

The ancient cemeteries of Astypalaia, Greece

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The small island of Astypalaia in the southern Aegean Sea has produced two first millennium BC cemeteries, one containing remains of individuals of all ages, the other exclusively newborn babies and young children. The sites have been studied by the 22nd Ephorate of the Greek Archaeological Service since 1996. Since 2000 there has been a formal collaboration with the Institute of Archaeology to study the human remains, first described in Archaeology International 2001/2002. Here the leading scholars involved in the project describe the work undertaken over the last eight years.

and delicate nature of children's skeletons but they are also less commonly buried alongside those of adults and often lack clear burial markers, making them hard to identify even when preserved. During the Classical period in Greece, however, children of all ages were frequently buried within the main cemeteries and the very young were often placed within domestic or trade pots.^{2,3} What is unusual about the Kylindra cemetery is that these infant burials are present in such high numbers, with over 2700 identified so far, making

The island of Astypalaia is situated within the southern part of the Aegean Sea, 280km southeast of Athens (Fig. 1). Together with 11 other major islands, including Kos and Rhodes, Astypalaia makes up the Dodecanese archipelago. The island itself is shaped like a butterfly, measuring approximately 18km long and 13km wide with an area of about 99km². Unlike its neighbouring islands of Kos and Rhodes, little is known about Astypalaia archaeologically. Since Classical times and up until the first century AD the island was an independent state, whose capital was located on the site of the modern town of Chora (Fig. 2). The island was also part of the Roman and subsequently the Byzantine Empire with the remnants of several mosaic floors and a Roman bath forming some of the island's most visited tourist attractions. After the Venetian seizure of Greek islands following AD 1204, the island became the inherited land of the Querini family who built the castle, which still dominates the main town today. Most of the island's inhabitants lived within the castle walls for protection from pirates but, after the solution of the piracy problem in AD 1830, people started to build houses outside. The modern town grew particularly after the Second World War.

Archaeological investigations

In 1981 the 22nd Ephorate of Prehistoric and Classical Antiquities undertook the first excavations on the island, which led to large scale excavations.² Two cemeteries, Katsalos and Kylindra, associated with the Classical settlement period on the island, were excavated. The Katsalos cemetery is located on the neighbouring hill to the main town of Chora, with archaeological finds dating its use from the Late Geometric (around 750 BC) until Roman times. Preliminary analysis of the skeletal remains from this cemetery suggests that individuals of all ages were buried there. In contrast the Kylindra cemetery, located on the southwest slope of Chora directly below the Venetian castle, appears to have been reserved for the bodies of newborn babies and a few



Figure 1 Map showing location of Astypalaia

young children. The burials are all within large pots, following common practice for Archaic and Classical cemeteries. The oldest pot form is Late Geometric but the bulk date from Late Archaic to Early Classical times (600–400 BC). There are also Hellenistic and Roman period pots. Broadly therefore, Kylindra and Katsalos overlap in date.

Although young children would be expected to make up a substantial part of any death assemblage, these remains are rarely retrieved from archaeological sites. This may partly be due to the small

it easily the largest ancient children's cemetery in the world. To understand this unique cemetery a detailed study of the burials from Katsalos, which more closely resembles a typical island cemetery, also needs to be made.

The collaboration between the 22nd Ephorate and the Institute of Archaeology began in 2000, with Eleni Pharmakidou, who coordinated the programme and arranged all the required permits from the Greek Ministry of Culture. In the following years Maria Michalaki-Kollia, was responsible for the excavation and



Figure 2 The town of Chora with excavations on its southern slope



Figure 3 Bone fragments from Grave 3, Katsalos cemetery

the study of the archaeological finds from the Katsalos and Kylindra cemeteries. The IoA team, led by Professor Simon Hillson and including human remains specialists, conservators and postgraduate students from the IoA and universities from around the world, have conducted eight field seasons on the island between 2000 and 2009. They have been responsible for the recovery, conservation and study of the skeletons from both cemeteries.

Over the last ten years work has focused on the skeletal material from the infant cemetery of southwest Kylindra, but during the 2009 field season part of the team concentrated on the cleaning, inventory and preliminary analysis of the material from the Katsalos cemetery. This most recent field season was also marked by a change in premises from a small laboratory to much larger accommodation in the old school building. This was made possible with the assistance of Mr Panormitis Kontaratu, the Mayor of Astypalaia and the Island Council, the advice of Professor Christos Doumas and the work of our colleagues from the 22nd Ephorate. Most importantly, it allowed a much larger number of students to take part in the 2009 field season.

