

SVENSKA INSTITUTEN I ATHEN OCH ROM  
INSTITUTUM ATHENIENSE ATQUE INSTITUTUM ROMANUM REGNI SUECIAE

---

# Opuscula

Annual of the Swedish Institutes at Athens and Rome

10  
2017

STOCKHOLM

**EDITORIAL COMMITTEE:**

Prof. Gunnel Ekroth, Uppsala, Chairman  
Prof. Arne Jönsson, Lund, Vice-chairman  
Ms. Kristina Björkstén Jersén, Stockholm, Treasurer  
Dr. Erika Weiberg, Uppsala, Secretary  
Prof. Karin Blomqvist, Lund  
Prof. Peter M. Fischer, Göteborg  
MA Axel Frejman, Uppsala  
Dr. Kristian Göransson, Rome  
Prof. Arja Karivieri, Stockholm  
Dr. Emilie Karlsmo, Uppsala  
Prof. Anne-Marie Leander Touati, Lund  
Dr. Jenny Wallansten, Athens

**EDITOR:**

Dr. Petra Pakkanen  
Department of Archaeology and Classical Studies  
Stockholm University  
SE-106 91 Stockholm  
[editor@ecsi.se](mailto:editor@ecsi.se)

**SECRETARY'S ADDRESS:**

Department of Archaeology and Ancient History  
Uppsala University  
Box 626  
SE-751 26 Uppsala  
[secretary@ecsi.se](mailto:secretary@ecsi.se)

**DISTRIBUTOR:**

[eddy.se](http://eddy.se) ab  
Box 1310  
SE-621 24 Visby

For general information, see [www.ecsi.se](http://www.ecsi.se)  
For subscriptions, prices and delivery, see <http://ecsi.bokorder.se>  
Published with the aid of a grant from The Swedish Research Council  
The English text was revised by Rebecca Montague, Hindon, Salisbury, UK

*Opuscula* is a peer reviewed journal. Contributions to *Opuscula* should be sent to the Secretary of the Editorial Committee before 1 November every year. Contributors are requested to include an abstract summarizing the main points and principal conclusions of their article. For style of references to be adopted, see [www.ecsi.se/guides-contributors](http://www.ecsi.se/guides-contributors). Books for review should be sent to the Secretary of the Editorial Committee.

ISSN 2000-0898  
ISBN 978-91-977798-9-0  
© Svenska Institutet i Athen and Svenska Institutet i Rom  
Printed by Elanders, Sverige AB, Mölnlycke 2017  
Cover illustration from N.-P. Yioutsos in this volume, p. 172

## Contents

7	KATIE DEMAKOPOULOU, NICOLETTA DIVARI-VALAKOU, JOSEPH MARAN, HANS MOMMSEN, SUSANNE PRILLWITZ & GISELA WALBERG   Clay paste characterization and provenance determination of Middle and Late Helladic vessels from Midea
50	PETER M. FISCHER & TERESA BÜRGE   The New Swedish Cyprus Expedition 2016: Excavations at Hala Sultan Tekke (The Söderberg Expedition). Preliminary results. With a contributions by L. Recht, D. Kofel and D. Kaniewski, N. Marriner & C. Morhange
94	MARIE-CHRISTINE MARCELLESI   Power and coinage: The portrait tetradrachms of Eumenes II
107	PAAVO ROOS   The stadion of Labraunda
128	STELLA MACHERIDIS   Symbolic connotations of animals at early Middle Helladic Asine. A comparative study of the animal bones from settlement and its graves
153	JEANNETTE FORSÉN, TATIANA SMEKALOVA & ESKO TIKKALA   The lower city of Asea, Arcadia. Results from a geophysical project 2001–2012
164	NEKTARIOS-PETER YIOUTSOS   The last occupation of Asine in Argolis
190	Book reviews
196	Dissertation abstracts 2016–2017

STELLA MACHERIDIS

# Symbolic connotations of animals at early Middle Helladic Asine

A comparative study of the animal bones from the settlement and its graves

## Abstract\*

This paper is a contribution to the zooarchaeological research on animals or animal parts found in human graves during the Middle Bronze Age in Greece. The animal bones from the early Middle Helladic settlement (MH I-II, c. 2100-1800 BC) and contemporary burials at Asine are presented. The goal is to compare the animal bones from the settlement with those from the burials, in terms of species composition and body part distribution. Through this comparison, this paper aims to discuss any symbolic connotations of bone waste from everyday-life practices. The results show that the most common domesticates from settlement contexts, pig, sheep/goat and cattle, also appear to be the most abundant animals deposited in the early MH graves at Asine. This is consistent with mortuary data from other sites on the Peloponnese, especially Lerna. The pig was most abundant in both settlement and graves at Asine. The similarities between wild and domestic pigs might be important, and are discussed as a possible inspiration for the pig symbolism in MH I-II Asine. I also propose a regional change in the later Bronze Age of how animals were deposited in graves, in which period the presence of wild mammals, dogs, and horses in high status graves increases. Throughout, pig, sheep/goats and cattle remained the most important animals for ritually connoted events such as funerary meals or feasts.

**Keywords:** Asine, zooarchaeology, Middle Bronze Age, settlement debris, grave goods

## Introduction

During the last decades we have witnessed an increase of studies of animal bones from ritual contexts in the Aegean Bronze Age. We can find examples of animals occasionally found in human grave contexts, such as the dogs in the Mycenaean chamber tomb at Galatas, Peloponnese, or the horse burials at the Mycenaean cemetery at Dendra.<sup>1</sup> Traces of ritual activities from Mycenaean sites in the form of burnt animal bones have been discussed as the remains of burnt animal sacrifices, e.g. at Pylos.<sup>2</sup> However, animal bones as part of grave goods in human graves rarely constitute the focus of archaeological research of the Middle Helladic societies of Greece.

The excavations of Asine in the north-eastern Peloponnese, Greece, revealed, among other things, the remains of a Middle Helladic (MH, c. 2100–1700 BC) settlement and its contemporary burials. These excavations produced a large animal bone assemblage.<sup>3</sup> This material provides an exceptional opportunity to compare the settlement and the graves zooarchaeologically. The goal of this paper is to do such a comparison, i.e. between the animal bones from the settlement of Asine and those from the contemporary graves at the site as well as in the vaster southern Mainland region in Greece. This enables the discussion of symbolic or ritual aspects of various contexts from a zooarchaeological perspective. Can we infer any meanings in terms of symbolic connotations in any proposed connections between food waste and grave goods?

\* The animal bones from the 1926 excavations of Asine are part of the Asine collection at Museum Gustavianum, Uppsala University. I am grateful to the Museum for the loan of the material. I am particularly thankful to David Reese, who has kindly assisted me in providing faunal data from the Middle Helladic graves from Lerna, to Gullög Nordquist, who has provided valuable feedback on earlier drafts as well as aiding with stratigraphic issues concerning the graves of Asine, and to Dimitra Mylona, who has provided valuable feedback on the text and has kindly shared zooarchaeological data from the graves of the East Cemetery at Asine. I thank Fredrik Ekengren, Anne Ingvarsson-Sundström, Kristina Jennbert, and Michael Lindblom for valuable comments and feedback on earlier drafts of this paper. Additionally, I am very grateful to the comments and recommendations from Gerhard Forstenpointner and Sofia Voutsaki, which greatly improved the quality of the paper. Any misconceptions or mistakes are my own.

<sup>1</sup> For the Mycenaean tomb at Galatas see Hamilakis 1996, 41; for the horse burials at Dendra see e.g. Protonotariou-Deilaki 1990a and Pappi & Isaakidou 2015.

<sup>2</sup> Isaakidou *et al.* 2002.

<sup>3</sup> The animal bones from Bronze Age Asine make up the basis for the author's doctoral research at Lund University. This paper is part of this research.



The study is restricted to the early Middle Helladic (MH I–II or early MH, c. 2100–1800 BC) Asine. This paper presents hitherto unpublished data on the faunal remains from this period at the site. The animal bones from the graves at the nearby coastal settlement of Lerna are used as comparative material, enabling a discussion of possible patterns at Asine from a regional perspective. Examples from nearby sites (see *Fig. 1*) from the broader MH and Late Helladic (LH, c. 1700–1050 BC) are included to nuance the regional perspective and provide a long-term perspective to the discussion of animal bones in grave-related contexts.



*Fig. 1. Map of the Peloponnese, with the locations of mentioned sites. 1) Asine, 2) Lerna, 3) Midea, 4) Dendra, 5) Prosymna, 6) Mycenae, 7) Zygories, 8) Epidauros, 9) Ayios Konstantinos, 10) Aegina Kolonna, 11) Eleusis, 12) Orchomenos, 13) Maltzi, 14) Pylos, 15) Nichoria, and 16) Ayios Stephanos.*

## Theoretical perspectives

### SYMBOLIC CONNOTATIONS OF BONE WASTE

The assumptions underlying this paper are based on what is called “the symbolic connotations of bone waste”. This asserts the importance of and associations between two theoretical terms, ‘symbol’ and ‘waste’. Since the animal bones studied here should be considered as the remains of prehistoric social actions or processes, a view on symbols as vital in social processes is important.<sup>4</sup> This follows the works of the anthropologist V. Turner, who investigated how symbols function in mainly ritual processes of the Ndembu people of north-western Zambia. According to him, symbols are combined and are used for metaphorical communication between people in any social process in order to direct the outcome or consequences of that process.<sup>5</sup> It is thus not meaningful to study symbols in isolation from their social context. In most societies, animals have symbolic meaning beyond merely providing protein intake.<sup>6</sup> Therefore, it is assumed that the choice of consuming a specific animal, or disposing of its remains in any or specific locations, can have symbolic connotations. By this I mean that such a choice communicates certain meanings to other people. The classic example is perhaps a choice of animal which signals religious beliefs, such as the avoidance of certain animals prescribed in for example Moslem or Jewish traditions.<sup>7</sup>

The notion of dirt as “matter out of place”, formulated by M. Douglas, became the starting point for research on waste. Since material categorization and valorization is culturally specific, the material category of waste is seen as a relative and dynamic notion.<sup>8</sup> Waste has a temporal (everyday-life practices change over time) as well as a spatial dimension (different waste materials are disposed of in different places). Not only is the categorization of waste due to the use of physical space, i.e. refuse goes there but not

<sup>4</sup> Ortner (1984) provided a review of the main theoretical perspectives in anthropological research from the 1960s to the 1980s. According to her, the view of symbols as operators in the social process was essential for Victor Turner’s work (1966 and 1967; see Ortner 1984, 131).

<sup>5</sup> Turner 1966; 1967.

<sup>6</sup> E.g. Russell 2012.

<sup>7</sup> See Douglas 1966 (2002), 51–71.

<sup>8</sup> E.g. Douglas 1966 (2002); Strasser 1999; Drackner 2005.

there, but it can also be connected to symbolic aspects of the material itself.<sup>9</sup>

That bone waste is often symbolically laden has zooarchaeological implications. As N. Russell argues, ritual or symbolic preferences can be a biasing factor in human deposition of animal bones, and thus in the formation of the zooarchaeological record.<sup>10</sup> Also, animal bones bear traces of cultural perceptions of bone waste and symbolic associations of different materials, animals, and body parts.<sup>11</sup> One example of bone symbolism can be found in the Mongol tribe described by S. Szyrkiewicz.<sup>12</sup> In this case, the sheep tibia was a symbol of patrilineal descent and a spiritual communication tool. Strict rules applied to the disposal of this bone, involving burning and deposition in a ritually clean space.<sup>13</sup>

Consumption waste from the settlement can thus reflect the symbolic preferences of the studied prehistoric society. This concurs with the idea that ritual activities were embedded in everyday life during the Middle Helladic.<sup>14</sup> This idea should be connected to a definition of ritual as a process, which is encompassed in the term 'ritualization'.<sup>15</sup> Ritualization acknowledges that rituals are repetitive formalized action sequences, directed by social conventions and thus dynamic in their essence. Rituals are not restricted to the sacral sphere, and to infer the existence of a sacral/profane dichotomization in any prehistoric world view is not always relevant. In this paper, I use the term 'ritual' mainly for graves.<sup>16</sup>

## GRAVE GOODS AND FUNERARY MEALS

The material studied in this paper also includes animal bones found as grave goods in MH graves. It is necessary to clearly define what is included in the term 'grave good', and why I do not use more traditional concepts, such as grave offerings or gifts, for animal bones or other finds connected to the grave deposit. Further, in providing a regional perspective on the animal bones found in graves at Asine, I look beyond solely grave contexts and consider examples with remains of the ritual consumption of animals, e.g. funerary meals and feasts.

<sup>9</sup> E.g. Douglas 1966 (2002); Hodder 1982; 1987; Moore 1982; Strasser 1999; Marciniak 2005; Gifford-Gonzalez 2014.

<sup>10</sup> Russell 2012, 143.

<sup>11</sup> E.g. Russell 2012; Rudebeck & Macheridis 2015.

<sup>12</sup> See Szyrkiewicz 1990.

<sup>13</sup> Szyrkiewicz 1990, 74.

<sup>14</sup> Nordquist 1987, 111; Whittaker 2010, 536.

<sup>15</sup> Bell 1992, 220; Bradley 2005, 34.

<sup>16</sup> Considering that rituals probably were embedded in everyday life for the MH Asineans, it might be inconsistent to use the term ritual only for graves. However, this approach has been chosen mainly because no clear ritually connoted contexts have been documented from the settlement, other than graves. In other words, the existence of traces from ritual activities in the settlement debris is hard to detect, even if some meals were ritually connoted.

