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The Talaiotic culture of the Balearic Islands

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Abstract

This article aims to outline the essential features of the human communities which developed on the islands of Mallorca and Menorca between the mid-10th and mid-6th centuries BC. The name Talaiotic culture identifies communities which inhabited small villages dedicated to crop and livestock farming in an autarchic regime whose social development was in the process of hierarchisation. Despite the dissolution of this economic and social structure, contact with the outside world was marked by the strong commercial and political impact of the Punic and Greek colonies, according to the archaeological record.

Keywords: social complexity, humanisation of the territory, territorialisation, cyclopean architecture, collective burials

Introduction

By Talaiotic we are referring to the period on the islands of Mallorca and Menorca roughly spanning the first half of the first millennium BC, which in technological evolution corresponds to the late Bronze and early Iron Ages. The word talaiot is rooted in the Catalan word *talaia*[1] and is associated with the concepts of tower and keeping watch, a purpose that hovered over the earliest hypotheses on the use of the most emblematic constructions from this period. As these towers are the most monumental structures from prehistory on Mallorca and Menorca, they have been used as a reference when developing systematisations of prehistory. Therefore, we talk about pre-Talaiotic and post-Talaiotic.

The Institut d'Estudis Catalans was the promoter of the earliest scientific studies carried out on Mallorca, after which the first systematisation of the island's prehistory was undertaken.[2] This scholarly institution sent the archaeologist Josep Colomines there between 1915 and 1920 to conduct extensive research, which was reported in several articles.

Currently, numerous research groups are working on the prehistory and especially on the Talaiotic period on both islands, a situation which has sparked the use of different terminologies and the development of different periodisations which reveal nuances, albeit all based on common patterns. This disparity is largely due to the fact that the radiocarbon datings performed decades ago do not come from well-determined stratigraphies and to the fact that the datings from this period, and there are many of them but focused on just a handful of sites, have a broad chronological scope. These two factors created problems when specifying the start of Talaiotic constructions and, in consequence, when pinpointing the timespan of the Talaiotic period.

Despite the name of the culture used for both Mallorca and Menorca, it is not synonymous with homogeneity, and, in fact, this could extend to all of prehistory. They have major similarities and significant divergences in both their architectural expressions and material cultures. One constant feature in the comparative prehistory of both islands is the magnitude and importance of the prehistoric architecture on Menorca. The prehistoric communities on Menorca produced larger and technically more skilled constructions; there were fewer settlements, but they were larger and together they exerted a heavy influence on the land and landscape of Menorca. Talaiotic architecture is the tangible reflection of the economic and social transformations that were occurring in the first half of the first millennium BC, which can be guessed at through archaeological items, and some archaeological studies are beginning to consolidate them.

Periodisation

The systematisation of island prehistory is characterised by the chronological and terminological nuances used by certain individuals and teams to highlight differences with others. This is an erroneous approach when every-

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one is drawing from the same scant sources. Radiocarbon tables and the clarification of their stratigraphic contexts have helped align the systematisations, although there are still different interpretations and nuances.

On the one hand, the Son Forners team has established two periods for the timespan we are examining. The first is the proto-Talaiotic (1050-850 cal BP), which corresponds to the period when the first examples of the naviform architectural transformation appeared, in which the population concentrated into more cohesive complexes because structures were attached to each other. On the island, there were experiments with new forms of architecture, such as the vertically projected forms which became clearly defined in the subsequent phase. The funerary aspects took shape in the development of Menorcan navetas and in the end of natural caves with collective burials through inhumation. Therefore, this is a transitional period between the naviform and the Talaiotic. The Talaiotic period developed from 850 to 600 cal BP.[3] The first date indicates the time that the majority of turriform constructions were built, while the latter refers to the date around which the violent destruction of the majority of Talaiotic structures took place. It also signals a time of profound transformation in which outside influences, especially from Punic Ibiza, played a prominent role.

On the other hand, in the systematisation by Víctor Guerrero there is a Talaiotic Bronze Age with dates that are quite similar to the Son Forners team's proto-Talaiotic period (1100-800 cal BP) but with different content. In Guerrero's opinion, during this period the settlements in navetiforms was partly maintained and walled settlements were built with no talaiots but with prestigious elements such as turriform structures. Ceremonial centres were also built. During this period, we can detect a drive to trade with the outside world expressed in the proliferation of prestigious bronze items. The talaiots began to be built between 900 and 800, and the model of walled settlement and ceremonial centre took root. This theoretical approach was previously suggested by Javier Aramburu.[4] In the social aspects, Guerrero believes that during this period there was most likely a proto-aristocracy which surrounded itself with prestigious elements. He claims that in around 800-700 BP, this evolutionary process collapsed and many of these centres were abandoned or turned into living spaces. He suggested the influence that Punic Ibiza may have exerted as a possible reason for this collapse. He stressed the construction of sanctuaries as prestigious buildings that replaced the turriform constructions and indicated changes in the social and political structure.[5]

Three years later, the same researcher, this time in conjunction with Manuel Calvo and Bartomeu Salvà, made a correction in the systematisation he had suggested and started speaking about a transitional period (1100-900) using the same rationale as the Son Forners team.[6]

The transition towards the Talaiotic period

Traditionally, the origin of Talaiotic culture was considered to be the outcome of an invasive process caused by the instability triggered throughout the entire Mediterranean because of the outbreak of what were known as the Sea People. This theory is the product of the current of thought that prevailed at the time, which regarded the Middle East as the cradle of civilisation and the advances of humanity, which then radiated through the Mediterranean from East to West. The outcome of this process had generated the communities that built the large towers in Corsica, Sardinia, Menorca and Mallorca. Simultaneously, scientific opinion dated the start of the Talaiotic in around the 14th century BP.

The intense research effort in the past three decades, the organisation of the archaeological record, and the radiocarbon datings which we now have on the Balearic Islands, especially Mallorca, have enabled us to posit a new interpretation of events and a timeline of this evolution.

Currently, the Talaiotic period is regarded as an evolution from the previous stage, naviform or late pre-Talaiotic, which spanned from the 17th to the 10th centuries cal BP. This was a slow process towards greater ideological and social complexity which is expressed in the evolution and change in the archaeological items.