Katsalos

Katsalos represents a typical Classical island cemetery with burials containing

the skeletal remains of men, women and children as well as evidence that the graves had been reused many times. The retrieval of the human remains from the grave cuts represented a significant challenge, as many were deep and narrow and the bones were highly fragmented (Fig. 3). During the 2009 field season work began on cleaning, labelling and identifying the remains from each of the burials. An inventory of the remains was made as well as a photographic record.

The fragmentary nature of the human skeletal remains from Katsalos suggest that most of the graves were reused many times and it appears that each time a new burial was introduced the old burial was cleared away, leaving behind some skeletal elements from the previous burials, occasionally whole limbs. This type of burial practice has frequently been observed in Classical cemeteries from the Greek islands.^{3,4} Only in a few cases was a partial burial left behind in the ground before a new one was introduced.

Most of the bone fragments retrieved from the graves could be attributed to the part of the skeleton to which they belonged. In addition, some fragments contained information about age at death and sex of the individuals buried within



Figure 4 Lower limb bones from Grave 20, Katsalos cemetery representing at least three individuals

the same grave. Preliminary analysis of the human remains from the Katsalos cemetery focused on the establishment of a minimum number of individuals present within each grave and the identification of any information on age and sex. This was an extremely time-consuming process and in total the skeletal remains from five burials were cleaned, sorted, identified, recorded and photographed.

Burial 20 contained the highest minimum number of individuals with the remains of three adults, one juvenile and a neonate skeleton (Fig. 4). A mixture of adult and juvenile remains was also discovered in two other large graves, Burial 3 and Burial 11. Burial 3 contained the skeletal remains of 1 old adult, 2 adults and one juvenile. Two of the adults also showed indicators of sex, with one being male and one female. Three adults and one juvenile skeleton were discovered within Burial 11, mostly represented by their teeth, which more commonly preserve in archaeological sites than bones. The two other burials analysed during the 2009 field season contained skeletal remains that could only be attributed to a single adult. The fragmentary nature of both these burials suggests that they were also reused over time, but the skeletal



Figure 5 Excavations at the Kylindra infant cemetery

remains were too fragmentary and lacked any elements to indicate that more than one adult was present.

This preliminary analysis also showed that the male skeletons buried within the Katsalos cemetery were unusually large and robust. The best evidence for this comes from the size of their joints. There is also evidence for low-level joint disease and dental decay, although these are both extremely common in most archaeological cemetery collections.

Kylindra (Figs 5 and 6)

Most of the pots used to bury the children from the Kylindra cemetery were trade amphorae, but domestic pots such as hydria have also been found in association with some burials (Fig. 7). An opening was cut into the side of the pots and the bodies of the babies placed inside (Fig. 8). This hole was then sealed by replacing the piece of pottery and the neck of the pot blocked with a stone stopper set in mortar

and covered with a pottery sherd or second stone. The pots were then placed into a pit dug into the hard bedrock and backfilled. The accumulation of soil and refuse on top of the pots had, in most cases, led to the collapse of the uppermost part of the pots, which then became in filled with soil. Over time, the soil has been cemented together with carbonate and, within these hard accumulations, the skeletons of the babies are preserved. 22nd Ephorate archaeologists lift the pots and associated soil accumulations from the site. It is the job of the IoA team to recover the skeletons of the babies from within the pots, to clean and conserve, inventory and study them.

Over the last eight field seasons the bioarchaeological team from the IoA has developed specialized methods for recording, recovering, conserving and storing these delicate human remains. At the time of writing, over 845 infant skeletons have been recovered from within the Kylindra pots.

The large number of infants discovered at the Kylindra cemetery make it possible to study the variation of growth and development within different part of the skeletons. Standards derived from the development of modern children yield a scale against which the Kylindra skeletons can be compared. The teeth, long bones and base of the skull are the most useful parts of the infant skeleton for this (Figs 9 and 10).⁵ Their measurements suggest that the great majority of infant remains represent full-term babies dying around the time of birth, but some are much smaller, suggesting they were born pre-term and others are much larger, suggesting they survived for at least a few



Figure 6 Pots lying in situ at the Kylindra infant cemetery



Figure 7 A decorated pot from the Kylindra infant cemetery



Figure 8 A trade amphora from the Kylindra infant cemetery with a lid cut out of its side to enable a baby to be placed inside

months after birth.⁶ The smallest baby to be excavated from the Kylindra cemetery represents, by modern standards, a child of approximately 24 weeks' development in utero. It is extremely unusual to have remains of such small babies preserved on archaeological sites. The remains of a few older children have also been found within the cemetery, with one pot containing the remains of a child showing a stage of development equivalent to a three-year old in terms of modern standards.