Therefore, there is a need to define 'feasting' and 'funerary meals' or 'feasts', commonly reoccurring terms in archaeological research.<sup>17</sup>

## Grave goods

As a term, 'grave goods' can be a good alternative to describe grave finds in order not to imply social meanings beyond the ritual context of burial.<sup>18</sup> For example, the terms 'offering' or 'gift' imply the act of offering/giving, which in its turn indicates a specific social meaning within the burial ritual which cannot always be ascertained by the material culture or the contextual circumstances. Grave goods can have many different meanings.<sup>19</sup> The neutral expression 'grave goods' is suitable for this paper for other reasons as well. It includes animal bones, besides other artefacts, which were found in connection with the dead individual in the ritual context of formal burial, but not always documented with high contextual resolution. Most of the graves at Asine were excavated in the early 20th century, which has made it difficult, sometimes impossible, to reconstruct the necessary contextual information needed to differentiate between such categories as the ones mentioned above. The exact location of bones is most often missing since they generally were not documented on plan drawings. This hinders the evaluation of intentionality in the placement of grave goods, which would be expected if animal parts were part of, for example, the gifts to the dead individual.

The term 'grave good' is not used here as an alternative aiming to escape the issue of lack of documentation. I acknowledge this problem as it concerns the Asine assemblage. Therefore, each grave, to which animal bones are associated, is evaluated individually in order to assess whether or not the animal bones were connected with the grave as grave goods, or belonged to the infill of the grave. This contextual discussion of the animal bones from the MH Asine graves can be found in Appendix 1 of this paper.

## Funerary feasts or meals

Feasts are large-scale ritual events which involve communal consumption of foods and drinks.<sup>20</sup> The funerary feast can have large impact on the society, alliances, and power dynamics;<sup>21</sup> such specific events require specific food.<sup>22</sup> In this study, the term 'funerary meal' is preferred in order also to include small-

<sup>17</sup> E.g. Hamilakis 1998; Wright 2004; see also Twiss 2012, 363.

<sup>18</sup> Ekengren 2013.

<sup>19</sup> See Härke 2014, 45–52. Among others, grave goods might represent gifts or equipment for the dead (e.g. Méry & Tengberg 2009), remains of funerary meals/feasts (e.g. Hamilakis 1996, 165), and indicators of social status/identity (e.g. Jennbert 2011, 158–159).

<sup>20</sup> Dietler 1996, 88; 2001, 65; see Pollock 2003, 21.

<sup>21</sup> Hayden 2009.

<sup>22</sup> Marciniak 2005, 72.

scale consumption events. Animal bone waste from funerary meals reflects the actual consumption, in terms of which animals and animal parts were chosen, and disposal strategies, i.e. if all waste ended up in the grave infill or in specific disposal locations for remains from funerary meals.<sup>23</sup> Food and drink are symbolically important because of everybody's basic biological need to eat.<sup>24</sup> Consumption waste, both in terms of leftovers and biological refuse, is a consequence of consumption. This, a direct link between consumption and consumption waste, is an important presumption of this paper.

## Early Middle Helladic Asine: the material

Ancient Asine is located on a peninsular cliff on the north-eastern Peloponnese (*Figs. 1–2*). The site was excavated in several campaigns during the last century, of which the majority was directed by Swedish archaeologists. The initial 1922–1930s project was followed by several excavation seasons during mainly the 1970s.<sup>25</sup> These campaigns revealed the long continuity of Asine, dating from at least the Early Helladic period (c. 3100–2100 BC) to the 8th century BC. During the Archaic and Classical periods the settlement declined, but it was densely occupied in the Hellenistic period. It was finally abandoned during Late Antiquity, although it was revisited in later historical periods.

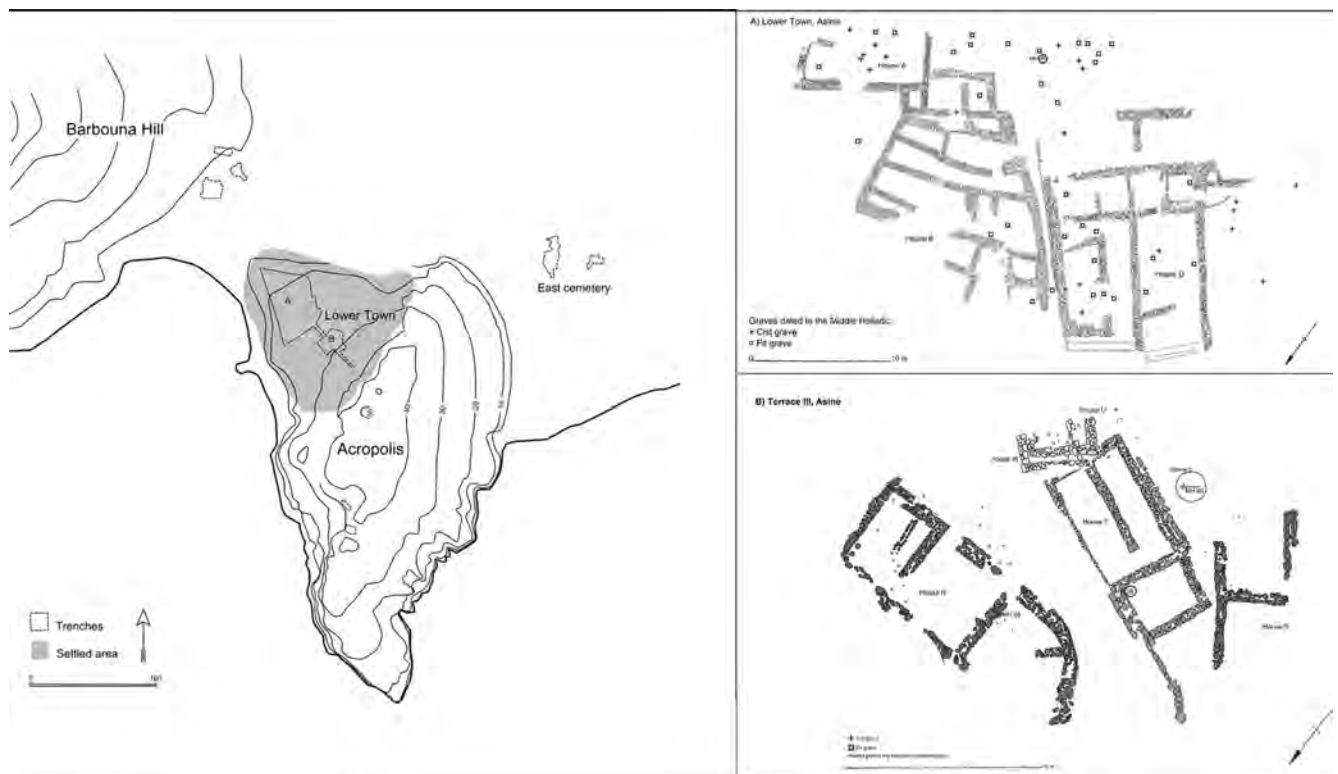


Fig. 2. Map of Asine during the MH I-II. Only the locations of burials in the Lower Town trenches are illustrated. Right plan drawings are made after Frödin & Persson (1938). Left plan drawing is made after Nordquist (1987). With permission.

<sup>23</sup> In this case study I do not delve in to the latter, i.e. if there are any specific locations for the disposal of funerary meals, because clear examples of such contexts are not evident in the documentation or the publication of the excavations of the site.

<sup>24</sup> E.g. Dietler 1996, 89; Pollock 2003, 18.

<sup>25</sup> Frödin & Persson 1938; e.g. Hägg & Hägg 1973; Dietz 1980; 1982; Wells 1983.



## THE SETTLEMENT

During the MH and the Late Helladic (LH, c. 1700–1050 BC), Asine flourished as a settlement. This is testified by expansions of the settled areas, increase in archaeological finds, more diverse material culture, and the establishment of burial areas. Some of the biggest changes to the settlement were the additions of House T on Terrace III during MH I (2100–1900 BC), and Houses pre-D, B, and D in the Lower Town in MH II–early MH III (about 1900–1750 BC).<sup>26</sup> This growth of the settlement is visible in the rich material culture from this period.<sup>27</sup>

The animal bones, excavated in 1926, were found in cultural layers in or around the houses; strata covering large parts of the open trenches.<sup>28</sup> Because the excavation was not always made in respect of single contexts, i.e. separate events such as the filling of a specific construction with soil, it is possible that separate fill layers within these strata existed. Therefore, I do not to focus on single events, but on cultural layers tied to the different dwelling areas. This provides a lower level of contextual resolution. The areas are the Lower Town (around Houses pre-D, B, and D) and Terrace III (around House T). The houses are similar in degrees of complexity, i.e. with more than one room, although the house plans differ (*Figure 2*).

Although the MH houses excavated in the Lower Town were constructed later than House T, the animal bones from the settlement used in this study are all from layers dated to the same period (early MH, or MH I–II). While animal bones from the settlement, dated to the broader Middle Helladic, have been published elsewhere, the early MH assemblage from Asine has not been studied previously.<sup>29</sup> In total, 3,014 animal bones from the settlement, of which 1,149 bones (38% of total NSP) were identified to species, are presented in this paper.<sup>30</sup>

## THE GRAVES

Two burial areas were in use during the earlier MH (*Fig. 2*): in and around the houses in the Lower Town and Terrace III (the Kastraki), and the East Cemetery (EC). The EC is different from the Kastraki because of the formality in its design. The Kastraki graves are intramural, often in floors, abandoned house plots, or between walls, while the EC is a burial area located outside the settlement, and contained a tumulus construction with a *peribolos* marking its boundaries.<sup>31</sup> The human remains and the artefacts found in the Asine burials have been analysed from several angles.<sup>32</sup> The EC burials were more often made in cists rather than in pits, which is the case at Kastraki.<sup>33</sup> Adults are overrepresented in EC, while children were most often buried within the settlement's boundaries.<sup>34</sup> The differences between the burials in the EC and the Kastraki continued and became more pronounced in the latter MH III–LH I period.<sup>35</sup>

At least 147 Middle Helladic graves have been excavated at Asine.<sup>36</sup> About 72% (106 graves) did not contain any grave goods. Just over half of the graves with goods (22 graves) contained the occasional object, for example one vessel.<sup>37</sup> The low occurrence of grave goods is characteristic of this period.<sup>38</sup> Thus, it is not surprising that the number of MH graves at Asine containing animal bones as part of the grave goods is also small. Five such graves could be identified (*Table 1*).<sup>39</sup> Fifty animal bones, of which 28 have been identified to taxa, were found in these graves.<sup>40</sup> Although this number provides a small data set, these bones were part of the grave goods, and are unique in this aspect.

In Appendix 1 the contextual assessments on whether or not the animal bones should be connected to the grave goods or to the grave fill are included. The location, or even the presence, of animal bones in graves is seldom mentioned in the publications. Available contextual information present on

<sup>26</sup> Nordquist 1987, 72, 79; see *Fig. 1*.

<sup>27</sup> See Nordquist 1987.

<sup>28</sup> Frödin & Persson 1938.

<sup>29</sup> Moberg Nilsson (1996) discussed smaller parts of the MH animal bone assemblage from Asine, while Macheridis (2016a) studied the complete collection of animal bones dated to the broader MH from Asine.

<sup>30</sup> The zooarchaeological analysis of the animal bones from Asine was made with access to reference literature and collections at the Osteological Laboratory, Lund University. Few small mammals, fish or bird remains have been identified, which could be explained by the lack of systematic sieving (e.g. Mylona 2003). This remains a problematic issue for this particular collection. Number of Identified Specimen (NISP) and Minimum Number of Elements (MNE) are used for quantification. Information on Minimum Number of Individuals (MNI) is provided. Additionally, Number of Specimens (NSP) is included to note the unidentified bones (e.g. Grayson 1991; Lyman 2008, 266).

<sup>31</sup> Dietz 1980; Nordquist 1987, 101; Voutsaki *et al.* 2011, 455.

<sup>32</sup> E.g. Nordquist 1987; Gillis 1996; Nordquist 2002; Ingvarsson-Sundström 2008; Voutsaki *et al.* 2007, 71–80; Voutsaki *et al.* 2011; Ingvarsson-Sundström *et al.* 2013.

<sup>33</sup> Voutsaki *et al.* 2011, 452.

<sup>34</sup> Ingvarsson-Sundström 2008, 102; Ingvarsson-Sundström *et al.* 2013, 153.

<sup>35</sup> E.g. Voutsaki *et al.* 2011, 453.

<sup>36</sup> Frödin & Persson 1938; Hägg & Hägg 1973; 1975; Dietz 1980; Nordquist 1987, 91.

<sup>37</sup> Nordquist 1987, 101.

<sup>38</sup> Nordquist 1990, 36; Hielte-Stavropoulou 2004, 17.

<sup>39</sup> Additionally, one grave (MH 45) contained one long bone splinter from a large animal. Since the animal bone could not be identified it is not discussed further in this study.

<sup>40</sup> Additionally, according to the excavators, grave MH18 contained fish vertebrae, and grave MH62 contained bones of small animals (Frödin & Persson 1938, 117, 123). These bones could neither be found nor re-examined for the purpose of this paper.

find unit labels indicates if the animal bones were retrieved from graves. In order to assess whether or not this means the grave deposit or the grave fill requires a thorough reading of available documentation, i.e. of field journals and plan drawings.

It is hard to assert with certainty that the samples from the grave fills contain material from activities connected to the burial, because they might also derive from nearby soil used for the infill. The graves in the Lower Town were made in abandoned settled areas (*Fig. 2*), so the animal bones might derive from settlement debris. Because of this issue, the animal bones from the grave fills are not discussed in this text. They are included in Appendix 1 in order to i) to present data from the site, and ii) to illustrate the process which led to the

assignment of animal bones to either grave fill or deposit. It is important to be transparent with the latter, because the assignment of animal bones to grave fills or deposits involves an interpretation of the documentation by the analyst, and could be uncertain.