To understand the Talaiotic period, it is essential to outline the basic features of the previous period, the naviform, in order to grasp the evolutionary process and changes towards greater social complexity.

There is consensual belief that the construction of naviform structures got underway in the early 17th century cal BP; together with the burial hypogaea, they made an architectural duo that would mark the archaeological identity of the period, especially on Mallorca. The final phase of this period, according to different authors, was between 1100 and 950 cal BP. This phase corresponds to the start of constructions that are distinct from the naviform structures based on the agglutination of buildings, although it in no way materialised in a defined structure that extended throughout all the communities, as would happen in the next period, the Talaiotic.

Naviform architecture is cyclopean in nature. The habitats are structured into U-shaped huts with the elongated arms around 15-20 m long and an earthen and stone roof held up by trunks or slabs. Naviform settlements tend to be located in flat lands and are made up of different naviforms separated from each other, or two or three grouped together with common walls, which never alters the sense of the space. The stratigraphic sequence of some of these naviforms indicates the existence of an upper chamber. The use of naviform huts is documented with absolute datings from between the 17th and 9th centuries cal BP. The proliferation of this building model on Mallorca is noteworthy, with 146 nuclei identified there,[7] but it is less

common on Menorca. Therefore, it is feasible to speak about a substantial demographic increase. In fact, a territorial study of Mallorca indicates that the entire territory was occupied, albeit unevenly. Based on the high density of the settlements, we can deduce human pressure on the natural environment.

We know that in around 1300 cal BP, some naviform constructions were abandoned on both islands. This affects a large percentage of the naviform constructions excavated, but we are unaware of the scope and causes of this abandonment. Examples are the Ponent naviform in the S'Hospitalet Vell and the Canyamel complex on Mallorca and Cala Blanca on Menorca. We have too little archaeological documentation on these centuries to develop a clear discourse on the evolution from the naviform to the Talaiotic period. The excavations of naviform structures indicate heterogeneous events. The Ponent naviform in the S'Hospitalet Vell complex (Manacor, Mallorca) and the Canyamel naviform (Capdepera, Mallorca) show abandonment dates of around 1300 cal BP.[8] This situation is also reflected on Menorca with the abandonment of the naviform in Cala Blanca.[9] The excavations of the naviform complex in Els Closos de Can Gaià (Felanitx, Mallorca) show that the settlement lasted until 800 cal BP.[10] On Menorca, we should highlight the apsidal structure located under the large talaiots in Trebalúger with a more recent dating from around the 11th century cal ANE.[11]

At the end of this period, in around the 10th century cal BP, some archaeological sites excavated on Mallorca and Menorca allow us to identify a change process based on the modification of this construction model, whose end result was tower-shaped structures.

The excavations conducted in El Figueral de Son Real identify experiments in this process. The site consists in different clusters of dispersed naviform structures. In one of these clusters, there is a process of transformation which indicates the intention to seek a different architectural model of the structure used until then in order to yield spaces and an architectural composition to meet new needs, even though the result is architecturally and functionally far from being recognisable as a Talaiotic or turriform structure.

A nucleus of constructions which have been identified as an example of this process has also been found in S'Illot. The core nucleus of this settlement is made up of complex superimposed and attached constructions. The evolution took place through the presence of huts which were probably two attached naviform structures. Over this structure, another quadrangular tower-shaped structure was built. We have three radiocarbon samples from here. The oldest ones are from the wood used on the roof

Figure 1. Aerial photograph of the naviform complex of Els Closos de Can Gaià (Mallorca). Three naviform huts can be seen laid out in an anarchic fashion.

Figure 2. Turriform construction in Trebalúger (Menorca). Large, solid structure resting atop a hill and over a hut from the naviform period.

of the huts, which indicates the earliest date documented: the late 14th century cal BP. Since this wood was used for the roof, we may posit that the construction was in use after this date. Another date comes from a carbon sample extracted from a construction attached to the turriform structure. The date indicates a timeframe between the 11th and 10th centuries cal BP. Thus, the turriform structure we are interested in highlighting must have been built previous to that time.[12]

The evolutionary process on Menorca has not been identified, even though we have some radiocarbon datings which show synchrony with the process on Mallorca. The archaeological excavations of the Trebalúger complex identified a structure under the large talaiot which yielded a radiocarbon dating of 1247-969 cal BP, which provides us with an objective basis for situating the construction of the talaiot at a later date. The radiocarbon dating of the sample extracted from a beam in the circular talaiot in Sant Agustí Vell yields a date of 1007-812 cal BP. The excavations performed in the Biniparratx Petit complex have yielded different radiocarbon datings that help pinpoint the timeline of these constructions. Four datings extracted from the level on which the talaiot sits have been published. All four range between 1000 and 850 cal BP;[13] therefore, they fully concur with the other datings. Likewise, the rectangular layout of the construction attached to the large talaiot in Cornia Nou provides radiocarbon datings on the oldest level from around the turn of the millennium.[14]

On Mallorca, we should highlight the extraction of a surface sample from one of the beams in square talaiot A in Capocorb Vell, which yielded the date 1002-833 cal BP, along with the different samples from the lower levels of talaiots 2 and 3 in Son Forners, both of which yielded 901-811 cal BP. Therefore, between the 11th and 10th centuries cal BP, we witness a phase of change in which the construction of turriforms begins, while naviforms are also still inhabited.

All of this information shows the building of turriform structures on both islands after 1000/950 cal BP. I am of the opinion that the cases identified of experimentation with a new structure based on naviforms do not yet sufficiently clarify the process. As different authors have indicated, the turriform building models found in the Western Mediterranean arc may have influenced the adoption of this architectural concept.

