a series of primary and secondary formations with quaternary infills in the north and a platform of Miocene limestone in the south. The necropolis is cut out of the cliff walls of this limestone platform.

The entrance of the artificial cave is a rectangular doorway, in some cases decorated with a bas-relief representing columns and an architrave. Some caves even have an imitation corniche.



The 91 burial caves of Calas Coves (Alaior, Minorca) are situated where the barranc of Sant Domingo and the barranc of Biniadrís join each other and run into the sea. After Veny Meliá.

In the cliffs of Calas Coves, there are three recognisable types of burial chamber. First of all, there are the natural caves closed off by a cyclopic wall. Next there are the artificial caves with a simple circular or oval floor plan. They date from the 9th–8th century BC. Finally there are the most spectacular and complex caves from the post-Talayotic period. The entrance to these caves is sometimes finished with a bas-relief imitating the entrance pillars of houses. Inside these artificial caves false pillars, architectonical decorations and niches can be found. Photo Mark Van Strydonck.




Well with a staircase at Calas Coves.
A: view from above
B: section
After L. Plantalamor-Massanet.

In other caves, one can still see the groove for the copestone. Unfortunately a lot of these entrance doorways were destroyed in recent times and new entrances have been cut out from the rock.

On the inside, most caves have the same architectural elements. The inside of the doorway shows similar sculpted decorations to those on the outside. When cutting out the rock, a rectangular column was left in most caves. This column was not necessary for the stability of the cave but served a purely aesthetical purpose. The pillars are larger near the top so that the illusion of a chapiter is created.

The interior is lobed, dividing the interior into separate spaces. In the cave wall niches were cut out and the marks of the tools used to cut out the rock are still visible on the walls as well as on the floor and ceiling.

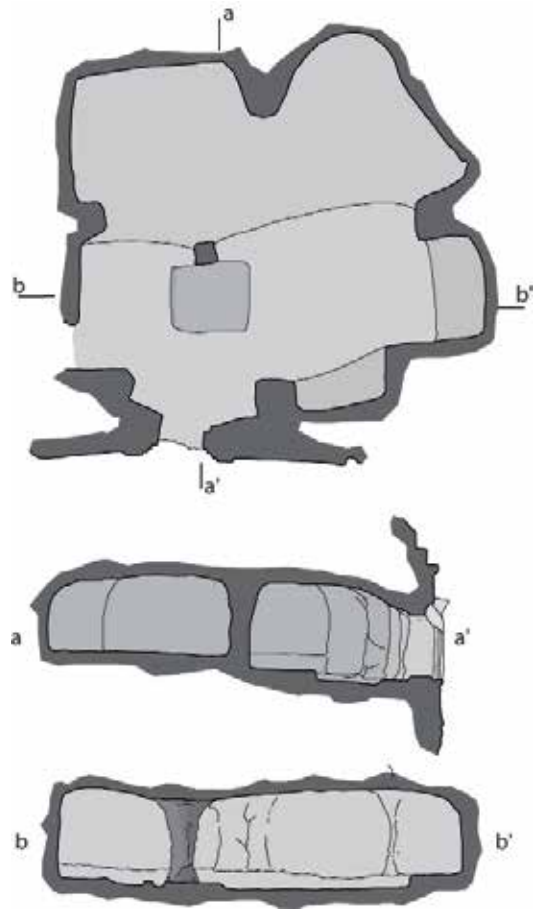
In one place in the cliff wall, one can see 22 holes or niches at different levels, over a length of about 20m: the so-called 'Capades de Moro' or 'butts of the Moor'. One might speculate that these niches are children's graves, but more probably they were for urns.

On Majorca, too, there is a unique burial site that is unequalled on either island in concept and size. It is the site of Son Real (municipality of Santa Margalida) in the bay of Alcúdia. The site encompasses a necropolis, a burial island and two artificial burial caves.