The assignment of animal bones to grave deposits or fills has been based on two variables. First, the contextual information, such as any notes on the location of the bones in the field journals and/or plan drawings, is of importance. Secondly, zooarchaeological indicators of peri-depositional processes affecting bone condition have been used. This includes the degree of fragmentation, articulation status of bones, and surface wear, i.e. the presence of marks from weathering, trampling,

Burial area	Grave no	Grave type	Age/sex	Artifacts	NSP	Identified animal bones	Date
Kastraki	MH 58	Pit	Adult (ca. 50 or 44 yrs)	Bronze spear head	18	1 pig mandible 1 cattle rib 9 large-sized rib fragments (probably from cattle rib)	Probably MH II
	MH 60	Cist	Adult female	Terracotta whorl	14	5 pig bones: 1 tooth, 1 frontal bone, 1 phalanx I, 1 pelvic fragment, 1 maxillary bone 2 cattle bones: 1 humerus, 1 phalanx I 1 sheep/goat radius	Early MH I
	MH 66	Pit/ Wooden box	Child (5 yrs±6 months)	None	3	2 pig bones: 1 rib, 1 mandible	MH II
	MH 102	Pit	Child (ca. 1 year)	None	8	2 pig bones: 1 mandible, 1 pelvis bone	MH II-III
East Cemetery	1971-13	Cist	Adult (30 yrs) female	None	7	1 astragalus, 1 tibia and 1 metatarsal of sheep/goat (sheep?) from the hind leg of one individual 1 radius and 1 ulna of pig from the lower front leg of one individual	MH II

Table 1. Middle Helladic Asine graves with animal bones. Contextual information is taken from Field diaries 3:1 (E.J. Knudzon) and 9 (H. Arbmänn), from Nordquist (1987; 1996a, 1996b), and from Dietz (1980). Bioarchaeological information from Ingvarsson-Sundström (2008). Number of Specimens (NSP) counts the total amount of bone. Data on animal bones from the East Cemetery graves were provided by D. Mylona.

and gnawing on the bone.<sup>41</sup> When information on the location of animal bones within the grave is absent from field journals or plan drawings, conclusions are based on zooarchaeological indicators.

Four of five graves are from the Kastraki. Three graves contained juvenile individuals, while two burials were of adults, of which one was female. No male grave was identified. None of the graves of children or newborns contained grave goods. This is not true for all such burials; a few did receive burial gifts.<sup>42</sup> Further, jewellery artefacts are often as common or more abundant in child graves when compared to adult burials in the greater Peloponnesian region.<sup>43</sup> All adult burials used in this study contained grave goods other than animal remains (Table 1). The one EC grave, 1971-13, contained an adult female. Interestingly, it is among the poorest EC graves in regards to other find categories. In general, the distribution of grave goods other than animal bones, e.g. jewellery and sets of pottery, in the MH graves at Asine and other sites do not indicate any specific gendered differences.<sup>44</sup>

Taxon	NISP	MNE	MNI
Domestic pig ( <i>Sus domesticus</i> )	425	78	15
Sheep/goat ( <i>Ovis aries</i> / <i>Capra hircus</i> )	361	52	8
of which: Sheep ( <i>Ovis aries</i> )	21	20	5
Goat ( <i>Capra hircus</i> )	33	17	4
Cattle ( <i>Bos taurus</i> )	266	49	5
Dog ( <i>Canis familiaris</i> )	11	8	2
Horse ( <i>Equus caballus</i> )	3	3	1
Donkey ( <i>Equus asinus</i> )	1	1	1
Deer (Cervidae)	15	-	-
Red deer ( <i>Cervus elaphus</i> )	51	22	3
Roe deer ( <i>Capreolus capreolus</i> )	1	1	1
Fallow deer ( <i>Dama dama</i> )	1	1	1
Tortoise/turtle ( <i>Testudine</i> )	14	-	-
<b>Total</b>	<b>1149</b>	<b>215</b>	<b>37</b>

Table 2. List of identified species from the MH I-II settlement at Asine

## Intra-site comparison of settlement and graves in early MH Asine

The comparison between settlement debris and grave goods at Asine is based on species composition and body part distribution. Age and sex data is included only from the settlement, since very few bones from grave-related contexts provided such information. Mortality patterns and sex distributions are provided for the settlement in order to give a fuller overview of the animal consumption and management at the site.

### SPECIES COMPOSITION

In the settlement debris of the early MH, we can note the presence of both horse and donkey among the domesticated animals, although pigs, sheep, goats, and cattle dominate (Table 2). The slight focus on pigs and predominance of medium-sized mammals is also seen in other Middle Helladic settlements on the Mainland.<sup>45</sup> Red deer dominate the wild animals at Asine. Additionally, roe deer and fallow deer are represented. While roe deer are often present on Aegean sites, fallow deer are not as common. The latter species is rarely identified in the Peloponnese during this period.<sup>46</sup>

The taxonomic compositions in MH I-II settlement and graves at Asine are illustrated in Fig. 3. In the settlement, pigs were most common (38%) followed by sheep/goat (32%) and cattle (24%). Goat bones are slightly more abundant than those of sheep.<sup>47</sup> However, considering MNI counts these animals are almost equally represented in the material (Table 2). About 6% derive from deer, predominantly red deer. Animal bones from grave deposits correspond partly to this picture. The results of a chi-square test of the distribution of pig, sheep/goat, cattle, and deer between the settlement and the graves indicated a statistical significant difference ( $\chi^2=8.86$ ,  $df=3$ ,  $p<0.05$ ). This is best explained by the frequencies of pig and sheep/goat bones in the graves; pigs are more abundant than

<sup>41</sup> Table B in Appendix 1 presents data on the presence of zooarchaeological indicators on the bones from each grave.

<sup>42</sup> Ingvarsson-Sundström 2008, 110.

<sup>43</sup> Nordquist 2002, 126.

<sup>44</sup> E.g. Nordquist 2002, 126–127. See also Voutsaki *et al.* 2007, 78.

<sup>45</sup> Examples of zooarchaeologically investigated Mainland settlements where pigs are most abundant is Lerna (Gejvall 1969), Nichoria (Sloan & Duncan 1974), and Ayios Stephanos (Nicodemus 2008, 507; Reese 2008a). In contrast, an emphasis on sheep/goat rearing is observed at Aegina Kolonna (Forstenpointner *et al.* 2010) and Midea (Reese 1998, 281).

<sup>46</sup> Yannouli & Trantalidou (1998) provided a review of the archaeological representation of fallow deer in ancient Greece. The animal is present at nearby Tiryns, according to von den Driesch & Boessneck 1990.

<sup>47</sup> Sheep and goat were distinguished using postcranial bone elements recommended by Zeder & Lapham (2010). Additionally, horn core morphology and cranial features described by Boessneck (1969) and Prummel & Frisch (1986) were used for this purpose.

expected if the bones from settlement and graves were homogeneously distributed, while sheep/goats are less abundant than expected. Deer bones are not present in the graves. This absence might be due to the low sample size, or that deer were not common as grave goods during this period.

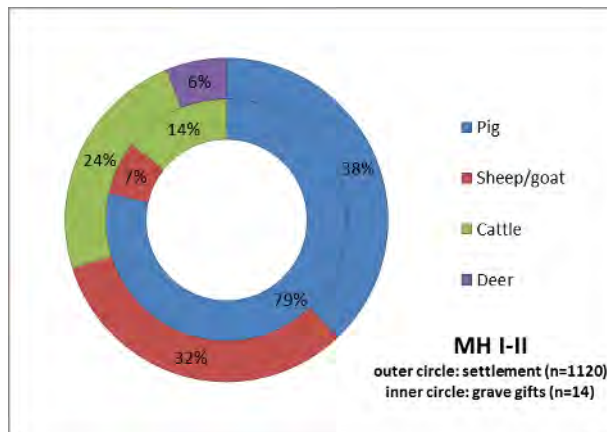


Fig. 3. Relative taxonomic abundance (%NISP) in the general settlement debris compared to grave-related contexts, early MH Asine. Three articulating sheep/goat bones and two articulating pig bones in grave 1971-13 are counted as one NISP each in this graph.

### BODY PART DISTRIBUTION

In the settlement debris, all body parts are represented.<sup>48</sup> The vertebrae and the ribs are overrepresented (Fig. 4). Vertebral bone elements and ribs have a less dense structure, and are thus more prone to post-depositional destruction.<sup>49</sup> It is possible that a certain degree of density-mediated attrition has affected the assemblage. This was indicated in an earlier study of animal bones from MH Asine in which the axial fragments proved to be underrepresented in relation to the other body regions no matter the contextual category or taxonomic representation.<sup>50</sup> It is therefore expected that these parts are underrepresented. Processes of post-depositional destruction are known to cause representation issues in animal bone assemblages, with biases towards higher abundances of loose teeth.<sup>51</sup> In this study, the overrepresentation caused by including loose teeth is avoided since the quantification of MNE was based on mandibles. Still, the head region is overrepresented in the case of Asine.

<sup>48</sup> The anatomical categories provided by Stiner (1991) are used, i.e. *horn*, *head* (skull and mandible), *neck* (atlas, axis, and cervical vertebrae), *axial* (vertebrae, ribs, sternum, pelvis), *upper front* (humerus, scapula), *lower front* (radius, ulna, carpals, metacarpals), *upper hind* (femur, patella), *lower hind* (tibia, fibula, metatarsals, tarsals), and *feet* (phalanges, sesamoids). Raw data of the distribution of the body parts at the Asine settlement is presented in Appendix 2.

<sup>49</sup> Lyman 1994, 234–258.

<sup>50</sup> Macheridis 2016a.

<sup>51</sup> E.g. Peres 2010, 20.

The meaty areas of the pig's body, i.e. the axial region and the limbs, are represented with between 11–20%. However, considering the probable post-depositional bias, the abundance of the trunk was probably larger. The head is overrepresented (37%), while feet are rare (1%). It seems that the remains of pig in settlement remains are from consumption rather than butchering. Most body parts common in settlement debris were occasionally deposited in graves. Similarly to the settlement debris, the graves most often also contained pig bones from the head and the axial skeleton. One each of the lower front limb and lower hind limb is present.

In the settlement debris, the categories of horn, neck, axial, and feet each contribute less than ten percent each to the relative distribution of sheep/goat MNE. The limbs and the head are well represented. Since the neck, vertebrae and ribs trunk might be underrepresented, it is not unlikely that the distribution of the body parts resembled the one discussed above for pigs. That the material derives from mainly consumption waste is also supported by the underrepresentation of the non-meaty feet, which is sometimes discarded early in the carcass processing.<sup>52</sup> Four sheep/goat bones representing one lower front and one lower hind limb could be assigned to graves MH60 and 1971-13. This does not correspond to the settlement debris, in which the head and the upper front limb were among the most common body parts.

In the settlement debris, feet are the most common body part among cattle bones (22%), followed by head (20%). Other body parts contribute with less than 11%, except lower hind limb (14%) and upper front limb (12%). Higher abundance of foot bones is traditionally connected to the so called *schlepp* effect, i.e. transporting the body using the feet. However, it is as likely explained by damage caused by canids, where the meat-rich elements are often targeted first.<sup>53</sup> The phalanges are small but compact, relatively resistant to post-depositional destruction.<sup>54</sup> Thus, the *schlepp* effect is not the only possible explanation. The abundance of low-nutrient body parts as the feet should perhaps rather be discussed as the remains of mainly butchery waste.<sup>55</sup> It can also partly be seen as the consequence of post-depositional destruction of less dense bone structures, such as vertebral bodies. Still, at least the neck and axial parts should in that case be represented to the same degree as the compact meaty limbs. The trunk, i.e. vertebrae and ribs, and feet are represented in the graves. This corresponds partly to the cattle bone waste from the settlement.

<sup>52</sup> E.g. Arnold & Lyons 2011.

<sup>53</sup> Marean *et al.* 1991.

<sup>54</sup> Lyman 1994, 246–247, Table 7.6.

<sup>55</sup> E.g. Thomas & Lacock 2000.