One factor worth highlighting in this transitional period is the proliferation of large metal objects which show not only the adoption of prestigious attributes (swords, daggers, mirrors, pectorals, armguards, etc.) but also trade with the outside world. After 1300 cal BP, casting moulds can be located in different naviforms excavated. The most noteworthy example on Mallorca is the one from the Ponent naviform in the S'Hospitalet Vell complex. Seven moulds used to manufacture punches, armguards, knives and axes were found in the hearth of this hut.[15] On the other hand, coastal enclaves were also built architectural complexes on both Mallorca and Menorca. Bearing this fact in mind, Salvà, Calvo and Guerrero believe that after 1300 cal BP there were communities capable of funnelling their surplus production towards trade, and we thus can posit the existence of some degree of social complexity.[16]

Talaiotic architecture

By talaiot we mean a circular or quadrangular construction with thick, sloping walls, especially on the outside. The wall is very thick, more than two metres at the base,

and it is made of two faces built with large blocks of stone which are minimally carved and arranged in horizontal rows. The space between the faces was filled with gravel. Based on this profile, we can find a range of solutions in the interior spaces, entrances and construction sizes, especially on Menorca. Nonetheless, we can talk about a largely standardised model on Mallorca, which is also found on Menorca, made of an entrance with a lintel on the lower level of the construction. The low height of the hallways often meant that it had to be crawled through. The hallway led to a chamber which has a central column made of large stone blocks running from smaller to larger in diameter. The column is the central axis supporting the roof, which is held up – in the handful of cases conserved or studied – with trunks (talaiot A in Capocorb Vell and talaiot 1 in Son Forners on Mallorca, and Sant Agustí on Menorca) or with large slabs (S'Hospitalet Vell, Sant Agustí Vell, Torre Vella d'en Lozano). There are also examples which were entered via the upper part of the construction (talaiot B in Son Forners and the square talaiot in S'Hospitalet Vell). In the examples that are well-preserved, the standard sizes of this model are around 12-15 metres in diameter at the base and around 4-5 metres high. This model was so widespread on Mallorca that several hundred of them still survive.

In contrast, on Menorca they show manifest complexity and diversity. The volumetrics of the constructions fluctuate between talaiots like the ones on Mallorca to cases like Trepucó, Torelló, Trebalúger, Cornia, etc., whose diameters range between 20 and 26 metres. The internal layout is also quite diverse. Examples with a circular chamber with a central column like the ones on Mallorca are rare. Some examples can be found with a hallway that connects to a small lobulated chamber, with a staircase leading to the upper floor, and there are other variations as well.[17]

The dry-stone building technique means that certain proportions have to be maintained. The higher the desired height, the larger the base, the more accurate the stonework and the thicker and more inclined the walls have to be. This proportion often means that the usable internal spaces are quite small, and sometimes solid structures even have to be built if the purpose is to gain greater height. This is the case of some of the large turriform constructions on Menorca which we have mentioned. However, this is an avenue of research that has yet to be conducted.

The research team at Son Forners performed a study on the building technique and the time required to build talaiot I at Son Forners, which has the features we have described as standard. This is one of the largest talaiots on

Figure 3. Aerial photograph of the Talaiotic complex of Son Forners (Mallorca). Two circular talaiots can be seen with quadrangular Talaiotic and post-Talaiotic constructions aligned between them.

Mallorca, with a maximum diameter of 17.3 metres. Its walls are more than 5 metres thick, and they lead to a circular chamber measuring 6.6 metres in diameter. The flat roof with stumps gave it a terrace measuring 200 m². The quarry where the blocks were extracted has been located just 100 metres away. By calculating the displacement distance and weight transported, the research team reached the conclusion that a human group of around forty to fifty people were able to build it entirely in around two months.[18]

The interpretation of the functionality of the talaiots on Mallorca is grounded upon the results of excavations performed in the two circular talaiots of Son Forners. Talaiot A, which is circular and measures 17.5 metres in diameter, fits within the model described above as standard. At the time that it was violently abandoned by fire, it was used as a site to slaughter and dismember chiefly swine, but also cattle, which were then distributed among the homes in the settlement. Talaiot B, which is also circular but smaller in size and with the feature that the chamber was quite small and entered from the upper floor, has been interpreted as a cultural site given the lack of household goods and food remains, along with the presence of large vessels which have not been identified elsewhere in the settlement.[19] This information leads us to regard talaiots as buildings made by the community for communal uses. We have seen that even though they appear quite homogeneous on the outside, their internal layouts show variations, most likely according to the needs of each one.

In addition to the way the chamber in the talaiot was used, namely as a place where communal activities were held (gatherings, ceremonial meals, food redistribution), it is essential to point out that the goal of the constructions were more than just the utility of the spaces. Their striking nature made them referents in the region, an important social and economic factor which is part of a process of territorialisation of the island. In this sense, it is important to note that the architectural model of the talaiot can also be found in isolation, but as we shall see when we analyse the territorial dynamic, in that case it was always part of a settlement unit of the communities and located on their periphery. The results of the excavations performed in isolated talaiots have yielded the basic items for household use with no further information.

A second turriform model called tumuli are much more sporadic than talaiots and are found on both islands as well (Son Oms, Pula, Son Ferrer, etc. on Mallorca, and Toraixa, Binicudrell, Sa Torreta de Tramuntana, etc. on Menorca). The three that have been excavated on Mallorca are built on top of earlier structures. In the first two examples, they are placed atop naviform constructions, and in Son Ferrer they are atop an artificial hypogaeum from the naviform period. They are quadrangular in shape and stepped, and they may have had entrance ramps on the outside. The information available leads us to believe that they served a strictly cultural purpose. We think this must also have been the purpose of the large talaiots on Menorca, large, solid mounds which attained considerable height, where the only useful space was the terrace.

With this information, we can see that turriforms were not limited to a single use and that their size and internal organisation adapted to certain functions resulting from collective needs, including economic needs (as a redistribution hub, as in talaiot 1 in Son Forners), social needs (talaiot 2 in Son Forners), cultural needs (tumuli on Mallorca and large, solid talaiots on Menorca) and territorial needs (the upper part of the talaiots and isolated talaiots located some distance from the settlements). The turriform structures also shaped the layout of the settlement. We can see that the other constructions, both the buildings and the wall, were built around them. This distribution does not seem to follow a single pattern; we can find turriforms that are lined up in a row, laid out in a triangle or randomly distributed.