It is currently extremely difficult to determine the sex of individual children from their skeletons, as the main distinguishing features do not start to develop until after puberty. A number of previous studies, however have shown some variation between young boys and girls in the shape of the sciatic notch of the ilium.⁷ This is currently the subject of a postgraduate student project, using the Kylindra material.



Figure 9 The post-cranial remains of a neonate

Most of the undisturbed burials contain a single baby lying on its side with its knees drawn up to its chest, similar to the foetal position. In the majority of the burials the head of the baby is positioned towards the neck of the pot and its rump towards the base. The opposite position, with the head towards the base and the rump towards the neck, is observed in 10% of the burials for whom position could be determined. This is not much more than the 2–5% of modern deliveries which are breech presentations (in which the rump of the child emerges first).⁸ Can it be that the position of the child within the pot represents the presentation at birth? The slightly higher prevalence in the Kylindra cemetery might be explained by a higher rate of mortality of breech births.

So far, most of the pots which have been excavated contained a single infant, but in some instances between two and three skeletons were found. Most commonly the second and third skeletons are represented by only a few elements, which frequently occur in pots from the most heavily disturbed areas of the site and most likely represent intrusions. In some cases, however, two almost complete skeletons have been found (Fig. 11). These double burials could either represent the death of two unrelated infants at similar times or the presence of twins. Once again, the prevalence of double burials is about 1.9%, which is similar to figures for the prevalence of twins in modern European women and it is tempting to suppose that the burial is a deliberate attempt to represent the situation at birth.⁸



