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Animals in the sanctuary

Bird bones and eggshell

Abstract

Excavations at the Sanctuary of Poseidon at Kalaureia and the application of a systematic soil sampling and water flotation programme led to the collection of a moderate amount for bird bones and eggshell fragments. Their dating in the first millennium BC and their association with cult renders them a significant addition to the extant bird remains record in Greece. In this paper the bird and egg remains are presented in detail by chronological phase and by feature, they are compared with other contemporary assemblages of bird remains, and some commentary is offered on their significance.*

Keywords: Kalaureia, Poros, sanctuary, Poseidon, bird bones, egg shells, zooarchaeology

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Introduction

The bird bones from the Sanctuary of Poseidon at Kalaureia contribute to our understanding of some of the questions concerning life at the sanctuary, including ritual activity and feasting. They also contribute to a broader understanding of the role of birds, especially domestic chickens, in Greece in the first millennium BC. The recovery of animal bones was given a high priority on the excavations. As well as careful recovery by hand, many samples were taken for water flotation (*Fig. 1*).¹ Neither bird bones nor eggshell were recovered from Area C during the 2003–2005 campaigns. The Late Hellenistic/Early Roman period (H II) fill of the cistern (Feature 03) was exca-

vated in its entirety and water floated to 1 mm. This resulted in the recovery of very small bird bones such as phalanges, and it gives great confidence that all the bird bone to survive was recovered. Altogether 65 bird bones were present (*Table 1*). In addition eggshell was recovered from the Late Hellenistic/Early Roman period fill of the cistern. The small number of bird bones is typical for contemporary sites in Greece; with a few exceptions referred to below, bird bones have rarely been recovered in quantity on sites of the first millennium BC.

The bones were identified in Poros Museum with the aid of a small reference collection. As well as records of modifications, the degree of completeness of each bone was recorded.² Bones were measured to 1/10th mm, following Angela von den Driesch³, and Teresa Tomek and Zbigniew M. Bochński.⁴ The bones are stored in Poros Museum. The Geometric period did not produce any bird remains. Some were recovered from Archaic, Late Classical/Early Hellenistic and Hellenistic strata, while most were found in the Late Hellenistic/Early Roman fill of Feature 03 (the cistern, H II).

Archaic period

Two fragments were recovered in water flotation samples of the Early Archaic period (*Fig. 1*): a phalanx and a distal tibiotarsus of a small passerine of the size of a goldfinch (*Carduelis* sp.) or serin (*Serrinus* sp.) (*Table 1*).

* *Acknowledgements:* I am most grateful to Berit Wells and Dimitra Mylona for inviting me to study this interesting assemblage and for their support. I also thank the Wiener Laboratory in Athens for allowing me to consult their reference collection.

¹ Penttinen & Mylona 2019.

² Cohen & Serjeantson 1996, 109–111.

³ von den Driesch 1976, 103–129.

⁴ Tomek & Bochński 2000, 24, 40–41, 64.