Architecturally speaking, Talaiotic settlements were often made up of no fewer than three turriforms accompanied by smaller structures arranged around them, with trapezoidal, rounded and rectangular layouts forming rows of quadrangular constructions. However, this model is not uniform. One example is the Puig Morter complex in Son Ferragut, where we can identify a talaiot with a square layout, three rectangular buildings and two smaller buildings, one square and the other rectangular. As we shall see, some authors believe that these differences in the talaiots indicates social heterogeneity within the Talaiotic communities on Mallorca.

In recent decades, excavations of Talaiotic buildings have provided only scarce information on this phase. The benchmark nucleus is Son Forners, where the excavations which got underway in 1979 have revealed (with the results of the studies published) a talaiot with a circular layout and four rooms within a complex where two more circular talaiots and different houses have been excavated, although a great deal still remains to be studied. The four houses published have two different kinds of layouts. The two attached to talaiot 1 are made with walls attached radially to the talaiot and walls parallel to it which yield rounded spaces. The other houses have a quadrangular layout and form a line between two circular talaiots. The two houses which were built with radial walls from the talaiot are the smallest ones, measuring 13 and 17.25 usable square metres. The two quadrangular houses measure 23.5 and 40 m². Another example of the excavation of a construction attached to a circular talaiot and held up with radial walls is found in the Les Talaies de Can Jordi complex. In this case, the usable space measures 18.5 m². These houses have a column to hold up the roof made of wild olive tree branches supporting a layer of slabs and clay. The rectangular house in Puig Morter in Son Ferragut is quite different; it is a construction measuring almost 300 m² with 148 m² of usable space.[20] Furthermore, this house had a more complex internal layout, since almost two-thirds of the space is occupied by a gallery whose central part was roofless and held up by six stumps

on stone bases. The rest of the space was occupied by two square rooms.

The excavations of these constructions show that they were primarily used as homes for household units (Son Forners, Son Ferragut) in which chiefly livestock products were stored and consumed. In the case of Son Ferragut, the basic tools for making ceramic and cloth have been detected. The result of the excavation of the house attached to the talaiot in Can Jordi differs, as it showed that it was exclusively used as a ceramic workshop.[21] This entails identifying structures with communal uses: talaiots, tumuli and minor constructions, in addition to the constructions for the use of household units.

Some of the Talaiotic complexes are surrounded by a wall comprised of an external face made of large orthostatic blocks placed atop a stone plinth. Other large blocks were aligned horizontally over the orthostatic blocks. The walls had different lintelled entrances. The perimeter that the walls enclosed measures around one hectare. There is no consensus regarding when these defensive barriers were built, largely because of the difficulty of getting radiocarbon datings. Some researchers choose to consider the walls as structures built around the start of the Talaiotic period,[22] while based on the architectural stratigraphy, others believe that the walls were built subsequently, at some unspecified date after the turriform structures were built. This hypothesis is based on the observation that the wall structures seek to surround the outermost turriform structures in each complex on the walls that attach to them. What is more, due to the layout of the turriform structures, it is clear that the initial conception of the settlement did not include surrounding them by a wall.[23] On the other hand, we should also observe that the initial building technique in the Talaiotic period is based on rows of large blocks laid flat, and we are unable to chronologically pinpoint the start of the technique of fitting large vertical blocks over a stone plinth. The Alpha building in Puig Morter shows an orthostatic building technique even though horizontality dominates in the proportion of ashlars.

This approach has been corroborated by radiocarbon dating extracted from an occupancy level under the wall in the Pou Celat settlement (Porreres, Mallorca), which has a wide time range (760-390 cal BP), meaning that the defensive construction dates from sometime later than the mid-8th century cal BP.[24] The dating of Pou Celat and the Menorcan settlements of Son Catlar and Trepucó situates them in an advanced phase or within the post-Talaiotic period.[25]

The geographical distribution of settlements and territorial occupation

In terms of land use, we can see that in the late Bronze Age there was a significant increase in naviform settlements and the occupation of and extensive physical familiarity with both islands. Currently, the percentage of structures is notably higher in the coastal area than in inland Mallorca, but this is likely due to greater human pressure on the inland regions throughout history. On the other hand, in the naviform period we can detect an irregular distribution with greater pressure in the areas of Pollença and the isthmus of Alcúdia on the far north of Mallorca, and in the area of Salines cape and around the Palma lagoon. However, very empty zones which show scarce use during the period have also been detected; these correspond to the more mountainous zones of Mallorca, the Tramuntana mountains, with the exception of Sóller valley, and the mountains in the Llevant, the eastern part of the island. They are also very scarce in the Raiguer region, although in this case we cannot discount the impact of pressure from agriculture that the area has experienced in recent centuries. We should also add the extensive territory of the marinas of Manacor and Felanitx, where there is a scarce presence of manifestations from the naviform period. In other regions in the townships of Llucmajor, Campos, Santanyí, Santa Margalida and Petra, the presence can be described as homogeneous and sporadic; in the first three townships, this means that the distance between complexes is around 2,500-3,000 metres, and in Santa Margalida and Petra it is around 1,400-1,800 m.

The naviform structures are primarily located on flat areas. They show no interest in strategic locations, elevations or other factors that can be seen in the Talaiotic period. A spatial analysis of Mallorca shows the conservation of a number of Talaiotic settlements quite similar to the naviform ones, although the strategies are different. The Talaiotic settlements show a clear tendency to be located over promontories or strategic points. They do not seek major elevations but slight orographic changes which allow them visual dominance over the nearby land (small hills or mounds, rocky steps or the upper part of a coast). The architectural characteristics of Talaiotic construction models coupled with their territorial distribution show a high interest in the territorialisation of the space. The desire to mark the territory near each community is clearly different to the naviform period and shows the strategy developed with a scarce resource on an island: land. We know that turriforms played an important role in delimiting and controlling the land; through population nuclei and isolated talaiots located some distance from the settlements, they most likely marked the community's land and served as its lookout points. This shift in criteria means that there is little overlap in the location of Talaiotic and naviform structures, except in regions where the orography is primarily flat.

