

Some preliminary finds from the Tholos tomb and ossuary at Borzi Hill, Tzannata, Kefalonia:

An example of a multidisciplinary approach to understanding of the Lives and Deaths of Mycenaeans

ABSTRACT

Preliminary results are presented from the analysis of human and faunal remains from the unique tholos-ossuary combination at Borzi Hill, Tzannata, Kefalonia, excavated from 1992 to 1994. The analysis began in 2015 and is on-going. The paper illustrates how the systematic analysis of well-provenienced remains can be an important source of data to complement traditional archaeological methods for investigating mortuary, political and economic practices of the Late Bronze Age. Preliminary finds include: the tombs contained 100-150 people ranging in age from neonate to over 60 years, with about equal numbers by sex; the tholos tomb was used continuously until the Proto-Geometric Period by one biological lineage; the ossuary was a purpose-built structure for reburial indicating a previously unrecognized pattern of mortuary practices; faunal offerings found only in the tholos tomb include sheep, goats, dogs, cows, a very rare horse, and the earliest cat ever found in Greece.

Keywords: Late Bronze Age; Kefalonia; Tholos; Ossuary; Osteology; Faunal

* Doutor em Antropologia pela McMaster University, Hamilton, Ontario e Postdoctoral Fellow, Social Science and Humanities Research Council of Canada University of Toronto, Toronto, Ontario, no Canadá. Professor de Antropologia Biológica e Antropologia Forense incluindo cursos práticos de laboratório em osteologia humana no Department of Integrative Biology, University of Windsor, Canada. CV: <https://uwindsor.academia.edu/JohnAlbanese>

Alguns achados preliminares do túmulo em Thólos e ossuário em Borzi Hill, Tzannata, Cefalônia: um exemplo de uma abordagem multidisciplinar para a compreensão das vidas e mortes dos micênios

RESUMO

Os resultados preliminares são apresentados a partir da análise de remanescentes humanos e faunísticos da combinação única de tholos-ossuário em Borzi Hill, Tzannata, Cefalônia, escavado de 1992 a 1994. A análise começou em 2015 e está em andamento. O artigo ilustra como a análise sistemática de vestígios de boa proveniência pode ser uma importante fonte de dados para complementar os métodos arqueológicos tradicionais para investigar as práticas mortuárias, políticas e econômicas do final da Idade do Bronze. Os achados preliminares incluem os seguintes dados: os túmulos continham 100-150 pessoas com idades entre recém-nascidos e mais de 60 anos, indivíduos com quantidades semelhantes de ambos os sexos; o túmulo em thólos foi usado ininterruptamente até o Período Proto-Geométrico por uma linhagem biológica; o ossuário era uma estrutura construída para o reenterro, indicando um padrão anteriormente não reconhecido de práticas mortuárias; as oferendas da fauna encontradas apenas no túmulo em thólos incluem ovelhas, cabras, cães, vacas, um cavalo muito raro e o primeiro gato já encontrado na Grécia.

Palavras-chave: Idade do Bronze Recente; Cefalônia; Thólos; Ossuário; Osteologia; Fauna

Algunos hallazgos preliminares de la tumba de Thólos y el osario de Borzi Hill, Tzannata, Kefalonia: un ejemplo de un enfoque multidisciplinario para comprender las vidas y muertes de los micénicos

RESUMEN

Se presentan resultados preliminares del análisis de restos humanos y de fauna de la combinación única del tholos-osario en Borzi Hill, Tzannata, Kefalonia, excavada entre 1992 y 1994. El análisis comenzó en 2015 y continúa. El artículo ilustra cómo el análisis sistemático de restos de buena procedencia puede ser una fuente importante de datos para complementar los métodos arqueológicos tradicionales para investigar las prácticas mortuorias, políticas y económicas de la Edad del Bronce Terminal. Los hallazgos preliminares incluyen: las tumbas contenían entre 100 y 150 personas de edades comprendidas entre recién nacidos y mayores de 60 años, con un número aproximadamente igual por sexo; la tumba tholos fue utilizada continuamente hasta el Período Proto-Geométrico por un linaje biológico; el osario era una estructura construida con el propósito de volver a enterrarlo, lo que indica un patrón de prácticas mortuorias previamente no reconocido; las ofrendas de fauna que se encuentran solo en la tumba de tholos incluyen ovejas, cabras, perros, vacas, un caballo muy raro y el gato más antiguo que se haya encontrado en Grecia.

Palabras clave: Edad del Bronce Final; Cefalonia; Tholos; Osario; Osteología; Fauna



In the second half of the 19th century, Heinrich Schliemann found Mycenae and Troy, but after two fruitless searches on the Ionian Island of Ithaki he gave up looking for Homeric Ithaca, the home of the mythical Odysseus. The ongoing focus over the last 140 years by amateurs and professionals to find Homeric Ithaca on the Island of Ithaki has meant that the adjacent island of Kefalonia has not been the focus of research despite extensive evidence of a dense Late Helladic (LH) occupation (see Middleton, 1995, for a detailed discussion of the greater negative impacts of over-reliance on myths on Late Bronze Age archaeology). Over a dozen Late Bronze Age cemetery sites are known from the southern part of Kefalonia including two LH III tombs that were found at Borzi Hill, Tzannata in 1991. During excavation over three field seasons from 1992 to 1994 under the direction of Dr Lazaros Kolonas, it became clear that these tombs, a tholos tomb and an ossuary, were different from each other and different from other tombs that had been excavated on the island in the preceding 100 years. The potential significance of a tholos tomb was recognized before excavation began, but the uniqueness of the ossuary has only recently begun to be understood through the research presented in this paper. Although this combination of tholos tomb and ossuary is found on Crete during this time, the Borzi Hill site is the only known location for the unique combination of a tholos tomb and ossuary during the LH anywhere else in Greece. The only other known similar ossuary from the LH is not associated with any other tombs or contemporaneous LH structures (Galaty, 2016).

In the last 15 years, there has been renewed interest in the study of skeletal remains from sites in the western Peloponnese from the Late Bronze Age such as Pylos and Voudeni (for example, Schepartz et al, 2009; Petroutsas et al, 2009), but after Angel's (1943) initial work on Kefalonia, no research has been done using skeletal remains from this period on the island. Aside from the cleaning of the remains and a cursory separation of human and faunal bones from the tholos and ossuary at Borzi Hill, the skeletal remains from these tombs were not analyzed until the start of this project in 2015. Data collection from the human and faunal remains of both tombs is on-going. In this paper, I present some of the archaeological and geographical context for the area and briefly review the greater significance of these types of tombs. This background is provided as context for interpreting the preliminary results from the analysis of the human and faunal skeletal remains from the tholos tomb and adjacent ossuary at Borzi Hill. Through the systematic analysis of their well-provenienced skeletal remains, the long-term goal of this project is to better understand the real people, sometimes mythologized as Mycenaeans, who lived during and after the Late Bronze Age on the Ionian Islands.

The Strategic Location of an Island Fortress

Often dismissed as being on the "Mycenaean periphery" and due to its proximity to the Island of Ithaki, the LH occupation of Kefalonia has not been the focus of much research (Souyoudzoglou-Haywood, 1999). However, there is a great deal of archaeological, geographical, and ecological evidence that Kefalonia was a major centre that was strategically located to control the movement of goods and people in the Late Bronze Age economy (see Tartaron, 2013 for more information on the greater trade networks during this period).