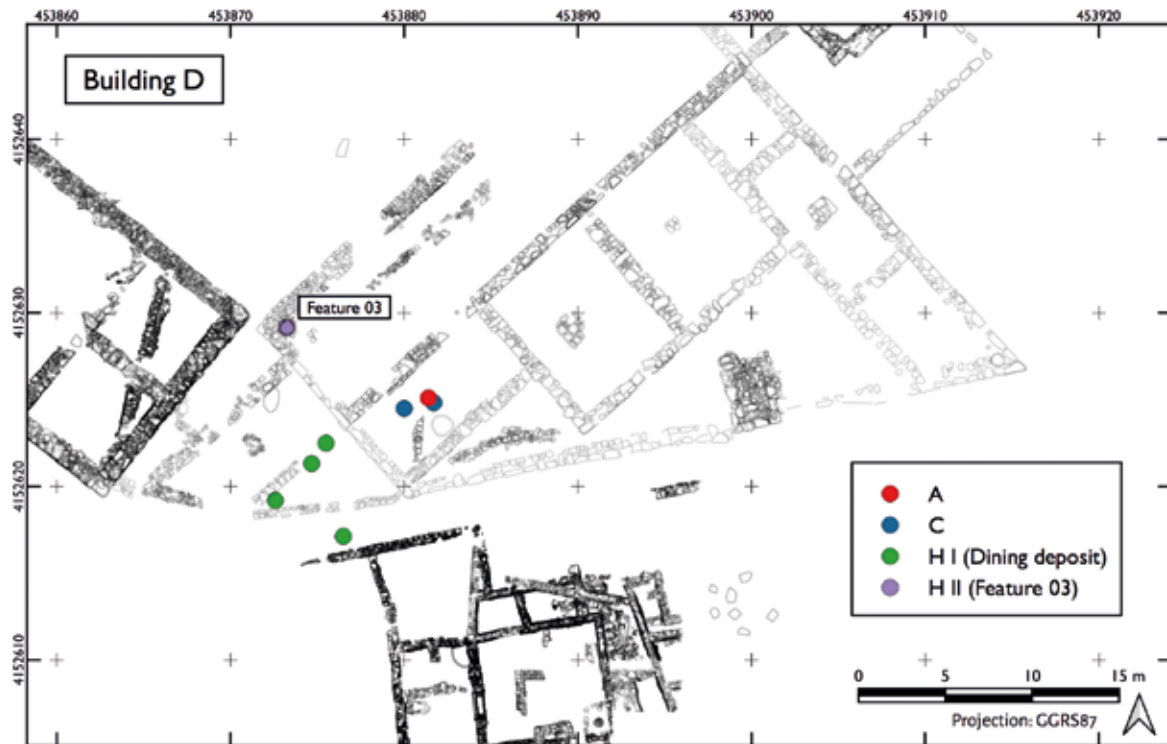


Fig. 1. Plan showing locations of soil samples in which bird bones and/or eggshell fragments were found. By R. Rönnlund.

Editorial note

The section on the bioarchaeological remains from the Sanctuary of Poseidon at Kalaureia, published in the *OpAthRom* 12, includes seven articles: Penttinen & Mylona 2019; Mylona 2019; this contribution by Dale Serjeantson; Lymberakis & Iliopoulos 2019; Syrides 2019; Ntinou 2019; Sarpaki 2019. Summary of chronological phases (presented in Penttinen & Mylona 2019):

Abbreviation	Phase	Chronology	Area	Comment
EIA I	Early Iron Age	c. 750 BC	D	Fills of Features 07, 08, and 09 (three pits). Fill underneath Early Iron Age building.
EIA II	Early Iron Age	c. 750–700 BC	D	Floor accumulation in Early Iron Age building.
A I	Archaic	7th century BC	D	–
A II	Archaic–Hellenistic	6th century–Hellenistic	C	Construction of Wall 24.
			D	Remains from outdoor activities. Feature 05 (supposed altar).
A III	Archaic	c. 500 BC	C	–
			D	Construction of Stoa D and Features 03 and 04 (interconnected cisterns). Feature 10 (kiln).
A IV	Archaic	after c. 500 BC	D	Life span of buildings constructed during A III.
C I	Late Classical/Early Hellenistic	c. 325 BC	C	Construction of Building C.
			D	Construction of back part of Building D, including Feature 06 (staircase), Feature 01, and Feature 02 (unknown, altar?).
C II	Late Classical/Early Hellenistic	after c. 325 BC	D	Finds in the dirt floors of Building D.
H I	Hellenistic	c. 165 BC	D	“Dining deposit” west of Building D.
H II	Late Hellenistic/Early Roman	c. 50 BC–c. AD 100	D	Fill of Feature 03 (cistern). Finds from trench against Wall 11, which exposed Wall 33.



Fig. 2. (Centre) spur of domestic chicken from the late 4th century BC. It is compared with a pair of tarsometatarsi from a modern chicken, (R) with a fused spur and (L) with roughened area where the spur is about to fuse to the bone shaft. Photograph by D. Serjeantson.

Late Classical/Early Hellenistic period

Two bones only were found in the late 4th-century deposits (C I) (Fig. 1): a terminal phalanx, probably of domestic fowl, *Gallus gallus*, and a spur core (Fig. 2). The cock spur consists of a keratin sheath surrounding a bony core, which later fuses to the tarsometatarsus. This unfused spur core is particularly interesting as the spur is well-developed but still unattached. It is likely to be from a cock, though hens of certain breeds also have spurs. The core fuses when the cockerel is about 18 months of age, so this is from a bird younger than 18 months, but not much younger. This is the age at which male birds would have been killed for sacrifice and consumption. It is also the age at which they would begin to be used for cockfighting, a popular sport in Classical Greece.⁵

Hellenistic

“DINING DEPOSIT” (H I)

Six bird bones were found in the 2nd-century “dining deposit” (Fig. 1), of which four were recovered in the water flotation samples. Five (a sternum, furcula, scapula, and two premaxillas), are certainly or probably from domestic fowl, and the sixth is the unidentifiable phalanx of a small bird. There are two premaxillas or upper beaks of domestic chicken from strata 1 and 2. They show that at least two chickens are represented. A large quantity of mammal and also fish bones was recovered from this deposit, where bone survived well, so the small number of bird bones show that neither domestic chick-

Table 1. Summary of bird bones.