In terms of the territorial distribution, there are still uneven densities. The Tramuntana mountains remained sparsely populated, with the exception of the valleys (Sóller, Valldemossa, Orient). The eastern regions of the townships of Manacor and Felanitx continued to be marginal. The density in the inland regions of Mallorca in-

creased, and it declined in the areas near lagoons and wetlands. By applying Thiessen polygons on those areas where the Talaiotic settlements are best conserved, the average settlement density has been proposed at every 7.3 to 7.5 km². The territorialisation strategy varied depending on the orography of the land. We can see that on flat lands there is often a settlement that has a talaiot an average of 550 metres away. In contrast to this architecturally simpler model, we can find more complex settlement units in which the settlement is arranged around a central point and surrounded by isolated talaiots laid out according to the features of the orography. One example of the latter is Son Serra de Marina, with a settlement unit delimited by two streams and the settlement located at the central point, with seven isolated talaiots encircling the territory around the settlement at a distance of between 440 metres and 1,450 metres.

Therefore, we can see that despite the fact that the number of naviform and Talaiotic settlements is similar, the architectural density of the latter is notably higher. The Talaiotic settlements have a larger number of constructions for household use, coupled with those for communal and prestigious uses which encompass different kinds of turriforms. And we should also add a significant number of isolated talaiots which often have an attached structure. We can also see that these models of settlement units can be associated with the characteristics of the ecosystem. Specifically, on flat lands with scarce water resources and very thin soil, the model we find is a settlement which has an isolated talaiot located a certain distance away, around 500-800 metres. In contrast, in the small valleys with more pronounced orography, thicker soil and more water resources, more complex settlement units are developed. The larger architectural scale of some settlement units comes with a larger area occupied by these archaeological items. The territories where the archaeological complexes are best conserved allow us to analyse the size of the land which must have pertained to each settlement unit. Thus, the settlement in the townships of Campos, Ses Salines and Santanyí indicates an average of around 200 hectares, while the more developed ones, such as the one in Son Serra de Marina, had around 450 hectares[26] of better-quality lands.

We have little information that would allow us to determine the purpose of the isolated talaiots. The majority are old excavations with little documentation. Everything seems to indicate that the isolated talaiots had an inner chamber which was used as a home and few tools to produce and manipulate food. We could say that they are subsidiary structures of the settlement which were often clearly built for geostrategic reasons to delimit and control the territory used by the community. The most recent excavation performed at an isolated talaiot is the one in Son Serralta. It is a circular talaiot located in the foothills of the Tramuntana mountains next to a mountain pass. Excavated between 1958 and 1959, it yielded different ceramic materials for everyday use to store water and cook. No bone remains or utensils to handle food were found. These factors determined its use as a home.[27]

Finally, we should mention the architectural model known as the *taula* areas on Menorca and sanctuaries on Mallorca. The construction form is quite similar on both islands: a façade with slightly concave wall with squared corners and a central entryway, while the outside wall is apsidal. Even though they start from the same concept, their materialisation is different on the two islands. On Menorca, the sanctuaries, known as *taula* areas, are larger and more monumental, with two large stones laid out in a T-formation placed at the centre of the construction. Other large stones, albeit smaller than the central one, were attached to the inner face. The placement of these lateral monoliths sometimes formed a lobulated layout inside.

Figure 4. View of the Talaiotic complex of Torralba d'en Salord (Menorca) with the *taula* area in the foreground and a circular talaiot in the background. This clearly shows the upper part of the talaiot's visual domination over the nearby land.

On Mallorca, the expressions are more heterogeneous. This model of a horseshoe-shaped layout is quite widespread, but there are also examples of sanctuaries with a quadrangular layout. Instead of building the *taula*, different aligned columns were placed in the centre of the construction.

One of the issues yet to be resolved regarding the sanctuaries is when they began to be built, since we do not have sufficiently precise information on their dates. They were traditionally believed to hail from the post-Talaiotic period, since the excavations yielded materials that were situated between the 4th century cal BP and the start of our era. However, the excavation of Son Mas sanctuary on Mallorca substantially shifted this hypothesis. This construction rests atop a space that had been frequented by humans for a long time. In fact, bell-shaped ceramics have been documented outside the building, and radiocarbon datings showed the start of the second millennium cal BP. The lower level of the sanctuary is from the Talaiotic period, and the constant use of the sacred buildings over time makes it difficult to get information on their origins and therefore to ascertain whether the construction of buildings used exclusively as sanctuaries was common in the Talaiotic period.

The excavations of the *taula* in Torralba d'en Salord have provided radiocarbon datings from the mid-9th century cal BP, a time when the sanctuary was already in use according to one of the participating archaeologists.[28]

A third case is the Menorcan complex of So na Caçana, which is comprised of ten monumental constructions. It has been interpreted as a religious centre based on the excavations of three *taula* areas and the architectural interpretation made by Lluís Plantalamor, director of excavations. The radiocarbon datings of the excavated premises situate their origin at around 1000-800 cal BP, a timeline which places them in the same period as the construction of the turriforms. The fact that the report on the excavations is not published makes it impossible to determine how they were actually used.

Therefore, the recent excavations indicate that at the beginning of the Talaiotic period, buildings were constructed with architectural features that are quite common for exclusively sacred uses.

Economic activity

For the analysis of the production and consumption of food, we can draw from few archaeological studies: the ones mentioned above at the Son Forners complex and the ones in the Alfa building Puig Morter (Son Ferragut), both on Mallorca. In the former, the conclusion is that the food was livestock-based, revolving around the consumption of pork, sheep, beef and goats, in descending order. A plan of the livestock hut can be seen aimed at taking advantage not only of the meat but also the different products derived from these animals (wool, milk, blood, traction and loading and tool-making). Depending on the interest, the animals were consumed young or adult. Thus, the cattle, sheep and goats were consumed at an older age, while the swine was consumed at their peak weight, around two years old. We believe that the crop farming activity was considerably less important, since only two mills have been found in the rooms. The pollen analyses have not detected the presence of cultivated plants or the remains of fauna or tools that indicate hunting.