A burial chamber at Cala'n Morell cut out from the rock as if it was the room of a house with false pillars and niches. Photo Mark Van Strydonck.





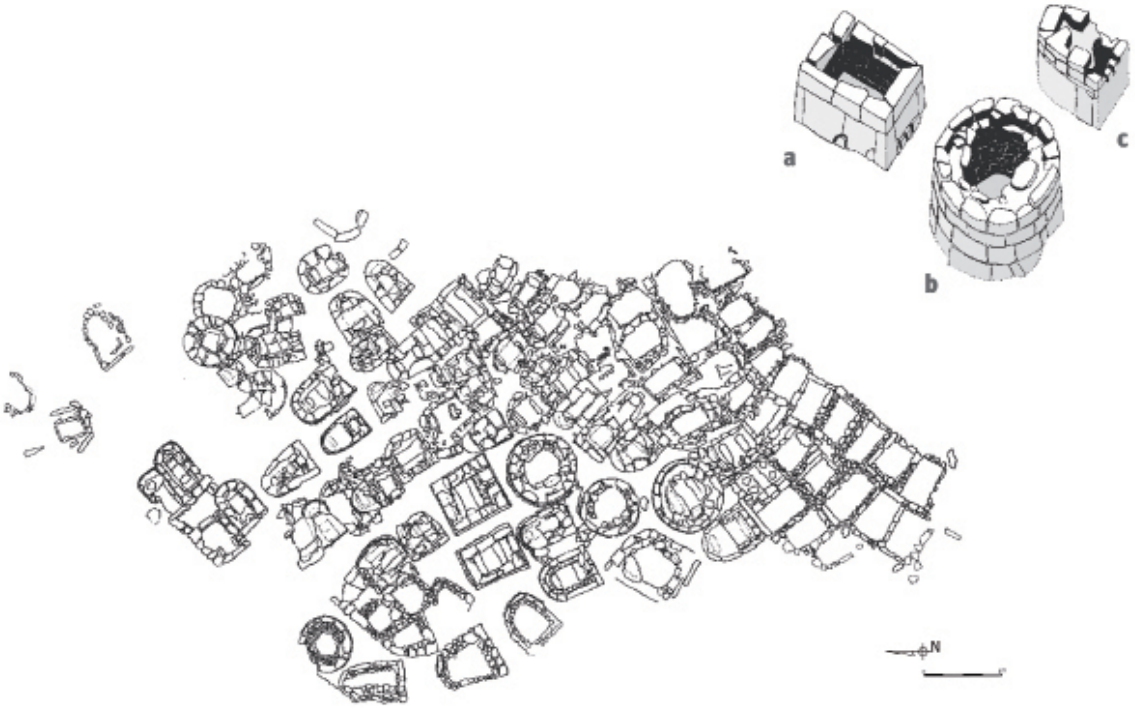



Floor plan and section of cave #4 at Cala 'n Morell. The doorway with sculpted columns and other ornaments is placed central in the façade. The inside is poly-lobed with a central pillar. The pillar has a square section and divides the space in different segments. Each segment is probably a space were the deceased were deposited. In the central part a small cavity is cut out of the floor. After L. Plantalamor-Massanet.

One of the artificial caves at Cala 'n Morell. The two columns cut out of the rock as well as the architrave and a little higher against the cliff wall an imitation corniche are visible. Photo Mark Van Strydonck.

The necropolis, commonly called 'Cementiri des Fenicis', is located on the small headland called Punta des Fenicis and consists of about hundred graves like little houses. Some are circular in shape, others square or rectangular. Others still are rectangular with one concave wall, resembling a micro-naveta.