	Archaic (A II)	Late Classical/Early Hellenistic (C I)	Hellenistic “Dining deposit” (H I)	Late Hellenistic/Early Roman. Fill of Feature 03 (H II)	Total
Identified					
Chicken <i>Gallus gallus</i>		1	4	25	29
Crow <i>Corvus</i> cf. <i>corone</i>				8	8
Partridge <i>Alectoris</i> sp.				1	1
?Quail ? <i>Coturnix</i>				1	1
Finch <i>Fringillidae</i>				1	1
Unidentified					
Chicken-size		1	1	18	19
Small				1	1
Tiny	2		1		3
Total	2	2	6	55	65

ens nor other birds were eaten at the time, or at least they did not form an important part of the ceremonial meals at the sanctuary.

Late Hellenistic/Early Roman

FILL OF FEATURE 03—THE CISTERN (H II)

All the bird bones from the Late Hellenistic/Early Roman period come from the cistern (Figs. 1 & 3). They were recovered both by hand and from flotation samples. Altogether 55 bones were recovered, of which 39 could be identified (Table 2). The unidentified chicken-size fragments are likely to come from that species or the crow. They seem originally to have been from a single deposit, with some elements percolating down through the sediments to lower strata.

The most frequent species is the domestic fowl. Comparisons (Table 3) with contemporary sites in the Roman world show that chicken remains are very similar in size to those from Kassope,⁶ Carthage,⁷ and Buto in Egypt.⁸ All parts of the body are present. The assemblage includes hens, as two tibiotarsi contain medullary bone, a tissue which forms within the marrow cavity of the long bones of hens which are about to lay. The only tarsometatarsus in which the relevant area of

⁶ Friedl 1984, 181–184.

⁷ Baumgartner 1996, 95–96.

⁸ von den Driesch 1997.

⁵ Jennison 1937, 10.

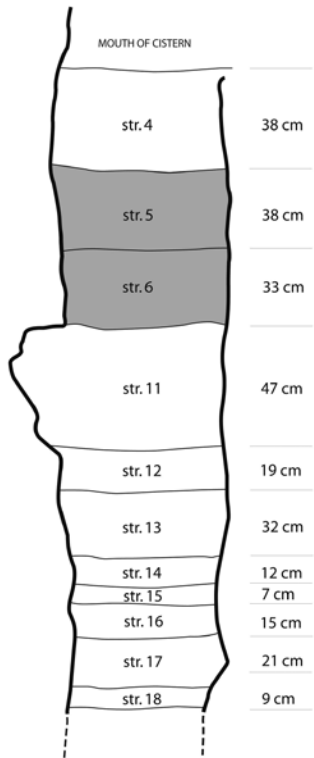


Fig. 3. Drawing of cross-section of Feature 03 (the cistern) showing the stratigraphic units. By A. Hooton.

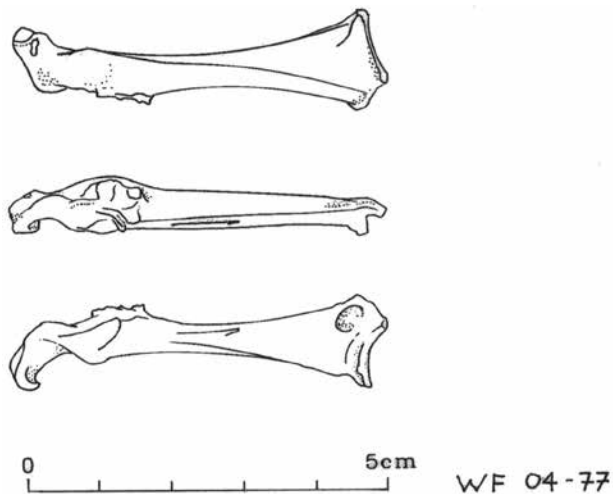


Fig. 4. Coracoid of domestic chicken from the Hellenistic period with pathological alterations at the articulation with scapula (WF 04-77). By A. Hooton.

the shaft survives lacks a spur, so is also from a hen. All age groups are present, since out of the 25 chicken bones, one is from an immature bird and two are from very young chicks. The coracoid is from a bird with a diseased or wounded shoul-

Table 2. Element distribution of birds from the cistern (Feature 03). Eggshell was also found.