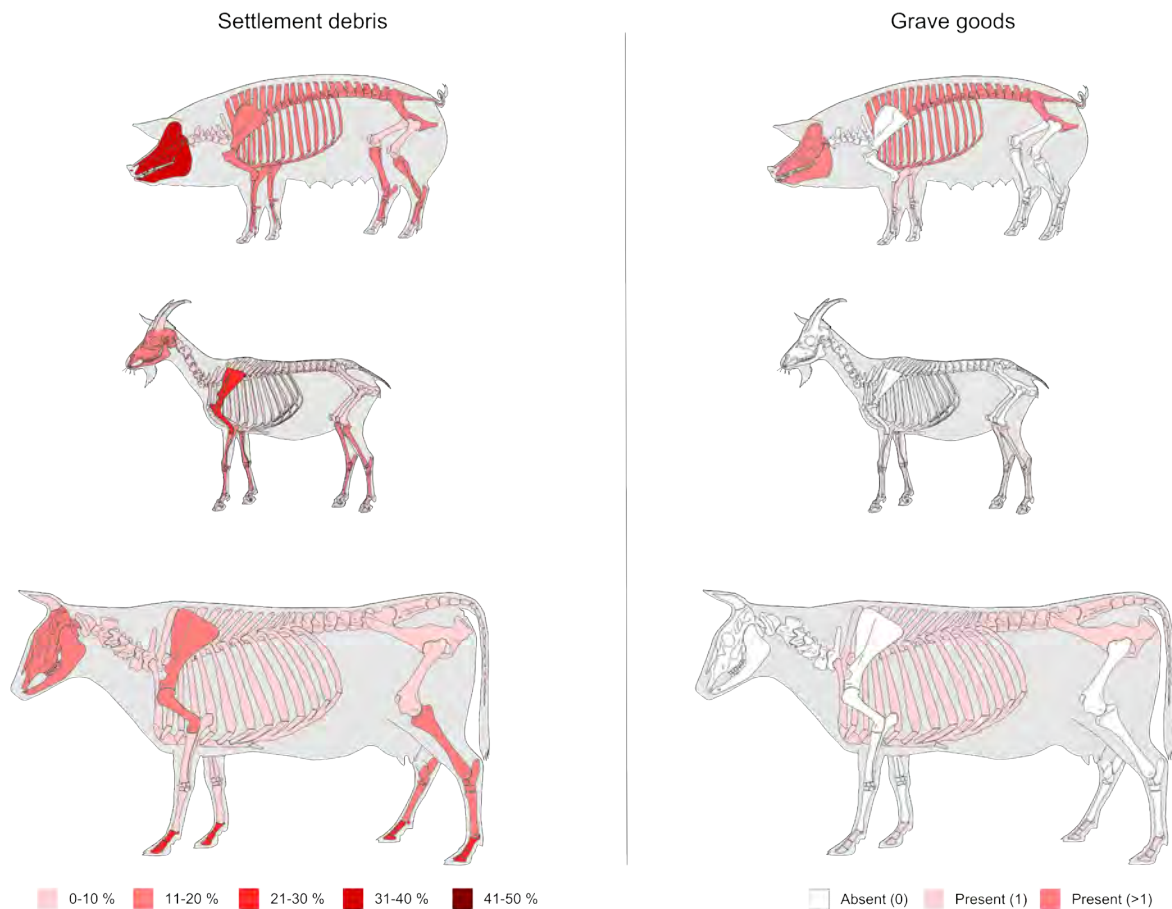


Fig. 4. Relative (%MNE) body part distribution of pig, sheep/goat (represented by goat), and cattle in the settlement debris (left) versus grave goods (right). The bones from graves are presented in terms of presence and absence of each body part.

## MORTALITY PROFILES AND SEX DISTRIBUTIONS<sup>56</sup>

In Fig. 5, the distribution of slaughter ages in the three common domesticates from the settlement debris, we can see that the husbandry and/or consumption of pigs focused on juvenile (46% below 12 months) and young adult individuals (12–42 months). Some reached older ages (19% above 3.5 years). There seems to be a slight focus on male individuals (13 of 19 bones). An excess of adult males is not necessary for the continuation of the herd. As fragile juvenile bone is more prone to post-depositional destruction, this could explain the

slight overrepresentation of adult males. It could also be explained in terms of manifestation of wealth, as it is more expensive to feed older individuals than to kill off juvenile pigs.<sup>57</sup>

About 18% of the age-assessed sheep/goat bones derive from juvenile individuals (<12 months). Two of these were from newborn animals. About 26% survived to ages above 30–42 months (2.5–3.5 years, Fig. 5). There seems to be an even sex distribution (4 females, 3 males). The survival of older individuals together with an even sex distribution is similar to the optimal kill-off pattern from wool production described by S. Payne.<sup>58</sup> This is a possible scenario for early MH Asine, considering that some young individuals are missing due to post-depositional biases. Because there is an even species composition, and varied ages, it remains equally plausible that the

<sup>56</sup> Age assessments were based on epiphyseal union data from post-cranial bone elements. Age translation of fusion status of cattle, sheep/goat, and pig was based on data from Silver (1969) and O'Connor (1982), cf. Vretemark (1997, 41). Sex assessments of cattle and sheep/goat were based on morphological features of the pelvic bones (Boessneck 1969). Sex assessment of pig was made on basis of canine tooth morphology (Mayer & Lehr Brisbin 1988).

<sup>57</sup> Halstead & Isaakidou 2011, 169.

<sup>58</sup> Payne 1973, 284.



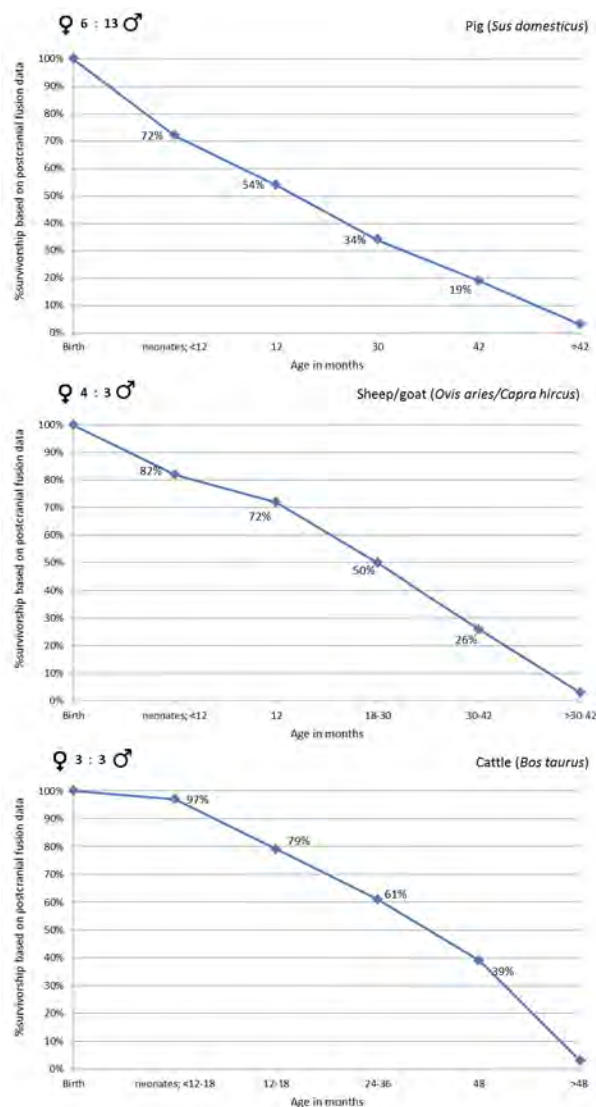


Fig. 5. Relative survivorship curves of pig, cattle, and sheep/goat at early MH Asine. Information on sex distribution is provided in the top left corner of each animal category.

focus of animal management and consumption was mixed, and not specialized.<sup>59</sup>

The survivorship curve of cattle is similar to that of sheep/goat, but with fewer neonate and juvenile individuals. Approximately 40% were slaughtered between the ages of 12–18 months to 48 months (1–4 years). The same proportion (*c.* 40%) were slaughtered at ages above 48 months. The focus on older animals has been explained as a consequence of older draught and milk animals being brought from the hinterland in to the

village.<sup>60</sup> This is common in early urban and/or central sites.<sup>61</sup> This could be a scenario for some of the older cattle consumed at the site, and as such it could be a function of the growing central importance of Asine within the surrounding region.

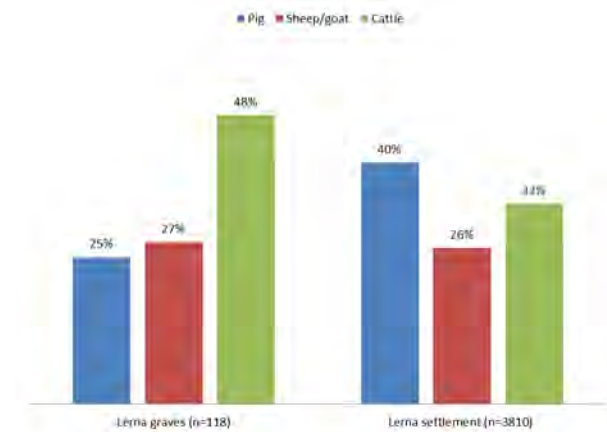


Fig. 6. Relative distributions of pig, sheep/goat, and cattle in MH Lerna. Data on the settlement is taken from Gejvall (1969, 6–8) and the graves is provided by D. Reese.

## Inter-site comparison between MH graves at Asine and Lerna

In this section, the animal bones from early MH Asine are compared to the animal remains from graves at the nearby Middle Helladic settlement at Lerna (Fig. 1). This is made in order to evaluate the most obvious pattern from the Asine collection, namely that the same animals dominating the settlement are most common in the graves. I briefly evaluate the body parts' representation in the Lerna material. Although it is important to include other findings beside animal bones in this discussion, this is only partially done as it is beyond the scope of this paper.

At least 228 Middle Helladic graves were excavated at Lerna. E. Blackburn (1970) has provided an inventory of the Lerna graves.<sup>62</sup> There are several similarities between the MH burials at Lerna and Asine. Mentions of animal bones among the grave offerings or the material associated to graves are scarce. Most graves were located within the settlement's boundary, and most burial types were small in their form, often as pits, jars or cists.<sup>63</sup> In her study on age/gender distinctions in the mortuary evidence, e.g. grave goods and grave types, at

<sup>60</sup> Macheridis 2014.

<sup>61</sup> E.g. Magnell 2009.

<sup>62</sup> Blackburn 1970.

<sup>63</sup> Voutsaki 2004, 344–345.

<sup>59</sup> See Halstead 1996.

MH I-II Lerna, S. Voutsaki could not find good evidence of specific gender or age categories.<sup>64</sup> The exception is a long term trend in which adult burials became located outside the settlement in the MH III–LH I period, while children were buried inside it. This is also consistent with the situation at Asine, where the extramural East Cemetery contained mostly adult burials. Additionally, at Lerna children also received a more diverse set of grave goods than adults.<sup>65</sup>

N-G. Gejvall studied the animal bones from MH Lerna; however, he did not focus on the graves.<sup>66</sup> The animal bones have since been re-examined by D. Reese, who has kindly provided the unpublished data on animal bones from the Middle Helladic graves. Reese reports on animal bones from at least 58 graves.<sup>67</sup> This number excludes mollusc remains. It is uncertain whether or not these bones should be regarded as grave goods, as many were probably included with the overlying grave fill.<sup>68</sup> They are used here for illustrative purposes, and seen as probably deriving from activities connected to the burial. Still, we cannot avoid a degree of uncertainty regarding the contextual integrity of these samples.

Fig. 6 presents an overview of the composition of pig, sheep/goat, and cattle from Lerna graves and settlement. The settlement data is taken from Gejvall's 1969 publication on the animal bones from Lerna. Since publication, some chronological assessments have been revised, and so this distribution is only approximate. Nevertheless, we can observe that the distribution of pigs, sheep/goat, and cattle in the Lerna settlement is similar to Asine (Table 2, Fig. 3). Contrary to the animal bones in the Asine graves, the animal bones in the Lerna graves do not correspond to the general picture provided by its settlement. Instead, cattle are most common, followed by sheep/goats and pigs. This is interesting as it is different from the consumption waste found in settlement layers at Lerna.

Pigs were the most common animal in the consumption on an everyday basis at both Lerna and Asine. However, it seems each site regarded different animals as most important for ritual use (cattle at Lerna and pig at Asine). Perhaps, this indicates that values other than purely economic or functional were important in choosing animals for funerary purposes, and that this preference varied between sites within the same region. This also highlights the difficulties in using animal

#### Body parts associated to the MH graves of Lerna

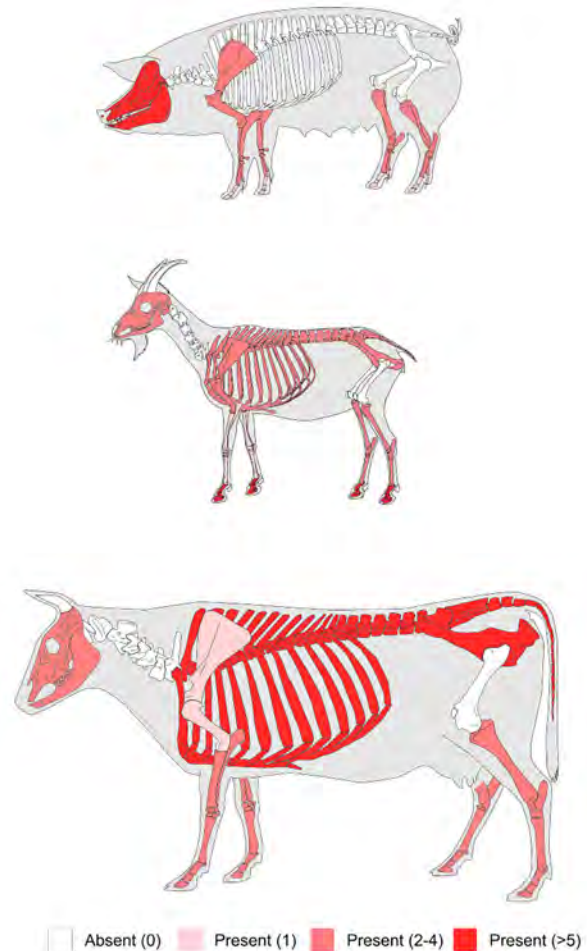


Fig. 7. Relative (%MNE) body part distributions of pig, sheep/goat, and cattle in the MH Lerna graves. Data provided by D. Reese.

bones from ritual contexts to reflect on general animal consumption in everyday life. This discrepancy is similar to the one discussed by S. Isaksson in an Early Medieval Scandinavian context, in which written sources indicate meat-focused diet, while lipid analyses from pottery revealed a probable lack of animal protein in everyday-life food consumption.<sup>69</sup>

In Fig. 7 we can see the distribution of the body parts of the three most common animals in the graves from Lerna.<sup>70</sup> Almost the whole body, except horn core, neck, and the upper hind leg, is represented for sheep/goat and cattle. The trunk is

<sup>64</sup> Voutsaki 2004.