Archaeologically, the evidence of a significant LH II-III occupation dating from approximately 3550 to 3050 years ago, with more than a dozen major cemetery sites, indicates that Kefalonia was a thriving populous area during this time (Souyoudzoglou-Haywood, 1999). The tholos tomb at Borzi Hill, the largest and most sophisticated of its kind in the Ionian Islands, is associated with a cluster of LH II-III habitation, civic and burial sites (Vasilakis, 2011, Souyoudzoglou-Haywood, 1999). At a higher elevation and to the north-east of the tholos-ossuary combination is the stone foundation of a wooden structure that is consistent with a *megaron*, i.e. the “big room” of a palace complex (Vasilakis, 2011). The relative location of the tholos-ossuary combination and this major civic building is similar in pattern to the relative location of the palace complex at Mycenae and the cluster of tholoi immediately outside the Lion’s gate. This cluster of sites on Kefalonia strongly suggests the existence of a much larger occupation for the immediate area on and around a cluster of small hills that includes Borzi. These hills are situated in the south-east end of a fertile valley for the Vohinas River, that until recently had running water almost year-round. The valley is protected on all sides by two of the highest mountains in the Ionian Islands, including Mount Ainos. The only way from Borzi Hill to the coast was to follow the then navigable mouth of the Vohinas River through a narrow gorge at the modern town of Poros, which likely sits atop the ancient port for the settlement that once existed at Borzi Hill.

Geographically, the island of Kefalonia is situated opposite the Gulf of Patras in the Ionian Sea and has long been a strategic island for controlling trade passing through the Gulfs of Corinth and Patras, around the Peloponnese, and to destinations across the Ionian and Adriatic Seas. The location of Borzi Hill within the naturally occurring island fortress would have allowed for ease of access to the coast, protection of the entire fertile valley, and control of trade passing by Poros. Shipments of copper and tin from Italy and other locations to the north and west (Muhly, 1985) would have had to travel through a navigational bottle neck in the straight between Kefalonia and Ithaki. There was no way to pass without being seen and likely taxed. Almost all the movement of people and trade goods from the western Mediterranean to the Peloponnese would have been funnelled past the port for the community at Borzi Hill.

Ecologically, given the fertility of this valley and several other valleys on Kefalonia, the island would have supported a large population and would likely have been a net exporter of agricultural products. Furthermore, the altitude of Mount Ainos, the tallest mountain in the Ionian Islands, makes it one of the few places where the massive Kefalonian fir trees (*Abies cephalonica*) grow outside of the mountains of mainland Greece (Politi et al, 2009). This combination of ecology and geography also allowed for an easier harvesting of timber when compared to other sources. Mount Ainos is oriented from the north-west to the south-east. This orientation and the location of the mountain relative to Borzi Hill to the north-east and to the sea to the south means that the trees could be easily harvested from both major slopes of the mountain. The timber could be delivered to several ports where it could be traded or used for ship building.



A Very Rare Combination of Tombs

The Construction and Use of Tholos Tombs During the Late Helladic

Many of the better-known LH II-III sites on Kefalonia are burial sites consisting of large and prominent chamber tombs (see Souyoudzoglou-Haywood, 1999 for a systematic review of all tomb types found on Kefalonia during the Late Bronze Age). However, in addition to the tholos at Borzi Hill, there is some evidence of as many as six or possibly seven tholos or “beehive” tombs on the island including at Mavrata, Mazarakata, Kokkolata-Kangelisses and other locations (Souyoudzoglou-Haywood, 1999). A tholos tomb is a beehive-shaped structure that was used after about 1500 BC for the burial of elites (Graziadio, 1991). The beehive shape, resulting from a corbelled vault, was built up into a small hill (*tumulus*) with a closable, decorated entrance (*stomion*) visible at the end of a passage (*dromos*). Inside the tholos tomb was often one or more cists in the floor that was usually lined with stone slabs. The largest and best-known tholos tomb is the “Treasure of Atreus” at Mycenae, but that tomb is unusual in its enormous size and in having a side chamber (see Como, 2009). Tholos tombs were first built at Messenia and have been found at major Mycenaean centers including Tiryns and Pylos. Regionally and through time, tholoi varied in size and sophistication, but the essential beehive shape and dry-masonry construction methods remained the same (Murphy, 2014; Como, 2009; Castleden, 2005; Cavanagh and Laxton, 1988; Wright, 1987; Taylour, 1983).

Chamber tombs were contemporaneous with tholos tombs, but much more common than tholoi (Castleden, 2005; Taylour, 1983) and followed the same basic layout typically with a *dromos* leading to an entrance that allowed access to a dome-shaped or beehive-shaped chamber. However, unlike a tholos tomb, an entire chamber tomb, including the *dromos* and multiple cists in the ground for the placement of the deceased, were carved out of rock often by expanding existing caves (Castleden, 2005; Souyoudzoglou-Haywood, 1999; Taylour, 1983). Across Greece during this period, chamber tombs varied in size and complexity and reflected the wealth of the people who were buried in each tomb. The distinction between tholoi and chamber tombs should not necessarily be equated with a simple two-tier class structure since chamber tombs and tholoi varied in size and complexity through time and space (Murphy, 2014; Schepartz et al, 2009; Souyoudzoglou-Haywood, 1999; Voutsaki, 1995; Mee and Cavanagh, 1984; Dickinson, 1983; Iakovidis, 1966).

Reconstructing how chamber tombs and tholoi were used has been a challenge. Many tombs were systematically looted in antiquity, and by the middle of the 19th century the most prominent tholoi had been completely emptied of all contents including all the skeletal remains. The tholoi and chamber tombs seemed to have been re-used in a similar manner. When skeletal remains have been recovered from tholoi and chamber tombs, the combination of undisturbed and commingled accumulations of bones has been interpreted to mean that bodies were placed in a cist until there was complete decomposition of soft tissues and then another body was added on top if the cist was deep enough, or the bones were removed to the side of the tomb as the cist was continually reused (Souyoudzoglou-Haywood, 1999; Voutsaki, 1995; Mylonas, 1948). The tholoi and chamber tombs function as both the primary burial (typically in a cists if



present) and secondary placement adjacent to the cists or along the outer walls of the tombs (see Jones, 2014 for more about secondary placements of remains). In other cases, such as the tholos tomb at Petroto (Achaia) a central cist was not used, and the stratigraphy reveals layers where human remains were deposited interspersed with sterile fill, suggesting the tomb was re-used in waves (Jones et al, 2018). In other cases, smaller tholoi were used over a very short period and lack a cist and distinctive stratigraphy (Tsipopoulou et al, 2003).

The Prolonged Use of the Tholos Tomb at Borzi Hill, Tzannata

Based on the systemic assessment of late Bronze Age tombs in the Ionian Islands by Souyoudzoglou-Haywood (1999), the tholos tomb at Borzi Hill is consistently cited as the largest tholos tomb in the Ionian Islands. Unfortunately, in most cases, these other tombs described as tholoi have been completely obliterated and are known primarily from field notes or other early descriptions that are in some cases 100 years old. Based on these descriptions, and more recent research, at least some of these tombs could be better described as tholos-shaped or hybrid tombs that combine architectural and construction elements of chamber tombs carved from existing caves and capped with dressed stones to mimic the peak of a true tholos (see also Dickinson 1983). Souyoudzoglou-Haywood (1999, p. 58) cites early sources describing the tholos tomb at Mazarakata, which is now completely obliterated, as having been "...dug into the rock..." as with the many chamber tombs at the site. In other cases, two tombs found at Kokkolata-Kangelisses are described as tholoi. With these tombs, the stones found around cists with skeletal remains are assumed to be tholoi because of the circular orientation of the stones, but only one course of stones was found around each tomb, and there is no evidence of a *stomion* or *dromos*.

Through personal communications with Dr Kolonas, soon after the tholos at Borzi Hill was excavate, Souyoudzoglou-Haywood (1999) provides the most comprehensive and scholarly description of the tholos tomb (Figure 1). At 6.8 meters, the diameter of the Borzi tholos is over two meters larger than the next largest known tholos at Mavrata, and twice as large as the other known tholos tombs on Kefalonia and on the island of Zakynthos found to the south.