Three large circular tombs are located in the central to south-western sector. They are collective graves with a diameter varying from 4 to 5 m. The same section also includes some large rectangular tombs. The 'micro-navetas' form a group of some 30 tombs. These tombs have two small parallel ditches in which grave gifts were deposited. In the room, one or two bodies were placed in the foetal position, the feet towards the concave wall of the tomb. The little houses are sealed off with large stone slabs. The outside walls are very well finished. The construction no longer has anything cyclopic. Some of these little houses have small 'ventanas' or windows. They are nothing more than holes one stone high in the wall. The function of these windows is unclear. In one grave it is obvious how two standing stones, a threshold and a lintel form a more or less trapezoidal doorway. The doorway is closed by a large stone which fits perfectly in the opening.




The necropolis of Son Real (Majorca). This necropolis is a succession of three types of burial chambers: A) rectangular graves; B) the micro-talayots and C) the micro-navetas. After Jordi Hernández Gasch.

The necropolis of Son Real (Majorca). Photo Mark Van Strydonck.

The square and rectangular graves form an uninterrupted series of poorly constructed tombs in the southeast part of the site. These tombs show traces of cremation practices.

The archaeologists divide the history of this necropolis into three phases. The round and more or less centrally situated square burial chambers belong to the oldest phase (ca. 7th–6th century BC). The uninterrupted series of square tombs in the south-east part of the necropolis belong to the youngest phase (4th–2nd century BC, reused until the 1st century AD). The remaining square and naviform constructions belong to the middle phase (about 5th century BC).

The content of the graves is very diverse. The pottery inventory comprises local, Iberian, Roman as well as imitation material and amphora. Amongst the metal objects, iron antenna swords, and spiral arm and hair bands were

A burial on the small island of S'Illot des Porros (Majorca). Photo Mark Van Strydonck.

found, as well as bronze axes, lead pectorals and the so-called 'tintinabulo' or 'jingle'. These are cast or beaten bronze discs, sometimes with pointillé decorations, attached with a chain to a bronze rod. It is assumed that the stick was placed between the hands of the deceased, while the disc is put on the mouth. These 'tintinabulo' are also very common on other burial sites. All kinds of glass paste fragments were found beside a lot of bone 'taps'. These are small conically cut bone fragments made of bovine tail bones. These bones probably had a ritual function in the bull cult. Archaeologists imagine a ritual whereby the meat of the animal is consumed, while parts of it are given as an offering. This of course does not explain why the tailbones were conically shaped.

At Son Real, archaeologists also found two individuals with a perforated skull. Both individuals survived this dangerous procedure.

It is obvious that in the case of this necropolis, just as for those on Minorca, the proximity to the sea must have been very important. It is not only the presence of the sea, but also the shape of some graves, namely the micro-navetas, which is reminiscent of the other island. These micro-navetas represent the final evolution of a building concept present on the islands since the Bronze Age.

A few hundred meters east of Punta des Fenicis, close to Punta des Patró, a small island lies about 65 m off the coast. On this island, S'Illot des Porros, a few, big, almost circular chambers and micro-navetas with people in the foetal position were found. The oldest artefact recovered from this small island is a belt from the 5th century BC. It looks, based on some Roman pottery, as though the site was used until the 1st century AD.

More than 30 archaeological sites from different periods are known within a perimeter of about 3 km around those necropolises. This area must have been very attractive to live in, but unfortunately no settlement that can be directly associated with these burial sites.

It is remarkable that so many different types of burial sites as well as burial rites were in use at the same time on the Balearic Islands. Beside the aforementioned necropolises, people in the post-Talayotic period were also buried in tauromorph sarcophagi as well as being cremated and buried in graves covered with quicklime. It has also been discovered that in the same period, people were also buried in reused Bronze Age hypogea. The artificial hypogeum situated next to the staggered turriform of Son Ferrer, for example, was first used as a collective necropolis during the Bronze Age and in post-Talayotic times it was used as a collective burial place again. About a hundred people were buried in this hypogeum between ca. 500 and 180 BC. Of these, 49 % were foetuses or perinatal individuals, children under 14 made up 38 % of the total, whereas adults amounted to only 13 %. 61 % of them were aged between 20 and 35. The human remains had been displaced, except for three inhumations (two adults and one infant), just before the cave was sealed. The contrast is enormous: in some places, people were very neatly deposited in a tomb, whilst at other sites they were cremated and their bones were thrown on a heap without further consideration. If we regard the lime burials as an extended form of cremation, then this rite fits in with what happened in Catalonia and further north in Europe. Burying people in the foetal position, on the other hand, is a practice with a long tradition on the islands as well as the Iberian Peninsula. Do these differences mean that we have to consider the presence of different cultural groups on the islands, or is it merely a matter of social differences? It is far from clear. In some of the tombs of Son Real — S'Illot des Porros, the use of lime can be identified, be it in limited amounts. Likewise, the typical grave gifts (like lead pectorals,