<sup>65</sup> Voutsaki 2004, 356.

<sup>66</sup> Gejvall 1969.

<sup>67</sup> Graves dated to the latter phases of the MH period, as published by Blackburn (1970) and based on data from Voutsaki *et al.* (2013) are excluded. Among the included graves for this paper, 19 graves remain more broadly dated to the MH phase. These graves could be of later MH origin. This underlines the above-discussed uncertainty of contextual integrity of these samples.

<sup>68</sup> Reese, personal communication, 26 May 2016.

<sup>69</sup> Isaksson 2000, 55.

<sup>70</sup> Raw data of body part distribution from the Lerna graves is presented in Appendix 2.

best represented among the body parts of cattle at MH Lerna, while for sheep/goat the feet are most common. The pig is represented by the head, the upper front and lower front leg, the lower hind leg, and the feet. This is different from Asine, where the only the trunk and the head are represented (see *Fig. 4*). Similarly to Asine, the pig's head is most common in the Lerna graves. This can perhaps partly be explained by low sample sizes.

Animal bones from ten of the later MH III–LH I graves were studied by Reese. Pig bones were found associated with five graves, while cattle and sheep/goat were found in two graves.<sup>71</sup> Only in one of the graves were these three animals deposited together.<sup>72</sup> The common occurrence of pig bones in the later Lerna graves is similar to the early MH graves at Asine. It indicates that the preference of pigs in the graves of early MH Asine was local for that specific period, but that the ritual use of pigs in graves was not singularly unique for MH I Asine, as it is evidenced in other sites of other periods in the region, such as early LH Lerna.

## Regional and long-term perspectives

In the Middle Helladic graves of other sites, I have found few mentions of animal bones as grave goods.<sup>73</sup> Animal bones were sometimes neglected and not collected in older excavations.<sup>74</sup> Different local geological circumstances might result in differential preservation of bones. Nevertheless, the lack of animal bones also corresponds to the general lack of other kinds of grave goods during this period.<sup>75</sup> Thus it is probable that this lack not only is the consequence of the bones not being collected but also reflects the burial practices, where it was not common to deposit animals/animal parts in graves. Below, I use other regional examples of animal bones from mortuary contexts dated to the broader MH and LH periods

to illustrate two points.<sup>76</sup> First, I argue that the trend in which the most common domesticates, pig, sheep/goat and cattle, dominate as grave good animals, as exemplified by Asine and Lerna, is temporally restricted to the earlier MH. This becomes evident through a brief review of regional examples of animal bones in graves from the later MH, in which animals not commonly consumed and/or herded become more common. Second, I argue that in the early MH mainly the domesticated animals were deposited as grave goods. During the later MH and Mycenaean periods, these animals became reserved instead for ritually connoted consumption activities, such as funerary meals. As is exemplified below, this argument is based on the fact that domestic animals are abundant in other types of ritually interpreted contexts, besides graves.

Bones of horse, dog, and wild boar, seemingly as part of food offerings, gifts, or equipment for the dead, became common among the grave goods in the rich graves of the later Bronze Age. The earliest horse burials can be found in the LH II period.<sup>77</sup> For example, nearby Dendra is famous for its horse burials, which should be placed in the LH IIIA–B periods.<sup>78</sup> Examples of the deposition of dogs in rich graves during the MH III–LH I can be found at Midea, specifically in Pit II of the tholos tomb.<sup>79</sup> Another example of animal-related grave goods consists of the worked boar tusks often for or as part of helmets which are found in graves of the Shaft Grave Period.<sup>80</sup>

Bones of horse, dog, and wild boar are not present in the early MH graves at Asine, although most animals are identified at the settlement (*Table 2*). The end of the MH was a socially dynamic period, resulting in the formation of the Mycenaean societies. In this cultural complex, hunting seems to have been a manifestation of power, important for the élite. This is presumably reflected by the use of dogs in burial contexts and boar tusk helmets as artefacts and in iconography.<sup>81</sup> This appears to not have been the case during the early Middle Helladic, at least not at Asine. Further, most of the instances of dogs, horses, and wild mammals can be tied to high status graves. Meanwhile, in the early MH Asine monumental structures indicating higher social complexity arrive first in MH II, as exemplified by the tumulus construction in the East Cemetery.<sup>82</sup>

<sup>71</sup> Reese 2008b, 18–20; Reese unpubl.

<sup>72</sup> Pit grave DB-1. In this grave a pig skull and mandible, two cattle teeth and one sheep/goat scapula were found along with some shells (Reese 2008b, 20). Other mammal species identified from the bones of these later Lerna graves includes dog (DC-1-2, Reese 2008b, 18) and red deer (BE-2, Reese unpubl.)

<sup>73</sup> No animal bones are mentioned in the graves at Mycenae (Alden 2000), Orchomenos (Bulle 1907), Zygouries (Blegen 1928, 55–56), or Prosymna (Blegen 1937, 30–50). For the locations of these sites, see *Fig. 1*.

<sup>74</sup> MacKinnon 2007. One example is the site of Malthi. During the 2016 excavations of the site two child burials were excavated, in which animal bones were found (Lindblom personal communication 16 August 2016; Macheridis 2016b). Pig was identified in both burials, while sheep/goat was found in one. This is in contrast to the older excavations of MH graves, in which no animal bones are mentioned (Valmin 1938). The presence of pig bones at Malthi is similar to the Asine graves in which pig bones are most common.

<sup>75</sup> See Cavanaugh & Mee 1998, 31.

<sup>76</sup> The inclusion of later temporal examples is motivated because animal bone data from early MH graves is, as mentioned, scarce. The scarceness of the evidence has made it necessary to contrast the data of this time to other regionally and temporally close contexts. This is made in order to define tendencies of the MH I–II which are not apparent due to the limited amount of data.

<sup>77</sup> Pappi & Isaakidou 2015, 477; but see Reese 1995, 36.

<sup>78</sup> Pappi & Isaakidou 2015; cf. Protonotariou-Deilaki 1990b, 101.

<sup>79</sup> Persson 1931, 39.

<sup>80</sup> Such examples can be found among other in the Cuirass Tomb at Dendra (Åström 1977) and the “Warrior Grave” at Eleusis (Cosmopoulos 2015, 76).

<sup>81</sup> Hamilakis 2003, 243; see also Day 1984.

<sup>82</sup> Dietz 1980; Voutsaki *et al.* 2011, 448.



Among other ritual contexts, besides graves, we have the large Middle Helladic ritual pit underneath the sanctuary for Apollo Maleatas at Epidauros. Among its many finds were the bones of sheep, cattle, pigs, and antler fragments from deer; as they have not been zooarchaeologically analysed the identifications remain uncertain.<sup>83</sup> The presence of domesticated animals in this type of context, i.e. ritual non-grave contexts, continues into the LH. We can note the MH-LH examples of the bones belonging to “a goat and two other small animals” which were found in a pit near grave Δπ18 at Eleusis.<sup>84</sup> Associated to Tomb IV at Zygouries, C.W. Blegen reported on the presence of two nearly complete goat skeletons, which he suggested were sacrificial remains in connection to the burial.<sup>85</sup> The material found in the infill of Shaft Grave 1 and Shaft Grave 2 at LH I Lerna has been interpreted as the remains of one or two funerary feasts.<sup>86</sup> A re-examination of the animal bones revealed that sheep/goat and pig were the most common animals chosen for meat consumption within these events, although wild species also have been identified.<sup>87</sup>

Another example of the use of the common domesticated animals in ritual consumption contexts is the discussion of burnt animal sacrifices, a seemingly wide-spread practice in the Mycenaean cultures. For example, at Pylos the burnt animal sacrifices focused on cattle, specifically the jaw, upper front limbs, and upper hind limbs.<sup>88</sup> Y. Hamilakis and E. Konsolaki discuss the burnt remains of juvenile pigs in Room A of the main sanctuary at Ayios Konstantinos as remains of burnt animal sacrifice.<sup>89</sup> Similarly, M. Cosmopoulos regards the burnt bones from the non-meaty parts of at least three pigs in Megaron B as evidence of burnt animal sacrifice at Eleusis.<sup>90</sup> Although the domesticated animals are occasionally found in MH III–LH I or II graves, such as at above-mentioned LH I Lerna, the above examples show the increasing reliance on pigs, sheep/goat, and cattle in ritually connoted consumption events, such as meals, feasts, or sacrifices, during the later Bronze Age periods.

## Discussion and conclusions

Let us return to the focus of this paper, namely to discuss the symbolic connotations of animals in early MH Asine on the basis of the various connections between animal bone waste from the settlement and the animals or animal parts deposited in its graves. In the above, I have focused on species compositions and body part distribution of pig, sheep/goat and cattle. The latter, the comparisons of body parts, did not provide good basis for the discussion of symbolic aspects of the settlement debris. For example, the low-nutrient parts of cattle were abundant in the settlement, which could indicate butchery waste and some input of preservation bias to the advantage of compact and small bones such as phalanges and tarsals. On the other hand we do see meaty body parts in the graves, which indicate that butchery waste was not the most common in grave-related contexts. This conforms with the idea that the grave goods were either meat portions as gifts for the dead or the remains of some funerary meal.<sup>91</sup> It does not provide us with direct symbolic connotations of the bones found in the settlement debris.

### SYMBOLIC VALUE OF THE PIG

The clearest similarity between settlement and graves at Asine, which can be discussed in terms of symbolic connotations, is that the pig is most abundant in the settlement and graves at Asine.<sup>92</sup> In the graves, pig bones were present in higher abundances than expected. The animal was not only of economic and nutritional use; it was also used for symbolic and ritual purposes at Asine, as testified by its abundance as grave goods. In contrast, at MH Lerna, cattle bones were most abundant in graves, while pig remains were most common in the settlement debris there (*Fig. 6*). The pig appears also to have been the most abundant animal at other settlements in the southern Mainland during the MH.<sup>93</sup>

The research on suid symbolism during the Bronze Age centres on the wild boar, predominantly in terms of power

<sup>83</sup> Theodorou-Mavrommatidi 2010.

<sup>84</sup> See Cavanaugh & Mee 1998, 32; Cosmopoulos 2015, 54–55.

<sup>85</sup> Blegen 1928, 41.

<sup>86</sup> This is based on the magnitude of the pottery assemblage, its relative completeness, the high inclusion of imported ware, and the large animal bone assemblage, representing a substantial amount of meat (Lindblom 2007; 2008, 191).

<sup>87</sup> Sheep/goat was more abundant of the two. Bones of cattle, red deer, dog, hare, fox, donkey, and tortoise were also identified, with the addition of gooschawk and heron in Shaft Grave 2 (Lindblom, personal communication, 16 August 2016). The remains from the infill of these graves are interpreted as the remains of one or two funerary feasts (Lindblom 2007; 2008, 191).

<sup>88</sup> Isaakidou *et al.* 2002.

<sup>89</sup> Hamilakis & Konsolaki 2004.

<sup>90</sup> Cosmopoulos 2015, 106.

<sup>91</sup> See Härke 2014.

<sup>92</sup> By this I presume that the deposition of pig in graves had symbolic connotations, which did not stop at the grave, but were present also in daily life. This is based on the proposal that there was no strict sacral versus profane sphere during the MH (Nordquist 1987, 111; Whittaker 2010, 536), and that animal symbolism is an important cosmological component in many traditional societies. For an overview of the latter, I refer to Russell 2012, 7–51. There might have been symbolic connotations to other animals, such as tabooed ones, which were at least as important for the MH people; these are harder to discuss on basis of present data. I highlight the pig because it clearly was both an important meat animal and an important ritual animal at early MH Asine.

<sup>93</sup> Sloan & Duncan 1974; Reese 2008a; see Trantalidou 1990, 398; Halstead 1996, 29.

and increased importance of hunting for the élite during the late MH and the Mycenaean periods.<sup>94</sup> Few discuss the domestic pig in terms of animal symbolism during the MH I–II periods. This probably results from the lack of systematic assessments of available data. It is thus hard to discuss further in this text. Still, the characteristics of the pig itself might be interesting for this discussion. For example, the similarities between wild boar and pig are generally acknowledged, and were probably recognized by the prehistoric people as well.<sup>95</sup> Such general similarities perhaps affected the prehistoric perception of these animals, in which they were considered related.<sup>96</sup> Because of their closeness physically and morphologically, the pig could have been viewed as related to the wild boar.

The pig as a symbol during the MH I–II could thus have been multireferential, i.e. both as meat provider and as a liminal being with ties to the wild boar, hunting and the “wild”.<sup>97</sup> This would further indicate that the early MH animal symbolism maybe had long-lasting influences for the rest of the Bronze Age, when the wild boar symbolism gradually became more important as reflected in the archaeological and the iconographical evidence. This remains an idea for future research and not a conclusion of this paper. What the results of this paper show is that the use of pigs in the early MH society at Asine was not only of economic importance as reflected in its high frequency in the settlement debris, but also of ritual and symbolic importance, as evidenced by its presence as grave goods during this period.

<sup>94</sup> The wild boar symbolism is evidenced foremost by the presence of tusk helmets as grave goods in high status graves, and of the animal in iconography (Morris 1990; Crowley 1995, 487, 489; Hamilakis 2003, 241 and 243).

<sup>95</sup> Ethnozoarchaeological observations have testified of the occasional interbreeding between wild and domestic pigs, resulting not only in increased similarity in morphology but also increased physical closeness between wild and domestic pigs, as described by e.g. Halstead & Isaakidou (2011, 161 and 170), Albarella *et al.* (2011, 151), and Hadjikoumis (2012, 357).