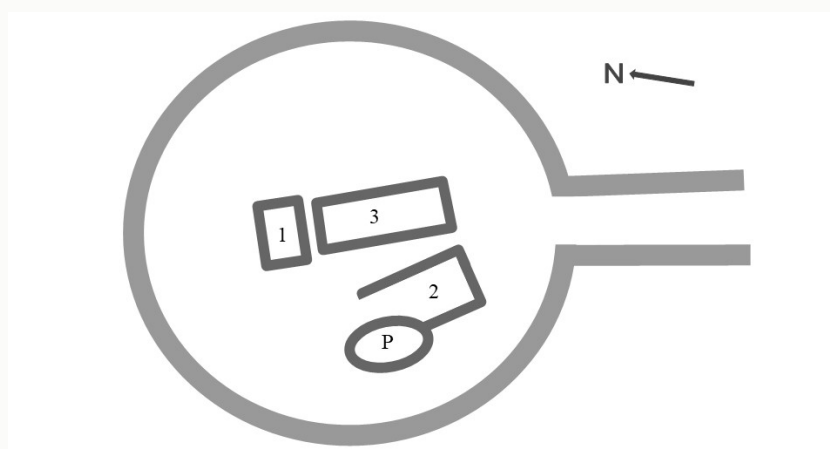


Figure 1. Layout of Tholos Tomb at Borzi Hill illustrating the relative size and position of cists (ΘHKH) numbered 1, 2, and 3, and P for the pithos burial

Reference: Original by Amanda Spencer in 2021, based on her observations of the tomb, written descriptions and photos by John Albanese, and a map from the Archaeological Museum of Argostoli

There are no known tholoi on Ithaki (Souyoudzoglou-Haywood, 1999). Furthermore, the smaller tholoi on Kefalonia and Zakynthos are similar to the tholoi found in Aetolia (on north Coast of the Gulf of Corinth), whereas the monumental architecture of the tholos at Borzi Hill is similar to the tholoi at Messenia (Souyoudzoglou-Haywood, 1999). Although there is evidence that the tholos tomb at Borzi Hill was looted in antiquity, a small cache of valuable offerings was found during excavation that included seal-stones, jewelry, gold rosettes, and a miniature gold double-axe. The tomb was likely constructed about 3350 years ago and replaced an earlier smaller tholos tomb that was built around 3450 years ago. Kolonas noted that two distinct types of stone (*poros* stone and sandstone) were used in the construction which strongly suggests that elements of the earlier tomb were re-used to construct the second tholos. This second tholos tomb was still being used during and after the LH IIIC, after palaces at Mycenae and Pylos had been burned and tholoi had fallen into disuse on the Peloponnese (Cline, 2014; Tartaron, 2013; Jones et al, 2018). Currently, the roof of the tomb at Borzi Hill is collapsed, but the original lintel over the 1.9-meter high *stomion* is preserved in place. The *dromos* is much smaller in relative size when compared to other better-known tholoi at Mycenae and is similar to the tholos located west of Tiryns. Skeletal remains were found in three distinct cists that were lined with stones. Within the tomb is a main central cist (ΘHKH 3) that is about 60 cm by 140 cm and over 2.15 meters deep and dates to LH IIIC. To the west of the central cist was a much shallower and slightly shorter cist (ΘHKH 2). To the north of ΘHKH 3, opposite the door is a highly unusual cist (ΘHKH 1) that is oriented vertically and was constructed by removing large slabs from ΘHKH 3.

In addition to the three cists, remains were also found on the floor to the east of the central cist and in a Proto-Geometric pithos that partially covered ΘHKH 2. The late date (LH IIIC) for the very deep ΘHKH 3, the presence of the pithos burial and its superposition on ΘHKH 2, and the orientation and construction method of ΘHKH 1 are strong evidence supporting a prolonged and continuous use of the tholos until at least the early part of the Proto-Geometric period. It is not clear if the burial in ΘHKH 1 post-dates the pithos, but it certainly post-dates ΘHKH 3. The major skeletal elements of only one person (discussed below) with no pottery was found in ΘHKH 1. This person would have had to have been placed in a seated fetal position to fit in the cist. This burial position and orientation are in sharp contrast to and a major deviation from the extended position of bodies in cists in tholoi and chamber tombs. The orientation of the ΘHKH 1 was likely intentional and not functional to minimize its footprint. There was no effort to avoid disturbing other burials because ΘHKH 1 was constructed using part of the lining of ΘHKH 3.

Late Helladic Ossuaries and the Uniqueness of Borzi Hill

Several examples of Minoan ossuaries associated with tholoi have been found at the Messara Plain on Crete. At Odiyitria, multiple tholoi have been found with adjacent rectangular multi-roomed ossuaries that were built in phases from the Early Minoan I to Middle Minoan IIA (Vasilakis and Branigan, 2010). However, very little is known about true ossuaries from the LH in the rest of Greece. Part of the problem stems from how the term ossuary has been used in the literature for over 100 years. Entire Mycenaean chamber tombs with comingled bones, cists within chamber tombs, and pits outside of chamber tombs have sometimes been described as



“ossuaries” (Galaty, 2016; Souyoudzoglou-Haywood, 1999). These ritually significant practices are better described as secondary treatment or secondary burials within existing tombs (Jones, 2014). If an ossuary is more precisely defined as a purpose-build structure for secondary burial as seen at Odiyitria, then there are only two known ossuaries from the LH: one is at Ksagounaki, Mani, Peloponnese (Galaty, 2016) and the other is the one at Borzi Hill (Figure 2).



Figure 2. Ossuary at Borzi Hill as it currently appears

Reference: Photo taken by the author in 2018

The ossuary at Ksagounaki has only briefly been described in scholarly and popular sources (Galaty, 2016; Novoscriptorium.com). The ossuary at Ksagounaki is circular and the entrance was from the top. The stratigraphy (pebble floor/bones/pebble floor/bones) suggests that the entombment occurred in two major phases. The ossuary is about 20 km from the nearest known Mycenaean site which presents major challenges for understanding who would have been included in the ossuary and why. Although the Ksagounaki ossuary is far from other known Mycenaean sites, it is situated near the Alepotrypa Cave, where a large village, ritual complex and burials including Neolithic ossuaries, demonstrate a continuous occupation and/or ritual use since the Neolithic (Papathanasiou et al, 2000). Galaty (2016) hypothesized that the Mycenaean ossuary was constructed there because the area was seen as ritually significant by the local population from the Neolithic to the Late Bronze Age.

The ossuary at Borzi had a similar pebble floor, but is rectangular and does not have sharp stratigraphy, possibly because the entrance was from the short side rather than from the top (Souyoudzoglou-Haywood, 1999). Based on the pottery recovered from the ossuary, Kolonas suggests the ossuary was used between about 3400 and 3200 years ago (Souyoudzoglou-Haywood, 1999). It is clear from excavation photographs that the ossuary was used for secondary burial. At least along the west wall and possibly the north wall of the tomb,

remains were deposited in a clear pattern. Remains were not in anatomical position but rather were organized with a skull placed on top of aligned long bones (femora, tibiae, fibulae, humeri and forearm bones). In addition to the shape of the tomb, the single biggest difference of the Borzi Hill ossuary from the Ksagounaki ossuary, is its location. The ossuary at Borzi Hill is only a few meters from a tholos tomb; the entrances to the tholos and ossuary are in rough alignment with each other from the south; and the tholos-ossuary combination is part of a cluster of LH II and III habitation, civic and tomb sites (Vasilakis, 2011; Souyoudzoglou-Haywood, 1999).