	<i>Gallus</i>	<i>Corvus</i>	<i>Alcedo</i>	<i>Coturnix?</i>	<i>Fringillidae</i>	Chicken-size unid.	Small unid.	Total
Skull fragment						1		1
Premaxilla	1				1			2
Mandible	1							1
Cervical vertebra		1						1
Coracoid	3	1						4
Scapula	1							1
Humerus	3	2						5
Radius	4					1		5
Ulna	3	2				1		6
Carpometacarpus	1							1
Femur						1		1
Tibiotarsus	5	1						6
Tarsometatarsus	3	1	1	1		1		7
Phalanx 1 or 2						4		4
Phalanx 3						1		1
Rib						1		1
Long bone splinter						7	1	8
Total	25	8	1	1	1	18	1	55

der: the area of the muscle attachment with the scapula has become enlarged and swollen (Fig. 4). Two bones, an ulna and a tibiotarsus, appear to have been chopped through, and a tibiotarsus has a cut or nick on the distal articulation. Chickens were eaten at the sanctuary, either for regular meals or following sacrifices. The presence of very young chicken suggests—though does not prove—that fowls were also raised there in the Late Hellenistic/Early Roman period.

Eight bones of a crow were also found in the cistern. They seem originally to have been from a single deposit, with some elements percolating down through the sediments to lower strata.⁹ The bones almost certainly come from the same bird, since they are from the adjacent strata (7, 11, 12, 13—see Fig. 3), are in similar condition, and none of the elements is duplicated (Table 2). The unidentified chicken-size fragments are likely to come from the crow or from domestic chickens. They were checked with illustrations and measurements of modern corvid bones¹⁰ and prove to be at the top end of the published size range for the rook, *Corvus frugilegus*, but fall well within the size range for the crow, *Corvus corone* and the

⁹ Penttinen & Mylona 2019; Mylona 2013.

¹⁰ Tomek & Bochński 2000.

Table 3. Measurements, in mm, of *Gallus*, after Driesch (1976), compared with contemporary sites.

Kalaureia	Element									Comment
	Coracoid	GL	52.5	Lm	49.6	Bd	13.6	BF	10.7	
	Scapula	Dic	12.6							
	Humerus					Bd	14.05			
	Ulna	Bp	8.0							
	Ulna	Bp	8.1							
	Carpometacarpus	Bp	11.0							
	Tibiotarsus	Dip	11.0			Bd	10.2	Dd	11.1	Medullary bone
	Tibiotarsus	Dip	12.2							Medullary bone
	Tarsometatarsus	Bp	13.8							
	Tarsometatarsus	Bp	11.5							
	Tarsometatarsus			SC	7.41	Spur L	11.4			
	Tarsometatarsus					Bd	11.2			
Comparisons			Mean	n						
Kassope	Coracoid	GL	53.1	7						
		Lm	51.1	8						
Carthage	Coracoid	GL	53.3	3						
		Lm	49.9	5						
Kassope	Tibiotarsus	Bd	11.3	2						
Carthage	Tibiotarsus	Bd	10.7	6						
Kassope	Tarsometatarsus	Bp	13.0	6						
Carthage	Tarsometatarsus	Bp	12.4	10						

Key: GL = Greatest length; Dic = Cranial diagonal; Bp = Breadth proximal; Dip = Diagonal of the proximal end; GL = Greatest length; Lm = Medial length; Bd = Breadth distal; Sc = Scapula.

Table 4. Measurements of *Corvus* bones from Kalaureia compared with modern rook (*Corvus frugilegus*) and carrion and hooded crow (*Corvus corone* and *Corvus cornix*) from Tomek & Bochenki 2000 (figs. 34, 77 and 129). The Kalaureia corvid is within the range for both rook and hooded crow but consistently nearer the top end of the range of the larger species.