glass beads, bone taps etc.) were found in the necropolises as well as in the lime burials. This shows that that there is some uniformity between the burial practices. Although a lot of the grave offerings like the glass beads are culturally related to the Punic world, the Punic Tophets, cemeteries of small urns containing the cremated remains of young animals and children are absent on the islands. This confirms the hypothesis that the islands were never colonised by Carthage.

# 11. The classic authors, an unexpected source of information

Although ancient written sources may often give inaccurate information about historical facts, they constitute nevertheless important evidence. When interpreting them one has to keep in mind that very often they were subject to political bias such that glorification of statesmen and warlords sometimes prevailed over historical precision.

A first record of the Gymnetes is found in the Ora Maritima (Sea Coasts) by Avienus (about 550 BC), a compilation of older writings. But still, this is probably not the oldest reference. The geographer Hecataeus of Miletus (about 500 BC) refers to two islands named as Kromyoussa and Meloussa, meaning the "island of the onions" and

Attic (Greek) aryballos (perfume-flask) from the ship wreck discovered at El Sec (Calvià, Majorca). In the mid-4th century BC a ship sank near the entrance to the harbour of Palma de Majorca. Most probably it was a Punic vessel on its way to the Iberian Peninsula. It was loaded with Greek products: amphoras with wine and oil from Corinth, Cos and Rhodes; bronze vases, and red- and black-figure pottery. Some of these objects bore commercial graffiti and other scratched marks by which Punic and Greek traders marked the price and the quantity of the goods. Photo Museu d'Història de Manacor.

Necklace made of glass paste from Cova des Rafal (Son Severa, Majorca): post-Talayotic import material from Ibiza. These glass pastes were made under Punic influence. Photo Museu d'Història de Manacor.

the "island of the apples" respectively. The ending-oussa was used by Greek sailors at the beginning of the last millennium BC to indicate place names on the sea route connecting Italy with the Iberian Peninsula.

The story, as noted before, that the inhabitants of the islands descend from the Trojan warriors was also mentioned by Strabo. He called the islands the Gymnesiai. This was without any doubt the most prevalent name for the islands in the Greek world. There exist numerous explanations for this name, some more colourful than others. First the name would come from the mere sight of the — already largely deforested, but fertile — landscape. Other authors claim that the name was given because people, at least during summer, were naked. Finally it could also signify that warriors fought without wearing armour.

The first unequivocal reference to the islands is found in Diodorus and refers to the year 409 and 406 BC. The text deals with the recruitment of mercenaries by the Carthaginians for their major campaign on Sicily. The name Baliares is not used before Polybius in the second half of the second century BC. The name probably derives from the local word for slinger or from the name the locals themselve gave to the islands. The author mentions already that it is wrong to suppose that the name derives from the Greek word ballein, which means "throw".

Punic coloured glass paste from a necklace. Photo Mark Van Strydonck, D.A.M.A.R.C.

That the Balearic slingers had a special reputation can be deduced from the numerous quotations in classical authors. Accounts of the Punic wars provide the most plentiful information. The mercenaries of Hannibal's army were mostly recruited in Spain. From the writings of Polybius we can infer that in total two to three thousand such mercenaries were recruited. This is a very considerable number if we can accept Timaeus' statement that the population of the islands numbered about 30,000.