Other stand-alone ossuaries and/or tholos-ossuary combinations may have existed on Kefalonia at Kokkolata-Kangelisses during the LH IIIA2-B (Souyoudzoglou-Haywood, 1999) and thus possibly in other locations on the Peloponnese during the LH III. Although nothing remains of the tombs, the records that have survive describe two tholoi at Kokkolata-Kangelisses having had adjacent pits with skeletal remains, but the excavation was poorly described, and the remains are no longer available for analysis (Souyoudzoglou-Haywood, 1999). The tombs described as tholoi at Kokkolata-Kangelisses are consistent with other tholoi in being circular and having one or more cists or pits that contained skeletal remains. However, these tholoi also have some features in common with the ossuary at Ksagounaki. First, as Souyoudzoglou-Haywood (1999, p. 58) notes "...only the lowest course, made of shaped stones was preserved, and there were no traces of entrances...", and second, the circular structures were built on top of Middle Helladic cist graves. If not for the thorough and systematic approach used to excavate the ossuary at Ksagounaki, it could have been misinterpreted as a tholos tomb (Galaty, 2016).

Major Preliminary Finds Through the Analysis of Human Remains

Even with a renewed interest in the study of human skeletal remains from the LH III, much of the research involving remains from tholoi and chamber tombs has been relatively targeted (for example, Schepartz et al, 2009; Petroutsas et al, 2009). The application of a systematic approach of the analysis of human remains from larger tholos and chamber tombs has been limited to a few cases such as the tholos at Petroto (Jones et al, 2016), the chamber tombs at Voudeni (Moutafi, 2021), and the current project described in this paper. While the commingling of fragmentary skeletal remains in various tombs has made research difficult and time-consuming (Angel, 1943), the analysis of the human and faunal skeletal remains from the tholos and ossuary at Borzi presents an opportunity to directly address some of the questions about the use of tholoi and ossuaries. A better understanding of who was included in different tombs at Borzi Hill is an important step to understanding the rarity of the ossuary, the continued use of the tholos, and how both may reveal more about political and ritual use of tombs during the Late Bronze Age and afterwards. The fragmentary nature and commingling of the remains present challenges, but it is worth stating explicitly that the condition of the remains is not an impediment to collecting evidence, the condition of the remains is the evidence of mortuary, political and ritual behaviour (Jones, 2014). The following sections describe some of the major finds thus far and are based on the analysis of approximately 70% of the human and faunal remains from both tombs at Borzi Hill analyzed from 2015 to 2019, when analysis was halted because of travel restriction due to the COVID-19 pandemic.



Demographic Composition of the Tombs

Some of the simplest and most important questions to ask about any tomb are, first, how many people were included in it, and second, what is the demographic composition of the sample. While asking this question is easy, it is exceedingly difficult to give a precise answer given the highly fragmentary and commingled nature of the remains. Most published estimates from various tombs should be considered suspect unless an osteology expert has been involved in the recovery and/or analysis of the remains (for example, Tsipopoulou et al, 2003), and unless the faunal remains have been systematically assessed in earlier excavations. The widely reported number of 72 individuals found in the ossuary at Borzi Hill is almost certainly incorrect (first described by Souyoudzoglou-Haywood, 1999 based on discussions with Dr Kolonas, and subsequently re-cited by some scholars and in museum displays). This number likely underestimate the number of individuals in the ossuary. The current systematic analysis of the human and faunal remains, indicates that most of the highly fragmentary bones of children were misidentified as faunal remains during excavation and/or during the initial cleaning and processing of the remains. The shafts of long bones with unfused epiphyses of human juveniles are easily mistaken for the limb bones of sheep and goats, which are common offerings at the tholos tomb. In addition to most of the children's remains, the remains of some of the oldest individuals in the tholos tomb were also misidentified as faunal remains. In several cases, fragmentary edentulous human mandibles were curated with the label "Faunal Remains". Anywhere from 10% to 90% of the bones in any box or bag marked "faunal remains" are actually the remains of children. Although Gallou (2015) has synthesized a great deal of information about childhood from the LH III, she demonstrates and explicitly states the need for the study of more well-provenienced juvenile skeletal remains. Much of the previous focus has been on isolated intramural burials of children and speculation on who is "missing" (for example, Kostanti, 2017). The remains are not missing (see Tsipopoulou et al, 2003). The presence of children in relatively high numbers in both tombs at Borzi Hill suggests a need for a shift in conceptualizing childhood since the remains of these children were treated like the adults, and the sample provides an enormous source of data to address gaps in knowledge that have been identified by several scholars (Gallou, 2015; Olsen, 1998; Voutsaki, 1995; Iakovidis, 1966).

At this time, it is not possible to give a precise estimate of the minimum number of individuals or the likely number of individuals in each tomb because the entire excavated sample has not been analyzed. Furthermore, it may never be possible to have a precise estimate because of the highly fragmentary nature of the remains and the fact that excavation of the tholos tomb had to stop because the structure was becoming unstable during excavation in the mid-1990s. However, based on the analysis thus far, the number of individuals in both tombs is certainly over 100 and likely less than 150, with approximately 75-80% coming from the ossuary.

Several things can be stated with certainty about the demographic composition of the tombs. First, a very wide range of ages are present in both the tholos tomb and the ossuary from neonate to extreme old age. Approximate age at death for the younger juveniles is based on the length of various long bones with unfused epiphyses, and for the older juveniles it is



based on partial fusion of epiphyses (for example, Hoppa and FitzGerald, 1999). Every stage of growth and development is represented from many different individuals from both tombs suggesting ages between birth and early 20s. Seriation of dental wear was used to estimate the ages of the adults. The dental wear ranges from minimal wear on second molar and no wear on newly erupted third molars, suggesting an age in the late teens, to many cases of mandibles with loss of all teeth, suggesting ages that are likely over 60 or 70 years of age. Although many individuals had pit or linear hypoplasia, almost no gross carious lesions have been found. The lack of carious lesions suggests that tooth loss in older adults was age-related due to advanced wear in extreme old age.

The second thing that can be stated with certainty is that males and females are present in about equal numbers in both tombs. The best source of information for estimating sex can be found in the pelvis (Albanese, 2003), and fragments of pelvic elements confirm the presence of both sexes in both tombs. Given the fragmentary and commingled nature of much of the remains, sex estimation was based primarily on the size of the joints of long bones, the best source of data outside the pelvis (Albanese et al, 2005, Albanese, 2013). A variation of the methodology developed by Albanese and colleagues (2005) was used to seriate various joints to estimate sex, and regardless of joint used, the sex ratio was consistently about equal. Although the analysis of remains is still in progress, there is strong evidence that ritual treatment of the remains was the same regardless sex or age in the tholos, and the same regardless of sex or age in the ossuary.

Biological Relationships

Angel (1973) noted some of the cranial similarities among individuals from Grave Circle B at Mycenae, and Bouwman and colleagues (2008) confirmed using mitochondrial DNA (only maternally inherited) that the male Γ55 and female Γ58 were likely brother and sister. However, Bouwman and colleagues were able to recover usable DNA from only four of 22 individuals sampled, and their results illustrate the importance of using multiple lines of evidence to establish relationships. Alternatives to destructive methods for aDNA analysis are essential to preserve irreplaceable specimens.

A systematic assessment of the skeletal remains in the tholos tomb at Borzi Hill has revealed very strong evidence that all the individuals in this tholos were related. This evidence includes a very pronounced mandibular morphology, a distinct hyper-shovelling of the upper lateral incisors (Figure 3). Analysis of the cranial remains from Borzi Hill is in progress and is being hampered by the pronounced damage to the mid-face of almost all crania. The analysis of the dentition from the maxilla has been limited to two cases thus far and both have the distinct hyper-shovelling of lateral incisors (see Scott and Turner, 1997 for an overview of dental traits). In contrast to the mid-face, mandibles with teeth *in situ* are very well represented in the tholos tomb. The condition of the mandibular remains ranges from small fragments to nearly complete mandibles in multiple parts.