		Kalaureia measurement (mm)	<i>Corvus frugilegus</i> range	<i>Corvus corone</i> and <i>C. cornix</i> range
Coracoid	Length of the acrocoracoid (c)	9.1	7.0–9.8	7.6–9.9
Ulna	Proximal width (b)	10.9	8.6–11.0	9.6–11.4
Ulna	Diagonal distal width (f)	9.6	8.3–10.0	8.6–10.4
Tarsometatarsus	Distal width (d)	6.8	5.8–7.5	6.5–7.4

hooded crow, *C. cornix* (Table 4). The latter is most common today in Greece. There is nothing to suggest that the crow was eaten: no butchery marks were seen and the elements missing are those most fragile and vulnerable to damage in the ground. Few societies eat members of the crow family and no records suggest that they were eaten in ancient Greece. The large corvids are widely shunned as food for their associations with scavenging and death. The crow was most probably deposited deliberately in the cistern, with the dogs, snakes, birds' eggs, and other material.¹¹

A fragment of the shaft of a tarsometatarsus with a calcaneal ridge is from a partridge. The midshaft width (4.1 mm) is compatible with that element in a skeleton of a rock partridge, *Alectoris graeca*, in the Wiener Laboratory in Athens (width 4.0 mm). The rock partridge is the most frequent partridge species in the area today, but the skeletal elements of the chukar partridge, *A. chukar*, which has also been recorded in Greece, cannot be distinguished from the rock partridge, so neither that species, nor the North African partridge, *A. barbara*, can be ruled out. As Poros is close to Mainland Greece, there would have been no barrier to partridges reaching the island. Partridge remains have also been found in the Hellenis-

¹¹ Mylona 2019; Lymberakis & Iliopoulos 2019; Syrides 2019.



Fig. 5. Egg fragments retrieved by water flotation (WF082). They most likely belong to chicken eggs. By C. Mauzy.

tic town of New Halos¹² and one bone, identified as “female chukar”, was found at the sanctuary at Kommos, Crete.¹³ The distal end of a small galliform tarsometatarsus has the shape and size of a quail (?*Coturnix coturnix*), but this identification could not be confirmed from the reference material available. We know from the Classical authors that by the 2nd century BC both partridges and quails were tamed. Male partridges and quails have spurs and can be set to fight as fiercely as do cockerels, and these birds as well as domestic cockerels were kept for fighting.¹⁴

The mandible (lower beak) of a small to medium size finch, Fringillidae, was also recovered in the cistern. It matches that of the linnet (*Linnaria* sp.) or serin, both of which could probably be found in the area. This may be from a wild bird which died at the site, but it is worth bearing in mind that birds of the finch family were kept as pets in Hellenistic times.¹⁵

Eggshell was recovered from strata 5, 12, 13, 14, and 16. The fragments are shiny and almost white in colour on the external surface and stained brown on the internal surface (Fig. 5). This may reflect the fact that the internal is more porous than the external surface and so has taken up more colour from the surrounding soil. Most was small fragments but one piece was large enough (maximum dimension 15.2 mm) to suggest that it may originally have come from a complete, unbroken

egg. The scientific techniques now used for the identification of eggshell to species¹⁶ were not available at the time of the excavation and no attempt was made to identify the fragments from Kalaureia. All fragments are compatible with chickens' eggs in thickness and curvature¹⁷ and most likely come from that species. There are accounts in Classical literature of offerings of eggs made to the gods. Eggshell has been found at a number of other sites in ritual contexts; for instance 26 eggs were found in the Maussolleion at Halikarnassos,¹⁸ along with the mammals and birds sacrificed there.¹⁹ Eggshell has also frequently been found at other sites in the Mediterranean region: some has been found in Phoenician tombs and Hellenistic period sites in Spain²⁰ and Egyptian sites often have eggshell.²¹

Discussion

The few wild birds present in all periods do not suggest an environment which is very different from today; all would have been found naturally in the neighbourhood of the site.

The absence of domestic chickens in the Archaic period deposits tends to confirm that the chicken was almost unknown in the Greek world at this time, a conclusion deduced from the absence of any reference to the domestic chicken in Homer. Domestic chickens are descended from the wild jungle fowl, which was native to northern India and south-east Asia. They must have been brought to the Mediterranean via the Persian Empire at some time in the first millennium BC.²²

From the Classical period onwards domestic fowls were occasionally referred to.²³ Aphrodite and Artemis were depicted with cockerels earlier than the 3rd century BC. The scarcity of remains at this time in the deposits at Kalaureia suggests that they were rarely eaten or sacrificed. This is borne out by the few chicken bones found at other Greek sanctuaries. One element only, again a foot bone of a fowl, was found at Isthmia, while chicken remains are absent from the excavations at the Altar of the Heroon and Demeter at Messene and from the hero shrine at Nemea.²⁴ None was present at Corinth—where most of the deposits with animal remains predate the 3rd century BC—despite a very careful programme of recovery

¹² Prummel 2005.