<sup>96</sup> Animals sharing morphology and behaviour are sometimes considered related in traditional societies. A contemporary example is 20th century Malekula in Melanesia, where pigs are categorized on the basis of age and gender, rather than domestication status (Funabiki 1981, 179). See also examples in n. 97.

<sup>97</sup> Examples of liminal attitudes towards certain animals can be found elsewhere. For example, the red deer in Ireland during the Early Middle Ages were labelled “wild cattle” because of the species’ liminal status. It was seen as belonging to the domestic and social sphere, as it was similar to cattle, but also as belonging to the wild as it was hunted (Soderbergh 2004, 168). Among the Ethiopian Konso, the consumption of deer meat, or meat from horned animals, was allowed because they were similar to cattle, sheep, and goats (Hallpike 2008, 329).

## RITUAL USE OF HERDED ANIMALS CONTRA HUNTED ANIMALS, HORSES AND DOGS

The dominance of bones from sheep/goats, cattle, and pigs in the graves of Asine and Lerna suggests that these animals were ritually and symbolically important as grave goods during the Middle Helladic. It is reasonable that the symbolism tied to these animals also permeated everyday life outside the burial sphere, and that for example the consumption of these animals was symbolically or ritually laden. Perhaps meat consumption was ritualized in occasional but recurrent events such as feasts for the community or smaller but more frequent meals within the household.<sup>98</sup> This would be in line with the proposed idea that everyday life was permeated by ritual meaning.<sup>99</sup>

The domesticated animals in the MH graves of Asine and Lerna were exchanged for hunted animals or those animals used during hunts during the Late Bronze Age in the region. It is however reasonable that domesticated animals retained ritually important functions in large-scale events, such as meals, feasts, or sacrifices, probably because they symbolized economic power.<sup>100</sup> The appearance of the burnt animal sacrifices in the Mycenaean period is cited as an example of this.<sup>101</sup> The public sharing and distribution of meat, for gods and/or humans, would have been more important in a social context; the funerary feast (or meal) is an important event in terms of building alliances and manifesting power.<sup>102</sup> The increase of wild animals in grave goods during the LBA was perhaps rather an indicator of a dead individual’s identity than symptomatic of the social dynamics at the time, for which feasts probably had a more important function. The presence of wild animals in high status graves can perhaps be tied to the rising social inequalities during this period, visible foremost in the mortuary evidence, in which some graves exhibit extreme wealth compared to others, such as the Shaft Graves of Mycenae.

In conclusion, this paper shows the potential in comparing zooarchaeological intra-site patterns to discuss symbolic connotations of the leftovers from everyday life. Future studies will test the conclusions of this paper. This is needed in order to more fully understand which parts animals played in early Middle Helladic life. Although sites documented with modern-day techniques might provide higher contextual resolution, this does not mean that we should neglect the evidence from old excavations. This is illustrated in this study by using the almost century-old documentation of the 1926s excavation of Asine.

<sup>98</sup> I refer to the discussion earlier in this text where I distinguish between feasts and meals. The former are large-scale ritual events impacting on the power relations on a communal level (Dietler 1996, 88 and 2001, 65), while the latter include smaller consumption events.

<sup>99</sup> Nordquist 1987, 111; Whittaker 2010, 536.

<sup>100</sup> E.g. Russell 2012, 331.

<sup>101</sup> Hamilakis & Konsolaki 2004; Isaakidou *et al.* 2002.

<sup>102</sup> E.g. Hayden 2009.

## Appendix I

Three systems of labelling the graves of the Lower Town (Kastraki) have earlier been employed. In the text, I use the grave numbers stated in the column “Grave no.”. When trying to reconstruct the animal bones associated to the Kastraki graves, the following field diaries from the old excavations have been consulted: Diaries 3:1 and 3:2 by Erik Jo Knudzon, Diary 5 by S. Neander Nilsson, and Diary 9 by Holger Arbman. The diaries are stored in Museum Gustavianum at Uppsala University.

Age assessments of juvenile individuals are taken from Ingvarsson-Sundström 2008. Adult ages by both Fürst (F) and Angel (A) are provided for the Kastraki graves. Information on the animal bones found in the East Cemetery graves has been kindly provided by Dimitra Mylona (DM). The author (SM) has analysed animal bones from the Kastraki graves. References to plans and/or photographs are present in the “References” column. Data on zooarchaeological indicators needed for Table B were only present from the Kastraki graves.

*Table A. Contextual assessments of the animal bones found in the MH graves of Asine. For data on zooarchaeological indicators of bone condition, such as articulation status, exposure and surface wear, see Table B in this Appendix.*

Burial area	Grave no.	Date	Stratigraphic discussion	Conclusion	References
East Cemetery	1971-11	MH II	The remains of a 30–40 years old female (61AS) were found in this cist grave. It is hard to tell whether or not the two unidentified animal bones recorded by DM are from the grave deposit, but as no goods were found, it is assumed that they derive from the fill of the grave. No grave goods. This grave was made in the upper layer of the IQ tumulus at Asine.	The animal bones belong to the grave fill. This burial of this individual should perhaps be associated to 1971-12.	Dietz 1980, 23.  Plans/photographs: Dietz 1980, 16, fig. 3; 24, fig. 10.
	1971-12	MH II	This was the cist grave of a 6–12 years old child (62AS). Three animal bones were found in the grave: one sheep/goat rib, one tooth of red deer, and one unidentified but large-sized bone splinter, according to DM. This is the only instance of wild mammals among the graves in this study. No goods were found in the grave. Dietz (1980, 26) mentioned the bones of sheep/goat in the fill. The three bones examined by DM are most likely from the fill of this grave. 1971-12 was also made in the upper layer of the tumulus. It is perhaps near-contemporary, but a bit later, than 1971-11.	The animal bones belong to the grave fill. This burial of this individual should perhaps be associated to the earlier 1971-11.	Dietz 1980, 25–26; Voutsaki <i>et al.</i> 2011, 451.  Plans/photographs: Dietz 1980, 16, fig. 3; 25, fig. 11; 26, fig. 12.

Burial area	Grave no.	Date	Stratigraphic discussion	Conclusion	References
East Cemetery	1971-13	MH II	This grave was made outside the tumulus. It was a cist grave containing the remains of an adult (around 30 years old) female (63AS). Seven animal bones were examined by DM: three sheep/goat (probably sheep) fragments from the hind leg (one astragal, one tibial, one metatarsal bone) of the same individual, two pig bones from the front leg (one radius, one ulna), and two unidentified medium-sized rib bones. DM interpreted these as remains of body parts forming food goods, since they articulate and form specific body parts. This seems plausible. The animal bones were not specified by Dietz (1980, 60). No other goods are specified.	The animal bones belong to the grave deposit.	Dietz 1980, 60–61.  Plans/photographs: Dietz 1980, 16, fig. 3; 61, fig. 71.
	MH 22	MH II–III	This pit grave contained the fragmentary remains of a newborn infant. It was made in the foot-end of MH 21, the burial of an adult male. It was located above wall 2 of House A (earlier MH), but was seemingly below House C (later MH).  However, these graves might not be connected according to the excavators. The animal bones (AS 3400) were labelled as “animal bones grave no 158 (grave V)” or “around grave V”. Grave V equals MH 22. Since the exact placement of the bones does not seem to be with the buried individual but around it, I assume they were found in the fill of the grave. It is possible that they also were found around the grave construction as well.  Three animal bones are recorded of which one pig humerus was identified, as well as an unidentified small-sized fragment and one unidentified bone splinter. The small fragment might derive from the buried infant of this grave. No indicators of exposure were found on the animal bones.	The animal bones probably belong to the grave fill.	Diary 5: 24/06/1926; Frödin & Persson 1938, 117; Nordquist 1987, 129; 1996a, 23; 1996b, 118.  Plans/photographs: Nordquist 1987, 194, fig. 99; 1996a, 24, fig. 5.
	MH 45	MH II–III	MH42 and MH 45 belong to the same cluster of graves south of House D, below House E. They were most probably contemporary with House D, and date to the MH II or MH III periods.  This pot-grave contained an infant aged to around birth to 2 months. The animal bone (AS 3377) were labelled “in vessel of <i>bothros</i> grave”. Therefore it is assumed that the contents of this single vessel should be associated to the burial event. Considering this relatively good contextual information it is unfortunate that only one cattle or deer tibia was recorded from this grave. No other burial gifts are recorded from this grave. No indicators of exposure were found on the animal bone.	The animal bones belong to the grave deposit.	Diary 9: 24/04/1926; Frödin & Persson 1938, 121; Nordquist 1987, 132; 1996b, 118.  Plans/photographs: Nordquist 1987, 194, fig. 98; 1996a, 28, fig. 10.

Burial area	Grave no.	Date	Stratigraphic discussion	Conclusion	References
Kastraki	MH 58	Post MH I, probably MH II	<p>This pit grave contained the remains of an adult aged to c. 50 (F) or 44 (A) years. A spearhead was found in the burial. It is located on Terrace III and was made on top of the stone floor of room VII in House T. Although it might have been made in a house which was in use at the time, due to its elaborate and space-demanding construction (cist grave) it is more probable that it is younger than House T. However, it seems clear judging from the diary that these bones do not belong to the usage phase of House T.</p> <p>The AS no. of the animal bones associated to this grave is probably AS 4800. According to the field diary, on the day that these bones were found, 13 March, the human skull was found. The soil around and under the skull was kept in a box. It is plausible that the animal bones belong to this unit and are from the grave deposit.</p> <p>A total of 18 animal bones were recorded: one pig mandible and one cattle rib, as well as seven unidentified mammal splinters. Nine large-sized rib fragments probably belong to the cattle rib. No indicators of exposure were found on the animal bones.</p>	The animal bones probably belong to the grave deposit.	<p>Diary 3a: 13/03/1926; Frödin &amp; Persson 1938, 123; Nordquist 1987, 132; 1996a, 27; 1996b, 118.</p> <p>Plans/photographs: Nordquist 1996a, 28, fig. 10.</p>
	MH 59	MH I	<p>This cist grave contained the remains of an adult female, 40-50 (F) or around 30 years old (A). It is located on Terrace III. An obsidian chip was found in connection to the grave. It was found on 19 March, and most animal bones (AS 2138) derive from the day of the initial excavation of the grave on 20 March. They seem to belong to the grave fill. From this fill, five pig fragments were identified: one left maxillary, one right temporal, and three tibiae (two right and one left). One cattle tooth was identified. In addition, one medium-sized limb bone fragment and one mammal cranial fragment, and two unidentified fragments were recorded.</p> <p>Three animal bones, belonging to AS 5228, which was excavated ten days after this, when they lifted the skeleton. They probably derive from a deeper level of the fill: one pig pelvic bone and one cattle tooth. No indicators of exposure were found on the animal bones.</p>	The animal bones belong to the grave fill.	<p>Diary 3a: 19, 20, 29/03/1926; Frödin &amp; Persson 1938, 123; Nordquist 1987, 132; 1996a, 28; 1996b, 118.</p> <p>Plans/photographs: Nordquist 1996a, 28, fig. 10.</p>



Burial area	Grave no.	Date	Stratigraphic discussion	Conclusion	References
Kastraki	MH 60	Early MH I	<p>This cist grave contained the remains of an adult female. It was located on Terrace III, and it was made in bothros 2 south-west of House T. One terracotta whorl was found. The grave was fully excavated and documented on 7 April, and most of the saved finds were found associated with the burial itself (AS 2360), which was located below a layer of hard soil. The stratigraphy is unusually well documented.</p> <p>Fourteen animal bones were recorded, five of which derived from pig: one frontal bone, one maxillary fragment, one tooth, one pelvic bone and one phalanx. Additionally one sheep/goat radius, one cattle phalanx and one cattle humerus were recorded. One unidentified large-sized fragment and five cranial fragments from medium-sized mammals were also among these bones.</p> <p>Although the one phalanx of pig was mildly weathered (Table B), the generally good condition of the bones as well as the possible articulated pig's skull suggest that the bones derive from the grave deposit. Possibly, the phalanx might be intrusive.</p>	The animal bones belong to the grave deposit.	<p>Diary 3a: 07/04/1926; Frödin &amp; Persson 1938, 123; Nordquist 1987, 131; 1996a, 28; 1996b, 118.</p> <p>Plans/photographs: Nordquist 1996a, 30, fig. 13.</p>
	MH 66	Possibly MH II	<p>This burial was a pit grave on Terrace III, located above wall 5 of room II in House R, which was used during EH and early MH. Therefore the feature should be dated to early MH, most probably MH II.</p> <p>The burial contained the remains of a child aged 5 years <math>\pm</math> 6 months. The animal bones (AS 4737) were excavated the day after the skeleton was identified. The grave was documented and fully excavated on this day. It is assumed that the animal bones should be regarded as part of the actual grave. One pig rib and one pig mandible were found together with an unidentified mammal fragment. No indicators of exposure were found on the animal bones.</p>	The animal bones probably belong to the grave deposit.	<p>Diary 3a: 20/05/1926; Frödin &amp; Persson 1938, 124; Nordquist 1987, 132; 1996a, 29; 1996b, 118.</p> <p>Plans/photographs: Nordquist 1996a, 31, fig. 15.</p>
	MH 102	MH II–III	<p>The grave was excavated on Terrace II above Terrace III. The stratigraphy and dating of it remains preliminary. Based on its location stratigraphically and physically over bothros 1 (EH III–MH I), a possible date is MH II–III.</p> <p>This pit grave contained the remains of a one-year-old child. The animal bones (AS 2171) were excavated on 17 May. The burial was removed the same day. The AS no. is also the label for the child skeleton, which is why it is assumed that the animal bones were located very close to the body and should be considered part of the grave deposit.</p> <p>Eight animal bones were recorded: one mandible and one pelvic bone of pig, four fragmented mammal specimens, and two medium-sized bones (one rib and one limb bone). No indicators of exposure were found on the animal bones.</p>	The animal bones probably belong to the grave deposit.	<p>Diary 3b: 17/05/1926; Frödin &amp; Persson 1938, 17; Nordquist 1987, 134; 1996a, 29; 1996b, 118.</p> <p>Plans/photographs: Nordquist 1996a, 36, fig. 24.</p>

Table B. Zooarchaeological indicators of average size, articulation status and surface wear (weathering, trampling, and gnawing) on bones from the Kastraki graves in Table A.