The conclusions from the studies at the Alpha building in Puig Morter are similar. The livestock hut was made up of the same animals, and the cattle, sheep and goats were eaten as adults, which indicates husbandry and the consumption of by-products. Flint tines and the remains of starch have been found in the different slabs on which some kind of grain-based foodstuff must have been produced. Likewise, we should also note the presence of a mortar and pestle, which may have also been used to process this product.

The excavation and study of talaiot 4 at Son Ferrandell shows a livestock hut much like the one detected in the two aforementioned sites. There are signs that other products besides meat were extracted from the sheep, goats and cattle. We interpret this as meaning that the consumption of cattle at an advanced age reveals the existence of grain-based farming.[29]

Studies of the fauna based on the excavations performed in the Mallorcan settlement of S'Illot have the disadvantage that they were performed over all the bone matter, without respecting the different occupation phases. In this case, the presence of wild fauna is notable. What is more, fishing tools were collected, along with the remains of monk seals and remnants of seafaring activity. Bones from different kinds of terrestrial and coastal birds and wild mammals were also recovered.[30] It should be borne in mind that the first two examples outlined are located in the centre of the island, while the S'Illot settlement is near the sea and at that time very close to a lacustrine zone.

The old excavations reported finding receptacles that contained grains, as in the Son Oms talaiot and the one in Marina de sa Punta in Ca n'Amer.[31] Other information on farming activity comes from the Cova des Càrritx in Menorca, in whose necropolis fruit and seeds of wild olive trees, fig trees, grapevines, barley, wheat and mulberries were found.

In both Son Forners and Puig Morter, the results are clear regarding a meat-based diet. While the archaeological evidence on grain production in Son Forners can be deduced by the presence of several hand-mills and mortars, in Puig Morter we can find their presence through the analysis of the slabs which were used to make some grain-based product. On the other hand, there is also indirect evidence, such as ceramic tools. The shapes are quite rudimentary and show little variety. This may indicate elementary culinary activity in which processed foods must have been minimal. We find large containers

known as pythoid amphorae which were used to store water. Pots seem to be the only ceramic forms which are directly related to cooking food. The raw material must have been toasted or heated directly in the fire. Pebbles seared by the effect of fire are often found, which may have been used to heat water or toast like a grill.

Relations with the outside world and trade

Throughout the naviform period, we can find objects in the archaeological record which can only be interpreted as coming from direct imports (ivory objects and vermilion) or indirect imports (bronze items whose typology is based on external models).

In the Talaiotic period, there is no proof that commercial activity outside the island was a common practice. While in the pre-Talaiotic or transitional period, we can detect a significant influx of bronze and ivory, and the introduction of prestigious manufactured items (ceramic, ornaments and iron) after the 6th century cal BP, there is not enough information from the Talaiotic period to discuss the topic. The habitat sites excavated which chronologically fall between the 9th and 7th centuries cal BP have yielded no imported items, and the information on the necropolises is extremely scant. The only thing we can glean from this information is the existence of some random contacts which brought bronze and iron objects as either raw materials or fabricated items. Until the end of the Talaiotic period, we can regard the output as the product of island autarchy and are unaware of any relations among settlements.

Towards the end of the Talaiotic period, these relations increased, marked by the colonisation process of the Greeks and Semites, which influenced the proto-history of settlements in the western Mediterranean. The areas of influence in this space were centred around the Phoenician and Punic settlements in the southern shore after Carthage, and the Greek influence in the north with the settlement in Marseille. The Talaiotic period falls right in the midst of the colonisation process of these two trading powers, which were interested in reaching the eastern trade routes, especially the metal trade. In theory, the Balearic Islands fell outside the scope of their interest, and indeed according to the archaeological finds, these relations were quite scarce, focused primarily on iron armaments throughout much of the period.

Because of both the influence and the impact it had, we should highlight the Phoenician-Punic settlement on Eivissa, which started with the settlement in Sa Caleta in the 8th century cal BP and with the Punic settlement in Ebussus after that.[32] As archaeology has proven, despite the areas of influence mentioned above, Greek and Punic traders managed to gain access to the markets on both shores. The excavation of the 6th-century Greek boat in Cala Sant Vicent on Mallorca reveals that both commercial interests, the Greco-Phocaean and the Punic-Ebussitan, were present on the Balearic Islands.[33] Until then, there were doubts whether the finds of Greek ceramics, always scant, came from Semitic or Greek trade. However, the discovery and excavation of this boat opened the possibility of a trade dichotomy on Mallorca and allowed us to posit zones of influence: the southern coast with trade contacts with the Punics via the establishment on Eivissa, and the northern part of the island with Greek contacts from the settlements in Marseille and Emporion. However, in the case of the Balearic Islands, the Ebussitan influence became increasingly strong until it led to the creation of the Punic Ebussitan factory on the islet of Na Guardis in southern Mallorca during the post-Talaiotic period.[34]

Talaiotic imports tended to be prestigious items, as mentioned above. The oldest iron objects dated on the Balearic Islands come from Cova des Càrritx in around 850-800 cal BP. In fact, throughout the 8th century cal BP, the introduction of iron weapons following Atlantic models, such as cubic and flat axes and spearheads, was on the rise.[35] In the 7th century cal BP, the first antenna swords were found in the necropolis in Son Real. Finds of these objects dating from the first half of that century increased, and decorative ceramic objects began to be introduced in the middle of the next century, which must have given their owners prestige locally.[36] Another element of prestige are the molten glass beads located in funeral deposits such as in Cova des Càrritx on Menorca and on the lower level of the Cova de Son Maimó on Mallorca. After the 6th century cal BP, in the post-Talaiotic period, relations with the outside world accelerated and there was a constant influx of objects. The post-Talaiotic period is when the stage of trade contacts was superseded by Punic coastal settlements on different islets, the most notable of which is on Na Guardis, as mentioned above. In this period, relations with the outside world went beyond just commercial interests, and the Talaiotic communities must have been involved in the wars of Carthage, with the participation of slingers in the Punic Wars.