Figure 3. Hyper-shoveled maxillary lateral incisor. The entire crown and root are curved into a canal with a pit in the crown and a fissure extending the length of the root

Reference: Photo taken by the author in 2016

Over 20 different adults are known from the mandibular fragments alone. Based on the analysis of the better-preserved mandibles, over a dozen distinct metric, nonmetric, and morphological traits have been identified in two similar patterns: one pattern for males and one pattern for females. A system has been developed to score the presence, absence and pronouncement of these traits. Every mandibular fragment studied thus far from the tholos tomb, regardless of how small the fragment, clearly manifests these traits in a very pronounced way. Although there are differences by sex, all the males and all the females have the same very distinctive mandibular morphology (see Saunders and Rainey, 2008 for more about nonmetric traits). The only divergence from this pattern is due to the premortem loss of teeth and subsequent remodelling of the mandibular body. All the individuals included in the tholos would have looked very much like each other when they were alive. All the morphological evidence thus far assessed strongly suggest that inclusion in the tholos tomb for both sexes was based on biological relationships.

Only a small portion of the mandibles from the ossuary have been analyzed, but the preliminary evidence supports the idea that the tholos tomb was reserved for a distinct lineage. As expected, some of the morphological traits should be found in mandibles of anyone from the island from this period, and these traits are found on some of the mandibles from the ossuary. However, the manifestation is less pronounced or not symmetrical in the ossuary sample. For example, one of the mandibular traits is the shape, size, and depth of the digastric fossae on the lingual side of the anterior mandible (Figure 4). In all cases from the tholos tomb where this area has been recovered, the manifestation is very pronounced and symmetrical along the midline, and present on both the left and right mandibular bodies. In cases from the ossuary, the fossa is smaller and follows a different pattern, or if it follows the tholos pattern the manifestation is not symmetrical. In addition to completing the analysis of all the remains from the ossuary, there are plans to score as many traits as possible from the archival photographs taken during Angel's visit to Kefalonia. Most of those remains are not available for direct analysis because they were lost during the earthquake that levelled much of Kefalonia in 1953. A three-way comparison between the mandibles from the tholos, ossuary and other chamber tombs from the island will be useful to confirm using non-destructive methods that the tholos tomb was used for only one lineage. Furthermore, this three-way comparison could help to determine if the ossuary was used as a secondary burial for extended relations and other important individuals who died elsewhere on the island or off-island.



Figure 4. Symmetrical manifestation of pronounced digastric fossae (large symmetrical ovals at top) on No 38 from ΘHKH 1. Mandible is view from below. Anterior (chin) is towards the top of the picture. Note how enlarged fossae make chin more pronounced (see also Figure 5)

Reference: Sketch made by the author's research assistant, Sarah Shaver, in 2019

The Last Burials

As noted above based on the stratigraphy and pottery, among the last entombments in the tholos was the lone individual in Θ HKH 1 who would have been placed in a seated fetal position, and the burial in the Proto-Geometric pithos. The remains from the pithos have not been located for analysis. However, based on some of the photographs taken during the excavation of the remains *in situ*, the individuals placed in the pithos was a large and very robust adult male. The head of the humerus and the olecranon process of the ulna are very large, and the interosseus crests of the ulna and radius are very robust. The mandible is not visible in the photographs and none of the mandibular traits can be scored.

The other distinctive zone of interest in the tholos tomb is the area to the east of the central cist (Θ HKH 3), immediately to the right upon entry into the tomb. In this area, the remains of several individuals were recovered on a bed of flat stones. The area covered by the stones was approximately the same dimensions as Θ HKH 3, which is large enough to place a person in an extended position. One of the individuals laid out in the area is also among the last individuals in the tholos tomb because they are found at one of the highest strata that contains remains. Furthermore, this individual is one of the most complete individuals found in the tholos, and is at similar level of completeness as the burial in Θ HKH 1 (who was analyzed) and the pithos (known only from photographs *in situ*). In contrast to these three individuals, all other individuals recovered from the tholos are completely commingled, likely as part of the mortuary treatment of remains after skeletonization, and possibly because of looting in antiquity. Various skeletal elements from the entire body were recovered from this individual, "No 37", including many hand bones which are very rare in both tombs, suggesting the remains were not disturbed or moved from the place of primary placement to accommodate additional entombments. Number 37 has the very distinctive male mandibular morphology found in all cases in the tholos tomb. The upper incisors are not available for analysis for this individual. The pronounced dental wear suggests this person was an older adult, but the retention of all his teeth suggests he was not among the oldest recovered from the tomb.

The lone individual in Θ HKH 1, "No 38", is one of the more complete individuals thus far analyzed. Nothing was found in Θ HKH 1 with this individual except for an offering of a goat's head. The lack of material cultural in Θ HKH 1 makes the exact dating of the burial difficult, but there is some circumstantial evidence that it may be more recent than the proto-geometric pithos burial. The carefully constructed shape of the cist was by design so that the body had to be placed in a very unusual seated fetal position. The stone slabs used to build Θ HKH 1 were taken from Θ HKH 3 which was used as late as the LH IIIC. All indicators throughout the skeleton strongly suggest this individual is male. The dental wear on the teeth suggests an age similar to No 37, an older adult but not the oldest recovered from the tholos. As with No 37, No 38 has the very pronounced mandibular morphology present in all individuals found thus far in the tholos tomb as well as a hyper-shoveling of the lateral incisors. Number 38 shows clear evidence of healed trauma, including multiple healed fractures of cervical vertebrae, and



a massive slashing injury that stretch from his left eye to the mandible (Figure 5). The trauma would have resulted in the loss of the left eye, and the injury cleaved the first mandibular premolar and dislodged the second adjacent premolar. The facial injury is very well-healed, and this person would have been immediately recognizable while alive from this “war wound” and distinctive mandibular morphology. In some scholarly and popular sources various tombs with an abundance of bronze weapons and armor from this period have been referred to as the tombs of “warriors” (for example, Marchant 2017, but see also Smith 2009). However, in the case of No 38, this description could be correct. The slash on the left side of the face is consistent with slash wound from a right-handed attacker using a heavy sharp weapon such as sword. The contextualized skeletal evidence strongly suggests the tholos tomb was used exclusively and continuously by one lineage until at least the Proto-Geometric.



Figure 5. Very well-healed trauma to left eye and mandible of No 38 from ΘHKH 1, one of the last people included in the tholos tomb. Note distinctive mandibular morphology found on all mandibles in the tholos

Reference: Photo taken by the author's research assistant, Sarah Shaver, in 2019

Using Skeletal Evidence to Reconstruct Material Culture and Ritual Behaviour

Most monumental architecture was meant to be seen and in the case of tholoi and other tombs to function as a source of legitimacy by linking the ruling lineage to prominent ancestors (Murphy, 2014). Anyone entering through the Lion's Gate at Mycenae, would have to first pass by a cluster of tholoi immediately outside the gate and then Grave Circle A immediately inside the gate. Furthermore, all these tombs, Grave Circle B, and the even more prominent "Treasury of Atreus" would have all been clearly visible from the *megaron* at Mycenae. The intended visibility of these tombs and their political significance meant that the tombs became obvious targets for economic and political looting when the power structures in the society collapsed. Based on the recovery of material culture from other undisturbed tombs (for example, Marchant, 2017; King, 1970), gold jewelry and often oversized bronze weapons and armor were included with the deceased during this period. Valuable or precious metals would have been the obvious targets for looters motivated by economic gain while making a political statement about the ancestors of the ruling lineage.