At the battle of Trebia (218 BC) the Balearic slingers formed the forefront of Hannibal's army. Before the actual battle started they bombarded the Roman army with their projectiles. Strabo as well as Timaeus describes the expertise of the slingers. They were capable of throwing projectiles made of stone, baked clay or leaden bullets. Each warrior had three slings, each of them suitable for a different distance. One sling was wound around the head, another kept in the hand and the third was girt about the waist. The slings were made of tendons, leather or very tough grasses (esparto). According to Caesar, who used slingers during the Gallic wars, the weight of a sling stone was about 1 pound.

After Carthage's luck had changed and Cadiz was sacked in 206 BC Mago, Hannibal's brother, disembarked at Minorca were he built a bridgehead that received his name: Portus Magonis. The name evolved to Maó in Catalan and Mahón in Castilian. The story goes that — much later in history — the seizure of Minorca by Napoleon Bonaparte from the English was celebrated by the creation of a new dish or dressing by the French called "mayonnaise". If this story is true, then this very popular dressing is etymologically related to the Carthaginian hero!

Balearic mercenaries are also mentioned during the famous revolt in 240 BC, suppressed near the end of the first Punic war by Hamilcar Barca. It is not a first-hand testimony, but a later citation. In 202 BC during the battle

Glass paste with a clear Punic influence. Photo Mark Van Strydonck, D.A.M.A.R.C.

of Zama there were still Balearic mercenaries fighting with the Carthaginian troops.

The Balearic slingers became so famous that they became a synonym for fast and furious. Ovid in Book 2 of his Metamorphoses tells the story of the winged god Mercury in love with the king's daughter Herse. He writes that the god, enraptured by her beauty, glided through the sky and started to glow as a lead bullet thrown by a Balearic slinger.

Diodorus of Sicily tells us that the mercenaries had no monetary system and that they were paid by wine and women. It is true that in pre-Talayotic and Talayotic sites no gold or golden objects were found. That the import of gold and silver was prohibited explains perhaps the presence of lead jewellery found in post-Talayotic contexts. Wine was indeed a luxury product imported by the Punic sailors and related to religious and ritual festivities. The presence of wine amphoras in post-Talayotic settlements shows that the people were attached to this beverage. According to Diodorus of Sicily, Ibiza had a some vineyards but this was not the case on the Balearic Islands.

Although the mercenaries were renowned warriors, the classical authors had no very high opinion of the island dwellers. The islands were described as savage and exotic. The islanders had amongst other things the strange habit of rubbing in their body with resinous oil from the mastic tree (Pistacia lentiscus). Lycophron describes them as dressed in sheepskins and going about barefoot. Strabo reports that it was the Punic people who taught the island dwellers to dress in large plain tunics and a shirt. Together with this clothing, numerous ornaments were introduced like necklaces, glass paste pendants, etc.. The classical authors found the clothes of the mercenaries rudimentary and crude.

Timaeus mentions that a burial rite on the islands, in which the body was broken with wooden sticks, after which the pieces were placed in urns, then a heap of stones was thrown on top. This is probably a very vague description of a lime burial. The "heap of stones" may refer to the lime blocks and the bones in the lime look like dismembered and beaten bodies.

Vitruvius notes the presences of red lead (vermillion) on the islands. This explains, according to him, the absence of snakes.

The classical authors describe a range of peculiarities in relations between the sexes. It seemed to be a marriage custom, as it was also amongst the Nasamonians of Libya, that the bride on the first night of her marriage had intercourse with all the guests who gave a gift that they had brought from their home. Women abducted by the enemy were often bought back by trading them for three to four men. Even if true, however, the motivation for this practice is unclear.

The pharmacologist and botanist Dioscorides refers to a local pastry made of flour of the rootstock of the Dragon Arum (Dracunculus vulgaris), a kind of arum, to which honey was added.