Funerary manifestations

Mallorca and Menorca took different pathways in terms of their architectural expressions, but they were quite similar in their ideotechnical framework. Both islands came from the tradition of collective burials in both natural cavities and series of artificial caves, the latter much more extensive on Mallorca than on Menorca. Despite this dichotomy between natural and artificial cavities, the characteristics and objects were the same, as far as we know: they were necropolises in which the members of an extended family were buried over the course of generations. As seen in the excavations of the natural cave in Can Martorellet, these collective necropolises were used throughout the entire naviform period. In the case of

Can Martorellet, there are five radiocarbon datings which span from an initial date between 2020 and 1770 cal BP until a date between 1400 and 1120 cal BP.[37] The last date dovetails with the period of transformations that marked the shift from one period to the next, which, as discussed above, can be detected archaeologically by the appearance of prestigious metal objects coming from trade exchanges.

A similar case comes from Menorca in the necropolis of Cova des Càrritx, a collective necropolis which took advantage of a natural cavity to bury the members of an extended family for 600 years, between 1450-1400 and 800 cal BP.[38] It is symptomatic that the collective necropolises that had remained in use for many generations were abandoned precisely at the time of profound transformations, thus revealing the social changes that generated them. Despite this, the archaeological data only enable us to glimpse signs or symptoms of this shift.

The Talaiotic period on both islands entailed a rupture, since the burial sites used throughout the naviform and transitional or proto-Talaiotic period were abandoned. The hypogaea characteristic of the naviform period also stopped being built. Therefore, this is a fairly widespread change in necropolises, although the system of collective burials in natural cavities remained in use. The continuation of collective burials does not hinder us from grasping the social changes that were gestating within the Talaiotic communities. One new development during this period is the use of lime burials. The difficulties excavating this kind of burial is one of the reasons why there is so little research on this method. On the other hand, the poor state of conservation of the objects that have been subjected to the action of lime creates serious interpretative difficulties. That is compounded by the difficulties generated when extracting radiocarbon datings. This entire set of issues involved in researching lime burials may have been one of the reasons for the lack of information on the funerary activity during the Talaiotic period.

Son Matge cavern can be cited as an archaeological referent on Mallorca. From the very start of settlement of Mallorca, this natural shelter was used in different periods and for different purposes, although its complex archaeological record and interpretations do not provide us with clear information on the relationship of the stratigraphy, its archaeological contexts and the radiocarbon dating tables extracted. We know about one level of burials next to which different bronze armaments and other ornamental objects (sword, knives, armguard) are found, which is chronologically located in the transitional period. A level was also found with 650 lime burials which would correspond to the Talaiotic phase, although its exact chronology has not been clearly determined.[39]

Apart from Son Matge, no excavations of Mallorcan necropolises from this period have been published in recent decades. We only have some information and ancient finds, such as the cases of La Cometa dels Morts and the lower level of Cova Son Maimó, which shed no light on this cultural aspect.

The practice of secondary burials in some Talaiotic necropolises has been posited. According to this theory, which is upheld by Jaume Coll, there would be open-air spaces in which the human body was left to rot, after which it was placed in a natural cavity. This is the interpretation made of the necropolis of El Coval d'en Pep Rave.[40]

The first constructions in the Son Real necropolis date from the end of the Talaiotic period. This funerary space is a unique, prominent hallmark of the period, since it is an extensive set of small outdoor constructions near the sea made with a hasty technical quality in a material that was rarely used by Talaiotic culture, namely sandstone. The constructions are circular, square, rectangular and naviform, and we can detect the deliberate use of architectural models built by their ancestors, namely talaiots and naviforms. However, we are interested in focusing on the structures that were chronologically built during the Talaiotic period. The necropolis began to be used in the second half of the 7th century cal BP, and the circular and some of the square structures found were built between this date and the first half of the 6th century cal BP, according to the datings available. Significant differences can be detected compared to what had been common until then: collective burials of most members of a community. In these tombs in Son Real, we can see that some house a small number of members, and tomb 5 contains just a single individual accompanied by an iron sword, the well-known kind known as the antenna sword because of its hilt, in addition to punches and other items. The theoretical interpretations of the necropolis range from considering it initially as exclusive to prominent figures in society to interpreting it as a necropolis of an entire community that reveals the hierarchical differences. The researcher of the necropolis believes that military chieftains and their family members were buried there.[41]

From this scant information, we can state that during the Talaiotic period, the ritual of collective burials in natural cavities remained in place, surely with some individuals treated unequally, as shown in funeral deposits which contain prestigious objects. During the latter phase of the period, after Son Real necropolis, we can infer the existence of differences between communities which generated the adoption of a totally new model on the island. These changes were caused by the evolution in the social and economic structure, which progressively evolved towards an accentuation of social and economic differences. In this process, the relationship between the indigenous and the Punic and Phocaean merchants seems to have played a key role.

On Menorca, the transitional period between the late naviform phase and the start of the Talaiotic is the time when the last navetas were built and used (Tudons, Rafal Rubí, Biniac-l'Argentina, etc.). These constructions were collective burial necropolises with two superimposed

Figure 5. Naveta in Tudons. This is a burial naveta in the shape of an inverted ship built with the cyclopean technique during the Bronze Age and located within the township of Ciutadella (Menorca).

burial chambers. Their use spanned from the 11th to the 9th centuries cal BP. Natural caves located on rocky walls of cliffs facing the sea or ravines were also used; one of the examples researched is Cales Coves. This site was perpetuated for centuries, and 84 hypogaea have been counted there. Between the 11th and 10th centuries cal BP, natural cavities started to be used there, and a cyclopean wall was built at the entrance to some of them. It seems that the construction of artificial caves began at the end of the Talaiotic period, as apparently indicated by some bronze objects located in this set of caves. Those built at the peak of the Talaiotic were small in size and layout, with a rectangular or semicircular doorway leading in.[42] Based on the joint analysis of Cales Coves, we can infer that the burials were treated differently since the start of the necropolis, since in one sector of cave 21 a repository of prestigious objects associated with a limited number of burials was found.

Since the early Talaiotic period, we can find repositories of prestigious objects, especially made of bronze (swords, daggers, knives, mirrors, armguards) and occasionally of iron. Late in that same period, the range of this kind of object expanded thanks to the increase in trade contacts; they were amortised as funerary deposits.