As a result of the prominence of the tholos at Borzi Hill, it seems that many of the valuable offerings were lost to looters in antiquity. However, a systematic analysis of the human remains has revealed some important clues about what was included in the tholos at Borzi Hill. Not surprisingly, numerous examples of the typical greenish-blackish staining associated with oxidized bronze have been found on the bones of various individuals. In a few cases, small fragments of bronze have been identified adhering to some bones. More surprising is evidence for amber beads and iron from stains left on bones (Figure 6). The brown oval stains are likely all that remains of amber beads and the bright red rust stain strongly suggest the presences of iron. In addition to providing evidence of offerings, stains on the remains also provide additional evidence about ritual behaviour. The bones of No 37, described above, manifest clear evidence of burning but not an attempt at cremation. Only the skull and upper body of this individual shows clear evidence of burning. Based on photographs taken during the excavation, this person's upper body would have been located immediately to the right of the door. It is possible that a fire was not intentionally set on top of No 37 person, but instead was set for ritual purposes near the door when the pithos burial or when No 38 from ΘHKH 1 were placed in the tholos.





Figure 6. Anterior view of mid-shaft of femur from ossuary. Note the oval brown stain likely cause by amber beads, and the bright red rust stain likely caused by oxidized iron

Reference: Photo taken by the author in 2018

Secondary Burials, Missing Skeletal Elements, and Possible Evidence of Intentional Breakage

As noted above, based on photographs taken during the excavation, it is clear that some remains were carefully position in a secondary “bundle burial” in the ossuary, certainly along the west wall and possibly along the north wall. There are no photos of bone *in situ* from the excavation of the east wall. Bundle burials are well-known secondary burials in different parts of the world at various times. Following primary burial, skeletal elements that were considered of ritual or spiritual significance were exhumed and set aside for reburial at a different location. Typically, these skeletal elements included the skull and the major long bones including the femora, tibiae, fibulae, humeri, and forearm bones. The bones were then re-buried in a new location in a “bundle”: long bones were stacked like a bundle of sticks in parallel and then a skull was placed on top of the bundle of long bones. In addition to the excavation photographs, evidence of this bundled secondary burial is present in the bones. In several cases from the ossuary, a limestone matrix with the consistency of concrete has solidified around the aligned bones and still holds them in the bundle position in which they were placed in the ossuary for secondary burial.

Given this approach to secondary burial with a focus on retaining skulls and major long bones, other specific skeletal elements such as vertebrae, ribs, and hand and foot bones are under-represented in the ossuary as expected. These elements should not be completely absent from the ossuary. Not all individuals included in the ossuary would have been bundled after primary burial, and accidental inclusions of specific elements in the ossuary should be expected. For example, given the focus on skulls and long bones there appear to be a higher-than-expected number of tali and to a lesser extent the calcanei in the ossuary. If we assume that foot bones were not meant to be included in secondary burial then higher than expected means more than zero. If foot bones were meant to be included, with an estimated 80 or more adults included in the ossuary, one would expect to find close to 160 of each major ankle bone. Thus far over 20 tali have been recovered and under 20 calcanei have been recovered from the ossuary. The inclusion of these ankle bones is consistent with the secondary burial of tibiae where complete skeletonization had not yet occurred. The tibia articulates with the talus which articulated with the calcaneus. Multiple ligaments likely still held the talus or both ankle bones in anatomical position relative to the tibia. When the tibiae were removed from primary burial, these ankle bones were still attached to the tibia and included in the bundle that was placed in the ossuary.

While the pattern of missing skeletal elements in the ossuary is consistent with secondary burial, the same pattern of under-represented skeletal elements is also seen in the tholos. This pattern of missing vertebrae, ribs, and hand and foot bones is much more complicated and difficult to explain in the tholos. As described above, some tholoi seemed to have been re-used continuously or in waves as the primary and secondary repository of remains. The deceased were placed in a cist or on the ground in an extended position and then were covered or moved and repositioned but kept in the tholos tomb, a pattern also seen in chamber tombs. Preservation bias may seem like an obvious explanation for why some skeletal elements have not been recovered from the tholos, but preservation bias is very complicated. Micro-environments within the tomb could have a huge impact on preservation. For example, bone quality and texture is very different for individual No 38 recovered from ΘHKH 1. Given the construction of ΘHKH 1, it is likely that it trapped water that seeped into the tomb and the bone quality and texture of No 38 is consistent with having been immersed in water for extended periods at various points over the last 3,000 years. In other cases, such as No 37, some of the bones rested in an elevated area within the tomb where drainage was much better and the bones were not immersed in water, and preservation is excellent despite being burned. Hand bones are associated with No 37, who was one of the last included and was not disturbed and was also among the best preserved. Some of the bones that are missing from the tholos are some of the most fragile bones that are most susceptible to taphonomic degradation. However, at the same time, some of the best-preserved bones are some of the most fragile bones of very young children including a few isolated ribs. Preservation bias is likely considering the complicated and highly variable micro-environments within a tholos tomb, but it cannot be the only explanation for the missing elements.



The other possible explanation for the missing skeletal elements is that the bones were intentionally broken down into smaller pieces either as part of the initial mortuary practices after skeletonization and secondary positioning within the tholos, or as a political act of desecration by looters with the collapse of power structures in society. More research is required, but there is some evidence to support this hypothesis of intentional breakage. Many of the more fragile skeletal elements that are missing such as ribs, would have been easier to break and once broken would have been susceptible to further environmental degradation. Whereas intentional breakage of more robust long bones would survive, and the evidence of intentional breakage should be visible. Various examples of healed pre-mortem trauma and sharp force perimortem trauma have been identified in multiple individuals, and clear evidence of cut marks associated with butchering are visible in many of the animal remains (see section below on faunal remains). However, the pattern seen in many long bones is consistent with intentional chopping of bones at mid-shafts (Figure 7).



Figure 7. Examples of intentional chop marks found on bones in both tombs. Top: a tibia with over a half dozen marks in a small area of the mid-shaft. Bottom: a humerus with three distinct marks close together. Uniform staining in the chop mark indicates breaks are ancient

Reference: Photo taken by the author in 2018

The breaks are ancient and show evidence of multiple chop marks within millimetres of each other. The roof can cave in only once and cause damage, but multiple chop marks in very close proximity in the mid-shafts of long bones is consistent with multiple blows and an effort to break the bones. At least some of these breaks were intentionally made post-mortem. Ritual modification of human bones after death has never before been described in a Mycenaean tomb of any kind, and it is possible that the damage was part of a ritual desecration by looters. Confirming this hypothesis is a work in progress that currently involves completing the analysis of all remains from both tombs.

Reconstructing mortuary practices and trade networks with faunal remains

A systematic analysis of faunal remains has been lacking from many investigations of Mycenaean sites (Jones et al, 2018; Moutafi, 2021; Souyoudzoglou-Haywood, 1999; Hamilakis 1996, Day 1984). Given the complexity of data collection from such fragmentary and commingled remains from the tholos and ossuary at Borzi Hill, originally the focus of the current project was only on the human remains from both tombs. However, early on in data collection, it became clear that the bags labelled as having human remains also contained animal bones and it seemed likely that the opposite was also true. As mentioned above when discussing the remains of children, one of the greatest benefits of systematically assessing all the skeletal remains, is the identification of the oldest and the youngest people who were buried in both tombs. In addition to locating the “missing children” in LH tombs, the time invested in this analysis of faunal remains is already yielding important finds at Borzi Hill that are helping to reconstruct mortuary rituals and trade networks from the Late Bronze Age. Only a summary of some of the preliminary finds and their possible significance is presented here.