After the Punic wars the islands were not immediately conquered by the Romans. Consequently the post-Talayotic culture prospered until 123 BC when the consul Quintus Caecilius Metellus conquered Majorca. Orosius writes that Metellus went to conquer the Balearic Islands in the course of Rome's struggles against piracy. The actions of Metellus fitted in with the efforts of Rome to keep the trade route from Italy to Spain free of pirates. Amongst others, the inhabitants of Massilia (Marseille) asked for such measures. It was said that the primitive island dwellers attacked Metellus' ships with their slings from crudely constructed rafts. Livy related in his book LX, which unfortunately is lost, how the Romans protected their ships with leather cuirasses which the projectiles would bounce off. Florus describes how with a lot of screaming and shouting, as if they were a herd of sheep, the natives fled away to the nearest tumulus (talayot). This passage reveals that some talayots were still in use till Roman times. After they were driven away from their home, the Romans chased them into the mountains. Strabo is the only author who speaks up for the natives. He notes that the Balearics have suffered a lot from the desire of others to take possession of their fertile land and that piracy was only committed by a minority.

The actions of Metellus and establishment of a garrison on Majorca seemed to be successful because during the Late Republican period there are no reports anymore of piracy. In 121 BC Metellus made a triumphant return to Rome and was given the title Balearicus.

Strabo mentions, further, that Metellus settled 3,000 Romans, probably veterans from Spain, on the islands and that he founded two Roman cities: Palma and Pollentia. These settlements ensured the Roman control of the islands. According to Pliny five important urban settlements existed: Palmeria, derived from the word 'palm of victory' later transformed to Palma de Mallorca, Pollentia (near the present day city of Alcúdia), Bocchor (Civitas Bocchoritana), Guius en Tucis. From the first two settlements archaeological finds have been found and of Bocchor or Bocchoris it is known that there was an indigenous nucleus, but from the other two there is no further evidence.

Finally the written sources include some names written on Roman commemorative stones, self-evidently after the annexation by Rome. On these stones names like Cucuma, Cudunia, Isaptu or Norisus are written down, from which experts have concluded that the island dwellers had Indo-European roots.

# 12. The Romans

## 12.1. Incorporation in the Empire

After the second Punic war the Romans were the only superpower in the Mediterranean Sea, which they named without any scruples Mare Nostrum. At first sight it is surprising that Rome only decided at a late stage to annex the Balearic Islands. After the sack of Carthage in the year 146 BC the entire western Mediterranean basin was open to the Romans, but they were not interested in the Balearic Islands, which perhaps seemed to be too insignificant! It was only because of piracy that they took action. Because of the abundance of Roman artefacts and the presence of a Roman fortress it is presumed that the Romans disembarked in the area of Ses Salines — Es Trenc. Archaeological excavation suggests that

Imitation Roman pottery from the post-Talayotic phase of Son Fornés (Montuïri, Majorca). Photo Francesc Ferreri, Museu Arqueològic de Son Fornés.

the capture of the island was very violent. Some sanctuaries and settlements were destroyed and trading places such as El Turó de ses Beies where the locals traded products with the Punic merchants were abandoned very hastily, leaving behind properties of all sorts. Some settlements made pacts with the Romans which preserved them from destruction. Ibiza did the same, and by the end of the second Punic war it became an ally of Rome.

Although their incorporation in the Roman empire had an enormous impact on the islands, already in the 3rd century a development had begun to take place in which a rural elite started to establish larger farming units or holdings. This went along with an increasing social differentiation. A surplus economy started to develop with intensified agriculture and trade with the surrounding world. In this period the import of high-quality pottery from Italy, the Iberian Peninsula and Ibiza can be identified. The common people had no easy access to these new products. This is very well testified by the presence of local imitations of Roman pottery. In contrast to the Roman goods, this pottery was still hand-made. For the common people integration into the empire was very slow. Administratively the Balearic Island became part of the province of Hispania citerior with Carthago Nova (Cartagena) as capital. Later, after the provincial reorganization of Augustus, the islands came under the administration of Tarraconensis with Tarraco or Tarragona as capital. Under the reign of Diocletianus, near the end of the 3rd century AD, they became part of the province of Cartaginesis, and during the 4th century the province of Insulae Baleares was created.