Grave	Grave fill/ deposit	No. of bones	Average size (mm)	Articulation (yes/no /possibly /not applicable*)	Weathering	Trampling	Gnawing
MH 22	Grave fill	3	40	Not appl.	None	None	None
MH 45	Grave deposit	1	not appl.	Not appl.	None	None	None
MH 58	Grave deposit	20	20.5**	Possibly (cattle rib)	None	None	None
MH 59	Grave fill	14	40.7	No	None	None	None
MH 60	Grave deposit	14	36	Possibly (pig skull)	One weathered bone (pig phalanx)	None	None
MH 66	Grave deposit	3	43.3	Not appl.	None	None	None
MH 102	Grave fill	11	23.2	No	None	None	None

\* Not applicable signifies that the count of bones is too small for this assesment.

\*\*The average size is small due to post-depositionally fragmented splinters and therefore not representative for bone status prior to deposition.

## Appendix 2

The anatomical distributions of pig, sheep/goat and cattle, MH I–II Asine, the settlement.

	Pig ( <i>Sus domesticus</i> )	Sheep/goat ( <i>Ovis aries</i> / <i>Capra hircus</i> )	Cattle ( <i>Bos taurus</i> )
Horn core	Not applicable	18	14
Cranial	74	24	21
Mandible	85	28	31
Loose teeth	40	61	23
Vertebrae	19	21	18
Ribs	17	8	4
Scapula, humerus	66	47	21
Radius, ulna	30	44	18
Carpals, metacarpals	12	15	12
Pelvic region	24	15	17
Femur, patella	9	8	11
Tibia, fibula	19	25	12
Tarsals, metatarsals	21	33	31
Metapodials, phalanges, sesamoids	9	14	33
<b>Total</b>	<b>425</b>	<b>361</b>	<b>266</b>

*The anatomical distributions of pig, sheep/goat and cattle, MH Lerna, the graves. Graves dated to the MH III and/or LH I are excluded. Data kindly provided by Reese (unpubl.).*

	Pig ( <i>Sus domesticus</i> )	Sheep/goat ( <i>Ovis aries</i> / <i>Capra hircus</i> )	Cattle ( <i>Bos taurus</i> )
Horn core	Not applicable	0	0
Cranial	2	1	2
Mandible	8	2	0
Loose teeth	4	9	5
Vertebrae	0	0	9
Ribs	0	0	0
Scapula, humerus	4	2	1
Radius, ulna	5	0	2
Carpals, metacarpals	0	1	1
Pelvic region	0	3	3
Femur, patella	0	0	0
Tibia, fibula	2	2	2
Tarsals, metatarsals	3	1	2
Metapodials, phalanges, sesamoids	1	6	2
Shaft or fragment*	0	5	28
<b>Total</b>	<b>29</b>	<b>32</b>	<b>57</b>

\* 7 of Reese's *Bos* identifications are labelled as fragments

STELLA MACHERIDIS  
Department of Archaeology and Ancient History  
Lund University  
Helgonavägen 3, 221 00 Lund  
Sweden  
[stella.macheridis@ark.lu.se](mailto:stella.macheridis@ark.lu.se)

## Bibliography

- Albarella, U, F. Manconi & A. Trentacoste 2011. 'A week on the plateau: Pig husbandry, mobility and resource exploitation in Central Sardinia', in *Ethnozooarchaeology: The past and present of human-animal relationships*, eds. U. Albarella & A. Trentacoste, Oxford & Oakville, 143–159.
- Alden, M. 2000. *Well built Mycenae*, Fasc. 7; *The prehistoric cemetery: Pre-Mycenaean and Early Mycenaean graves*, Oxford.
- Arnold, E.R. & D. Lyons 2011. 'Ethnozooarchaeology of butchering practices in the Mahas region, Sudan', in *Ethnozooarchaeology: The present and past of human-animal relationships*, eds. U. Albarella & A. Trentacoste, Oxford & Oakville, 107–119.
- Åström, P. 1977. *The Cuirass Tomb and other finds at Dendra*, Part 1: *The chamber tombs*, Göteborg.

- Bell, C. 1992. *Ritual theory, ritual practice*, Oxford.
- Blackburn, E.T. 1970. *Middle Helladic graves and burial customs with special reference to Lerna in the Argolid*, Ph.D. thesis, Cincinnati, Ann Arbor.
- Blegen, C.W. 1928. *Zygouries: A prehistoric settlement in the valley of Cleonae*. Cambridge, Massachusetts.
- Blegen, C.W. 1937. *Prosymna: The Helladic settlement preceding the Argive Heraeum*, Cambridge.
- Boessneck, J. 1969. 'Osteological differences between sheep (*Ovis aries* Linné) and goat (*Capra hircus* Linné)', in *Science in archaeology*, eds. D. Brothwell & E. Higgs, London, 336–359.
- Bradley, R. 2005. *Ritual and domestic life in prehistoric Europe*, London.
- Bulle, H. 1907. *Orchomenos I: Die älteren Ansiedlungsschichten*, München.
- Cavanaugh, W. & C. Mee 1998. *A private place: Death in prehistoric Greece* (SIMA 125), Jonsered.
- Cosmopoulos, M.B. 2015. *Bronze Age Eleusis and the origins of the Eleusinian mysteries*, New York.
- Crowley, J.L. 1995. 'Images of power in the Bronze Age Aegean', in *POLITEIA: Society and state in the Aegean Bronze Age*, eds. R. Laffineur & W-D. Niemeier (*Aegaeum* 12), Liège/Austin, 475–491.
- Day, L.P. 1984. 'Dog burials in the Greek world', *AJA* 88, 21–32.
- Dietler, M. 1996. 'Feasts and commensal politics in the political economy: Food, power and status in prehistoric Europe', in *Food and the status quest: An interdisciplinary perspective*, eds. P. Wiessner & W. Schieffelin, Providence & Oxford, 87–125.
- Dietler, M. 2001. 'Theorizing the feast: Rituals of consumption, commensal politics, and power in African contexts', in *Feasts: Archaeological and ethnographic perspectives on food, politics, and power*, eds. M. Dietler & B. Hayden, Washington & London, 65–114.
- Dietz, S. 1980. *Asine II: Results of the excavations east of the Acropolis 1970–1974. Fasc. 2: The Middle Helladic cemetery, the Middle Helladic and Early Mycenaean deposits* (ActaAth-4°, 24:2), Stockholm.
- Dietz, S. 1982. *Asine II: Results of the excavations east of the Acropolis 1970–1974. Fasc. 2. General stratigraphical analysis and architectural remains* (ActaAth-4°, 24:2), Stockholm.
- Douglas, M. 1966 (2002). *Purity and danger*, London/New York.
- Drackner, M. 2005. 'What is waste? To whom? An anthropological perspective on garbage', *Waste management & research* 23, 175–181.
- Ekengren, F. 2013. 'Contextualizing grave goods: Theoretical perspectives and methodological implications', in *The Oxford handbook of the archaeology of death and burial*, eds. S. Tarlow & L. Nilsson Stutz, Oxford, 173–192.
- Forstenpointner, G., A. Galik, G.E. Weissengruber, S. Zohmann, U. Thanheiser & W. Gauss 2010. 'Subsistence and more in Middle Bronze Age Aegina Kolonna: Patterns of husbandry, hunting and agriculture', in *Mesohelladika: The Greek Mainland in the Middle Bronze Age* (BCH Supplément 52), eds. A. Philippa-Touchais, G. Touchais, S. Voutsaki & J. Wright, Athens, 733–742.
- Frödin, O. & A.W. Persson 1938. *Asine I: Results of the Swedish excavations 1922–1930*, ed. A. Westholm, Stockholm.
- Funabiki, T. 1981. 'On pigs of the Mbotgote in Malekula', in *Vanuatu: Politics, economics and ritual in Island Melanesia*, ed. M. Allen, Sydney, 173–188.
- Gejvall, N.-G. 1969. *Lerna: A preclassical site in the Argolid*, vol. 1: *The fauna*, Princeton.
- Gifford-Gonzalez, D. 2014. 'Constructing community through refuse disposal', *African Archaeological Review* 31, 339–382.
- Gillis, C. 1996. 'Tin at Asine.' in *Asine III: Supplementary studies on the Swedish excavations 1922–1930* (ActaAth, 45:1), eds. R. Hägg, G.C. Nordquist & B. Wells, Stockholm, 94–100.
- Grayson, D.K. 1991. 'Alpine faunas from the White Mountains, California: Adaptive change in the late prehistoric great basin?', *JAS* 18, 483–506.
- Hadjikoumis, A. 2012. 'Traditional pig herding practices in southwest Iberia: Questions of scale and zooarchaeological implications', *Journal of Anthropological Archaeology* 3, 353–364.
- Hägg, I. & R. Hägg 1973. *Excavations in the Barbouna area at Asine*, Fasc. 1: *General introduction, bibliography, geological background and a report on the field-work in the Levendis sector, 1970–1972* (Boreas. Uppsala Studies in Ancient Mediterranean and Near Eastern Civilizations 4:1), Uppsala.

- Hägg, I. & R. Hägg 1975. 'Discoveries at Asine dating from the Shaft-Grave Period', *AAA* 8, 151–160.
- Hallpike, C.R. 2008. *The Konso of Ethiopia: A study of the values of a Cushitic people*, rev. ed., Central Milton Keynes.
- Halstead, P. 1996. 'Pastoralism or household herding? Problems of scale and specialization in early Greek animal husbandry', *World Archaeology* 28:1, 20–42.
- Halstead, P. & V. Isaakidou 2011. 'A pig fed by hand is worth more than two in the bush: Ethnoarchaeology of pig husbandry in Greece', in *Ethnozooarchaeology: The past and present of human-animal relationships*, eds. U. Albarella & A. Trentacoste, Oxford & Oakville, 160–174.
- Hamilakis, Y. 1996. 'A footnote on the archaeology of power: Animal bones from a Mycenaean chamber tomb at Galatas, NE Peloponnese', *The Annual of the British School at Athens* 91, 153–166.
- Hamilakis, Y. 1998. 'Eating the dead: Mortuary feasting and the politics of memory in the Aegean Bronze Age societies', in *Cemetery and society in the Aegean Bronze Age*, eds. K. Branigan, Sheffield, 115–132.
- Hamilakis, Y. 2003. 'The sacred geography of hunting: Wild animals, social power and gender in early farming societies', in *Zooarchaeology in Greece: Recent advances*, eds. E. Kotjabopoulou, Y. Hamilakis, P. Halstead, C. Gamble & P. Elefanti, London, 239–248.
- Hamilakis, Y. & E. Konsolaki 2004. 'Pigs for the gods: Burnt animal sacrifices as embodied rituals at a Mycenaean sanctuary', *Oxford Journal of Archaeology* 23:2, 131–151.
- Härke, H. 2014. 'Grave goods in early medieval burials: Messages and meanings', *Mortality* 19:1, 41–60.
- Hayden, B. 2009. 'Funeral as feasts: Why are they so important?', *Cambridge Archaeological Journal* 19, 29–52.
- Hielte-Stavropoulou, M. 2004. 'Traces of ritual in Middle Helladic funeral contexts including an assessment of geographical location', in *Celebrations: Sanctuaries and the vestiges of cult activity*, ed. M. Wedde, Bergen, 9–34.
- Hodder, I. 1982. *Symbols in action: Ethnoarchaeological studies of material culture*, Cambridge.
- Hodder, I. 1987. 'The meaning of discard: Ash and domestic space in Baringo', in *Method and theory for activity area research*, ed. S. Kent, New York, 424–448.
- Ingvarsson-Sundström, A. 2008. *Asine III: Supplementary studies on the Swedish excavations 1922–1930*, Fasc. 3: *Children lost and found* (ActaAth-4°, 45: 2), Stockholm.
- Ingvarsson-Sundström, A., S. Voutsaki & E. Milka 2013. 'Diet, health and social differentiation in Middle Helladic Asine: A bioarchaeological view', in *Diet, economy and society in the Ancient Greek world: Towards a better integration of archaeology and science*, eds. S. Voutsaki & S.M. Valamoti, Leuven, 149–162.
- Isaakidou, V., P. Halstead, J. Davis & S. Stocker 2002. 'Burnt animal sacrifice at the Mycenaean "Palace of Nestor", Pylos', *Antiquity* 76, 86–92.
- Isaksson, S. 2000. *Food and rank in Early Medieval time*, Stockholm.
- Jennbert, K. 2011. *Animals and humans: Recurrent symbiosis in archaeology and Old Norse religion*, Lund.
- Lindblom, M. 2007. 'Early Mycenaean mortuary meals at Lerna VI with special emphasis on their Aeginetan components', in *Middle Helladic pottery and synchronisms*, eds. F. Felten, W. Gauss & R. Smetana, Wien, 115–136.
- Lindblom, M. 2008. 'Funerary meals at the LH I Shaft Graves at Lerna', *Bulletin of the Institute of Classical Studies* 51, 191–192.
- Lyman, R.L. 1994. *Vertebrate taphonomy*, Cambridge.
- Lyman, R.L. 2008. *Quantitative paleozoology*, Cambridge.
- Macheridis, S. 2014. 'The pastoralism of Bronze Age Argolis: A case-study of the interdependence between agro-pastoral transformation and waste management', in *Abstracts. ICAZ 2014, 12th International Conference of Archaeozoology*, ed. A.D. Izeta, Córdoba, 99.
- Macheridis, S. 2016a. 'The use of multiple correspondence analysis (MCA) in taphonomy: The case of Middle Helladic Asine, Greece', *International Journal of Osteoarchaeology*, doi:10.1002/oa.2571.
- Macheridis, S. 2016b. 'A report on the preliminary osteological assessments of the bones from Malthi, 2016', unpublished technical report.
- MacKinnon, M. 2007. 'Osteological research in Classical Archaeology', *AJA* 111, 473–504.
- Magnell, O. 2009. 'Den urbana borgen och den lantliga staden. Djurhållning och kost i det medeltida Sölvesborg', *Ale, Historisk Tidskrift för Skåne, Halland och Blekinge* 2009:4, 20–24.