Some Expected Offerings Included in the Tholos tomb

Although data collection is in progress, a clear pattern is emerging. All the faunal remains have been recovered from the tholos tomb and no faunal remains have been identified from the ossuary. Faunal offerings might have been made at the primary burial and not in the ossuary re-burial. It is also possible that all the faunal offerings were made at a specific location in the ossuary that has not yet been analyzed, or that offerings were made outside the ossuary in a location not yet excavated. But thus far, not even tiny fragments of animal bones that may have been accidentally commingled have been found in the ossuary. In contrast to the ossuary, bones from many different species have been identified in the tholos. Although all offerings are ritual in nature, these faunal remains can be divided into two general categories. The first category includes offerings that were intended for “consumption” by the deceased and possibly those attending the burial. As expected, numerous examples of leg bones from sheep and goats have been identified from the tholos at Borzi Hill. Some of the faunal remains show evidence of cut marks near joints that is consistent with butchering, and other bones have a colour and texture consistent with having been cooked. The remains were likely part of a funerary feast or ritual meal with offerings for the deceased being included in the tomb.

The second category of faunal remains are those not meant for “consumption” by the deceased, but rather remains meant for veneration. As mentioned above, only a goat’s head was found in ΘHKH 1 with individual No 38. There is clear evidence of decapitation with cutmarks on the occipital condyles on the base of the goat’s head. The goat was likely decapitated as part of a sacrifice or decapitated soon after its death, specifically to be included in the tholos. Other similar examples, include several examples of cranial bones and tusks from pigs, which were included because of their symbolic significance and obviously not for consumption. The remains of one or more cows have also been identified and given the context and processing involved, there is some evidence of cooking and butchering for “consumption” as well for veneration with the inclusion of horns.



The Expected and the Unexpected Offerings: Dogs, a Cat, and a Horse

In addition to the ritual inclusion of pigs, goats and cows, the remains of at least six dogs, including one juvenile, have been identified from the tholos. The combination of cut marks in some cases but no evidence of cooking, suggests that some of the dogs were sacrificed for inclusion but not consumption. The inclusion of dogs in burials throughout the Late Bronze Age in Greece has been well-documented (for example, Day, 1984), and their inclusion in the tholos at Borzi Hill was expected. However, other species have been identified from the tholos that can be described as very rare or even truly exceptional. Some of the rare finds include the fetal bones of sheep and goats, at least one rabbit or hare, several species of yet unidentified birds, and at least one turtle. The truly exceptional finds include at least one cat and at least one horse.

The inclusion of horses is exceptional for the Late Bronze Age. There are approximately nine documented examples of horses associated with tombs from the entire LH and only two of those cases are from the LH III (Kosmetatou, 1993). All the skeletal elements from the Borzi Hill tholos -seven teeth, proximal half of the right radius, parts of both femora, parts of both hipbones, and one phalanx- are consistent with one horse that was two to three years old based on dental evidence and epiphyseal union. Cases of horses as offerings during the LH from Dendra and Marathon suggest that two horses that drew a funeral cart were sacrificed outside the tomb while possibly still yoked. The case from Borzi Hill follows a pattern consistent with a tholos tomb at Archanes on Crete during the contemporaneous Late Minoan III Period. Marks on the bones suggest that the horse at Borzi Hill was chopped into pieces as in Archanes. A horse in its prime, likely brought from the mainland, would have represented an exceptional offering for a prominent individual, above and beyond inclusion in a monumental tholos tomb at Borzi Hill. The strong Minoan influence of mainland Greece since the Middle Helladic has been well-documented. However, the treatment of the horse along with the unique tholos-ossuary combination of tombs hints at a possible stronger than expect connection between Kefalonia and Crete.

The canine, proximal femur, metatarsal, and a vertebra of a cat have thus far been identified. The earliest evidence of a domesticated cat has been found on Cyprus dating to about 9500 years ago where a cat was included with a human burial (Driscoll et al, 2009). But it was after about 3700 years ago that evidence for the veneration of domesticated cats is widely seen in carvings and other iconography in the eastern margin of Mediterranean and Egypt. Given that cats were considered sacred by the Egyptians, it has been widely reported that the export of cats from Egypt had been banned for centuries and this ban was maintained by the Ptolemeic dynasty (Driscoll et al, 2018). After the end of the Ptolemeic dynasty just over 2000 years ago, there is evidence of cats spreading to the entire Roman Empire (Driscoll et al, 2009). Given the nature of domesticated cats, Johansson (2012) questions the efficacy of a political ban on the behaviour of cats. Regardless of whether a ban on the export of cats existed or could be enforced, this find from the tholos at Borzi Hill is at least 2900 years old and possible as much as 3350 years old, thus and predates the earliest documented cases of a cat in Greece by about 500 years, and the rest of Europe by about 1000 years. Whether a ban on the exports



of cats from Egypt was enforceable or not, the presence of a cat on Kefalonia at that time is evidence of an extensive trade network, and great wealth and influence of the ruling family. A cat would have been a truly exceptional animal to possess and to subsequently sacrifice as a mortuary offering.

Discussion and Conclusion

The analysis of the human skeletal remains alone from the tholos tomb and ossuary at Borzi provide a great deal of information for reconstructing how the tombs were used and who was included in the tombs. Extrapolating from the analyzed sample, the tombs contained approximately 100 to 150 people, with about 75-85% coming from the ossuary. In both tombs, males and females are approximately equally represented and age at death ranges from neonates, suggesting inclusion was based on familial relationships, to over 60 years suggesting living conditions allowed for survival of many people into old age. However, the analysis of the skeletal data is even more valuable when considered in a more holistic way to complement the archaeological evidence and geographic context of this combination of tombs at this specific location.

The monumental architecture with the distinctive corbelled vault of the resource-intensive tholos tombs strongly suggests they were used for the burial of prominent individuals, but as Murphy (2014) notes there has been a shift in the literature concerning who was included in these tombs: from exclusive use by one royal family, to use by elites, and most recently to use by anyone with enough wealth and prestige to build one (Schepartz et al, 2009; Castleden, 2005; Souyoudzoglou-Haywood, 1999; Graziadio, 1991; Mee and Cavannagh, 1984; Wright, 1987; Taylour, 1983). Much of the lack of consensus about who was included in tholoi is a result of a lack of data. Because of their prominence, most tholos tombs were looted and completely emptied in antiquity and excavated in the early 20th century when there was little interest in skeletal remains. Schepartz and colleagues (2009) cite excavation notes from the 1930s, which state that "35 baskets" of bones were recovered from Tholos III at Pylos. Although more work is needed, a systematic analysis of the remains from the second tholos tomb at Borzi Hill built 3350 years ago strongly suggests that this tomb was used exclusively and continuously by one ruling family for over 300 years, well into the Proto-Geometric Period.

Based on an assessment of pottery in and near the tholoi and chamber tombs at Pylos, Murphy (2014) found differences between Mycenae and Pylos, and changes through time at Pylos during the LH III. Murphy concluded that initially the tholoi at Pylos were used to leverage connections to ancestors as the basis for the authority of the leaders. Once the identity of the rulers was established and there was no longer a political need for the ancestors, there was a spatial and political shift away from the tholoi and mortuary rituals to the palace and ritual feasting. This interpretation illustrates another trend in the literature that was summarized by Murphy (2014) regarding interpretations of Mycenaean tombs: a shift from considering the tombs as passive representation of social hierarchy to framing the tombs as an active manipulation to legitimize claims to power, local resources and wealth (Voutsaki, 1995). Kefalonia was geographically removed from the major contemporaneous centres on the mainland, but also



strategically located for controlling essential maritime trade from the Gulf of Corinth, Crete and the southern Peloponnese, and destinations to the north and west. The tholos-ossuary combination at Borzi Hill may reflect a politically motivated adherence to balance both pan-Mycenaean practices of legitimizing authority (the tholos) and non-Mycenaean influences (the ossuary) necessary to maintain control of a lucrative and geographical expansive trade network that flowed through the Kefalonia-Ithaki bottle neck during the LH III. The uninterrupted and continued use of the Borzi Hill tholos tomb by one ruling family into at least the Proto-Geometric may reflect a similar politically motivated practice as described by Murphy (2014) at Pylos. However, in contrast to Pylos, the tholos tomb at Borzi Hill seems to have remained the focus for legitimizing authority, even after the complete collapse of the palace political structure everywhere else.