Figure 10 The developing deciduous dentition of a neonate

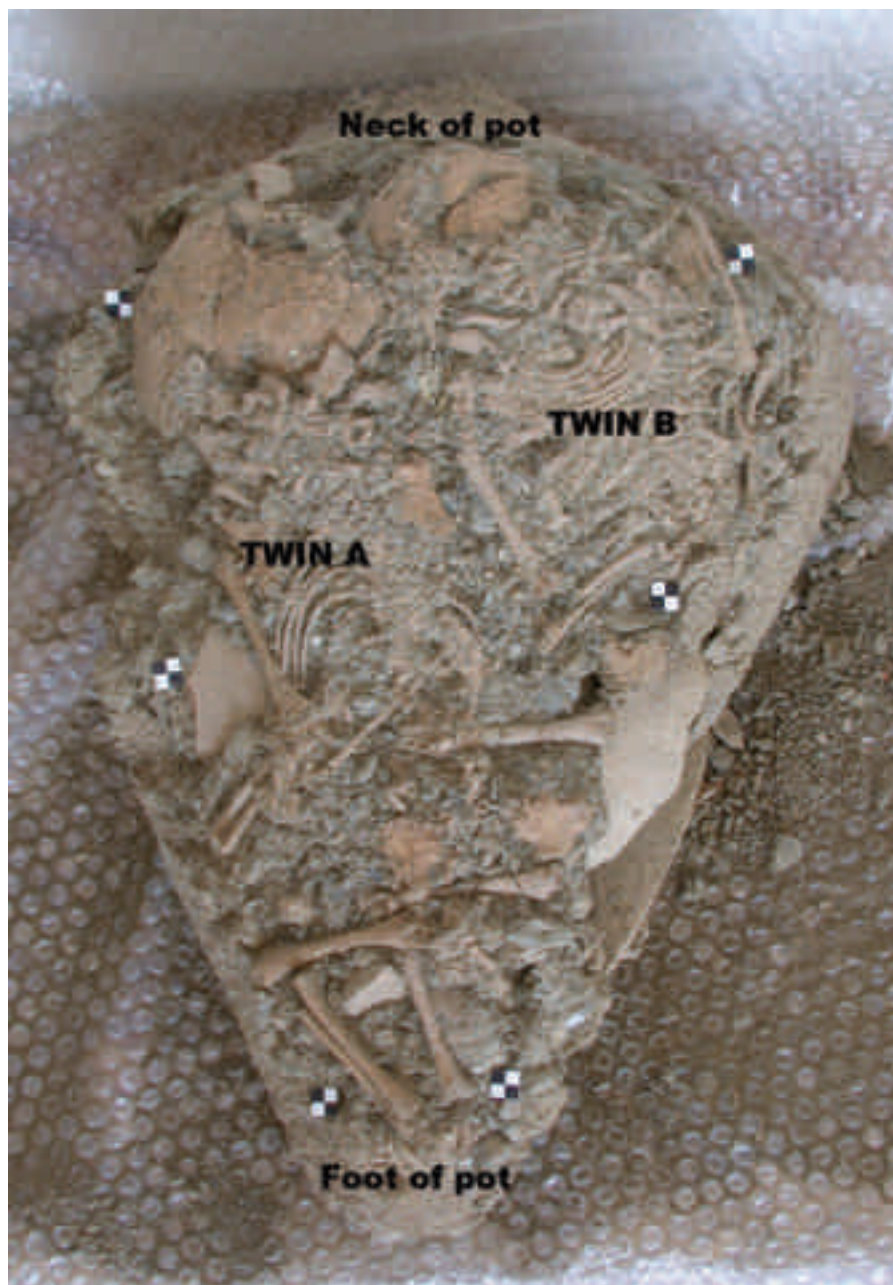


Figure 11 Two neonate skeletons buried within the same pot

No skeletons recovered so far show any signs of injury, congenital abnormality or any other evidence that might lead to the diagnosis of cause of death. Despite sieving the soil contents of the pots through a fine mesh, no signs of textiles or other organic remains have been found. Very few of the burials contained any objects that could be identified as offerings. Fragmentary pottery has also been found around the burials, but it is unclear as to whether these represent intentional grave goods, intrusions or simply a means of blocking the neck of the pot. Maria Michalaki-Kollia believes that the site is associated with the worship of deities protecting labour and childbirth, based on inscriptions found at Chora referring to Artemis Lochia and Eileithyia.⁹

Future research

For the 2010 field season the IoA team will continue to focus on the recovery, recording, conservation and analysis of the skeletal remains of babies from the Kylindra cemetery. The cleaning, recording and identification of the skeletal remains from the Katsalos cemetery will also continue. One of the key research questions relating to this project is whether the babies buried in the pots were from local mothers or were brought to the island after death from other parts of the eastern Mediterranean. The 22nd Ephorate will be conducting a detailed analysis of the pots and this will be one key way of answering this question, but another long-term aim of this project is to use analysis of stable isotopes in the bones and teeth in order to reconstruct any travelling by the mother prior to

the birth. At present, however, little is known about stable isotope variation in the ground water of the Greek islands and this will need to be established first. In a collaboration with Dr Charles FitzGerald of McMaster University, additional research on growth is being carried out using microscope sections of teeth from the Kylindra cemetery. The regular layer structure of dental enamel makes it possible to study in more detail the timing of the development schedule in these children. Preliminary results from this analysis show that approximately 25% of the infants survived long enough after birth to allow a neonatal line to form within their developing dentition.¹⁰

It is the long term aim of both the 22nd Ephorate and the IoA team to establish a study centre on Astypalaia for research into the development of the skeleton and dentition in young children.

Notes

- 1 22nd Ephorate of Prehistoric & Classical Antiquities.
- 2 M. Michalaki-Kollia, "Céramique incisée de tradition géométrique trouvée dans l'île d'Astypalée", in *Archaeology in the Dodecanese*, S. Dietz & I. Papachristodoulou (eds), 225–43, (Copenhagen, National Museum of Denmark, 1988).
- 3 I. Morris, *Death-ritual and social structure in Classical Antiquity* (Cambridge: Cambridge University Press, 1992).
- 4 R. Garland, *The Greek way of death* (New York: Cornell University Press, 2001).
- 5 L. Scheur & S. Black, *Developmental juvenile osteology* (London: Elsevier Ltd., 2000).
- 6 S.W. Hillson, "The world's largest infant cemetery and its potential for studying growth and development", in *New Directions in the Skeletal Biology of Greece*, L.A. Schepartz, S.C. Fox & C. Bourbou (eds), 133–50, (Princeton, NJ: American School of Classical Studies at Athens, 2009).
- 7 S.M. C. Holcomb & L.W. Konigsberg, "Statistical study of sexual dimorphism in the human fetal sciatic notch", *American Journal of Physical Anthropology* **97**: 113–25, 2005.
- 8 N.A. Beishcher, E.V. Mackay & P.E. Cole, *Obstetrics and the newborn: an illustrated textbook* (London: W.B. Saunders Ltd., 1997).
- 9 M. Michalaki-Kollia, "Un ensemble de 2,750 enchytrismes de nouveau-nés et de foetus découvert dans l'île d'Astypalée en Grecques Nécropole ou sanctuaire funéraire?", in *L'enfant et la mort dans l'Antiquité: Table Ronde 1 Nouvelles recherches dans les necropoles grecques, Le signalement des tombes d'enfants*. Ecole Française d'Athènes 29-30 Mai 2008.
- 10 C. FitzGerald & S.W. Hillson, "Resolving the mystery of the Kylindra cemetery: deciduous tooth development in ancient Greece", *American Journal of Physical Anthropology* **S48, 128**, 2009.