- Marciniak, A. 2005. *Placing animals in the Neolithic: Social zooarchaeology of prehistoric farming communities*, London.
- Marean, C.W., L.M. Spencer, R.J. Blumenshine & S.D. Capaldo 1991. 'Captive hyaena bone choice and destruction, the *schlepp* effect and Olduvai archaeofaunas', *JAS* 19, 101–121.
- Mayer, J.J. & I. Lehr Brisbin 1988. 'Sex identification of *Sus scrofa* based on canine morphology', *Journal of Mammology* 69:2, 408–412.
- Méry, S. & M. Tengberg 2009. 'Food for eternity? The analysis of a date offering from a 3rd millennium BC grave at Hili N, Abu Dhabi (United Arab Emirates)', *JAS* 36, 2012–2017.
- Milka, E. 2010. 'Burials upon the ruins of abandoned houses in the Middle Helladic Argolid', in *Mesohelladika: The Greek mainland in the Middle Bronze Age* (BCH Supplément 52), eds. A. Philippa-Touchais, G. Touchais, S. Voutsaki & J. Wright, Athens, 433–443.
- Moberg Nilsson, K. 1996. 'Animal bones from Terrace III in the Lower Town of Asine', in *Asine III: Supplementary Studies on the Swedish excavations 1922–1930* (ActaAth, 45:1), eds. R. Hägg, G.C. Nordquist & B. Wells, Stockholm, 111–115.
- Moore, H.L. 1982. 'The interpretation of spatial patterning in settlement residues', in *Symbolic and structural archaeology*, ed. I. Hodder, Cambridge, 74–79.
- Morris, C.E. 1990. 'In pursuit of the white tusked boar: Aspects of hunting in Mycenaean society', in *Celebrations of death and divinity in the Bronze Age Argolid. Proceedings of the Sixth International Symposium at the Swedish Institute at Athens, 11–13 June, 1988* (ActaAth-4°, 40), eds. R. Hägg & G.C. Nordquist, Stockholm, 149–156.
- Mylona, D. 2003. 'Archaeological fish remains in Greece: General trends of the research and a gazetteer of sites', in *Zooarchaeology in Greece: Recent advances*, eds. E. Kotjabopoulou, Y. Hamilakis, P. Halstead, C. Gamble & P. Elefanti, London, 193–200.
- Nicodemus, A. 2008. 'The mammal and reptile remains, 1973–1977', in *Ayios Stefanos: Excavations at a Bronze Age and Medieval settlement in southern Laconia*, eds. W.D. Taylour & R. Janko, London, 506–513.
- Nordquist, G.C. 1987. *A Middle Helladic village. Asine in the Argolid* (Boreas. Uppsala Studies in Ancient Mediterranean and Near Eastern Civilizations 16), Uppsala.
- Nordquist, G.C. 1990. 'Middle Helladic burial rites: Some speculations', in *Celebrations of death and divinity in the Bronze Age Argolid. Proceedings of the Sixth International Symposium at the Swedish Institute at Athens, 11–13 June, 1988* (ActaAth-4°, 40), eds. R. Hägg & G.C. Nordquist, Stockholm, 35–41.
- Nordquist, G.C. 1996a. 'New information on old graves', in *Asine III: Supplementary Studies on the Swedish excavations 1922–1930* (ActaAth, 45:1), eds. R. Hägg, G.C. Nordquist & B. Wells, Stockholm, 19–38.
- Nordquist, G.C. 1996b. 'Grave concordance, Asine 1922–1930', in *Asine III: Supplementary studies on the Swedish excavations 1922–1930* (ActaAth, 45:1), eds. R. Hägg, G.C. Nordquist & B. Wells, Stockholm, 117–119.
- Nordquist, G.C. 2002. 'Pots, prestige and people: Symbolic action in Middle Helladic burials', *OpAth* 27, 119–135.
- O'Connor, T.P. 1982. *Animal bones from Flaxengate, Lincoln*, London.
- Ortner, S.B. 1984. 'Theory in anthropology since the sixties', *Comparative Studies in Society and History* 26:1, 126–166.
- Pappi, E. & V. Isaakidou 2015. 'On the significance of equids in the Late Bronze Age Aegean', in *Mycenaeans up to date: The archaeology of the North-eastern Peloponnese – Current concepts and new directions* (ActaAth-4°, 56), eds. A-L. Schallin & I. Tournavitou, Stockholm, 469–481.
- Payne, S. 1973. 'Kill-off patterns in sheep and goats: The mandibles from Asvan Kale', *Anatolian Studies* 23, 281–303.
- Peres, T.M. 2010. 'Methodological issues in zooarchaeology', in *Integrating zooarchaeology and paleoethnobotany: A consideration of issues, methods, and cases*, eds. A.M. VanDerwarker & T.M. Peres, New York, 15–36.
- Persson, A.W. 1931. *The royal tombs at Dendra near Midea* (Acta Regiae Societatis humaniorum litterarum Lundensis 15), Lund.
- Pollock, S. 2003. 'Feasts, funerals, and fast food in Early Mesopotamian state', in *The archaeology and politics of food and feasting in early states and empires*, ed. T.L. Bray, New York, 17–38.
- Protonotariou-Deilaki, E. 1990a. 'The tumuli of Mycenae and Dendra', in *Celebrations of death and divinity in the Bronze Age Argolid. Proceedings of the Sixth Inter-*

- national Symposium at the Swedish Institute at Athens, 11–13 June, 1988* (ActaAth-4°, 40), eds. R. Hägg & G.C. Nordquist, Stockholm, 85–106.
- Protonotariou-Deilaki, E. 1990b. 'Burial customs and funerary rites in the prehistoric Argolid', in *Celebrations of death and divinity in the Bronze Age Argolid. Proceedings of the Sixth International Symposium at the Swedish Institute at Athens, 11–13 June, 1988* (ActaAth-4°, 40), eds. R. Hägg & G.C. Nordquist, Stockholm, 69–83.
- Prummel, W. & H.-J. Frisch 1986. 'A guide for the distinction of species, sex and body side in bones of sheep and goat', *JAS* 13, 567–577.
- Reese, D. 1995. 'Equid sacrifices/burials in Greece and Cyprus: An addendum', *Journal of Prehistoric Religion* 9, 35–42.
- Reese, D. 1998. 'Appendix II: The faunal remains', in *Excavations on the acropolis of Midea, vol. I:1. The excavation on the Lower Terraces*, ed. G. Walberg, Stockholm, 277–291.
- Reese, D. 2008a. 'Appendix 8: The mammalian and reptilian remains. Catalogue and comparanda', in *Ayios Stefanos: Excavations at a Bronze Age and Medieval settlement in southern Laconia*, eds. W.D. Taylour & R. Janko, London, 156–185.
- Reese, D. 2008b. 'Faunal remains from Late Helladic Lerna (Argolid, Greece)', *Mediterranean Archaeology & Archaeometry* 8:1, 5–25.
- Reese, D. 'Lerna animal bones and shells from graves', unpublished manuscript.
- Rudebeck, E. & S. Macheridis 2015. 'The proper way of dwelling at the Early Neolithic gathering site of Almhov in Scania, Sweden', in *Neolithic diversities: Perspectives from a conference in Lund, Sweden*, eds. K. Brink, S. Hydén, K. Jennbert, L. Larsson & D. Olausson, Lund, 173–187.
- Russell, N. 2012. *Social zooarchaeology: Humans and animals in prehistory*, New York.
- Silver, I.A. 1969. 'The ageing of domestic animals', in *Science in archaeology*, eds. D. Brothwell & E. Higgs, London, 283–302.
- Sloan, R.E. & M.A. Duncan 1974. '6: Zooarchaeology of Nichoria', in *Excavations at Nichoria in southwest Greece, vol. 1: Site, environs, and techniques*, eds. E. Rapp & S.E. Aschenbrenner, Minneapolis, 60–77.
- Soderbergh, J. 2004. 'Wild cattle: Red deer in the religious texts, iconography, and archaeology of Early Medieval Ireland', *International Journal of Historical Archaeology* 8, 167–183.
- Stiner, M.C. 1991. 'Food procurement and transport by human and non-human predators', *JAS* 18, 455–482.
- Strasser, S. 1999. *Waste and want: A social history of trash*, New York.
- Szynkiewicz, S. 1990. 'Sheep bone as a sign of human descent: Tibial symbolism among the Mongols', in *Signifying animals: Human meanings in the natural world* (One World Archaeology 16), ed. R. Willis, London.
- Theodorou-Mavrommatidi, A. 2010. 'Defining ritual action: A Middle Helladic pit at the site of Apollo Maleatas in Epidauros', in *Mesohelladika: The Greek Mainland in the Middle Bronze Age* (BCH Supplément 52), eds. A. Philippa-Touchais, G. Touchais, S. Voutsaki & J. Wright, Athens, 521–533.
- Thomas, R. & M. Lacock 2000. 'Food for the dogs? The consumption of horseflesh at Dudley Castle in the eighteenth century', *Environmental Archaeology* 5:1, 83–91.
- Trantalidou, C. 1990. 'Animals and human diet in the prehistoric Aegean', in *Thera and the Aegean world III, vol. 2: Earth sciences (Proceedings of the third international congress, Santorini, Greece 3–9 September 1989)*, Greece, 392–405.
- Turner, V. 1966. *The ritual process: Structure and anti-structure*, Ithaca & New York.
- Turner, V. 1967. *The forest of symbols: Aspects of Ndembu rituals*, Ithaca & New York.
- Twiss, K. 2012. 'The archaeology of food and social diversity', *Journal of Archaeological Research* 20:4, 357–395.
- Valmin, N.M. 1938. *The Swedish Messenia Expedition* (SkrLund 26), Lund.
- von den Driesch, A. & J. Boessneck 1990. 'Die Tierresten von der mykenischen Burg Tiryns bei Nauplion/Peloponnes', in *Tiryns: Forschungen und Berichte XI*, Mainz, 87–164.
- Voutsaki, S. 2004. 'Age and gender in the southern Greek Mainland, 2000–1500 BC', *Ethnographisch-Archäologische Zeitschrift* 45, 339–363.
- Voutsaki, S. 2010. 'Agency and personhood at the onset of the Mycenaean period', *Archaeological Dialogues* 17:1, 65–92.

- Voutsaki, S., S. Triantaphyllou, I. Ingvansson-Sundström, K. Sarri, M. Richards, A. Nijboer, S. Kouidou-Andreou, L. Kovatsi, D. Nikou & E. Milka 2007. 'Project on the Middle Helladic Argolid: A report on the 2006 season', *Pharos* 14, 59–99.
- Voutsaki, S., A. Ingvansson-Sundström & S. Dietz 2011. 'Tumuli and social status: A re-examination of the Asine tumulus', in *Ancestral landscapes: Burial mounds in the Copper and Bronze Ages*, eds. E. Borgna & S. Müller Celka, Lyon, 445–461.
- Voutsaki, S., E. Milka, S. Triantaphyllou & C. Zerner 2013. 'Middle Helladic Lerna: Diet, economy, society', in *Diet, economy and society in the ancient Greek world*, eds. S. Voutsaki & S.-M. Leuven, 133–147.
- Vretemark, M. 1997. *Från ben till boskap: Kosthåll och djurhållning med utgångspunkt i medeltida benmaterial från Skara*, del 1: *Skrifter från Länsmuséet Skara*, Skara.
- Wells, B. 1983. *Asine II: Results of the excavations east of the Acropolis*, Fasc. 4: *The Protogeometric period*, Part 1: *An analysis of the settlement*, Stockholm.
- Whittaker, H. 2010. 'Some thoughts on Middle Helladic religious beliefs and ritual and their significance in relation to social structure', in *Mesohelladika: The Greek Mainland in the Middle Bronze Age* (BCH Supplément 52), eds. A. Philippa-Touchais, G. Touchais, S. Voutsaki & J. Wright, Athens, 535–543.
- Wright, J.C. ed. 2004. *The Mycenaean feast*, Princeton.
- Yannouli, E. & C. Trantalidou 1998. 'The fallow deer (*Dama dama* Linnaeus 1758): Archaeological presence and representation', in *The Holocene history of the European vertebrate fauna: Modern aspects of research*, ed. N. Benecke, Berlin, 247–281.
- Zeder, M.A. & H.A. Lapham 2010. 'Assessing the reliability of criteria used to identify postcranial bones in sheep, *Ovis*, and goats, *Capra*', *JAS* 37, 2887–2905.