The fragmentary and commingled nature of remains in many tombs has presented many challenges to reconstructing the behaviour that created these assemblages. Because the tombs were disturbed in antiquity the assumption has been that the displacement of bones and missing elements were caused only by the looters, and the looting itself is not a source of useful information for reconstructing the decline in the significance of the tomb and the people in it (Papazoglou-Manioudaki, 2011). In other words, the activity of looters has been erroneously considered as not having any ritual and political significance. The skeletal evidence suggests that at least some of the human bones were intentionally broken postmortem, and likely after complete skeletonization in some cases. Whether it was part of the mortuary practices involved in re-using the tholos tomb or intentional political acts of desecration by looters, the damage to the bones reflects political and/or ritual behaviour during this period that needs further systematic investigation in other tombs that were re-used.

The systemic analysis of faunal remains has yielded a great deal of evidence to help reconstruct in more detail some of the well-known mortuary practices during this period, including the importance of dogs and ritual consumption of food offerings. Some of the most exceptional finds include the oldest cat ever found in Europe (with the exception of Cyprus) and only the third known horse sacrifice from the LH III. Along with the monumental architecture of the tholos tomb itself, these animals reflect the wealth and prominence of the lineage that was entombed in the tholos, and of specific individuals in the tomb. Furthermore, Tartaron (2013) discusses the archaeological underrepresentation of trade goods during this period. Some of this evidence may have been lost to a preservation and/or excavation bias. A detailed analysis of the human and faunal remains may provide some evidence to fill some of these gaps. The cat, along with stains on human bones likely caused by iron and amber are important evidence of the extent of wide-spread trade networks that funneled through the navigational bottle neck between Kefalonia and Ithaki. Finally with respect to the uniqueness of these faunal discoveries, it is important to note that the absence of evidence does not equal evidence of absence. The rarity of the horse sacrifice at Borzi Hill, and the presence of the cat may be an artifact of the tomb surviving relatively unnoticed until the late 20th century, and the systematic approach to analyze every bone fragment from both tombs. Other cats, horses and other rare animals already excavated from various tombs may be waiting in storage to be identified.



The ossuary at Borzi Hill presents some difficult, but exciting challenges for reconstructing mortuary practices and their significance during this period. There are at least four possibilities for how the ossuary was used and who was included in this type of burial. First, it is possible that the ossuary may contain the remains from the first tholos tomb that was built around 3450 years ago. The ossuary could have been constructed and the remains from the first tholos could have been placed in it while the second tholos was built about 3350 years ago on the same location as the first tholos. The timing for when the ossuary may have first been used supports this first hypothesis, but this first hypothesis as an exclusive possibility seems unlikely since there is clear evidence that the ossuary was used for about 200 years. In other words, the ossuary and the second tholos tomb were used continuously and simultaneously throughout most of the LH III.

The second possibility is that the ossuary may have been used in a similar fashion to those on Crete, where remains seemed to have been moved from the tholos to the ossuary for ritual purposes or when space was needed. This hypothesis is not supported by the likely biological relationships. The differences in the manifestation of the mandibular morphology in the tholos versus the ossuary strongly suggest that all the individuals in the tholos tomb looked like each other and were very closely related to each other. The evidence recovered from the ossuary thus far suggests these individuals were more heterogeneous in their mandibular morphology. The complete lack of faunal remains in the ossuary also suggests that this second hypothesis is not likely. There is clear evidence of secondary bundle burials in the ossuary and that occasionally and accidentally ankle bones were included in these bundles. However, not a single fragment of faunal remains has been found in the ossuary thus far. If the practice was to move human remains from the tholos to the ossuary, then it is likely that some faunal remains would have been accidentally transferred as well.

Third, it is possible that individuals were brought to a secondary burial location near the tholos tomb for ritual or political reasons after primary burial elsewhere on the island or off-island. Souyoudzoglou-Haywood (1999) suggested that the ossuary at Borzi and the pit graves at Kokkolata were used in a similar fashion. She suggests a hierarchical relationship between those individuals in the tholoi and those in the adjacent ossuary or pit. Given the lack of good excavation records for these pits at Kokkolata, there is no clear evidence to support or refute Souyoudzoglou-Haywood's hypothesis. However, with the evidence of the extensive trade networks flowing by Kefalonia, the ossuary could be conceptualized as a repository for important Kefalonians and their children who died off-island and were repatriated to the island and entombed in the ossuary. These individuals and their children were important figures who were close to but not part of the core ruling lineage from the tholos tomb. This hypothesis is consistent with the use of the ossuary at Ksagounaki. In that case specific individuals were brought to be in proximity to the Alepotrypa Cave, which was of ritual significance since the Neolithic. In the case of Borzi Hill, individuals were placed in the ossuary to be in proximity to the tholos tomb.



Fourth, it is possible that the use of the ossuary changed over time. It may have been initially built for the occupants of the first tholos, and subsequently used as on Crete with remains moved from the second tholos, and also to house the remains of people who died elsewhere and were brought to be near to the tholos for political or ritual purposes.

Conclusion

The systematic analysis of well-provenienced human and faunal remains can be an important source of data to complement more traditional archaeological methods for investigating the Late Bronze Age in Greece. The preliminary results from on-going research involving the contextualized analysis of remains from the tholos and ossuary at Borzi Hill is contributing to a better understand of these tombs and of the mortuary, political and economic practices during the Late Bronze Age. The appropriate theory and methodology demonstrate that the commingled and fragmentary human and animal remains are not a barrier to research. Rather, as is illustrated using the examples presented, the nature of the remains is evidence for previously unrecognized mortuary practices.

Completion of the analysis is essential to confirm the various hypotheses stemming from the research in progress, but there is evidence to support some preliminary conclusions. First, extrapolating from the analyzed sample, both tombs contained approximately 100 to 150 people, with about 75-85% recovered from the ossuary. In both tombs, males and females are approximately equally represented and age at death ranges from neonates to well over 60 years. The demographic composition of the sample indicates that treatment of the dead for these types of tombs was the same for all individuals regardless of age or sex, that inclusion was based on familial relationships and not merit since infants were included, and that living conditions allowed for many to survive until old age. The evidence from the mandibular morphology strongly suggests that all the individuals in the tholos looked alike and were probably closely related. Second, the ossuary was a purpose-built structure for the reburial of selected skeletal elements after skeletonization had occurred at another unknown location. Its proximity to the tholos tomb and the careful arrangement of only some specific bones suggest a previously unrecognized pattern of ritual behaviour with human remains from the late Bronze Age in Greece. Third, some of the bones from the tombs show evidence of intentional breakage. The pattern found on many of the human bones in both tombs is consistent with damage to dry bone after complete skeletonization. The proximity of chop marks, only millimetres apart, and the consistent location of the marks on many bones suggest an effort to systematically break bones. Whether this pattern of breakage is part of a previously unidentified mortuary ritual associated with the reuse of a tomb or the intentional desecration of remains by looters, this damage is evidence of ritual behaviour that requires further investigation. Fourth, faunal offerings for "consumption" or for veneration have been found in the tholos tomb, but thus far none have been found in the ossuary. In addition to sheep, goat, dog and cow bones, the remains of a cat and a horse have been identified. The horse remains were processed in a manner that was different from the only two other known LH III tombs with horses, and the cat predates the earliest known cat in Greece by about 500 years.



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