¹³ Reese 1989.

¹⁴ Pollard 1977.

¹⁵ Jennison 1937.

¹⁶ Stewart *et al.* 2013.

¹⁷ Serjeantson 2009, table 7.1.

¹⁸ Højlund 1983.

¹⁹ Jeppeson *et al.* 1981.

²⁰ Garcia Petit 2002, 73–80.

²¹ Hamilton-Dyer 1997; Mylona 2019.

²² Peters 1993; Serjeantson 2009, 270.

²³ Jennison 1937; Pollard 1977; Csapo 1993.

²⁴ Nobis 1997; MacKinnon 2018.

of plant and animal remains.²⁵ However, cocks, hens and also eggs were included in the sacrifice in 353 BC which accompanied the burial in the Maussolleion at Halikarnassos.

It is noticeable that the depictions of the Classical period are of cockerels and that most of the references are to cockfighting rather than to chickens as food. According to a historian of cockfighting, in Classical Athens at the time of Themistocles the practice was partly religious and partly also a political institution “but was afterwards abused and perverted, both here and in other parts of Greece, to a common pastime and amusement, without any moral, political, or religious intention”.²⁶ Chickens were added to the list of sacrificial animals (ox, sheep, pig) from the 5th or early 4th century onwards and a recent study sees them as appropriate for “male heroes and healing deities and for magical rites”.²⁷ The few remains of domestic fowls in deposits at Kalaureia earlier than the Hellenistic period are compatible with their use in occasional rituals or cockfighting rather than as food. The few fragmentary remains of partridge and possibly quail cannot themselves suggest why the birds are present, but it may be significant that these birds were also traditionally kept for fighting.

It is only from the Hellenistic period onwards that the diversity of anatomical elements, the butchery marks and the fragmentation suggests that birds were regularly part of the eating and feasting at Kalaureia. Chicken remains are also common elsewhere in Greece in strata of this period. They were the most common bird in the Late Classical/Hellenistic deposits at the sanctuary at Mytilene; out of 8,100 identified bones, 5% were from domestic fowl, and in later centuries this rose to 10% of a sample of 11,800 bones.²⁸ At the 3rd-century town of New Halos two areas were excavated, the south-east gate and a group of houses. Birds were absent from the houses, but made up more than 3% of the fauna from the area of the south-east gate. Of the birds present, domestic chickens were 30% of identified bones there; domestic pigeons (*Columba livia*) were even more numerous (50%), and the balance was wild birds.²⁹ The eating of chickens and other birds from 3rd century BC onwards represents a widening of the scope of the foods which were considered legitimate to eat—and to sacrifice—a trend found in the wider Mediterranean world from Anatolia to Spain.

The other animal remains from the cistern at Kalaureia (Feature 03) suggest that it contained not only food remains,

but also creatures deposited whole, possibly as offerings or sacrifices. The crow probably belongs with these: as birds that “talk” they were believed to reveal the intentions of the gods.³⁰ Crows were occasionally depicted on vases³¹—but remains are rarely found. The sacrifice could have been of a crow which had been kept as a sacred bird at the sanctuary, deliberately buried when it died, or of a bird caught in the wild for sacrifice. Several other examples are known from Iron Age and Roman Europe.³² The cistern contains an unusual suite of animal offerings; taken together they may well make up offerings to chthonic deities, as discussed more fully elsewhere.³³ The presence of the eggs, as well as the part-skeleton of the crow, would support this interpretation.

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²⁵ Bookidis *et al.* 1999.

²⁶ Serjeantson 2009, 325–327. The quotation is from Pegge (1775), an early scholar who sums up the general view of how cockfighting developed in the Greek world.

²⁷ Villing 2017, 63–101.

²⁸ Ruscillo 1993.

²⁹ Prummel 2005.

³⁰ Arnott 2007, 114.

³¹ Fiore & Tagliacozzo 2001, 90.

³² Serjeantson 2009, 325–331.

³³ Mylona 2013; 2019.

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