Roman Pollentia (Majorca). Photo Mark Van Strydonck

## 12.2. Villages, cities and local industries

Archaeological excavations have shown that the town of Pollentia was most probably not founded before the second quarter of the first century BC and was accomplished during Augustus' reign. The 3,000 colonists that Quintus Caecilius Metellus brought to Majorca lived almost certainly in encampments on the most strategic places such as the bay of Palma and the bay of Alcúdia. It was probably Quintus Caecilius Metellus Pius who was responsible for the foundation of Pollentia. He brought Italian veterans from the war on the Iberian Peninsula against Sertorius (80–71 BC) to Majorca. Somewhat later Augustus gave Pollentia as well as Palmeria (Palma) the status of colonia civium Romanorum or Roman colony. Pollentia always remained the most important city on the island. With a surface of 18 ha Pollentia was a large city by Roman-Iberian standards. Originally, indeed until the 3rd century, the city was not walled. Even today, remains of the forum with the capitolium and shops, the curia, gymnasium and houses are still visible. The theatre was built outside the city walls. The water supply of the city was assured by a channel more than 13 km long, with aqueducts.

Not much remains of Roman Palma. Some people seem to recognize in the shape of the row of houses formed by the Pca. Joan Charles I, the C/Jovellanos and the C/Paraires the shape of the Roman theatre. Also the Minorcan cities Ciutadella and Maó have a Roman past. Besides these new cities the post-Talayotic settlements continued to exist and were only slowly Romanised.

At the same time Roman villas were built on country sites specialising in agriculture, animal husbandry and in the production of garum, a fermented fish sauce.

Also some basic industrial activity was stimulated such as salt-panning from sea water. On Majorca, as in many other places around the Mediterranean, Tyrian purple, also known as royal purple, was made. The Tyrian

purple is a dyestuff made from murex shells. The dye was greatly prized in antiquity because the colour did not easily fade in contrast to purple made by mixing red and blue dyes. The dyestuff is not present in the living animal as such, but develops by enzymatic hydrolysis of uncoloured components after the animal died. This process has to be performed immediately after the collection of the shells. During this preparation an unpleasant smell is produced (rotting of the animal) therefore it was forbidden to perform this activity in urban areas. So the purple production was done "on site", in the absence of large buildings or constructions. As a result of this the archaeological remains of these sites, like the one on the island of Cabrera and the one near the Civitas Bocchoritana, are very poor except for the large quantities of murex shells that are left behind.

Finally it has to be mentioned that besides some important settlements the Balearic Islands were for the Romans not really "the place to be".

# 13. Epilogue

The Balearic story doesn't stop with the Romans. After the Romans the Vandals conquered the islands (427) followed by the Byzantines (534). The islands knew several Viking incursions, the Moors took advantage of periodic instability to embark on several raids. It was the Moors who improved agriculture by construction of irrigation systems and the building of the terraces still visible in the mountains. In the 13th century Jaume (James) I of Aragon invaded the islands. Shortly afterwards, and this for only a brief moment, the Kingdom of Majorca was founded (1276–1344). The islands also became involved in the War of the Spanish Succession. In the 18th century the English as well as the French occupied the islands. Even today the English influence on Minorca is still noticeable. The Spanish Civil War divided the archipelago in two. Minorca supported the Republicans while Majorca was inclined to follow the Nationals. Nowadays the Balearic Islands (including Ibiza and Formentera) form an autonomous community and a province of Spain.

All in all, the islands have, considering their small size, a remarkably complex history.

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# Location Index