In the chronological period from 1600 to 900 cal BP, a great deal of effort was poured into funerary architecture (hypogaea and navetas), while during the Talaiotic period funerary architecture was abandoned to instead concentrate on building civil architecture in the guise of turriforms. This has been related to the sociological change which occurred in the shift from the naviform to the Talaiotic period, in which social integration practices changed via funerary rites, with a greater emphasis on civil practices related to political segmentations.[43]

Talaiotic society

The studies which have analysed Talaiotic society in recent decades are primarily based on the reports published from the excavations in Son Forners and Son Ferragut on Mallorca and Cova des Càrritx on Menorca. As we have seen, Son Forners shows an egalitarian distribution of certain meat products from talaiot 1 as far as the four rooms analysed. Based on this, we can posit the existence of a system to control the production and distribution of goods. The Son Forners research team believes that the existence of profits for part of the population which would give rise to social classes is not proven.[44] They do believe that the remains show the beginning of the hierarchisation of people who took control over and organised the production, with a society grounded upon kinship re-

lations which would not necessarily entail unequal appropriation of the production.[45]

The objects in the archaeological record are quite materially and formally homogeneous among settlements at a considerable distance from each other, which reveals the high intercommunity interaction most likely sustained by a kinship structure. This factor may have been based on a system of social relations using the extended family model, which has been applied theoretically in the case of Puig Morter.[46] There is consensus that Talaiotic society must have been divided into small communities or settlements which had an optimal social organisation to manage the construction of large communal buildings, to control and manage the land, and to conduct the economic activity. The studies performed allow us to distinguish between two main groups of spaces, the communal ones and the homes of the household units. In neither have any elements been detected that might indicate the presence of internal differences in the household units. The comparison among homes shows equality in both the tools and in the products consumed. In order to coordinate the communal tasks mentioned, there must have been a leadership based on the respect and acknowledgement of the community. Despite this, we can also posit that there must have been a hierarchisation in terms of age and gender, just as there is in today's pre-industrial communities.

The research team at Son Ferragut shows the contrast between the building excavated from this settlement and the houses excavated in Son Forners: they show a clear difference in terms of the structure of the buildings and the number of members in the household units. In Son Forners, the houses are small, between 13 and 40 m^2, while the building in Son Ferragut measures 296 m^2. The calculation of the number of people per home in each settlement is quite distinct. In Son Forners, it is calculated that each of the household units was comprised of seven to nine individuals, while in Son Ferragut there were believed to be groups of between 20 and 26 people. These asymmetries have given rise to considerations of the heterogeneity of the Talaiotic communities.

The evolution of the burial systems and funerary deposits allows us to deduce a social process working its way towards greater complexity. These differences begin to be detected in the communal necropolises from the start of the period, where just a few were given funerary goods with prestigious objects, indicating a different social rank. Thus, the end of the Talaiotic period and especially the beginning of the post-Talaiotic period began with the creation of necropolises which marked the social rank of the people buried there. On the other hand, the construction of large cultural buildings (sanctuaries, tumuli and perhaps large solid talaiots) indicates the magnitude and complexity of religious activity. This poses the question of the role played by priests, their social standing and whether it was a specific activity that released the person with religious knowledge from economic activities, which has led some authors to speak about a priestly caste.[47]

Religious practices

The start of the Talaiotic period shows a notable transformation of island societies, which also affected religious aspects. Until then, the religious practices of which we are aware were performed in natural caves. In the necropolises, we can detect religious practices and rituals which were performed when dealing with a person's death. In the Talaiotic period, the dead were buried, placed squatting on their side, most likely shrouded and accompanied by personal effects and a deposit or offering for their journey.

The discovery and analysis of Cova d'es Mussol (Menorca) provides us with information on a complex ritual which was carried out in around 1200-1100 cal BP, at the end of the naviform period. This cave is very difficult to reach and is located on coastal cliffs. It is made up of different chambers; the one that is the most difficult to reach contained different wood carvings, two of them anthropomorphic, one of which is a horned human figure. The size of the chamber could fit two people, who had to use firelight to guide themselves there and when in the cave. This information seems to indicate that an initiation ritual must have been performed there. In this ritual, the shaman introduced the initiate into the forces of the underworld, in this case materialised in the horned male figure. This element is found in many prehistoric Mediterranean cultures as a syncretism of strength and fertility, and in the post-Talaiotic period it often appears in Mallorcan and Menorcan sanctuaries with the figures of bulls and horns made of bronze.

Different votive deposits from the transition to the Talaiotic period or at its onset have been found; they consist in sets of bronze objects (swords, knives, daggers, mirrors, ornaments, etc.) buried either outdoors (Can Jordi, Cas Corraler, Lloseta) or in cavities (Son Matge, hall 4 of the Cova d'es Mussol). They seem to be amortisations of objects with a high symbolic value which were buried at a time of social change following a ritual. This information reveals that the world of beliefs was more developed and had defined rituals.

In the sanctuaries from the post-Talaiotic period, bronze figures representing warriors and bulls are quite common. Through religious syncretism, these figures have been associated with deities that express the concepts of strength, fertility and war, which highlight masculine qualities and most likely sought to reinforce the characteristics of Talaiotic society with religion.

In addition to the sanctuaries, we should also include within the realm of the sacred the tumuli of Mallorca, and perhaps the large solid turriforms on Menorca. The sanctuaries on Menorca have been associated with worship of the Sun, the Moon and the stars such as Alpha Centauri or Sirius based on a study of the placement of the lateral columns with respect to the central stone or *taula* and the paths of the stars and planets.[48]

In the ritual practices, we should mention the discovery of bones from a hand in the Son Forners settlement

and the sanctuary of Son Mas, which could be interpreted as founding rituals.

Structures like tumuli or superstructures in natural cavities may be associated with worship of the underworld and the forces of nature.

In the Talaiotic necropolis of Son Matge, a small area was built where a small, awkward clay figure was found which has been interpreted as a deity.

All of these cultural expressions reveal the importance of the supernatural in everyday Talaiotic life. Each of the cultural activities we have listed must have had one or more referents, some of which had a physical, syncretic representation. However, we do not know whether these supernatural powers actually took shape in the form of deities.

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